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CONTENTS

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The studies included in this volume are largely updated versions of papers presented at two Expert Meetings organized by UNCTAD's Trade Negotiations and Commercial Diplomacy Branch, Division on International Trade in Goods and Services, and Commodities (DITC) on "Energy Services in International Trade: Development Implications", held in July 2001, and on "Strengthening Capacities in Developing Countries to Develop their Environmental Services Sector", held in July 1998. The Meetings were organized by Simonetta Zarrilli, under the supervision of Murray Gibbs and David Diaz. Jolita Butkeviciene, Alberto Gabriele, Emily Mburu, Rolf Traeger, Faten Azar, Sophie Munda, Josie Maximo, Fabien Dumesnil, Aurangzeb Butt and Irene Musselli provided valuable support to this work.

Laurence Tubiana chaired the Expert Meeting on environmental services and Werner Corrales the Expert Meeting on energy services. At the time of the meetings Ms. Tubiana was a member of the Cabinet of the French Prime Minister and Ambassador Corrales was the Permanent Representative of Venezuela to the international organizations in Geneva. The excellent chairmanship provided by both of them was a major factor contributing to the success of the two meetings.

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Foreword

The papers included in this publication emerged primarily from two Expert Meetings organized by UNCTAD on "Energy Services in International Trade: Development Implications", in July 2001, and on "Strengthening Capacities in Developing Countries to Develop their Environmental Services Sector", in July 1998.

The member States of UNCTAD have made use of the mechanism of expert meetings, established at UNCTAD IX in 1996, to examine a number of service sectors, including health, tourism, air transport, construction and audiovisual services.

The meeting on energy services was a considerable success in that it attracted significant interest by exposing a variety of aspects of a sector undergoing a dramatic transformation, one which is of relevance to the economic growth and development of all countries, whether developed or developing, both energy exporters and energy importers. The sector is moreover the subject of current negotiations in the World Trade Organization (WTO).

The meeting discussed how increasing demand for investment, the introduction of new technologies and the liberalization of markets have created a new dynamism in this sector. On the other hand, it also highlighted the plight of 2 billion people in developing countries who still have no access to commercial energy sources and the impact of this lack of access on the development prospects of many countries, especially the least developed countries. The meeting also learned from the successful experiences in some energy-producing countries in developing domestic capacities in the energy services sector as a central element in their development strategies.

Energy issues form part of current and forthcoming trade negotiations, whether those on the accession to the WTO, the new

Work Programme launched at Doha in November 2001, or regional and subregional trade agreements. The current negotiations on energy services mark the first time that energy issues have been formally negotiated within the GATT/WTO framework of multilateral trade rights and obligations. However, the implications of the Doha agenda for energy policies as part of a development strategy transcend the General Agreement on Trade in Services (GATS): the negotiations in such areas as subsidies and countervailing measures, anti-dumping, trade and environment, market access, investment and competition policy are all relevant for energy policies. Energy is also a major element in the current negotiations on accession to the WTO, since non-members of the WTO account for almost half of world petroleum exports and a considerably greater proportion of energy reserves.

The Expert Meeting on environmental services was one of the first intergovernmental gatherings devoted to this emerging services sector. As was the case for energy services, during the multilateral trade negotiations of the Uruguay Round limited attention was paid to the environmental services sector, considering that little international trade was taking place in the sector at that time: Governments were providing most environmental services, and private operators were not allowed or not willing to enter the market. During the Round, negotiations and classification efforts concentrated on those services that offered immediate prospects for international trade. Sectors like environment and energy, which did not at the time appear to be particularly promising candidates for liberalization, were neglected.

The situation for environmental services, however, has changed significantly since the end of the Uruguay Round. The sector went through deregulation and privatization and is now offering lucrative business opportunities for the private sector. The environmental industry experienced dramatic growth in industrialized countries during the 1980s and most of the 1990s, reaching US$ 522 billion in revenues in 2000. Efforts are taking place within the ongoing services negotiations to draw up a better classification of the sector so as to reflect both the way in which business operates at present and the shifting emphasis from end-of-pipe pollution control to prevention.

However, demand for environmental services in developed countries has levelled off as the regulation-driven demand has been satisfied through compliance with the established norms. On the other hand, the environmental problems that populations, especially in developing countries, experience remain extremely serious. The rapidly growing urban population in developing countries has generated a mounting demand for drinking water that has outstripped its supply. Access to safe water is particularly problematic in Africa, where more than 300 million people lack adequate access. The large majority of cities of one or less than one million inhabitants of Africa and Asia have no sewerage system at all. Solid waste management, or the absence of it, is an increasingly dramatic problem in developing countries. Air pollution has been another steadily growing problem in developing countries, resulting from urban expansion, rapid industrialization, increased road traffic and rising energy consumption. As was highlighted at the Expert Meeting, efforts should be made to link the growing business opportunities which resulted from the reform of the environmental sector and are emerging from the Doha Work Programme – including its call for further liberalization of trade in environmental goods and services – to the fulfilment of people's basic environmental needs, especially in developing countries. A gap exists in developing countries between their environmental needs and the resources available to satisfy them. International cooperation and financing are key factors in enabling developing countries to address their most pressing environmental problems.

The energy and environmental services sectors therefore have several features in common: both sectors underwent structural reform in the last decade and are now open to private operators, both need a more appropriate classification within the GATS, both have attracted considerable attention in the ongoing multilateral services negotiations, both imply considerable investments which make the issue of ownership and control particularly relevant, and for both the issue of public services is crucial. However, the most important feature they share is the fact that limited access to commercial energy, safe water, sewerage and waste-collection systems has an adverse

effect on public health and the environment, hampers the economic growth of countries and ultimately impedes sustainable development. This is why we decided to include in the same volume the results of the two expert meetings.

Rubens Ricupero
Secretary-General of UNCTAD

Chapter I

Energy Services

ENERGY SERVICES, ENERGY POLICIES AND THE DOHA AGENDA

Murray Gibbs[*]

Introduction

The Expert Meeting on Energy Services in International Trade: Development Implications, held in July 2001, was one of the most successful of the many meetings on services trade issues held in the series of such Expert Meetings in UNCTAD. The Expert Meeting mechanism had been introduced into UNCTAD at the Ninth Conference, held in Midrand, South Africa, in 1996, as a technique for examining specific technical aspects of the broader issues included in UNCTAD's mandate. In the area of trade, trade in services has attracted the greatest interest on the part of member States, which have instructed the secretariat to organize Expert Meetings on health services, tourism services, air transport, environmental services, construction services, energy services and audiovisuals. The energy services meeting created considerable interest and led to a decision that UNCTAD should carry out further work in this area. The high degree of international interest in this meeting was clearly related to the fact that a number of proposals relating to the liberalization of the energy services sector had been submitted in the GATS negotiations. Most of these proposals suggest a reclassification of various sub-sectors in the key GATS document W/120 in order to define a coherent energy services sector that would enable the negotiators to address the overall "problematique" of trade and investment in energy services.

This approach would constitute one of the first major initiatives to address energy issues in the context of the multilateral trading system. Against that background, this chapter recalls the history of the

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treatment of energy issues in the General Agreement on Tariffs and Trade (GATT) and the World Trade Organization (WTO), and in other trade agreements. It summarizes the main issues arising in the negotiations on energy services, drawing upon the presentations made at the Expert Meeting and related studies. It also explores other areas on what can be termed the "trade/energy interface" in the context of the trading system, and in particular the trade agenda agreed upon at the Fourth WTO Ministerial Conference, held in Doha in November 2001.

1. Energy issues in GATT

Petroleum-producing developing countries did not see any point in becoming contracting parties to the GATT; those that did acceded under Article XXVI (i.e. without negotiations). Issues related to petroleum and energy were not discussed in the GATT forum. It is said that a "gentleman's agreement" existed among the major trading countries not to discuss petroleum issues in the GATT, for fear that the strategic nature of petroleum trade and the importance of security concerns in respect of petroleum products would "politicize" the debate. Security considerations greatly influenced trade policy in the energy sector; for example, the United States decided to leave its tariff on crude petroleum unbound in its tariff schedule.

In any case, it was only immediately before and during the Uruguay Round that petroleum-exporting developing countries began to accede to GATT. At present, six members of the Organization of the Petroleum Exporting Countries (OPEC) are also members of the WTO, while four others are seeking accession. However, many other non-OPEC petroleum-producing countries, mainly former republics of the USSR, are also in the process of accession. The implications of the accession negotiations will be discussed below. Until the initiation of the current negotiations on energy services, petroleum-related issues arose in the GATT and WTO primarily in the context of three disputes, and in each case the measure in question was linked to environmental protection.

2. Negotiations on energy services: Main issues

Classification of energy services

Energy issues are being addressed in the WTO within the framework of the current negotiations under the General Agreement on Trade in Services (GATS). Negotiating proposals relating to the energy services sector have been submitted by the European Union, the United States, Canada, Norway, Japan, Chile and Venezuela. These proposals provided the background to the debate in the Expert Meeting, and are described in this volume by the experts who participated.

Most of the proposals draw attention to the fact that the GATS classification does not define an energy service sector. The few commitments on market access or national treatment included in the GATS schedules are inscribed as "services incidental to mining rendered on a fee or contract basis at oil and gas fields", "transportation via pipeline of crude or refined petroleum and petroleum products and of natural gas", or "services incidental to energy distribution", reflecting what can be described as the upstream, transportation/transmission and downstream segments of the energy value-added chain. Most of the negotiating proposals define the scope of the energy services sector as covering the whole chain of energy activities, and suggest new classifications. For example, Norway specified this as covering resource identification, production, transmission, transportation, and distribution, sales and marketing. Other proposals cover only the upstream (Canada) or downstream (Chile) segments. There is an attempt to include both "core" and "non-core" services. The paper by Jasmin Tacoa-Vielma summarizes the discussions in the GATS context on classification of energy services, at the time of the Expert Meeting. Subsequently, there were more intensive discussions to define the energy services sector and its sub-categories on the basis of "commercial realities". This has produced proposals for a breakdown of the sector into the following categories: geological exploration; drilling and completion of oil and gas wells; oil- and gas-production-related services; design and construction of facilities to produce, transform and supply energy; operation,

management and maintenance of energy facilities and of energy networks, including transportation, transmission and distribution of energy; environmental services for the energy industry; wholesale marketing of energy; and retail supply of energy. As pointed out by Christopher Melly, these requests for an improved classification originate from the concern of industry representatives that because energy services are ill-defined it is unclear whether specific commitments to accord market access and national treatment apply to their activities.

The main thrust of these proposals is to obtain commitments to liberalize trade and investment in this sector, it being recognized that to achieve effective access additional commitments going beyond those on market access/national treatment may be necessary. One proposal would link any liberalization by developing countries to transfer of technology and access to networks, as a means of effectively implementing Articles IV and XIX of the GATS, which aim at increasing the participation of developing countries in world trade in services. These proposals are all careful to state that the ownership of natural resources is not intended to be put in question. However, access to and control of energy services, such as exploration, extraction, transport, transmission, trading and marketing, would seem to be paramount for access to and control of energy itself.

Access for upstream services

It emerged from the discussion that the trade and development issues at stake differ considerably as to whether the upstream, transmission or downstream segments of the sector are being addressed. The proposals submitted in the GATS negotiations all aim at the liberalization of the "upstream" services sector, what Canada has termed the oil and gas sector,[1] or what Carlos Añez has termed the

[1] WTO, Communication from Canada. Initial Negotiating Proposal on Oil and Gas Services, S/CSS/W/58, 14 March 2001.

"oilfield services business".[2] These include services linked to the exploration for, and extraction and transmission of, energy, basically oil and gas, and the various associated services, including geological exploration, drilling, well testing and wireline services, completion and cementing services, and production services.

The overall result has been to strikingly illustrate that the impact of commitments in the energy services sector could have major strategic implications. The pursuit of commitments on trade and investment in the GATS negotiations on energy services has been specifically listed as one of the major elements in the recommendations of the National Energy Policy Development Group for a new national energy policy of the United States. Strategic considerations apart, the trade potential of the sector is impressive. This arises from the need for dramatic new investments to ensure adequate oil and gas production to meet expected demand over the next 20 years. In his article, Ramón Espinasa[3] extrapolates from his model, developed for the Western Hemisphere, that the investment required to increase world production by 45 million barrels per day would lead to a demand for related energy services worth over US$ 12 billion per year for only those related to the initial investment, not taking into account the services used in the daily production and export of petroleum and refined products, natural gas and hydroelectric power.

As pointed out by Craig VanGrasstek,[4] United States energy policy encourages investment in the production of oil and gas in each of the three main oil and gas "provinces", namely the Caribbean, the Middle East and Central Asia, even though the output may never be exported to the United States: this has a strategic motivation to increase the security of supply of energy by increasing the production of petroleum

[2] See C. Añez, "The trade of technical services for oil and gas exploration and production: Observations by an old Venezuelan contractor", in this volume.

[3] See R. Espinasa, "Oil trade and economic growth: The case of the Western Hemisphere", in this volume.

[4] See C. VanGrasstek, "United States energy trade policy: The consequences of a pivotal year", in this volume.

worldwide, while simultaneously reducing the political leverage of any individual or group of energy exporters and creating markets for United States exports of energy-related services and goods. This strategy is accompanied by actions aimed at obtaining a greater legal claim to energy resources and markets through trade agreements, the main example being the North American Free Trade Agreement (NAFTA), and potentially the Free Trade Area of the Americas (FTAA) and other regional agreements as well as the WTO. Thus the stakes are indeed high in the negotiations in these sub-sectors, as are the value of concessions by the energy-producing countries.

Some energy-producing countries have been able to follow successful strategies aimed at fostering a strong energy services sector, one with forward and backward linkages in the economy around the extraction and export of petroleum and natural gas. The model presented in the article by Ramón Espinasa[5] highlights the potential multiplier effect in the economy of the domestic production of energy services and related goods and labour. The relative impact on the economy depends, of course, on the size of the energy sector in the overall economy. Against this theoretical background, the presentations by Venezuelan experts illustrated Venezuela's successful experience in developing a strong energy services sector, with interlinkages to the rest of the economy. The Venezuelan strategy was designed to ensure the participation of domestic service firms along the entire energy supply chain, to promote downstream industrialization, to encourage the penetration of foreign markets by domestic energy services companies and to stimulate efficient access to energy throughout society. This strategy was reflected in the proposals submitted by Venezuela in the GATS negotiations.[6]

The Venezuelan proposal would seek additional commitments aimed at implementing GATS Articles IV and XIX:2 in the energy

[5] See R. Espinasa, "Oil trade and economic growth: The case of the Western Hemisphere", in this volume.

[6] WTO, Communication from Venezuela. Negotiating Proposal on Energy Services, S/CSS/W/69, 29 March 2001; and Negotiating Proposal on Energy Services - Addendum, S/CSS/W/69/Add.1, 15 October 2001.

services sector, so as to permit developing countries to execute policies aimed at maximizing the multiplier effect of the energy sector. At the same time, it would ensure access to the networks and distribution channels of the major oil companies, so as to enable enterprises in developing countries to provide their services on a global basis. The objective would be to modify the "North-South" aspect of energy trade which was noted in several presentations, in that the developing countries (and countries in transition to a market economy) supply the crude oil and natural gas, while the related energy services, goods and technologies originate almost exclusively in developed countries. To an ever greater extent these services are provided by specialized firms whose services are contracted by the major oil companies that have gradually dismantled their corresponding technical departments, i.e. the phenomenon of the "externalization" of services. These services suppliers must cope with a market characterized by dramatic fluctuations in demand, in terms of both overall world demand and geographical regions. Thus, they must be capable of supplying a variety of services anywhere in the world, at any time.

Transmission and transit issues

A second segment of the energy service market relates to the transmission of energy, both within and across national borders. This gives rise to two types of barriers, those relating to access to networks (i.e. third-party access or TPA) and those relating to transit across national frontiers. Several of the negotiating proposals – notably those by the United States and Norway – suggest that in this respect the energy sector gives rise to interconnectivity issues similar to those of the telecommunications sector. That is, it is generally impractical to construct competing pipelines or grids and effective access to markets requires additional commitments to ensure equitable access to these distribution channels. As Thomas Wälde puts it:

> "Liberalization of cross-border energy (in particular electricity and gas) trade is not possible without an effective system of providing standardized, easily managed and predictable access to energy networks… The transport system is the stranglehold.

> Control over it makes it possible to fill it – and thus to claim lack of capacity, charge excessive transport fees, and obtain information that allows the undercutting of new competitors and provides a method to delay and obstruct access by long negotiations, litigation and manipulation of price, terms and technical conditions. Third-party access (TPA) is hence an essential condition for creating competitive national energy markets and competitive cross-border energy markets."[7]

Wälde's views are reflected in several proposals that the "Reference Paper" model of the Telecommunications Protocol be adopted in the energy services sector, so as to ensure equitable third party access and to address issues of cross-border transit. As described in Prof. Wälde's paper, efforts are under way to negotiate a transit protocol under the Energy Charter Treaty, based on its Article 7 (which in turn is based on Article V of GATT), which would address the more specific problems that arise in the cross-border transit of energy.

The presentations by experts draw attention to new phenomena that are transforming the energy sector, namely the break-up of monopolies in the electricity and natural gas sectors, the privatization of State-owned energy firms and the general liberalization of national energy markets. Christopher Melly's paper and the document submitted by the United States International Trade Commission (USITC) provide an overview of the evolution of this process.[8] It has created new opportunities for trade in energy with respect to four segments of the downstream energy market – generation of electricity, transmission, distribution and retail supply – and the creation of a new segment: electric power trading.[9] As stressed by

[7] See T. Wälde and A. J. Gunst, "International energy trade and access to energy networks", in this volume.

[8] See C. Melly, "Electric power and gas market reform and international trade in energy services", in this volume.

[9] United States International Trade Commission, "Electric power services: Recent reforms in selected foreign markets", Inv. No. 332-411, publication no. 3370, November 2000.

Norman Anderson,[10] the liberalization and privatization of State monopolies, increasing energy demand and the introduction of new technologies that have dramatically reduced minimum efficient scale – the ingredients that led to the boom in the telecommunications sector – will lead to an equally dramatic transformation of the energy sector. Recognition of the contribution that liberalized energy markets can make to the efficiency of the economy has given rise to the political process described in the USITC document. The representatives of the European Communities have continually stressed the positive experiences in opening the energy sector to competition; the acceptance of this objective by all member States was the main theme of the Barcelona Summit of the European Union, held in March 2002.

Negotiating proposals aim at achieving access to those liberalized markets and eliminating monopolies, or at least reducing the scope for residual monopoly power to frustrate competition. This is also the objective of penetrating the new markets for "energy trading". Again, the "problematique" would seem to extend beyond what can be addressed by market access and national treatment commitments. In addition to dealing with the interconnectivity aspects mentioned above, there are proposals for additional commitments to govern anti-competitive behaviour, specific rules concerning the regulation of the energy sector and in particular the independence of the regulatory authority. It was proposed that the Reference Paper could go beyond the interconnectivity issue and include additional commitments to ensure the transparency of the formulation, promulgation and implementation of rules, regulations and technical standards. It could also oblige members to maintain appropriate measures for preventing certain anti-competitive practices. These would build on the existing provisions of Articles VII and IX of GATS.

The Barcelona Summit mentioned above addressed these issues at the level of the European Union, urging the adoption of such measures

[10] See N. Anderson, "Technology revolution and the new industry structure of the energy sector: Opportunities for developing countries", presentation made at the UNCTAD Expert Meeting on Energy Services in International Trade: Development Implications, July 2001.

as freedom of choice of supplier for all European non-households for electricity and gas, separation of transmission and distribution from production and supply, non-discriminatory access to the network for consumers and producers, and a tariff-setting system for cross-border transactions in electricity. It also called for a decision on the definition of public service obligations, security of supply and the protection of remote areas and of the most vulnerable groups in the population.

Thus, as was the case with other services sectors examined in UNCTAD's Expert Meetings, it is clear that there are sectoral specificities that have to be addressed if effective liberalization is to take place and particularly if the provisions in favour of developing countries in Article IV and XIX:2 are to be fully implemented.[11] It should be noted in this context that the proposals for additional commitments, through a Reference Paper or otherwise, involve two considerably different approaches. The telecommunications Reference Paper involved the acceptance, by those countries inscribing market access or national treatment commitments in their schedules, of additional commitments, reflecting the interconnectivity peculiarity of telecommunications, to ensure that these commitments provided effective access for foreign suppliers. A similar approach is being proposed, for example by Prof. Wälde, to deal with comparable phenomena in the energy sector. Other proposals would also involve additional commitments by countries making market access or national treatment commitments on energy services, namely those on the transparency and independence of the preparatory process, on possible commitments with respect to action against anti-competitive practices or on government procurement.

However, the effective implementation of GATS Article IV – through the application of Article XIX:2, which specifies that developing countries, when making access to their markets available

[11] These were explained in J. Butkeviciene, D. Diaz Benavides and M. Tortora in "Services performance in developing countries: Elements of an assessment", UNCTAD paper presented to the WTO Symposium on Assessment of Trade in Services, 14-15 March 2002.

to foreign service suppliers, may attach to such access conditions aimed at achieving the objectives referred to in Article IV – would entail a somewhat different mechanism. In such a case, the additional commitments would be accepted by the countries benefiting from the market access or national treatment commitments, or would be imposed on the firms and individuals so benefiting. Alternatively, an annex could be drawn up reaffirming the rights of developing countries under Article XIX with specific details as to how these would be applied in practice in the energy service sector. It could also set out sector-specific obligations applying to both the exporting and the importing countries for the application of the general provisions on monopolies and exclusive service suppliers, (Article VIII), business practices (Article X) and subsidies (Article XV).

In this context, the fact that the GATS negotiations are also addressing horizontal issues should be recalled. In particular, the negotiation of an Emergency Safeguard Mechanism would have particular implications for the energy services sector, for example to deal with situations where foreign suppliers gained an inordinate share of liberalized energy markets.

3. Access to energy

Presentations at the Expert Meeting dramatically demonstrated the plight of energy-poor developing countries. While in developed countries the energy sector has achieved a new dynamism for the reasons mentioned above, as pointed out by Dr. Naidu, over 2 billion people have no access to commercial energy.[12] This not only reduces the ability of a country to compete in international trade, but also has social and health implications. For example, in India about 90 per cent of rural households use firewood, chips and dung cakes as a primary source of energy for cooking. As pointed out by Léonidas Ndayishimiye, the energy balance in Burundi is dominated by traditional sources, such as wood and vegetal residues. Electricity

[12] See B.S.K. Naidu, "Energy services: Implications for India", in this volume.

represents only 0.6 per cent of the final energy balance, and the electrification rate is just 2 per cent.[13]

It should be noted that the World Energy Assessment prepared by the United Nations Development Programme, the United Nations Department of Economic and Social Affairs and the World Energy Council, states in its preface that:

> "We cannot simply ignore the energy needs of the 2 billion people who have no means of escaping continuing cycles of poverty and deprivation. Nor will the local, regional and global environmental problems go away on their own. Other challenges confront us as well: the high prices for energy supplies in many countries, the vulnerability to interruptions in supply and the need for more energy services to support continued development. The World Energy Assessment affirms that solutions to these urgent problems are possible and that the future is much more a matter of choice than of destiny".[14]

4. Energy issues in the Doha agenda

As noted above, the GATS negotiations on energy services are the first attempt to directly address aspects of energy polices with a view to bringing them within the disciplines of the multilateral trading system. However, many of the WTO rules, including those which could be clarified or negotiated in the Doha round, directly impinge upon energy policies. During the Uruguay Round, attempts were made to devise rules that would have considerably restricted the scope of action for energy exporting countries.[15] The WTO rules concerning export restrictions on exhaustible natural resources and the freedom to

[13] See L. Ndayishimiye, "Energy services: Implications for the Economic Community of the Great Lakes Countries", in this volume.
[14] UNDP, UNDESA and WEC, *Energy and the Challenge of Sustainability***,** New York, 2000, p. iii.
[15] See UNCTAD, *Trade Agreements, Petroleum and Energy Policies*, UNCTAD/ITCD/TSB/9, United Nations, New York and Geneva, 2000, chapter 1.

impose export taxes enable petroleum-producing countries to control production and exports and to maintain energy prices for domestic consumers and producers at levels lower than those of world prices. Such “dual prices” do not in themselves conflict with WTO rules if they are generally available. However, the provision by the Government of low-priced energy to industries on the basis of export performance would be considered a prohibited export subsidy. If such low-priced energy was made available to selected industries, this would fall into the category of "specific" subsidies and thus be "actionable", in the sense that downstream products could be subject to countervailing duties if it could be established that such "subsidy" caused injury to producers in other countries. Some countries have used anti-dumping legislation and the WTO rules on State trading to undermine the advantage of energy-producing countries. It is important that artificial calculations of energy costs are not used to inflate anti-dumping duties, and that State-owned energy companies are not inhibited from playing an active role in the development process.

The negotiations on WTO *Rules* will aim at clarifying and improving disciplines under the Agreements on Subsidies and Countervailing Measures and on Anti-Dumping, precisely those instruments which could have the greatest potential impact on energy policies. Energy costs have been used in anti-dumping cases, for example, and the possibility of unfavourable interpretations of the specificity concept in the subsidies context cannot be ruled out.[16] The requests made to energy-exporting countries acceding to the WTO and the positions taken in the accession negotiations by some energy-importing countries would suggest that there may be initiatives – as in the Uruguay Round – to tighten the rules so as to constrict the scope of energy-exporting countries to use their resources to promote their industrialization and competitiveness. On the other hand, this could provide an opportunity to clarify the rules in order to preclude the

[16] See, for example, Council Regulation EC No 950/2001 of 14 May 2001 imposing a definitive anti-dumping duty on imports of certain aluminum foil originating in the People’s Republic of China and Russia.

harassment of energy-producing countries so as to consolidate their freedom of action for their energy policies.

The negotiations on *market access for non-agricultural products* will aim at eliminating or reducing tariffs and non-tariff barriers. Energy-producing countries could use these negotiations to pursue some of their traditional objectives, such as obtaining free and secure access for their energy and downstream energy products. Multilateral trade negotiations can provide an opportunity for petroleum-producing countries to seek improved market access for petroleum and chemical products and to obtain reciprocity for any liberalization of the markets for goods and services. Those countries could also press for the elimination of the discrimination against petroleum as opposed to other energy sources, and obtain bindings of tariffs on crude petroleum as well as the reduction of internal taxes on gasoline. It is notable that in 1998 fuel taxes yielded a revenue of US$ 358 billion in the G7 countries, almost twice that earned by OPEC members from their exports of petroleum.

The Doha Ministerial Declaration mandates negotiations on certain aspects of *trade and environment*, including the relationship between the rules and procedures of the multilateral environmental agreements (MEAs) and the WTO. Only 20 of the approximately 200 treaties for the protection of the global environment and conservation of natural resources contain trade provisions – for example, they envisage the possibility of limiting trade through, *inter alia*, bans, quotas and notifications – for the effective achievement of their environmental goals. The MEA of greatest interest to energy-exporting countries is the Kyoto Protocol, which does not contain such trade provisions.[17] However, measures that countries may take to implement the Protocol, such as the introduction of energy efficiency standards,

[17] The Kyoto Protocol was adopted in December 1997 at the Third Conference of the Parties to the United Nations Framework Convention on Climate Change. The Parties agreed to reduce their overall emissions of six greenhouses gases by at least 5 per cent below 1990 levels between 2008 and 2012. The Protocol also establishes emission trading between countries and a range of other flexible mechanisms as valid tools for achieving reductions.

energy taxes, subsidies, or the use of specific environmentally sound technologies, eco-labels, and government procurement policies, could have significant trade implications. The manner in which Governments allocate emission allowances will affect the international competitiveness of their industrial sectors. Some of these actions could be challenged because of their possible inconsistency with specific WTO agreements, such as the Agreement on Subsidies or the Agreement on Technical Barriers to Trade, and there may be initiatives to modify these agreements. Furthermore, the implementation of the Protocol will create new markets for specific goods (e.g. energy-efficient goods) and services (e.g. services related to the trading of emissions rights), for which market access will be negotiated under GATT and GATS.

As noted above, energy-related issues were the subject of three disputes in the GATT and WTO. In each case an environmental measure was being challenged on the ground that it was inconsistent with either the unconditional most-favoured-nation (MFN) or national treatment obligations. It is notable that the first case brought before the WTO dispute settlement body involved a successful challenge by an OPEC member country, Venezuela, to discriminatory measures against its exports of gasoline. Resort to the dispute settlement mechanism may prove particularly necessary in the future, given the possibility that environmental protection measures will again be used for protectionist motives. The negotiations in this area should provide more specificity to ensure that such discrimination can be easily challenged. In particular, they could ensure that environmental taxes and subsidies are applied in an equitable manner and do not discriminate against imported energy products that are “like” domestic energy products or “directly competitive or substitutable products”.

The mandate on trade and environment from the Doha Ministerial Conference gives priority to the “reduction, or as appropriate elimination of tariff and non-tariff barriers to environmental goods and services”. Environmental services were the subject of another UNCTAD Expert Meeting, and certain studies presented to that meeting are included in the second part of this volume. The energy

sector is a major cause of environmental degradation, and "environmental insults".[18] The services to deal with this can be classified under either sector. For example, the evolving classification of energy services includes the sub-category of "environmental-related services for the energy industry", encompassing such services as decommissioning of energy facilities and networks, remediation of contaminated areas and facilities, handling, treatment and disposal of waste from energy facilities, and pollution control and monitoring services. Furthermore, some of the "non-core" services, such as construction, may be the same for both sectors. It is worth noting that there are also proposals to reclassify the environmental services sector in the GATS. As indicated in the paper by Dale Andrew, certain categories of services in the proposed new classifications deal directly with energy management, such as reduction of energy and heat losses.[19]

The market for environmental services is a function of regulation in the sense that the laws and regulations aimed at protecting the environment create the demand for environmental services. However, the demand for such services is also related to the process of privatization and liberalization when private firms are called in to provide essential public services such as water supply, which in most countries has traditionally been the exclusive domain of the public sector. The paper by Grant Ferrier describes the structure of the environmental service sector and illustrates the tremendous potential demand for environmental services in developing countries.[20]

In *agriculture* (like services) negotiations have been under way in the WTO for over two years. The negotiations are focusing on how to

[18] See J. Holdren and K. Smith, "Energy, environment and health", in UNDP, UNDESA and WEC, op. cit.

[19] See D. Andrew, "Modernizing the list of environmental services: OECD proposals", in this volume.

[20] See P. Bifani, "Environmental needs in developing countries and the environmental industry", mimeo, 2002. See also G. Ferrier, "The environmental industry and the prospects for building capacity in developing countries", in this volume.

make the Agreement on Agriculture more consistent with the needs and realities of the agricultural sectors of developing countries. Most petroleum economies have been characterized by a weak agricultural sector, often resulting in social tensions, and an excessive dependence on imports. Energy-producing countries would seem to have an interest in participating actively to ensure that any outcome, such as a "development box", takes full account of their concerns.

Negotiations will begin at the 5th WTO Ministerial Conference in the areas of *government procurement*, investment and competition, providing acceptable modalities can be agreed upon. The negotiations on transparency in government procurement could also be of relevance given the importance of the purchases of goods and services by State-owned energy companies for their own use. As noted above, it has been suggested that additional commitments in the energy services sector could include commitments on government procurement.

A possible multilateral framework on *investment* could have major implications for petroleum-producing countries given that these countries would wish to retain control of the exploitation of their natural resources. In some countries foreign investment in the petroleum sector is prohibited by the Constitution. The investment negotiations might also aim at imposing further limitations on investment performance requirements, thus reducing the policy space available to developing countries. This would create considerable confusion in that the GATS permits, and could even be said to encourage, under its Article XIX, performance requirements. How multilateral rules on investment would coexist with GATS is a question that will have to be addressed if negotiations are to proceed in this area.

While any agreement on *competition policy* could be expected to focus on private practices, there would always be pressure to use competition rules to challenge OPEC. In fact, there has already been some debate in the United States Congress as to the possibility of

challenging the OPEC "cartel" in the WTO.[21] As has been noted above, many of the proposals on energy services envisage separate, sector-specific obligations on anti-competitive practices, which would go beyond the provisions of GATS Article IX.

5. Accession issues

The position of developing and transition economy energy producers in the WTO is substantially weakened by the fact that many of them are not members, and thus find themselves in a difficult situation as regards effectively defending their interests in that organization. Currently, two OPEC countries – Algeria and Saudi Arabia – are in the process of accession to the WTO, while two others are seeking accession but have not begun the accession process, namely the Islamic Republic of Iran and the Libya Arab Jamahiriya. Major energy producers among the former republics of the USSR, notably the Russian Federation, Kazakhstan and Azerbaijan, are also negotiating accession, as are other developing energy exporters such as Federation, Viet Nam, Sudan and Yemen.

Countries seeking to become members of the WTO and other non-members account for almost 50 per cent of world petroleum exports, and a greater share of petroleum and natural gas reserves. In fact, taken as a whole, the current accession negotiations could be seen as a negotiation between importers and exporters (or potential exporters) of energy. Energy issues are thus being negotiated in the WTO accession process.[22] Some acceding countries have been required to fully liberalize their energy services sector. These accession negotiations are being used by some major WTO member countries to obtain commitments from acceding countries (e.g. Algeria, Saudi Arabia and the Russian Federation) that extend beyond WTO

[21] See colloquy of the House of Representatives, 22 May 2001.

[22] The terms of accession of countries having recently acceded to the WTO, as well as the issues facing those in the process of accession, including energy-exporting countries, are analysed in the UNCTAD publication *WTO Accessions and Development Policies*, UNCTAD/DITC/TNCD/11, United Nations, New York and Geneva, 2001.

obligations, notably with respect to aspects of their domestic energy policies, such as dual price systems and export taxes.

"Precedent-setting", under which certain principles or "agreed interpretations" of rules are first negotiated in the framework of regional or bilateral agreements and subsequently introduced into the multilateral arena, has traditionally constituted a central element of strategy in international trade negotiations. The NAFTA Agreement, for instance, contains certain "affirmations" and "agreed understandings" of GATT Articles, for example with respect to the prohibition of minimum and maximum export requirements, which would seem to be contrary to GATT rules and practices.[23] Acceding countries have been asked to accept "interpretations" of various GATT Article (e.g. Article XVII on State Trading Enterprises) that would not only restrict the scope of their energy polices, but also provide a precedent that could be used in other accession negotiations, as well as in the multilateral trade round.

The WTO accession negotiations, where the acceding country is in a particularly vulnerable position, provide ample opportunity for the application of this strategy. As noted above, already some acceding countries are being requested to accept commitments that could have implications for the position of all energy-producing countries in the multilateral trade negotiations. It is essential that the acceding countries make full use of their ability to participate in the negotiations as provided in paragraph 48 of the Doha Declaration. Active participation in the negotiations on WTO rules or on trade and environment, for example, could serve to counterbalance pressure in the accession negotiations to accept obligations that exceed WTO obligations or conflict with WTO rights.

Conclusion

In conclusion, energy issues are now fully on the agenda of the multilateral trade negotiations. The implications of the energy services negotiations transcend GATS and can be seen as part of an overall

[23] See UNCTAD, op. cit., chapter 2.

negotiation on energy that has implications for the energy policies of all countries, particularly those that seek to build a development strategy upon their energy resources. As is pointed out in the World Energy Assessment, "the energy sector should never be analyzed in isolation. It is not sufficient to consider only how energy is supplied, the analysis must include how and for what purposes energy is used".[24] All countries, developed and developing, energy exporters and energy importers, will have to examine the possible implications for their energy policies, and the impact of these policies on their overall competitive position in international trade, with respect to each item of the negotiating agenda agreed at Doha.

[24] UNDP, UNDESA and WEC, op.cit., note 14.

INTERNATIONAL TRADE IN ENERGY SERVICES AND THE DEVELOPING COUNTRIES

Simonetta Zarrilli*

Introduction

Energy determines the quality of our daily lives and is one of the most important drivers of economic development. The provision of adequate, affordable energy is essential for eradicating poverty, improving human welfare and raising living standards worldwide. Access to energy, however, varies dramatically between countries and regions. Around one billion people in the industrialized countries consume nearly 60 per cent of the total energy supply, whereas the five billion people living in developing countries consume the remaining 40 per cent. At least two billion people, mainly in the rural areas of poor countries, lack access to electricity, but the real number may be considerably higher. In some African countries the electrification rate is as low as 2-3 per cent. The use of inferior fuels – for example charcoal, crop residues and cow dung – usually in ways that are damaging to both human health and the environment, may account for around a quarter of the world's total energy consumption and three quarters of all energy used by households in developing countries. According to the World Bank,[1] the urban areas of China lose some 20 per cent of potential economic output because of the effect on human health of dirty energy use. In India, indoor air pollution from dirty fuels causes as many as two million premature deaths a year, particularly among women and girls, who do most of the cooking. The lack of access to modern and sustainable energy is a

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[1] Quoted in *The Economist*, "Power to the poor", A Survey of Energy, 10 February 2000, pp. 17-19.

major cause of environmental degradation in vast areas of the developing world, and a major impediment to sustainable development.

According to the World Energy Assessment,[2] the current energy system is not sufficiently reliable or affordable to support widespread economic growth. The productivity of one third of the world's people is compromised by lack of access to commercial energy, and perhaps another third suffers economic hardship and insecurity due to unreliable energy supplies. Energy is essential for providing sustainable economic growth: efficient and reliable access to energy is a precondition for industrial development and for attracting foreign investment. Developing countries will not be able to address their supply-side shortcomings in production unless secure access to energy is guaranteed. The importance of energy as a precondition for economic growth is increasing as a consequence of the digital revolution.

Energy is most likely the biggest business in the world economy, with a turnover of at least US$ 1.7-2 trillion a year.[3] The World Energy Council estimates that global investment in energy between 1990 and 2020 will total some US$ 30 trillion at 1992 prices.[4] However, until quite recently, Governments worldwide have considered the sector too crucial to be left to market forces. At present, countries in all regions are unbundling vertically integrated utilities previously engaged in whole interrelated chain of energy activities and are often concurrently transferring ownership/management of formerly State-owned energy facilities to the private sector.

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[2] United Nations Development Programme, United Nations Department of Economic and Social Affairs, World Energy Council, *World Energy Assessment: Energy and the Challenge of Sustainability*, New York, 2000, p. 3.

[3] *The Economist*, "The slumbering giants awake", A Survey of Energy, *supra*, footnote 1, pp. 6-7.

[4] Ibid.

INTERNATIONAL TRADE IN ENERGY SERVICES AND THE DEVELOPING COUNTRIES

The energy market is a segmented market where over 30 types of different services could be singled out. This market seems to include a small number of large firms, which are especially active in oilfield services, and a myriad of small and medium-sized enterprises (SMEs), which are increasingly active in specific segments of the market, such as energy management and metering. Companies that operate in the sector have to be versatile to provide different kinds of services, able to respond quickly to requests for services, and able to provide services in different places. The market concentration and vertical integration that the sector experiences are the result of these requirements, which very few firms are able to meet.

Energy services are required at each step of the energy process from the location of the potential energy source to its distribution to the final consumer: services constitute the value added in the energy chain. Energy services include upstream services such as exploration, extraction, drilling, derrick building and other construction services. Some of these have been identified in the General Agreement on Trade in Services (GATS) under "services incidental to mining, rendered on a fee or contract basis at oil and gas fields". The second stage relates to the transportation of energy, in some cases an undifferentiated segment of maritime transport, but in other cases specific to the energy sector, such as the GATS category of "transportation via pipeline of crude or refined petroleum and petroleum products and of natural gas". The third, downstream stage, includes the services involved in delivering energy to the final consumer, such as the GATS category "services incidental to energy distribution", which refers to "transmission and distribution services on a fee or contract basis of electricity, gaseous fuels and steam and hot water to household, industrial, commercial and other users".

On the other hand a new set of energy services has emerged from the process of structural reform that is being carried out in the energy sectors by both developed and developing countries.[5] The breaking up

[5] Structural reform in the energy sector is meant to cut costs and improve the economic performance and efficiency of the energy sector by imposing free-market disciplines and commercial criteria. It can refer to a range of policy

of integrated energy systems, the introduction of competition and the privatization of previously State-owned enterprises, especially in the downstream segments of natural gas and electricity, have led to the externalization of previously integrated services – such as energy transmission and distribution – and the demand for new services to take advantage of the opportunities of a freer market for energy, for example the operation of power pools, the provision of continuous information on energy prices, energy trading and brokering, and energy management. Additional emerging services include those related to greenhouse gas emissions reductions and trading of emission rights.

The above developments provide the background against which developing countries will have to formulate policy objectives with respect to energy services and pursue such objectives in trade negotiations. Two dimensions have to be kept in mind. The first of these is the *development dimension*, under which a number of questions should be considered. For example, how can the strengthening of the energy services sector contribute to better and greater access to energy in developing countries, and how can implementation by developing country Governments of structural reform in their energy sector impact on their own development perspectives. The second dimension is the *trade dimension*, under which one of the key questions to answer is how to strengthen developing countries' competitiveness in the world market for energy services This question is particularly relevant for developing countries that are major energy producers. Related to this is the fact that developing countries need to have some assessment of the implications that deregulation of the energy sectors in the major

measures and take several different forms, including privatization (the selling of part or the whole of a government-owned energy system to private owners, including foreign investors), increasing competition, de-monopolization (particularly to unbundle the monopoly into distinct entities) and deregulation (covering both the removal of regulations and the reassessment of regulatory methods in areas where regulation remains appropriate). Regulatory reform is itself part of a wider phenomenon – the drawing back by Governments from direct intervention in markets.

developed countries could have for their markets for energy goods and services. Finding the appropriate answers to these questions is a precondition for ensuring that commitments made in the energy services sector in the GATS negotiations are supportive of each developing country's overall energy policy and sustainable development.

1. Sectoral markets of energy and energy services

Each one of the different energy sources – petroleum, natural gas, coal, nuclear energy, renewable energy, and primary and secondary electricity – has its specific market for the supply of energy services.

A. Petroleum

Oil and gas activities include the initial determination of likely sub-surface reserves (reservoir engineering), which today many companies carry out using highly sophisticated computer processing drilling services, derrick erection, well casing, specialized construction services to build pipelines and refineries, and services to clean oil from impurities and to liquefy and re-gasify natural gas. In 1999, activities related to the search for oil and gas by large oil firms made up only a fifth of their revenues, but contributed two thirds of their profits. In contrast, refining and retailing, which were never very profitable businesses, have become even less profitable in recent years because of stringent environmental regulations and fierce competition from new entrants.[6] New environmental requirements also apply in the shipping sector, with the result that capacity utilization of the world's tanker fleet was 97 per cent in 2000, the highest since 1973.[7]

[6] *The Economist*, "Hunting the big one", 21 October 2000.
[7] *Financial Times*, 1 September 2000.

Text box no. 1
Oil prospecting licence

An oil-prospecting licence confers an exclusive right on the licensee to explore for petroleum and to apply for an oil mining lease to develop the field. The exclusivity of the right means that no any other investor would be granted a licence to explore for oil in the same area during the period of the first licence. Most importantly, the licence gives the licensee the right to carry away and dispose of petroleum discovered and saved during its prospecting operations. The licence may be alienated for value or transferred but usually with the consent of the country authorities. An oil-prospecting licence may include conditions and restrictions on the investor in the exploitation of natural resources, such as the obligation to conserve the resource, to protect the environment, to promote health and safety, etc.

Despite the domination of the petroleum and natural gas sectors by large, vertically integrated multinationals engaged in the extraction, refining and distribution of oil and gas products (see text box no.1), there is considerable scope for independent companies to provide specialized services, as multinational companies contract out most of the services they need to find, develop and deliver oil and gas. Exploration and production of oil and gas are closely linked (see text box no.2)

Tex box no. 2
Oil-related services in Ecuador

Petroecuador, the large State-owned utility, still largely dominates the petroleum sector in Ecuador, accounting for three quarters of Ecuador's oil production and managing 86 per cent of the total number of oil fields. The Constitution of Ecuador provides that oil resources belong to the State; however, their extraction and development can be undertaken by public and private enterprises, domestic and foreign. The degree of service liberalization actually achieved under domestic law in the oil-related services sector is considerable: foreign services suppliers are

allowed in practically all activities through different contractual arrangements. However, the outsourcing of services activities in the oil sector seems to have been beneficial mainly to foreign providers, while it has not been conducive to the development of a domestic services industry. The qualitative contribution of oil-related foreign presence to the Ecuadorian economy has been limited. In particular, transfer of technology, enhancement of domestic technical and management skills and strengthening of energy-related domestic industrial capacity through inter-industrial linkages have been scarce owing to the lack of local technology, and managerial and organizational skills, and to the need to restructure the State-owned enterprise. Advanced services are mostly imported or supplied by established foreign firms. Additionally, the impact of energy service activities on the indigenous community and the environment has been, in a number of cases, negative. In a recent lawsuit between Texaco and Amazonian Indians, Texaco was alleged to have caused direct damage to 400,000 hectares and indirectly to 1 million hectares of land. As part of the Government's strategies aimed at reactivating the industry, a plan called "Oil Opening 2000" was unveiled in November 1999. The implementation of the plan will not be possible without the increased involvement of foreign investors.

Source: UNCTAD, *Investment Policy Review: Ecuador*, UNCTAD/AD/ITE/IPC/Misc.2, 2000, pp. 14 and 59.

B. Natural gas

Natural gas is an energy source undergoing a strong and rapid expansion worldwide, mainly because of its potential contribution to achieving the goals of environment protection and energy diversification. Gas is usually transported and traded via pipelines both inside a country and between geographically neighbouring countries. Very long-distance and overseas gas transportation, however, usually takes place by sea in the form of liquefied natural gas (LNG). High transportation costs and complex legal and logistic problems implied by the construction and management of international pipelines contribute to explaining why the share of natural gas production that is internationally traded is still relatively low: 24 per cent against 70 per cent for crude oil. Three quarters of international trade in gas takes place via pipelines, and a quarter via

LNG transportation. However, international trade in gas is forecast to evolve progressively towards worldwide integration.

A specific set of problems and challenges is faced by those countries that are geographically situated between exporters and importers, as the availability of portions of their territories is necessary for gas transportation via pipelines. The construction and operation of gas pipelines may have impacts on the landscape and the environment. The capital-intensive and long-term nature of investments in pipeline construction and the complexities involved in evaluating the costs and benefits of allowing gas transportation make it difficult for transit countries to negotiate advantageous agreements on gas transportation: many of these countries are particularly poorly equipped for this task.[8]

The exploration and production of natural gas is closely linked to the exploration and production of oil. However, the characteristics of transmission and distribution are rather different from those for oil and more similar to those for electricity. Transmission includes transport from the point of purchase to the principal areas of demand, gas storage for strategic or load-balancing purposes and distribution to companies, large-volume customers and power generators. Distribution involves the movement of gas through local low- or medium-pressure pipelines to final consumers. Other services related to distribution include storage, meter reading, invoicing and administrative accounting.

The gas sector has been traditionally dominated by State-owned vertically integrated utilities, which produced, purchased or imported gas, and stored, transported and delivered it to the end-users. The introduction of competition in some countries has altered this pattern, allowing the emergence of independent operators. In liberalized markets, gas transport via pipeline – which remains a natural

[8] The severe problems faced by transition countries in Eastern Europe and Central Asia are illustrated in M. Bannikov, "Energy regulators in the emerging markets", *International Energy Law and Taxation Review*, Issue 8, August 2000.

monopoly – has been separated from the other functions, namely production, wholesale and retail. Regulated third-party access gives any gas producer the ability to transport its product to the end market and any customer the ability to buy gas from any producer or wholesaler. Open access to transport and such services as storage have stimulated the appearance of large numbers of traders. By buying gas at one time from one or several producers and reselling it later to others, who in turn may sell it again, traders are more than just middlemen in the supply chain, they act as competitors with the traditional suppliers.[9]

C. Coal

Coal is the most abundant fossil fuel. Coal burning contributes to major environmental problems such as air pollution and global warming; however, coal is still the cheapest source of energy in many countries. The largest user of coal is the electricity sector. Internationally traded coal flows correspond to little more than 10 per cent of total consumption.[10] Tapping the abundant existing resources of coal increasingly involves challenging technical and regulatory problems, as combustion efficiency is to be improved while protecting the environment. Hence the coal industry is bound to become increasingly capital-and technology-intensive.

Most aspects of the coal industry relate to trade in goods. However, there are establishments that perform coal mining and preparation services for others on a contract or fee basis. The transport and distribution of coal seems to be like that of other goods.[11] Therefore, coal is the form of energy that least involves service activities and as such it is hardly touched by GATS discipline. However, by becoming

[9] International Energy Agency, *Regulatory Reform: European Gas*, OECD/IEA, Paris, 2000, p. 11.
[10] A. Bisio and S. Boots, *The Wiley Encyclopaedia of Energy and the Environment*, vol.1, Wiley, New York, 1997.
[11] WTO, *Energy Service: Background Note by the Secretariat*, S/C/W/52, 9 September 1998, p. 4.

increasingly technology-intensive, the coal industry may attract more services.

D. Electricity

Secondary electricity can be generated by different primary energy sources, such as coal, oil and natural gas. Primary electricity includes nuclear power plants, hydroelectric plants, wind power plants and other sources of renewable energy.

Within the electricity sector, four main functions can be singled out. *Generation* is the conversion of primary energy into electrical energy. This function includes the operation of power stations and the procurement of primary energy. *Transmission* is the transfer of electrical energy in bulk from generators or import sources to the distribution level and to certain large final customers. This function also includes the transfer of electrical energy between electricity grids and/or between countries. The transmission system operator (TSO) is the entity responsible for running the high-voltage transmission grid and is the technical centre of any electricity system. *Distribution* is the transport of electrical energy from the transmission network to final customers. Distribution system operators are the entities responsible for running the medium- and low-voltage distribution lines. In most countries there is a TSO and several distribution system operators. *Supply* is the selling of electricity to end-users. It also includes metering and billing and other services to customers, such as information, advice and financing. Transmission and distribution remain natural monopolies over given geographical areas, and access to the grid on non-discriminatory terms is therefore essential for new suppliers in the electricity market. All reform plans in the sector include some degree of separation between grid management and the generation of electricity. In the absence of such a mechanism, former monopoly utilities would be able to keep privileged access to the grid for their own electricity transactions.

Wholesale buying and selling of electricity may be regulated either by bilateral contracts, which are negotiated between individual participants, or by a pooling mechanism, which functions as a

predetermined multilateral contract amongst market participants. The power pool is an open-access, competitive market for electric energy, which functions like a stock market that establishes a dispatch merit order based on the bids it has received. The idea of establishing competitive wholesale markets for electricity is gathering momentum: electricity pools are now in operation in several European countries, in the province of Alberta, Canada (see text box no.3) and in Australia, Chile and Argentina. Power pools need to be structured carefully through regulations to guarantee open and non-discriminatory access to the pool for all players and to avoid the abuse of market power.

Services providers who make the wholesale purchases on behalf of end customers are emerging. These services providers may or may not be involved in the actual infrastructure of the power sector: they may only provide the service of purchasing electricity to deliver to consumers. Traditionally, these transaction services were provided by telephone; however, they are now moving onto the Internet. Several sites are available now to provide direct trading and brokering services of electricity and other energy products. A large North American company is reporting about 550 million transactions done on-line in 2000.

Box no. 3
Power pools: Alberta's Experience

Since January 1996, an electric energy power pool has been operating in Alberta. It functions like a stock market. For every hour of the next day, suppliers offer power to the pool at various prices and in various quantities. Suppliers include marketers, independent power producers and importers. At the same time, purchasers (i.e. retailers, direct access customers and exporters) put in their bids indicating how much power they are willing to buy at different prices. Bids are ranked from highest to lowest according to willingness to pay. These bids and offers form the basis for a forecast of how much power will be needed on the system during that hour and what generating units will be brought on line to meet the demand on the system. A single price is declared for each hour and all energy is traded at the declared pool price for the hour. In this system, the lowest-cost generators are used first and the more expensive

ones are only brought in as necessary to handle a higher load. The Pool was set up under the Electric Utilities Act. An independent Power Pool Council governs the pool and is responsible for its operation. In addition, an independent Transmission Administrator oversees the use of the transmission system by buyers and sellers to ensure fair rates, non-discriminatory access for all markets participants and the safe and reliable operation of the system. However, very significant spikes in electricity prices occurred during the last trimester of 2000 and the first trimester of 2001 as a result of a lack of new generation capacity. While there is an expectation that industry will eventually respond with new capacity, the Government of Alberta has been subject to severe criticism from many quarters for mishandling the transition to a new deregulated environment.

Source: Alberta Department of Resource Development, Power of Competition, website: www.resdev.gov.ab.ca/electric/rgeneral/poc-5htm: and Canadian energy experts.

Another company that matches buyers and sellers of electricity, gas and similar products reports about US$ 1.5 billion a month in transactions. Traders and brokers of electricity aggregate supplies of energy, trade one form of energy for other energy forms or services, and provide supplementary energy during peak hours of electricity use.[12] Several North American companies are now offering packages to their clients that include goods and services aimed at energy savings (see text box no. 4). The savings are usually achieved through higher-efficiency equipment and controls. This kind of project, however, requires significant initial investments, and funding sources are therefore necessary.

[12] R. Thompson, *Integrating Energy Services into the World Trading System*, Energy Services Coalition, April 2000, pp. 16 and 40.

Text box no. 4
Example of a contract between an ESCO and a client

The following is an example of the kind of contractual arrangements that a private energy service company (ESCO) may offer to a client. The ESCO identifies and evaluates energy-saving opportunities and then recommends a package of improvements to be paid for through savings. The ESCO usually guarantees that savings meet or exceed annual payments to cover all project costs — usually over a contract term of seven to 10 years. To ensure savings, the ESCO may also offer staff training and long-term maintenance services.

An ESCO announced in early May 2001 that it had been awarded a contract valued at almost US$ 6.5 million by a college in Los Angeles. The company is providing facility upgrades in 17 major buildings at the college that will lower energy costs and save about US$ 9.4 million. The contract with the college calls for the ESCO to install new interior and exterior lighting throughout the campus in order to provide better lighting with lower energy costs. The ESCO will upgrade existing heating, ventilation and air conditioning systems from constant use to a system that will match use requirements, thereby allowing the college to operate equipment on the basis of occupancy and schedule changes to save energy. The private company will also air-condition five additional buildings and add a thermal storage facility to produce chilled water at night when electricity costs are lower. The chilled water will then be used the following day during peak electricity demand periods when costs are higher. According to the company's Chief Executive Officer, the project will supply the college with better lighting and additional air conditioning, while providing substantial energy savings.

The establishment of most wholesale electricity markets has been accompanied by the development of financial markets to manage the risks inherent in any commodity trading. In the electricity market, risks such as changes in fuel prices, short-term and long-term demand shifts, and regulatory and political changes, have to be taken into account; therefore, effective financial markets for electricity have become a crucial tool in the management of price fluctuations (see text boxes nos. 5 and 6).

Text box no. 5
The Dabhol project

The Government of India opened the power sector to private investment in 1991 in order to expand electricity capacity to meet desired targets. A large number of potential investors expressed interest in setting up independent power projects in several parts of the country: A widely publicized dispute between a United States energy company and the Indian State Government of Maharashtra underscored the conflicts that might arise between foreign investors and host Governments. The Dabhol project started in 1992 with the aim of setting up the world's largest private power plant at Dabhol. In 1995 a newly elected Maharashtra State Government decided to cancel the project even though the American corporation and its partners had already spent US$ 300 million.

The new Government alleged that its predecessor had secretly negotiated the contract on terms that favoured the United States company and disadvantaged consumers. It also alleged that the project had received an improper clearance. In early 1996, the foreign company renegotiated a deal with the State Government that allowed the project to proceed. The Dabhol project includes two plants, one 740-megawatt plant already operative, and another 1,624-megawatt plant, costing US$ 3 billion, which was scheduled to go into operation by the end of 2002. The situation has changed lately owing to the bankruptcy in December 2001 of the United States corporation that owned most of the Dabhol Power Company (DPC). At the time of writing, seven major groups – both foreign and Indian – had expressed an interest in acquiring a stake in the power company.

The sole customer of the power plant is the Maharashtra State Electricity Board (MSEB), which cannot afford to pay for electricity at the rate charged by DPC. In January 2001, MSEB came close to default on US$ 23 million of bills owed to the power company since October 2000. The power plant has been closed since August 2001, following the inability of MSEB to pay for DPC power. The tariff rates are high because MSEB is committed to paying full capacity charges to the power company on the basis of a higher plant load factor even if it draws less power from the company. If MSEB believes that its power requirements for a particular month are lower, it can ask the power company to operate on lower capacity. In such cases, MSEB will have to pay fuel cost only for units

generated. However, the capacity charges (covering debt, fixed running costs, and the profit of the United States company and the other shareholders) have to be paid in full. Thus, if MSEB takes more power from the Dabhol project, the unit cost comes down vis-à-vis the capacity charges. However, even when the plant is operating at close to full capacity, its electricity is more expensive that that from other sources available to MSEB. MSEB's inability to pay its bills is not entirely Dabhol's fault. As in other States, Maharashtra's Government obliges the electricity board to supply power at below cost to farmers and other favoured consumers. MSEB loses a third of the electricity it buys to theft and leakage. Reforms under discussion in India could help. A bill pending in Parliament would encourage full-fledged trading of electricity, which would allow Dabhol to seek customers besides MSEB.

The Dabhol case clearly highlights some of the major failures that can occur in the decision-making process in the power sector. Independent power producers (IPPs) were invited to the country; however, the necessary reforms such as the setting up of independent regulatory bodies with adequate expertise to discharge their functions effectively (i.e. regulate power-sector decisions and operations) had not been carried out. The problems related to the collection of dues from customers and the maintenance of transmission and distribution systems could have been addressed with a reform beginning at the distribution end, so that any supplier of power could have an assurance that dues would be collected and payments made for power sold.

Better grid management could have ensured transfer of power between States to correct the imbalance in terms of base-load versus peak-load power capacity. In December 2000 and January 2001 India suffered a major collapse of the entire northern grid. The breakdown is symptomatic of the above-mentioned problems.

By opening its power market to foreign firms, India tried to solve the problem of inadequate investments and management in power generation, transmission and distribution; however, the opening of the market before a number of crucial questions were addressed leaves some doubt about the wisdom of the decision.

The Dabhol case also shows the difficulties a developing country may face in dealing with large energy companies, especially if those companies enjoy a high degree of political influence in their own country and, through it, become politically influential in the host country. The situation is further complicated when the foreign companies engage in

questionable lobbying practices for the clearance of contracts or bribe politicians and parties.

Sources: "Enron in India: Generation gaps", *The Economist*, 13 January 2001; R.K. Pachauri, "Dabhol: A big mistake?", *The Economic Times*, 9 January 2001; P. Bidway, "Lessons from Enron's collapse: The way out in Dabhol", *The Daily Star*, 12 February 2002.

Electricity can be regarded as both a good and a service. It cannot be stored, and this is probably one of the key factors that led the drafters of GATT to assume that it should not be classified as a commodity. However, later on, several GATT Contracting Parties started regarding electricity as a commodity and some of them have undertaken tariff bindings on it. In the Harmonized Commodity Description and Coding System (HS) developed by the World Customs Organization (WCO), electrical energy is a commodity. However, it is an optional heading in the HS, so that WCO countries are not required to classify it as a commodity for tariff purposes. The optional nature of the electrical energy entry in the HS classification might reflect the fact that some countries do not regard it as a commodity but as a service. [13] In both the Canada-United States Free Trade Agreement and the subsequent North American Free Trade Agreement (NAFTA). The parties removed any doubt on this point by specifically making electricity subject to the disciplines on trade in goods. At present, most agree that the production of primary and secondary energy does not constitute services subject to the GATS, but that it results in goods whose trade is regulated by GATT rules. Transportation and distribution, on the other hand, are commonly regarded as services if they are provided independently. This might imply that, when activities related to energy production are supplied through commercial presence in the host country, the Agreement on Trade-Related Investment Measures would apply.

[13] WTO, op. cit., p. 3.

Text box no .6
California's power crisis

Californians endured a series of power emergencies during the first quarter of 2001 because the two leading State power utilities were unable to buy power owing to financial constraints. Since October 2000, the utilities had been forced to buy power for far more (up to five times) than they are allowed to charge their retail customers; they therefore accumulated debts of over US$ 12 billion.

Wholesale prices went up because of a shortage of supply and a surge in demand. Limited transmission capacity made it difficult to import electricity from neighbouring States. The impact of the supply squeeze was amplified by structural rules which forced the utilities to buy all their power through a single market – the State's power exchange – no more than a day in advance. The intention was to prevent long-term contracts between the major players from limiting the scope of competition. The result was to introduce an element of price volatility that proved beyond the scope of financial planning. According to some, the situation was the result of a liberalization process that was not very well conceived from the outset. When the electricity sector moved from a regulated to a market-based structure, there was an effort to take on board the concerns of all stakeholders, mainly the utilities that wanted compensation for the "stranded costs" (stranded costs – which are specific to the transition between regulatory regimes – are the unamortized costs of prior investments that are scheduled for recovery through regulated monopoly rates but would not be recovered under competition), consumer organizations that wanted special treatment for particular groups to continue, and green organizations that wanted environmental considerations to be given high priority and opposed the building of new generating capacity. Given that those concerns conflict somewhat with each other, the deregulated market was not allowed to work properly.

On the other hand, since the power sector is extremely sensitive from social and economic points of view, it is difficult to reform it ignoring the positions of the main stakeholders. An additional lesson that can be drawn from California's experience is that reform is not just about competition, but also about adequate investment in generation and transmission, and that it should be accompanied by carefully planned regulatory structures.

Developing countries that are implementing structural reform in their power sector have to keep in mind these problems, which may be more acute when financial and managerial resources are scarce and the number of household and industries that cannot afford to pay the proper price for electricity is large.

Sources: "The electricity crisis in California: Causes and consequences", *Oxford Analytica*, 30 January 2001; "California's power crisis", *The Economist*, 20 January 2001; "When the lights go out", *The Economist*, 20 January 2001; "Light on solutions", *The Economist*, 13 January 2001; "Serious flaws hinder power market", Energy & Utilities Review, *Financial Times Special Report*, December 2000.

E. Nuclear energy

After the oil shocks of the 1970s, nuclear power seemed to be a stable and economic source that would ensure security of supply. In recent years, growth has stalled owing to lower fossil-fuel prices – which have made electricity generation from coal and gas economically more attractive – and increasing public concern.[14] At present, however, a growing number of experts say nuclear power will have to be seriously considered if the world is going to meet the forecast sharp raise in energy demand and reduce carbon dioxide emissions. Developing countries, particularly in Asia, will account for most future growth in nuclear power. This scenario may be conducive to a transfer of expertise and equipment from the Organisation for Economic Co-operation and Development (OECD) and economies in transition to developing countries.

Nuclear power does not depend only on plants and nuclear plant manufacturers, but also on extensive infrastructure, including skilled personnel, regulatory bodies, industrial and research facilities. It is relatively capital-intensive and services-intensive. The main nuclear activities that may fall within the services domain are those related to the transformation process (uranium procurement, the conversion of

[14] International Energy Agency, *World Energy Outlook: 2000 Edition*, OECD/IEA, Paris, pp. 354 and 356.

uranium oxide into uranium hexafluoride, nuclear power enrichment services, fuel fabrication, production of secondary energy from nuclear reaction); engineering and project management services, inspection and maintenance services; nuclear safety services; services related to the disposal of nuclear fuel wastes; and research and development. Usually the different services are provided by different suppliers.

Article XIV bis of the GATS includes among the security exceptions Members' action to protect essential security interests "relating to fissionable and fusionable materials or the materials from which they are derived". It is unclear whether essential security interest could be at stake in the international trade of nuclear energy services for peaceful purposes.[15]

F. Renewable energies

Renewable energies include non-hydro renewables such as bioenergy, thermal and photovoltaic solar energy, wind energy, mechanical and thermal ocean energy, and geothermal energy. Small and micro hydro applications are also included within the common definition of renewables.[16]

Non-commercial energy accounts for about 2 per cent of energy consumption in industrialized countries, but an average of 30 per cent in developing ones. In some low-income developing countries, traditional biomass accounts for 90 per cent or more of total energy consumption.[17] In most developing countries, a considerable part of the population lives in sparsely settled and remote areas, which have little prospects of having early access to grid-based electricity. In such remote off-grid locations, renewable energy systems are often the most economical means to provide lighting and power.

[15] WTO, op. cit., p. 7.
[16] International Energy Agency, World Energy Outlook: 2000 Edition, p. 291; Renewable Energy Policy in IEA Countries. Vol. I: Overview, OECD/IEA, Paris, 1997, p. 37.
[17] World Energy Assessment, p. 4.

Renewable energies are more evenly distributed than conventional energy sources and tend to be more environmentally friendly. The current installed renewable capacity reflects only part of the estimated potential.[18] If an increasing number of countries are going to rely on renewable energies to meet part of their energy shortfall and achieve environmental goals, an inflow of capital, skills and technology may be expected in the sector.

Services in the renewable energy sector consist of a large array of activities, ranging from the identification and development of renewable sources of energy to the operation of the facility. Renewable energy services are typically concerned with activities such as engineering, consulting, research and development (R&D), design, feasibility studies, environmental impact assessments and environmental monitoring.

2. International trade in energy services and trade barriers

Energy services may be traded through Modes 1 (cross-border trade), 3 (foreign commercial presence) and 4 (movement of natural persons). Mode 1 is of relevance especially for on-line trading and brokering services and professional services that can be delivered by mail or electronically, such as consulting or legal services. Mode 1 also covers services related to the cross-border transmission of electricity and gas through pipelines and interconnected grids. Mode 3 is of paramount importance since it covers all different forms of foreign commercial presence, such as BOT and IPP.[19] Mode 4

[18] In the case of India biomass and waste potential stand at 17 GW, with an installed capacity of 49 MW; the small hydro potential accounts for 10 GW, the installed capacity dropping to 271 MW. Estimates put ocean potential at 50 GW, with no installed capacity. IEA, *World Energy Outlook: 2000 Edition*, pp. 329-330 (estimates referring to renewable capacity and potential in 1999).

[19] In the BOT (build, operate, transfer) system, a Government invites the contractor to finance a power facility, build and operate it, and sell the output to the national system over a period of time long enough (usually 20 years) to recover its costs and earn an appropriate return on its investment. When this period expires, the ownership of the plant is transferred from the builder-

includes the movement of skilled professionals who deliver technical and managerial services, as well as the movement of semi-skilled and unskilled personnel needed, for example, for the construction and upgrading of facilities and grids.

In penetrating foreign markets, international providers of energy services face the traditional barriers that services suppliers in other sectors face. For example, for Mode 1 there is the need to have a local professional certify the legal, engineering or consultancy work provided from abroad. In the case of Mode 3, there are limitations on foreign share, nationality requirements for top officials and/or for the majority of the directors, limited possibilities for foreigners to use the courts in the event of disputes with local partners, limitations on foreign ownership of facilities or land, preference for local firms and public procurement rules. For Mode 4, there are difficulties in obtaining visas and work permits, non-recognition of professional qualifications obtained abroad, time limitations on the presence of foreign experts and economic needs tests.

There are, however, some trade barriers that are specific to the delivery of energy services. For Mode 1 these include limited access to the transmission grid, limited transit rights, unfair or non-transparent transmission fees, cross-border trading of energy subject to commercial presence, and limitations on the cross-border transfer of capital to finance energy-related transactions. For Mode 3, specific limitations may include difficulties in gaining uncontrolled access, at a competitive price, to transmission and distribution networks due to pre-existing exclusive rights and monopolies (the same happens in many other services sectors such as air transport and telecommunications). In view of this, liberalization of trade in energy

operator to the host Government, which continues to operate it. In the IPP (Independent Power Producer) system, a generating plant sells its output to the system and operates in compliance with the system, but is not owned by the system. An IPP owner-operator is under no obligation to surrender title to the plant during its lifetime, or limit its earnings to any level previously agreed with the Government; therefore, it is under significantly less stringent control by the host Government than under the BOT system.

services might require some competitive safeguards aimed at ensuring access to scarce network facilities (see text box no. 7). A typical practice used by established players is to enforce temporary rate cuts to prevent new entrants from building their business strategy. One way of combating such practices is to impose a floor, rather than a ceiling, on prices. The State of Texas, for example, which began the process of deregulation of the electricity sector in 1999, is fostering competition by extending rate regulation on incumbent utilities for the first five years of deregulation.[20] In general, non-transparent regulatory frameworks are perceived as trade barriers. Some segments of the energy sector rely on considerable investment that can only be recouped in the long run; therefore, limitations on ownership and control of utilities are serious barriers to the establishment of foreign firms.

Text box no .7
The single market for electricity in the European Union

Electricity production in the EU has for decades been based on monopoly production and 15 separate, national markets. In December 1996, after eight years of negotiations, Community Directive 96/92 EC was adopted (OJ L 27, 30.1.1997) with the aim of contributing to the three energy policy objectives of the EU, namely increased competitiveness, improved environmental protection and greater security of supplies. The Directive ranges from access to the grid, mechanisms for entry into power generation and access by some end-users to alternative EU power generators or suppliers. In consideration of the major restructuring that companies have to go through to adapt to the new competitive environment, the Directive allows countries to progressively open their markets. The Directive indicates three dates for liberalization: 19 February 1999, when at least 26 per cent of national electricity demand had to be liberalized and consumers of more than 100 gigawatt hours (GWh) per annum ("reference size") were permitted to choose their supplier; 19 February 2000 (at least 28 per cent of national electricity demand had to be liberalized and the "reference size" was set at 40

[20] "The electricity crisis in California: The impact on deregulation initiatives in other states", *Oxford Analytica*, 30 January 2001.

GWh); and 19 February 2003 (at least 33 per cent of national electricity demand will have to be liberalized; the "reference size" will be set at 9 GWh). Most member States, however, are moving faster than the Directive requires. This type of phased opening may produce interesting dynamic effects. Since users of the same size may be subject to very different rules in the purchase of electricity, and if liberalization does indeed result in substantial price decreases, firms that compete in the downstream market (the goods market) may well pay very different prices for electricity. To the extent that this has important effects on overall profitability, users in less liberalized member States may exert pressure for greater domestic liberalization. The same phenomenon may happen at the broader, international level.

At the European Council meeting of 23-24 March 2001, the general objective of opening national markets for gas and electricity was endorsed, but the EU Commission's plan to set 2005 as the date to allow all Europeans to choose their supplier of electricity and gas was rejected. The EU Heads of Government, however, agreed that the Commission could use competition law to put pressure on countries to liberalize their markets and to stop monopoly suppliers competing unfairly in open markets in other EU countries.

Despite the liberalization process, barriers to trade exist and real competition remains limited. It has proved very difficult to combat the market power of former national monopolies and oligopolies, which continue to dominate most local markets. Gaining uncontrolled access, at a competitive price, to transmission and distribution networks remains a problem, particularly where these are controlled by large integrated companies that have a vested interest in keeping rivals from using the wires. Complex cross-shareholdings linking large regional generators and transmission operators to local municipally controlled utilities have also created strong alliances which have proved a powerful barrier for potential new entrants to overcome. Harmonization of transmission fees will be crucial if cross-border electricity sales are to increase and erode the market power of the dominant local suppliers. Efforts to replace national and regional charges with a single fee were halted in November 2000 because of disagreement among member States. Congestion of national grids and missing links also inhibit free trade. Cross-border trade represented only 7 per cent of total electricity consumption in 2000 and a low level of interconnection capacity for some member States restricts the benefits of the opening of the markets. On 20 December 2001, the Commission proposed an energy infrastructure package aimed at optimizing the use of existing gas and electricity infrastructure and

encouraging the construction of new infrastructure to seize the benefits of a true internal market and to meet the challenges of security of supply. Finally, cross-border takeovers, mergers and joint ventures are occurring in Europe at a very fast pace, more than in any other region, as companies strive to protect their share of national markets and gain share in other member States.

There is a fear that large-scale energy mergers will lead to a situation where national monopolies and oligopolies will be replaced by a single market dominated by six or seven mega-utilities.

Despite the efforts of the Commission, corporate restructuring in the EU energy sector seems to be outpacing market liberalization, which can diminish its benefits for consumers and can also have implications for the quality and security of energy supply.

According to some, the model of liberalization worked out in the EU will probably be adopted by other countries; therefore, companies that are willing to explore new markets may have to cope with the kind of market access difficulties described above. European companies, on the other hand, which are acquiring experience in expanding their business into other markets within the EU, will use their expertise in the sector to become stronger players in the international market and may leverage their dominant positions in the EU market to export services to foreign liberalized markets.

Sources: European Commission, "Guide to the Electricity Directive", website http://europa.eu.int/comm/energy/en/elec_single_market/memor.htm;
Commission Press Room, "Energy infrastructure: Commission proposes action to fight congestion and bottlenecks", 20 December 2001, DN:IP/01/1890; International Energy Agency, *Electricity Market Reform: An IEA Handbook*, OECD/IEA, 1999; "Setback for single energy market plan: EU summit leaders in discord over liberalisation dates", *Financial Times*, 26 March 2001; "Competition proves illusive: European electricity", Energy and Utility Review, *Financial Times*, 13 December 2000.

3. Energy services in GATS

The WTO "Services Sectoral Classification List" (document MTN.GNS/W/120) does not include a separate comprehensive entry for energy services. The United Nations Provisional Central Product Classification (UNCPC) also does not list energy services as a separate category. Annex I, however, provides a compendium of

energy-related products listed under different headings in the CPC, including energy-related services. Additionally, important energy services cut across existing sectoral classifications. Architectural and engineering services, scientific and technical consulting services, construction services, wholesale and retail trade services with respect to fuels and energy equipment, transportation services and several financial services are, among others, the sub-sectors and sectors that might be relevant to the energy sector. In addition, three specific energy-related activities are explicitly listed as separate sub-sectors in the WTO classification list.

Two entries are related to petroleum and gas. One is "transportation of fuel" under the broad category of Transport Services. The CPC describes it as "transportation via pipeline of crude or refined petroleum and petroleum products and of natural gas" (subclass 71310). The second is "services incidental to mining", which falls under the category of Other Business Services and relates to upstream activities for oil and gas. The CPC describes it as "services rendered on a fee or contract basis at oil and gas fields, e.g. drilling services, derrick building, repair and dismantling services, oil and gas well casings cementing services" (Division 88). However, mineral prospecting services, oil and gas field exploration and seismic and geological surveying services are excluded from this Division and are classified under "Geological, geophysical and other scientific prospecting services" (subclass 86751), under "Engineering related scientific and technical consulting services" (class 8675).

The third specific entry relates to downstream activities for gas and electricity: "Services Incidental to Energy Distribution" (CPC 88700), under "Other Business Services". It refers to "transmission and distribution services on a fee or contract basis of electricity, gaseous fuels and steam and hot water to household, industrial, commercial and other users".

Various practical problems are associated with the fragmented and non-exhaustive classification of the energy services sector. First of all, considering that the energy sector consists of a chain of interrelated activities, an energy services supplier may need market access in a

number of relevant services sectors to adequately provide his/her service. As these services are spread throughout the classification system, the actual access conditions in a given market may be unclear and create unpredictability regarding the actual possibility of delivering the energy service effectively. On the other hand, commitments may be made with respect to other sectors which could have unforeseen implications for the energy sector.

With respect to those sub-sectors that can be clearly identified as energy services, the existing commitments that WTO Members have undertaken are very limited (see Annex). Other relevant commitments can be found in the services sectors that cover, among others, energy-related activities, and in the horizontal commitments applying across all sectors.

4. The ongoing debate at the WTO

Discussions in the WTO Committee on Specific Commitments (CSC) have focused on whether there is a need to create a specific sector for energy services.[21] The United States introduced a proposal in May 2000 on the topic,[22] advocating a comprehensive classification of energy services where the different activities that constitute the entire chain of energy services would be included. Such a listing would serve as a basis for a model schedule for commitments in the energy services sector, and enable WTO Members to undertake commitments affecting the entire range of energy services. It is suggested that commitments should be scheduled across the entire range of sectors covered by the model schedule.

At the time of writing, seven proposals on energy services had been tabled in the framework on the ongoing services negotiations. The proposal by the **United States** builds upon its earlier submission and includes an "Index for Classification of Energy Services", to

[21] The debate is reflected in WTO documents S/CSC/M/15-16-17, 18/Rev.1 and 19.
[22] WTO Committee on Specific Commitments, *Communication from the United States. Classification of Energy Services*, S/CSC/W/27, 18 May 2000.

identify categories that contain energy services, under both the W/120 and the CPC Provisional Classification Lists. The entries are rather broad, such as "architectural services", "engineering services", "management consulting services", "installation work", and "wholesale trade services". The proposal suggests that the index be used to negotiate the broadest possible market access and national treatment commitments. It encourages countries to allow the temporary entry of the highly specialized personnel necessary for the delivery of energy services, to liberalize the movement of electronic information and transaction, and to consider the elimination of tariffs on energy-related goods. In a subsequent communication,[23] the United States addressed the issue of energy activities not currently open to foreign services suppliers, such as wholesale marketing of energy, and that of existing energy monopolies. In the first case, the communication encourages countries to schedule market access, national treatment and non-discriminatory access to the grid commitments, and in the second case, to apply appropriate GATS rules to the current official monopoly or consider new commitments.

The proposal submitted by the **European Communities** (EC)[24] identifies a number of sectors and sub-sectors where the EC considers that WTO Members should make commitments in all modes of supply to further reduce the barriers to trade in energy services. The preliminary list of sectors includes a broad spectrum of services related to exploration and production; construction of energy facilities; networks; storage; supply; services for final use; decommissioning; and other energy-related services, such as installation, maintenance and repair of energy equipment. The EC proposes to hold further discussions on how to improve and facilitate the temporary movement of natural persons for the provision of specific services, including the movement of contractual service suppliers.

[23] WTO, *Communication from the United States; Energy Services: Negotiating Objectives*, JOB(01)/167, 4 December 2001.
[24] WTO, *Communication from the European Communities and Their Member States. GATS 2000: Energy Services*, S/CSS/W/60, 23 March 2001.

The **Canadian** proposal[25] differs from the United States and EC proposals in that it avoids addressing the issue of downstream energy markets and focuses mainly on upstream oil and gas services, encouraging WTO Members to broaden and deepen their liberalization commitments in all four modes of supply. According to the proposal, in addition to the specific entry "services incidental to mining", services related to oil and gas can be found in other sectors and sub-sectors of the existing classification list (e.g. real estate services, rental/leasing services, scientific and technical consulting services); however, the current classification has certain merits and logic, because it regulates services of the same nature and not according to specialization areas (e.g. all engineering services, irrespective of whether it is civil or energy-related). Services related to the energy sector could be subject to a "checklist" that Members may use as an aide-mémoire during the negotiations.

The proposal from **Norway**[26] suggests that in order to realize fully the benefits of efficient and competitive energy services and to make economically meaningful commitments as regards market access and national treatment, the entire chain of activities involved in resource identification, production, transmission, transportation, distribution, and sales and marketing should be considered. The proposal includes a preliminary "checklist" for energy services that refers to services such as engineering services, computer and related services, R&D services, management consulting services, wholesale trade services and environmental services. It is suggested that the list be used as a negotiating tool to assist Members in scheduling commitments. However, the proposal specifies that since several of the included services cover activities with dual or several end-uses, the reference is limited to the energy-relevant component of the activities.

[25] WTO, *Communication from Canada. Initial Negotiating Proposal on Oil and Gas Services*, S/CSS/W/58, 14 March 2001.
[26] WTO, *Communication from Norway. The Negotiations on Trade in Services*, S/CSS/W/59, 21 March 2001.

The **Venezuelan** proposal[27] is based on the principles of flexibility and of specificity of energy sources. It suggests that a classification of the energy services sector be established according to several criteria - the sources of energy (e.g. oil, gas, hydropower) and the phases of the energy process (e.g. services related to transport, distribution and sales) - and that a distinction be made between "core" energy services, which are those directly involved in the main processes of the value chain (i.e. upstream services for discovering and developing energy resources and downstream services for design, construction, operation and maintenance of energy facilities and networks), and the "non-core" services, which are related to processes that support this chain. Such a detailed classification would represent the precondition for WTO Members to schedule liberalization commitments in this strategic sector. The proposed classification would preserve flexibility for countries to liberalize their markets according to their national development strategies. The Venezuelan proposal links negotiations on energy services with the achievement of a number of development objectives for developing countries, mainly their ability to continue to use energy services as a lever to diversify their economies, promote their development and strengthen their private sector.

The **Chilean** proposal[28] suggests that negotiations should include the whole spectrum of energy services related to the electricity and hydrocarbons industries: those related to generation, transformation, transport, distribution and supply. The proposal underlines that subsidies play an important role in the energy sector and hamper the development of open and competitive markets. Therefore, the issue of subsidies should be addressed in the negotiations on the liberalization of the energy services sector.

[27] WTO, *Communication from Venezuela. Negotiating Proposal on Energy Services*, S/CSS/W/69, 29 March 2001, and *Negotiating Proposal on Energy Services – Addendum*, S/CSS/W/69/Add.1, 15 October 2001.
[28] WTO, *Communication from Chile. The Negotiations on Trade in Services*, S/CSS/W/88, 14 May 2001.

The **Japanese** proposal[29] notes that the lack of transparency in energy services regulations reduces predictability for trade in the sector and results in a deterioration of market confidence in the country concerned; therefore, it is in the interest of all Members to improve transparency. It suggests that during the development of a new classification for energy services and the inclusion in the negotiations of the entire range of such services an initial focus should be placed on the "core" energy services, namely wholesale sales, transmission and distribution, and retail sale of energy. "Non-core" energy services – such as energy-related engineering and construction services – should be discussed separately using a checklist for reference purposes. The proposal encourages Members to consider negotiating the broadest concessions on market access and national treatment.

These proposals give rise to a series of questions that developing countries will have to take into account in pursuing negotiations in this sector. The proposals have some common elements. They are based on the assumption that improved market access in the energy services sector can have beneficial effects for all countries; they stress that negotiations on the liberalization of the energy services sector should not address the issue of ownership of natural resources; they recognize that the energy sector will continue to be regulated to ensure the achievement of public goals; and they acknowledge that since countries are in different phases of regulatory development, their commitments will reflect the levels of existing market reform.

The Norwegian and Venezuelan proposals refer to the need to promote trade for all and to secure a share of international trade for developing countries. The United States' and Norway's proposals call for the development of a reference paper in line with the Reference Paper to the GATS Agreement on Basic Telecommunications Services. The purpose of such a paper would be to ensure transparency in the formulation and implementation of rules, and non-discriminatory third-party access to and interconnection with energy

[29] WTO, *Communication from Japan, Negotiation Proposal on Energy Services, Supplement*, S/CSS/W/42/Suppl.3, 4 October 2001.

networks and grids, and to prevent anti-competitive practices for energy services in general. The Japanese proposal also refers to the need for a multilateral framework for domestic regulations to ensure a competitive environment, and non-discriminatory, fair and transparent access to the network. The EC proposal, without mentioning the need for a multilateral instrument such as a reference paper, invites WTO Members to establish an appropriately transparent, objective and pro-competitive regulatory framework for the energy services sector. The EC, Japan and the United States make reference to energy activities irrespective of the energy source. This approach apparently overlooks the fact that some energies are more sensitive than others from political and strategic points of view and are therefore under different regulatory regimes. The Venezuelan proposal, while allowing maximum flexibility to WTO Members to schedule their commitments, may lead to some market unpredictability due to a segmented opening of the sector. The proposals of the United States and Japan recommend the elimination of tariffs and non-tariff barriers for energy-related goods. This approach may create some confusion between negotiations and trade-offs in the two usually distinct areas of goods and services. Developing countries, however, could use liberalization commitments in services as leverage to obtain improved market access for their goods.

The United States' proposal refers to the concept of "technological neutrality". This concept is not developed in the GATS itself, but was introduced into the negotiations on Basic Telecommunications. The thrust of this concept is that where no specific references are made to the type of technology used in providing basic telecom services, specific commitments would automatically cover all means of technology, i.e. services transmitted via all types of cable, wireless or satellites. Nevertheless, where different measures were applied by Members in regulating market access or national treatment, depending on the type of technology, WTO Members scheduled them in their commitments.

The sectoral approach is seen by its different proponents as serving different purposes. First, it has been presented as simply a means of

facilitating greater coherence in the negotiations by enabling negotiators to have a clearer view of the economic and business interrelationships among sub-sectors when making specific commitments. Some proposals, however, suggest a more ambitious objective, aiming at achieving the maximum degree of liberalization commitments within the sector, as was the case, for example, with the post-Uruguay Round financial service and basic telecommunications negotiations. The sectoral approach also permits the negotiation of additional regulatory provisions that can apply to the commitments made within the cluster. The Reference Paper to Basic Telecommunications Services was drawn up in the recognition that the liberalization commitments made in that sector required additional provisions specific to telecommunications (interconnectivity) intended to ensure that the commitments in that sector resulted in effective access to the market. It has been suggested that the transmission of electricity and gas shares many aspects with telecommunications and that a reference paper with a similar objective should be negotiated. It has also been suggested that additional regulation could ensure the effective implementation of Article XIX:2 and by implication Article IV of GATS to ensure that the supplying developed country firms provide access to technology and to distribution channels and information networks, as a condition for enjoying the access to markets provided in commitments made in the sector. Public services obligations could also be included in a reference paper (see section below).

5. Implications for developing countries

Energy is central to achieving the interrelated economic, social and environmental aims of sustainable human development, and energy services play a crucial role in providing efficient access to energy in support of such development. They also constitute the value added in the energy chain, from exploration to consumption. Developing countries are thus faced with the challenge of, on the one hand, achieving more reliable and efficient access to energy, and of, on the other hand, obtaining a greater share of the energy "business". Pursuit of both goals requires access to the knowledge, expertise, technology and managerial know-how that will allow developing countries to

continuously improve their energy sector and to benefit from their natural resources.

Developing country energy producers are major importers of the traditional energy services, such as services related to oil and gas exploration, wells and pipelines building, drilling services and derrick erection. The provision of these services, which tend to be increasingly sophisticated and technology-intensive, often goes beyond developing country capacity. However, developing countries have made few commitments in this sub-sector in their GATS schedules. They thus still maintain the flexibility to liberalize where this is deemed most consistent with domestic energy policy objectives, and to seek important reciprocal concessions.

Only a limited number of developing countries have experience with structural reform in the energy sector; consequently, they have not developed those emerging energy services that usually emanate from the breaking up of integrated energy systems and the introduction of competition, especially in the gas and electricity segments. The design of effective domestic energy policies would be promoted by a better understanding of the experiences of those countries that have implemented reforms in their energy sectors and permitted the emergence of competitive energy markets. Additional emerging services include those related to greenhouse gas emissions reductions and trading of emission rights (see text box no. 8).

Text box no .8
Emerging energy services and emissions trading

A major issue that has implications for the energy services sector and for development relates to the global warming resulting from increased greenhouse gas emissions, and to the strategy designed to address this threat. The central instrument for this strategy is the Kyoto Protocol of 1997, which sets legally binding emission limitations and reduction commitments for OECD countries (with some exceptions, such as Mexico and the Republic of Korea) and countries with economies in

transition. Emission reductions should be primarily achieved through domestic actions.

Additionally, the Protocol allows Parties to meet part of their commitments through reductions abroad using International Emissions Trading (IET), Joint Implementation and the Clean Development Mechanism (CDM). The last-named is the only vehicle for trading emission rights (called certified emission reductions) with developing countries (global trading). These mechanisms would improve the cost-effectiveness of emission reduction by exploiting country differentials in marginal abatement costs. The lack of convergence between the position of the EU and the United States on the relative importance of domestic measures and flexible mechanisms for the purpose of achieving reduction commitments was one of the factors that led to the failure of the COP 6 at The Hague in November 2000. In March 2001, President Bush declared his opposition to the Kyoto targets, making the future of the agreement very uncertain. However, negotiations continued after the United States' rejection and a final deal was struck at the COP 7 (Marrakesh, 29 October – 9 November 2001), where Governments finalized the operational details of the Protocol, opening the way to ratification and the Protocol's entry into force. In February 2002, President Bush committed America to "an aggressive strategy to cut greenhouse gas intensity by 18 per cent over the next ten years".

Despite the fact that the real significance of this commitment is far less significant than it looks like at first blush (no absolute reduction in United States emissions), this new step and the possible early entry into force of the Protocol may allow a lucrative service sector to develop in relation to the trading of emissions rights. The complexities involved in conducting, monitoring, verifying and enforcing emissions trading schemes and in designing and implementing carbon credit projects allow considerable margin for the market development of various services activities. Both the IET and the CDM are expected to achieve sizeable market significance, and emissions trading as a whole is expected to became one of the largest commodity markets in the world. The potential CDM market size is estimated to be in the range of US$ 5 to 10 billion per annum financial flows to developing countries. Although this will not happen immediately, as the market will start with a fraction of this estimate, it may quickly ramp up to higher levels. However, much of this enormous market potential depends on the strategies that will be pursued to combat climate change.

Services under the CDM facility would mainly consist of project-specific activities related to the design and implementation of projects (e.g. environmental and social impact assessments, packaging financing, development of carbon baselines, seeking host government approval and permits); services related to the crediting mechanism (e.g. registration of the project for crediting by a CDM Executive Board, baselining and monitoring of net emissions, verification of emissions reduction by CDM operational entities, sharing of credits and other project proceeds among investors); services activities aimed at ensuring that the projects favour sustainable development in the recipient country (e.g. search for government certification that projects promote sustainable development, indicators of technology transfer, environmental and social impact assessments); and services that serve the emerging secondary market (e.g. trading, exchanges, brokerage).

The early experiments in emissions trading have underlined the key role played by large consulting firms from industrialized countries in setting up the market infrastructure and in framing the individual deals; therefore, the trading of emission entitlements, although favouring considerable financial transfers to developing countries, is likely to represent a business opportunity primarily for services suppliers from the developed world.

Most services involved are in fact complex activities with substantial expertise requirements that at present fall beyond the capacity of developing countries.

The risk of developing countries being passive recipients of financial flows rather than proactive architects in the design of the emissions market has some important implications in relation to the achievement of CDM objectives, namely providing cost-effective compliance options for developed countries and helping developing countries to achieve sustainable development. The equitable achievement of these dual objectives, however, is likely to depend heavily on how individual transactions are actually shaped. The services component becomes crucial for this purpose. The lack of domestic service capability in the emissions field and the heavy reliance on external expertise from developed countries might be conducive to a situation where cost-efficient commitment compliance and development are not pursued on an equitable basis.

Sources: "Europe's air of self-righteousness", *FT.com* site, 19 December 2000; "Hot air about global warming", *FT.com* site, 29 November 2000; C. Vrolijk, The potential size of the clean development mechanism, Second International

Conference, Emerging Markets for Emissions Trading, London, 26-27 April 1999,
website: http://www.riia.org/Research/eep/eeparticle.html; UNCTAD, UNDP, UNEP and UNIDO, *The Clean Development Mechanism: Building International Public - Private Partnerships under the Kyoto Protocol: Technical, Financial and Institutional Issues*, United Nations, Geneva, July 2000, p. 9; UNFCCC, press release, Governments ready to ratify Kyoto Protocol, 10 November 2001.

A series of questions would seem to confront developing countries in the ongoing multilateral negotiations on services. With respect to the question of classification, a sufficient degree of precision in the definition of "energy services" would facilitate an approach under which negotiations of specific commitments could be undertaken in a manner consistent with energy policy objectives. Another question would be whether additional provisions, reflecting the specificity of the energy services sector, could be attached to the liberalization commitments. Such specificities could relate to the interconnectivity aspects of energy transmission and distribution (the relevance of the Reference Paper for Basic Telecommunications has been mentioned), and to the importance of GATS Article IV provisions, such as transfer of technology and access to distribution channels and information networks, with a view to increasing the competitiveness of developing country firms in the supply of energy services. An additional set of conditions could aim at ensuring that where foreign enterprises were permitted to operate in liberalized energy markets in developing countries, a set of "public services" obligations could be attached (see text box no. 7). The inclusion of these conditions in an Annex or Reference Paper applicable to the sector could ensure that developing countries could obtain benefits they might not be able to effectively negotiate with stronger trading partners, or investors in a bilateral context. The objective would be (a) to "level the playing field"; (b) to link energy and development in a clear manner – including the achievement of public services goals; and (c) to prevent developing countries from competing among themselves to attract investment in the energy sector by lowering their requirements vis-à-vis foreign providers.

Text box no. 9
Public services in the electricity sector

Energy markets alone cannot be expected to meet the needs of the most vulnerable groups of the population or to protect the environment; therefore, targeted government policies are needed to harness market efficiencies for the protection of public goals. Several Governments consider electricity a public service; however, the question is what is happening to public services in a liberalized system in which firms (domestic and foreign) compete for business.

Several countries that have opened their electricity markets to competition have included in their legislation specific provisions related to consumer protection. Article 3.2 of the EC Electricity Directive states that "Member States may impose on undertakings operating in the electricity sector, in the general economic interest, public service obligations which may relate to security, including security of supply, regularity, quality and price of supplies and to environmental protection". The measures and mechanisms that Member States put in place for the achievement of these objectives should not restrict trade and competition more than necessary, should be objective and transparent, and should be imposed on a non-discriminatory basis on all operators equally. In March 2001, the EC Commission proposed a new set of measures in this regard. To make sure that the opening up of electricity (and gas) markets serves the interests of all European consumers, the Commission's proposal requires Member States, *inter alia*, to guarantee a secure supply for all consumers; to take steps to protect vulnerable persons and to take steps to protect the rights of energy consumers by developing strict rules to govern energy supply contracts, providing transparent information on prices, and enforcing low-cost and transparent procedures for dealing with consumer complaints.

Considering that one of the main problems that developing countries wish to tackle by liberalizing their power market is the inadequacy of electrical supply, they may consider including a clear reference to the provision of public services when private actors are in charge of supplying electricity. Qualifications to market access commitments under GATS could focus on measures aimed at ensuring equity, such as maximum prices for consumers, uniform fees charged across all regions regardless of costs, and provision of energy supply to remote rural areas even if unprofitable. However, if developing countries compete among

themselves to attract private investment in the power sector, companies may be reluctant to accept public service obligations because of the developing countries' weak capacity to include public service obligations in their investment agreements and deregulation policies.

As described above, the growth of the energy services sector can be attributed to the increasing demand for energy combined with the externalization of activities, first, at the upstream stage by transnational enterprises, and, more recently, at the downstream stage through increasing competition and demonopolization, especially of the gas and electricity segments. Some oil-producing and exporting developing countries have not only been able to encourage the creation of a specific energy services sector, but also strengthened the supply capacity in other service sectors, supplying the oil industry (see text box no. 10). These approaches might be replicated by other developing countries.

In developing countries the construction of utilities, such as power plants or hydro-electric stations, is largely financed by multilateral or bilateral assistance programmes. Usually, bidding procedures are set up for assigning the construction works. Developing country firms are very often unable to participate in those procedures because they do not meet the pre-qualification requirements. The works are therefore carried out by developed country firms at costs higher than those that would have been charged by local firms. A primary concern for developing countries is to improve the competitiveness of their firms so that they can compete successfully in the multilaterally or bilaterally financed construction projects in their countries. Once they have accumulated expertise and strengthened their competitiveness, these may be translated into export capacity.[30]

[30] This was noted at UNCTAD's Expert Meeting on Regulation and Liberalization in the Construction Services Sector and Its Contribution to the Development of Developing Countries, 23-25 October 2000.

Text box no. 10
Construction services related to energy: The case of PDVSA

Venezuela is the second largest energy producer in the Western hemisphere, but it is also the second largest consumer of energy-related services, including physical construction services and engineering services.

In 1980 there were only 25 engineering companies in Venezuela which had the capacity to develop medium-size projects of a value of between US$ 100 and 200 million. In 1992, Venezuela had 200 engineering companies with such a capacity, including 25 that had developed the expertise to manage complex projects. These companies have been increasingly able to provide the local oil company, PDVSA, with the kind of construction services that it needs for its activities. At present, 90 per cent of PDVSA's requirements in the engineering sector are met by local companies.

This situation is the result of a global strategy put in place by PDVSA to support the development of local capacity in all the sectors needed by the company for its operations. In the engineering sector, PDVSA encouraged the development of capacity and expertise by local firms and promoted partnerships with those foreign firms that were willing to transfer technology, train personnel and share their design and project control systems with local firms.

However, many problems had to be addressed and solved before local engineering firms could qualify as adequate business partners for PDVSA. Problems included the inability of Venezuelan companies to deal with large and complex projects, their lack of financial leverage and the serious restrictions existing in the domestic banking system. Therefore, large projects were split into several "easy to handle" packages; joint ventures were implemented where human resources training was set as a central issue, and high standards were established in the areas of design, cost estimation, planning, construction and inspection.

Venezuelan engineering companies that provide services to PDVSA have diversified their activities and are at present also active in other industrial sectors, such as hydroelectricity and petrochemicals. However, they are not yet key players in the international market for energy-related construction.

Source: Presentation made by the representative of PDVSA at UNCTAD's Expert Meeting on Regulation and Liberalization in the Construction Services Sector and its Contribution to the Development of Developing Countries", 23-25 October 2000.

In summary, the elements of a strategy for the energy services sector for developing countries would include pursuing the following objectives: (a) to ensure efficient access to energy by all segments of the population; (b) to strengthen their competitive position in the supply of energy services at the various stages of the energy chain; and (c) to negotiate commitments and additional provisions in the multilateral negotiations on trade in services supportive of these objectives.

ANNEX

Overview of the GATS commitments in energy-specific services sectors:[31] Commercial presence[32]

Horizontal (affecting all industries) commitment[33]
The Republic of Bulgaria for Services Relating to the Use of Nuclear Energy for Peaceful Purposes – No commitment for services relating to the exploration, extraction and processing of fissionable and fusionable materials or the materials from which they are derived, as well as to the trade therewith, to the maintenance and repair of equipment and systems in nuclear energy production facilities, to the transportation of such materials and the refuse and waste matter of their processing, to the use of ionizing radiation, and all other services relating to the use of nuclear energy for peaceful purposes (including engineering and consulting services and services relating to software, etc.). Full national treatment granted in this area. In *Iceland* non-residents are excluded from obtaining full property rights to real estate if unusual rights are linked to it, such as exploitation rights as regards waterfalls, geothermal energy, etc.

[31] Based on the review of 131 schedules of GATS specific commitments. Where the commitment for market access and national treatment is "Unbound", it is excluded from the table. This concerns also a horizontal commitment by Bulgaria on nuclear energy.

[32] Commitments for the GATS movement of natural persons were mostly made at the horizontal level and only for a few categories of persons, mainly intra-corporate transferees and business persons. For detailed discussion of Mode 4 commitments, see UNCTAD/ITCD/TSB/10, pp. 193–207. At the sector-specific level as included in these tables, none of the countries have made provision for market access of specialists in any of the relevant categories for supply of the energy services (except Turkey for mining services).

[33] The following measure in the European Communities for Italy has expired: for a period of five years, the acquisition of large equity stakes of companies operating in the field energy may be subject to the approval of the Ministry of the Treasury.

In *Peru*, within 50 kilometres of the frontier, foreigners may not under any circumstances directly or indirectly purchase or own mines, land, woodland, water resources, fuel or energy sources, whether individually or as a company, on penalty of transfer of the rights thus acquired to the State.	
Transportation via pipeline of crude or refined petroleum and petroleum products and of natural gas	
No sector-specific restrictions: (bound as "none")	Australia, Croatia, Kyrgyz Republic, New Zealand
Some sector-specific restrictions exist or limited scope of coverage:	*Hungary* – services may be provided through a Contract of Concession granted by the State or the local authority *Brazil* – excludes fuels and hydrocarbon products
Services incidental to energy distribution: transmission and distribution services on a fee or contract basis of gaseous fuels to household, industrial, commercial and other users	
No sector-specific restrictions: (bound as "none")	Croatia, Georgia, Latvia, Nicaragua, Oman, United States
Some sector-specific restrictions exist or coverage of a limited scope:	*Australia* and *Hungary* – limited to consultancy services *Colombia* - design, construction, operation and maintenance of oil and gas pipelines *Dominican Republic* – national treatment may not be granted *Gambia* – conditions for market access not specified, except that individuals/companies must be certified and registered by the Professional Associations or Registrar General's Office; subject to payment of fee, tax deposit and professional qualification of the individual. *Kyrgyz Republic* – excludes electric energy distribution

	Sierra Leone – through joint venture only *Slovenia* – for gas only
Services incidental to mining: rendered on a fee or contract basis at oil and gas fields	
No sector specific restrictions: (bound as "none")	*Albania, Argentina, Canada, Colombia* (broader coverage), *Ecuador, Georgia, Israel, Kyrgyz Republic, Latvia, Malawi, Mongolia, Nicaragua, Oman, Pakistan, Panama, South Africa, Turkey, United States, Venezuela, Zambia*
Some sector-specific restrictions exist or coverage is of a limited scope:	*Australia, Austria, European Union* (Spain and Portugal restrict access for mining engineers to natural persons), *Finland, Hungary, Republic of Korea, Singapore, Sweden* – for consulting services only *Poland* – excluding exploitation of natural resources, *Switzerland, Liechtenstein* – excluding exploration, exploitation, prospect and survey services *Dominican Republic* - national treatment may not be granted *Thailand* – 49 per cent limit on foreign equity participation

Overview of the GATS commitments in energy-specific services sectors: cross-border supply

Horizontal (affecting all industries) commitment	
The Republic of Bulgaria for Services Relating to the Use of Nuclear Energy for Peaceful Purposes – No commitment for services relating to the exploration, extraction, and processing of fissionable and fusionable materials or the materials from which they are derived, as well as to the trade therewith, to the maintenance and repair of equipment and systems in nuclear energy production facilities, to the transportation of such materials and the refuse and waste matter of their processing, to the use of ionizing radiation, and all other services relating to the use of nuclear energy for peaceful purposes (including engineering and consulting services and services relating to software, etc.). Full national treatment granted in this area. In *Canada:* Alberta – First consideration may be given to service suppliers from within Alberta or Canada when they are competitive in terms of price and quality in the case of all large-scale energy projects needing industrial development, forest management, oil sands, power plant or gas plant and coal development permits.	
Transportation via pipeline of crude or refined petroleum and petroleum products and of natural gas	
No sector-specific restrictions: (bound as "none")	*Australia, Croatia, Kyrgyz Republic* and *New Zealand*
Some sector specific restriction:	*Hungary* – conditions for market access not defined
Services incidental to energy distribution: transmission and distribution services on a fee or contract basis of gaseous fuels to household, industrial, commercial and other users	
No sector-specific restriction: (bound as "none")	*Gambia, Georgia, Latvia, Nicaragua, Oman, Sierra Leone, United States*
Some sector-specific restriction or coverage of a limited scope:	*Colombia* – design, construction, operation and maintenance of oil and gas pipelines *Côte d'Ivoire* for energy generation – Enterprises must

	receive government approval. The criteria that must be satisfied in order to obtain approval may include the preferential use of local services if available under conditions of quality, price and delivery equivalent to those for like products of foreign origin. The employment and training of local executives and supervisors. *Croatia* – commercial presence required to access the market *Dominican Republic* - national treatment may not be granted
Services incidental to energy distribution: transmission and distribution services on a fee or contract basis of gaseous fuels to household, industrial, commercial and other users *(cont'd)*	
Some sector-specific restriction or coverage of a limited scope (cont'd):	*Australia* and *Hungary* – limited to consultancy *Slovenia* – for gas only *Malaysia* (advisory, guidance and operational assistance services concerning management of the transmission of non-conventional energy) – through a locally incorporated joint-venture corporation with Malaysian individuals or Malaysian-controlled corporations or both, and Bumiputera shareholding in the joint-venture corporation of at least 30 per cent

Services incidental to mining: rendered on a fee or contract basis at oil and gas fields	
No sector specific restrictions: (bound as "none")	*Albania, Argentina, Canada, Colombia* (broader coverage), *Georgia, Kyrgyz Republic, Latvia, Malawi, Mongolia, Nicaragua, Oman, Panama, United States, Zambia*
Maintain some sector-specific restrictions or commitment of a limited scope:	*Australia, Austria, European Union, Finland, Hungary, Republic of Korea, Singapore, Sweden* -- for consulting services only, *Poland* – excluding natural resources *Dominican Republic* -- national treatment may not be granted *Switzerland, Liechtenstein* – excluding exploration, exploitation, prospection and survey services *Turkey* – requires establishment; nationality for real persons

MFN exemption in energy services

Country	**Measure**
United States of America *With respect to pipeline transport due to lack of reciprocity*	Pursuant to the Mineral Lands Leasing Act of 1920, aliens and foreign corporations may not acquire rights of way for oil or gas pipelines, or pipelines carrying products refined from oil and gas across onshore federal lands or acquire leases or interests in certain minerals on onshore federal lands, such as coal or oil. Non-United States citizens may own a 100 per cent interest in a domestic corporation that

	acquires a right of way for oil or gas pipelines across onshore federal lands, or that acquires a lease to develop mineral resources on onshore federal lands, unless the foreign investors' home country denies similar or like privileges for the mineral or access in question to United States citizens or corporations, as compared with the privileges it accords to its own citizens or corporations or to the citizens or corporations of other countries. Nationalization is not considered to be denial of similar or like privileges. Foreign citizens, or corporations controlled by them, are not permitted to obtain access to federal leases on Naval Petroleum Reserves if the laws, customs or regulations of their country deny the privilege of leasing public lands to United States citizens or corporations. Applies to all countries.
Venezuela *With respect to petroleum-related services*	Bilateral agreement services relating to distribution and the marketing of petroleum and petroleum products, advisory services and exchange of technology, in which preferences are granted. Applies to Germany, France, Brazil, Central American and Caribbean countries.

DEFINING ENERGY SERVICES FOR THE GATS: AN ISSUE UNDER DISCUSSION

Jasmin Tacoa-Vielma[*]

Introduction

As the services negotiations at the WTO are about to commence the process in which member Governments exchange specific sectoral access commitments, uncertainties as to what should be understood as energy services remain. This paper presents a brief overview of the situation and some of the issues involved in defining energy services under the General Agreement on Trade in Services (GATS). In doing so, it first looks at the general framework for classification of the universe of services sectors covered by the GATS. This is intended to assist readers in assessing the possible impact of classification issues on energy services negotiations. It then addresses the specific aspects of the energy services sector classification, i.e. the current situation, efforts made to date, and the challenges encountered.[1] The groundwork for definition and classification of the sector was carried out at a technical level and preceded the current negotiating process, where proposals for the liberalization of trade in energy services are being discussed.

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[1] As of May 2002.

1. What is the situation regarding classification of services in general under the GATS?

The GATS framework does not contain a definition of what is meant by the term "services", nor does it contain a classification that identifies each element of the services universe covered and that could be subjected to its liberalization disciplines. Moreover, WTO members until now have not agreed on a unique classification that must be used by all members in the context of negotiating and inscribing sector-specific commitments. However, a tool for such purposes was designed during the Uruguay Round, namely the Services Sectoral Classification List contained in document MTN.GNS/W/120 of 10 July 1991 (W/120). This document consists of a list of service sectors based on the Provisional Central Product Classification (CPC) of the United Nations of 1991. It divides all services into 12 broadly defined sectors, which are further divided into some 150 sub-sectors.

Each of the sub-sectors in the list is annotated with CPC codes, which refer to the appropriate part of the CPC's explanatory notes. This cross-reference to the explanatory notes of the CPC is meant to provide a clear description of the services covered by each sub-sector listed. However, in some cases the CPC notes are not very specific and describe by way of examples, which might introduce a level of interpretation as to what is covered by a code. An interesting case is that of the category “other” of the W/120, which in some sectors is not accompanied by a code while in others the explanatory note referred to may read: "any service not elsewhere classified". When used to determine the sectoral scope of a commitment in a GATS schedule, the lack of specificity or broad coverage of some of the CPC explanatory notes could give rise to ambiguities.

As a list prepared by the then GATT Secretariat for reference purposes, the W/120 is in fact a document of non-binding legal nature, that is to say, its use by WTO members in inscribing their commitments under GATS is not mandatory. Nevertheless, the W/120 and CPC codes have been used, in whole or part, in 90 per cent of the schedules containing sectoral commitments under the Agreement to

date. The sectoral inscriptions using CPC codes in the first column of national schedules, which determine the scope of the services committed, are legally binding on the Government inscribing them.

In exploring the possibility of developing an agreed services classification for the GATS, the W/120 has been under examination since 1995. So far, such an examination seems to reveal that an update could be necessary in areas where services sectors have evolved and their description in the W/120 does not reflect the activities included in the sector or the way in which the sector is organized. Apart from the technical aspects involved in identifying the necessary changes, the main question facing WTO members is the extent to which a revision of W/120 is desirable and viable from a pragmatic viewpoint. In this respect, it is important to consider the implications, if any, that a revision of the classification list could have for the existing commitments of those members that have used it. The answers to such questions would depend on the actual nature of the revision, but also on the extent to which a revision of the non-mandatory list could automatically introduce modifications to the actual inscriptions contained in the national schedules of members, which are the only legally binding instrument determining the scope of commitments.

An examination of the schedules reveals that the W/120 approach has been in most cases followed, although with various degrees of departure. For instance, a schedule might have in most first-column entries a reference to CPC codes, but not in all. In some cases, the coverage of a CPC code inscribed might be reduced, as activities covered originally are excluded through express indication. Therefore, to determine the exact "sectoral scope" of a commitment one has to look at the actual entry in the schedule under the first column and, if CPC codes have been used for that purpose, the actual explanatory notes introduced therein by reference. In other words, it is not W/120 that determines the sectoral scope of a commitment but an actual entry in a schedule and, where inscribed, the explanatory notes of the CPC.

In that regard, it may be worth noting that regardless of its extent and nature, any potential revision of the W/120 would not constitute a

revision of the Provisional Central Product Classification or its explanatory notes. The CPC is a completely separate instrument whose determination is not under the competence of the WTO. Recently introduced revisions of the CPC have not been deemed to have an impact on W/120, even though the latter is based on the former. Those same revisions have not been considered to affect the commitments that have been inscribed using the CPC. It may be worthwhile to bear that in mind when assessing the likelihood that modifications made to W/120 today could de facto modify commitments already inscribed in a schedule.

A related question is the impact of a revision of the existing classification list on commitments where the classification or definitions used is unclear. It would be necessary first to determine the relevance of W/120 or any other classification in defining the content of existing entries. In that regard, it is worth noting that W/120 has been used in other WTO legal texts,[2] as an indication of the services universe. It may be also worth noting that, except for those of recently acceded members, most schedules do not indicate whether W/120 or any other classification has been used as a basis, perhaps because at the time of making those commitments the question of an evolving classification was not considered. The perception about the need for explicit indications of the classification used might change in the current negotiations.

At this stage, it would seem that there is a tendency to preserve W/120 in its present form as much as possible. While it is true that agreeing multilaterally to a unique classification or definition of the services sectors under the GATS would be ideal – since a common language for what would be negotiated and committed facilitates the process while adding certainty and comparability to resulting commitments – it is also true that such a task has proved to be difficult. Given that the negotiations are fast approaching the stage at which members have to define services to request and offer

[2] See WTO, *The Results of the Uruguay Round of Multilateral Trade Negotiations: The Legal Texts 1994* - Understanding on Rules and Procedures Governing the Settlement of Dispute, Article 22 (f).

commitments, and the fact that the lack of an agreed classification has not prevented negotiations in the past, the task of devising an agreed classification, on the basis of an updated W/120 or otherwise, might be delayed.

2. How are energy services addressed in the W/120 list?

Examination of the treatment of energy services within W/120 has revealed serious shortcomings. The first of these is a gap in the list with respect to the sector, i.e. there is no separate section on energy services. However, W/120 contains three specific sub-categories that have been identified as part of a potential "energy services" sector, namely “services incidental to mining”, “services incidental to energy distribution” and “pipeline transportation of fuels”. Those activities constitute sub-categories of other services sectors listed in W/120, i.e. Business Services for the first two and Transport Services for the latter. Bearing that in mind, one should not rule out that unspecified activities relevant to the energy services sector could be deemed to be covered under other categories of the W/120 and CPC [3]. Such a determination would be essential in seeking to identify the content of a new separate section for energy services. However, that could only be done based on a clear understanding of the sector and an examination of the W/120 and CPC categories to the highest level of disaggregation, which may entail interpretation of the coverage of the CPC explanatory notes. The latter would not be an easy task for WTO members.

Another perceived deficiency relates to the fact that a variety of other services that intervene in the energy value-added chain (from production to sale to final consumers) are found in the whole range of services sectors on the list, e.g. research and development, engineering, construction, management consultancy, environmental,

[3] For instance, services incidental to mining, CPC 883, are defined as "services rendered on a fee or contract basis at oil and gas fields, e.g. drilling services, derrick building, repair and dismantling services, oil and gas well casings cementing services." (emphasis added) The W/120 also includes under this subsector "Site preparation work for mining" (CPC 5115).

financial and distribution services. These services could be termed "energy-related services" because of their relevance, but not exclusivity, to the energy industry. It has been argued that such dispersion of “energy-related services” makes it difficult to determine existing commitments and to negotiate the totality of the services necessary for the energy industry; that would make sense from an economic viewpoint. However, this situation is not unique to the energy industry, as most economic activities or industries require a variety of services inputs that in many cases are designed or adapted for different end-uses. For example, there are engineering, financial or construction services especially tailored for the energy industry as well as for the telecom industry.[4] Having an all-encompassing definition of the energy services sector would certainly facilitate considering the totality of services involved in the industry; however, that should not be equated to a guarantee of complete coverage by GATS commitments.

A third potential drawback of the list might be the lack of coverage of "new services" specific to the sector. Such services may have arisen as a result of structural changes experienced by energy markets since 1991 when the sectoral list was drawn up, emergence of new technologies, and efficiency or environmental concerns, for example. In this connection, it is worth noting that similar questions about the classification of recently emerged services – Internet services being the most commonly cited example – have also been raised in relation to other sectors. One issue relevant to this point is the distinction between "new services", that is activities that did not exist genuinely in the past and thus could not be found in any existing classification, and "new ways" of performing or delivering existing services. Also relevant would seem to be a distinction between "new services" and services that were performed in-house, in a vertically integrated structure, and that now are subject to outsourcing. In such a case it could be argued that what is "new" is not the service in itself but its

[4] To further illustrate the point, waste handling, treatment and disposal, and engineering design services for industrial processes and production – identified as part of environmental and engineering services – would be activities pertaining to energy facilities but also to other industrial facilities.

tradability, and that may vary from country to country. It may well be that definitions of those "newly tradable" services are not missing from existing classifications.

3. How may classification relate to the negotiation of commitments?

Some of the reasons that may explain the inadequate way in which the energy services sector is treated in the W/120 point to the structural reality of the energy markets at the time of the Uruguay Round. The negotiating efforts in the Uruguay Round seemed to have focused on independent services sectors easily identifiable, where international services trade was already considerable, and where interest in commercial liberalization existed. The energy markets instead were characterized at the time by vertically integrated, State-owned companies, operating mainly in national markets in monopoly positions, which performed most of their own services internally. In other words, international trade in the services segments of the energy industry, and the interest in commercial liberalization under the GATS that would derive from it, may not have been developed sufficiently to merit attention during the Uruguay Round.

That situation seems to have changed as energy markets have experienced, or are initiating, structural reforms leading to more private sector participation and the unbundling of services. That has allowed a certain amount of international services trade and generated commercial liberalization interest, which are preconditions for the inclusion of the sector in the GATS process. However, the GATS approach requires countries to be able to identify "energy services" that can be independently committed to under its liberalization process, and thus there cannot be negotiations and commitments without adequate recognition by Governments, at least individually, of the sector.

4. What has been done so far regarding energy services?

The issue of the definition and classification of the sector in the context of the GATS was first approached in 1998, during the

information exchange programme preparatory to the current services negotiations. In that process the deficiencies of W/120 referred to above were recognized and the desirability of delineating the activities clearly covered by the Agreement, and potentially subject to its progressive liberalization programme, was acknowledged. What has been under discussion is not the coverage of the "energy services sector" by the GATS as such, but its identity as a separate sector in its own right, as opposed to a group of sub-sectors covered by other services sectors. The technical work on classification of the sector began in 1999 and was therefore in progress at the time proposals for the liberalization of the sector were tabled.

Technical discussions were based on two written initiatives attempting to identify the services comprising the sector and to relate them to the W/120 and CPC classification. The suggested activities pertain to the whole process of the energy industry, from exploration or resource identification to sale to the end-user, although the two contributions vary in terminology and level of detail. They also vary in their approach in relation to the W/120 and CPC classification. One of them presented a preliminary list attempting to identify from the outset "pure energy services" activities not covered by W/120, and sought to avoid overlaps between other services sectors already listed and the future "energy services" sector. By contrast, the other started by identifying a broad range of activities involved in the "energy sector" taking into account commercial realities.[5] It suggested a methodology based on identifying activities of the "energy chain" already clearly covered by other W/120 sectors; activities not yet specified or unclear in the list that should be included; and those that may possibly be outside the scope of the GATS.

The discussions on those initiatives have raised a number of questions that so far remain unresolved: (a) whether to create a new section for energy services or to rely on the existing coverage of

[5] The term "energy sector" is used here to refer to a number of energy-related activities participating in the whole "energy chain", which could be distinguished from the "energy services sector", the latter being only part of the former.

relevant activities by other sectors; (b) how to identify the energy services sector and avoid overlap within the classification and commitments; and (c) if the creation of a separate definition of the sector is pursued, what approach should be followed in constructing it? The paragraphs below briefly address each of these issues.

(a) The creation of a new section for energy services in W/120 is linked to a number of considerations, such as the extent to which it would be feasible to take commitments in the sector with the current list; the benefits of having comparable and well-circumscribed inscriptions in schedules as a result of a widely accepted definition of the sector; and the possibility that actual changes to W/120 could modify existing commitments inscribed according to such a classification. Of these issues, the most controversial one seems to be the latter. Some considerations that would seem relevant in pondering this issue have been outlined above in a more general context. As important as these questions may be, it would be very difficult and perhaps premature to address them adequately in the abstract, i.e. without knowing first what the sector is composed of and what a revision would entail. Further work on this front is necessary, as the two initiatives referred to above represented work in progress. Without more insight as to what would be required in order to have an adequate and clear definition of the sector vis-à-vis the W/120, it is very difficult to assess the "pros" and "cons" of such an exercise.

(b) With respect to identifying the energy services sector, the first question is how to distinguish "energy services" – so-called "pure" or "core" energy services – from other "energy-related services". One approach to making such a distinction seems to be by exclusion. In other words, "pure" energy services would be those that are part of the energy chain and are not already covered elsewhere in the W/120 and CPC framework. Another approach seems to be based on the role that the activity may play in the energy chain. These would include services that are an essential part of the energy sector chain of supply and without which it could not function, as well as services that are mainly an input for the energy industry, although they might also be an input for others. Should the latter include elements already covered

elsewhere in the sectoral list, the question arises as to how to deal with overlaps among various services sectors. Here the issue is how to avoid duplication, or perhaps omissions, in the future inscription of commitments in the light of the fact that existing commitments in other sectors, e.g. business services, engineering and construction, may already include energy services. Such double listing, or its absence, may be seen as undermining concessions already granted. In considering this question it would seem useful to differentiate between, on the one hand, a "definition of the sector" for the purpose of inclusion in W/120 and, on the other hand, one for the purpose of negotiating commitments for the entire energy chain. To avoid overlap a possible definition could be confined to those activities that can be categorized as pure or core services, however they might be defined. An all-inclusive definition could be designed for negotiating and verification purposes, to ensure that the various services activities could be considered, but without requiring a reclassification of sub-sectors based on end-use and separation from the sectors where they are found at present, either in W/120 or in the schedules.

Additionally, a more complex issue has emerged from the fact that "energy" as such is mostly considered a "good", whose trade regime would be determined by GATT disciplines. Some of the activities of the energy chain under consideration for inclusion in the definition of "energy services", whose trade is subject to GATS, may indeed constitute or be part of the production or manufacturing of energy goods. The question is how to treat those activities closely related to production of energy within a definition of the "energy services" for GATS purposes, while avoiding overlaps with the GATT framework. Examples of such activities include services related to mining, petroleum extraction (drilling), refining of oil and electricity generation.

In this context it is worth noting that the W/120 contains the category “services incidental to mining”, whose broad definition includes drilling and may be interpreted to include other services

involved in production at oil and gas fields. [6] In addition, the list also includes “services incidental to manufacturing”, defined in the CPC as manufacturing on a fee or contract basis without the property of the raw material. These activities, currently found under the sub-sector "Other business services", have been included in the schedule of specific commitments of some members.[7] However, questions have been raised as to the appropriateness of considering these as services under the GATS. It has been argued that to assimilate the energy production – a process involving the production of a good for some – to a service could undermine the classic distinction between goods and services that sustains the separation of the scopes of application between the GATT and GATS. It is worth noting that while production activities as such are not regulated by GATT, the Agreement on Trade-Related Investment Measures (TRIMs) contains certain disciplines on investment-related performance requirements. It has also been argued that, in reality, the fact that the W/120 and CPC framework treats manufacturing on a fee or contract basis as a “service” does not oblige WTO members to take the same view, as CPC is not legally binding and could not determine the legal scope of the GATS. However, those that have introduced CPC codes in their schedules are obliged by those inscriptions and those commitments have created rights and obligations.

It is also worth mentioning that the idea of a strict separation of the scopes of application between GATT and GATS, perhaps prevailing at some point, has been tested in a couple of disputes which found that certain measures could be covered by both Agreements. This might suggest that some forms of overlap between the two frameworks may be unavoidable. Moreover, a straightforward legal answer to this issue cannot be given, as there is no guidance that could be drawn from the GATS text, which does not define the term "services". Therefore, it would seem that resolution of this issue would be a matter for decision by members, probably on the basis of the desirability of possible

[6] See footnote 3.

[7] Services incidental to mining appear (in whole or part) in 36 schedules, while services incidental to manufacturing have been listed (in whole or in part) in 26 schedules.

outcomes. The complexity of this situation is compounded by the existing commitments on services incidental to mining and manufacturing; this makes it necessary that any decision on GATS coverage of the activities in question would have to take into account those commitments. Preliminary discussions would seem to suggest that while some would prefer not to subject manufacturing or production on a fee or contract basis to GATS disciplines, others would prefer to avoid a discussion in the abstract and follow a case-by-case approach. This issue was set aside from the energy discussion without reaching conclusions, as it was deemed a systemic issue affecting the coverage of the GATS and requiring a definition of the term "services". However, it would seem important to seize the opportunity afforded by the present negotiating context to clarify the issue before more commitments are added or withheld owing to uncertainties in this respect.

(c) As to the approach to be followed in constructing a definition for the sector, the need to consider diverse market and regulatory structures – e.g. degrees of private participation, vertical integration of operators, and competition – as well as the various energy sources, has been suggested. Given the differences in regulatory approaches among the 144 WTO members and the ongoing processes of restructuring and innovation in a number of energy markets, it would seem relevant to assess to what extent it is viable and advisable to reflect any particular reality in defining the sector for multilateral-level purposes. Instead, it would seem preferable to consider drawing up a definition of the sector sufficiently neutral and comprehensive, and sufficiently disaggregated, to afford the necessary flexibility to tailor commitments to individual market realities. A case in point would be the approach followed in the basic telecommunication sector negotiations, where market structures differed widely at some point. The approach taken in that context consisted of drawing up a number of categories for each basic telecommunication service to allow for subtleties as needed to facilitate undertaking commitments, taking into account the level of liberalization in terms of private participation and trade possibilities existing in each country.

Regarding the need to consider the peculiarities of diverse energy sources, it has been argued that different activities in the energy chain exist depending on the type of energy involved. Thus, a definition of the sector could consist of separate sub-sectors for each type of energy source involved. The alternative to that suggestion would be identifying the services of the energy sector as a whole regardless of the source of energy, what has been referred to as an "energy-neutral approach". In pondering both approaches, it would seem relevant once again to separate the structure of a classification for the sector, on the one hand, from the flexibility provided by GATS in the undertaking of commitments on the other. Independently of whether a future classification of the sector is energy-neutral or not, members always have the possibility of taking commitments based on the type of energy of their preference. In other words, an energy-neutral classification in W/120 can always be made energy-based in a schedule of commitments of a Member, or the other way around.

Concluding observations

As the preceding paragraphs highlight, the lack of clarity as to what energy services are and whether they can be found, or are included, in the W/120 and CPC classification constitutes an important issue in the present negotiating context. While technical deliberations have attempted to find answers to the issues presented above, proposals for the liberalization of the sector have nonetheless been tabled in the current negotiating forum. In acknowledging the classification problem, those proposals have put forward pragmatic solutions yet to be discussed and agreed upon. New strategies to advance definitional work may be under consideration resulting from a shift in the dynamics of the process. Innovative approaches to the classification issue may result from the increased flexibility that the negotiating context presents, as participants have ample discretion in deciding what to request and offer as commitments, whose coverage could be shaped at various levels, i.e. unilateral, bilateral, plurilateral or multilateral.

In spite of the importance and complexity of the issues, the voluntary approach to classification, together with the flexibility

enjoyed by countries in the undertaking of commitments within the GATS, would seem to provide ample scope for manoeuvre to WTO members in the ongoing process to ensure the undertaking of energy services commitments under the Agreement. Additionally, it would still be a necessary step for countries individually to determine the activities where trade is feasible for them and where interest in trade liberalization exists. For the time being, the issue of a more clear classification of energy services remains under discussion and it seems likely that pressure to resolve it will intensify to the extent that current negotiations demand multilaterally agreed solutions.

An Overview of the Negotiating Proposals on Energy Services under the GATS Negotiations

CANADA

Josée De Menezes[*]

The energy services sector is important for the development of all countries, including developing countries, and is certainly important for Canada. In this context, a proposal was submitted by Canada in the framework of the ongoing GATS negotiations, which covers the oil and gas services. Canada's proposal focuses on improving access to foreign markets by services suppliers. It suggests that market access negotiations could possibly use a checklist of energy services as an aide-mémoire to help negotiators to identify activities in the energy sector that could be subject to requests and offers of specific commitments.

Canada's proposal does not touch on the issue of the ownership of natural resources. Furthermore, it does not seek to call for deregulation. The right of WTO Members to regulate and to introduce new regulations on the supply of services within their territories in order to meet national policy objectives is enshrined in the GATS. Liberalization of trade in energy services is consistent with and supports the development of good regulatory practices. The GATS cannot be interpreted as requiring Governments to privatize or to deregulate any services.

The energy sector is characterized by small and medium-sized enterprises (SMEs) operating alongside large companies. Relevant in this respect is the negotiating proposal submitted by Canada on SMEs. This proposal stresses that technical developments have provided an

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opportunity for SMEs to become involved in the international scene. Canada considers that it is important to address the particular situation of small and medium-sized service suppliers in the context of GATS market access negotiations. For example, transparency and the need for greater predictability of regulatory conditions are an issue of particular importance to SMEs, as smaller companies cannot respond as quickly as large ones to regulatory changes. This last issue is addressed in more detail in the proposal that Canada submitted on regulatory transparency.

Among the obstacles identified in the oil and gas sector are those facing the entry and stay of professionals. In Canada's view, it is important to seek improvement in market access commitments made with respect to temporary entry of service providers. Another related issue is the temporary admission of equipment that service suppliers often require.

Further liberalization of energy services markets could help expand the use of environmentally friendly technologies and increase the transfer of skills. For example, the latter goal could be furthered through joint ventures and partnerships among companies in the sector. This is an issue that could be handled by contracts between private parties.

The GATS notes that progressive liberalization must take place with due respect for the level of development of individual Members and facilitate increased participation of developing countries in trade in services. Canada is interested in exploring ways to address the interest and concerns of developing countries, especially least developed ones.

An Overview of the Negotiating Proposals on Energy Services under the GATS Negotiations

CHILE

Ana Novik[*]

Introduction

Chile recognizes the crucial role of energy in the development of countries and the importance of promoting more efficient and affordable access to it. Even though Chile is not an important energy producer, and indeed is highly dependent on imported energy, it has presented a proposal on energy services in the current GATS negotiations.

A key element of Chile's energy policy has been progressive liberalization under an appropriate regulatory framework. Such liberalization has been the product of unilateral reform, but multilateral and regional negotiations also play an important role.

1. The energy sector in Chile

1.1 Sources

The Chilean energy sector includes electricity, oil and its by-products, coal, and – in a lower percentage – other sources (firewood and clean and non-traditional energy technologies).

Chile is not self-sufficient in energy resources. A total of 58 per cent of primary energy consumption is imported. The main final

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energy product used is oil, followed by natural gas. The industrial and mining sectors consume 27 per cent of total energy, followed by the transportation sector.

Table 1. Consumption of primary energy, 1978-2008

Teracalories					
	1978	1988	1998	1999	2008[e]
Crude oil	48%	38%	40%	40%	39%
Natural gas	9%	9%	11%	16%	33%
Coal	9%	12%	16%	16%	4%
Hydroelectric	18%	23%	17%	13%	14%
Firewood and others	16%	18%	16%	15%	10%
Gross consumption	104 370	139 524	250 920	264 693	448 138
Index	100	133.68	240.41	253.61	429.37
Annual growth rate		2.9%	6.0%	5.5%	6.0%
E: Estimate.					
Hydroelectric power with a caloric equivalent of 2750 kcal/kWh, 2504. Kcal/kWh until 1997 and 2504 kcal/kWh from then on.					

Source: CNE (National Energy Commission).

Table 2. Consumption of secondary energy, 1978-2008

Teracalories					
	1978	1988	1998	1999	2008[e]
Oil and natural gas derivatives	54%	45%	43%	41%	39%
Natural gas	6%	7%	13%	16%	28%
Coal and coke	12%	16%	17%	17%	7%
Electricity	8%	10%	11%	11%	16%
Firewood and other	20%	22%	16%	15%	10%
Gross consumption	96 964	127 857	264 754	286 266	550 533
Index	100.00	131.86	273.04	295.23	567.77
Average rate of growth		2.8%	7.6%	8.1%	7.6%
e: Estimate.					
Considers electricity with a caloric equivalence of 860 kcal/kWh.					

Source: CNE (National Energy Commission).

1.2 Evolution

Chile carried out an early economic reform of the energy sector. It undertook structural reforms in several economic sectors more than 20 years ago. The economic model emphasizes the role of private investors, stimulates market competition and assigns a regulatory and oversight role to the State. Currently, in the energy sector, the private sector accounts for more than 91 per cent of investment.

The energy sector in Chile has been growing during the last two decades, with a slowdown during 1998 due to the Asian financial crisis. This is directly linked with the evolution of the economy as a whole – real GDP grew at an average of 7.7 per cent between 1990 and 1998. It is also linked with the privatization process of the 1980s, which resulted in more investment in different sectors, thus increasing the demand for energy.

On the other hand, Chile underwent a crisis in the coal industry and experienced some exhaustion of the oil resources of the country in the last decade. These two factors led Chile to augment imports of energy and to apply a policy of diversification and integration of energy. This process was underpinned by a transparent price policy, stable macroeconomic indicators and regulatory harmonization initiatives with neighbouring countries.

In terms of price policy, the energy sector followed the general price policy of the economy, namely a free and competitive market. In the electricity sector, in particular prices are free for large consumers. However, for small consumers, the National Energy Commission fixes prices on the basis of strict and transparent methodologies that reflect production costs for transmitting and distributing power in an efficient manner. In the case of oil and gas, the prices follow international markets.

1.3 Last decade

The energy market is becoming increasingly competitive, improving the quality and availability of energy supplies for all consumption and production units.

The gradual energy integration with neighbouring countries has produced a change in the Chilean energy matrix. The most important example was the increase in consumption of natural gas due to the installation of natural gas pipelines with Argentina.

The energy sector is increasingly internationalized. Not only have new foreign investments been made in the sector, but also Chilean investors have invested in other countries of the region.

Finally, substantial progress has been made in environmental protection. The gradual implementation of the general environmental legal framework has had direct and indirect effects in the energy sector. In addition, the use of clean technology and the search for alternative sources of energy have been promoted.

1.4 Future trends and challenges

One of the future challenges is the introduction of new renewable resources – i.e. geothermal, wind and solar. This will help not only to extend the availability of energy to rural and isolated communities in the country, but also to improve the environmental sustainability of energy production, distribution and consumption.

Another challenge is to strengthen energy integration with other countries, especially South American ones. This would not only ensure a better availability of resources, but also help to achieve more diversified and competitive energy markets.

In the context of these and other challenges, the Government has introduced new reforms in the energy regulatory system.[1] The objective is to increase the efficiency and transparency of the energy market, avoiding unnecessary governmental intervention and ensuring availability and respect for users' rights.

2. Energy sector as part of the chilean negotiation proposal in the WTO

2.1 Proposal

The Chilean negotiation proposal includes, among other sectors, energy services. It makes a general presentation, describing the reasons for including the energy sector in the WTO negotiations. It also highlights two points: the importance of covering a full range of energy services and the importance of analysing subsidies in the energy sector – at least as a way of increasing transparency on this issue.

2.2 Reasons for presenting a proposal

By and large, energy services have not been included in bilateral and regional free trade agreements. Only a few commitments were made during the Uruguay Round negotiations. The principal reason for this is that the energy sector, in the vast majority of the countries, was controlled by State-run, vertically integrated enterprises that in most cases acted as State monopolies. However, in many countries legislative and regulatory instruments have been updated; the main features of the energy markets have been reshaped; and privatization and internationalization of the sector have been encouraged, thus resulting in greater competitiveness. Reforms within the legal

[1] The initial reform took place in 1982. In 20 years, the energy sector has changed and experience has been acquired; consequently, further reforms are needed.

framework are a tendency that will probably continue in the future. In this context, more countries will be able to include the energy sector in future negotiations, not only in the WTO but also in regional and bilateral negotiations.

Chile, being open and highly dependent on imported energy, is interested, through multilateral negotiations, in ensuring efficient and affordable access to energy. It is also interested in attracting new foreign investment and opening foreign energy markets for Chilean investors and professional suppliers of energy services.

Non-discriminatory access to the domestic energy market is provided. Through WTO negotiations, Chile wishes to promote open and competitive international markets for energy services. In this context, Chile will look for clear, stable and non-discriminatory rules in all markets, respecting national regulation – in particular those related to environment and social policies. Chile will promote the negotiation of a wide range of energy services. This implies not only the inclusion of generation, transformation, transportation, distribution and supply of energy services, but also the negotiation of activities associated with the sector – i.e. professional services.

In the context of regional integration, Chile is actively participating in the energy business. Domestic electricity companies have made investments and supplied professional services to Argentina, Brazil, Colombia and Peru. Furthermore, other fields of business for Chile to invest in have been natural gas and professional services, which have grown in recent years. Chile wants to reinforce this trend through the multilateral negotiations.

The issue of subsidies has been mentioned in different negotiation proposals, but Chile is the only country that mentions it in the context of the energy sector negotiations.

Chile wants to examine – in the round of services negotiations – how subsidies hamper competition in different services sectors. The

energy sector should be one of the sectors analysed. Chile is not demanding – at this stage – an elimination of energy subsidies. The idea is to engage in an exchange of information to increase transparency in terms of knowing the kinds of subsidies, their amounts, their beneficiaries, etc.

An Overview of the Negotiating Proposals on Energy Services under the GATS Negotiations

EUROPEAN COMMUNITIES

Jolita Butkeviciene*

Introduction of the main points contained in the proposal

The European Communities and their Member States submitted a communication in March 2002 to the WTO Council for Trade in Services containing their proposal on how to address energy services in the GATS 2000 negotiations.[1]

The proposal recognizes the changes that have occurred in the markets of energy and related services since the Uruguay Round, including accumulated experiences with liberalization at the national level, as well as experience with the well-established presence of third country suppliers in the oil and gas segments.

The communication aims at engaging in further liberalization negotiations only those Members "who have opened their national market to competition or those that are willing to do so". In addition, it reiterates the importance of balancing the trade, liberalization and public policy objectives.

The communication proposes a list of services which are neutral with respect to the energy source and which would constitute the scope of and be negotiated under the GATS energy services sector. At the same time, the EC suggests the possibility of and underlines the need for a different treatment of energy services depending on the

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[1] WTO, *Communication from the European Communities and their Member States, GATS 2000: Energy Services*, S/CSS/W/60, 23 March 2001.

energy sources, due to the specific characteristics of the latter, including in the trade context. The EC considers that the regulatory framework may differ depending on the energy source, including the possibility of using a step-wise approach to opening up the markets to competition. It seems that in this communication the EC has paid more attention to the natural gas and electricity markets compared with other energy sources, while making it clear that nuclear energy cannot be treated in the same way as other energy sources.

Through this communication, the EC is aiming at achieving progress in the WTO in two areas, namely *sectoral negotiations* and *classification.* Sectoral negotiations would aim at reducing (rather than removing) barriers to trade in energy services and specific examples of such barriers are listed. A list of services sectors for consideration under the new GATS energy services category is proposed.

Issues raised in the communication and the existing GATS framework

The EC suggestion that there be differentiation in the sectoral services negotiations according to the different energy sources at stake could be well accommodated in the way in which specific commitments are made in the GATS. But from the point of view of promoting transparency and consistency, it is important to allow fair competition between all forms of energy. Scheduling different conditions for trade in services depending on the energy source would create unequal conditions for competition for the service providers operating in different segments of the energy market and would favour some and undermine others in their competitive provision of services.

The established objectives of the energy policy in the EC are to ensure overall competitiveness, security of energy supply and environmental protection. The same objectives are manifested in this communication, where, in addition, the EC reconfirms the right of its Member States to impose public service obligations while opening market access to foreign competition. These are two points that merit further discussion: public service obligations and the pursuit of

environment-related policy objectives on the one hand, and the creation of a competitive environment in international trade on the other.

Notably, the EC proposal suggests the need to create a transparent, objective and pro-competitive regulatory framework for the energy sector. The only case where such a framework has been established is in the area of basic telecommunications through the adoption and incorporation of the so-called Reference Paper into the specific commitments scheduled by WTO Members in the sector. The horizontal rules on competition have not been developed under the GATS; thus, the only way to ensure the existence of a pro-competitive regulatory framework is to negotiate additional disciplines for the sector, which is what the present EC proposal seems to suggest. Certainly, this is a more limited approach, making the agreement more complex and less transparent as a whole when compared with the option to develop and strengthen GATS disciplines in the area of Business Practices (GATS Article IX). The need for additional regulatory disciplines to ensure a competitive environment is gaining more importance in many services sectors as the way to ensure that gains from progressive liberalization are distributed in a balanced manner among all actors in international trade.

Concerning the second aspect – public service obligations and the pursuit of environment-related policy objectives – the GATS recognizes the right of Members to regulate and to introduce new regulations aimed at achieving national policy objectives.[2] Public service obligations aimed at providing reliable access to energy for the population or the protection of the environment are examples of such policies. However, WTO Members' right to pursue such policies has lately become an issue of concern, especially for the socially sensitive services sectors, such as the health and education sectors. One of the reasons for such concern is the understanding that the imposition – say, of universal obligations by a Member – would be assessed with

[2] To address these concerns the WTO Doha Ministerial Declaration restated Members' right to regulate in its paragraph 7, WT/MIN(01)/DEC/W/1, 14 November 2001.

respect to the trade restrictive impact of the measure. During the negotiations on basic telecommunications, the issue of universal access was addressed and included in the Reference Paper, which was appended by WTO Members to their schedules of specific commitments in the sector.[3] This approach may be also adopted in the area of energy services.

The communication recognizes the GATS principle of progressive liberalization: first, it refers to the possibility of using the step-wise approach to opening up the markets to domestic and foreign competition; second, it recognizes the need to maintain conditionalities regarding market access opening; and, third, the proposal is aimed at reducing barriers to trade rather than removing them outright. However, many WTO Members, and especially the developing countries, may find themselves under increasing pressure in negotiations to "pre-commit" to full market access and to accelerate their liberalization efforts, as well as to remove or shorten periods of transition for market opening inscribed in their specific commitments. This has happened in past negotiations especially owing to the imbalance in the negotiating strength of the developing countries and their developed trade partners when negotiating bilaterally specific commitments. To address these imbalances, the proposed additional discipline aimed at creating a pro-competitive environment (as discussed above) should include provisions that would ensure increasing participation of developing countries in trade in energy services. Conditions necessary for ensuring a "win-win" situation could be identified in the sectoral negotiations at the multilateral level.

The shortcomings of the existing classification are underlined and a new list based on a principle of neutrality of the energy source is

[3] The Reference Paper in its paragraph 3 covers universal service: "Any Member has the right to define the kind of universal service obligation it wishes to maintain. Such obligations will not be regarded as anti-competitive *per se*, provided they are administered in a transparent, non-discriminatory and competitively neutral manner and are not more burdensome than necessary for the kind of universal service defined by the Member."

proposed. The communication stresses the importance of avoiding double listing in the services classification, since a number of energy-related services are already covered under the existing classification. The suggested list of services for the new energy services category covers, however, a number of those services, which are already included under different headings of the GATS services classification. From the point of view of those WTO Members who will receive requests in this area, it is important to know how different services are linked, so that the real impact of making specific commitments in different services sectors can be assessed. The present services classification has not been made mandatory in the GATS and is in itself subject to negotiating proposals. An agreement should be reached on how the list of energy-related services would be treated in the process of negotiations – as guidance or as a means of making specific commitments. In the latter case, additional work on defining the coverage of energy services may be beneficial for achieving greater precision and providing definitions for every sub-category, as was the case in other services sectors. Among other issues, it may be important to consider including the research and development of the new energy technologies so that developing countries can seek to negotiate conditions under which they could benefit from the application of new technologies.

The communication also refers to issues which are subject to ongoing work in the relevant GATS bodies. The outcome of such work would have a direct impact on such issues as mentioned in the communication, including transparency and objectivity in licensing procedures. It is questionable to what extent development of these or additional disciplines within one sector would be an useful approach in general.

Finally, in its proposal the EC does not seek significant market opening for the temporary movement of natural persons and only recognizes that further discussion is necessary "to improve and facilitate the temporary movement of natural persons related to the provision of specific services". Progress must be achieved in this area in order to bring meaningful benefits to developing countries aiming

to establish themselves as the exporters of energy-related services. So far, only intra-corporate transferees and contractual service suppliers have been included in the specific commitments under the Agreement by the EC and often less by other WTO Members. In this context, the GATS negotiations should focus on identifying those categories of professionals, skilled workers and other technical and service personnel that are indispensable in the supply of energy and related services. This should be done at the sectoral level and may include time- or quota-bound specific commitments.

Bringing energy services into the GATS negotiations under their own heading would expand the scope of the GATS into this new area of international trade. However, a number of conditions need to be met for the benefits to accrue to those countries that will open up their markets to competition, as well as to those that will host new investment, look for new trade opportunities and face new challenges.

An Overview of the Negotiating Proposals on Energy Services under the GATS Negotiations

JAPAN

Contribution by the Government of Japan

Introduction

There are various factors in national energy policies. To refer to our own example, Japan is a country heavily dependent on energy imports. Its experience of oil shocks has caused its dominant policy considerations to be the pursuit of a stable energy supply and of energy efficiency. There has been a fresh input of environmental consideration into this policy since late 1980s, amid a growing global awareness of the impact of the energy sector on the global environment and warming. Recently, Japanese people have shown an interest in liberalization and deregulation in this sector with a view to cutting industrial energy costs and enhancing competitiveness in the international market.

Liberalization of trade in energy services is directly related to this last point and is an interest of the Japanese people. However, in the course of discussing trade liberalization, other considerations also need to be taken into account, as trade liberalization constitutes only a part of a comprehensive energy policy. This is the background mindset of Japan's negotiating proposal on energy services.

Outline of Japan's negotiating proposal

Trade in energy services, together with the liberalization of the energy market, is beginning to play an important role. However, in a number of countries the conditions for energy services trade are still insufficient, owing to underdevelopment of regulatory frameworks and lack of transparency in the application of those regulations in the energy sector. Lack of transparency in energy services regulation reduces predictability of trade in this sector. In addition, a system with insufficient transparency causes apprehension about potential trade

barriers, thus resulting in deterioration of confidence in the market of that country. Accordingly, it is in the interest of all countries to improve the regulatory transparency in energy services.

At the same time, since energy services are a basic infrastructure for sustaining a modern economy in any country, loss of confidence in a stable supply would not only damage consumer benefits, but also have a significant negative impact on the whole economy. In particular, in the light of recent cases where liberalized markets have faced difficulties in maintaining a stable energy supply, which placed a heavy burden on the economy, it is necessary to make efforts to ensure energy security and the stable supply of energy while pursuing regulatory reform and business reorganization.

In addition, environmental issues have been raised in global discussions since the end of the 1980s. Furthermore, discussions are currently ongoing concerning global environmental issues, and Japan believes that efforts should be made in all countries to harmonize energy policies with environmental policies in accordance with their national circumstances, and that those countries undertaking these measures should not in any way be disadvantaged in energy services trade.

Regarding rule-making in the energy services sector under the GATS, in order to address public interest in such areas as the enhancement of energy security and supply reliability, environmental protection, and the maintenance of universal service and public safety, member countries may reserve their respective rights to adopt those regulatory measures which are transparent, competition-neutral and not more burdensome than necessary. The difference in commitments scheduled under the GATS should be justified under such members' rights.

Furthermore, possible rules under the GATS for the domestic regulation of the energy services sector should acknowledge the diversity among member countries, based on the fact that each country has a different history of energy services (e.g. whether energy services have been provided by a State-owned or private provider), and also in

accordance with the current industrial structure. Rules, however, should be non-discriminatory to the greatest possible extent and should ensure maximum transparency.

In the light of the consideration described above, Japan submitted a proposal on energy services to the Council for Trade in Services in October 2001. Japan would like to continue discussion with its counterparts from developing countries as well as from developed countries on this extremely important issue during the course of the negotiations on services trade.

An Overview of the Negotiating Proposals on Energy Services under the GATS Negotiations

NORWAY

Rikke Eeg-Henriksen[*]

The Norwegian proposal on energy services sets out four goals:

1. Negotiations should encompass all energy services;
2. Increased commitments in market access and national treatment should be sought;
3. Regulatory issues need to be specifically addressed, possibly through a reference paper;
4. A model schedule or a checklist for energy services could be a useful negotiating tool.

In order to give the background to our proposal, I would like to refer to our experience with our electricity market.

The Norwegian electricity market was formally opened in 1991. Norway has since then, step by step, deregulated the domestic electricity market, allowing consumers the choice of energy service supplier, which they now often choose over the Internet. The aim of this policy change was to increase efficiency in generation and supply.

Customers have access to a competitive market. This does not mean, however, that the market is unregulated. Because of the special characteristics of the energy market, the Government has played an active role in setting up the legal framework for competition in

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generation, trade and supply, in addition to setting up the regulatory regime for natural monopolies, transmission and distribution.

All in all, Norway has been satisfied with the results of the policy changes introduced in the electricity sector. We have also gone further and now have a common liberalized market in the Nordic countries.

In order to deregulate the system, the separate functions of the electricity sector have had to be unbundled. In this process it also became clear that we could identify a number of separate services. So far there are relatively few commitments in this area. And this includes commitments by Norway.

As mentioned in our proposal, Norway regards reliable, efficient and competitively priced energy as a fundamental requirement for economic and social development. We see efficient energy services as a key factor in economic growth and we believe that liberalization will benefit national economies.

Norway is in the process of reorganizing its oil and gas sectors.

Our experience has shown that in order to fully realize the benefits of efficient, competitive energy services and to make economically meaningful commitments, we need to consider the entire chain of activities involved. We would therefore like to address resource identification, production, transmission, transportation and distribution, sales and marketing, irrespective of whether the activities take place onshore or offshore.

We realize that we need to discuss how we can best deal with scheduling energy services. Energy services do not form a separate sector or sub-sector in W/120, and the relevant services are included in different parts of the classification. For discussion purposes we therefore attached a preliminary checklist for energy-related services as part of our proposal.

Our proposal is based on the legitimate right of national authorities to regulate and on respect for national policy objectives, including

environmental considerations. We do not see the question of public ownership of natural resources as part of these negotiations.

As energy services are complex and highly regulated, it will, however, also be important to address regulatory issues. A reference paper could be a way of dealing with this. Central elements in such a paper would be rules on transparency, non-discriminatory access to energy networks and grids, and requirements that prevent anti-competitive practices.

We also acknowledge that Members are in various phases of regulatory development and that competition for energy services varies significantly from one country to another. We therefore expect that there will be differences in the level of commitments.

To conclude, Norway has benefited both from liberalizing its domestic energy market and from Nordic cooperation. We feel that the energy sector has potential for all WTO Members, including developing countries.

An Overview of the Negotiating Proposals on Energy Services under the GATS Negotiations

UNITED STATES

Lana Ekimoff*

Introduction

I would like to share with you the ideas for the GATS energy services negotiations that the United States put forward as a proposal to the WTO Council on Services. First, I will discuss the history in developing the proposal, briefly describe the issues in the proposal, and then note where we are with regard to the negotiations.

In preparation for the GATS negotiations, the United States reviewed the service sectors and noted that there was no separate or obvious classification for energy service activities. United States energy companies raised the issue of the void in the GATS negotiations with the Office of the United States Trade Representative. The companies noted that the energy industry had changed dramatically over the last decade and that this had resulted in a substantial growth of a service sector in energy.

More than a year ago, we began to discuss with our colleagues at the GATS negotiations the idea that we perhaps needed to recognize the energy services sector as a separate sector under the GATS, like telecommunications, financial services, computer services and environmental services.

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1. Developing the proposal for energy services negotiations

To prepare a proposal for negotiation, we first had to determine what energy services are and identify the activities associated with the sector.

We looked at the entire chain of activities involved in providing energy consumers with access to efficiently produced, reasonably priced and reliable energy. For discussion purposes, energy activities were divided into the following five categories:

1. Activities related to the exploration, development and production of the energy resource;

2. Activities related to the operation of an energy facility;

3. Activities related to energy networks (e.g. energy transportation, transmission and distribution);

4. Services related to wholesale markets in energy, including trading and brokering;

5. Services related to the retail supply of energy, including metering and billing, as well as customer service.

We recognized that each of these five categories includes many different activities. These energy activities are closely interrelated and, taken as a whole, can be said to comprise the "energy sector". Some of these activities cut horizontally across existing sectoral classifications. Others may involve activities not yet specified and not within the scope of the classification system. Some energy services are currently addressed in different categories such as services incidental to energy distribution and mining listed as "other business services" and pipeline transportation of fuel under "transport services".

The next issue we dealt with is why there is a need to address the energy service sector. It was noted that the market has changed significantly as many countries have privatized and deregulated their energy sector, resulting in the unbundling of services. Prior to this, the energy industry in a number of countries was dominated by State-owned enterprises operating mostly within home markets as vertically integrated companies with monopoly positions.

Also, new activities developed in the energy service sector with advances in technology, including the development of the Internet, more sophisticated drilling methods, equipment and methods to save energy, and unique technology to produce energy such as microprocessors. The need for and use of new technology has grown rapidly as Governments, industry and consumers have become more conscious of finding innovative solutions to provide efficient, stable and reasonably priced energy.

There were several fundamental questions in determining whether to pursue an agreement on energy services. One is how would providers of energy services benefit from an energy services agreement. It was determined that it could serve as a foundation that would contribute to having countries make significant and meaningful market access commitments for energy services. In turn, it would provide government officials and energy services providers with greater certainty about which energy services are part of a country's commitments.

An even more important question is what and how countries would benefit if a classification of energy services were to be adopted. First, there is little doubt that all countries would benefit. Energy is a catalyst for economic development and growth. It is essential to develop and sustain economic sectors such as manufacturing, agriculture and telecommunications. In addition, it provides basic social services to the population at large. According to the United States Energy Association, the demand for energy is expected to grow

by 50 per cent over the next 20 years, and approximately $200 billion will be needed annually to build and operate energy systems.

Opening up markets provides a choice of resources, suppliers, technology, equipment and know-how to a country. Liberalization of a country's market for energy services does not require it to yield ownership of its underlying energy resources. In Norway, for example, ownership of electricity utilities has stayed with the Government. Nonetheless, open access to transmission networks and competition among (Government-owned) generators has resulted in significant price decreases and improved service to customers. The availability of varied sources of energy at reasonable prices is a significant determinant of a nation's ability to compete in the world market place. Without reliable, efficient, competitively priced and environmentally sustainable energy, road and air transport, financial markets, and computer, broadcasting and telecommunications systems, among others, could not function. Nations with a limited and/or high-cost supply of energy are at a major competitive disadvantage: high-cost energy inputs adversely affects domestic industries and a nation's ability to attract foreign investors, who avoid high-cost energy sources as a base for foreign operations. In addition, high-cost energy is a burden to residential consumers and social services, from heating and street lighting to hospitals.

In December 2000, taking these factors into consideration, the United States submitted a formal proposal for consideration in negotiating an energy services agreement. Briefly, it noted:

- The importance of the environment;
- The importance of competition for providing services that ensure that consumers have access to efficiently produced, market-priced, reliable energy;
- The change in industry structure since the Uruguay Round;

- Recognition of the right to regulate energy resources in a manner that reflects national policies, including protecting the environment and sustainable development;
- Barriers in many foreign countries limit market access and promote discriminatory access;
- Ownership of resources is not part of the negotiation;
- The idea of a reference paper that outlines access issues.

The proposal which outlined the discussion of the recognition of energy services as a distinct sector in the negotiations led to five other submissions – from the EU, Norway, Venezuela, Canada and Chile (since this conference Japan has submitted a proposal) – and we hope many more will be drafted.

There are a number of similarities among the proposals, including:

- Recognition of an energy services sector;
- Need for competition (within a regulated regime);
- Benefits to the economy;
- Ownership of resources not part of negotiation;
- Major barrier is the entry of equipment or "tools of the trade";
- Importance of the environment;
- Regulation should reflect national policies.

Naturally, there are still some key outstanding issues that deal with:

- Definitions;
- Classification;

- Scope of energy services.

In December 2001, the United States tabled a communication (WTO, JOB (01)167, 4 December 2001) on the proposed negotiations.

2. Current status

Finally, where are we in regard to the issues we raised? We still are discussing, debating and seeking more information. That is why we are here to listen about the concerns and interests of all countries. Our delegation found the formal and informal interaction we had with our fellow participants yesterday very fruitful and educational. In some cases, we found that others have the same questions as we have – such as the differences in various energy services sectors – and have raised questions that we had not really dealt with, such as the role of small and medium-sized companies. We encourage a frank and open dialogue in this excellent forum, so that we can develop the best possible framework in which to negotiate.

An Overview of the Negotiating Proposals on Energy Services under the GATS Negotiations

VENEZUELA

Elbey Borrero*

Introduction

The purpose of this contribution is to present the Venezuelan approach to World Trade Organization (WTO) negotiations on energy services in the light of the particularly attractive framework offered by the General Agreement on Trade in Services (GATS).

Trade negotiations do not single-handedly contribute to the development of domestic supply capacities. In order to facilitate participation in the global economy, developing countries must design and implement a blend of trade and industrial and technological market-friendly policies. These policies should aim at overcoming supply-side constraints and obtaining maximum gains from trade liberalization.

In these negotiations, the Venezuelan delegation has proactively promoted among participants "a wider focus than merely trade-based".[1] For Venezuela as a WTO developing country Member, it is paramount that the outcome of trade negotiations enhance economic growth and the well-being of its population.

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[1] WTO, Communication from Venezuela, *Negotiating Proposal on Energy Services*, S/CSS/W/69, 29 March 2001.

1. Scope of the Venezuelan proposal

Venezuela states in its proposal that the main objective sought as an outcome of these negotiations is to strengthen its domestic entrepreneurial supply capacity. The Venezuelan proposal states that negotiations on energy services should be linked to the achievement of development objectives for developing countries, primarily their ability to continue to use energy services as a lever to diversify their economies, to promote their development and to strengthen their private sector. Furthermore, improving entrepreneurial capacities through technology transfer and other means is also pursued by Venezuela in this context.

The proposal assumes that improved market access in the energy services sector should have beneficial effects for all countries. Further important premises for Venezuela, which concur with other negotiating proposals in this field, are that the negotiations should not address the ownership of natural resources, and that the energy sector will continue to be regulated to ensure the achievement of national policy objectives and public services obligations.

An additional aspect addressed in the proposal is that of the classification of energy services. Venezuela recommends that the classification should be flexible and respond to the specificity of energy sources. To this end, the proposal states three sorting criteria: first, according to the energy sources (e.g. oil, gas, hydropower); second, defining the phase of the energy process (e.g. services related to production, transformation, transportation, distribution and sales); and third, making a distinction between "core" energy services, which are those directly involved in the main processes, and "non-core" services, which are related to processes that support the energy services value chain.

A qualified team of policy makers and negotiators from the public sector and experts from the private sector have carried out the work following the presentation of the proposal. This valuable team

experience has shown that the outcome of the classification exercise should clearly reflect the commercial reality of how energy services are marketed internationally, thus facilitating understanding for the main actors, these precisely being trading firms and enterprises. Furthermore, an adequate classification and definition of the sector would be instrumental for the possibility of introducing policy and regulatory distinctions into the exchange of market access and national treatment concessions. This would help WTO Members to schedule commitments in this strategic sector and would preserve flexibility, especially for developing countries, to liberalize their markets according to their national development strategies.

The Venezuelan delegation circulated as an addendum to its proposal a list of core energy services to feed into future WTO discussions on this subject.

2. Perspective of the negotiations

The negotiations on energy services should represent gains for all participants. On the one hand, countries with expertise and potential to provide energy services will increase their trading opportunities. On the other hand, countries with limited domestic capabilities will have the opportunity to place developmental conditions on the market openings they decide to undertake. These conditions should be aimed at benefiting the final consumers (households and industry).

Clearly, a "mutual gain" scenario depends on the way Members conduct the negotiations and couple their results with domestic policy revisions and subsequent implementation. Getting the sequencing right between the negotiation of commitments and policy implementation is not always an easy task. The regulatory environment is of the utmost importance for the results of negotiations to be as effective as possible. The aim of negotiations under GATS is neither deregulation nor privatization of services sectors. The perspective promoted by Venezuela is that countries should think in

terms of "re-regulation", which, in principle, entails regulating in a way that encourages both competition and efficiency.

So far in the services negotiations, individual developing countries have not been particularly ready to take a leap into viewing energy services as one of their priority sectors of interest. Tourism and construction services, among others, have received more attention as sectors with "export" potential. The analytical work undertaken by UNCTAD and the results of the expert meeting on energy services has shed further light on the importance of energy services for developing countries, and the best way to maximize their benefits through WTO negotiations.

3. Policy options

The implications that the negotiations on trade in energy services may have for domestic energy policies will depend on how commitments are first negotiated, and second consolidated, or "locked in", by Members. This is the first round of negotiations since GATS entered into force, and it will not be the last.

The most important principle that developing countries should be mindful of when participating in these negotiations is that of GATS' flexibility for conditioning market access and national treatment commitments. Once a country has made its internal assessment and decides to make a commitment, the design of these conditions should be the result of an evaluation of the existing and future regulatory structure and of the current market configuration. Some of these conditions or requirements could include joint ventures, employment and/or capacity-building requirements for local employees, diffusion of technology, etc.

The emphasis placed by this paper on the possibility of imposing conditions on market access is in line with the "wider focus than merely trade-based" approach stated by Venezuela in its negotiating proposal. It is also important to bear in mind that developing countries

face major supply constraints and do not satisfy the preconditions for building a competitive services sector.[2] In this sense, having market access and national treatment in other countries will be of interest only for those countries in the sectors in which they have export capacities. This is why one of the first steps towards ensuring that liberalization makes a positive contribution to the achievement of national goals is to build a competitive energy services sector. Governments can be successful in the creation of a competitive environment by consciously designing the terms that market players must comply with.

It will be also highly desirable that developing countries encourage and indeed request developed countries to take measures with the aim of increasing their participation in world services trade. This is provided for in Article IV of the GATS, when it suggests that this participation "shall be facilitated through negotiated specific commitments… relating to a) the strengthening of their domestic services capacity and its efficiency and competitiveness, inter alia, through access to technology on a commercial basis; b) the improvement of their access to distribution channels and information networks …".[3]

If all the participants in these negotiations make purposeful policy decisions and regulatory reforms, the results in the future will be the best for all. Energy services are a key input into all economic activities, as well as important revenue generators in themselves. That is why the domestic policy environment that accompanies the commitments resulting from these negotiations will determine the chances of success.

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[2] See, Mashayekhi M., "GATS 2000: Progressive liberalisation", in *Positive Agenda for Developing Countries: Issues for Future Trade Negotiations*, UNCTAD/ITCD/TSB/10, Geneva, 2000, p. 175.

[3] The General Agreement on Trade in Services, in *The Results of the Uruguay Round Multilateral Trade Negotiations: The Legal Texts*, WTO, 1995.

4. A word on SMEs

Currently, most Venezuelan energy service providers are small or medium-sized enterprises (SMEs). These SMEs face competition from large service transnational corporations (TNCs), which have huge financial strength, access to state-of-the-art technology, global networks and a sophisticated information and communications technology (ICT) infrastructure.

There is an interesting relationship between services liberalization and foreign direct investment (FDI). This is mainly because the third mode of supply is defined by the GATS as "Commercial Presence" (of a service supplier of one Member in the territory of another Member). This being the case, there is ample room for the promotion of links between domestic firms and foreign affiliates. "Linkages are a stepping stone towards strengthening the competitiveness of domestic firms, giving them a foothold in international production networks and embedding foreign affiliates fully in host economies. … Linkage programs should be seen as part of a broader set of FDI and SME policies". [4]

The implementation of linkages is in line with GATS rights and obligations and could become part of the commitments negotiated between developed and developing countries in the framework of the energy services negotiations. According to 1999 figures, six of the world's 25 largest TNCs and two of the 10 largest TNCs from developing countries operate in the energy services industry (petroleum exploration/ refining/ distribution).[5] Clearly, the room for creating linkages in this sector is there. It is up to Governments to take advantage of these opportunities.

[4] UNCTAD, *World Investment Report 2001: Promoting Linkages*, UNCTAD/WIR/2001, United Nations, New York and Geneva, 2001.
[5] Ibid., table III.1, p. 90, and table III.9, p. 105.

Concluding thoughts

The Venezuelan negotiating proposal conveys the idea that with these negotiations Venezuela will bring about two important things. Firstly, it will put in place conditions so that domestic service providers also obtain benefits from the consolidated and predictable commitments the country decides to concede to other trading partners. Secondly, it will derive increased revenues from the expanded trade opportunities that will arise from market access and national treatment openings of other WTO Members.

Another fundamental aspect that Venezuela has reaffirmed in its proposal is to preserve the right to regulate the energy services sectors in such a way that national objectives are achieved. The GATS is one of the results of the Uruguay Round that clearly favours an environment in which developing countries can feel more comfortable with trade liberalization and obtain very positive gains for their growth.

An important lesson that developing countries can learn from these negotiations thus far is the need to participate actively and to make clear what they expect as a result. The challenge ahead, given the Doha Work Programme and the benchmarks that were set for the services negotiations as a whole, will be to translate into initial requests all that has been stated in sectoral negotiating proposals so far. The shape that the final lists of commitments take will be a result of how well prepared they are for this next phase of the negotiations.

With some of the ideas in this contribution, developing countries may possibly find new ways to participate in these negotiations and to strengthen positions within the given framework, while furthering development goals. The role of UNCTAD in enhancing the research capabilities of developing countries and its leadership in promoting a network of specialists in the field of energy services are indeed of great value.

INTERNATIONAL ENERGY TRADE AND ACCESS TO ENERGY NETWORKS

Thomas W. Wälde and Andreas J. Gunst*

1. Access to networks as a precondition for cross-border trade in energy and energy services

International energy trade has been little developed in the debate on and jurisprudence of international trade law. The major reason is that it is only over the past decade that privatization followed by liberalization of former national energy monopolies has opened up increasingly competitive national and then regional markets in energy (understood here as electricity and gas). There is also a major distinction between trade in "normal" goods and services and trade in energy. Energy trade, at least in electricity and gas, is as a rule network-dependent (the exception in the case of gas is liquefied natural gas (LNG) transportation by ship). Network dependence means in essence that the mere lifting of import barriers is not enough-proactive measures have to be taken to open up networks (and network establishment) to imported energy. However, this assumes that energy networks actually exist and, as we explain, this gives rise to the challenge of how to attract investment in new network infrastructure. The purpose of this article is to discuss and explain this

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distinctive feature of international energy trade and to formulate policy proposals for further liberalization, in particular in the interest of developing countries.

Free cross-border trade in energy (in particular electricity and gas) over interconnections can offer significant economic benefits in terms of security, flexibility and quality of energy supply and greater competition, and this will enhance national welfare through consumer price and service benefits. The reasons for interconnection may vary for electricity and gas. Whereas it might be indispensable to trade gas internationally across borders because a country has no or insufficient indigenous resources, interest in exchanges of electricity (itself a secondary energy source) may be more in the spheres of utilizing the lowest marginal cost generating plant on the interconnected system (e.g. inexpensive excess hydropower).[1] Nevertheless, there are also security benefits for electricity from emergency exchanges of capacity or exchanges of spinning reserves. These benefits became apparent as early as the 1990s when already several interconnected power systems existed in North America and Europe, but trade was never free and was administered through State import and export monopolies (or sometimes by regionally demarcated private concerns as in the case of West Germany). It was not until the tide of utility liberalization that some States re-discovered energy free trade[2] as a means of elevating the encrusted markets of their former gas and electricity monopolies.

[1] Many interconnected systems aimed at exploiting the natural synergy which exists between systems that were predominantly hydro-based and those that were based on thermal plants; it allows the surplus hydro capacity to be fully utilized in rain periods and also firms up the hydro system capacity in times of drought.

[2] Few would now doubt that gas is not a commodity or good. This has been questioned, unconvincingly, for electricity, but as Pierros and Nuesch point out, in international and supranational agreements and hence in a free cross-border trade situation electricity is seen rather as a good and a commodity. Besides, differences between free trade in services and goods are meagre. Philip-Xenophon Pierros and Sabina Nuesch, "Trade In Electricity: Spot On", 34 *Journal of World Trade*, 4, August 2000, 95–124.

However, the number and capacity of most of the existing interconnectors was only constructed to meet the needs of security aspects and these needed significant upgrading to allow for competition purposes.

While liberalization—and thereby its crucial component, third-party access—is always and everywhere decried by existing operators, and their employees and political allies sustained by patronage from monopoly rent, and argued against from social, economic, cultural and legal perspectives, it has so far worked everywhere. In the United Kingdom, it was predicted that energy liberalization would lead to a general breakdown of energy supply. That did not happen. Prices came down, basically because privatized and competitive markets should work more efficiently according to economic theory, and actually do work better in commercial practice.[3] Cost savings come not only from reduced employment needs and greater efficiency in more focused development and application of new technologies, but also by reallocation of producing assets by mergers and acquisitions to obtain more productive asset mixes.

Lower energy costs help economies to be more competitive, but also allow governments to impose higher energy tax: a good share of the productivity gain from energy liberalization is currently being taken by new energy taxes, and that is likely to increase. A major advantage is that it makes hitherto heavy and lethargic monopolies closely linked to politicians and trade union interests more flexible, innovative, international and forward-looking: it transforms dormant industries into very competitive industries. The countries that manage to do this - in overcoming major obstruction - are usually those that are economically the strongest. There have been cases where liberalization policies are sometimes viewed as having failed. In summer 2001, Californian electricity supply shortages were widely cited as an illustration of such failure. But California was - but no longer is - a situation where freeing up of wholesale prices was not

[3] A recent reader on the notion of competition in economic theory is Jack High, *Competition in Economic Theory* (Cheltenham, Elgar, 2001).

combined with freeing up of retail prices; higher supply prices created by the then very strong economic growth could not be shifted to customers. All the required incentives were missing: to invest in new capacity (obstructed by pervasive opposition to power stations), to build interconnectors to other States, and, on the demand side, to emphasize energy savings.[4]

The potential for economic benefits from energy trade is particularly large, and hitherto barely developed, in relations between developing countries. Institutional barriers (law, tax, political and regulatory risk, discrimination, lack of technical interoperability and absence of good-neighbourly relations) are as a rule prohibitively high. Developed economies have over the past 15 years made substantial progress in facilitating cross-border energy trade. But such progress has been denied to developing countries. The underdevelopment of external and internal governance is the main cause.[5]

Without liberalization of energy trade, liberalization of energy services is unlikely. Experience in open or opening energy markets shows that new services emerge (energy trade, shipping, demand management, supply, brokerage, futures trading). These did not exist in any significant form before liberalization, except to some extent as minor management functions within integrated energy monopolies. Liberalization of the energy markets means that existing monopolies (and their political and social appendages) lose or are forced to restructure to become competitive; but it also means that there is a

[4] T. Brennan, "Drawing lessons from the California power crisis", *Resources for the Future* (*RFF) Newsletter*, 144 (summer 2001), 8–13 (www.rff.org); see also *The Economist*, 21 July 2001: the malfunctioning of the privatized British Railtrack company is always cited. Again, this was a privatization that set up a highly complex, multi-tier regulatory system with not enough incentives for either Railtrack or the railway operators to invest in upgrading a public railway system emaciated by decades of under-investment.

[5] See further R. & A. Seidman, T. Waelde, *Making Development Work: Legislative Reform for Institutional Transformation and Good Governance*, Kluwer 1999.

great potential for highly qualified jobs and business opportunities, partly new, partly migrating out of the restructuring of existing energy monopolies to new service operators.[6]

Another advantage of liberalization is that it greatly reduces the potential for corruption inherent in closed utility industry—State machinery collusion. Virtually all energy monopolies have been involved in above-average corrupt relationships with politicians.[7] The survey by Transparency International shows that the energy industries have one of the highest incidences of "grand corruption".[8] That is unavoidable as utility rent is sustained by politicians and then shared. Corruption scandals have centred on utilities bribing politicians and parties in virtually every country. With competitive energy markets, the interpenetration of politics and energy industries is diminished, and thus the potential for corruption of whole political systems.

[6] On the social and economic effects of energy liberalization, see EU Commission, Report of March 2001, *Completing the Internal Energy Market*, and the Commission staff working paper of December 2001, *First Report on the Implementation of the Internal Electricity and Gas*, SEC (2001) 1957.

[7] In all European countries the relationship between State-owned, or privately owned but cartel-organized utilities and both the trade union and the public sector was highly corruptive. The Italian "mani pulite", and the French or German press and prosecutors' campaigns illustrated that the energy monopolies, and their legal protection by the State, constituted a huge and safe corruption machine, e.g. Douglas Porch, *The Secret Services* (Oxford, Oxford University Press, 1997); "Les comptes extraordinaires de la Maison Elf ", *Le Nouvel Observateur*, 12 March 1998, 64–65; "L'Elysée de Mitterrand au coeur du système Elf ", *Figaro*, 12 July 2000. One can safely assume that such relationships existed in all EU countries, less based on national culture prone to corruption than as on the close linkage between State-protected monopolies and the financial needs and greed of politicians in control of State support.

[8] See http://www.transparency.org/documents/cpi/1999/bps.htm#bpi. The third-highest corruption incidence rating (3.5) is in the power industry, but since public energy agencies carry out public procurement, the incidence of corruption may be even higher—the highest, at 1.5, in the survey.

Energy monopoly in essence means State–industry collusion with corruption as its essential purpose (and probably also of union leaders co-opted). Energy liberalization means that the close links disappear, monopoly rent fades, and politicians are much less necessary for sustaining monopoly rent as this form of income goes, and monopoly rent is also no longer available for sharing with politicians. Competition drives down monopoly rent, and shareholders, following market logic, replace politicians and trade union leaders.

Liberalization of cross-border energy (in particular electricity and gas) trade is not possible without an effective system of providing standardized, easily managed and predictable access to energy networks. That is the lesson of the telecommunications market, where access by competing providers of telecommunications services to final customers has required access to telephone lines, a problem now largely solved in most developed countries. It is also the lesson from domestic energy liberalization and the emergence of competitive energy markets, first within the United States, in the United Kingdom and now, on a growing basis, both within other EU member States and then within the European Union itself. Network-bound energy cannot reach distributors and customers (both larger industrial and household customers). Without it the importer of electricity or gas or the producer of electricity can have access on reasonable terms to pre-existing interconnections, storage, transport and distribution networks; the right to build new facilities of this type is necessary, but will help only in exceptional cases. Existing operators, typically State-owned (often now privatized) or private countrywide or regional/local-integrated monopolies will often do all they can to prevent new entrants/competitors from gaining access to their system. The transport system is the stranglehold. Control over it makes it possible to fill it - and thus to claim lack of capacity, charge excessive transport fees, and obtain information that allows the undercutting of new competitors and provides a method to delay and obstruct access by long negotiations, litigation and manipulation of price, terms and technical conditions. Third-party access (TPA) is thus an essential condition for creating competitive national energy markets and competitive cross-border energy markets. Without TPA, existing energy monopolies operate in effect as an unavoidable tollgate for

market entry; the benefits of new supplies and competition go to existing operators rather than to consumers and the economy at large. Electricity and gas trade is possible, but only on the terms and to the benefit of existing monopolies, which in fact can further strengthen their monopoly position by forcing new suppliers to channel their energy through their facilities on their terms and subject to their strategy.

In this - partly historical, partly analytical, partly legal, partly policy-oriented - article we survey the main economic concepts underlying third-party access to energy networks, follow the evolution of the third-party access concept in competition law, and in energy regulation, with a particular emphasis on the recent, most relevant and ongoing EU experience, sketch out the main issues of international cross-border energy transit and conclude with a proposal for a "reference paper" approach to liberalization of energy and energy services trade under a future GATT regime.[9]

2. The main concepts: natural monopoly, political economy and economic regulation of energy transport facilities

A. Natural monopoly

Cross-border energy movement (imports, exports and transport) and supply of energy used to be considered a "natural monopoly", i.e. an activity that cannot be carried out in a competitive context in any commercially viable way and needs to be carried out by a sole company with the necessary, legally enshrined exclusivity required by public interest. This used to be the case of all energy activities, in particular the electricity and gas industry,[10] although private

[9] A recent work on the notion of competition in economic theory is Jack High (see note 3).

[10] See the Communication by the European Commission, *Services of Interest in Europe*, OJ 1996 C 281/3, and the *XXVIth report on European) Competition Policy* (1996), points 22 and 113 et seq.; also generally, Buendia Sierra, *Exclusive Rights and State Monopolies Under EC Law* (Oxford, Oxford University Press, 1999); Francoise Blum and Anne Logue, *State*

investment stood at the cradle of those industries in the nineteenth century.[11] This strong connection made between energy supply, monopoly and public interest is inherited from the first part of the twentieth century: war, insecurity and emphasis on national security of supply and autonomy combined with the collectivist tendencies of that period led to national public monopolies or cartels; these fears are still ingrained in the collective mindset.[12] The State, like a parent, is expected to be the guarantor of supply; its absence engenders insecurity. State-controlled import and export monopolies took care of trans-border energy exchange, but only when it was considered absolutely necessary for national security of supply. All that has changed gradually, not only under the impact of technological change, regional economic integration (mainly in the EU) and economic globalization, but also because of changed perceptions laws, and in particular with the maturing of the network of infrastructure for the energy industries (generators, transmission grids, distribution

Monopolies under EC Law (New York, Wiley, 1998); and Damen Geradin (ed.), *The Liberalisation of State Monopolies in the European Union and Beyond* (The Hague, Kluwer Law International, 1999).

[11] F. Botchway, The Role of the State in the Context of Good Governance and Electricity Management, 27 *University of Pennsylvania Journal of International Economic Law* (2000), 781 et seq.

[12] These perceived disadvantages are often not logical or supported by evidence, but nevertheless they are deeply enshrined in one's culture and change only slowly. For example, after a decade of anti-monopoly preaching by the European Commission, it "recognizes" in its Communication *Services of General Interest in Europe* (OJ 1996 C 281/3) that although the operation of market forces generally produces better-quality services at lower prices, these mechanisms sometimes have their limits because the benefits may not extend to the entire population and the objective of promoting social and territorial cohesion may not be attained. One of the principles underlying the Commission's policy in this area is therefore that member States should be able to make the fundamental choices concerning their society, whereas the job of the Community is to ensure that the means that they employ are compatible with their European commitments.

facilities, storage facilities, interconnectors).[13] Generation and supply are no longer considered to be a natural monopoly, while such qualification continues to cover electricity transport and distribution. There are large costs involved in building alternative energy networks. There are environmental considerations militating against competing networks, and economic efficiency suggests that it is better to use and expand existing facilities than to build a competing network. But even this may change as technology and perceptions evolve. In natural gas transport, for example, competing pipelines have been built, and this can change the face of an industry in the direction of greater competition.

Natural monopolies not only require regulation to minimize unproductive monopoly rent and to protect consumers, but also, in order to foster competition and greater diversity of suppliers, access by outside producers/importers of energy (electricity and gas) to the energy facility (interconnector; transport, storage and distribution) owned and controlled in the form of a natural monopoly. There is still the traditional idea that public ownership per se will take care of such regulatory and public service concepts, but State companies did develop very much an interest of their own. Even in the case of publicly owned integrated monopolies (e.g. France), a separation of ownership from organizationally distinct State regulation has proved necessary.

However, one needs to be careful not to confuse such regulation of natural monopolies with "real" competition. Regulation is only a second- or third-best solution. Lifting formal legal restrictions on competition may be necessary for competition, but is rarely sufficient

[13] Christopher Foster, *Privatisation, Public Ownership and the Regulation of Natural Monopoly* (Oxford, Blackwell, 1992); Piet Jan Slot and Andrew Skudder, "Common features of community law regulation in the network bound sectors, 38 *Common Market Law Review 1* (2001), 87–129; James Mark Naftel, "The natural death of a natural monopoly: Competition in EC telecommunications after the Telecommunications Terminals Judgement", *14 European Competition Law Review 3* (1993), 105–113.

for competition. Access regulation with respect to an energy natural monopoly is almost always imperfect. What is in the end necessary is a structure of industry and ownership that aligns the commercial interest of owners of such facilities with the interest of access-seeking users. Full competition can therefore only emerge if the network, i.e. the natural monopoly element, is completely "unbundled" from the supply business. This objective of mandatory ownership unbundling has not yet been achieved in EU liberalization, where "management" rather than "ownership unbundling" is currently the reality.

Nothing leads to greater competition than the establishment of competing networks.[14] This often means that short-term interests (liberalizing a market through mandatory open access for all energy networks) and medium- and long-term interest (high and mature competition and minimum intervention under cost-effective "light-touch" national regulation) have to be balanced. Country experience with private sector participation in the financing of capital-intensive energy facilities in an often high-risk environment suggests that at the initial stage of establishing such facilities for the first time in an "immature" region exemptions from mandatory access regimes may be required in order to enable investment. What is then expected is fiercer competition through competing networks in the medium and long term.[15] The key is to align the duration and scope of the exclusivity permitted with the duration and scope of the financing

[14] Europe has many examples that underline the importance of competing networks. Where former State monopolies own and operate all interconnection facilities, import restrictions and impediments may not be legal, but remain de facto; see for instance the report on an official investigation into the internal gas market focusing on ENI's de facto monopoly, Alessandro Bossi, "Italy: Gas Market Report", 16 *Journal of Energy & Natural Resources Law* 4 (1998), 430–431.

[15] This is further discussed for cross-border interconnector access regimes comparing the European Union, the United States and Australia in Sam Hamilton, "The regulation of Trans-European Networks", in Laura MacGregor, Tony Prosser and Charlotte Villers (eds.), *Regulation of Markets Beyond 2000* (Dartmouth, Ashgate, 2001), pp. 43-57.

requirements by investors and banks and not to let protection overshoot beyond what is necessary. This requires a difficult and critical distinction between reasonable and excessive demands for long-term exclusivity in order to facilitate financing.

1. *Third-party access*

Third-party access (TPA) means[16] that third parties, often competitors of the generation, supply and distribution divisions of the transmission facility owner, are legally entitled to use such facilities, either only for unused capacity (an opaque concept), or on the basis of fair sharing of existing capacity, against a reasonable fee and on practical technical terms.[17] TPA is always resisted by transmission operators that are also in the supply business as their monopoly or dominant position in supply is aided by their control over transmission. TPA therefore requires a legal right with procedures that give practical effect to such rights.[18] The extreme is "common

[16] One has to be careful with a common (global) use of access concept phrases. Common carriage in the United States requires access to be granted to all applicants even if that means cutting down on use by existing shippers. The latter part of the concept does not exist in the European energy law, although the term has been frequently used. The same can be said of the requirements for access to an essential facility; the constraint on the ECJ to apply the Treaty, and especially in the context of Article 86, has led to different requirements and scope of a "European essential facilities doctrine" than the concept received in the light of decisions of US Federal Courts. For a most comprehensive and conclusive view, see B. Doherty, "Just what are essential facilities?", *Common Market Law Review* (2001), 397–436. For an instructive view, see Jurgen Grunwald, "Common carriage—a reassuring view from Brussels", 8 *Oil & Gas Law & Taxation Review* 3 (1989/90), 55–61.

[17] For Australia, see Andrew Thompson and Matthew Callahan, "Australia: Gas pipelines access legislation 1998", 16 *Journal of Energy & Natural Resources L*aw 4 (1998), 414-415; Kirsten Webb, "Australia - Competition policy: Privatisation of utilities", 3 *International Trade & Regulation* 5 (1997), 94–97.

[18] Should the transport facility lose its character as a legal monopoly, mainly through the emergence of adequate inter-network competition, regulation

carriage", i.e. after complete unbundling of other business functions, the common carrier is solely providing the natural monopoly of transport service under open tariffs.[19] Broadly, two groups of access regime may be distinguished: those where the majority of binding access terms and conditions are set by the parties themselves (negotiated access) and those set externally by an authority (independent regulators, courts, State ministries and administrative bodies, especially competition authorities, and industry associations) watching over implementation (regulated access).[20] Because of the

should become more relaxed and a legally binding right may no longer be necessary.

[19] Alexander J. Black, "Common carriage of European natural gas and relevant Canadian experience", 8 *Oil & Gas Law & Taxation Review* 7 (1990), 195–207.

[20] Again, care should be taken when notions of negotiated and regulated access are discussed: many of the discussions and findings are full of misperceptions. Exceptionally instructive is the German–European situation. Germany has chosen an access regime whereby access conditions are set by energy industry forum codes that are not binding but generally complied with. For a discussion of the German system see Achim R. Boerner, "Negotiated third party access in Germany; Electricity and gas", 20 *Journal of Energy & Natural Resources Law* 1 (2002). These codes are flanked by general access and competition legislation and resultant case law. The majority of access conditions are hence set by external "authorities". Nevertheless, under the definition of both, the 1996 EC Electricity Directive and the 1998 EC Gas Directive (OJ L 27, 30/01/1997, p. 20, and OJ L 204, 21/07/1998, p. 1, corrigendum OJ L245, 04/09/1998, p. 43), the German system is seen in most of the commentary as being a system of negotiated access. On the European plane, most of the commentary is however English and therefore dominated by a "British" perception of the problem. Britain had its own problematic history with the initially stalled liberalization through British Gas's (BG) monopoly and negotiated access, and having introduced access codes long before the two relevant EC Directives had to be transposed into domestic law, the terms, definition and the overall approach of the British access codes tend to be rather different from those included in the EC legislation. Much of the criticism Germany attracted for its access systems appears to come from a generalized conclusion along the lines of "Germany uses negotiated access—negotiated access has not worked with BG—

current natural monopoly situation, negotiated access usually proves ineffectual given the economic incentives of an integrated transmission system operator (TSO) to refuse and obstruct fair access, because of its better bargaining position and superior insight and intelligence as a network operator. Intervention by an external authority in regulated TPA can help to balance bargaining powers, especially if the rules issued are legally binding, but it also has its shortfalls; it typically leads to protracted litigation - itself an obstruction tactic - and can be costly in countries with diverse ownership of networks. The next phase is therefore the elimination of business structures which obstruct TPA - accounting unbundling (making TSO operations disclose their operations separately to eliminate cross-subsidies); management unbundling (to avoid one division helping another division by obstructing TPA or by gaining competitive intelligence about competitor operations from the transport division); and finally ownership unbundling and reducing the TSO to something quite akin to a common carrier, i.e. a business exclusively devoted to transportation under regulated tariffs, with the main commercial objective of maximizing transport revenue and profit, and with no interest or inclination by way of common ownership in helping the profit and competitive position of other businesses competing with the energy company using the transport network.[21]

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therefore the German system is inefficient" without a proper analysis of the regulatory framework around BG and German access. Because there is hardly any administrative regulatory framework alike in Europe, such an analogy that too easily lends itself, but is in the main misleading, must be avoided. See the comparison in Catherine Redgewell, Martha M. Roggenkamp, Anita Ronne and Inigo del Guayo, "Energy law in Europe; Comparisons and Conclusions", in Martha M. Roggenkamp et al. (eds.), *Energy Law in Europe, National, EU and International Law Institutions* (Oxford, Oxford University Press, 2001), ch. 14.

[21] For a discussion of the relevance of the increasingly rigorous forms of required or recommended "unbundling", see EU Commission, *Completing the Internal Energy Market*, of March 2001, COM (2001) 125 final, and in particular the explanatory memorandum regarding the proposed amendment

2. *Regulation and regulators*

Regulation of access has become a principal function of newly created energy regulators. As a result, the natural monopoly offers fair access, does not mix its competitive business with its monopoly business (i.e. cross-subsidization, competitive intelligence acquisition, obstruction of access), that prices in natural monopoly do not contain monopoly rent, i.e. reflect cost or benchmarked possible cost. Without such regulation, TPA is largely ineffectual.

Different regulatory function models have emerged.[22] The major model is the independent regulatory agency modelled on the United States Federal Energy Regulatory Commission (FERC) and the United Kingdom gas/electricity (now joined in OfGEM) regulators.[23] Here the agency enjoys large-scale independence in terms of budget and appointment for long periods of regulators who cannot be dismissed by the political authorities and who have substantial regulatory powers, left the ministries being with minimal powers. Ministries and politicians generally do not like that model as it reduces their power and patronage. However, it does offer some advantages for politicians. In much the same way as independent central banks, much of the political responsibility of the ministers is now shifted to more technical, professional—and thereby respected—independent agencies. If these manage to fill their independent mandate with public respect, politicians are off the hook, and the agency decisions are largely respected. If regulators earn the respect of the professional press and professional community, their formal independence becomes "material" independence, protected by their political and professional constituencies. The independence of the regulator is

of the 96/98 energy directives; also *Second to the Council and the European Parliament on Harmonisation Requirements*, SEC (1999) 470, pp. 12–13.

[22] Christopher Foster, "The future of regulation", 4 *Utilities Law Review* 3 (1993), 110–111; Colin D. Long and Michael J. Rhodes, "The nature, application and enforcement of regulation: public duties and private rights", 1 *Communications L*aw 2 (1996), 62–70; and Redgewell et al., (note 20).

[23] "Green Paper on utility regulation", 19 *Business Law Review* 5 (1998), 125–126.

always a sensitive issue. Not everything that is labelled independent is necessarily politically independent (e.g. as in the Russian Federation).[24]

With considerable discretion in the harmonization of energy utility regulation,[25] diverse regulatory mechanisms have developed in Europe.[26] Not all have followed the approach of a United Kingdom OfGEM-like regulatory authority. In some cases national sensitivities meant that commissions were set up to bring together utilities, consumers and regional and local governments in order to regulate access and prices, or that the general administrative departments of energy ministries were designated for regulatory responsibilities. Germany, for example, has refused to set up an independent energy regulator (although its independent telecom regulator has performed outstandingly). Here, formal consultations of the energy industry, consumers and the ministries involved result in specific access codes. These are then adopted in the contracting operations by the network operators. A specialized competition authority and courts exercise control *ex-post* if competitors are denied reasonable access. There is some criticism that this model is not equally effective as an independent regulator. A system that relies more on, to some extent, collusion has its shortcomings when rules have to be adjusted or changed; a proactive regulator seems to be more effective in obtaining in a shorter time a positive response from incumbent operators.[27]

[24] John Stern, "Utility reform, privatisation and regulation: lessons from central and eastern Europe and from China", 27 *International Business Lawyer* 11 (1999), 510-512.

[25] See Article 22 in both the 1996 EC Electricity and the 1998 EC Gas Directive (OJ L 27, 30/01/1997, p. 20 and OJ L 204, 21/07/1998, p. 1, corrigendum OJ L 245, 04/09/1998, p. 43). It obliges member states to "create appropriate and efficient mechanisms for regulation, control and transparency".

[26] Redgewell et al., pp. 984-989.

[27] Whether sector-specific regulation is preferable to reliance on general competition law for utilities in terms of entry barriers, cost structures, investments, customer relations and political, expediency is discussed in T. Van Dijk, "General or specific competition rules for network utilities?", 2

However, once the system is reasonably established a system of industry-wide self-regulation may be less expensive to run—the cost of independent regulatory authorities is acceptable and has to be borne by the public (either through taxes or the energy price). Considerations regarding the costs of regulation should not form a large part of the official decision-making processes.

Regulatory decisions are, obviously, subject to review by the courts and are focused on law and procedure, but rarely on the quality of the economic analysis. Courts will also, as a rule, recognize that there needs to be non-justiciable space for economic assessment and regulatory decision-making, provided that no serious and manifest errors of procedure and judgement can be proved.[28] They are also required to disclose and account to the legislature for their regulatory activities, but without the legislature being able to impose its own will on regulatory agencies.[29] The model here is the independent central bank. An issue to be settled is the potential for overlap and competition between regulators focused on the energy industry and national authorities for general economic regulation, e.g. competition authorities.

There is currently (almost) no precedent for an international regulator, although cross-border energy flows are accelerating.[30] In the

Journal of Network Industries 1 (2001), 93–111. For a discussion of the institutional and cultural background of the success of proactive, individual UK electricity and gas regulators in the liberalization phase, see T. Wälde, "Die Regelung der britischen Energiewirtschaft nach der Privatisierung", in Peter Tettinger (ed.), *Strukturen der Versorgungswirtschaft in Europa* (Stuttgart, Boorberg, 1996), pp. 59-95.

[28] The European Court of Justice, in its review of regulatory activities by the Commission and national authorities, has developed these criteria. For a review, see *Commission v. France et al*., October 1997 judgement.

[29] See the recent changes in UK law relating to the duties of OfGEM to account to Parliament, 2001 (*Denton Wilde Sapte Energy Newsletter*, 2001).

[30] That raises the difficult question of what an international regulator is. National authorities progressively work in comity to define and harmonize rules; does that make them international regulators? For the role of regulators

European cross-border context, the European Commission has some modest regulatory powers through the interpretation and enforcement of competition law under the EC treaty and also by deciding on the justification for derogations and temporary exceptions from the standard model of liberalization provided for directly under primary competition law and in the 1996–1998 energy directives.[31] It seeks greater harmonized State regulatory powers through the proposed amendment to the two energy directives,[32] but the role of the Commission as an international regulator is subject to the understanding of interconnector regulation itself. It seems that the Commission will continue to influence effective competition, fair workable network access and the harmonization of their regimes

in cross-border trade regulation, see Lise H. Jordan, "The role of State regulators in United States/Canadian energy trade", 10 *Journal of Energy & Natural Resources Law* 4 (1992), 380–386. Consequences of lack of federal policy or mechanisms to deal with cross-border issues are discussed in Leigh Hancher, "Energy regulation and competition in Canada, 15 *Journal of Energy & Natural Resources Law* 4 (1997), 338–365.

[31] See P. M. Roth (ed.), *Bellamy and Child European Community Law of Competition* (5th edn, London, Sweet and Maxwell, 2001), in which ch. 1 gives a general overview and ch. 16 is devoted to energy-specific issues. See also B. Develin and C. Levasseur, "Energy chapter", in J. Faull and A. Nickpay (eds.), *The EC Law of Competition* (Oxford, Oxford University Press, 2000). Competition law issues are also considered in M. Roggenkamp, A. Ronne, C. Redgewell and I. del Guayo, *Energy Law in Europe, National, EU and International Law and Institutions* (Oxford, Oxford University Press, 2001); P. D. Cameron, *Competition in Energy Markets* (Oxford, Oxford University Press, 2002); T. Wälde, *EU Energy Law, From Plan to Market* (London, Longman, forthcoming, 2002); and R. Tudway (ed.), *Energy Law and Regulation in the European Union* (London, Sweet and Maxwell, loose-leaf, from 1998).

[32] See the Communication from the Commission, *Completing the Internal Energy Market*, COM (2001) 125, final. The proposed new Article 22 in both directives would oblige member States to establish national regulatory authorities with the "sole responsibility to … define the rule on the management and allocation of interconnection capacity, in conjunction with the national regulatory authorities for authorities of those member states with which interconnection exists".

through the application of primary law (especially the competition provisions Articles 81 and 82), interpretative guidelines and regulations, and to channel self-regulation and dialogue through the Madrid and Florence process. This consultative institution for (gas and electricity) regulatory institutions includes national regulatory authorities, member States, the European Commission, transport/transmission system operators, gas and electricity traders, consumers, network users, and power and now fledgling gas exchanges. It has been set up by the Commission to discuss cross-border trade, tariffication and allocation and management of scarce interconnection capacity,[33] and the first guidelines on congestion management have been agreed upon.[34] Most of the current draft work for detailed tariff and access provisions as well as their administration seems to have been reserved for the joint efforts of energy industry organizations (e.g. the European Transmission System Operators' Association—ETSO) and national regulatory authorities, with some minimum coordination by the Commission, mostly for reasons of subsidiarity, scarcity of human and financial resources, and industry-wide consent.[35]

[33] For conclusion of the Florence Forum (electricity), see http://europa.eu.int/comm/energy/en/elec_single_market/florence/index_en.html; and for the Madrid Forum (gas) see http://europa.eu.int/comm/energy/en/gas_single_market/madrid.html.

[34] For a summary on the guidelines on congestion management agreed upon at the 6th Florence Forum in November 2000, see the December 2001 Communication from the Commission to the Council and the European Parliament on European energy infrastructure, pp. 18 et seq. For an earlier report on harmonization requirements for interconnector regulation, see *Second Report to the Council and the European Parliament on Harmonization Requirements*, SEC (1999) 457, pp. 5 et seq.

[35] Thus, for instance, the European Transmission System Operators' Association (ETSO) is currently reviewing the guidelines on transparency and congestion management in order to propose a revision and recommendations for common minimum requirements. Also in the field of technical and administrative rules regarding the operation of interconnectors, ETSO is asked to take a lead in initiating, drafting and revising. The national

Because fair access regimes to cross-border network such as interconnectors will often require detailed regulation and supervision procedures, an effectively functioning international agreement on cross-border energy trade regulation and an appropriate supervision and dispute settlement body are difficult and cumbersome to set up. An alternative is to place this task exclusively in the hands of a national regulatory authority. In most cases an interconnector is located solely within the territory of one State. Regulatory power can then be demarcated according to the principle of territorial jurisdiction. There are, however, cases where interconnector facilities (or their pipeline or transmission grids) will cross national borders (e.g. Europipe I and II, UK-Belgium gas interconnector, UK-France electricity interconnector) and there is more than one State to claim territorial jurisdiction. In Europe this has often resulted in bilateral agreements conferring upon one State the sole regulatory power but requiring consultation with the other State having jurisdiction. Regarding dispute settlement, the establishment of a dispute settlement committee is common, in which both States are equally represented and with a final arbitration if the committee fails.[36] A regulatory regime for interconnectors (within national borders or cross-border) can also be formulated through appropriate licensing conditions. If two countries are involved, these can be negotiated and imposed jointly on the interconnector operator; non-energy

regulatory authorities are asked to ensure that the guidelines are implemented and adhered to, and have the "duty" to inform the Commission of results. See the communication on energy infrastructure (ibid., at p. 9). Intriguing in this respect is that at the European regulatory level this consultation and drafting method is adapted by the Commission while essentially the same method of drafting access regulation and its administration in Germany are still officially decried at the Community level.

[36] A more detailed discussion can be found in Martha M. Roggenkamp, "The Gas Directive implications for offshore pipelines in the North Sea", *International Energy Law & Taxation Review* 6 (2001), 120 et seq.

interconnector arrangements, e.g. the Channel Tunnel, provide precedents as well.[37]

Likewise, institutions such as the Energy Charter Conference and the WTO dispute settlement system have a potential for - so far quite weak - indirect regulatory powers; they can influence TPA and cross-border transit by dialogue, by "naming and shaming", by formal arbitration, by the setting of model terms and by country review and other systems of formal or informal dispute settlement.[38] Apart from model terms (e.g. the transit model agreements emerging from the ECT), these are *ex-post*, not *ex-ante*, regulatory influences.

B. Political economy

One cannot understand the practicalities of introducing competition, liberalization and TPA without comprehending the political economy of such an often-painful transition. Energy utilities are among the industries closest to the State.[39] They are often the archetype for corruption and patronage. They over-employ and provide patronage to union leaders. There are protected domestic

[37] 24 *International Business Lawyer* 1 (January 1996); also Matthias Herdegen, "Der Konzessionsvertrag aus offentlich-rechtlicher Sicht: das Beispiel des Kanaltunnelprojekts", in F. Nicklisch (ed.), *Rechtsfragen privatfinanzierter Projekte, Nationale und internationale BOT-Projekte* (Heidelberg, C. F. Mueller, 2000).

[38] E.g. Article 7 of the Energy Charter Treaty (ECT), which includes a binding "conciliation" mechanism. Article 10 of the ECT forbids Governments to discriminate against foreign investors; they need to ensure (Articles 22, 23) that State enterprises and private companies with "special or exclusive rights" conform to this obligation. In our interpretation, this can be the basis for a right to non-discriminatory access by (established) foreign investors to be enforced against host States (invoking their duty to regulate in favour of non-discriminatory access), and possibly even (by direct effect of the treaty in domestic law) against private energy transport monopolies. T. Wälde, "International investment under the 1994 Energy Charter Treaty", 29 *Journal of World Trade* 5 (1995), 5–72.

[39] This is reflected in Cosmo Graham's discussion, "Takingp politics out of regulation and competition", 10 *Utilities Law Review* 3 (1999), 87–88.

supplier relationships. They tend to be focused on national markets, with little, very collegial, "exchanges" of electricity across borders with similarly structured monopolies. Political linkages operate on every level: national, regional and local. German municipalities, for example, raised a hidden quasi-tax from ownership of municipal electricity companies as well as from concession fees. Politicians as a rule get a second job by taking up positions on the board of utility companies and can move, after their political careers come to an end, into such patronage positions. In Colombia, expressing this society's particular tradition, privatization plans led to death threats against its architects.[40] Implementation of the EU electricity directive in France has been held up by the strong political influence of the communist trade unions dominating EDF and the Government. The main French State oil company served for decades as the favourite conduit for bribery of politicians in developing countries—but possibly also in Germany and France.[41] A chairman of the Italian State energy company ENI committed suicide when in jail on corruption charges. The contracting operations of Pertamina, the Indonesian State oil company, have been known to be riddled with corruption.[42] Utility companies in Germany have reportedly paid additional emoluments and remuneration, sometimes hidden in underpriced services, to politicians whose support was considered necessary. All these vested interests and communities are threatened by liberalization and competition. Over-employment is squeezed by competition; politicians are ousted from control; trade union leaders lose influence. Protected domestic suppliers suddenly find themselves no longer competitive when faced with technical and commercial, and no longer political, procurement criteria. The "protection margin" for politicians

[40] CEPMLP/Dundee served as a temporary refuge for the thus threatened Director-General of Energy.

[41] "Les comptes extraordinaires de la Maison Elf ", *Le Nouvel Observateur*, 12 March 1998, 64-65; "L'Elysée de Mitterrand au coeur du système ELF", *Figaro*, 12 July 2000.

[42] N. Machmud, *The Indonesian Production-Sharing Contract* (The Hague, Kluwer Law International, 2000); Edward Jay Epstein, *The Secret History of Armand Hammer* (New York, Random House, 1996).

of the past was financed by monopoly rent, but it is no longer viable in a competitive market.

In an international context, threatened national interests can oppose liberalization by presenting it as a foreign takeover, thereby mobilizing ever-present xenophobic sentiments: exploitation by a foreign energy company is easier to attack than exploitation by a domestic alliance of companies, trade unions and politicians. The natural xenophobic element of anti-foreign investment and anti-globalization movements is thus easily combined with simple protection of economic privilege. Foreign investment also involves often, in systems that are not open, a tollgate function for national powers - companies, politicians - and the foreign investor needs to associate with domestic power-brokers ("crony capitalism" as in Indonesia) to break into the market or is sucked into the corrupt environment of national utilities. Corruption by foreign companies usually receives far more negative publicity than routine corruption at home. A frequent strategy is purely formal adoption of contemporary models - privatization, liberalization, independent regulator - without the real relations changing very much.[43] Legal liberalization often does not mean that real competition ensues. Eligibility for purchasing electricity from abroad has not meant, in the EU context, that national companies actually do purchase from abroad and that real competition, rather than a formal and theoretical possibility of competition, develops. Legal and regulatory systems, administration, established business practices, culture and linkages will often favour for a long time the established national companies.[44] But legal and formal liberalization and the introduction of TPA seem to be a necessary first step, albeit not by itself a sufficient step to bring about competition.

[43] T. Wälde and C. von Hirschhausen, "The end of transition: An institutional interpretation of energy sector reform in Eastern Europe and the CIS", 11 *MOST* (2001), 91–108.
[44] See P. Brenton, "What are the limits to economic integration?", *Journal of World Investment*, 3(1) (2002).

Liberalization also disrupts existing commercial and political relations between power producers and customers. Electricity is often not paid for. Non-collection is endemic throughout developing and transition countries. Electricity is also routinely stolen in large amounts in many developing and transition countries. This undermines re-investment and the stability of the power system, but it constitutes a de facto subsidization of the poor - but also the powerful (e.g. military or companies with privileged political connections). A commercial investor, foreign or national, cannot tolerate or survive in such an environment. It has to collect reasonable tariffs and avoid loss by theft. The Government then rarely replaces the former implicit subsidization with explicit subsidies, directing social anger at the now privately owned electricity company. This constitutes a serious investment impediment - and thus an obstacle to a well-functioning energy industry.

3. Legal methods and concepts for TPA

The concept of a right to access to a competitor's energy transport facilities is not natural. An owner of a facility constructed at great cost and great risk to serve its business will not feel any sympathy at all for the proposition that a competitor should have "easy access", without having invested and faced possible failure. Owners of such facilities always and inevitably claim expropriation if TPA is imposed on them by law. The gist of the TPA concept is that the State's responsibility is to intervene sometimes in the economy in order to keep or make it competitive; in such cases, owners of existing facilities are asked to suffer and bear the loss because competition is considered, with very good evidence, to make economies more competitive, stronger and prosperous. But there is always a balancing act: between the legitimate property rights of facility owners - and no economy has ever prospered without extensive respect for property rights - and intervention by the State to ensure a better chance for new competitors. It is a question not only of access rights in principle, but also of the right tariffs (reflecting cost, possibly also investments made and risk assumed) and of arbitrating between existing and newly demanded usage and of technical interoperability. Finally, effective regulatory reform requires measures to combat the manipulability of

all these criteria by incumbent, strongly positioned operators. These will wish not only to be seen to respect such new and much disliked law, but also to make it ineffectual in practice.

United States antitrust law (interpreting Article 1 of the Sherman Act) introduced the idea of third-party access for competitors to essential facilities[45] that could not be practically replicated. The concept was later introduced into the European context, but the doctrine itself clearly carries less favour with the Community Courts, which have only referred to it indirectly.[46] But, much like the United States doctrine, the Court developed a view in a number of cases that a dominant undertaking that reserves to itself an ancillary activity which might be carried out by another undertaking, with the possibility of eliminating all competition from such undertaking, abuses its position.[47] This has been extended to a series of decisions on the

[45] See *United States v. Terminal Railroad Association* 224 US 383 (1912). In the United States, regulation of networks, on both State and federal levels, differs markedly according to the industry involved. The essential facilities doctrine is a common thread of regulation between the various industries, which has historically underpinned any rights of access. In addition to the application of the doctrine in the courts, most network industries have industry-specific access policies allowing for third-party access (for the electricity industry, FERC order no. 888). A. Lipsky and G. Sidak, "Essential Facilities", 51 *Stanford Law Review* (1999), 1187 et seq.; and Doherty, (see note 16).

[46] In an *obiter dictum* the Court of First Instance in Cases T-374 etc., 94 *European Night Services v. Commission* (1998) ECR II-3141, at 3223, held that "a product and service cannot be considered necessary or essential unless there is no real or potential substitute", and in Case C-7/97 *Oscar Bronner v. Mediaprint* (1998) ECR I-7791, at 7830, the Court of Justice let slip the word "essential" when it suggested that it needs to be determined whether "such refusal deprives the competitor of a means of distribution judged essential", see R. Lane, *EC Competition Law* (London, Longman, 2000), p. 157.

[47] Case 311/84 *CBEM v. CLT and IPB (Telemarketing)* (1985) ECR 3261, at 3278; also Case 18/88 *Régie des Télégraphes et des Téléphones v. GC-Inno-BM* (1991) ECR I-5941, at 5979, also the Decisions 94/19 (*Sea Containers/*

obligation of a company to deal ("refusal to deal" doctrine) if fair dealing is necessary for essential supplies and refusal would be seen as abusing a dominant position.[48] Australia also received the United States doctrine into its competition law, under which a third party may secure access to an essential facility by seeking to have a facility declared an essential facility or by negotiating with an essential facility operator who is subject to an industry-wide access code.[49] Under essentially the same concept as now deployed against Microsoft Windows,[50] industrial (and in particular transport and infrastructure) facilities that are considered essential for running a business, owned by a competitor in a dominant or monopolistic position, need to be prised open if otherwise the new entrant cannot reasonably be expected to enter the business and start competition.

Stena Link) (*Sealink I*) OJ 1994 L 15/8; 94/119 (*Rodby Port*) OJ 1994 L 55/52; and 98/190 (*Flughafen Frankfurt/Main*) OJ 1998 L 72/30.

[48] A. Palasthy, "Third party access (TPA) in the electricity sector: EC competition law and sector-specific regulation", 20 *Journal of Energy & Natural Resources Law* 1 (2002); L. Flynn, "The essential facilities doctrine in the Community courts, 6 *Commercial Law Practitioner* 9 (1999), 245-248; F. Weingarten, "La théorie des infrastructures essentielles et l'accès des tiers aux réseaux en droit communautaire", PCJEG 549 (December 1998). Earlier, C. D. Ehlermann, "Role of the EC as regards national energy policies, *Journal of Energy & Natural Resources Law* (1994), 342, 349; Ruediger Dohms, "Die Entwicklungs eines wetbewerblichen Europäschen Elektrizitätsbinnenmarktes" ["The development of a competitive European energy market"], in *Aktuelle Rechtsprobleme der Elektrizitätswirtschafts*, 1995 (Linz, Universitaetsverlag Rudolf Trammer, 1995); and, more critically, S. Klaue, "Zur Rezeption der amerikanischen Essential-facility-doctrine in das europäische und deutsche Kartellrecht", *Recht der Energie* 2 (1996), 51-57.

[49] See Sam Hamilton, "The regulation of Trans-European networks", in Laura MacGregor, Tony Prosser and Charlotte Villers (eds.), *Regulation of Markets beyond 2000* (Dartmouth, Ashgate, 2001), pp. 43.57.

[50] K. Auletta, *Microsoft and Its Enemies* (London, Profile Books, 2001).

Abuse of a dominant position in a competitive context underlies the idea of third-party fair access to essential facilities.[51]

There is considerable argument about what constitutes an essential facility and when refusal to provide access is an abuse of a dominant position. Both in European Union and United States competition law, there is no easy distinction between "robust" competition by a powerful incumbent relying on its advantages and "abuse" of its dominant position vis-à-vis competitors. If a competitor can be reasonably expected to build such facilities himself, they are not "essential"; courts and competition authorities seem to be far more reluctant to accept an essential facility argument when the business is not so strategic (e.g. Austrian newspaper distribution), when competition existed, when facilities are reasonably new, and barriers to entry temporary and not overwhelming. The establishment of new energy transport facilities - interconnectors in particular - in areas with underdeveloped energy infrastructure and lacking connections will require a much greater tolerance for time-limited exclusion of TPA for reasons of commercial and financial viability than fully depreciated, well-established pipelines or transmission grids located within established systems. When facilities are not only hard to replicate (e.g. for financial, planning law and environmental reasons), but also legally protected on the basis of exclusive concessions, special rights and privileges, third-party access to essential facilities is accepted more easily than in the case of a temporary business advantage created by superior business acumen. The Microsoft case provides an excellent example of the arguments for and against equal access by competitors to a very important facility.

A justification of essential facility and restrictions of access has always been that a monopoly - and thereby the restriction of access - is absolutely required in order to provide a legitimate public service

[51] In the European context, see Roth, in note 31. See also Develin and Levasseur in note 31. Because Germany relies strongly on its competition authority to enforce third-party access, the concept of abusive behaviour and necessary exceptions is quite developed in German case law.

(e.g. secure distribution of electricity at fair and non-discriminatory terms throughout a country, including to high-cost locations and weak consumers; universal postal or electricity service). But this argument is weakening as it can be shown that liberalized and competitive systems can fulfil, by licensing conditions and general economic regulation, such social and public service functions equally, if not better.[52]

While court-made law has progressed at a slow pace, there have been bursts of regulatory activity, typically by independent regulators. Here, criteria quite similar to the judicially created essential facility doctrine standards have been laid down. Under these, regulators are given power to order TPA at fair rates. This is sometimes done explicitly and directly by regulation (e.g. national regulation implementing the 1996-1998 EU energy directives[53]), sometimes through licensing conditions, sometimes by governmentally sanctioned agreements between industry associations and sometimes by using available regulatory leverage (e.g. approval of acquisitions, licensing of operations) in a somewhat questionable way to obtain TPA commitments for which otherwise explicit regulation would be necessary. TPA has an element of affirmative action, i.e. discrimination against existing monopoly operators to compensate for their incumbency advantage to create a more level playing field, but such affirmative action is, however, deeply resented and should rather be transitory and reflect the waning power of incumbents and the emerging power of new entrants putting together new dominant positions through mergers and acquisitions.

Third-party access regulation in whatever way - by *ex-post* administrative or judicial control of alleged abusive practices by an essential-facility operator against a new entrant into the energy industry requesting access contracts or by *ex-ante* setting of access

[52] The EU Commission paper *Completing the Internal Energy Market*, March 2001 COM (2001) 215 final, discusses this.

[53] For detailed discussions of the issues, see Palasthy (in note 48) and Boerner (in note 20).

conditions, access terms, access procedures and access disclosure - requires that complex issues of access conditions, contracting procedures, tariffs and management of congestion and lack of capacity be dealt with. Technical systems need also to be made interoperable and there must be terms and a monitoring system to ensure that technical incompatibility is not made a reason for obstructing TPA requests.

The following issues in particular need to be dealt with:

Lack of capacity: Pro-rata sharing between existing commitments and new entrants (requiring intervention in existing, although possibly frequently manipulated and affiliate, contracts)? Or only access for available capacity, which needs to be objectively ascertained? Of the several options available - first-come first-served, merit order, renewable or source-specific priority, bidding and auctioning - the latter seems commonly to be the most favoured. Also, an obligation should be considered to expand capacity if new demand so requires - and there is a readiness to provide acceptable financial guarantees to finance new investment. Related is the issue of congestion management. Existing operators typically fill up available capacity and interconnectors in order to have an argument to refuse access. Just accepting "lack of capacity" objections therefore is less effective than requiring, perhaps on an incremental basis, fair sharing of existing transport and interconnector capacity among all technically and financially qualified applicants for access. Where long-term reservations are necessary in order to encourage investment they should be restricted to the right of priority use of the line with the obligation to make unused capacity available to short-term markets; anti-competitive use of prior capacity reservation is then targeted by the application of a use-it-or-lose-it principle. Transparency requirements for actual wheeling/shipments commitments on an hourly basis (commonly run over Internet platforms, e.g. the United States OASIS system) help to provide information about available capacity. Often good congestion management requirements also provide for a certain level of offsetting or superimposing of counter-

directed flows, dispatching of generation, counter-trading and re-dispatching to further lower congestion problems.[54]

Tariffs: Should they be based only on incremental/marginal costs (often very low), or on not yet depreciated capital costs or, in case of older, fully depreciated facilities, on some element to take into account the original investment and risk (although perhaps already compensated by monopoly rent)? Tariffs should be constructed in such a way as not to obstruct crossing from one operator's facility to another, in particular in a cross-border trade context (problem of "pancaking"). Regarding electricity, regulatory institutions currently aim at non-transaction-based tariffs. Should tariffs be published? Probably for natural monopoly operators, but perhaps less so for new facilities built in a competitive context.[55]

Terms: These should be reasonable, not favour incumbents and not be discriminatory; and it should not be in the power of the incumbent operator to obstruct access. Furthermore, they should be standardized and publicly available.

Procedures: The worst is on all accounts by now pure negotiated TPA, where the negotiation itself is a considerable transaction cost and provides an opportunity for obstructionism. With tariffs and terms approved, and publicly available, negotiation should be standardized and be close to automatic—rather like using public transport. Negotiated TPA makes sense only for larger and long-term transactions, and in particular when new, competitive facilities are established and when the natural monopoly character disappears.

[54] See the guidelines on congestion management for electricity of the 6th Florence Forum.

[55] See the EU Commission proposal for the regulation of cross-border electricity trade, of 13 March 2001 in COM (2001) 125 final, and the December 2001 COM on energy infrastructure.

Expropriation of existing facility owners is a standard argument when TPA is introduced. Constitutional laws and treaty-based international law (customary law, but in particular modern bilateral and multilateral investment treaties, e.g. NAFTA, Energy Charter Treaty) protect against regulatory action that is "tantamount/equivalent" to formal expropriation.[56] An argument can be made, and has been made, that introduction of TPA is expropriation – "regulatory taking" - that requires full compensation.[57] No case has yet arisen, and it has not been applied or accepted so far in the context of the United States, the United Kingdom or the European Union. The counter-argument is that competition law as part of the economic policy powers of the State circumscribes the use of ownership, and thus limitations on use of private property in order to introduce competition and combat abuse of dominant positions are not excessive regulation amounting to a taking, but rather a legitimate and moderate use of State regulatory powers (Article 1, protocol I, of the European Convention on Human Rights on Property). It is probably hard to convince a court of the expropriation case if a long existing, legally protected and, through monopoly rent, highly profitable energy transport monopoly is now obliged to provide access on reasonable terms.[58] There may be cases - access conditions - which do not allow for full recovery of cost, a facility based on new investment with no account taken of investment cost and risk, facilities opened up in favour of a dominant competitor, breach of commitments assumed by government when privatizing energy infrastructure, indications of domestic protectionism and discrimination against a new (in particular

[56] T. Wälde and A. Kolo, "Environmental regulation, investment protection and regulatory taking in international law, 50 *International and Comparative Law Quarterly* (2001), 811–848.

[57] Correspondence between the authors and the late Prof. Seidl-Hohenveldern (2001). Similar views have been expressed in the context of German constitutional law; see Uwe Hueffer, Knut Ipsen and Peter Tettinger, *Die Transitrichtlinien für Gas und Elektriztiät* (Stuttgart, Boorberg, 1991).

[58] S. Rose-Ackerman and J. Rossi, "Disentangling deregulatory takings," *Virginia Law Review* (2000), 1441, 1451, 1480–1485.

foreign) entrant and new owner of such a facility—where the expropriation argument could be more convincing.

4. Cross-border and international law issues

A. Third-Party Access

It is difficult to identify a norm in international law (excepting the EU energy directives and primary EC Treaty competition rules, not considered here as international law proper) that imposes third-party access.[59] In Europe there are some agreements concerning cross-border upstream pipelines that require third-party access in the mature offshore production area of the North Sea.[60] Bilateral governmental agreements concerning cross-border transport facilities (e.g. Channel Tunnel, electricity and gas interconnectors and pipelines) are also increasingly likely to include at least some programmatic principles on access by third parties.[61] The issue has also come up in the negotiation of the Energy Charter Treaty.[62] The 1991 European Energy Charter and the earlier drafts of the ECT had language that could be read as obliging Governments to introduce TPA. That was eliminated under pressure from energy monopolies (EDF, Gazprom,

[59] A.M. Klom, "Liberalisation of regulated markets and its consequences for trade: The internal market for electricity as a case study", 14 *Journal of Energy & Natural Resources L*aw 1 (1996), 1–13; Martha M. Roggenkamp, "Implications of GATT and EEC on network bound energy trade in Europe", 12 *Journal of Energy & Natural Resources Law* 1 (1994), 59–82.

[60] Wolfgang Wiese, Grenzüberschreitende Landrohrleitungen und seeverlegte Rohrleitungen im Völkerrecht (Berlin, Duncker & Humblot, 1997).

[61] An APEC project headed by Australian lawyer Robert Pritchard is currently preparing a report on interconnectors in national and international law, focusing on the threshold issue of how, where no interconnectors exist, investment in this essential type of transportation infrastructure can be attracted.

[62] T. Wälde (ed.), *The Energy Charter Treaty* (London, Kluwer, 1996); Olivia Q. Swaak-Goldman, "The Energy Charter Treaty and trade: A Guide to the Labyrinth", 30 *Journal of World Trade* 5 (October 1996), 115–164.

Ruhrgas) and the ECT Final Act has an "understanding" confirming that no TPA is intended.[63] But the non-discrimination obligation of the ECT (Article 10(1)), together with the obligations to ensure that State companies and special and privileged enterprises comply with the ECT (Articles 22, 23), leads inevitably to a situation where such companies—mainly the energy transport monopolies' special and privileged companies—are prohibited from discriminating against foreign investors by not providing access or only providing access with discriminatory provisions.[64] That is not comprehensive TPA (which would apply to all foreign and national companies), but it comes close to TPA, which in the end is based on the concept of non-discrimination applied to companies in a dominant market position through control over the natural monopoly of energy transport. Similar non-discrimination provisions in bilateral investment treaties (BITs) could be interpreted in the same way. No case of a TPA request based on the ECT or BIT is so far known, although western oil companies have complained about discrimination by Gazprom with respect to their interest in securing access on equitable conditions to Gazprom gas pipelines, which are essential for getting Russian (and Central Asian) gas produced by foreign investors to Russian and foreign markets.[65]

An obstacle to the practical effect of a rule of third-party access under international law is that access obligations are aimed at private entities, whereas international law is primarily concerned with the conduct of States. This is not to say that private individuals cannot be

[63] Reprinted in Wälde, ibid.

[64] T.W. Wälde and P. Wouters, "State responsibility in a liberalised world economy: State, privileged and subnational authorities under the 1994 Energy Charter Treaty, an Analysis of Articles 22 and 23," 27 *Neth Yarbook of International Law* (1996), 143–194.

[65] Gazprom, the Russian gas transport monopoly company, is the main and most effective opponent of ECT ratification in the Russian Federation. There has been talk for years about restructuring Gazprom to create a more competitive gas and gas transportation market in the Russian Federation, but as of 2001, no proposals had been implemented.

the object or the subject of international law. There are a growing number of examples that prove the contrary (e.g. international criminal law, human rights law and investor-State arbitration). But it is very difficult to develop a coherent and specific access regime by way of "direct effect" in national law of the few general principles in, for example, ECT Article 10. Another way would be to construct out of the increasingly frequent national regulation of energy transport facilities with "third-party access" regimes either a State practice in the sense of customary international law or an international trade practice. Contracts between private operators and intergovernmental agreements could then be interpreted for conformity with such transnational State and/or commercial practice. One should also examine whether if non-discriminatory access could not be achieved through the extraterritorial reach of national competition law. This should in principle be possible since the limited legality of extraterritorial application of national competition law is now acknowledged under international law or has been practised in energy matters, as in the case of the United States Helms-Burton law punishing foreign investment in Cuba and the D'Amato law targeting energy investments in the Islamic Republic of Iran and the Libyan Arab Jamahiriya.[66] A denial of TPA in an important electricity interconnector or gas pipeline might well have an effect on competition in the third country. This could create a legitimate jurisdiction in the third country affected by such restraint on electricity trade to impose, extraterritorially, an access rule. Remarkable in this respect is that a relative harmonized essential facilities doctrine already exists throughout the world. The United States and the European Union are net exporters of their antitrust regimes, and with both practically containing an essential facilities doctrine, basic requirements for third-party access have implicitly been incorporated into the national antitrust laws of many countries. However, the interpretation of access rules under competition law is not yet

[66] Antoine Caillard, "EU: US extraterritorial jurisdiction—EU/US agreement", 4 *International Trade Law & Regulation* 4 (1998), 54–55; T. Wälde, "Managing the risk of sanctions in the global oil and gas Industry", 36 *Texas International Law Journal* (2001), 184–230.

complete. The EU Commission has only started to develop its competition law to regulate cross-border network access. It will need some time to redefine the ambit of what is common under an essential facilities doctrine, and an eye should be kept on States that rely on competition law for network access matters (e.g. Germany) as well as on the evolution of TPA regimes under economic regulation in implementation of the 1996–1998 EU energy directives. International agencies, such as the OECD, IEA, WTO and UNCTAD, might also wish to consider the feasibility of developing a model instrument for non-discriminatory access to energy transport facilities.

Only where an antitrust regime does not exist, would extraterritorial application have to be considered. In the United States, in response to foreign concerns about the application of its antitrust laws, courts and scholars have developed the concept that the exercise of an extraterritorial jurisdiction may be limited to take account of important policy interests of another State in which the activities in question take place.[67] The case law of the European Commission reflects this approach.[68] After all, a quasi-international application of US/EU-style antitrust law has the advantage that effective access dispute resolution mechanisms already exist under national competition enforcement (including injunctions!) and that it needs some cooperation at the international level, which could be dealt with in comity agreements.

B. Cross-Border Energy Transit

Energy transit is an important factor for cross-border energy (electricity, oil and gas) trade. It is quite distinct from third-party access. Energy transit is commonly understood as energy originating in one country (exporter), transiting at least one second country (transit country) and then entering into the destination country

[67] See, in particular, *Timberlane Lumber Co. v. Bank of America* 549 F. 2d 597, also Restatement (Third) of the Foreign Relations Law of the United States, § 403.

[68] See Aluminium Imports from Eastern Europe, OJ 1985 L 92/81, [1987] 3 *Common Market Law Review* 813.

(importer). It is an area of international law that is now developing rapidly-reflecting the technical and institutional changes that move away from segregated national energy markets towards regional and perhaps at some time global energy markets (such as already exist in oil). The 1921 (general) and 1923 (electricity-specific) Barcelona conventions on transit established the principle that transit should be facilitated, not obstructed and not give rise to "transit rent" using transit as a stranglehold, but only if reasonable, cost-related fees are charged.[69] But there was no obligation to build new facilities or even use State powers to facilitate the construction of new transmission lines.

Article V of the GATT is largely based on the Barcelona Convention.[70] It allows only reasonable, cost-related charges (no

[69] Martha M. Roggenkamp, "Transit of network bound energy: A new phenomenon? Transit examined from the Barcelona Transit Convention to the Energy Charter Treaty", 19 *World Competition* 2 (1995), 119--46.

[70] For the application of GATT and GATS to transborder energy, especially electricity, trade, see Philip Pierros, "Exploring certain trade-related aspects of energy under GATT/WTO: Demarcation questions regarding electricity", 5 *International Trade Law & Regulation* 1 (1999), 26–27; Francis N. Botchway, "International trade regime and energy trade," 28 *Syracuse Journal of International Law and Commerce* (2001), 1 et seq.; Kepa Sodupe and Eduardo Benito, "Pan-European Energy Cooperation: Opportunities, Limitations and Security of Supply to the EU", 39 *Journal of Common Market Studies* 1 (2001), 165–177; David S. MacDougall, "Trade in energy and natural resources: The Role of the GATT and developing countries", 12 *Journal of Energy & Natural Resources Law* 1 (1994), 95–116; David S. MacDougall and Peter Cameron, "Trade in energy and natural resources: Trade-Related investment measures-Focus on Eastern Europe", 28 *Journal of World Trade* 3 (June 1994), 171–180; "Energy and international law, development, litigation and regulation", 36 *Texas International Law Journal* (2001), 1 et seq. For NAFTA and energy trade, see Jorge Jimenez, "The great impact of NAFTA in the energy sector: A Mexican perspective", 18 *Journal of Energy & Natural Resources Law* 2 (2000), 159–194; J. Owen Saunders, "Energy, natural resources and the Canada–United States Free Trade Agreement", 8 *Journal of Energy & Natural Resources Law* 1 (1990), 3–19; H.J.H. Reinier, *Symposium: Mexico–United States Energy Trade and*

customs duties) and requires, through the evolution of the most-favoured-nation status, treatment similar to non-discrimination. It enshrines, in theory, freedom of transit. There is no precedent—i.e. dispute settlement cases—for application of GATT Article V,[71] although there are many cases where transit, in particular of energy, has been used by the transit State to extract excessive transit fees or otherwise obstruct an oil and gas operation, in particular in the case of landlocked States absolutely dependent on transit. Transit has been a thorny issue in the former Soviet Union, where transit of gas has basically become dependent on the goodwill of Gazprom, which is often denied, e.g. in transit requests from Uzbekistan, Kazakhstan and Turkmenistan.[72] Similarly, there are numerous transit disputes between the Russian Federation and Ukraine—gas transiting through Ukraine is routinely stolen. One needs to bear in mind that many of the States where transit problems occur are not (yet) members of the WTO. The lack of GATT and now WTO disputes with respect to transit may reflect the fact that most of such problems have arisen outside WTO membership. The problem is also that it is often not the state per se, but powerful energy companies, often only formally dependent on the State and in effect often more powerful than the

NAFTA, 1 *United States–Mexico Law Journal* (1993), 235 et seq.; and "The Canada/US Free Trade Agreement and energy: Some implications for international energy trade and EC 92", 7 *Oil & Gas Law & Taxation Review* 1 (1988/89), 5–12; Alexander J Black, "Regulatory relations; United States–Canada free-trade in energy", 8 *Connecticut Journal of International Law* (1993), 583 et seq.; Barbara K. Bucholtz, "Coase and the control of transboundary pollution: The Sale of Hydroelectricity Under the United States–Canada Free Trade Agreement of 1988", 18 *Boston College Environmental Affairs Law* (1991), 279 et seq.; Arturo Gandara, "United States–Mexico Electricity Transfers. Of Alien Electrons and the Migration of Undocumented Environmental Burdens", 16 *Energy Law Journal* (1995), 1 et seq.

[71] Note the terse discussion in J. Jackson, *World Trade and the Law of GATT* (Indianapolis, IN, Bobbs-Merrill, 1969), p. 51, para. 19.3.

[72] Similar problems were encountered with the transport of oil from in particular Azerbaijan and Kazakhstan, but these problems seem to have diminished in recent years.

State ministry dealing with energy, that obstruct transit. Article V of the GATT has not yet been developed—as it perhaps should be—into an effective obligation of the State to ensure that State-owned, privileged and special companies—i.e. natural monopoly operators—comply with the transit obligation of the GATT. But that would come close to moving from the inter-State dimension of the GATT transit obligation to what in effect would be a State obligation to introduce TPA by regulation against its energy transport monopolies. This is logical under an approach seeking to make the GATT Article V principle effective, but politically very difficult. The countries with a transit problem are precisely those that have political difficulties in formulating and enforcing transit and TPA rights against their most powerful privileged companies.

Article 7 of the Energy Charter Treaty, one of the most innovative and, with hindsight, significant elements of the Treaty, tries to fill this gap.[73] It not only reconfirms freedom of transit under GATT Article V, but also requires government to facilitate and take necessary measures to make transit practical, including an obligation to at least facilitate the construction of new pipelines and transmission lines. This would mean that a Government would have little excuse for denying authorization and support for the construction of new pipelines if the prospective pipeline investor is ready to pay and to comply with reasonable and non-discriminatory environmental and related obligations. The treaty requires non-discrimination; States have to encourage relevant entities (e.g. transmission system operators

[73] On Article 7 ECT, see M. Roggenkamp, "Transit under Article 7 ECT", in T. Wälde (ed.), *The Energy Charter Treaty* (London, Kluwer, 1996); A. Fatouros, "Transit—Energy Charter Treaty", *Revue Hellenique de Droit International* (1997), 185; R. Liesen, "Transit under the Energy Charter Treaty", 17 *Journal of Energy & Natural Resources Law* (1999). The Hancher analysis of the relationship between Article 7 and Article 26 ECT and the observation that the ECT has nothing to say on pipeline access is questionable—it ignores the potential inherent in Article 10 and Articles 22, 23 ECT: Leigh Hancher and Susann Wolgram, "The ECT transit conciliation rules and procedures", *Oil & Gas Law & Taxation Review* (1999), 364–367.

(TSOs) and pipeline operators) to cooperate, including in the modernization or establishment of new facilities and interconnectors. They have to refrain from interrupting energy transit for political reasons—something that occurs frequently in the former Soviet Union. The treaty also sets up a "conciliation" procedure that includes elements of temporary binding decision-making on interim tariffs by the conciliator—and thus helps to defuse tension and depoliticize an energy transit dispute. Article 26, on investor-State arbitration by a foreign investor in energy transit facilities, provides investment protection.

Although this transit article sets forth major and far-reaching principles, it is quite weak when it comes to specific issues of practical importance. It does not, for example, provide guidelines, criteria or specific rules for transit fees, the latter having become a thorny issue in several transit disputes. Their calculation is complex and elements of (forbidden) transit rent can be hidden in such charges. The article does not specify the regulatory obligation (and State liability) with respect to TSOs and gas pipeline operators except by reference to an opaque non-discrimination principle (Article 7(3)). There is no procedure for making the very open-ended obligation to "facilitate" and not to discriminate with respect to transit justiciable through action by private companies, as is possible in cases of mistreatment of foreign investors under Article 26 ECT. Governments control transit dispute management. Article 7 would have benefited from a special international dispute procedure with respect to requests by energy exporters (companies and states) for provision of transit capacity at internationally fair rates by the dominant TSOs/pipeline operators, such as a formal arbitration procedure initiated by energy traders requesting transit. The EU energy directives of 1996–1998 provide an example, with specific obligations, independent dispute settlement and monitoring by the EU Commission, as well as some powers of intervention for the latter. Nevertheless, Article 7 has considerable potential if Member States are willing to sponsor the

complaints of companies denied transit: the inter-State arbitration method of Article 27 is fully applicable to Article 7 transit disputes.[74]

For the past five years, there have been negotiations to develop out of the general Article 7 of the ECT a more specific Transit Protocol that would not only specify the general principles and provide dispute settlement procedures, but also include, perhaps as attachments, model transit agreements.[75] This negotiation strategy is comparable to the implementation experience of the EU directives where the Commission now suggests the need for special energy regulators, specific rules/methodology on cross-border tariffs, management unbundling of TSOs and interoperability and technical standards, but also fair sharing of interconnectors and storage facilities. It is not excluded that some of these concepts may at some time also be used to restructure Russian Gazprom into a more manageable, transmission-focused TSO rather than a monopolistic, all-powerful integrated gas company; but such changes depend on Russian domestic politics.

Within the EU, the 1991 transit directives[76] created a transit obligation for EU Member States. This directive provides:

- Procedural principles to facilitate transit negotiations: the right to have fair and serious negotiations;
- It is restricted to the major companies listed in the annex;
- A "conciliation" body chaired by the Commission;
- Principles for negotiations: non-discriminatory and fair; security of supply; quality of service; efficiency of operations;

[74] Article 27 is applicable to all inter-State disputes under the Treaty, except if explicitly excluded. Article 29 excludes Articles 5 and 29 disputes, but not Article 7 disputes. This seems to have been ignored by Hancher and Wolgram, (note 73).

[75] For recent developments, see www.encharter.org.

[76] Directive 90/547/EEC—Electricity Transit Directive, published in (1990) OJ L 313/30 and the Gas Transit Directive, 91/2906/EEC published in (1991) OJ L 147/37.

- The EU Commission has enforcement responsibility to act on complaints or on its own initiatives and enforce "Community Law".

While the directive is now considered to have largely been superseded by the 1996–1998 energy directives, it can still serve as a model for international agreements on energy transit and the interpretation of ECT Article 7. The potential of the transit directives to provide a ready-made legal model has yet not been properly appreciated.

C. Energy import restrictions

There are in principle no existing custom duties or other import restrictions under GATT or internal EU trade law, basically because energy trade (apart from oil, coal and uranium) occurred only in the very limited form of mainly exchanges/swaps between national energy monopolies controlled by Governments. Trade restrictions started from the level of refined oil products (e.g. reformulated gasoline) and petrochemicals.[77] With liberalization and emerging energy markets, all of this changes. Liberalized energy trade means that national regulation and tax can distort competition, with importers favoured or disadvantaged by State aid, export subsidies or a more favourable regulatory regime in the producer State. Importing States, prodded by the lobbies of national energy producers, have now to decide about protectionist policies versus free-trade rules imposed by the GATT or EU (or NAFTA) regimes. With environmental matters playing a growing role, the issue of environmentally motivated State aids can distort competition; similarly, prospective emission trading or green

[77] WTO Appellate Body: Report of Appellate Body in *US—Standards for Reformulated and Conventional Gasoline*, 35 *International Law Material* 603 (1996); see http://www.wto.org/wto/dispute/gas1.htm. C. Valentsien and D. Hembrey, "The WTO gasoline dispute", *Oil & Gas Law & Taxation Review* (1996), 332–338.

certificates[78] will cause trade problems as energy importers may be either unduly favoured or unduly handicapped.[79]

Energy import restrictions, apart from import monopolies,[80] have so far not played a major role, but this is changing. Actors in Austria and Germany are now calling on the Government to forbid the import of "dirty energy", i.e. electricity allegedly produced in nuclear power stations with unsafe standards.[81] The argument is that the import of

[78] See Towards an international trade in green certificates, ENDS 301 (2000), 18; "Green power contracts offer lifeline to renewable energy schemes", *ENDS* 282 (1998), 5–6.

[79] Issues of environment and energy trade are (briefly) considered in an OECD Environment Policy Committee communiqué, reprinted in 26 *Environmental Policy & Law* 2/3 (1996), 130–133. In relation to exports, see Alexander J. Black, "Environmental impact assessment and energy exports: Part 1, 13 *Oil & Gas Law & Taxation Review* 5 (1995), 173–185. Further, see Antonia Layard, "The European Energy Charter Treaty: Tipping the balance between energy and the environment", 4 *European Environmental Law Review* 5 (1995), 150–156; Catherine Redgwell, Energy, "Environment and trade in the European Community", 12 *Journal of Energy & Natural Resources Law* 1 (1994), 128–150; Irene McConnell, "North American Free Trade Agreement: Trading natural resource goods and protecting the environment", 12 *Journal of Energy & Natural Resources Law* 1 (1994), 151–174; Alastair R. Lucas, "Natural resources trade Under NAFTA: The international environmental treaties", 12 *Journal of Energy & Natural Resources Law* 1 (1994), 175–185. For environmental taxes and energy trade, see Marco Duerkop, "Trade and environment: International trade law aspects of the proposed EC Directive introducing a tax on carbon dioxide emissions and energy", 31 *Common Market Law Review* 4 (1994), 807–844.

[80] Patrick Blanchard, "French electricity sector: ECJ decision on monopolies for the import and export of electricity", 17 *Journal of Energy & Natural Resources Law* 3 (1999), 265–280; Peter D. Cameron, "European Union: Electricity and gas—Import and export monopolies", 16 *Journal of Energy & Natural Resources Law* 1 (1998), 110–111.

[81] See, for instance, the Austrian Electricity Act (ElWOG), which imposes on Austrian suppliers administrative approval for their electricity purchasing contracts with generation facilities from third countries (non-EC Member States). Approval is generally denied for electricity from sites that do not

nuclear electricity competes unfairly with German electricity produced to a much higher environmental standard. Is that compatible with either GATT or, if the electricity is from a EU State (or accession State), with the internal freedom of movement principle?[82] One should bear in mind that while GATT is not applicable to energy trade between WTO and non-WTO members, the Energy Charter Treaty's trade chapter makes GATT rules applicable to all ECT member States (i.e. in particular the former Soviet republics that are not yet members of the WTO). Established GATT principles do allow import restrictions based on legitimate environmental grounds if the product itself causes environmental damage, but not if the production process is environmentally substandard (e.g. *Tuna-Dolphin I* case).[83] That rule was somewhat relaxed by the WTO Appellate Body in the *Shrimp-Turtle* case, where damage to the global environment or indirectly to the national environment by production methods may under certain conditions justify import restrictions, provided that they are proportionate, least restrictive, likely to achieve the legitimate environmental objective, not unilateral, and based on international guidelines and efforts to reach an agreement. With such rules, electricity from nuclear stations could only then be kept out if excluding it would be the most effective, least restrictive method for improving the safety of the nuclear power plant (which is far from certain). Internal EU trade law is likely to operate under similar standards which are, given the existence of minimum EU-wide standards, probably even less permissive with respect to

adhere to common (likely Austrian or EU) standards or are environmentally unfriendly. The law is outlined in Christoph H. Hackl, "Update on opening of Austrian electricity market", *IELTR* 4 (2001), 63–65.

[82] For an (early) discussion of exceptions to energy trade under GATT, see Donald N. Zillman, "Energy, trade and the national security exception to the GATT", 12 *Journal of Energy & Natural Resources Law* 1 (1994), 117–127.

[83] For a discussion of cases that we consider analogous to the "nuclear electricity" import situation, see J. Cameron and K. Gray, "Principles of international law in the WTO Dispute Settlement Body", *International Comparative Law Quarterly* (2001), 248–299.

environmentally motivated national import restrictions.[84] But it is likely that the pressure for import restrictions will increase, and perhaps be exercised through bilateral agreements with the exporting country, using the threat of unilateral action and economic leverage by the EU.[85]

Conclusion

This short survey demonstrates the need for quite specific rules to achieve a competitive market through liberalization in practice.[86] The current EU drive towards an internal energy market started in 1995 and aiming at complete liberalization by 2007 reflects not only the difficulties but also the solutions that are likely to work. For developing countries, there are great advantages in energy liberalization both nationally and in a regional context, which should not be replaced by simplistic and blind zero-sum thinking. Energy liberalization promises cheaper energy, greater competitiveness of national economies and better utilization of national comparative advantage both in internal and cross-border energy trade and in trade with energy-intensive products. Liberalization can also promote comparative advantage through South–South energy trade. All the indications are that there are considerable synergies, but owing to institutional weaknesses and the related lack of essential network

[84] Dirk Vandermeersch, "Restrictions on the movement of oil in and out of the European Community: The Campus Oil and Bulk Oil Case", 5 *Journal of Energy & Natural Resources Law* 1 (1987), 31–54; and Leigh Hancher, The adjustment of State petroleum monopolies in the EC: A note on Commission v Greece (1990)", 10 *Journal of Energy & Natural Resources Law* 2 (1992), 197–202.

[85] Chris Sanderson, "Reciprocity as a condition precedent to Canada–US Trade in Electricity", 13 *Journal of Energy & Natural Resources Law* 1 (1995), 1–13; Angus Johnston, "Maintaining the balance of power: Liberalisation, reciprocity and electricity in the European Community", 17 *Journal of Energy & Natural Resources Law* 2 (1999), 121–150.

[86] Peter Glossop, "Recent US trade restrictions affecting Cuba, Iran and Libya: A view from outside the US", 15 *Journal of Energy & Natural Resources Law* 3 (1997), 212–247.

infrastructure they are little if at all developed. There are few developing countries that would not gain by either exporting or importing energy in trade with their neighbours (and often doing both through development of border trade particularly in electricity). But such trading opportunities require clear rules. Governments have great trouble agreeing on such rules in a bilateral context. Our proposal is therefore for taking the Reference Paper for the Telecommunications Protocol[87] as a model, and to develop a set of rules for cross-border electricity and gas trade. These rules have first to focus on transit and third-party access. They should cover electricity, oil and gas transit; and they should formulate specific access rules and procedures for interconnectors, storage and transport facilities. Such an annex could be negotiated as an interpretative instrument with respect to GATT Article 5. The issues summarily surveyed in this paper and contained in detail in the 1996-1998 EU Energy Directives and subsequent, more recent amendments and proposed cross-border trade regulations would furnish the opportunity to provide much of the regulatory experience and methodology that is required. Similarly, the Transit Protocol under the ECT[88] (which is, it is hoped, emerging) should provide a precedent for an Energy Transit Reference Paper under the GATT.

One needs to distinguish here between two different scenarios—developed countries with more or less developed energy interconnector and transport infrastructure on the one hand and, on the other hand, developing countries where such infrastructure largely does not exist. Much of the discussion in this paper on trading rules assumes that energy networks with adequate capacity to support increased levels of trade actually exist. There lies the rub: without being able to attract investment in this essential type of transportation infrastructure, increased trade will remain something of a pipedream for many countries. Attracting investment in the energy sector would be very much in the interest of the developing countries; however,

[87] Available from the WTO website, www.wto.org

[88] For an up-to-date survey, see K.P. Waern, "ECT Transit Protocol", 20 *Journal of Energy & Natural Resources Law* 2 (2002).

apart from clear energy trade rules, thought has to be given to stable investment frameworks and investment guarantees for a not yet fully developed energy infrastructure that need to be formulated. In addition, some limited exclusivity and long-term contract arrangements may be necessary in order to attract pioneer investors where desirable infrastructure (interconnectors, transmission grids and pipelines) would otherwise not be bankable.

As the energy interconnection and transport infrastructure matures, exclusivity needs to give way to a non-discriminatory third-party access regime. This highlights the critical nexus between international trade rules and international investment rules. The trade rules—fair access regimes—are necessary in order to encourage energy trade flows; but investment rules are necessary in order to encourage the establishment of capital-intensive infrastructure facilities, without which there is no channel for energy trade to flow through.

There is little doubt that companies from developed countries would benefit from a more transparent, better-regulated and more predictable regime for energy trade within countries and across borders, much as United States companies have been beneficiaries of EU energy liberalization. But one should not view this as a factor to negotiate energy access and investment rules as a "concession" from developing to developed countries. The primary interest in an improved energy trade and investment regime lies with developing countries. In many developing countries, the energy industry is in poor shape, not producing enough for the growing needs of industry and people, and producing inefficiently, too expensively, with too many losses, and too many bribery, patronage cost, theft and collection problems. These countries require most of all investment, which under current conditions of high political risk, uncertainty and inadequate legal foundation is not forthcoming. It is therefore in the primary interest of developing countries to create a legal and institutional environment to foster investment in cross-border energy infrastructure.

Cross-border trade in developing countries is likely to reveal very large trading benefits that are currently unexplored, owing to political

obstruction, politicization of energy and trade relations and lack of a legal and institutional framework with sufficient credibility. If there is a quid pro quo to be negotiated, it should probably concern the access of developing country energy products to developed countries, but also the absence of restrictions that disguise protectionism and involve cultural and environmental neo-colonialist tendencies. But the WTO debate on trade versus environmental agreements and WTO dispute practice provide enough of a precedent to come up with reasonable and mutually accepted solutions. Unlike the EU energy directives, an energy reference paper to be developed as a WTO protocol or protocol annex on energy and energy services trade should therefore cover not only trade, transit and TPA rules, but also investment rules. The survey of the interconnector situation now undertaken for APEC indicates that there are substantial opportunities, but they are in most cases not realized. The solution is therefore to create a solid legal, institutional and cultural framework for economically profitable investment in such interconnectors. The 1994 Energy Charter Treaty (in particular its Chapter III dealing with investment protection) provides a more or less ready-made package from which to work. The energy trade reference paper we propose here would therefore ideally incorporate Chapter III of the Energy Charter Treaty. Here we have a sophisticated, and carefully negotiated and crafted multilateral energy investment protection instrument. It would seem inefficient to try to "reinvent the wheel", particularly since such multilateral negotiations always have a high risk of failure. Again, importing the ECT's investment regime would not be a measure primarily in the interest of investors from developed countries, but an issue mainly in the interest of those developing countries that are faced with an interconnector opportunity, but no investment to establish an interconnector. The proposed reference paper should also include competition rules (State aid, subsidies, discrimination and minimum standards) for emission trading in case it emerges under the Kyoto (or some post-Kyoto) arrangement.

ELECTRIC POWER AND GAS MARKET REFORM AND INTERNATIONAL TRADE IN SERVICES

Christopher Melly*

Introduction

This paper[1] examines the relationship between regulatory reform and international trade by exploring the nature of regulatory reform, discussing its effects on market conditions and considering the implications for international trade in services. As major infrastructure services, the power and gas industries have significant influence on economic development as well as on international competitiveness. High costs for power and gas ripple through an entire economy, raising the prices of all goods and services and diverting resources from other

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[1] This paper draws extensively on the research and analysis contained in two studies directed by the author on behalf of the United States International Trade Commission. The Commission's reports, entitled *Electric Power Services: Recent Reforms in Selected Foreign Markets* (Investigation No. 332-411, USITC publication 3370, November 2000) and *Natural Gas Services: Recent Reforms in Selected Markets* (Investigation No. 332-426, USITC publication 3458, October 2001), may be obtained from the Publications section of the Commission's Internet site (www.usitc.gov). A printed copy may be requested by calling 202-205-1809 or by writing the Office of the Secretary, U.S. International Trade Commission, 500 E Street SW, Washington, DC 20436. Requests may also be made by fax to 202-205-2104. Any questions concerning this paper or the original publications should be directed to Christopher Melly (tel. 202-205-3461, fax 202-205-3161, email cmelly@usitc.gov).

sectors. Internationally, higher prices for energy relative to other countries translate into higher prices for exports of goods and services, and this retards competitiveness. The central importance of the power and gas industries creates a powerful incentive for Governments to pursue policies that foster efficiency. In response, Governments are increasingly turning to competitive market principles rather than regulatory instruments or direct State control in the belief that market price signals and consumer choice are more effective tools for matching supply with demand and driving investment decisions.

But the power and gas industries have long been considered to be natural monopolies, with high development costs and technical constraints favouring the provision of services by a single entity rather than by competing firms. Only recently has this assumption come to change. Policy reforms undertaken in the United States, the United Kingdom, Chile and elsewhere, have demonstrated that while natural monopoly conditions persist in the transmission and distribution segments, it is nevertheless possible and apparently advantageous to introduce competition into the production and marketing segments, or at both ends of a common network infrastructure.[2] For example, Doove and her colleagues examined a sample of 50 countries and estimated that introducing competition into the electric power industry could reduce electricity prices by more than 30 per cent for some countries and by 13 per cent on average.[3]

[2] In the transmission and distribution segments, the high cost of acquiring rights of way for pipelines and power networks can make the development of competitive networks uneconomic. At the very least, a firm that has already acquired rights of way will have an enduring competitive advantage over new entrants since it will be less costly to simply expand capacity along existing routes.

[3] Samantha Doove, Owen Gabbitas, Duc Nguyen-Hong and Joe Owen, "Price effects of regulation: Telecommunications, air passenger transport and electricity supply", Productivity Commission Staff Research Paper, AusInfo, Canberra, October 2001, p. 100, found at *http://www.pc.gov.au/research/staffres/peor/peor.pdf.*

The realization that competitive market principles can be applied to the electric power and natural gas industries has inspired an increasing number of countries to implement regulatory reform programmes. These programmes have resulted in major changes in market structure, created significant new business opportunities for domestic and foreign firms, and driven significant flows of international investment and trade.

1. The nature of regulatory reform

Regulatory reform entails introducing competition into industry segments that had previously been subject to control by privately owned, regulated monopolies, State-owned enterprises or government agencies. Competition is introduced by actively encouraging new firms to enter the market and by removing some regulatory controls over pricing, thereby permitting firms to compete on the basis of price. Because regulated prices are eliminated, this process is often called deregulation. In the power and gas industries, however, this term is somewhat misleading because only some prices are deregulated: those for power and gas commodities. Prices for physically moving the commodities through network transmission and distribution systems generally remain regulated. In addition, regulatory oversight is not eliminated, but instead undergoes a shift in focus from setting commodity prices to implementing policies that foster competition. Consequently, a more appropriate term for reform may be re-regulation.

Policy reforms that foster competition may be divided into three key elements: (*1) privatization,(2) structural adjustments* and *(3) open access to essential facilities.* In countries where state-owned enterprises or government agencies have traditionally dominated the power and gas industries, *privatization* is a necessary first step towards introducing competition. Government control of the industry usually is shifted to the private sector through a competitive-bidding process. This transformation itself appears to offer significant economic benefits. For example, Souza and Megginson, using a sample of 85 privatized companies in 28 countries, found evidence of significant increases in profitability, real

sales, operating efficiency and dividend payout.[4] Boubakri and Cossett achieved similar results using a sample of 21 developing countries.[5]

But simply shifting ownership of a large infrastructure monopoly from government to the private sector does little to foster competition if the new company retains the structure and dominant position of the old government entity. For this reason, privatization must be accompanied by *structural adjustments* to redistribute market power. Structural adjustments involve changing the structure of the market by breaking up dominant industry participants into various components in order to limit the potential for abuse of either monopoly or market power. Dominant firms can be restructured vertically as well as horizontally. Vertical restructuring, often called unbundling, entails breaking up a vertically integrated firm into separate production, transmission, distribution and marketing components. Establishing a clear separation between industry segments makes it possible to create a barrier between monopoly and competitive activities and thereby ensure that a firm cannot exploit monopoly power in the transmission or distribution segments to cross-subsidize or otherwise favour its activities in the competitive segments of production and marketing. The strength of this barrier varies depending upon the method used to implement vertical restructuring. Comprehensive vertical restructuring prevents owners of transmission and distribution facilities from owning any interests in competitive market segments. Weaker forms of separation would require legal separation of monopoly functions from competitive functions through a holding company structure or simply require separate accounts for each activity. The weaker

[4] Juliet Souza and William Megginson, "The financial and operating performance of privatized firms during the 1990s", *The Journal of Finance,* August 1999, pp. 1397-1448.

[5] Narjess Boubakri and Jean-Claude Cossett, "The financial and operating performance of privatized firms: Evidence from developing countries", *The Journal of Finance,* June 1998, pp. 1081-1110.

methods of restructuring may not be sufficient to discourage firms from abusing their monopoly power.[6]

Horizontal restructuring addresses the market power of a dominant firm within a single market segment, such as production or marketing. Market power is reduced by breaking up the dominant firm into smaller components, which then compete on a more equal footing with new market entrants and one another. Horizontal restructuring may be accomplished by selling portions of a firm during privatization, by auctioning concessions for some of the assets of the dominant firm, or by other legal or regulatory actions. Because the pursuit of market dominance is an inherent objective of competitive firms, horizontal restructuring must be followed by ongoing regulatory oversight to monitor industry concentration and control against the abuse of market power.

Open access to essential facilities represents the third prerequisite of a competitive market model. Once private participation is possible and structural reforms have constrained the market power of dominant firms, power and gas markets are confronted with the existence of a single transportation network that must somehow be shared by several competing firms. Ensuring that the common infrastructure is open to all competitors on an equal basis requires the development and enforcement of rules governing interconnection, access and use of network facilities. Among other things, these rules address the terms, conditions (including technical standards) and rates charged to connect to existing facilities. Above all, open access rules must ensure that all policies and procedures for using network facilities are transparent and reasonable.

Difficulties in achieving structural reform and open access appear to present significant and ongoing impediments to the development of competition. Incomplete vertical restructuring permits incumbent service

[6] Rauf Gonenc, Maria Maher and Giuseppe Nicoletti, "The implementation and the effects of regulatory reform: Past experience and current issues", Organisation for Economic Co-operation and Development, Economics Department Working Paper Series No. 251, 2000, p. 22.

providers to control the network while ostensibly competing with new entrants in the production and marketing segments. Inadequate horizontal restructuring enables incumbent producers and marketers to continue holding a dominant position and have the market power to influence prices for the market. With respect to open access, the most common impediments are unreasonably high access charges and discriminatory allocation of network resources by the transmission system operator. These problems appear to be most severe in cases where the terms and conditions for calculating access fees and usage conditions are not highly transparent.

The functioning of the regulatory agency itself is a critical factor in effectively addressing these enduring impediments to competition. In most cases, the regulator is a newly formed entity which is striving to develop appropriate policies and procedures as well as to establish its own authority. Since it is a fledgling organization confronting a host of new challenges, it is only logical to expect some degree of trial and error. In addition, the regulator will inevitably need to adapt its policies over time as the competitive market evolves. But since the regulatory authority is called upon to provide ongoing oversight and direct intervention to create a competitive market environment, the independence and objectivity of the regulatory agency are of the utmost importance. For this reason, most reform programmes include provisions to insulate the regulatory agency from undue influence by market participants and political elements.

2. The market effects of reform

Regulatory reform of the power and gas industries brings about a shift from a market characterized by few service providers and captive customers to one with an array of choices and participants. This in turn has created vast new opportunities for private sector participation, with the greatest business opportunities arising in the competitive segments of production and marketing. In the United Kingdom, for example, the decade following the initiation of power sector reform prompted a shift

from seven vertically integrated regional monopolies to 42 generation companies and 29 licensed marketers.[7]

The introduction of competitive marketing for power and gas enables consumers to choose their service providers on the basis of price and quality. Customer choice is usually phased in gradually by first permitting marketers to sell only at the bulk or wholesale level to large industrial consumers and other marketers. Over time, competition may be extended to progressively smaller consumers until ultimately all may choose their marketer. In the United Kingdom, competitive marketing was introduced in three stages: to large consumers in 1990, to medium-sized consumers in 1994 and to domestic consumers in 1998. By 2000, nearly 81 per cent of large consumers and 38 per cent of residential consumers had switched to a new power marketer at least once.[8]

Owing to the relatively short experience with competitive power and gas markets, it is difficult to quantify the economic effects of regulatory reform with any level of certainty. Nevertheless, anecdotal information may provide some useful insights. In the power sector, significant price reductions have been reported following the implementation of reform programmes, including declines of 30 per cent in the United Kingdom during 1990-2000, 20 per cent in Spain during 1997-2000, 15 per cent in Australia during 1990-98, and 50 per cent in Argentina during 1990-97.[9]

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[7] Electricity Association, Introduction to the UK Electricity Industry, found at Internet address *http://www.electricity.org.uk*, retrieved 28 January 2002.

[8] Electricity Association, Introduction to the UK Electricity Industry, found at Internet address *http://www.electricity.org.uk*, retrieved 28 January 2002.

[9] It should be noted, however, that the extent to which the introduction of competition is responsible for these price changes as compared with other factors such as technological advances, weather patterns or the pricing of alternative fuels has not been determined. Electricity Association, Introduction to the UK Electricity Industry, found at Internet address *http://www.electricity.org.uk*, retrieved 28 January 2002; Ana Nogales, Spain: "New competitive pressures for electric utilities", in *EU Electricity Directive Sparks Market Reforms Across Europe*, (London: Standard & Poor's, February 2000), pp. 30-31; and U.S. Department of Energy, Energy Information Administration, Electricity Reform

In the natural gas sector, prices declined by more than 20 per cent in the United Kingdom during 1990-2000, while in Australia, prices fell by 22 per cent and 11 per cent for the industrial and residential segments, respectively, during 1997-98.[10]

Regulatory reform is not always followed by price reductions, however, because market-based prices may ultimately be higher than those under a government-subsidized regime. For example, in Argentina, the removal of natural gas price controls and the introduction of competition actually resulted in a 15 per cent increase in wellhead prices during 1993-95.[11] Higher prices for natural gas in turn stimulated investment in exploration and development as well as in transmission and distribution capacity.[12] This experience suggests that the pre-reform price was artificially set at well below its competitive market value and that government control over the sector had impeded its growth. Indeed, even after the price increase, prices for natural gas in Argentina remained lower than those in other major markets, including the United States and the United Kingdom, and consumption of natural gas increased by 50 per cent during 1992-97.[13]

3. Implications for international trade in services

The development of competitive markets for electric power and natural gas has significant implications for international trade in services.

Abroad and U.S. Investment, 1997, found at Internet address *http://www.eia.doe.gov*, retrieved 10 March 2000.

[10] Gas Liberalization in Europe, *Petroleum Economist* (London: 2000), found at Internet address *http://proquest.umi.com/*, retrieved 1 June 2001; and Australian Gas Association, *Gas Statistics Australia 2000*, August 2001, found at Internet address *http://www.gas.asn.au.*

[11] Organisation for Economic Co-operation and Development, International Energy Agency, *Regulatory Reform in Argentina's Natural Gas Sector*, p. 56.

[12] The number of wells drilled increased from 14 in 1993 to peak at 72 in 1994 before receding to 40 new wells in 1997. Transmission and distribution capacity increased by over 36 per cent during 1992-97. Ibid., pp. 48-51.

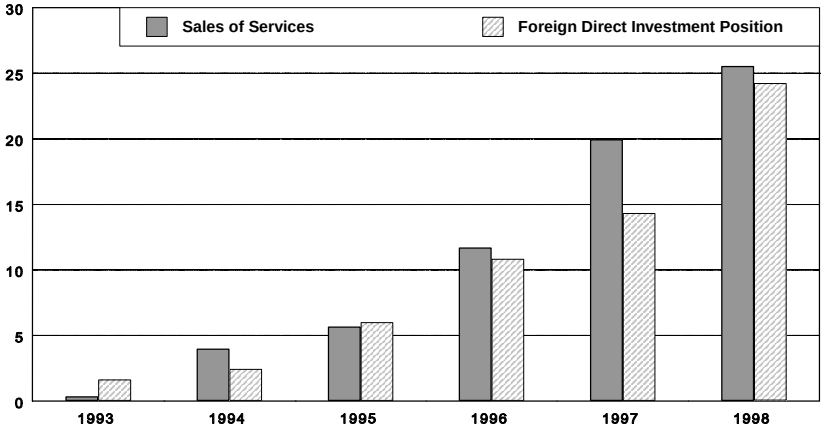
[13] Ibid.

Most clearly, the movement towards private participation and competitive markets is creating new opportunities for private firms to participate internationally in services related to natural gas production and power generation, as well as in power and gas transmission, distribution and marketing services. Whether foreign participation takes the form of direct investment or cross-border transactions, these new business prospects constitute new market access opportunities.

Data for United States direct investment and sales through foreign affiliates demonstrate how reform programmes implemented during the 1990s resulted in enormous flows of direct investment that in turn drove growth in sales of services through foreign affiliates. As shown in figure 1, sales of services by foreign affiliates of United States firms in the utilities business increased by well over 100 per cent a year, to grow from just $357 million in 1993 to more than $25 billion in 1998.[14] This rapid growth in investment and services trade directly coincided with major regulatory reforms undertaken in the United Kingdom, Australia and Latin America that permitted United States firms to enter the market.

[14] U.S. Dept. of Commerce, Bureau of Economic Affairs, U.S. Direct Investment Abroad: Operations of U.S. Parent Companies and their Foreign Affiliates, and U.S. Direct Investment Abroad, Detail for Historical-Cost Position and Related Capital and Income Flows, found at Internet address http://www.bea.doc.gov.

Figure 1. Sales of services by foreign affiliates of United States companies in the utilities business



The utilities category includes power, natural gas, and water services.
Source: U.S. Department of Commerce (USDOC), Bureau of Economic Analysis (BEA), *U.S. Direct Investment Abroad Series, 1993-1998.*

The fact that regulatory reform influences trade prompts the question of what role should be played by international trade negotiations, such as those taking place under the General Agreement on Trade in Services (GATS) of the World Trade Organization (WTO).[15] Should trade negotiations, which endeavour to expand trade, seek to bring about regulatory reform? Some feel this would be taking the mandate for trade policy too far. Because regulatory reform represents such a major domestic policy initiative, the extent to which an international agreement can drive the process appears to be limited. Consequently, it is unlikely that trade instruments such as those contained in the GATS can be used to explicitly promote regulatory reform in other countries. In fact, the

[15] When the GATS entered into effect in 1995, it included a built-in agenda to pursue progressive rounds of liberalization. In accordance with this provision, WTO members initiated a new round of GATS negotiations on 1 January 1 2000, with the objective of expanding trade and thereby promoting global economic growth. World Trade Organization, *General Agreement on Trade in Services and Related Instruments*, April 1994, p. 3.

European Commission has formally stated its opposition to using GATS negotiations to pursue deregulation.[16]

While trade negotiations do not appear to be an appropriate means for bringing about regulatory reform, they nevertheless may offer an instrument for supporting reform programmes. In order to be successful, regulatory reform programmes must facilitate market entry by any and all potential participants. A greater number of participants and sources of investment result in stronger competition and higher-quality, lower-cost services. Consequently, the pool of potential new entrants should be as large as possible and should include foreign participation. Foreign firms may face increased risk when operating internationally, however, as indigenous firms often have better access to and influence over the local regulatory, political and judicial systems. International commitments to a set of principles concerning foreign participation and the settlement of disputes can help mitigate this risk by providing assurance that foreign firms will be treated in a non-discriminatory manner.

WTO members have already made some commitments under the GATS that are relevant to power and gas services. These commitments may be divided into two categories: general commitments and specific commitments. General commitments apply to virtually all possible service sectors[17] and include broad obligations concerning most-favoured-nation treatment, transparency, domestic regulation, and monopolies and exclusive suppliers. Specific commitments apply only to specific service sectors that are explicitly named by each country in its Schedule of Specific Commitments. In scheduling commitments on market access and national treatment for specific service activities, WTO members worked from a list of service sectors that included cross-references to definitions contained in the United Nations Provisional Central Product

[16] World Trade Organization, Communication from the European Communities and their Member States, GATS 2000: Energy Services, submitted to the Council for Trade in Services, Special Session, document no. S/CSS/W/60, 22 March 2001.
[17] The sole exception is air transport services.

Classification (CPC).[18] The specific commitments include obligations concerning market access and national treatment.

However, two important open questions concerning the application of existing GATS commitments to power and gas services create considerable uncertainty for both businesses and Governments. First, the existing service classification system may not permit countries to make meaningful commitments on electric power and natural gas services in their Schedules of Specific Commitments. Industry representatives have expressed concern that because energy services are ill-defined by the classification system, it is unclear whether specific commitments to accord market access and national treatment apply to their activities.[19] Indeed, the classification system makes only oblique reference to power and gas services in two categories: Services Incidental to Energy Distribution, a sub-category of Other Business Services; and Pipeline Transportation of Fuels, a sub-category of Transportation Services. Trading and marketing of electric power and natural gas are not explicitly mentioned anywhere. Because it is unclear where these services are classified, industry representatives are not sure whether commitments made by WTO members apply to their activities, and governments are not sure about the full scope of commitments they have already undertaken. For example, if marketing of electric power and natural gas is simply a wholesale or retail distribution service, akin to distribution of auto parts or tennis shoes, specific commitments made by countries on distribution services would extend to power and gas marketing. But it is unlikely that the many countries that scheduled broad commitments on distribution services back in 1994 really intended those commitments to apply to electric power, given that relatively few countries had competitive power and gas markets at that time. Classifying power and gas marketing as a

[18] The list of service sectors prepared by the WTO Secretariat is identified by its document number: MTN.GNS/W/120.
[19] Rachel Thompson, "Integrating energy services into the world trading system", Washington, DC, 10 April 2000, p. 1.

new energy service would subsequently permit all countries to consider how best to make commitments specifically directed at this activity.[20]

The second open question concerns whether existing obligations provide sufficient guarantees of *effective* market access for the electric power and natural gas industries. The GATS market access discipline is defined to include only six types of restrictions, most of which pertain to quantitative limitations. Policies that restrict trade but are not included on this list are then permissible under the agreement. For example, a foreign firm may be granted market access and so be able to establish a power and gas trading and marketing affiliate, but then face impediments when trying to access the transmission network that foreclose effective access to the market. Further, the GATS general disciplines concerning transparency and domestic regulation may not provide sufficient coverage of elements of critical importance to the power and gas industries, such as specific measures implemented by energy regulatory authorities pertaining to network access.

However, the GATS offers flexibility to negotiate additional rules to meet the specific needs of an industry. Indeed, GATS negotiations concerning telecommunications set a precedent for such provisions by developing additional rules on access and use of network facilities and by strengthening GATS general rules on transparency and nondiscrimination as they apply to specific regulatory policies and practices.[21] Additional

[20] Other industry activities may merit consideration for similar treatment as new categories subject to new commitments. For example, it is not clear whether power and gas transmission and distribution services are within the category of Services Incidental to Energy Distribution, because it would seem that a service cannot be incidental to itself.

[21] GATS Article XVIII provides for the negotiation of additional commitments to address measures affecting trade in services that are not covered by the market access and national treatment provisions. As a result of negotiations on basic and value-added telecommunication services, additional commitments were appended to the GATS through two separate instruments: the Annex on Telecommunications and the Regulatory Reference Paper on basic telecommunications.

provisions for electric power and natural gas services could include some or all of the following: stronger rules governing anti-competitive behaviour by monopolies, rules on non-discriminatory interconnection to network facilities, rules on access to and use of network facilities, and stronger rules concerning regulation of the energy sectors that address transparency, non-discrimination and the independence of the regulatory authority. Additional, targeted commitments such as these could serve to enhance the credibility of regulatory reform programmes and support the development of a competitive market.

Conclusion

The trend towards regulatory reform of the electric power and natural gas industries appears to be proceeding internationally, in pursuit of lower costs and improved quality for these important infrastructure services. The nature of reform programmes is broadly consistent across countries, characterized by private participation, structural reform, and open access to networks. The effects of reform appear to be substantial in terms of creating new business opportunities and enhancing consumer welfare. Because regulatory reform makes international trade and investment possible, trade policy appears to have a role to play in the process, but one that serves to support rather than initiate reform. Commitments undertaken in international trade agreements can enhance the credibility of reform programmes, but the programmes themselves must be driven by domestic policy priorities. Existing international trade agreements provide a framework for making commitments relevant to electric power and gas services, but some adaptation may be necessary in order to clarify how obligations apply to specific service activities and to ensure that commitments effectively address issues concerning access to and use of networks.

POLICY-MAKING IN THE ENERGY SECTOR: THE GROWING INFLUENCE OF NON-STATE ACTORS

Dinos Stasinopoulos*

Introduction

This note discusses the role of non-State actors (NSAs)[1] in international policy-making in the energy sector and raises the issue of the need to adapt existing arrangements to reflect their growing influence in global energy affairs. This has become a highly topical issue, especially since the WTO Seattle 1999 and Doha 2001 Ministerial Conferences during which NSAs and, in particular, representatives of civil society, reconfirmed their importance on the global scene.

Fast-growing technology and gradual liberalization of markets account to a great extent for expanding globalization[2] of energy activities and are manifested in commercial alliances involving ownership and control beyond national borders. The energy sector is regulated at the international level mostly through bilateral agreements, while multilateral agreements are already in place and

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[1] Non-State actors (NSAs) is a wider term than, for example, non-governmental organizations and includes professional energy associations, trade unions and corporations.

[2] Globalization can be defined in several different ways, depending on the level we choose to focus on. We can speak of the globalization of the world, a country or a specific sector such as energy.

others are under consideration. The energy sector has been characterized by a gradual opening up of markets, and this contrasts with the speed of opening up of global commercial competition in the sector. In other words, global commercial pressures for rapid liberalization are overtaking the carefully planned but slow opening up of energy markets. More specifically, changes in the energy sector rapidly reflect the changing circumstances of such developments:

- The emergence of new technology such as computers, telematics, satellite navigation and positioning technology, which has extensive ramifications for energy and especially for production/exploration and distribution;
- The emergence of sustainable development and environmental considerations as important concerns in the energy sector;
- Liberalization in international energy trade fostered by policies of the European Union, the Organisation for Economic Co-operation and Development (OECD), the International Energy Agency (IEA), the United Nations Economic Commission for Europe (UN/ECE) and the World Trade Organization (WTO).

1. NSAs presence on the international scene

In addition to the structural changes in the energy industry, changes in policy development are taking place in which control and decision-making are becoming more diffused. As the global energy market develops, transnational operators act like locals wherever they operate. Technology has been a driving force in gradually shifting policy influence from States to NSAs and markets. Increasingly when Governments formulate energy policies they only have the appearance of free choice. As markets set rules enforced by their own power, NSAs become increasingly involved with policy development in the energy sector. At a time of fast-changing markets, NSAs respond to new opportunities quicker than Governments. NSAs are becoming more capable of large-scale activity across national borders, thereby

helping to break governmental monopoly on the collection and management of information on energy markets and infrastructure systems. Access to this information allows NSAs to carry out comprehensive studies and develop well-documented policy positions on issues. In addition, globalization has created cross-border environmental problems that Governments cannot tackle as effectively as NSAs.

NSAs were once largely relegated to the corridors in international organizations and their only option was to work through Governments. NSA delegates now serve on country delegations and penetrate energy decision-making by attending technical working group meetings.

Various international organizations set the standards in the various energy sectors, and markets become government enforcers when they adopt treaty standards as the basis for market judgements.

2. Growing influence of NSAs in the energy sector

Although international law does not formally recognize them, NSAs have organized influential campaigns and policy initiatives in the energy sector, with particular reference to energy efficiency and environment-related issues. National Governments, international institutions and the European Community increasingly view NSAs as indispensable partners in the energy sector.

More specifically the WTO, UN/ECE and IEA have gradually opened their doors to NSAs. The United Nations has accredited a large number of NSAs. Negotiations on the new global economy, including energy, take place in other organizations. The WTO invites NSAs to observe major meetings and they are also invited to the OECD and the IEA expert group discussions, although as yet there is no formal consultation structure.

As far as the European Union (EU) is concerned, a reference to civil dialogue was left out of the Amsterdam Treaty despite efforts made by the European Commission. However, European NSAs have sought and received a consultative role in relation to the European institutions. The Commission regularly consults NSAs during the policy proposal phase and organizes energy industry hearings for the elaboration of policy instruments of pan-European importance. A Commission working paper on relations with non-governmental organizations (NGOs) was published in 2000.[3] On 12 July 2001 the European Commission decided to create a European Energy and Transport Forum. The Forum will provide a single framework for dialogue between the Commission and NSAs and will enable the interdependent aspects of energy and transport to be managed more effectively. Its mandate will be to:

- Give opinions on all Commission initiatives on energy and transport policy;
- Act as an observer of energy and transport policies; and
- Assist the Commission in holding debates and carrying out actions in the framework of energy and transport policies.

Restructuring of the energy and transport industries, including environmental, social and safety concerns, will be on the agenda. Membership of the Forum will consist of energy operators (power generators, energy companies and industrialists); infrastructure and networks (managers); users and consumers; trade unions; and representatives of environmental and safety groups, and universities. This diversity should enable the Commission to take a broader view when drafting policy proposals. It will allow a growing universe of industry professionals, consumers and other elements of civil society to reinforce cross-border networks, generate new ideas, mobilize public support, carry out analyses and monitor policies.

3 "The Commission and non-governmental organizations: Building a stronger partnership".

A review of the work of international forums dealing with energy has revealed that NSAs are bringing to the global policy-making process a vitally important voice that complements and widens the policy discourse. They are usually granted access in the early phases of the policy process and limited access to the final elaboration of policy decisions. NSAs have enjoyed easy access to conferences when the outcome is "soft" and restricted access when legally binding decisions are involved. NSAs participate informally but effectively, alongside Governments, in agenda setting and preparation of conclusions.

International organizations look to NSAs for innovative ideas on concepts and standards, and Governments recognize that working with NSAs gives credibility to their public decisions. NSAs have experienced problems and even setbacks in their relations with international forums owing to member States' reluctance to agree to grant them formal consultation rights. They also often encounter negative and restrictive actions from the secretariats of international forums.

Policy-making at the global and EU levels in the energy sector is greatly influenced by NGOs and the energy industry. An alternative way of dealing with energy issues, involving the interaction of global industry, the EU and the member States, has been developed. The relative weight of the market in relation to politics has been altered in a substantial way. The pace and content of market liberalization in the EU are now influenced by global concepts emphasizing market functionality.

Environmental advocacy groups and organizations such as Friends of the Earth and Greenpeace are influencing policy orientation to take environmental considerations into account. Oilwatch, an international network, called for a moratorium on oil and gas exploration in order to place the consequences of climate change within the context of international energy policy. This is expected to influence the current debate on Arctic exploration in the United States.

Finally, the leadership role of energy business groups in building and sustaining the multilateral energy discussions in the WTO cannot be denied.

Conclusions

The energy industry has undergone tremendous changes in the past two decades. The sources of change and uncertainty include increased competition through deregulation and privatization, the emergence of integrated global players and changes in technology. The above-mentioned economic, market and organizational developments have a substantial effect on policy-making in the energy sector.

In this new environment policy-making in the energy sector represents a real challenge. It calls for a fundamentally different approach in international consultations and negotiations within a global governance framework.[4] Analysts have argued that a new policy architecture is required and that new channels of cooperation should be sought to acknowledge the revolutionary influence of new information technology and the increasing influence of NSAs.

Adaptations are needed that may involve changes in the terms of reference of international organizations so that they may better serve the needs of the energy industry and the public at large. New institutions and policy agencies that match the transnational scope of today's challenges, and meet the demands of European citizens for sustainable development, may also be required.

The strengthened relationship between NSAs and international organizations could be beneficial for the implementation of agreements, resolutions and other legal acts. It is no longer sufficient

[4] "Governance" can be best understood as the rules, processes and practices that affect the way in which policy is exercised. The EU could be considered a regional component of global governance.

to assume that Governments will act upon the promises and commitments that they collectively make at conferences. NSAs, nationally and internationally, have a crucial role to play in helping and encouraging Governments to take the actions that they have endorsed.

As the roles for State and non-State actors change and radical shifts in communications technology take place, there is a need to develop a long-term vision regarding the role of NSAs at the international level.

The modalities of consultations should be expanded to include a wide range of interactions such as hearings and working groups.

Greater transparency and better access to documentation is also considered a step in the right direction.

Although the scope of international organizations' activities has increased, their administrative structures have not changed. The result is a lack of effectiveness in global policy-making. There is a need to gradually adapt their structures to improve consultations with interested parties and streamline their policy-making.

The European Community is working closely with all important partners and international organizations to develop a framework for global governance in energy; this is done by associating all stakeholders effectively and fostering partnerships with business, trade unions and public authorities.

To sum up, as globalization in energy and global environmental issues make the world increasingly interdependent, the EU is contributing to the search for new ways to manage interdependence and address problems in the energy sector.

Global governance in energy and transport requires new partnerships between all stakeholders to ensure better consultation mechanisms between policy makers and industry representatives and civil society.

There is also a need for international organizations to better adapt their policy-making consultations and structures to meet the new challenges effectively.

Our efforts to improve the way in which the European Union works (Community governance)[5] will represent a role model for better governance in other regions of the world. Active participation in the work of international organizations will promote greater coherence between forums and facilitate the search for sustainable solutions to global energy problems.

[5] European Governance: A White Paper, COM (2001) 428.

UNITED STATES ENERGY TRADE POLICY: THE CONSEQUENCES OF A PIVOTAL YEAR

Craig VanGrasstek*

Introduction

Two thousand and one was a pivotal year. It was not the year that Arthur C. Clarke and Stanley Kubrick foresaw a generation ago: the key events all took place on planet Earth. Nor was it truly revolutionary, like 1492 or 1776: the latest events may have important implications for mere years, not generations. The year was nevertheless far more eventful than most, and ended on a note very different from the one on which it began. At the start of 2001, the United States economy appeared to be at the tail end of a lengthy expansion (but there were signs of a recession), the results of the presidential election of 2000 appeared tainted, the United States was at peace, oil prices were high, the country looked as if it was on the brink of a new energy crisis (especially in California), and the prospects for launching a new round of multilateral trade negotiations seemed doubtful. Every one of these points changed or was even reversed by the end of the year. The incoming administration had hoped to make energy policy one of its top priorities, issuing a task force report that called for major steps to promote production at home and abroad. While energy policy remained high on the administration's wish list at the end of the year, the political and economic foundations on which it based the plan had shifted radically.

In this chapter I examine the consequences that the events of 2001 have had in defining the United States approach to energy trade policy in the new round of World Trade Organization (WTO) negotiations and in alternative forums. The underlying thesis here is that the new

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round is only the latest in a series of opportunities for the United States to advance its interests as both an importer and an exporter of energy-related goods, services and capital. While those interests have been fairly consistent over the long term, they also respond to exogenous events. Three such developments took place in 2001. In declining order of importance and permanence, they are the terrorist attacks of 11 September, the collapse of the energy giant Enron and the emergence (and possible retreat) of an economic recession. Barring even bigger events in the near future, these developments set the stage for at least the next three or four years. The political calendar in United States politics is focused on 2004, when the next presidential election will be held. The trade policy calendar centres on 2005, when both regional and multilateral negotiations are scheduled to conclude. The policy debates in the United States during 2002-2004, and the negotiations with United States trading partners during 2002-2005, will be strongly influenced by the key events of 2001.

The launch of a new round of negotiations will not be conducted in isolation from events in the wider world. The underlying assumptions of this chapter are that (1) the United States will remain *primus inter pares* among WTO member countries (although both United States primacy and the influence of industrialized countries overall have come under increasing challenge), and (2) the United States negotiators will view the WTO as only one of several arenas in which they might seek to advance their country's interests in energy trade. Unilateral actions, as well as bilateral and regional negotiations, are also in play. From the perspective of United States energy trade policy the proposed Free Trade Area of the Americas (FTAA) could ultimately be the most significant option.

This chapter updates an earlier analysis in which I examined the interplay of three principal forces on trade policy.[1] The main features

[1] See "The energy trade policy of the United States", chapter 3 of *Trade Agreements, Petroleum and Energy Policies*, UNCTAD/ITCD/TSB/9 (New York and Geneva: UNCTAD, 2000).

of United States policy merit reiteration in order to understand how the latest developments fit into established patterns. It is my argument that United States policy towards trade in energy-related goods and services has three distinct dimensions: economics, security and the environment. The significance of any one influence will rise or fall with the tenor of the times and the party in power. As a general rule, the relative importance of economics and security depends upon the perceived vulnerability of the United States to external threats. Economic objectives tend to trump security concerns when the world is at peace, but the reverse is true in times of war or heightened tensions. Similarly, the relative priority assigned to environmental considerations depends on which party controls the reins of government. Democrats tend to place a higher value on environmental objectives, and are more willing to employ governmental power in support of this objective, than is the case for their Republican rivals. This point is equally true for initiatives that the Government pursues at the domestic and international levels.

The tension between security, economics and the environment informs almost all of the issues in this field of public policy. The first two dimensions have an especially long history: States have always had to balance economic and security objectives in pursuit of their trade objectives. Because of its special role in national security, the energy sector is peculiarly resistant to full integration into the rules and disciplines of the global trading regime. The energy crises of the 1970s are a vivid and bitter memory for American policy makers, who sometimes take a “balance of power” view of global energy markets; they seek to prevent too much concentration of energy resources in any single region. Energy security for the United States not only affects the need to maintain secure access to a strategically vital commodity, but also raises concerns about the leverage that oil producers may employ in their relations with the United States. While security concerns are of great importance, they are not always paramount. Energy is also an economic sector of vast importance, and one in which the United States cannot afford to forgo market opportunities. The United States dependence on foreign sources of hydrocarbons is counterbalanced by its status as an exporter of goods,

services and capital used in the production of energy. Security and economics are not necessarily at odds with one another; they are perfectly complementary when it comes to the development of new sources of energy in countries that are friendly to the United States.

Environmental issues are also very high-profile matters in contemporary trade policy. Nowhere is this more evident than in the case of energy and related sectors, which are often identified as leading contributors to such environmental problems as oil spills, global warming and potential nuclear disasters. Debates over energy policy in the United States always entail conflict between those who see ready supplies of low-cost energy as the solution to the energy problem and those who view cheap power as a major cause of environmental woes. This conflict has lately become an important element in the politics of United States trade policy, with Democrats insisting that environmental issues should be "on the table" in trade negotiations and Republicans insisting that these are extraneous considerations that should be dealt with elsewhere.

The significance of the major events of 2001 should be seen in the context of the tension among these three currents of policy. What is striking about the latest developments is that they simultaneously pull policy makers in different directions. Consider, for example, their effect on the perennial demands for restrictions on energy imports in order to reduce United States dependence. If the only major event in 2001 had been the outbreak of the war on terrorism, one would expect concerns over energy security to increase markedly; if the only event had been the emergence of the recession, with its depressing effect on energy prices and consumption, the effect would be just the opposite. In a year when both events occurred simultaneously, coupled with the collapse of Enron (which has heightened public cynicism over the energy industry's claims), the net effect is more difficult to gauge. To take another example, the new developments have seemingly contradictory consequences for United States policy regarding sanctions on oil-exporting countries. The war on terrorism has halted the movement towards sanctions reform as a matter of principle, but has also accelerated the removal of sanctions as a matter of practice.

The launch of the new round of negotiations and the start of the recession may provide further means and motives for the removal of sanctions, but the Enron affair may reduce the ability of the energy industry to exploit these opportunities politically.

It is difficult at this juncture to know which of these events will ultimately have the greatest influence on United States policy. The recession is the weakest candidate for this distinction; indications in 2002 are that this may prove to be one of the shortest, mildest downturns in recent United States experience. From the narrow perspective of energy policy, the principal consequence of this recession is its role in ending what appeared to be an emerging energy crisis. At the start of 2001, California and other Western States were hit by electricity shortages and severe price increases. The Bush administration and others emphasized these developments when pressing for the enactment of a new energy policy. That crisis disappeared almost as quickly as it had arisen, with the recession pushing demand down to the level of supply. (The Enron investigation may also uncover evidence to support critics' contentions that the apparent crisis was exploited or even caused by manipulations of the market).

It is far too early to view either the war on terrorism or the Enron affair with a proper sense of perspective. In the case of the attacks of 11 September and the United States response, the early indications are that the consequences for the trading system will be important but limited. Security is tighter at ports and other facilities, and the events have strengthened the position of those who insist that the United States must take steps to reduce its dependence on energy imports from volatile and potentially hostile regions. The available evidence nevertheless suggests that the new measures have not substantially increased the cost of shipping goods across borders, and have not driven trade below levels that one would expect in a recession.[2] At this stage, the most momentous consequences of the war would appear to be the effects that it has on redefining the relationship between the

[2] "Globalisation: Is it at risk?," *The Economist* (31 January, 2002).

United States and some of its most important trading partners. In some cases the war prompts allies to draw closer and former adversaries to become more cooperative. It has further encouraged the process of economic and security integration with Canada, helped to overcome the final vestiges of Cold War trade restrictions on the States of the former Soviet Union, and led to the relaxation or removal of sanctions on some countries that do not export oil (notably Pakistan). At the same time, it seems likely to deepen the level of conflict with Iraq and the Islamic Republic of Iran, while also causing new frictions in the relationship between the United States and Saudi Arabia.

The denouement of the Enron affair is more difficult to predict. It depends on whether the case ultimately proves to be little more than a bankruptcy of unusually large proportions, or whether the early suggestions of possible scandal grow into something much larger. At this stage it is evident that the energy giant engaged in some accounting practices that were of a very questionable nature while also enjoying an unusually high degree of influence in Washington. Its collapse could mark a sharp decline in the political fortunes of an industry that had appeared to have a position of unprecedented access and power. The President, the Vice-President and the Secretary of Commerce are all closely aligned with this industry. The most visible figure in this group is Vice-President Dick Cheney, formerly with the Halliburton Company (a major provider of oil-related services) and chairman of the administration's energy task force. His several hats do not all fit comfortably on his head at once. In early 2002 the General Accounting Office (an investigative arm of Congress) brought a lawsuit against Cheney, seeking to force his release of papers relating to the conduct of the task force's deliberations. Investigators want to know what influence Enron and other firms may have had over that body's formulation of the administration's energy policy. While it is unclear whether this inquiry will lead to any serious consequences, it does distract attention and resources that might otherwise be devoted to the enactment and implementation of new energy legislation. The unpleasant redolence of this affair could also affect the willingness of United States trading partners to pursue the negotiated deregulation of energy markets.

The analysis that follows is focused on three principal areas of United States energy trade policy: sanctions against oil-exporting countries, discriminatory trade agreements and programmes, and the new round of WTO negotiations. These three aspects of United States policy might be seen as the unilateral, regional and multilateral options, respectively. The options are not mutually exclusive, United States policy in this field having long proceeded in multiple forums. They nevertheless produce some tensions in policy, with the United States seeking in some instances to discriminate in favour of certain countries and against others, while also pursuing some initiatives on a non-discriminatory basis.

1. The unilateral option: sanctions

Sanctions are an important tool of United States policy, although they fall outside the scope of trade policy as it is generally understood. They are typically imposed not for the purpose of pursuing economic objectives but instead to impose costs on countries that are hostile to United States interests. They are thus to be distinguished from ordinary import barriers that are blatantly protectionist, although in the case of oil this can be a fuzzy distinction. The Suez incident in 1956 and the oil crises of the 1970s, for example, led to the imposition of import quotas but not actual sanctions. Since the 1980s the United States has been more secure, and hence has restricted imports only from certain countries. Those restrictions are *bona fide* sanctions, and are based on foreign policy considerations that are specific to the target country rather than on general concerns over United States energy security.

The demand for sanctions reform has become a potent political force since the end of the Cold War. For both political and economic reasons, a variety of interests in the United States call for current sanctions to be rolled back and legal limits to be placed on the imposition of new restrictions. Sanctions have been removed or relaxed for such diverse countries as South Africa the Democratic People's Republic of North Korea, former Soviet republics, China and

Viet Nam. The proponents of sanctions reform scored at least a symbolic victory with the enactment of the Trade Sanctions Reform and Export Enhancement Act of 2000, the principal effect of which is to make it more difficult for presidents to impose future sanctions affecting United States medical and agricultural exports. The most economically significant sanctions that remain in place are those imposed on oil-exporting States in the Middle East.

Top policy makers in the Bush administration endorse the view that sanctions usually fail to achieve their intended outcome. Secretary of State Colin Powell is a leading proponent of the widely held view that sanctions are generally ineffective in achieving their intended objectives. "I would encourage Congress to step back for a while, count to 10, and call me" before imposing a new sanction, he said at his Senate confirmation hearing in January, 2001.[3] Active engagement of current or potential adversaries, it is argued, will generally be a more effective means of promoting positive change. This position is reinforced by the energy policy argument. The main means by which the administration hopes to address the current United States energy problem is to encourage new sources of supply, both domestic and foreign. By this logic, sanctions that prevent the development of new oilfields or the importation of their product are self-defeating for the United States.

The events of 2001 exercise great influence on United States sanctions policy. This is especially true for the war on terrorism, which has a somewhat paradoxical effect: it may mean in principle the end of sanctions reform as a broad policy, but may also mean in practice that some existing sanctions on strategically important countries are removed or even replaced with trade preferences. The net result for front-line States will lean more towards the opening than the closing of markets. The collapse of Enron may have a less direct impact on policy. Enron had been an active member of coalitions that promote sanctions reform and trade liberalization. At a minimum, the

[3] David Sands, "Powell's criticisms buoys trade groups," *Washington Times* (30 January 2001).

demise of this company means a loss of resources for the organizations that it had supported.

1.1 Sanctions reform as export promotion

The United States business and agricultural communities have promoted sanctions reform for over a decade, arguing that politically motivated restrictions on exports and imports impose too high a price on American industries. This issue was once important primarily to agricultural exporters, for whom the Carter administration's grain embargo on the Soviet Union was a formative experience. After the fall of the Berlin Wall, however, manufacturers and other segments of the business community have become active on the issue. The energy industry is a key part of the anti-sanctions coalition in the United States. Apart from a few protectionist segments such as "wildcat" oil producers and coal miners, this is among the most cosmopolitan of United States industries. As such, it shares the anti-sanctions proclivities of the agricultural community. These and other pro-trade interests now work together in coalitions. Two business organizations in the United States take the lead in opposing sanctions. One is USA*Engage, a coalition of more than 670 companies and organizations. This group was established in 1997, and is devoted primarily to the issue of sanctions reform. Its members include the American Petroleum Institute and several oil companies. Similarly, the National Foreign Trade Council advocates a rules-based world economy. This is a much more experienced group, having been founded in 1914 at a time when other United States business organizations were still proponents of protectionism.

The private sector's argument in favour of reform is usually founded upon the contention that sanctions impose self-defeating restraints upon competitive, export-oriented industries in the United States. Lifting the sanctions, it is argued, will create new opportunities to promote exports. For example, USA*Engage argues that sanctions "have served only to exclude U.S. companies from Iran while that country's needs for investment, civilian technology and capital goods

are being met by other countries around the globe."[4] It is nonetheless worth observing that in most recent cases where the United States has eased or eliminated sanctions the principal effect was to boost imports rather than exports. The data reported in table 1 demonstrate this simple point. The United States took significant steps towards the easing of trade sanctions against several countries in the 1990s. The net result was that the United States has gone from having a small trade surplus with this set of countries to having a relatively large deficit. This point is not troubling to free traders, for whom imbalances merely indicate the operation of the market, but it does suggest that the sanctions reformers' neo-mercantilist appeals are based on a false premise. This pattern is universal: in every single case where there was either a partial or a major easing of sanctions, United States imports from the country rose faster than United States exports to the country. In several cases exports declined. The only countries to which United States exports increased were those for which the United States did not ease sanctions prior to 2000.

The attacks on 11 September renewed official interest in the use of all tools, economic and military, as a means of pressuring countries in the war on terrorism. It is difficult to find an important policy maker in Washington today who will declare blanket opposition to the use of trade and other economic sanctions as a tool of diplomacy. The question now is whether the war on terrorism will accelerate, retard or redirect the sanctions-reform movement. It is possible that some countries may be made subject to new or tightened sanctions. They could be few in number, however, and even smaller in economic significance. Most of the candidates in Central Asia and the Middle East are either already subject to sanctions or represent small volumes of trade with the United States. Trade and other economic sanctions are already in place against countries that are tied to one way or another with al-Qaeda and related movements. Any further tightening of trade restrictions on these countries and movements might be the commercial equivalent of "making the rubble bounce," although there may be some scope for further restrictions on investment and capital

[4] Letter of 18 April 2001 to Senator Trent Lott (Republican, Mississippi).

movements. Even more important than new restraints, however, may be the inducements that are offered to some countries already subject to sanctions. Where the reform movement would have lifted restrictions on economic grounds, the new calculus could lead to their removal for strategic reasons. The chief beneficiary of this trend is Pakistan, which is not an energy producer. The same trend could nevertheless affect other countries that do export hydrocarbons and derivatives.

1.2 The Middle East

The Islamic Republic of Iran, Iraq and the Libyan Arab Jamahiriya are among the most economically significant countries that are subject to United States sanctions. These three countries collectively accounted for 23.2 per cent of global oil reserves and 10.8 per cent of oil production in 2000,[5] but only Iraq — under the oil-for-food programme — currently sells oil to the United States. Relations with all three countries are now complicated by the war on terrorism, which also poses new problems for the United States relationship with Saudi Arabia. No formal changes have been made or officially proposed in the economic, diplomatic and security relationships between Washington and Riyadh, but the future course of this partnership is a matter of active speculation.

Prior to 11 September it appeared that sanctions might be relaxed or removed by the end of the year. There is still some prospect that the restrictions on the Libyan Arab Jamahiriya could be eased, depending on further developments in the Lockerbie case, but the war makes it unlikely that the same will be done for the Islamic Republic of Iran and Iraq. Secretary of State Powell had advocated the reform of sanctions on Iraq in early 2001. His "smart sanctions" plan would move from the current policy of broad restrictions on trade in general (with the oil-for-food exception) to more focused restraints on militarily critical goods. The outbreak of the war makes it very

[5] BP Amoco data.

unlikely that the United States will be trading freely with Iraq any time soon; the more immediate question is whether the military tensions will once again spill over into a shooting war.

The most noteworthy sanctions issue that the Bush administration faced early in its tenure was the Iran and Libya Sanctions Act (ILSA), a 1996 law that was scheduled to expire in mid-2001. This law is aimed at putting pressure on third countries by providing for sanctions on non-United States companies that invest over $40 million a year in the energy sectors of either the Islamic Republic of Iran or the Libyan Arab Jamahiriya. The European Union and its member States are strongly opposed to the imposition of sanctions on their firms and citizens that engage in economic relations with the Islamic Republic of Iran and the Libyan

Table 1.
Effects of eased trade sanctions on United States imports and exports

Normal script: United States imports for consumption, customs value, millions of dollars

Italic script: domestic exports, FAS value, millions of dollars

		% of Total World Exports	1993	1995	1997	1999	2001
Oil-exporting countries			1 732.9	4 224.2	4 848.5	9 272.0	11 420.9
			3 518.5	*3 278.0*	*3 560.7*	*2 158.4*	*3 024.5*
Russian Federation	MFN granted in 1992; GSP in 1993	1.65	1 732.7	4 019.9	4 290.6	5 705.8	6 178.1
			2 894.2	*2 753.7*	*3 205.0*	*1 823.5*	*2 567.3*
Islamic Republic of Iran	Sanctions tightened and relaxed in series of steps	0.47	0.2	0.2	0.1	2.4	143.0
			613.2	*274.5*	*1.1*	*48.1*	*8.1*
Iraq	Oil-for-food programme begun in late 1996	0.30	0.0	0.0	167.4	2 961.9	4 073.4
			4.0	*0.2*	*81.9*	*9.5*	*46.3*
Viet Nam	Embargo lifted in 1994; MFN approved in 2001	0.23	0.0	204.1	390.4	601.9	1 026.4
			6.9	*249.6*	*272.7*	*277.3*	*393.8*
Libyan Arab Jamahiriya	End of Lockerbie case could ease sanctions	0.22	0.0	0.0	0.0	0.0	0.0
			0.2	*0.0*	*0.0*	*0.0*	*9.0*
All others			1 862.8	2 229.7	2 633.1	3 812.5	5 405.7
			2 180.7	*2 741.1*	*3 018.6*	*2 507.3*	*2 921.3*
South Africa	Sanctions lifted in 1991; GSP granted in 1994	0.47	1 851.0	2 209.6	2 495.5	3 192.8	4 429.5
			2 144.5	*2 696.5*	*2 926.4*	*2 394.0*	*2 822.4*
Yugoslavia	Sanctions lifted in 2001; preferences are pending	0.03	0.1	0.0	10.2	4.8	5.4
			1.3	*2.0*	*48.4*	*58.6*	*55.0*
Cuba	Reform efforts in 2000 led to little change	0.03	0.0	0.0	0.0	0.6	0.0
			2.6	*5.8*	*9.3*	*4.7*	*6.9*
Cambodia	MFN granted in 1996, GSP in 1997	0.01	0.7	4.7	101.7	592.3	964.2
			15.5	*26.1*	*17.9*	*19.5*	*28.1*
Afghanistan	MFN denied since 1986	—	2.9	5.4	11.4	9.3	2.7
			9.5	*4.1*	*11.5*	*17.7*	*5.7*
People's Democratic Republic of Laos	MFN agreement reached in 1997 but still pending	—	8.1	10.0	14.3	12.7	3.9
			5.3	*1.6*	*2.7*	*1.5*	*2.5*
Democratic People's Republic of Korea	Embargo lifted in 2000; MFN still denied	—	0.0	0.0	0.0	0.0	0.0
			2.0	*5.0*	*2.4*	*11.3*	*0.7*
Total of above		U. S. imports	3 595.7	6 453.9	7 481.6	13 084.5	16 826.6
		U. S. exports	*5 699.2*	*6 019.1*	*6 579.3*	*4 665.7*	*5 945.8*
		Balance	2 103.5	-434.8	-902.3	-8 418.8	-10 880.8

Source: Calculated from World Trade Organization and United States International Trade Commission data.
Share of world exports are a country's percentage of global merchandise exports in 2000.
— : Data are either not available, or the country accounted for less than 0.01 per cent.

Arab Jamahiriya. That opposition, backed by the threat of retaliation against the United States, has encouraged the United States to exercise caution in the implementation of these laws. Domestic pressure against the sanctions had also grown, with energy interests and others urging that the law be allowed to lapse. The White House initially appeared eager to see this law expire, floating a "trial balloon" to this effect in early 2001. The negative reaction was so swift and strong that President Bush felt obliged to clarify his position immediately. He told a press conference that while it is "important for the country to review all sanctions policies to make sure they're effective", he had "no intention as of this moment for taking sanctions off countries like Iran or Libya".[6] In its final form, the much-awaited energy policy task force report more cautiously recommended that "the President direct the Secretaries of State, Treasury, and Commerce to initiate a comprehensive review of sanctions".[7] While noting that "Energy security should be one of the factors considered in such a review",[8] the report did not place this objective above others. The administration's fallback position, which it informally announced in mid-2001,[9] was neither to promote the expiration of ILSA nor to support a full, five-year reauthorization. The administration instead indicated that it would seek a two-year renewal. Even this position was unacceptable to critics in Congress. The ILSA renewal bill, as enacted in August 2001, reauthorized the law for five years.

There was some indication in the weeks following 11 September that the war on terrorism could revive and accelerate the Bush administration's review of policy towards the Islamic Republic of

[6] "Bush: "'No intention' to lift sanctions", Associated Press wire story (19 April 2001).
[7] National Energy Policy Development Group, *Energy Policy* (Washington, D.C.: U.S. Government Printing Office, 2001), pp. 8-18.
[8] *Ibid*.
[9] The administration made no formal announcement of the policy, but did make its intentions clear via the press. See, for example, Alan Sipress, "Bush seeks reduction of sanctions for Iran, Libya", *Washington Post* (9 June 2001), p. A20.

Iran, possibly leading to renewed efforts towards rapprochement. These expectations were further advanced by the tacit cooperation between the Washington and Teheran in the struggle against the Taliban. According to one school of thought, the United States should encourage moderate elements in the Islamic Republic of Iran and approach this country as a potential ally in the war against terrorism. An altogether different school identifies it as one of the State sponsors of terrorism, and argues that it should be among the next targets in the war. The latter group was gaining ground by the end of 2001, and President Bush's State of the Union message in 2002 revealed that they had won the internal debate. He identified the Islamic Republic of Iran — together with Iraq and the Democratic People's Republic of North Korea — as part of an "axis of evil" that is "arming to threaten the peace of the world".[10] It is safe to say that the United States and the Islamic Republic of Iran are not likely to establish a cooperative diplomatic or economic relationship any time soon.

1.3 The Caspian Basin

The current United States efforts to promote the development of oil fields in the States of the former Soviet Union fit well within the broader United States desire to enhance energy security. The primary intention is not to extract oil that will go directly to the United States. The additional capacity will nevertheless serve American interests by increasing global energy supplies, cutting prices and reducing the influence of adversaries with large reserves of oil, while also providing lucrative opportunities for United States firms. At the same time, it is vitally important to Washington that the pipelines for these oilfields not be routed through or near the territories of countries that are considered unfriendly to the United States (especially the Islamic Republic of Iran).

[10] George W. Bush, "The President's State of the Union Address" (29 January 2002).

The war on terrorism served to reinforce these strategic calculations, and may also lead to the removal of the Russian Federation and several other former Soviet republics from the Jackson-Vanik law.[11] These provisions of the Trade Act of 1974 are a statutory art fact of the Cold War. Originally enacted at a time when the Soviet Union restricted Jewish emigration, the law was intended to put pressure on the Soviets by linking their most-favoured-nation (MFN) status to the freedom of emigration. The United States and the Russian Federation currently extend MFN treatment to each another — now known in United States law as normal trade relations — but do so under the conditional terms of the Jackson-Vanik law. This status poses a major complication for Russian accession to the WTO. It is a well-established principle of United States policy to invoke "non-application" upon the accession of any Jackson-Vanik country to the WTO, a step that allows the country to accede but effectively means that bilateral relations with that country are conducted as if it were not a WTO member. Graduation requires an Act of Congress. The legislature has acted over the past decade to graduate several Eastern European countries and former Soviet republics, and is expected to act on the new initiative in early 2002. These events could affect sanctions on other countries. For example, in early 2002 President Bush waived sanctions that had been imposed on Azerbaijan after its conflict with Armenia. This move had long been sought by United States oil companies.

2. The bilateral and plurilateral options: regionalism and discrimination

The realist perspective on international relations is based on the proposition that countries do not have permanent friends or enemies, only permanent interests. This point can be easily confused in the geopolitics of oil, however, because countries have permanent geographical locations and more or less permanent resource endowments. Physical proximity means shorter lines of

[11] Armenia, Azerbaijan, Kazakhstan, Republic of Moldova, Tajikistan and Ukraine.

communication that are more easily defended against disruption from outside forces. As an oil importer, the United States has permanent interests in the supplies of certain countries — especially those in its own neighbourhood — and thus it is in the interest of the United States to promote permanent friendships with them. In the impersonal world of commerce, those friendships generally take the form of positive discrimination. This can be achieved on either a reciprocal basis, as in free trade agreements (FTAs) or customs unions, or in the non-reciprocal form of preferential trade programmes.

The extension of discriminatory treatment to oil-rich allies has been one of the main features of United States trade policy over the past generation. It is the mirror image of the sanctions policy discussed in the previous section. The events of 2001 could serve to accelerate this process, as the renewed concerns over security of supply may only reinforce the United States interest in regional initiatives.

2.1 The strategic significance of discrimination

Energy imports are perceived to pose a threat to national security whenever they reach a level that makes the United States vulnerable to disruptions in supply and/or a large share of these imports originates in countries that are actively or potentially hostile to United States interests. Two general principles govern the preferred composition of energy imports: propinquity and diversification. The first principle holds that the best sources of imported oil would be countries that are both geographically and politically close to the United States. The second principle is that it would be preferable to have a diversified portfolio of suppliers, notwithstanding the first rule, in order to ensure that the country is not excessively dependent on just one or two sources. Oil supplies from any single country or region might be vulnerable to disruption, whether through accident, natural disaster or national policy. On the basis of these two considerations, the United States has sought to avoid excessive reliance on suppliers that are outside the Americas. This is especially true for countries that are

considered hostile to United States interests or whose oil must pass through "choke points" that are distant and difficult to defend. The United States Navy finds it much less challenging to defend the Gulf of Mexico than to keep the Persian Gulf open to merchant shipping.

The trends over time have been towards greater security of supply, as is suggested by the data in figure 1. These shifting patterns of supply are not the result of pure market forces or mere happenstance, but are instead guided by the incentives and barriers employed both by the United States and by its suppliers. The nature and the extent of United States intervention in the market have gone through four periods, which may be summarized as follows:

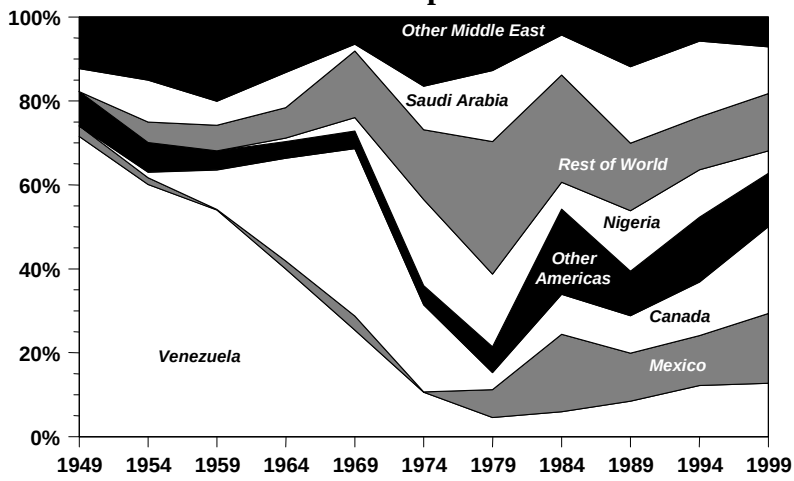
1. Prior to the 1950s, the United States imported relatively little oil. It was a net exporter in most years, and made no effort to influence the origin of imports.

2. The Suez crisis of 1956 changed the United States perception of energy security, and led policy makers to encourage imports from the Americas rather than the Middle East. President Eisenhower imposed the Mandatory Oil Import Program in 1959, which controlled United States oil imports until President Nixon terminated it in 1973.

3. In the period between the two oil shocks of 1973 and 1979, the United States neither encouraged nor discouraged imports from any specific suppliers. Presidents Ford and Carter each considered renewed import restrictions, but their policies were either short-term or overturned by Congress.

4. The 1979 oil shock that followed the Iranian Revolution led the United States to take a new tack in encouraging imports from neighboring countries. Rather than employing the negative tool of quotas, this new policy encourages the negotiation of FTAs.

Figure 1.
Regional and country shares of United States oil imports



Source: Calculated from U.S. Department of Commerce data.

Compared with the situation in past periods, the current distribution of imports shows a nearly ideal balance between propinquity and diversification. The heavy reliance on imports from Venezuela during the 1950s and 1960s violated the principle of diversification, but came at a time when imports supplied only a small share of United States oil consumption, while in the 1970s the Americas accounted for a very small share of imports. Security reached it nadir with the oil crisis of 1979, when the United States imported more oil from the Middle East than it did from the Americas. Since the mid-1980s, an increasing share of United States imports has come from the Americas, and imports both inside and outside the region have been well diversified.

Table 2 offers a more detailed picture of current United States imports of oil and other sources of energy. It shows that in 2001 the Middle East accounted for less than one fifth of total United States energy imports, and an even smaller share of oil and gas imports. The

Americas accounted for over half of all energy imports. The United States relationship with Canada, which is by far the most important supplier, demonstrates the end result of long-term United States policy initiatives. This northern neighbour not only provided the largest share of energy imports, accounting for over one third of the total in 2001, but also shipped a diverse range of fuels. For the six categories shown in table 2, Canada is variously the largest supplier to the United States (oil and gas, refined products, and electricity), the second-largest (liquid gas and uranium), or the third-largest (coal). This unique position is due in the first instance to Canada's rich endowments of hydrocarbons and other fuels, but is also attributable to the special economic relationship that the two countries have developed over the past generation. The negotiation of the North American Free Trade Agreement (NAFTA) further advanced the integration of North American energy markets, with Mexico being the fourth-largest supplier of energy to the United States. Energy trade in North America moves in both directions. While the United States imported $44.8 billion worth of energy from Canada and Mexico in 2001, this sum was partially counterbalanced by United States exports of fuels to Canada and Mexico ($5.6 billion) and goods used in the production and distribution of energy ($9.2 billion). The United States also exported $1.3 billion worth of electricity to Canada in 2001.

Table 2.
United States imports of energy, 2001
General imports, customs value, millions of dollars

	Oil & gas	Liquid gas	Refined petro-leum	Elec-tricity	Ura-nium	Coal	Total	Share (%)
The Americas	**42 774**	**8 933**	**12 722**	**2 680**	**331**	**572**	**68 012**	**54.5**
NAFTA partners	31 018	5 480	5 132	2 680	331	115	44 756	35.9
Canada	22 812	4 133	4 484	2 680	331	115	34 555	27.7
México	8 206	1 347	648	0	0	0	10 201	8.2
Rest of region	**11 756**	**3 453**	**7 590**	**0**	**0**	**457**	**23 256**	**18.6**
Venezuela	8 622	1 555	3 151	0	0	125	13 453	10.8
Colombia	1 347	1 070	502	0	0	330	3 249	2.6
Trinidad &Tobago	240	739	435	0	0	0	1 414	1.1

Brazil	97	17	1 049	0	0	0	1 163	0.9
Argentina	436	63	602	0	0	0	1 101	0.9
Aruba	0	0	1,028	0	0	2	1 030	0.8
Ecuador	855	6	110	0	0	0	971	0.8
All other	159	3	713	0	0	0	875	0.7
Rest of world	**22 693**	**20 324**	**11 902**	**0**	**1 673**	**97**	**56 689**	**45.5**
Middle East	**11 151**	**10 976**	**1 566**	**0**	**0**	**0**	**23 693**	**19.0**
Saudi Arabia	6 687	5 574	334	0	0	0	12 595	10.1
Iraq	2 588	3 207	5	0	0	0	5 800	4.7
Algeria	496	1 136	1 020	0	0	0	2 652	2.1
Kuwait	1 122	586	164	0	0	0	1 872	1.5
All other	258	473	43	0	0	0	774	0.6
All other	**11 542**	**9 348**	**10 336**	**0**	**1,673**	**97**	**32 996**	**26.5**
Nigeria	4 728	3 677	351	0	0	0	8 756	7.0
United Kingdom	1 351	1 005	1 015	0	206	3	3 580	2.9
Norway	1 649	1 378	415	0	0	1	3 443	2.8
Angola	1 742	1 248	103	0	0	0	3 093	2.5
Russian Federation	0	0	874	0	922	7	1 803	1.4
Gabon	882	740	0	0	0	0	1 622	1.3
Indonesia	246	130	160	0	0	38	574	0.5
Australia	192	217	57	0	26	11	503	0.4
Malaysia	55	68	267	0	0	0	390	0.3
China	78	43	127	0	12	1	261	0.2
All other	619	842	6,967	0	507	36	8,971	7.2
Total	**65 467**	**29 257**	**24 624**	**2 680**	**2 004**	**669**	**124 701**	**100.0**
Share (%)	**52.5**	**23.5**	**19.7**	**2.1**	**1.6**	**0.5**	**100.0**	

Source: Calculated from United States International Trade Commission data. Figures are based on SIC categories 1221, 1311, 1321 and 2911, and the HTS items for uranium and related goods (item 2844) and electrical energy (item 2716).

2.2 Free trade agreements

FTAs should thus be seen in their proper context. They are the product of decades of internal deliberation and international negotiation, beginning with United States feelers to Canada and Mexico in the late 1970s. The discovery of major new oilfields in Mexico coincided with the second oil crisis, and led three successive United States presidents to push for integration. Mexico rejected the proposals first made by President Carter, but after President Reagan succeeded in negotiating the FTA with Canada it took the initiative in proposing FTA negotiations with the first President Bush. President

Clinton and the next President Bush maintained this continuity, having proposed and pursued the negotiations for an FTAA. If these regional negotiations are successfully concluded in 2005, they will represent the culmination of a process by which the United States has reached preferential trade agreements with neighbours that successively represent over one quarter of United States energy imports, then over one third, and finally over one half.[12]

One of the principal benefits of the existing FTAs, from the United States perspective, is the legal character that they give to United States claims on these vital North American energy reserves. NAFTA is a "WTO-Plus" arrangement that entails greater commitments both from energy exporters and from energy importers. It is not yet clear whether the FTAA will go as far as NAFTA in ensuring that neither exporters nor importers will employ trade restrictions as a tool of foreign policy. With one third of United States energy imports already being covered under NAFTA, the FTAA would bring another one fifth under special and enforceable terms.

Both politically and economically, the most significant question in FTAA energy trade is how it will affect the United States-Venezuela relationship. Venezuela no longer holds the dominant position in United States oil imports that can be seen so dramatically in figure 1, but it remains a larger supplier of United States energy imports than either Mexico or Saudi Arabia. Nor are Venezuelan exports limited to fuels; the country is also an important investor in the United States oil-refining sector. Washington and Caracas unfortunately have a troubled history. The Organization of the Petroleum Exporting Countries was a Venezuelan initiative, and Caracas has shown increasing discomfort with the proposed FTAA. The war on terrorism created a new source of friction, with United States officials responding angrily to comments that Venezuelan President Hugo Chavez has made regarding the United States prosecution of the conflict. Disputes over

[12] These proportions are denominated in shares of United States energy imports in 2001, as in table 2, rather than the import shares that prevailed at the time that the respective agreements were concluded.

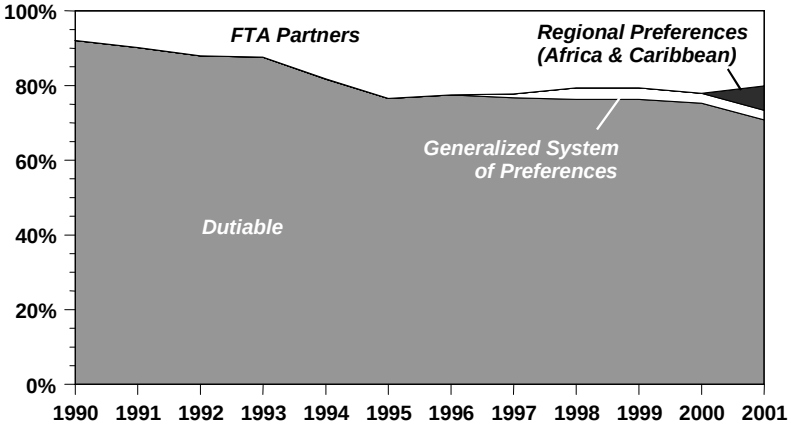
energy trade policy, as well as more political matters, may be a growing source of friction between the United States and Venezuela in the coming years.

2.3 Non-reciprocal preferences

In addition to the reciprocal option of FTAs, the United States can also use non-reciprocal preferences as a means of encouraging imports from some suppliers. This is a relatively recent development for energy imports, as the United States has long excluded oil from the Generalized System of Preferences (GSP) and other preferential trade programmes. This changed when Congress enacted the Trade and Development Act of 2000. While oil remains outside the scope of the GSP's duty-free privileges, preferential access is granted to oil imported from the beneficiary countries of the Caribbean Basin Initiative and the African Growth and Opportunity Act (AGOA). The results can be seen in figure 2. Prior to the late 1990s, Canada and Mexico were the only sources of duty-free imports of oil and other fuels into the United States. Some energy products were added to the GSP in 1997, followed by enactment of the new regional preferences. One fourth of all United States fuel imports are now conducted on a preferential basis, and that number may rise in the future. Oil is especially important to some sub-Saharan African countries. The United States imported $7.6 billion worth of goods under AGOA in 2001, of which liquid natural gas accounted for $3.7 billion, crude oil for $2.8 billion and refined products for $271.5 million. All other products accounted for less than 10 per cent of the total.[13] So far, Nigeria has provided most of the imports under AGOA.

[13] These numbers are calculated from United States International Trade Commission data.

Figure 2.
Tariff treatment of United States imports of fuels
Percentage Distribution Among Import Programs for Entries of Crude Oil, Refined Petroleum, Natural Gas, and Coal

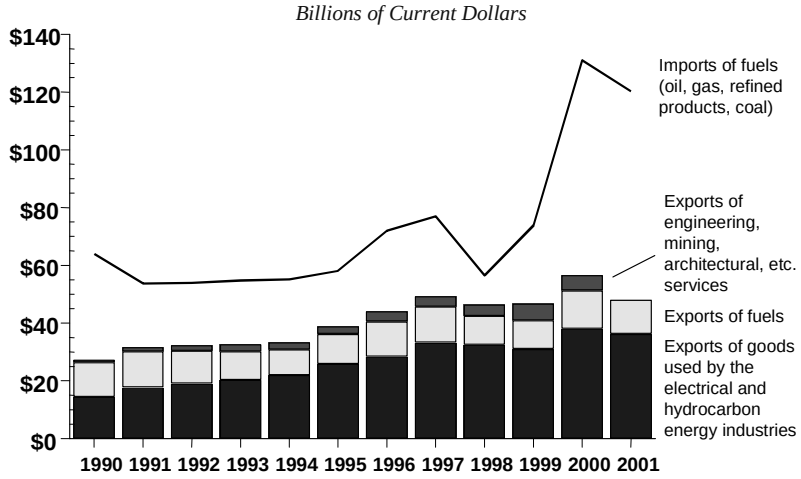


Source: Calculated from U.S. International Trade Commission data.

3. The multilateral option: energy in the new round of WTO negotiations

The analysis above indicates that the new round of WTO negotiations is not the sole forum in which the United States will pursue its objectives in energy trade. Indeed, it is not even likely to be the principal one. While the multilateral negotiations may produce new commitments to liberalize trade in energy-related goods and services, they are best seen as one side of a multifaceted United States effort to enhance its energy security and economic opportunities. The WTO is the lead forum only for those aspects of United States energy trade policy that are intended to be non-discriminatory, especially efforts to open foreign markets to United States exports of goods and services. The more significant aspects of United States energy trade policy are based on discriminatory tools, either positive (preferences) or negative (sanctions), and these are pursued outside the multilateral institution.

Figure 3.
United States trade in energy-related goods and services



Source: Calculated from U.S. International Trade Commission and Department of Commerce data;
data on services exports are not yet available for 2001.

The United States is known primarily as an energy importer. Its per capita consumption of oil is about five times greater than that of the world as a whole, and it consumes about one fourth of the world's oil. It is nevertheless important to remember that the United States has important export interests in this sector, especially for goods and services that are related to the production and distribution of energy. This point is graphically represented in figure 3, which illustrates the recent evolution of United States imports and exports in the energy sector. The data show that while imports of oil and other fuels are large and growing, they are substantially offset by United States exports of raw and refined fuels as well as goods and services used in other countries' energy and mining sectors. One of the main United States objectives in both regional and multilateral trade negotiations is to increase those exports by obtaining reductions in foreign barriers to energy-related goods and services. This point was made clear in the report issued in 2001 by Vice-President Cheney's energy task force. The report recommended that:

> "The President direct the Secretaries of State, Commerce and Energy to continue supporting American energy firms competing in markets abroad and use our membership in multilateral organizations, such as the Asia-Pacific Economic Cooperation (APEC) forum, the Organization for Economic Cooperation and Development (OECD), the World Trade Organization (WTO) Energy Services Negotiations, the Free Trade Area of the Americas (FTAA), and our bilateral relationships to implement a system of clear, open, and transparent rules and procedures governing foreign investment; to level the playing field for U.S. companies overseas; and to reduce barriers to trade and investment".[14]

The energy sector holds a position in the GATT/WTO system that is somewhat akin to that of agriculture before the Uruguay Round: it is not entirely exempt from multilateral disciplines, but neither is it fully within those rules. The past practice is exemplified by the unwritten, unacknowledged but nonetheless real "gentleman's agreement" that has largely kept oil outside the rules. This exception is not unique to the United States. Both energy-importing and energy-exporting countries have employed trade restrictions in pursuit of their diplomatic or security objectives, and neither side has opted to use this institution's rules to challenge their trading partners' major measures. The new round may reach limited reductions in energy-related trade barriers, but more ambitious goals are not likely to be pursued in the absence of a deeper understanding between the major players and the growing caucus of oil exporters. There is good reason to doubt that the interested parties will be prepared to strike such bargains in a multilateral and non-discriminatory forum. If they are not, it can be anticipated that regional or plurilateral forums such as the FTAA and OPEC will continue to be more significant than the WTO.

[14] National Energy Policy Development Group, *Energy Policy* (Washington, D.C.: U.S. Government Printing Office, 2001), pp. 8-18.

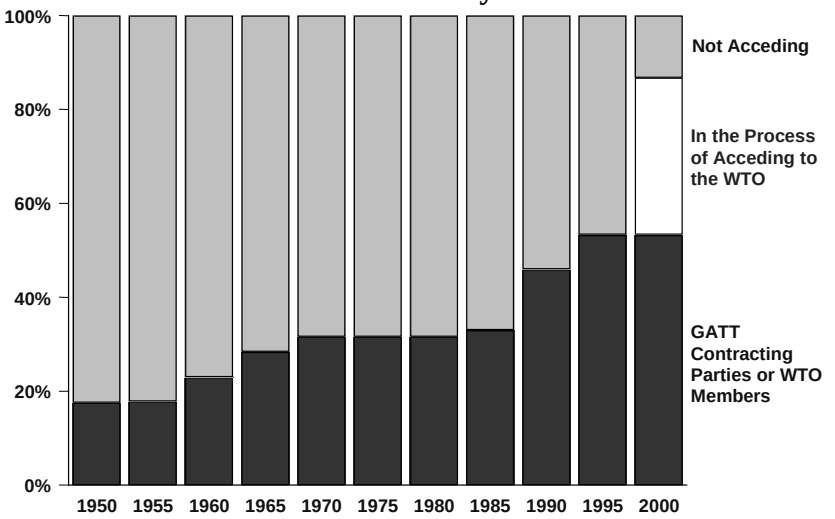
The events of 2001 may reinforce the tendency to rely upon alternatives to the WTO. The war on terrorism heightens concerns over security and the perceived need to cooperate more closely with regional suppliers. It is also possible that the collapse of Enron will reduce the pressure for new commitments on energy services.

3.1. Accession of major oil-producing States

The status and influence of oil-exporting countries in the trading system may change as more of them accede to the WTO. While the current membership of the WTO covers the vast majority of non-oil trade, the picture is quite different for oil. A watershed may soon be reached in which countries representing more than half of world oil exports are WTO members, and it can be anticipated that the organization's "oil bloc" will grow increasingly large and assertive in the years to come. As can be appreciated from the data reported in figure 4, GATT began with few oil producers, and many of the world's leading energy exporters remained outside the GATT prior to the 1980s. This changed with the accession of oil-rich Latin American and Persian Gulf States, most notably Mexico, the United Arab Emirates and Venezuela.

The WTO "barrel" can now be described as being either half-full or half-empty. As shown in table 3, some major oil-exporters — most notably Saudi Arabia — remain outside. They are nevertheless negotiating actively for their accession. The 11 countries in the table account for over half of global oil reserves and over one third of production. Ten of these countries are either acceding or have shown interest in doing so. Iraq is the only large producer that is not already a member, seeking accession or known to be considering this step. Within a few years the countries represented in the WTO may account for the great majority of global oil production and exports. It seems reasonable to expect that the "gentleman's agreement" that prevailed in the past will be questioned when there is a growing bloc of oil-rich gentlemen in the club.

Figure 4.
Share of oil production represented in the GATT/WTO system



Source: Calculated from BP Amoco data. Based on oil production in 2000, not in the years shown.

The road by which these countries enter the WTO is a two-way street. Just as the oil exporters may hope to use WTO rules to their benefit, the United States employs the opportunities for negotiation — both in general rounds and the WTO accession process — to obtain commitments that serve its economic interests. This was true for the negotiations over Mexican and Venezuelan GATT accession in the 1980s, and is equally true for the current negotiations over the WTO accessions of oil-exporting countries in the Middle East and the former Soviet Union. It is possible that the accessions of some of these countries will be affected by the changed political environment of the war on terrorism.

Accessions are also linked to sanctions policy, at least in the practice of the United States. The United States negotiators have repeatedly acted to block the formation of a WTO-accession working party for the Islamic Republic of Iran, and they could do the same

thing for the Libyan Arab Jamahiriya and the Syrian Arab Republic. The WTO's rule of consensus amounts to a unit-veto for any individual country, and the United States could hypothetically block the accession of these countries indefinitely. This aspect of United States policy may come under increasing criticism, however, with representatives of the European Union having already expressed some frustration over the United States policy on Iranian accession.

Table 3. Status of selected oil-exporting countries still outside the WTO
Oil data are in percentages of the global totals for 2000

	Share of global oil		Began accession	Status of accession and United States policy
	Reserves	Production		
Algeria	0.9	1.9	1987	Initial goods and services market access offers under review.
Azerbaijan	0.7	0.4	1997	Market access offers not yet made. The United States position is complicated by the country's continuing dispute with Armenia (which is also acceding), but an earlier ban on United States technical assistance to Azerbaijan has been relaxed and the United States allocated $1 million for accession-related projects. Like the Russian Federation, Azerbaijan is subject to the Jackson-Vanik law, but the Bush administration proposed its graduation in 2001.
Islamic Republic of Iran	8.6	5.2	-	Has sought to accede since 1996, but the United States and Israel have blocked the formation of a working party.
Iraq	10.8	3.6	-	Has shown no interest in acceding, and would presumably be blocked by United Nations sanctions if it were to request accession.
Kazakhstan	0.8	1.0	1996	Revised market-access offers expected in 2002. Like the Russian Federation, Kazakhstan is subject to the Jackson-Vanik law, but the Bush administration proposed its graduation in 2001.
Libyan Arab Jamahiriya	2.8	2.0	-	Applied for accession in 2001. The United States might act to block the formation of a working party.
Russian Federation	4.6	9.0	1993	The initial draft of the working party report is to be circulated in early 2002. The Bush administration proposed in 2001 that Congress approve permanent normal trade relations (PNTR, formerly MFN) by graduating the country from the Jackson-Vanik law. This would obviate the United States invocation of the non-application clause (WTO Article XIII) upon its accession. Congress is expected to vote on the matter in 2002.

	Share of global oil		Began accession	Status of accession and United States policy
	Reserves	Production		
Saudi Arabia	25.0	12.3	1993	The initial draft of the working party report is under review. The United States position is complicated by a 1994 congressional directive to oppose the accession of countries that participate in the Arab League boycott of Israel.
Syrian Arab Republic	0.2	0.8	-	Applied for accession in 2001. The United States might act to block the formation of a working party.
Uzbekistan	0.1	0.2	1994	Uzbekistan is subject to the Jackson-Vanik law, and is not one of the countries for which the Bush administration proposed graduation in 2001. No market access offers made yet.
Viet Nam	0.1	0.4	1995	Market access negotiations began recently. The establishment of NTR (MFN) relations with the United States in 2001 on a conditional basis will facilitate the process. The United States will nevertheless invoke non-application unless Congress grants that status on a permanent basis by graduating Viet Nam from the Jackson-Vanik law. Viet Nam is not among the countries for which the Bush administration has proposed graduation.

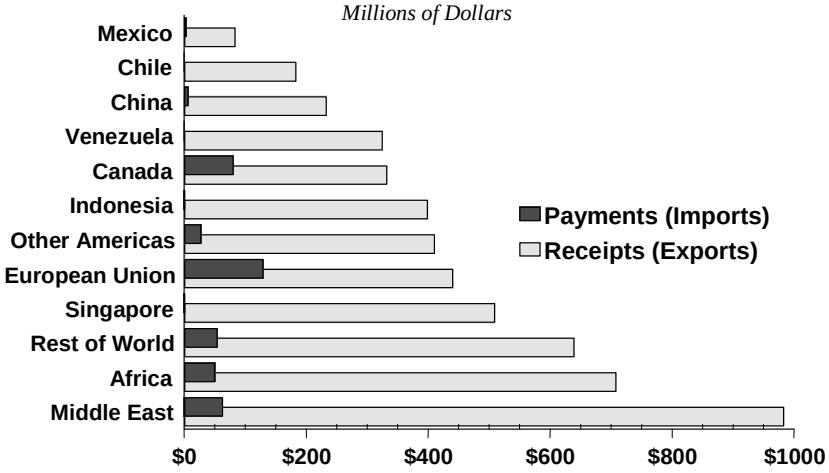
Source: Oil data from BP Amoco.

3.2 Market access for goods and services

The most traditional aspect of trade policy is the imposition or liberalization of tariff and non-tariff barriers to the movement of goods. Market access negotiations are a part of the new round, and are the least controversial issue on the table. The United States negotiators hope to establish a system in which all WTO member countries are open to the goods and services exported by United States firms in the energy sector, either for permanent importation or on a temporary basis as "tools of the trade", but the United States remains free to use WTO-legal means of restricting energy imports for reasons of national security. The United States has kept its options open by not binding its oil tariffs. Under these rules, there is nothing that would prevent the United States from imposing quotas, tariffs, or other restrictions in the event of a new oil emergency. Most other energy-related products that the United States imports are subject to duties that are bound at low or zero rates. This implies that the United States negotiators will need to make concessions in other sectors when bargaining for the reduction or elimination of other countries' barriers to energy-related goods.

Services tend to be more controversial than goods, and are also more complicated matters to negotiate. Energy services are no exception to this general rule, involving as they do some of the issues that made it so difficult to reach an earlier agreement on telecommunications services. As in the telecom case, this field involves important technological developments that undercut the older doctrine of "natural monopolies", and the negotiations come at a time when more countries are either liberalizing their national monopolies or privatizing altogether. The United States negotiators hope to encourage this process, and to "lock in" countries' unilateral actions in the form of enforceable commitments in the General Agreement on Trade in Services (GATS). The proposals that the United States has made on energy services are indeed quite similar in their aim and language to the proposals that United States negotiators made in years past for telecommunications services.

Figure 5.
United States trade in construction, engineering, architectural, and mining services, 2000



Source: Calculated from U.S. Department of Commerce data.

Energy-related services are of special interest for the United States. Complete and reliable data are unfortunately not available on United States trade in this precise sector, but figure 5 illustrates recent trade in the general category that incorporates energy. The data are somewhat misleading, owing to the overcounting of some activities and the undercounting of others. The category includes some activities that are related to energy (especially mining and engineering) and others that are not (especially architecture). They are undercounted in the sense that these figures appear to capture services that are exported from the United States (known in GATS parlance as Mode 1), but do not capture some important forms of energy services that are supplied through other means of delivery. These include the education services that are provided by United States schools to foreign students in energy-related fields (which falls under Mode 2 of GATS), foreign operations that are wholly are partly owned by United States parent companies (Mode 3) and the employment of individual Americans as engineers or other professionals by foreign energy firms (Mode 4). Even with these shortcomings, the numbers do offer some interesting

insights. Much of the revenue that the United States receives for these services originates in oil-exporting countries, especially in the Middle East. What is most notable about these services is that the level of payments (equivalent to imports) is far lower than the level of receipts (equivalent to exports). This is clearly an area where the United States firms are highly competitive, and for which the United States negotiators have a strong incentive to seek commitments from other WTO member countries.

American policy makers hope that new GATS negotiations will improve the opportunities for United States exporters of energy-related services. Known as the GATS 2000 negotiations, these talks are now incorporated into the larger round. The United States has submitted two papers[15] and a proposal[16] related to energy services, as well as further comments on the matter at an October 2001 meeting of the GATS Council.[17] The submission in 2000 suggested that the negotiations should aim to enhance opportunities for energy-service providers to sell and distribute their services on a non-discriminatory basis through all four modes of supply, the elimination of tariffs on energy-related goods, a right of temporary entry for essential personnel in energy services companies, and the free movement of electronic information and electronic commerce (e.g. for trading and brokering, data analysis, etc.). The proposal specified a few areas where the United States would seek no changes in existing international or domestic law. The United States explicitly declared that it was not proposing to address issues of State ownership of natural resources, and the paper provided for the imposition of restrictions that are intended to protect the environment and conserve

[15] See World Trade Organization, *Communication from the United States: Energy Services* S/C/W/58 (20 October 1998), and *Communication from the United States: Classification of Energy Services* S/CSC/W/27 (18 May 2000).
[16] See World Trade Organization, *Communication from the United States: Energy Services* S/CSS/W/24 (18 December 2000).
[17] See the as yet unissued document entitled "Communication from the United States: Energy Services: Negotiating Objectives" (4 December 2001).

natural resources. It made no mention of restrictions imposed for reasons of national security.

Trade liberalization is the international complement to deregulation, and the United States negotiators clearly hope that international energy markets will repeat the deregulatory experience of the telecommunications sector. This point is made clear in one United States submission, which states that:

> "Market access and national treatment commitments may well be meaningless without regulatory reform. At the same time, it does little good for trade liberalization as a practical matter to create a pro-competitive regulatory environment unless market access and national treatment restrictions are eliminated."[18]

It is nevertheless worth asking whether the events of 2001 may reduce the willingness of both the United States and its partners to move in this direction. At the start of the year it appeared that the emerging energy crisis in California offered an object lesson in how deregulation does not always produce the desired effects of increased supply and decreased prices. The recession soon solved that problem, but in the aftermath of Enron's collapse there may be a new challenge to the deregulatory push. Many suspect that the supposed crisis can be attributed more to the market manipulations of Enron and other firms than to the mistakes of regulatory agencies and utilities. These concerns could affect various aspects of United States energy policy. Charges of "crony capitalism", corruption and exploitation lead some State and Federal policy makers in the United States to question whether energy is just too important a field to be left to the markets — especially when a few large firms can use their political influence and asymmetrical information to undermine the operation of those markets. It is possible that these concerns will lead some State and local governments to tighten their regulatory systems, while at the

[18] World Trade Organization, *Communication from the United States: Energy Services* S/CSS/W/24 (18 December 2000), p. 2.

Federal level Congress now takes a more sceptical view of the proposals for a more market-oriented energy policy. It is entirely possible that the Bush administration's proposals for a new energy law will come to naught. The parties seem unlikely to negotiate a compromise over the Republican preference for production incentives and the Democratic preference for regulation, conservation and environmental protection. They will probably devote more attention to the investigation of the Enron scandal. While the House of Representatives did approve the proposed Securing America's Future Energy (SAFE) Act in 2001, the initiative has stalled in the Senate. At the time of writing, many close observers expect that the Republican-controlled House of Representatives, the Democratic-controlled Senate and the Bush administration will be unable to reach agreement on the terms of a new energy bill. Even if they do, it is not likely to include any important trade provisions. The thrust of the bill is to deal with energy imports through the indirect means of encouraging more domestic production, rather than via instruments of trade policy *per se*.

From the narrow perspective of the GATS negotiations, the question is whether other countries will share the new-found United States reluctance to deregulate. This depends in part on whether it tarnishes deregulation in general, and in part on whether it undermines the Bush administration in particular. The Enron scandal inspired a leading American columnist to call George W. Bush "a crony capitalist", and to declare that the administration's priorities have "less to do with market principle than with rewarding backers".[19] Those are strong words that carry a special resonance with some of the very countries with which the United States hopes to negotiate new trade agreements. If policy makers and opinion leaders in foreign countries come to share the writer's view, this can only undercut the gravitas and effectiveness of United States negotiators — especially when they seek commitments in the field of energy-related goods and services.

[19] Sebastian Mallaby, "When the Business of Business is Politics …," *Washington Post* (28 January 2002, p. A21).

One should nevertheless resist the temptation to make bold predictions on the basis of very preliminary developments. Here the experience with financial services offers a cautionary tale that argues against making premature forecasts. In the late 1980s and early 1990s the United States experienced a major scandal that stemmed from the botched deregulation of the savings and loan (S&L) industry. Congress and the Reagan administration had decided in their collective wisdom to remove many of the regulatory restrictions on this segment of the financial sector while leaving in place a very generous Federal insurance programme for S&L assets. With hindsight, the results of the moral hazard were all too predictable: with the "reforms" permitting them to invest in practically anything and the insurance freeing them from the consequences of bad decisions, S&L owners engaged in extremely reckless and even illegal lending. This led to the collapse of the industry and an extremely expensive government bailout for depositors. One might well have predicted on the basis of that experience that neither the United States negotiators nor their foreign counterparts would be eager to promote further deregulation and trade liberalization for the financial services industry. Such a prediction would have missed the mark altogether. Financial services are among the few sectors in which the GATS negotiations have so far produced major commitments.

3.3 Environmental objectives and United States negotiating authority

Yet another factor that must be considered is the lack of plenary authority on the part of United States negotiators. Here the third aspect of American energy policy — the environment — plays an important role. As discussed at the beginning of this chapter, the significance that Washington assigns to environmental considerations is a function of party control: Democrats attach greater significance to this issue than do Republicans. Partisan conflict over environmental issues stalled two of the Bush administration's goals. One is the energy plan that the Cheney task force produced in 2001, much of which aims to enhance energy security through domestic production incentives.

Democrats argue that this approach will have deleterious environmental consequences. The other is the administration's request for a grant of what it now calls trade promotion authority (TPA), formerly known as fast-track authority. TPA establishes special procedures for congressional consideration of trade agreements. This authority facilitates negotiations by assuring United States partners that Congress will vote on the implementing legislation for trade agreements within a limited period of time and without amendment. Fast-track authority was used in the past to approve the results of the Tokyo and Uruguay rounds of GATT negotiations, as well as the FTAs with Israel (1985), Canada (1988) and Mexico (1993). The last such grant expired in 1994, and both Presidents Clinton and Bush have asked Congress to renew the power.

Environmental and labour issues are the principal reason for the unwillingness of Congress to renew TPA. Beginning with NAFTA in the early 1990s, these two politically contentious matters have been at the centre of United States trade politics. While Democrats insist that fair trade requires consideration of environmental and labour standards, Republicans hold that these are non-trade issues that should be addressed through other means. The inability to resolve partisan differences blocked the Clinton administration's repeated efforts to secure a new grant of authority in 1994-2000.

President Bush ultimately succeeded where his predecessor failed, winning approval of a new grant of authority in the Trade Act of 2002. That law includes a renewed grant of negotiating authority while also strengthening the procedures for consultations between the two branches of government. While this victory should allow the pending trade negotiations to move forward, the episode also contains a warning. The House of Representatives approved its version of the TPA-renewal bill in late 2001 by a one-vote margin. Moreover, the vote was highly lopsided: Republicans provided nearly all of the support. That very close call highlighted the increasingly difficult and partisan nature of trade politics in the United States. It does not augur well for the future, especially if Congress is equally partisan in its

treatment of the trade agreements that the president submits for the legislature's approval under the new TPA grant.

Conclusions: beyond 2001

In 2001 Washington had to tackle the great issues of war and peace, recession and recovery, and scandal. We are still dealing with the aftermath of that year's key events, and are likely to do so for some time to come. The principal question for trade negotiators now is whether U.S. policymakers can maintain the tenuous internal consensus that is necessary to bring the regional and multilateral talks to successful conclusions.

The year 2002 is not yet over, as of this writing, but in one important respect that year did clarify the uncertainties that were left pending from the preceding year. Approval of the Trade Act of 2002, including a new grant of negotiating authority for the U.S. president, removes an obstacle that has impeded progress in trade negotiations since 1994. The trading partners with which the United States negotiates, whether at the multilateral or regional level, can now be assured that the agreements they conclude will be accorded the same expedited consideration that was given to all major agreements reached between the Tokyo and Uruguay rounds of GATT negotiations. That is not to say that Congress will inevitably approve anything that the executive signs, but it does offer an important guarantee of procedural fairness to the deliberations.

As important as enactment of the Trade Act of 2002 may be, its ultimate significance will be determined by the continuing effects of the three big events of 2001. As of this writing, none of the processes that were set in motion by those events have come to a conclusion. The terrorist attacks of September 11 sparked a military response that may affect oil markets for years to come, the collapse of Enron and other corporate scandals continue to rock the markets, and the economic recession has yet to disappear. Each of these events will shape the environment of energy trade policy for years to come. They

will affect the relative emphasis that the United States places on regional versus multilateral initiatives, the requests that U.S. negotiators make of their trading partners in the energy-rich countries, and the offers that they receive in response. They will also affect the internal political equation in the United States, including control of the U.S. Congress and the relationship between the executive and legislative branches. That relationship will help determine the real value of the new negotiating authority in the Trade Act of 2002. Concerns over war, corporate scandals, and recession could complicate the prospects for winning congressional approval of future trade agreements.

OIL TRADE AND ECONOMIC GROWTH: THE CASE OF THE WESTERN HEMISPHERE

Ramón Espinasa*

Abstract

This paper develops a scenario in which Latin America and Caribbean (LAC) countries increase oil production twofold over the next 15 years, from 10 million barrels a day (MBD) to 20 MBD. Out of the increased production, one third goes to supply domestic demand and two thirds to supply the widening United States oil gap. The 10 MBD capacity increase generates $200 billion in capital expenditure and $20 billion in operational expenditure plus $60 billion in additional government expenditure. The overall growth effect of such expenditures amounts to 20 per cent of GDP in LAC oil countries over the next 15 years. Oil services associated with such expenditures amount to $54.4 billion, with an economic growth effect of 6 per cent on the LAC oil countries.

1. Oil trade

The amount of oil traded worldwide will keep on increasing over time as consumption grows and reserves are exhausted in the main consuming countries. This is clearly the case of the Western Hemisphere, which I will use to illustrate the case for the world.

The American continent is the largest single continent in terms of oil consumption (40 per cent of the world total) and is the second largest single producer (30 per cent of total).

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The United States and Canada combined are the leading world oil producer and consumer. However, their combined production has been sharply declining and will continue to do so for the foreseeable future.

The United States alone is today the third largest oil producer and it was the first until the early 1970s. On the other hand, the United States is nowadays the leading world oil importer. It imports around 11 MBD of crude oil and petroleum products, roughly 60 per cent of its consumption. United States imports have more than doubled over the last 15 years and will double again over the next 20 years.

United States oil consumption has increased by 23 per cent over the last 15 years at an average rate of 1.5 per cent per year; on the other hand, yearly production has declined by 27 per cent at an average annual rate of 2.2 per cent. As a consequence of growing consumption and declining production, annual imports have increased by 110 per cent over the last 15 years at an average annual rate of 5.4 per cent. Imports have increased at 3.7 times the rate of consumption, reflecting the negative rate of growth of domestic oil production.

The rest of the continent –LAC countries – is the leading single supplier of oil to the United States and Canada, supplying roughly one third of their net imports. This share has remained roughly constant over the last 15 years; LAC countries' exports to the United States have doubled *pari passu* with United States imports, from 1.8 MBD up to 3.7 MBD. On the other hand, the United States and Canada export practically all oil-producing goods and services imported by LAC as a region and are the source of the bulk of foreign capital invested in the LAC countries' oil sector.

Moreover, the LAC countries' endowment of hydrocarbon reserves is more than enough to supply present and future continental demand. The comparative advantages derived from their endowment of reserves and geographical location have caused investment in the LAC countries' oil sector to increase several fold over the last decade.

Thus continental oil trade has deepened as the supply gap in the north has widened and oil investment and production in the south have grown. The north exports capital and oil-producing goods and services, and the south exports crude oil and products.

There are four features of the oil trade model that have developed in the Western Hemisphere that can be extrapolated to the world oil market. First, oil trade has been and will keep growing as traditional non-renewable sources of energy are depleted in the developed countries. Second, the three largest world oil provinces – the Persian Gulf, the Caspian Sea and the Caribbean Basin – plus smaller provinces, are all located in developing countries and their endowment of reserves is more than enough to satisfy developed countries' foreseeable oil requirement. Third, as a consequence of the supply deficit in developed countries, oil investment and production have steadily increased in developing countries. Fourth, developed countries export oil-producing goods and services and invest in the oil sector of the developing countries, which export crude oil and products.

Just to make a point that needs further empirical analysis, world crude oil trade has increased 62 per cent over the last 15 years at an average rate of 3.5 per cent per year, whilst consumption has increased by 26 per cent at an average annual rate of 1.7 per cent. International oil trade has grown at twice the rate of consumption, reflecting the widening gap between consumption and domestic production in the main consuming countries, particularly the United States.

2. Economic growth

Let us develop a scenario in which the United States doubles its oil imports over the next 20 years from 11 MBD to 22 MBD. Furthermore, assume that this growth in imports is linear over time: in 15 years' time United States oil imports will be in the order of 18.5 MBD.

We assume that, taking advantage of such a market opportunity, LAC oil-exporting countries will supply two third of the United States increase in imports. LAC exports to the United States will grow from 3.7 MDB to 10 MBD and will increase their share in United States oil imports from one third up to one half.

Let us on the other hand assume that LAC countries' consumption keeps growing at the same pace as over the last 15 years: LAC countries' own consumption will grow from 6.3 MBD to 10 MBD.

Thus, according to our scenario over the next 15 years, LAC countries' oil production will increase twofold from 10 MBD to 20 MBD. One third of the 10 MBD increase in production will go to supply LAC countries' increased domestic demand and two third to supply the United States increase in imports.

The oil production capacity increase of 10 MBD could represent an investment in the order of $200 billion in LAC countries over the next 15 years. In relative terms this amount is around 10 per cent of regional gross domestic product (GDP) and half the gross capital formation in LAC for one year.

In addition to capital expenditure, increased production will translate in a twofold operational expenditure increase over 15 years. If we assume operational expenditures in the order of $3 B/D, to produce 10 MBD requires annual current expenditures in the order of $10 billion, which would increase to $20 billion as production doubles over 15 years. Total expenditures would consolidate the oil sector as the single most important productive sector in the region.

Thus total expenditures by the oil sector in LAC to increase and sustain the additional capacity of 10 MBD will be $220 billion: $200 billion capital expenditures to increase capacity and $20 billion operational expenditures to produce the additional oil.

3. Economic multipliers

To study the economic impact of such an increase in oil investment and production it is first necessary to differentiate the two ways in which the oil sector relates to the exporting economy: as a source of foreign income to the Government and as an economic activity on its own.

One channel through which the oil sector impacts on the exporting economy is the expenditure by the Government of its take in oil export revenue. Government income earned from the oil sector is larger than that derived from normal taxation of other economic activities, since there are specific, usually large, levies on the oil sector in the form of specific oil-sector taxes and royalties. This specific revenue accrues to the State as owner of the reserves and can be categorized as a ground rent.

It is usually the case that such rent is demanded on oil exports and not on volumes directed to domestic consumption. Thus government oil revenue depends on export volumes and international prices. Such revenue can be assimilated in terms of its macroeconomic impact to a net transfer from abroad.

The economic impact of oil as a source of government expenditure will depend on the size of such revenue in relation to the size of the economy. As a good deal of government expenditure is on wages, the economic multipliers of such expenditure tend to be high. Among LAC countries, Venezuela and Mexico are examples of high oil fiscal revenue as a share of GDP: in Venezuela it is in the order of 10 per cent and in Mexico 4 per cent, representing roughly one half and one fifth of government expenditure respectively.

Secondly, the oil sector relates to the rest of the economy as an industry requiring labour, manufactured goods and services. The multipliers of oil industry expenditure will depend on both the degree

of integration of such industry into the domestic economy and the size of the oil industry in relation to the size of the economy.

The degree of integration measures how much productive inputs – labour, goods and services – are of national origin. An oil industry functioning as an isolated enclave with no links to the surrounding economy will have a low, if any, degree of integration. At the other extreme, an industry where all labour, goods and services are of national origin will show a high degree of integration. Brazil and Argentina are examples of LAC countries with highly integrated oil sectors.

The larger the relative size of the oil industry and the higher the degree of integration, the greater the impact of oil industry expenditure on the oil-producing country.

Thus in our model the oil sector will impact on the exporting economy through both the government expenditure of its take in oil exports and oil industry expenditures in the domestic market. Finally, it is worth differentiating operational and capital expenditures in the oil industry since the composition of demand for labour, goods and services varies, and thus so does the effect on the economy of such expenditures.

4. Measuring economic growth

In order to measure the economic impact of the growth of oil investment and production we shall use Venezuela as a representative country, and then extrapolate to the main LAC oil-exporting and producing countries. The main reason for using Venezuela as a representative country is that for this country we have the multipliers of both government and oil-sector capital and operational expenditures computed out of an input-output matrix. We will use these parameters to assess the impact of oil-related expenditure on all LAC oil countries.

There are, however, two objective reasons for taking Venezuela as a representative oil country for the LAC region. First, it is the leading exporter, and together Venezuela and Mexico are the largest producers in the region. Second, Venezuela is the fourth largest economy and its oil industry has quite a high degree of integration into the productive domestic structure.

To calculate the impact of oil-sector expansion on the economies of the region we shall proceed as follows. First, we shall assume that all investment and increase in production take place in the three countries with the largest reserves in the region – Mexico, Colombia and Venezuela (the G-3 countries), and then proceed to measure the growth impact which increased oil-sector and government expenditures have on economic activity. Second, we will add to the above-mentioned countries the remaining oil countries in the region with significant present and future hydrocarbon production potential – Brazil, Argentina, Trinidad and Tobago, Bolivia, Ecuador and Peru, and then perform the same exercise.

4.1 Main LAC oil exporters

In round numbers the combined GDP of Mexico, Colombia and Venezuela is $600 billion. We will calculate the multipliers of oil-sector and oil-derived government expenditures and measure the growth impact on an economy the size of the G-3 countries. The key underlying assumption here is that the multipliers for Venezuela are the same as those for the Mexican and Colombian economies.

Capital expenditures: The multiplier of oil capital expenditure is in the order of 1.36. That is, each dollar of investment has an associated value added of 1.36 dollars in the economy as a whole. A dollar invested in oil represents 1.36 dollars in GDP, through the direct domestic demand for labour, goods and services, and their indirect multipliers.

Thus the value creation of a $200 billion investment in oil will be in the order of $272 billion over 15 years. On a yearly basis these figures are $13 and $18 billion respectively. The growth impact of such an investment for an economy the present size of the G3 countries will be 3 per cent the first year and 45 per cent over a 15 year period.

Operational expenditures: To sustain increased capacity of 10 MBD over 15 years, or 670,000 barrels a day per year, $11 and $0.7 billion will be required respectively. The multiplier of oil operational expenditures is 1.5. Thus the value-added effect of such expenditures is $1.1 and $16.5 billion the first year and over 15 years respectively. And the growth effect in an economy with a GDP of $600 billion will be 0.18 per cent and 2.7 per cent.

Government expenditures: We can assume that the Government takes around 40 per cent of oil export revenue when income tax and specific oil taxes and royalties have been added together. The additional government take out of increased exports will be $4 and $60 billion per year and over 15 years, at $25/B.

The GDP multiplier of government expenditure is 2.2. Accordingly, the economy-wide value added of such expenditures will be $8.8 the first year and $132 billion in 15 years. Thus the growth effect of government expenditure of incremental oil fiscal revenue on the economies of the G-3 will be 1.5 per cent and 22 per cent respectively.

Total growth effect: The economic effect of increasing oil production to 10 MBD in the combined economies of Mexico, Colombia and Venezuela will be GDP growth of 5 per cent the first year and 75 per cent over the 15 year period.

4.2. Main LAC oil producers

The second exercise is simply to extend the results obtained for Mexico, Colombia and Venezuela to the remaining oil countries in the region. To these three will be added six countries – Brazil, Argentina, Ecuador, Peru, Bolivia, and Trinidad and Tobago.

The combined GDP of these nine countries is in the order of $1,800 billion. This is three times larger than the combined GDP of the G3. Thus the impact will be diluted and the growth effect will be a third of what has just been calculated for the G3 countries.

The growth effect of oil expenditures to increase and sustain capacity by 10 MBD as well as expenditure of related government revenue will be for the first year and over the 15-year period: (a) capital expenditures, 1 per cent and 15 per cent; (b) operational expenditures, 0.06 per cent and 0.9 per cent; and (c) government expenditure of additional oil fiscal revenue, 0.3 per cent and 4 per cent.

The total growth effect on the combined GDP of the nine countries will be 1.36 per cent the first year and 20 per cent for the 15 years. If we bear in mind that the combined GDP of the nine countries adds up to 90 per cent of LAC countries' total GDP, the growth effect of expanding oil capacity to supply domestic demand and the bulk of United States requirements over the next 15 years will be 18 per cent for the region as a whole.

5. Services

Special reference will be made to expenditure in services as a share of total oil capital and operational expenditures. We shall estimate how much of total expenditure to increase and sustain oil capacity accrues to services and what is the growth impact of such expenditure, performing an exercise similar to the one we just carried out for total oil expenditure.

We shall assume that around 25 per cent of capital expenditures and 40 per cent of operational expenditures are in oil services.

Thus, maintaining all previous hypotheses, to increase oil capacity to 10 MBD in LAC over a 15-year period to supply the widening gap in the U.S. market requires capital expenditures in the order of $200 billion over the whole period, or $13 billion per year, of which around $50 billion and $4.25 will be in services respectively.

Operational expenditures to sustain capacity will be in the order of $11 billion for 10 MBD, or $0.7 billion additional expenditure each year, of which $4.4 and $0.42 will be in services respectively.

Adding up total expenditure on oil-related services we have $54.4 billion over the 15 year period and $4.7 billion on a yearly basis.

To measure the economic growth impact of such expenditure we shall proceed as before: measuring it first for the main oil-exporting – G-3 – countries, and then extrapolating it to the nine main oil-producing countries in LAC.

5.1. Main LAC oil exporters

We do not have an exact estimation of what are the multipliers of oil-related services. However, as services tend to be rather labour-intensive, the multiplier of expenditures on oil sector services must be higher than that of the oil sector expenditures as a whole. We shall work with a multiplier of 2.0 for expenditures on oil-related services.

Again we are referring to the economies of Mexico, Colombia and Venezuela, with a combined GDP of around $600 billion. Maintaining all previous assumptions, the economic growth impact of oil-related services to increase and sustain capacity will be 1.5 per cent of GDP the first year and around 18 per cent over a 15-year period.

5.2. Main LAC oil producers

These countries include the previous three plus Argentina, Brazil, Bolivia, Peru, Ecuador, and Trinidad and Tobago: the nine countries with a combined GDP of $1,800 billion. The economic growth impact will be a third of that on the G-3 countries. Thus the economic impact of expenditure on oil services for the main LAC oil producers will be 0.5 per cent of GDP the first year and around 6 per cent over a 15-year period.

A final digression

In order to have a rough idea of the magnitudes in terms of capital and operational expenditures which the world oil industry faces in coping with forecast demand, let us take a mainstream scenario and calculate required world oil expenditures based on the LAC countries' experience.

Mainstream world oil demand scenarios forecast a demand increase in the order of 45 MBD over the next 20 years, from around 77 MBD up to 122 MBD. If we use the same parameter for investment required to increase capacity as we used for the LAC case – an investment of $20,000 per additional barrel per day – required investment for an increase to 45 MBD will be $900 billion over the next 20 years.

Operational costs to produce additional capacity we assume to be $3 per barrel per day, amounting to expenditure of $49 billion at the end of the 20-year period to produce 45 MBD.

Thus total additional worldwide expenditure in the oil sector, in addition to expenditure required to produce the 77 MBD which is the basis on which we are working, will be $949 billion to install and produce 45 MBD by 2020.

Taking the same shares of capital and operational expenditures to purchase services as we used for the LAC case – 25 per cent and 40

per cent respectively – worldwide expenditures in oil-related services over the next 20 years will be in the order of $245 billion.

United States oil balances 1985-1999-2020 (MBD)

	1985	1999	2020
Consumption	16.0	19.7	27.0
Production	10.6	7.8	5.0
Imports	5.3	11.1	22.0

United States oil balances average rate of growth 1985-1999 (%)

Consumption	1.5
Production	-2.2
Imports	5.4

United States imports and LAC consumption, exports and production, 1999-2020 (MBD)

	1999	2015
United States Imports	11.1	18.7
LAC exports to the United States	3.7	10.0
LAC consumption	6.3	10.0
LAC production	10.0	20.0

LAC capacity increase 10 MBD expenditures 15 Years ($ Billions)

	Expenditure	Multiplier	Overall impact
Capital exp.	200	1.36	272.0
Operational exp.	11	1.5	16.5
Government exp.	60	2.2	132.0

LAC growth effect capacity increase 10 MBD 15 Years (% GDP)

	Main exporters	Main producers
Capital exp.	45	15
Operational exp.	3	1
Government exp.	22	4
Overall exp.	75	20

Oil services expenditures capacity increase 10 MBD 15 Years ($ billions)

	Expenditure	Multiplier	Overall impact
Cap. ex. services	50	2.0	100.0
Op. ex. services	4.4	2.0	8.8
Overall ex. serv.	54.4	2.0	108.8

Oil services expenditures growth effect 15 Years (% GDP)

	Main Exporters	Main producers
Cap. Ex. services	16.6	5.5
Op. Ex. services	1.5	0.5
Overall ex. serv.	18.1	6.0

World oil production 1999-2020 (MBD)

	1999	2020
World oil production	77.0	122.0

World oil industry expenditures to increase capacity by and sustain production of 45 MBD

	Unit costs	Associated to 45 MBD
Capital expenditures	$20,000 BD	$900 billion
Operational expenditures	$ 3 BD	$49 billion
Total expenditures		$949 billion

World oil industry-related services expenditures to increase capacity by and sustain production of 45 MBD

	Share on services	Associated to 45 MBD
Capital expenditures	25%	$225 billion
Operational expenditures	40%	$20 billion
Total expenditures		$245 billion

THE TRADE OF TECHNICAL SERVICES FOR OIL AND GAS EXPLORATION AND PRODUCTION:

Observations by an old Venezuelan contractor

Carlos M. Añez*

Introduction

This paper is concerned with the trade of technical services for the upstream segments of the oil and gas industry. These services extend from the basic project management activities and the geological and geophysical exploration activities, through the operations related to drilling and completion of the wells and up to the construction, operation and maintenance of the production facilities. They are only part of what has been called "energy services" in the context of the World Trade Organization (WTO) negotiations on trade in services.

The paper is intended as a report by an entrepreneur who, in the past few years, has taken on the task of creating, developing and even saving domestic oilfield companies in Venezuela, and has experienced the enormous difficulties in that kind of endeavour.[1]

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[1] Between April 1974 and June 1978, the author carried out a wide-ranging research project leading to his dissertation for his Doctor of Philosophy degree in the University of Sussex (United Kingdom). The subject was the international transfer of technology for oil and gas exploration and production through the trade of oilfield technical services. Much of the conceptual framework of this paper is based on the findings of that research. However, the application of practical knowledge from the subsequent almost two decades of involvement in management of oilfield technical service firms in Venezuela has allowed him to introduce some important updating of the framework in order to present in this paper some "food for thought" for this Expert Meeting.

THE TRADE OF TECHNICAL SERVICES FOR OIL AND GAS EXPLORATION AND PRODUCTION:
Observations by an old Venezuelan contractor

1. The role of the oilfield technical services in oil and gas exploration and production

Technology for oil and gas exploration and production is supplied in the form of technical services and embodied in tools, machines and materials. The process of discovering and developing oil and gas fields can be viewed as a complex sequence of specialized technical services. These services are performed by specialized individuals and crews appropriately equipped and organized that are hired and coordinated by the exploration and production management of the projects. Currently, oil and gas exploration and production technologies are the evolutionary result of more than one century of industrial development supported by the continuous occurrence of innovations mostly of incremental scale.

Patented proprietary technologies have traditionally played a minor role in oil and gas exploration and production. Only relatively recently have proprietary design of some tools and equipment[2] or special pieces of software or innovative formulae of chemicals impacted on the market with some restrictive effect on competition, but they have in no way impeded the execution of any oil and gas development project at acceptable levels of quality and of cost and of time efficiency. This does not mean that technology does not play a crucial role in competition among service firms. Actually, technical innovations are frequently the instruments for competitive advantages in particular geological, commercial or operational situations. However, the innovators' competitors tend to develop competing versions of the technologies or are kept busy attending to customers in situations of the traditional types with their available technologies.

The usual organization of an oil and gas exploration and development project is centred on the management activity of the "operator", i.e. the entity in charge of executing the project for the owners of the venture. The operator obtains technical services from contractors and consultants and purchases equipment and materials

[2] The most important of these proprietary innovations are in the area of information technology applications and remote control devices.

from specialized suppliers. The reliance of the operator on contracted services has increased throughout the history of the oil and gas industry.

Formerly, the operators, i.e. the “oil companies”, performed the technical services by themselves and then gradually relied more and more on contracting services and dismantled their corresponding technical departments. Currently, the trend is towards outsourcing all activities beyond the core of the management's direct responsibilities for ensuring the success of the venture. The operators have become organizations dedicated mostly to technical decision-making, contract administration and supervision of the quality and performance of their suppliers. This is the process that created a large segment of what we are calling the market for “energy services”.

Four characteristics of the oilfield service business must be considered. Firstly, the demand for oilfield services generated by a single project or a single oil region fluctuates. The fluctuation happens not only because each exploration and development project has a given cycle of execution and not all types of services are needed in all phases of the projects, but also because investment in oilfield development follows the pattern of crude oil price variation in the world, which is secularly fluctuating. Thus it becomes unjustified to keep costly crews and equipment in the organization of the oil operator whenever the demand for services is low. The service contractors have been better able to adapt to falls in demand by moving internationally in order to capture sufficient sales from the remnants of oil investment activity in various oil regions.

Secondly, by being able to supply several operators at the same time, the service firms have greater possibilities to cover the high costs of the firms' necessary characteristics of ubiquity (i.e. the ability to work anywhere), versatility (i.e. the ability to use all the available techniques and solve the whole range of problems and situations) and readiness (i.e. the ability to attend to jobs, whenever required, on a 24-hour, 7-day-a-week basis and to solve any upcoming situations, including emergencies).

Thirdly, specialization has permitted the accumulation of experience and technical sophistication by the service firms. They have been important contributors of innovations and they are bound to be more important in the future because of the continuous effects of specialization. This does not mean that the large oil corporations are not contributing with technical progress as well. In fact, they have been very active in research and development (R&D) in the last decade and have dominated certain fields of oil and gas upstream technology.[3]

Fourthly, the nature of the technology for oil and gas exploration and production is such that there is no technical requirement compelling the oil operators to use a single supplier or brand of technical inputs for a particular project. For exploring the geology, drilling and completing the wells, protecting the environment, designing and building the production facilities and operating production, the operator may contract separate specialized contractors for the various services and buy equipment from several different suppliers of various origins and make them fit successfully together into the main process.

This analysis of the factors explaining the historical emergence and development of the service suppliers may be useful as conceptual reference for the negotiations in the WTO. This is because by understanding the rational substratum upon which the business of oilfield services has developed, both exporters and importers of services will be better able to define their negotiating positions and later compete in separate distant markets.

Thus, the fluctuating nature of the demand for services generates enormous obstacles for the successful entry of new firms and their survival in the long run. Negotiated commitments in the WTO will no doubt be affected by this fact. A deep enough downturn in demand for

[3] See Virginia Acha, and N. von Tunzelmann, " Innovation metrics and corporate strategy: The majors in the upstream petroleum industry", paper presented at the British Academy of Management Annual Conference, Edinburgh - September 2000.

oilfield services, which is sadly a common occurrence in all oil regions, might be sufficiently dangerous to be considered a situation calling for the application of whatever rules may be eventually approved to enforce Article X (Emergency Safeguards Measures) and Article XXI (Modification of Schedules) of the General Agreement on Trade in Services (GATS). Therefore, negotiators will have the fluctuating nature of the activity constantly in mind.

The great capital requirement imposed on oilfield service firms by the necessary conditions of ubiquity, versatility and readiness will also influence negotiations. The need for capital increases exponentially when the geographical extension of the market becomes international. Consequently, requesting wider access to foreign markets inevitably carries with it the assumption that the necessary capital will be there if access is achieved. It looks as if access to foreign markets is a "big leagues only" game. We may predict that this matter of the financing of service firms will demand much more attention from negotiators than, for instance, access to technology, as commonly expected by the layperson. On the other hand, knowing that technology is available from numerous and competing sources, and that different suppliers can be successfully combined for an oil and gas project, makes liberalization of service markets much more attractive to all players.

2. The oilfield technical services market

There is not one single market for oilfield technical services. The process of specialization has generated a number of separate markets. Depending on what criteria are applied, the number of markets may vary, but we may say that around 35 different sub-markets can be identified. They are activated during the life cycle of practically all oil and gas exploration and production projects. Annex 1 contains a list of services that constitutes a functional and fairly accurate base for understanding how the market for oilfield services is subdivided.

On the demand side, every one of the oil and gas exploration and production projects in the world acquires services according to various

contractual schemes, depending on the geological, legal, logistical, commercial and all other conditions of the venture.[4]

On the supply side, the large international oilfield service corporations, mostly based in developed countries, participate in all the key markets. Concurrently, groups of smaller-scale local or domestic suppliers participate in many of the markets but are active only in a single oil region or country. However, a steady process of industrial concentration has been occurring in most of the sub-markets caused directly by acquisitions and mergers and by the Darwinian process that is typical of fluctuating demand markets. This concentration process has brought about the usual negative effects of price increases, capital outflows, loss of access to technology, loss of trained personnel and other difficulties that have burdened the oil industry (the customers) of the producing developing countries.

The fragmented structure of the market for oilfield services must be taken into consideration in the negotiation process in the WTO. This subject is related to the crucial problem of agreeing to a classification of services for the purpose of reference in the negotiation of specific commitments. The classification must help WTO Members design and implement efficient public policies for promoting development in general and in the services sectors in particular. This implies enabling them to apply *differentially oriented* policy measures to the various subsectors of activities, including the assumption of appropriate negotiating positions in the framework of the GATS. The classification must help the negotiation process itself. It will be impossible to reach agreement at any level if we put on the table all sectors of services trade at the same time. Therefore, the class of "energy services" is too wide. It must be functionally subdivided to facilitate negotiations.

[4] Contractual schemes vary from the most aggregated ones of the "alliance" type, where by which a single company performs all the key services for a project, to the least bundled, in which each type of service is contracted to a different specialized supplier. However, even in the most bundled version, the main contractor will tend to subcontract smaller local firms to perform some lower-level jobs.

There are complications facing the negotiation of a classification for energy services. The first one is that it must cover not only the oilfield service sectors used in the oil and gas industry – which are the subjects of this paper – but also all the upstream and downstream services required by other energy sub-sectors (i.e. the other sources of modern commercial energy industries, such as coal, nuclear, hydro and renewable primary fuels, plus the generation, transmission and distribution of electricity).

A second complication stems from the fact that some services are used intensively by other industries besides the energy sectors. The most conspicuous of these "shared" service sectors are engineering and construction, environmental services and those based on information technology. Thus, the question arises whether these shared activities should be classified in the energy services lists or elsewhere.

Another troublesome aspect is that as a result of the Uruguay Round, many countries established specific commitments in selected service sectors, including some of the service types used by the energy industry. For that purpose, the WTO secretariat was requested to issue a classification of services ("the W120", so called because of the code number of the issued document), which was used by WTO Members to specify their commitments. Now the new round of negotiations must take into account these existing commitments and the classification on the basis of which they were scheduled.

3. The role of oilfield technical services in pursuing trade and development objectives

Since the oilfield service companies are the front row, so to speak, of the periphery of suppliers to the oil and gas industry, they have been and continue to be, at least in theory, particular subjects of interest in development policies. This has been even more so given the insubstantial results observed so far in terms of development of a strong domestic oilfield service sector after the periodic campaigns in respect of oil and gas exploration and production investments in the producing countries.

THE TRADE OF TECHNICAL SERVICES FOR OIL AND GAS EXPLORATION AND PRODUCTION: Observations by an old Venezuelan contractor

Downstream sections of the oil and gas industry are not recognized as important sources of direct employment compared with the upstream sections. In contrast, exploration and development of oilfields (oil wells and production facilities) are as labour-intensive as the engineering and construction industry to which they are closely related. Thus, oilfield service companies are highly esteemed by Governments as instruments to enhance productive employment. Actually, employment levels are approximately the same when foreign companies rather than local firms are involved in providing the services. The difference is that in the case of foreign companies, the posts requiring the greatest skills are usually occupied by expatriates and not by nationals of the host country.

The development of the service firms is important to developing countries from other points of view. A number of strategic benefits may derive from the development of a strong oilfield service sector, such as the following:

- Capital formation in the local economy;
- Opportunities for growth, highly productive employment, reduction of imports and increasing exports;
- Opportunities for the development of an industrial cluster of small and medium-sized enterprises that has important diversified socio-economic benefits, not least of which is the reactivation of the hinterland;[5]
- Linkages between the most active industrial sectors of the countries and the rest of their economies, generating very positive spillover effects;
- Promotion of technological development, increased productivity, and improvement of the general level of quality, safety and environmental protection in industry.

[5] This refers to the fact that domestic oilfield firms are mostly small and medium-sized enterprises that generate well-known economic development advantages and, furthermore, their activities are carried out mostly beyond the big cities – in the oilfields.

The recent development of strong oilfield service sectors in some key oil-producing countries has reinforced the economic development expectations relating to that kind of firm. The cases of Canada, Norway and the United Kingdom (Scotland), and to some extent, Brazil and Argentina, have been mentioned as worth studying in order to derive useful lessons for promotional policies. Another case worthy of study is the 20-year development of engineering and construction companies in Venezuela as the result of a sustained and purposeful policy implemented by the national oil company, PDVSA. One of the benefits that has been singled out as an achievement in those countries is that after a relatively short period of time the service sectors that they have deployed are now contributing considerably to exports.

Some words of caution are required here. These cases must be studied in depth in order to derive lessons for policy recommendations and discard any possible misconception and misunderstanding that may have developed through informal channels of information. For instance, it must be clarified whether capabilities in all specialities of services have been created in those countries or whether domestic firms continue to be absent in the core markets for oilfield technical services. Also, the influence of the respective Governments' key policies must be systematically studied if reliable conclusions are to be derived from these very interesting cases.

4. Barriers faced by domestic oilfield technical services firms in their own markets

In the context of the WTO negotiations, a great deal of attention is paid to the subject of "trade barriers faced by domestic firms supplying energy services in foreign markets". This is understandable, but we believe that we must first discuss the barriers faced by those firms *in their own markets*. A number of fundamental difficulties (barriers to entry) have been identified as those faced by new service firms entering oilfield service markets. They are:

- Fluctuating demand;
- Large requirements of capital;

- Lack of confidence on the part of their customers;
- Preferential treatment offered to foreign competitors by Governments and by the national and private oil operators;
- Weak linkages with international markets in other oil-and gas-producing regions and lack of information about commercial opportunities abroad;
- Scarcity of highly trained key personnel;
- High cost of developing and certifying quality assurance/quality control (QA/QC) systems;
- Weakness of entrepreneurship in the local private sector.

Contrary to what is commonly expected, technology in the form of equipment, tools, chemical products, patented processes and know-how has not been out of the reach of entrepreneurs wishing to enter the oilfield service market. Almost all of those technological inputs have been available in relatively open and competitive markets. Therefore, the domestic firms have been, at least in theory, commercially able to obtain them as required. Other resources such as the crucial managerial and operational skills required for the most specialized of the services have been scarcer. In this case, the domestic firms must rely on learning-by-doing in order to have the right number of people with the right skills. It is thus "capacity building" that is involved in this case. Since the first two items in the above list of barriers have been commented on earlier in this paper, we will focus our analysis on the rest of the list.

Lack of confidence on the part of the customers is a substantial barrier to entry that favours competition from the large international companies. In all businesses, gaining customer confidence and loyalty is a major part of management's task. This is especially so in competitive markets in which some dominant sellers are well established and well known, and well provided with resources to offer first-class service, as in the case of oilfield services. The new entrants find it very difficult to introduce competitive differentiation in their

offer other than in price reductions. Therefore, they are in a less than favourable situation with regard to competition.

In this case, the difference between the risk of the company and the risk of the manager becomes as important as the well-known difference between the risk of the bank and the risk of the banker when a loan is being evaluated. Officially, the customer company may be willing to assume the risk of contracting the small domestic firms, but the project manager may not accept the risk of failure involved in such willingness and tends to assign the job to one of the major service companies.

Foremost among priorities in oilfield service activities are the so-called quality, health, safety and environmental protection (QHSE) capabilities. This is a combination of procedures and policies that a contractor must deploy in order to be allowed to work in an oilfield. Gaining customer confidence is impossible without a proper deployment of a good QHSE system. However, substantial costs and efforts are associated with implementing QHSE standards in a company, particularly since it is based on training, training and more training. Consequently, this becomes an important element for gaining customer confidence and a considerable barrier to the entry of small domestic firms into the oilfield service markets.

Paradoxically, we have witnessed Governments, national oil companies and private operators giving preferential treatment to foreign competitors. This may have been an unplanned result of policy measures with other objectives, but the interference with competition has been significant. By "preferential treatment" we mean the combination of policy measures and business practices that lower the costs to foreign suppliers below those of local competitors. It includes one or more of the following elements: advance information about forthcoming projects, lower bond and guarantee requirements, tax exemptions and reductions, acceptance of higher fees for expatriate personnel, easier processing of imports and privileged immigration procedures.

The deleterious effects on competition of this kind of preferential treatment have reached catastrophic levels in the case of certain oil and gas projects in which the operator signs "alliance" contracts with one of the major oilfield service conglomerates at the beginning of the project. In these cases, the company selected supplies all the needs of the project and thus excludes the rest of the suppliers, domestic and foreign.[6] This market conduct almost requires a rewriting of Article XVII of the GATS, in which the commitment is to accord foreign suppliers conditions not less favourable than those accorded to national competitors. In point of fact, for oilfield services, the article should state the converse; that is, it should accord to national suppliers conditions not less favourable than those granted to foreign competitors. In other words, this is a case of domestic firms demanding "national treatment"!

To make this point more forcefully, let us look at the effects on costs of a policy allowing duty-free temporary imports of equipment. Let us take the example of the importation of an electric generator with a CIF price of US$ 100,000. The domestic company has to import the equipment without expecting to re-export it in the future. Thus, the company pays duty, VAT and port fees for about 35 per cent of the CIF price. It registers the total cost of US$ 135,000 as a fixed asset with depreciation in, say, three years, which must be paid back with the rental fees of 250 days a year (hopefully). This means that the rental price must include at least US$ 180 per day to cover depreciation before also covering other elements of cost related to maintenance, storage and consumables.

Now suppose that the foreign competitor is allowed to bring the equipment in without paying the duty and the VAT because it is a temporary import. Let us also suppose that the foreign company is buying a new generator just as the domestic company did and thus pays US$ 100,000 as well. The foreign company will have to pay

[6] This kind of "alliance" must not be mistaken for the partnering associations between large oilfield service conglomerates and domestic firms, which are sometimes also called alliances and have proved to be effective instruments for transfer of technology and capacity building in developing countries.

only the port fees amounting to 5 per cent of CIF. Thus the fixed-asset cost is only US$ 105,000 and the depreciation daily cost will be only US$ 140, i.e. 22 per cent lower than that for the domestic supplier, and only because the Government accorded the foreign company the benefit. It is just not fair.

5. Barriers faced by domestic oilfield technical services firms in foreign markets

The only antidote to the dangers of demand fluctuation is to cover as many different markets as possible. However, two limitations militate against this possibility. First, as we argued earlier, only the companies best endowed in terms of equity capital, management and resources will be able to cross international borders. Second, weak linkages with customers in other oil-and-gas producing regions and lack of information about commercial opportunities abroad make it very difficult for local service suppliers to extend their coverage beyond their original markets. However, by successfully working for certain customers in one market, it may be possible to create good relationships with them and to get work from them in other oil regions. In general, domestic oilfield technical services firms face the same barriers in foreign markets as in their original market, the difference being that those barriers are much greater when they are on an international scale.

6. Some ideas on possible strategies and policies for strengthening the domestic suppliers of oilfield technical services in developing countries

In the context of trade liberalization there is little room for policy-making by developing countries in order to strengthen their domestic suppliers of oilfield technical services. To be sure, liberalization and market access are what suppliers need in order to counteract the damaging effects of demand fluctuation by seeking to extend their activities to other oil regions. Consequently, market access is the basis for all policies. The room for policy-making is limited because the basic elements for developing service contractors are outside the scope of public policy. Such elements include availability of equity

capital, know-how and fundamental entrepreneurship, especially including risk-taking ability. Nevertheless, pending more detailed research on the subject, we may consider three fields for policy-making by oil producing developing countries: (a) all that can be done through the national oil companies purchasing practices; (b) Governments' use of policy measures to create a fair and transparent context for competition within a legal and economic environment favourable to business; and (c) all that can be done for specific capacity building.

The first of these fields for action is the most obvious: it is the trivial solution. However, it has proved to be a hard one to implement. This is because making the national oil companies behave homogeneously, as far as application of contracting policies is concerned, is an uphill endeavour. Project managers, procurement officers and purchasing agents tend to deviate from the official policy lines whenever they need to or want to. Thus, assuming that the management of the national oil companies succeeds in reining in their project managers so that they comply with policy, there are certain measures that could be applied. An important aspect of strategy is to promote the development of a market niche for domestic contractors by unbundling projects into smaller segments that can be executed by smaller companies. This has two virtues: it is legitimate and it can lower the costs of services for operators, although it can raise the costs of supervision and administration.

Another aspect of strategy is composed of all that can be done to dampen demand fluctuation. Policies that have been proposed by the Venezuelan Petroleum Chamber are good examples of this. For instance, national oil companies should avoid crash investment campaigns and favour a slower pace of execution to reduce fluctuations and at the same time allow domestic firms better chances to compete and grow. Others have proposed financial mechanisms to help small suppliers resist the crisis caused by sudden reductions in demand. Roughly speaking, this could take the form of creating a reserve fund in the national oil companies to finance projects to be executed during periods of recession in order to keep local suppliers

busy. This is not an easy idea and it might be considered to be breaking the rules for national treatment. Policy measures to create a fair and transparent context for competition include not only the basic anti-trust legislation to promote competitive markets, but also, as we have argued, the elimination of preferential treatment for any group of players.

A related policy area relates to all that can be offered as incentives for mergers, alliances and consortiums among local firms in order to promote the formation of larger-scale service entities capable of working on larger projects and securing contracts abroad. Capacity-building policy measures are also a "bread-and-butter" strategic line of action. Governments are forced to implement programmes of this kind for almost all strategically important sectors of their economies. Thus, training facilities, R&D, technical assistance, incentives for technical development and so forth are all policy instruments that must be activated.

As we have mentioned, however, founding and successfully developing oilfield service firms capable of expanding into international markets and of resisting the enormous pressures of demand fluctuations are not easy. Upward changes in demand require financial, operational and technical muscle. Downward changes will require “endurance capital” to cover sudden downsizing costs, and the resilience of the entrepreneurs will be put to extreme tests. Large numbers of highly trained personnel have been lost because of the grief and frustration caused by cyclical unemployment. In those situations very little can be done through public intervention. A deep understanding of the nature of the oilfield service business and a strong commitment to promote the development of domestic service firms on the part of Governments are the only sources of hope for dampening the effects of the downturns by perhaps maintaining a minimum level of contracting activity to keep the firms alive.

7. A neglected party for negotiation: the customers

It is surprising that a major part of the market for oilfield services – namely, oil and gas operators – is normally left out when policy

options are considered and when negotiations are proposed. These operators constitute extremely important aspect of demand. Perhaps this is a result of believing that negotiations are meant to be carried out by Governments and that private companies' market conduct will be ultimately shaped by policy measures as influenced by negotiation outcomes. Perhaps it is also the result of wrongly believing that major oil companies are not bound by international rules and agreements. However, if we look back for instance at what has been achieved in the last two decades as far as protection of the environment by the oil industry is concerned, we must acknowledge that the oil and gas industry is susceptible to pressures from public opinion and from Governments, and that a certain amount of room for negotiated agreements with that industry is available as well.

To illustrate this point, let us examine the case of the International Oil Committee (IOC) of the Venezuelan-American Chamber of Commerce (VENAMCHAM). The IOC is composed of those foreign and Venezuelan companies that are investors in and operators of oil ventures in Venezuela. As a result of lobbying by Venezuelan domestic suppliers of goods and services for the oil and gas industry, the IOC issued a document in 1999 which included a "Framework to Promote Venezuelan Content" in their oil development projects. The document was presented to the various groups of goods and services suppliers (oilfield, engineering, construction, transportation, consultants, distributors and others) through the "Alianza Empresarial", an entity created by all the associations of these businesses for common purposes.

The covering letter accompanying the document stated that the members of the IOC were all committed to the following principles:

" 1. Maximising the use of Venezuelan content in the projects when needed goods and services exist in the country, are competitive and comply with the requirements of the projects;

2. Treating all suppliers equally and fairly;

3. Promoting and ensuring the principle of transparency in the bidding processes;
4. Promoting a process of exchange of information and dialogue with the various chambers that represent the Venezuelan suppliers."

We may think that this kind of document is not legally binding and is hard to enforce. However, its ethical value cannot be denied. It defines areas for negotiated rules of business conduct. If a document like this one were to be signed at the international level, the development of domestic suppliers would benefit significantly. In our opinion it is a good reference for similar actions in other developing countries.

ANNEX 1

CLASSIFICATION OF TECHNICAL SERVICES FOR DISCOVERING AND DEVELOPING OIL AND GAS FIELDS

The following classification is an updated version for 2001 of the one contained in: Añez, Carlos M., "International transfer of technology for oil and gas exploration and production with special reference to the Venezuelan case"; mimeo; D.Phil. dissertation, University of Sussex, HSSS, 1978, Chapter 1.

1. GEOLOGICAL EXPLORATION

1.1. Exploration management services

- 1.1.1. Decision making on exploration ventures
- 1.1.2. Consulting services on:
  - 1.1.2.1. Management
  - 1.1.2.2. Legal matters
  - 1.1.2.3. Geological and exploration background
  - 1.1.2.4. Economic, financial and feasibility studies
  - 1.1.2.5. Environmental impact assessment studies
  - 1.1.2.6. Communications and e-business
- 1.1.3. Information and scouting services on:
  - 1.1.3.1. Exploratory activity of other producers
  - 1.1.3.2. Technical literature surveys
  - 1.1.3.3. Oil and gas statistics
  - 1.1.3.4. Legal matters
  - 1.1.3.5. Equipment availability (e.g. rig count)
  - 1.1.3.6. Local economic, political and legal conditions in target countries
  - 1.1.3.7. Industry news

1.2. Mapping and navigational services

- 1.2.1. On land

1.2.1.1. Overall geodetic surveys and large-scale mapping
1.2.1.2. Aerophotography and aerophotogrametry
1.2.1.3. Detailed topographic surveys and small-scale mapping
1.2.1.4. Satellite imagery processing and interpretation

1.2.2. Offshore
1.2.2.1. Sea floor surveys
1.2.2.2. Location of objects on the sea floor (wrecks, well heads, pipelines, etc.)
1.2.2.3. Underwater photography and television
1.2.2.4. Satellite navigational control and dynamic positioning

1.3. Geophysical services

1.3.1. Airborne geophysical surveys
1.3.2. Gravimeter and magnetometer studies
1.3.3. Seismic surveys on land and offshore
1.3.4. Shallow seismic surveys
1.3.5. Seismic data processing (2D and 3D)
1.3.6. Seismic data interpretation
1.3.7. Speculative seismic surveys
1.3.8. Various electrical and radioactivity logging of bore holes

1.4. Geological services

1.4.1. Geological mapping and photogeology
1.4.2. Regional geological studies
1.4.2.1. On special order
1.4.2.2. For publication and sale
1.4.3. Basin and concession evaluations
1.4.4. Stratigraphic analysis, including palaeontology, palynology and radiogenic dating
1.4.5. Petrography and sedimentology studies
1.4.6. Source rock studies
1.4.7. Geochemical surveys

2. DRILLING

2.1. Preparation of the drilling programme

2.2. Design and construction or selection of drilling equipment

2.3. Site preparation

2.3.1. On land

2.3.1.1. Detailed topographic survey
2.3.1.2. Engineering design of the site
2.3.1.3. Road building
2.3.1.4. Ground levelling and drainage construction
2.3.1.5. Camp installation
2.3.1.6. Equipment and materials transportation
2.3.1.7. Drilling equipment installation

2.3.2. Offshore

2.3.2.1. Rig transportation
2.3.2.2. Dynamic positioning of the rig
2.3.2.3. Anchoring and mooring works
2.3.2.4. Shore base preparations

2.4. Drilling

2.5. Drilling bits services

2.6. Casing

2.7. Mud engineering and supply

2.8. Solids control

2.9. Waste management (control, treatment and disposal of wastes)

2.10. Fishing and downhole special operations

2.11. Directional drilling

2.12. Logistics and catering

2.13. Telecommunications

3. LOGGING, WELL TESTING AND WIRELINE SERVICES

3.1. Wellsite geology and drilling control

3.2. Core taking

3.3. Core analysis and other laboratory tests

3.4. Electrical, acoustic and radioactive logging

3.5. Well testing

3.5.1. Drill-stem testing
3.5.2. Production testing
3.5.3. Formation fluids evaluation

3.6. Other wireline services

3.6.1. Perforating
3.6.2. Casing cutting
3.6.3. Production logging, etc.

4. COMPLETION AND CEMENTING SERVICES

4.1. Completion services

4.1.1. Supply and operation of completion fluids (brines)
4.1.2. Supply and installation of completion devices

4.2. Cementing

5. PRODUCTION SERVICES

5.1. Design and construction of artificial lift facilities

5.1.1. Pumping
5.1.2. Gas lift
5.1.3. Solvent and steam injection

5.2. Stimulation services

5.2.1. Swabbing
5.2.2. Fracturing
5.2.3. Acidizing

5.3. Workover and well repair services

5.3.1. Cleaning scales and other deposits
5.3.2. Completion and casing repairs
5.3.3. Formation repairs
5.3.4. Sand control
5.3.5. Well plugging and decomissioning

5.4. Reservoir engineering and secondary recovery services

5.5. Design, construction and installation of production equipment

5.5.1. Flow lines
5.5.2. Flow stations
5.5.3. Separators, heaters, etc.
5.5.4. Gas or water injection plants
5.5.5. Secondary recovery projects

5.6. Early production control services

5.7. Operation and maintenance of production (O&M services)

5.8. Firefighting and emergency control services

5.9. Oil spill control services

5.10 Remediation of environmentally damaged areas

ENERGY SERVICES: IMPLICATIONS FOR INDIA

B. S. K. Naidu*

Introduction: Commercial energy mix

We all understand that energy must be available, accessible and affordable. But let us remind ourselves that it varies amongst countries and regions and in spite of the growing awareness of environmental implications, the 20th century has ended with the world's commercial energy mix as follows:

- Fossil fuels - 85 per cent
- Hydro - 9 per cent
- Nuclear - 4 per cent
- New renewables - 2 per cent

Nearly two billion people (one third of the world's population) have no access to modern commercial energy forms such as electricity and oil.

1. Energy-environment interface

The energy-environment interface is dictated by greenhouse gas implications. Unless current CO_2 emissions are reduced to 60 per cent, there could be a major climate shift by 2050. In the global scenario:

- Current levels of CO_2 are the highest in 200,000 years;
- The rise in temperature by 2100 AD could be 3.5°C;

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- Sea levels are expected to rise by 1.5 feet, putting 100 million people at risk from flooding and storm surges;
- Island nations would lose a sizeable amount of land.

According to one estimate, if the world's fossil fuel consumption alone continues to increase at an annual rate of 2.79 per cent, the sea level may rise by 1.33 feet by 2050.

2. Energy issues facing the developing nations

The issues facing the developing countries are somewhat different. The crucial energy-related issues for them are the following:

- Accessibility to energy is extremely poor, even to satisfy basic human needs;
- Energy efficiency becomes relevant only when energy becomes available;
- The choice of renewable versus non-renewable, environmentally friendly versus environment-polluting and sustainable versus non-sustainable energy forms arises only when these options are available to the average person.

The stark reality is that people in developing countries use resources in their least energy-intensive forms – for example, wood chips, crop residues and cow dung – and usually in ways that are damaging to both human health and the environment.

In India 133 million tons of firewood, 73 million tons of cattle dung and 41 million tons of agro wastes and other biomass are burnt annually, with huge emissions of smoke and grit (particles of carbon) detrimental to the health of rural women and children.

3. India's Energy Scenario

- Thirty-six percent of the population of 1 billion live below the poverty line and cannot afford any form of commercial energy.
- Energy supplies in rural India, where 70 per cent of the population live, are of poor quality and unreliable.
- About 90 per cent of rural households use firewood, chips and dung cakes as a primary source of energy for cooking.
- India, which has more than 16 per cent of the world's population, has only 6 per cent of the world's coal reserves and only 0.6 per cent of oil and gas reserves.

The Indian electricity scenario is also very interesting. For instance:

- Installed capacity exceeded 100,000 MW in the millennium year, generating more than 500 billion units/year.
- A declining hydro share causes thermal plants to back down during off-peak hours. The all-India average PLF of thermal plants, which currently stands at 69 per cent, could have been 73 to 74 per cent with a judicious hydro and thermal mix. The present installed capacity breakdown is: thermal, 70 per cent; hydro, 25 per cent; nuclear and new renewables, 2.5 per cent each.
- Transmission and distribution (T&D) lines are spread over 5 million circuit kilometers, which represents more than a dozen times the distance between the earth and the moon.
- 400 million (77 million households) out of 1 billion people have no access to electricity.
- Per capita consumption is less than 1 unit a day.
- One third of electricity consumption is in the rural sector (40,000 MW connected to agricultural pump sets).
- One in 100 Indians owns an agricultural pump set, India being an agricultural country.
- Eighty-five per cent of villages are electrified, but only 31 per cent rural households have electricity.

- The present energy shortage is 8 per cent, and the peaking shortage is 13 per cent, according to the 16th Electric Power Survey of India.

4. Larger questions that India faces today

Although even in their teens, young Indian girls have to walk miles and miles to collect firewood for their daily cooking. What demand side management would you offer to these energy-starved people?

The emerging areas of non-conventional environmentally-friendly energy sources do not have enough funding support to provide a one-time subsidy of $1 per improved wood stove to all such deprived people, despite existing international funding mechanisms such as the Global Environment Facility.

Can the international community, under the sacred banner of the United Nations, think of evolving strategies for efficient access to energy, keeping deprived people in mind? Can we strengthen their competitive position in the energy –environment interface? Can we negotiate commitments in energy trade or services in support of these people?

5. Renewable energies and the environment

Renewables all over the world are either "environment-driven" or "energy-security-driven". For Indians, renewables are also ‘conscious-driven’. Mahatma Gandhi, the Father of our Nation, gave us a philosophy of life based on consciousness. Amongst many words of wisdom, he said:

- "There is enough in nature for everyone's need but not enough for everyone's greed."
- "What India needs is not mass production but production by masses."

- "India lives in her villages."

Translated into modern terminology, what Mahatma Gandhi was saying was:

- "Contain your greed and do not exploit nature unwisely, recklessly and ruthlessly, or else it will retaliate in the form of greenhouse gases, acid rains and so on."
- "Let the masses be involved in production in a decentralized manner, so that they are productively employed and the carrying capacity of a modular eco-system does not break down with large-scale development interventions."
- "Do not ignore the energy needs of the rural millions."

That is precisely where renewables fit in!

The Indian perception with regard to renewables has been based on the spirit of the Indian soil, generated many decades before the Rio Summit or the creation of the Global Environment Facility, which have only reinforced the Indian concept of a "sustainable model of development" – ensuring energy for ever and for all.

Moreover, with the present rate of consumption:

- India, as well as the rest of the world would exhaust all its oil, gas and easily minable coal within 50 years.
- Nuclear resources may last us for 100 years and coal (with difficult mining) for another 200 years.

We have just 50 years left to switch to renewables in a substantial manner (conventional hydro as well as new renewables such as wind, solar and bio energy).

6. Solar electrification: A case study

Pavur is a small village in South India, inhabited by the tribals in Kerala State bordering Karnataka State; though officially declared an electrified area, it never gets reliable power. Household electrification in this village under the "Bhagya Jyoti" Scheme has proved futile since a large power cut is experienced in rural feeders and the voltage dip is very high (120 V against 230 V). The problem is further compounded by some relatively richer families using voltage boosters in their houses. These tribals depend on basket weaving and making bidi (raw tobacco cigarettes), besides farming, to earn a living. The main cause of their poverty is low productivity and lack of education. It was realized that the root of the problem was poor lighting. They could not get enough hours of basket weaving after collecting the wild creepers from the nearby forest, as they arrived home only when it was dark and the light in their houses from the small kerosene lamps, though enough for bidi rolling, was grossly inadequate for weaving large size baskets. It was also found that many of the tribals and their children had health problems due to inhalation of the smoke from kerosene lamps they used at night; the quality of the kerosene lighting lessened the enthusiasm among the children to study; and most of the older women were suffering from severe eye problems as they have been working under poor light conditions for decades.

6.1. PV intervention in Pavur

The tribals, with annual household income ranging from Rs. 2,000 to Rs. 20,000, cannot afford to buy the proposed two-lights PV systems on an outright purchase basis. However, through appropriate credit mechanisms, they can afford the so-called unaffordable PV systems of the following specifications:

PV module size:	18 Wp
Compact fluorescent lamps:	2 nos. of 9 W each
Battery size:	12 V/ 40 AH
Autonomy:	2.7 days
Cost of the two-lights PV system:	Rs. 11,500

A revolving fund – the Basket Solar Fund (BSF) – has been created by Winrock International; it can be used for financing PV systems on a "sustainable" commercial credit basis.

6.2 Implementation and recovery mechanism

The local Don Bosco Society was already helping the tribals in marketing their baskets at a fair price in urban areas. Realizing the utility of PV lighting systems, the tribals have authorized the society to supply them with the lighting systems and deduct the monthly instalments from the sale proceeds. The money being collected is the principal with a nominal rate of interest (7.5 per cent) to offset the inflation so that the revolving fund is sustained.

A total of 120 homes in the village were identified for supply of PV systems. The scheme now in place has initial seed capital for financing 120 lighting systems. A revolving basket fund has been created with the objective of collecting the funds from the users of PV systems, who will repay the cost of systems with additional interest, and this fund will be reused to finance additional systems.

The beneficiaries/users are paying Rs. 150 every month towards the cost of the system out of a net increase of Rs. 600 in their income from the increased productivity of basket weaving.

7. India’s initiatives in the electricity sector

- Government commitment towards “Electricity for All by 2012”, comprising rural electrification by 2007 and household electrification of rural areas by 2012;
- Restructuring and corporatization of State Electricity Boards;
- Electricity Regulatory Commissions in States and in the Centre;
- Decreasing all subsidies in the agricultural sector in due course;

- Hydro Policy – 1998 to facilitate accelerated development of hydro;
- 100 per cent metering;
- Energy Conservation Act 2001;
- Electricity Bill 2001: Central legislation to obviate the need for state enactments introducing transparency, competition, efficiency and economy in a regulated environment;
- Renewable energy policy;
- Standing Committee to evolve National Training Policy for the Power Sector;
- Standing Committee on R&D to evolve Perspective Plan for R&D in Power Sector – A road map for 15 years;
- Encouragement to independent power producers (IPPs);
- Mega Power Policy;
- Captive Power Policy;
- Power sector reforms.

8. India's diversity – A challenge for energy planners

India, a country of continental dimensions supporting a population of 1 billion, is situated in a tropical zone with a diversity of resources. As a monsoon-governed country, it has huge hydro potential, ranking fifth in the world, 75 per cent of which is concentrated in the Himalayan belt, particularly in the North-Eastern Region. It has a huge stock of coal reserves (82.39 billion tonnes), primarily located in the States of Bihar and Madhya Pradesh in the central zone and Andhra Pradesh in the southern part of the country. Wind resource is considerable in the coastal areas of South India, particularly during monsoons. Solar incidence is highest in Rajasthan State and is also considerable in other States.

Rural electrification poses a special challenge in this vast country, where 70 per cent of the population lives in villages. While 85 per cent villages have been electrified, more than 80,000 villages remain to be grid-connected, being situated in difficult areas. More than 18,000 villages and hamlets are such that they can never be reached

by grid extension and will have to be energized through renewable sources such as small hydro, solar, wind and biomass. Some are suitable for establishing local/mini grids. Non-conventional energy sources can also be useful in supplementing electricity supply in the rural areas, which are very poor in terms of tail-end voltages and reliability of supply.

The capacity to pay varies largely in different strata of society in India. Thirty-six per cent of the population lives below the poverty line, and cannot afford any commercial forms of energy. They deserve to be helped by micro-credit mechanisms. Therefore, the use of different forms of energy, intermittent and otherwise, needs to be offset against their affordability.

In such a diverse country we therefore have to think of a National Grid for bulk transmission of power from the resource-rich regions to the power – needy regions through massive bulk transmission lines such as HVDC. Also, we have to go for decentralized power generation and isolated mini grids. We have to strive hard to keep an optimum balance between fossil & non-fossil fuel generation, while giving a determined thrust to conventional hydro and new renewables in the coming decades.

9. Energy consciousness

Developing countries are also aware of environmental degradation through carbon emissions, hydrofluorocarbons and the like, as well as of the need to control emissions. For a typical country such as India with diverse living standards, it is difficult to balance development and environmental protection. On the one hand, India is trying to give the poor sustainable living conditions, and on the other hand, it is trying to make conscious efforts to sensitize the masses about energy efficiency and energy conservation.

“Every one of us can generate power by conserving electricity”, “Renewables can prime the growth process that is sustainable” and

“We have just 50 years to switch on to renewables” are the concepts on which the National Power Training Institute (NPTI) is conducting energy consciousness programmes for the masses. The Public Energy Consciousness Campaign sensitized 26,782 pupils during 2000-2001. The International Green Land Society has honoured NPTI with their prestigious Jawaharlal Nehru National Award for energy conservation, since its work leads to environmental conservation.

10. Strategies for energy services in developing countries

- Basic energy service in humanitarian terms;
- No give and take from the very beginning: service first and business later;
- No blind technology transfer: re-engineering to suit local conditions utilizing local talent;
- The developed countries should not start with a basket of technologies and services known to them, but should first study the developing countries' needs in terms of energy resources, energy demand, appropriate technology, eco-friendly options, affordability, growing population and its aspirations. And then package the technologies and services;
- Encourage local capacity building, and partnering with local companies for mutual benefits.

11. Partnering for value-added business

"Labour is cheap in developing countries” is a notion that needs reorientation. Is it not reducing a man or a woman to a mere worker, just a hired commodity or resource engaged in the economic process? Under such a perception, he or she becomes an objectified and standardized component of the production process, who can be fired at any time.

This happens when we forget that:

- Man's intuitive instincts can fetch millions of dollars!
- Man's value added can be tremendous, indeed immeasurable!
- Man, for a given vision, mission or value, when motivated to the right degree, can resonate with an infinite amplitude and achieve astonishing levels of performance!
- Man has "super-conscious" powers, of which not more than 10 per cent consciously utilized.

So, if you look for partnership – not only for local labour but also for its inherent talent – you can have much more profitable business, with plenty of value added!

For example, the United States has profitably utilized Indian talent. Today:

- 38 per cent of doctors in America are Indians;
- 12 per cent of scientists in America are Indians;
- 36 per cent of NASA employees are Indians;
- 28 per cent of Microsoft employees are Indians;
- 17 per cent of Intel employees are Indians;
- 13 per cent of XEROX employees are Indians.

12. Balancing the strategies between developed and developing nations

A balanced strategic reorientation of the mindsets of the developed and developing nations would go a long way in creating a better world. A four-point strategy could be considered, as follows:

- Disentangle from mere arithmetics of carbon credits or assigning obligations to each other; focus on translating environmental objectives into actions;
- Developing nations should refrain from ignoring the environment in their quest for speedy economic growth;

- The dependence of the developing countries on bilateral/multilateral funding for environmental measures should not hinder the internalization of environmental concerns in the development process, which should be a matter of conviction;
- Environmental concerns should not be exaggerated, so that the basic development projects aimed at the ensuring survival of poor societies are overloaded.

However, survival comes first, and then its improvement. Let us energize human lives to bring about world peace, joy and togetherness.

13. Specific Recommendations

More than 2 billion people, mostly in developing countries, have no access to modern commercial forms of energy. Since their ability to pay is extremely limited, energy services should be provided to them on humanitarian terms, in accordance with the "service first, business later" principle.

This would require a common fund for establishing micro-credit mechanisms with moderate rates of interest just to set off inflation, so that the fund becomes a "revolving fund' ever multiplying the number of services provided to deprived societies.

Transfer of technology for energy services between developed and developing nations should not start with a basket of technologies and services familiar to the former. Developing countries' needs should first be studied in terms of:

Energy resources;
Energy demand;
Appropriate technology;
Eco-friendly options;

Affordability;
Growing population and its aspirations.

Only afterwards should the technologies and services, appropriately re-engineered to suit local conditions, be packaged.

While extending energy services, look for partnership, not only for local labour but also for its inherent talent, in order to have much more meaningful and profitable business, with plenty of value added!

Such partnerships would not only be sustainable and profitable, but also bring about togetherness amongst societies and unite the nations of the world to work for a common sustainable future, in which the energy and the environment are appropriately interfaced.

ENERGY SERVICES: IMPLICATIONS FOR THE ECONOMIC COMMUNITY OF THE GREAT LAKES COUNTRIES

Léonidas Ndayishimiye*

Introduction

Created in 1976, the Economic Community of the Great Lakes Countries (CEPGL)[1] is a sub-regional organization formed by Burundi, Rwanda and the Democratic Republic of the Congo (DRC). In 1979, this organization decided to promote in a formal framework (the organization of CEPGL for Energy, or EGL) cooperation among member countries in all energy sectors.

1. Presentation of CEPGL countries

Burundi

Burundi is a small landlocked country at the heart of the African continent, with an area of 27,834 km^2. According to a 1998 estimate, the population is about 6.3 million, with an average density of 230 inhabitants/km^2 and an annual growth rate of 2.7 per cent. The vast majority (93 per cent) of the population live in rural areas, with a scattered pattern of habitat.

Agriculture is the dominant activity, employing more than 90 per cent of the population and contributing more than 50 per cent of gross

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[1] From the equivalent French term – Communauté Economique des Pays des Grands-Lacs.

national product (GNP). It is essentially food-producing agriculture. Export crops are coffee, cotton, and tea, which account for more than 90 per cent of foreign exchange receipts.

The energy balance in Burundi is dominated by traditional sources, such as wood and vegetal residues. Electricity represents only 0.6 per cent of the final energy balance, and the electrification rate is just 2 per cent (source: Energy Statistics 1998-1999, Direction Générale de l'Eau et de l'Energie). Energy consumption is 18 kWh/capita (1999 figure).

Burundi has no oil resources, and all oil products consumed in the country (around 61 million litres in 1999) are imported. However, it is endowed with important hydroelectric resources, representing a 300 MW economically exploitable energy potential (the theoretical potential is 1,500 MW). At present, only 10 per cent of this potential is utilized, in spite of the fact that hydroelectricity contributes to 95 per cent of total electricity consumption. Electricity production on the interconnected network was 138.4 GWh in 2000 (against 140 GWh in 1999). Burundi also has important peat reserves, estimated at 100 million tons. Since the early 1980s, 10,000-12,000 tons have been exploited annually.

Rwanda

Rwanda, like Burundi, is a Central African country, with an area of 26,338 km^2 territory and a population of 8 million. Its population density of over 350 inhabitants/km^2 makes it together with Burundi, one of the most populated countries in Africa and in the world. The country is predominantly rural. Export crops are coffee, tea and pyrethrum.

As in Burundi, energy consumption is dominated by traditional sources, which contribute over 95 per cent of the global energy

balance. Access to electricity is 2 per cent, with a yearly per capita consumption of 24.6 kWh in 1999.

Like Burundi, Rwanda has no oil reserves. According to available estimates, its economically exploitable hydroelectric potential is 150 MW, out of which only 26.7 are currently utilized. However, the country is looking forward to exploiting an important deep-water methane gas reservoir in Lake Kivu in order to supply its economy's energy requirements.

Democratic Republic of the Congo

From an energy viewpoint, the relevant region inside CEPGL is the Kivu region, in the eastern part of the DRC. The Kivu region is mainly rural, and its economy is based on agriculture and mining. However, it also has many towns, such as Bukavu, Goma, Uvira and Butembo. Energy supplies come from the hydroelectric plant Ruzizi I (28.2 MW) and the community-owned (i.e. owned by CEPGL) Plant Ruzizi II (26.6 MW).

The DRC is endowed with huge hydroelectric reserves, estimated at 1 million MW. The exploitable potential is estimated at 774,000 GWh for an exploitable power of 88,400 MW, with about half of the total (44,000 MW) concentrated at the Inga site.

In 1995, installed capacity was 2,416 MW, corresponding to a yearly potential supply of 13,290 GWh. Energy demand from the Eastern DRC network stood at 166 GWh in 1998, for about 30,000 connected customers.

It has been acknowledged that the social and economic development of this sub-region will be based on the development of its energy infrastructure, and particularly on the construction of the Beni-Butembo and Kindu feeding lines, but the latter will be operational only if production is increased.

2. Community-owned means of production

In 1989 a community-owned electric plant (COEP), Ruzizi II, started operations. It is managed by the Great Lakes International Electricity Society (SINELAC), with a power of 2 x 13.3 MW, with two groups. A third 13.3 MW group, expected to bring the plant's total installed power to 40 MW, is currently under construction.

Table 1 shows the technical characteristics of the interconnected CEPGL network.

Table 1. Technical characteristics of the interconnected CEPGL network

Plant	Installed Capacity (MW)	Average Energy (GWh)	Guaranteed energy (GWh)
Rwegura (Burundi)	18.00	55.0	35.0
Mugere (Burundi)	8.00	40.0	26.0
Ruvyironza (Burundi)	1.35	11.0	10.5
Ntaruka (Rwanda)	11.25	30.0	22.0
Mukungwa (Rwanda)	12.50	48.0	48.0
Gihira (Rwanda)	1.80	10.0	3.0
Gisenyi (Rwanda)	1.20	8.4	5.4
Ruzizi I (DRC)	28.20	148.0	105.0
Ruzizi II (DRC)	26.60	141.0	141.0
Total	108.90	491.4	395.9

Source: Ruzizi III COEP Construction Project, Financing Requirement, EGL, November 2000.

Note: Ruzizi II installed power is to be upgraded to 40 MW with the ongoing construction of a third turbine alternator.

During the period 1997-1999, production on the interconnected network increased by 20 per cent (from GWh 426 to GWh 512).

3. Energy exchanges

Table 2 shows the evolution of the share of electric energy exchanges (equivalent to electric energy imports) as a percentage of domestic supply.

Table 2. Evolution of the share of electric energy exchanges as a percentage of domestic supply

Year	Rwanda	Burundi	East Congo
1992	50.8	34.1	14.7
1993	67.6	37.7	29.5
1994	58.5	47.7	24.8
1995	52.5	27.7	24.6
1996	53.5	4.4	31.3
1997	40.3	41.2	33.5
1998	32.5	28.8	30.4
1999	n.d.	45.4	n.d.
2000	n.d.	47.0	n.d.

Source: Ruzizi III COEP Construction Project, Financing Requirements, EGL, November 2000.

It has to be pointed out that, in spite of a volatile evolution of the exchanges, their relative weight remains important for each of the three CEPGL countries. Such weight is bound to increase further, as none of the three countries is planning the construction of new national hydroelectric facilities in the short term, and the Ruzizi COEP will be under increasing pressure to meet the expanding electricity demand from Burundi, Rwanda and the Eastern DRC.

4. Constraints on electric energy exchanges in CEPGL

The constraints on electric energy exchanges in CEPGL are of various kinds.

Financial and economic constraints

As the energy sector is very capital-intensive, CEPGL countries face enormous difficulties in meeting financing requirements for investments that would allow the production and exchange of energy (plants and transport lines). In fact, even the obtaining of financing for feasibility studies can take many years. These countries are indeed among the world's poorest (less than US$ 1 a day per capita income) and domestic savings are quite inadequate.

Political constraints

The Great Lakes region is notorious for its political instability. Political intra- and inter-State conflicts cannot favour or strengthen cooperation among these countries in general, and in particular in the domain of energy. Nevertheless, it may be observed that the "energy weapon" has been used very rarely so far (i.e. an embargo on imports of oil products imposed on Burundi in 1996-1997).

Structural and institutional constraints

In CEPGL countries, as in most of Africa, energy services are still managed by national electricity firms (Regideso in Burundi, Electrogaz in Rwanda and Snel-Est in the DRC that are public monopolies with very weak technical and financial performances. Thus, opportunities for external trade in energy have not always been considered with the necessary attention. Liberalization in the energy sector is in its first stages in the three countries (option in favour of a private operator on the part of the Rwandan national electricity society; promulgation of a law to liberalize public service electricity in Burundi).

Rate-related constraints

Rate levels are very different among the three countries, and this makes it harder to buy and sell electricity. For instance, SINELAC, the society that manages Ruzizi II COEP, applies far higher rates than Regideso in Burundi. As a result, the latter only utilizes SINELAC power as a last resort, i.e. when its own production capacities are exhausted. This fact also explains the difficulties encountered by national energy firms in paying for electricity bought from SINELAC. Therefore, rates harmonization, reflecting as far as possible marginal costs, but taking also into account the economic realities of each member State, could contribute to the optimal utilization of production means and to an increase in electricity exchanges.

CEPGL energy projects
(excluding exclusively national projects)

Project name	Project Objective	Project cost (US$ millions)	Realization stage	Participating countries
1. Installation (construction) of a third group in Ruzizi II COEP	To increase production capacity, upgrading installed power in Ruzizi II COEP from 26.6 MW (now) to 40 MW.	10.0	Ongoing	Burundi, Rwanda and DRC
2. Ruzizi III COEP project	Construction of another COEP with a 82 MW installed capacity (418 GWh average annual production potential) on the Ruzizi river	168.1 (construction) 3.5 (Studies, tender documents, miscellaneous)	Pre-feasibility study	Burundi, Rwanda and DRC
3. Rusumo Falls hydroelectric project	Construction of a COEP with a 61.5 MW installed capacity (403 GWh average annual production potential) on Akagera, in the framework of Nile basin infrastructure development	178.0 (at 1991 prices)	Detailed pre-project and tender documents available (1992)	Rwanda, Burundi and United Republic of Tanzania (Uganda)
4. Interconnection of North Burundi COEPs	To improve electricity supply security in	2.3	Feasibility study.	Burundi and United

Project name	Project Objective	Project cost (US$ millions)	Realization stage	Participating countries
and regional electrification	northern provinces and to deliver energy from the Burundian network to border Tanzanian towns (Kigoma, Uvinza and Kasulu)			Republic of Tanzania
5. Rwegura (Burundi)-Kigoma (Rwanda) 100 kV line	Construction of an electric grid to interconnect the two countries' networks, in order to ensure security of energy supply and the stability of the network	11.0	Pre-feasibility study	Burundi and Rwanda

Chapter II

Environmental Services

INTERNATIONAL TRADE IN ENVIRONMENTAL SERVICES AND THE DEVELOPING COUNTRIES

Simonetta Zarrilli*

Introduction

The environmental problems that developing countries face are enormous and put in jeopardy the ecological equilibrium not only of those countries but also of the entire ecosystem.

Worldwide, some 2.4 billion people lack access to basic sanitation and 1.2 billion, or one in five, lack safe drinking water. The rapidly increasing urban population in developing countries has generated a mounting demand for drinking water that has outstripped its supply. In most cities in the South piped drinking water is not available to everyone: those without access to safe water supply must buy water from vendors, paying between 4 and 100 times more than the price of water from a piped water city supply. Access to safe water is particularly problematic in Africa: more than 300 million people lack reasonable access to it. In developing countries more than 90 per cent of sewage is discharged directly into rivers, lakes and coastal waters without any treatment. The large majority of African and Asian cities with one or less than one million inhabitants have no sewerage system at all. When a sewage disposal system exists it only serves the rich

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residential areas. Solid waste management, or the absence of it, is an increasingly dramatic problem in developing countries, where about half of the urban population lacks adequate waste disposal and where less than 10 per cent of urban wastes are treated, with only a small fraction of that treatment meeting acceptable standards. Furthermore, in most developing countries squatters' settlements are usually not served by garbage collection services: it is estimated that between 20 and 50 per cent of the solid waste generated in the cities of the South remains uncollected. Air pollution causes premature deaths and chronic illnesses, which have a strong negative impact on the human and economic resources of the countries affected. Air pollution has been a steadily growing problem in developing countries, where urban expansion and rapid industrialization are accompanied by increasing road traffic and growing energy consumption.[1]

As a result of the increase in transnational trade, travel and migration, environmental problems that originate in a country do not remain confined within its boundaries. These problems, then, need to be solved as a matter of urgency and as a precondition for ensuring sustainable development worldwide.

Awareness of the importance of environmental problems has led a growing number of countries, particularly in the industrialized world, to introduce environmental legislation and taxation, and, more generally, has brought about the incorporation of the environmental dimension into overall economic and financial policy. Such action has had a noticeable impact on the expansion of the market for environmental and environment-friendly goods and services. The environmental industry experienced dramatic growth in industrialized countries during the 1980s and most of the 1990s, reaching US$ 522 billion in revenues in 2000; however, it now seems to face stagnation in demand. Firms in countries that are members of the Organization

[1] See Paolo Bifani, *Environmental Needs in Developing Countries and the Environmental Industry*, mimeo, 2002.

for Economic Co-operation and Development (OECD) may therefore be looking to emerging countries for new business opportunities.

Trade in environmental services appears to be relatively free of restrictions in comparison with other service sectors. The concern of exporters of such services would seem to be with the need to achieve greater market access in terms of commercial presence. Unlike in many other services sectors, exports of environmental services involve considerable investment in the importing country and thus ownership and control become a significant consideration. The movement of natural persons is also a relevant factor. Thus, additional commitments on environmental services in the framework of the General Agreement on Trade in Services (GATS) could offer new market opportunities to firms from developed countries and provide developing countries with greater access to such services, to the benefit of the environment, the people and their own developing environmental services industry.

Six negotiating proposals on environmental services have been put forward in the framework of the ongoing GATS negotiations. All of them address the issue of how to better classify the sector, in view of the fact that an appropriate classification is a precondition for scheduling meaningful commitments. The current GATS classification of environmental services fails to account for the present regulatory reality and for how business operates in this sector. This because it was drawn up at a time when the focus was on end-of-pipe pollution control rather than on prevention, and when environmental services were regarded basically as public infrastructure services provided to the general community. Moreover, little international trade was taking place in the sector at that time: Governments were providing most environmental services and private operators were not allowed or not willing to enter the market.

As in other services sectors, such as the energy sector, trade in environmental services may be affected by lack of market access in other sectors. Engineering, legal, consulting and analytical services are almost invariably in the vanguard of the provision of

environmental services. A new possible classification of the sector would therefore have to address the issue of the so-called non-core environmental services or services with "dual use". Liberalization would therefore include several sectors, where both developing and developed countries could find a trade interest. However, the benefits of such liberalization, in terms of both the trade interests of the exporter and the objectives of the importing country related to environmental protection and building domestic capacity, may not be realized if certain preconditions are not satisfied. In particular, appropriate domestic environmental legislation has to be developed and enforced and economic incentives have to be created to generate a sustainable demand for environmental goods and services.

The lesson that can be learned from the experience of developed countries is that a mixture of command-and-control and economic instruments is perhaps the appropriate way to deal with environmental problems and to ensure, at the same time, that compliance with regulations is not decoupled from economic benefits. Incentives to reduce pollution and to introduce technical innovation (the so-called dynamic efficiency) may be worth introducing, as well as flexibility in the ways and means of complying with environmental requirements. However, the effects of environmental policy instruments on prices, employment, trade and competitiveness should be carefully assessed. Their political acceptability depends on many factors, such as cost, simplicity, transparency and public participation.

A situation conducive to the transfer of environmentally sound technologies (ESTs) needs to be established, and domestic firms need to develop the skill to absorb ESTs and adapt them to local needs. Forging partnerships between firms in developing and developed countries is proving to be a viable tool for helping firms from developing countries to acquire state-of-the-art technologies, reach markets that otherwise would be difficult to access, and become part of an international network. For firms from developed countries, such partnerships facilitate their activities in emerging markets, where environmental and business conditions can be quite different from

those at home. Partnerships seem to have dramatically contributed to enhancing technological capabilities in developing countries.

A gap exists in developing countries between their environmental needs and the resources available to satisfy them. International cooperation and financing are key factors in enabling developing countries to address their most pressing environmental problems. Education and information can encourage public authorities, producers and consumers to adopt more sustainable approaches. Political willingness and leadership play a crucial role in making it possible to devote efforts and resources to environmental improvements. Governments, especially in developing countries where resources are limited and several key environmental needs have still to be satisfied, have an interest in ensuring that environmental policy decisions are the result of a participatory process.

Strengthening capacities in the environmental services sector in developing countries, while primarily aimed at addressing and eventually solving environmental problems, may also result in enabling those countries to become international providers in this field. It can also help them to increase their capacities to meet environmental requirements in the importing markets, become more attractive destinations for foreign direct investments, have easier access to capital and strengthen other domestic sectors such as tourism.

Some developing countries have proved able to build up a solid environmental services sector that has helped them in dealing with environmental problems. As a by-product, they have also been able to export their services. In these successful cases, several elements have played a role, namely political willingness and leadership, appropriate environmental legislation and enforcement, financial resources made available by international agencies, technical assistance provided by developed countries, cooperation between the Government and the private sector, and a participative decision-making process.

The environmental services sector presents equity problems similar to those faced in the health and energy services sectors. In the environmental sector, as in those other services sectors, all considerations ultimately point to the need for Governments to provide a strong and effective regulatory and incentive framework for the private actors involved in providing the services. An appropriate framework reinforces both equity and efficiency. Developing countries may therefore wish to set conditions under which foreign private companies are to operate, possibly in the form of qualifications to market-access commitments under the GATS. These qualifications could focus on measures to ensure equity (e.g. maximum prices for consumers, a percentage of profits that should be reinvested in the infrastructure) or capacity building (e.g. technology and managerial know-how transfer, training of personnel), in conformity with Articles IV and XIX of the GATS.

1. The Market

A. The environmental industry

Environmental services are one segment of the environmental industry. The environmental industry is a fairly new sector, and it presents problems of definition and quantification. According to the OECD, which has taken the lead at the intergovernmental level in defining and classifying the industry, "the environmental industry consists of activities which produce goods and services to measure, prevent, limit, minimise or correct environmental damage to water, air and soil, as well as problems related to waste, noise and eco-systems. These include cleaner technologies, products and services which reduce environmental risk and minimise pollution and resource use, although there is currently no agreed methodology which allows their contribution to be measured in a satisfactory way".[2] The industry is

[2] OECD/Eurostat, The Environmental Goods and Services Industry: Manual for Data Collection and Analysis, Paris, 1999.

going through important changes from a structural point of view (e.g. privatization, consolidation), and as regards the kind of outputs it provides (e.g. from end-of-pipe to cleaner technology) and the goals it aims at (e.g. from compliance with environmental regulations to resource productivity).

More specifically, the environmental industry includes (a) equipment (such as equipment for water supply and delivery; treatment of waste water; waste-handling; air pollution control; laboratory testing and prevention technology); (b) services (such as engineering design; construction and management of utilities; collection and treatment of waste waters; waste collection and processing; hazardous waste management; legal and consulting services; remediation services and strategic environmental management); and (c) resources (such as the sale of water, recovered materials and renewable energy). In 2000, the equipment segment accounted for 23.4 per cent of the whole industry and the resources segment 26.1 per cent, while the remaining 50.5 per cent was accounted for by the services segment.

The environmental industry can hardly be considered a cohesive unit. Within that industry, variation between segments is considerable and variation between developed and developing countries and transitional economies is also great. Among industry segments, recent growth has been led more by the equipment segment than by services or resources. The services markets are in relative decline in the developed countries, mainly because of the fundamental transitions in the industry. In general, customers have been less reliant on services providers to address and solve their environmental problems, while they have been trying to avoid those problems at the outset by changing processes, materials or product line. A separate factor that has led to an increase in sales of equipment as compared with services is the export of equipment. For instance, while the equipment segment in the United States makes up only 26 per cent of the industry, it accounts for 58 per cent of exports. Conversely, while the services segment accounts for more than 50 per cent of industry revenues, it represents only 19 per cent of exports. The globalization of the

equipment market has been facilitated by the inherent nature of the product: it is easier to export a piece of hardware than a consulting project.[3]

According to an estimate from the private sector, in 1996 the global environmental market represented some US$ 452 billion in revenues generated by private companies and public-sector bodies. It reached US$ 522 billion in 2000.[4] Half of the market was represented by fees generated by services, while the remaining half was almost equally divided between equipment sales and the sale of environmental resources such as water, energy or reclaimed material. Eighty-five per cent of total revenue was generated in the United States of America, Western Europe and Japan, with shares of 38 per cent, 30 per cent and 17 per cent, respectively; Asia (excluding Japan) generated 5 per cent of revenue, Latin America 2.4 per cent, countries in the Middle East 1 per cent and Africa 1 per cent. The leaders in the regional markets are Germany, France and the United Kingdom in Europe, the Republic of Korea, Taiwan Province of China and China in Asia (excluding Japan), and Brazil, Mexico and Argentina in Latin America. The collective annual growth in the United States, Western Europe and Japan has represented only 2-3 per cent in recent years, with the remaining growth mainly taking place in developing countries.[5]

The main purchasers of environmental goods and services have traditionally been (a) local authorities, which buy products such as equipment or laboratory services to discharge their tasks; (b) federal Governments, which hire environmental service providers for institution-building and to help them carry out their environmental initiatives; and (c) several manufacturing sectors, which buy goods and services from other firms to comply with environmental requirements or to improve their environmental performance. The

[3] See Grant Ferrier in this volume.
[4] These estimates include sales of equipment, services and natural resources.
[5] See Grant Ferrier in this volume.

public sector devotes the largest share of its environmental expenditures to water and effluent treatment, waste-handling and recycling, and cleaning up contaminated sites, while the private sector invests mainly in air-pollution control and waste treatment. In the OECD countries, total environmental expenditure is evenly divided between the public and private sectors, while in developing countries the public sector accounts for around 70 per cent of overall environmental expenditure. The public sector is also a large provider of environmental goods and services, providing the infrastructure for drinking water, waste-water treatment, waste management and decontamination, resource management and silviculture. However, things are changing: because of privatization in both developed and developing countries in the water, energy and waste sectors, private companies are replacing public authorities in the delivery of environmental services. On the other hand, some public-sector bodies that have developed expertise in the environmental services area are making it available to other countries, and are therefore competing with private firms in the market.

Traditionally, the environmental industry has not been very export-oriented. This is because for a long time local demand has provided enough business; small and medium-sized companies – which account for half of the market – have little inclination and limited capacity to export; and specific expertise linked to local environmental problems and conditions is often required. In 1998, in the United States only 10 per cent of industry revenues were generated from overseas business. In the same year, Germany exported around 20-25 per cent of its environmental industry capacity and Japan 15-20 per cent.[6] However, the trend towards harmonizing national environmental standards, adopting global environmental targets (especially through the implementation of multilateral environmental agreements) and privatizing utilities is making the industry more trade-oriented.

[6] Ibid.

The environmental industry has a dual structure, with a small number of large firms accounting for about 50 per cent of output in individual market segments and a large number of smaller firms accounting for the remainder. In 1995, the top 50 companies in the industry represented 18.6 per cent of the market, with American and French firms taking the lead. In 1998 the top 50 companies accounted for 20.6 per cent of the market, with a French firm as leader. No companies from developing countries appear in the list of the top firms.[7]

In most industrialized countries, and especially in the United States, the environmental industry is now showing the characteristics of a maturing industry: decelerating growth, intense competition, increasing consumer sophistication, pricing pressure, consolidation of market share by larger players, reduced profitability and strong merger-and-acquisition activity. In these countries the period of rapid growth – which was mostly related to the implementation and enforcement of environmental legislation – seems to be over. The high degree of compliance with existing legislation by the major industrial sectors, fewer new regulations and less stringent enforcement may have made the demand for environmental goods and services stagnate.[8] Some firms from developed countries providing environmental goods and services are therefore looking for new market opportunities.

The most rapid market growth may occur in developing countries, where booming population, fast-paced urbanization and flourishing industrialization create an enormous need for environmental goods and services: developing countries are in a "catch-up" mode and are addressing the most pressing pollution problems, much as the

[7] Ibid.

[8] D.R. Berg and G. Ferrier, "The US environmental industry", in *Meeting the Challenge: US Industry Faces the 21st Century*, United States Department of Commerce, Technology Administration, Office of Technology Policy, September 1997.

developed world did in past decades. However, scarce financial resources and competing needs, the absence of environmental regulations and enforcement instruments, and limited awareness of the risks associated with environmental problems, limit the potential demand in those countries.

Text box no. 1
Environmentally sound technologies

There are no commonly accepted definitions of environmentally sound technologies (ESTs), although they do share some generally recognized features – such as the fact that they are introduced in a highly regulated framework, represent a response to urgent global environmental problems and may benefit from public funding for research and development – and it is increasingly recognized that these features distinguish them from other technologies. It should be noted, however, that because of the evolving nature of environmental problems, what might be perceived as environmentally sound today may not necessarily be seen in the same way tomorrow. Moreover, a technology perceived as environmentally sound in one country may not be seen in the same way in another. The definition of environmentally sound technology, the environmental industry and environmental companies will continue to change. However, for the purposes of clarity, ESTs may be considered to refer to "clean" technologies which have little impact on the environment in terms of pollution or which are high in energy efficiency compared with other technologies currently in use. They are often categorized as "end-of-pipe" and "cleaner" technologies. "End-of-pipe" technologies concentrate on removing pollutants from waste streams; they include filters, waste incinerators, dumpers, composters, and dust and grease interceptors. Cleaner technologies are those which optimize the existing process of production by ensuring the correct measure of inputs and the reduction of pollution during and after the economic activity, as well as those which require more drastic changes in the production process and product composition, and thus avoid pollution from the beginning of the production process. Some examples of cleaner technologies are procedures that clean raw materials before they are used, processes that reduce the creation of hazardous wastes during production, and the use of substitutes for chlorofluorocarbons (CFCs).

The OECD/Eurostat Manual Classification includes in the "Cleaner/resource-efficient technologies and processes" those technologies which decrease material inputs, reduce energy consumption, recover valuable by-products, reduce emissions, minimise waste disposal problems, or some combination of these.

Source: UNCTAD in cooperation with the United Nations Environment Programme (UNEP) and the Department of Economic and Social Affairs (DESA), "The role of publicly funded research and publicly owned technologies in the transfer and diffusion of environmentally sound technologies", background document for the International Expert Meeting on the role of publicly funded research and publicly owned technologies in the transfer and diffusion of environmentally sound technologies, Kyongju, Republic of Korea, 4-6 February 1998; C. Almeida, 'Development and transfer of environmentally sound technologies in manufacturing: a survey', UNCTAD Discussion Papers, No. 58, April 1993; and OECD/Eurostat, Environmental Goods and Services Industry Manual Classification, Paris, 1999.

In **Latin America** expanding population and urbanization mean that there is a need to find solutions to serious air, water and waste problems. Therefore, the market has seen infrastructure-related projects, primarily in sewage treatment and water delivery, as the main drivers. In particular, the market for water and waste-water treatment is expanding rapidly. British and French water companies, thanks to a comparative advantage gained mostly as a result of accelerated privatization, have been able to take advantage of the demand and are providing integrated, system-wide solutions. The control of air pollution, from both stationary and mobile sources, has recently become an item on the regional environmental agenda, but legislation and enforcement are still lacking. The economic downturn experienced by most countries in the region in the recent years has had a significant negative impact on environmental projects in the region, since countries are not willing to enforce burdensome environmental regulations that could penalize their exports. In this context, there is little incentive for the development and implementation of environmental legislation, which is one of the main drivers of the environmental industry. However, the demand for environmental

goods and services varies considerably across countries and within countries.

In **South-East Asia**, most countries have implemented legislation related to air, land and water protection and have set up environmental authorities. Region-wide standards and regulations, particularly on hazardous waste and vehicle emissions, are being developed. Malaysia is in the process of privatizing the sewerage system of the entire country, while Indonesia, Thailand and the Philippines have started build-operate-transfer schemes in public utilities and public/private collaborations open to foreign participation. Some leading industries, such as the electronics industry, have already made the switch from end-of-pipe to cleaner technology, but fast-paced development and the concentration of industries in specific areas still create enormous environmental problems. Before the 1997 financial crisis, the South-East Asian market was regarded as the world's fastest-growing environmental market and many analysts believe that environmental markets are at present emerging even stronger than before. Opportunities exist especially in the most essential areas such as drinking water, immediate health concerns and clean-up of properties of high commercial value. In the Republic of Korea, the environmental market is mainly related to air-pollution control and waste management as a result of the implementation of strict legislation on air emissions and of a new waste policy which encourages incineration rather than landfill and aims at increasing recycling.

In **China**, the regulatory structure for environmental protection is probably more extensive and developed than in most other developing countries. However, environmental authorities do not have the resources to enforce regulatory policies throughout the country. Multilateral and bilateral assistance seems to be driving market growth at present, much as in the rest of the developing world, although provincial and municipal governments are emerging as legitimate customers for environmental service providers. The spending programme implemented by the Government on outside lending focuses on building and upgrading disposal and sewerage

facilities in major cities, as well as water supply and treatment systems and solid waste management. Forecast growth is strong at 10-14 per cent, with infrastructure supply and the services segments leading the way.

In **Africa**, rapid population growth and urbanization are making drinking water supply, solid waste disposal and waste-water treatment the main concerns. The African Development Bank has estimated that 73 per cent of the market is represented by water supply and sewerage, 23 per cent by waste management equipment and 13 per cent by pollution control equipment.[9]

B. The Environmental services segment

The environmental services sector is difficult to identify as a coherent sector. The public infrastructure services of drinking water, waste-water treatment and waste management are the core and most traditional environmental services, while services related to compliance with environmental legislation and remediation have developed in a subsequent phase. "Next-generation" environmental services are those aimed at helping companies to reduce pollution as part of the process of pursuing resource efficiency, high productivity and increased competitiveness not solely driven by regulations.[10]

[9] The analysis of the regional markets is based on Environmental Business International, Inc., San Diego, CA, USA, "The global environmental market and United States environmental industry competitiveness", executive summary of a research project and report funded by a grant from the United States Environmental Protection Agency entitled *The Global Environmental Industry: A Market and Need Assessment*, 1995.

[10] In its recently developed classification, the OECD includes services in the three main categories into which the environmental industry has been divided: "pollution management"; "cleaner technology and product"; and "resources management". However, the following detailed list of environmental services is included in the "pollution management" category:

For the purpose of this study, environmental services are divided into four segments: (a) environmental infrastructure services; (b) air-pollution control services; (c) remediation services; and (d) support services. [11]

(a) Environmental infrastructure services include services mainly related to water and waste management. More specifically, they include: the engineering design of equipment for the delivery and treatment of drinking water; the design of equipment for handling, storing and transporting solid, liquid or hazardous waste; the design, management and operation of waste-water treatment plants; the management and maintenance of drinking-water systems; the collection, treatment and disposal of solid waste; and waste recovery and recycling. In the OECD countries, environmental infrastructure services are mainly provided by municipalities and large firms or transnational corporations with a long-standing presence in the market. Traditional firms are expanding and taking advantage of privatization, mainly through acquisitions. In developed countries, the infrastructure for both water and waste is generally adequate, and so this segment is experiencing only limited growth, mainly related to periodical improvements. However, water utilities in Europe estimate

air pollution control; waste-water management; solid waste management; remediation and clean-up of soil, surface and ground water; noise and vibration abatement; environmental research and development; environmental contracting and engineering; analytical services, data collection, analysis and assessment; education, training and information; other (specific environmental services not elsewhere classified). See OECD/Eurostat, *op. cit.* A private-sector classification divides environmental services into the following categories: analytical services, waste-water treatment works, solid waste management, hazardous waste management, remediation, consulting and engineering. See Environmental Business International, Inc., *op. cit.* In the absence of a global statistical and methodological system for data collection in this specific industry, the latter classification has been widely used.

[11] The description of these segments and related trends is based on interviews with companies operating in the environmental market.

that they will need to invest around US$ 152 billion by 2005 to comply with EU regulations on sewage treatment.[12] The city of New York was recently confronted with new federal water standards. Official calculated that they would have to invest some US$ 5 billion to upgrade the city's water infrastructure to comply.[13] On the other hand, this segment may well expand rapidly in developing countries, since it is a high priority for most of them.

(b) Air-pollution control services consist of engineering design, installation and operations management of pollution control and abatement equipment and systems at stationary and mobile pollution sources, usually addressed in industries according to the intensity of their energy use, with power utilities in the forefront, followed by producers of primary metals and heavy industry. United States companies used to be the most competitive providers in this segment of the industry, mainly because the first comprehensive air quality legislation was passed in the United States (Clean Air Act, 1970). However, countries in Western Europe and Japan subsequently introduced air-control-related regulations that are stricter than those in the United States, and are now the international leaders. The need to comply with the requirements of multilateral environmental agreements (the United Nations Framework Convention on Climate Change and the Montreal Protocol on Substances that Deplete the Ozone Layer) aimed at reducing, stabilizing or replacing gas emissions that pollute the air or damage the atmosphere has created demand for air-pollution control technology in both developing and developed countries. Large companies are active in the market, sometimes as subsidiaries of companies operating in other segments of the industry or in the power sector.

[12] "Dirt poor: A survey of development and the environment", *The Economist*, 21 March 1998.

[13] The standards were met instead by spending about US$ 1 billion on preserving forest and agricultural systems in the Catskills, the source of the city's water. See "Pulp friction", *The Economist*, 16 March 2002.

(c) Remediation services include site clean-up activities, emergency response to specific accidents, and remediation assessment and design. Remediation services are usually provided by medium-sized specialized firms or by large firms that also operate in other segments of the market. The demand for land remediation activities has been fairly strong in the United States because of strict legislation and enforcement (especially through the Superfund Amendments and Reauthorization Act of 1986), but it has never been consistent in Europe and is almost non-existent in developing countries. However, the demand for remediation services is declining in the United States because of the relaxation of legislation and less strict enforcement. Demand could rise in the long run in developing countries, especially to increase the economic value of areas that are at present contaminated, or as land scarcity and development needs turn attention to contaminated properties as opposed to the continued exploitation of undeveloped properties.

(d) Support services include analytical services such as environmental laboratory testing or on-site analytical and monitoring services, legal services, consulting services, auditing, research and development, and strategic environmental management. Consulting and engineering services also support local and federal governments with environmental institution-building, monitoring, compliance assurance and enforcement. These services are typically provided by small or medium-sized companies. This segment seems to be experiencing a decline in developed countries. The main goal of support services is to help companies to comply with environmental legislation. However, since most major industrial groups in developed countries comply with the rules and only limited new legislation is being implemented, the need for this kind of service seems to be shrinking. New openings will result from the implementation of voluntary instruments, such as environmental management systems (e.g. ISO 14001) or eco-labelling programmes. However, it is unlikely that they will compensate for the loss of business opportunities related to environmental regulatory compliance, even though some evidence suggests that the use of environmental management systems is spreading in developed and developing countries. Litigation appears

to be declining in industrialized countries, since existing legislation has already been interpreted and implemented. On the other hand, this segment might well grow rapidly in developing countries, where there is an increasing need for feasibility studies on infrastructure development, capacity-building for drawing up environmental legislation and for setting up appropriate environmental authorities, environmental impact assessment (also environmental impact assessment related to the international financing of environmental projects), and environmental due diligence related to multinational acquisitions.

The delivery of services is frequently accompanied by the delivery of goods and technology: goods, services and technology form an integrated package to address a particular environmental problem.

2. Demand-generating factors in the environmental services market

Four main drivers may be identified: (a) regulations and market-based instruments; (b) education, information and public pressure; (c) economic and financial considerations; and (d) tax policy.

A. Regulations and market-based instruments

The implementation and enforcement of environmental legislation has been the traditional driver of the environmental services market. The link between environmental legislation and the demand for environmental services is very close. For example, the Japanese air-pollution control industry expanded rapidly in the 1970s and early 1980s as a result of increased domestic demand following specific legislation in this area. German expertise in water and effluent treatment equipment derives in large part from early and stringent national legislation relating to water-pollution control. In the Netherlands, the effort to overcome land contamination problems has

led to the development of advanced soil-remediation technologies. In the United States, legislation relating to site clean-up and toxic wastes greatly contributed to the country's international leadership in hazardous and waste management technologies.[14] Private management of the water and waste-water infrastructure in France has resulted in French companies assuming world leadership in this segment. When firms develop expertise in a specific field in response to domestic legislation, they have the opportunity to become internationally competitive in that field.

Command-and-control instruments have been relied on in the first phase of countries' efforts to deal with environmental problems and, in general terms, have led to a noticeable improvement in the environment. Environmental expenditures have focused on minimizing the negative consequences of pollution, waste accumulation or contamination rather than on preventing them. As a consequence, compliance with environmental regulations has often been associated with costs and decoupled from benefits.

Rules related to investments in infrastructure are a particularly powerful driver of demand for environmental goods and services. For both foreign and domestic investors it is crucial to know the environmental rules they have to comply with and the liability they have to face. In developing countries, it seems that investments are the main driver of demand for environmental services at present.

Environmental improvements can also be achieved through the introduction of economic instruments. Economic instruments – such as environmental charges and taxes, tradable permits, emission fees and tradable emissions allowances, and environmental subsidies [15] –

[14] OECD, *The OECD Environmental Industry: Situation, Prospects and Government Policies*, Paris, OECD, GD(92)1, 1992.

[15] According to the WTO Agreement on Subsidies and Countervailing Measures, subsidies that provide assistance to firms to promote adaptation of existing facilities to new environmental requirements imposed by law and/or

are generally used in addition to regulatory instruments. They complement regulations by providing incentives for pollution abatement and/or a source of revenue for financing environmental services. The lesson in environmental policy development from several developed nations is that while the regulatory approach seems adequate in the first phase of dealing with environmental problems, economic instruments appear to be more effective in the second phase, when the objective is to raise environmental performance beyond compliance and to stimulate continuous environmental improvement. Experimentation with economic instruments is quite widespread[16] and their use is being reinforced in several countries through the introduction of new instruments and by making the existing ones more effective and capable of inducing real changes in polluters' behaviour.[17] Economic instruments, however, have not yet been institutionalized as major market drivers, and their full effect on companies' behaviour and on environmental quality has yet to be realized.

Developing countries do not constitute a homogeneous group: while most of them are still in the first phase of addressing environmental problems – and therefore the command-and-control approach seems adequate, creating a demand for a broad spectrum of environmental services – others are already introducing market

regulations that result in greater constraints and financial burden on firms are non-actionable if they are granted as a one-time non-recurring measure and are available to all potentially interested firms.

[16] For example, Poland uses air-pollution taxes, China uses waste-water discharge fees, the Netherlands, Denmark and the Republic of Korea use packaging deposit/refund systems, Indonesia and Brazil use watershed charges, Malaysia and Guatemala use carbon offsets, China and Germany use over-compliance credits, and the United States, Germany, the Netherlands, the United Kingdom, Australia, Canada and Thailand use tradable permits. See Berg and Ferrier, *op. cit.*

[17] J.P. Barde, "Economic instruments for environmental protection: experience in OECD countries", in *Applying Market-based Instruments to Environmental Policies in China and OECD Countries*, OECD, 1997.

instruments to complement regulations. This generates an additional and differentiated demand for the products of the environmental industry. The need to comply with environment-related requirements in the importing markets is also stimulating demand for environmental goods and services in the manufacturing industries of developing countries.

The expansion of demand from the public sector is hindered by budgetary constraints: insufficient public funds are available to meet the need for environmental infrastructure building/upgrading and clean-up in developed and developing countries. Another driver of demand in the public sector has traditionally been the implementation of large construction projects, such as roads, bridges or hydroelectric power stations. However, public funds for these purposes seem to be shrinking in both developing and developed countries. Lack of awareness by public authorities, especially in developing countries, of the risks and costs related to environmental problems represent an additional obstacle to the expansion of demand in the public sector.

B. Education, information and public pressure

Environmental education stimulates both producers and consumers to appraise the benefits of a less polluted environment and may facilitate the inclusion of environmental considerations in business practices and consumption patterns. The generation and dissemination of information on the interaction between economic and environmental choices and on their costs can alter the public perception of environmental risks and problems, thus leading to more sustainable approaches. In many developing countries, the very limited availability and poor quality of information on natural endowments, environmental risks and costs accentuate the difficulties in making people accept having to pay for the delivery of environmental services, such as water supply or waste collection. Requiring disclosure or reporting of air and water emissions, waste generation and environmental liabilities serves as an important step in improving environmental behaviour in the industrial community,

through public information and increasing public accountability on the part of the generators of waste and pollution. A requirement that information be made public can be viewed as a market instrument because it enables consumers to choose, and can be effective in altering corporate behaviour. Well-informed public opinion may be supportive of public decisions that would otherwise be unpopular, such as to increase water prices or to shift public funds from other purposes to environmental improvements. There is a trend for enterprises to disclose to the general public information concerning their environmental policies, objectives and programmes and the corresponding costs and benefits, and to disclose and provide for environmental risks. How an enterprise's environmental performance affects its financial health is often a matter of concern to investors, owners and shareholders, because of the impact that environmental costs may have on the financial return on their investment in the enterprise. However, customers, suppliers, regulators and the general public may also have an interest.[18] The call for greater transparency also affects public utilities. According to the 1998 government green paper on utility regulations, information on British utilities held by regulators should be disclosable unless companies can show that this will cause substantial harm.[19]

In response to the setting up of vocal environmental groups, and in order to respond to consumers' expectations in domestic or foreign markets, firms have started including environmental concerns in their business practices with the aim of acquiring a "green" image and the related market advantages (premium prices, increased market share, increased acceptability as a supplier). This trend has led to the well-known phenomena of "eco-labelling" – where products are identified as being more environmentally acceptable than competing

[18] Working Group of Experts on International Standards of Accounting and Reporting (ISAR), "Position paper: Accounting and financial reporting for environmental costs and liabilities", UNCTAD, TD/B/COM.2/ISA/2/Rev.2, 13 February 1998.
[19] "Utility regulation: Going backwards", *The Economist*, 28 March 1998.

products – and environmental management systems, such as ISO 14001, whereby companies adhere to a set of voluntary rules in order to be able to better control the environmental impact of their activities. The willingness to have a green image is a driver for export-oriented firms and transnational corporations in particular. Global companies often feel that they have to address global environmental problems as a sign of their economic and moral leadership. However, public pressure is not always strong and coherent enough to represent a sustainable driver of the demand for environmental goods and services.

C. Economic and financial considerations

The demand for environmental services may be unrelated to the regulatory system, and may derive from economic and financial considerations. Firms that have integrated environmental factors in their decisions, by investing in research and development and by adopting advanced production processes and product designs, usually reap economic benefits due to a more rational use of raw materials and energy and the reduction, avoidance or reutilization of waste. However, in the environmental sector, as in any other sector, companies eventually reach the point of diminishing returns. This means that the additional efforts they make in improving environmental performance represent a cost that does not lead to any saving, unless market rewards for excellent environmental performance are in place. Some leading companies in the OECD countries have already implemented those measures that really pay, and so further steps to become "cleaner" will be increasingly expensive.[20] For other companies, there is still room for environmental

[20] Monsanto, a large American chemical company, admitted that the costs of doubling investment in environmental protection in the late 1980s absorbed most of the improvement in profit margins the company might otherwise have enjoyed in that period. Texaco planned in 1995 to invest US$ 1.5 billion a year for five years in environmental compliance and emission reduction. The total investment will be three times the book value of the company and

improvements that are also economically viable, especially in the area of waste avoidance and reutilization. However, it seems that firms are going to introduce them at their own pace. Evidence from some developing countries, especially in Latin America, shows that firms have implemented those pollution prevention measures that involve little investment, short implementation periods and simple technology, such as water, energy and input savings, and that these practices lead to positive economic returns when first adopted. However, measures that involve more complex technology and greater uncertainty, greater investments and longer lead time, have not been applied. Moreover, the adoption of more advanced environmental practices has been concentrated in a limited number of firms, especially large, export-oriented firms and the subsidiaries of transnational corporations.[21]

Financial considerations can also be a factor in generating demand for environmental goods and services. Insurance premiums, credit conditions and treatment of liability may be differentiated between companies that can show sound environmental performance and the others. In the United States, the Securities and Exchange Commission now requires that all publicly traded companies listed on the stock exchange quantify their contingent liabilities. This mostly relates to environmental liabilities such as contaminated properties, and the requirement has stimulated demand for analysis and clean-up by environmental services firms.

twice its asset base. Yet this project will provide little revenue. Even though these figures may turn out to be exaggerated, they give an indication that pollution prevention is not free. See F. Cairncross, *Green, Inc*., London, Earthscan, 1995.

[21] D. Chudnovsky, A. López and V. Freylejer, *The Diffusion of Pollution Prevention Measures in LDCs: Environmental Management in Argentine Industry*, Centro de Investigaciones para la Transformación (CENIT), January 1998.

D. Tax policy

According to some, the surest path to sustainable development is through ecological tax reform, whereby the environmental damage dimension is incorporated in taxation policy. In this view, the goal of fiscal policy would be to incorporate the social and environmental costs of any activity or product in its purchase or manufacturing price, allowing the market to effectively reward the most sustainable products. In the current system, pollution is an externality in economic terms, and ongoing pollution, waste generation and resource consumption only serve to continuously reduce the economic value of the natural resource base. An effective two-track environmental policy in the form of compliance-focused regulations and economic instruments, together with effective economic policy reform based on ecological tax reform, might ensure that developed and developing countries would pursue sustainable development. However, there is a widespread recognition that the levying of environmental taxes would need to be facilitated by some kind of international cooperation or harmonization, so as to avoid undermining the international competitiveness of those introducing ecotaxes unilaterally.

The above-mentioned drivers, however, can be effective only if certain preconditions are met: there must be, for example, an administrative infrastructure (e.g. a billing company) that allows for the assessment of costs of natural resources and environmental services and the collection of fees; the political willingness and leadership to make it possible to take decisions that may be controversial; and a threshold economic level. Several low-income countries and LDCs are below the economic threshold that would allow them to provide basic environmental services to the population.

Text box no. 2
Privatization in the water sector

Across developed and developing countries, local governments are granting water concessions to private firms. For example, in the Philippines the water supply, treatment and distribution utility serving metropolitan Manila, Rizal and part of Cavite was privatized in August 1997. It awarded 25-year concessions to two consortia (including Philippine, British, American and French industrial groups) to assume full operational and investment responsibility for the cities' water and sewage system, covering 11 million people. In 1992 a consortium led by a French firm won a 30-year contract to run water and sewerage services in Buenos Aires; the same company was subsequently awarded a 25-year contract to construct and operate a drinking-water treatment plant in the city of Medan, Sumatra (Indonesia). China's first water supply build-operate-transfer (BOT) project was approved in July 1998 to help meet the demand for water in Chengdu (3.2 million inhabitants). This is the first urban water infrastructure project approved by the Government using foreign funds (consortium led by a French firm) under a BOT plan. In South Africa a subsidiary of a French company won a EUR 76 million build-own-operate-transfer (BOOT) contract for the construction of a treatment plant for the recycling of process effluent water in Durban.

A services contract valued at US$ 25 million was awarded in September 1999 to a consortium for managing the water supply and distribution system for Maputo and the four other major cities (2.5 million people) in Mozambique. The programme relies upon financing from the World Bank. Some questions remain, however, about the notion of profits being made from public services. On the one hand, the involvement of private companies often produces dramatic improvements in the efficiency of water utilities – which are often bureaucratic, inefficient and corrupt – and provides the capital needed to connect millions of new customers. On the other hand, private entities operate on the basis of market rules, and it is questionable whether those rules are always consistent with the public interest. It can be argued that all the profits generated by water supply, or most of them, should be invested in water infrastructure. Similarly, conflicting views are found regarding water prices. With few exceptions, consumers worldwide are charged less for the water they consume than it costs to provide it. A survey of water projects financed by the World Bank showed that the average price charged for water

covered only a third of the cost of supplying it. Usually, this shortfall is made up by government subsidies, or by allowing the infrastructure to deteriorate. According to some, artificially low water prices cause problems, particularly in developing countries. Consumers are given little incentive to conserve water, utilities are reluctant to connect new customers because prices are too low to allow them to recoup their investment and, ultimately, the subsidies intended to ensure that water is a basic entitlement for everybody end up penalizing the poor. According to others, a rise in water prices would have negative effects on basic cleaning habits, such as hand-washing, and would thus increase the risk of spreading diseases; in this view government subsidies are necessary policy tools. However, Governments that subsidize water prices face high costs that they might not be in a position to afford in the long run, especially if they are trying to improve the infrastructure at the same time. The question remains of how additional resources to satisfy basic environmental needs can be mobilized.

Source: For the case studies see: OECD, Environmental Goods and Services – The benefits of further global trade liberalization, Paris, 2001.

3. GATS commitments in the environmental services sector and the negotiating proposals

A. GATS commitments

According to GATS, and in accordance with the United Nations Central Product Classification (CPC), environmental services include: (a) sewage services; (b) refuse disposal services; (c) sanitation and similar services; and (d) other (cleaning services for exhaust gases, noise abatement services, nature and landscape protection services, and other environmental services not elsewhere classified). Therefore, the classification reflects a very traditional view of environmental services as largely public infrastructure services supplied to the general community, and focuses mainly on waste management and

pollution control.[22] Most non-traditional environmental services are, then, excluded from this classification. More specifically, the GATS classification is narrow for a number of reasons: (a) it is not clearly organized according to the provision of services for specific environmental media (e.g. water, soil, air, noise); (b) it focuses on traditional "end-of-pipe" approaches with no or little coverage of pollution prevention and sustainable resource management services; (c) it covers the services provided in the operation of certain facilities, plant and equipment, but not the design, engineering, R&D and consulting services necessary for building and upgrading them; and (d) it focuses on services supplied to the general community and overlooks those supplied directly to the industry.[23]

The favoured modes of supply for environmental services are commercial presence and the presence of natural persons. However, information technology now makes it possible to use the cross-border mode of supply for the partial or full delivery of some services (mainly support services), although this would not be feasible for the majority of traditional labour-intensive environmental services, such as waste management, sewage treatment and water utilities. There seems to be limited scope for consumption abroad in this sector, with the exception of some education-related services and some services linked to the transport and handling of waste.

Nearly 50 member countries of the World Trade Organization (WTO) have made commitments on environmental services in the context of the GATS, but they include those that are the major players in the international markets (see table 1). The majority of commitments have been made by developed and Eastern European countries (20). Only two commitments are scheduled by countries from the Asian region and two from Latin America. The remaining commitments have been made by countries from Africa. Notably, no

[22] OECD, *Environmental Goods and Services: The benefits of further global trade liberalization*, Paris, 2001.
[23] Ibid.

limitations on foreign investment have been included in the specific commitments, although limitations included in the horizontal commitments, which reflect economy-wide legislation and affect all services sectors, might restrain foreign investment in this sector.

Further commitments under the GATS relating to commercial presence and the presence of natural persons could stimulate trade in environmental services and encourage foreign investment in developing countries. The impact on trade of such commitments, moreover, might be enhanced by liberalization in other service sectors. There is a significant component of specialized services in virtually every environmental project, from design to engineered solutions. Few environmental solutions are standardized and off-the-shelf, hence the widespread and often ongoing involvement of consulting, engineering and management services. Liberalization efforts might therefore be extended to other service sectors that touch on the environmental area, such as construction services, engineering services, research and development, legal services, accounting, auditing and bookkeeping services, and management consulting services.

An additional peculiarity of some environmental services, especially those related to utilities, is that they involve considerable investment, which can only be recouped in the long run. Thus, ownership and control become a significant consideration, and liberalization in this area may be worth considering as far as the environmental sector is concerned.

Table 1. Commitments on environmental services made under the GATS*

Environmental services – 37 country commitments overall
(A) Sewage services – 29 commitments
(B) Refuse disposal services – 30 commitments
(C) Sanitation and similar services – 31 commitments
(D) Other services – 28 commitments

Modes of Supply of Service	Fully open market access				No restrictions on national treatment				Barriers to trade if free trade is not granted
	(A)	(B)	(C)	(D)	(A)	(B)	(C)	(D)	
Cross-border	8 (28%)	8 (27%)	10 (32%)	12 (43%)	10 (35%)	10 (33%)	11 (36%)	11 (39%)	Technical unfeasibility.
Consumption abroad	25 (86%)	26 (87%)	26 (84%)	24 (86%)	26 (90%)	28 (93%)	27 (87%)	25 (89%)	None
Commercial presence	27 (93%)	26 (87%)	31 (100%)	25 (89%)	29 (100%)	30 (100%)	31 (100%)	27 (96%)	Licences, authorization, limited number of licences issued; domicile needed; economic needs test, monopoly; foreign equity limited to 49%.
Movement of suppliers as natural persons	1 (3%)	1 (3%)	2 (7%)	1 (4%)	3 (10%)	6 (20%)	7 (23%)	8 (29%)	Licence; operate through local representative.

* This table indicates the number of countries that have made commitments in each subsector of environmental services on market access (first set of columns) and on national treatment (second set of columns), according to the four modes of supply of the GATS.

B. The negotiating proposals

At the time of writing, six negotiating proposals on environmental services had been introduced in the framework of the ongoing GATS negotiations: five by developed countries – the United States, the European Communities, Canada, Switzerland and Australia – and two by developing countries, Colombia and Cuba.

The proposals have some common elements. First, all of them are based on the assumption that further trade liberalization of the environmental services sector may lead to a "win-win" situation where environmental protection and economic growth are pursued in parallel. The increased competition that will result from improved market access for foreign firms can lead to innovation and improved services. Less expensive and better-quality services will serve to make health, safety and environmental protection more efficient and improve access to drinking water, sanitation facilities and garbage collection systems for all segments of the population, especially in developing countries. At the same time, further market liberalization will create new business opportunities for environmental services suppliers. New business opportunities will in turn increase investment in the host country, facilitate the transfer of environmentally sound technology, and favour partnerships between foreign and domestic firms.

All the negotiating proposals address the problem of the inappropriateness of the present classification of the sector and include suggestions on how to better classify it. They also offer suggestions on how to treat the so-called ancillary or dual-use services. The proposals of the EC, Colombia and Australia refer also to the mutually exclusive nature of the GATS classification list and call for its preservation. A more appropriate classification of the sector is regarded in all proposals as a precondition for scheduling meaningful commitments.

The **United States'** proposal[24] suggests the establishment of a core list of environmental services, which are those classified as such in the current classification, and a list of environmentally related services, which are those necessary for the provision of environmental services, such as construction, engineering and consulting services. Both core and related services should be liberalized. Such liberalization would be most beneficial in the context of modes 3 and 4. The proposal states that the liberalization of the environmental services sector must not impair the ability of Governments to impose performance and quality controls on environmental services and to ensure that services providers carry out their tasks in an environmentally sound way.

The proposal of the **EC**[25] foresees the creation of seven "purely" environmental sub-sectors (as opposed to the three present ones), namely, water for human use and waste-water management; solid/hazardous waste management; protection of ambient air and climate; remediation and clean-up of soil and water; noise and vibration abatement; protection of biodiversity and landscape; and other environmental and ancillary services. Other specific services – which facilitate the provision of environmental services, but which are also used for other purposes (dual-use services) – should remain classified elsewhere in the classification list. These are: business services with an environmental component; R&D with an environmental component; consulting, contracting and engineering with an environmental component; construction with an environmental component; distribution with an environmental component; transport with an environmental component; and others with an environmental component. The EC propose that these services could be included in a checklist that could be used as an aide-mémoire during the negotiations. The proposal encourages WTO members to

[24] WTO, *Communication from the United States. Environmental Services*, S/CSS/W/25, 18 December 2000.
[25] WTO, *Communication from the European Communities and their Member States. GATS 2000: Environmental Services*, S/CSS/W/38, 22 December 2000.

schedule liberalization commitments without restriction for all sub-sectors as far as modes 1, 2 and 3 are concerned. For Mode 4, the EC propose that further discussions be held on how to improve and facilitate the temporary movement of natural persons for the provision of specific services.

The **Canadian** proposal[26] encourages liberalization in all modes of delivery and in all sub-sectors contained in the present list of environmental services (core services) and in the other related services (non-core or dual-use services). The latter could be included in a checklist to be used as an aide-mémoire during the negotiations.

The **Swiss** proposal[27] suggests a classification of the core environmental services into seven sub-sectors very similar to those proposed by the EC: waste-water management; waste management; protection of ambient air and climate; remediation and clean-up of soil and water; noise and vibration abatement; protection of biodiversity and landscape; and other environmental and ancillary services. The list of related services would include: professional services relating to the environment; research and development relating to the environment; consultancy, sub contracting and engineering relating to the environment; and construction relating to the environment. Switzerland seeks broader specific commitments in respect of market access and national treatment mainly under Mode 3, but also under Modes 1 and 2 (where technically feasible). Liberalization of Mode 4 would be particularly important for the related services.

The **Australian** proposal[28] supports the classification suggested by the EC and encourages WTO members to use it for the negotiations on

[26] WTO, *Communication from Canada. Initial Negotiating Proposal on Environmental Services*, S/CSS/W/51, 14 March 2001.
[27] WTO, *Communication from Switzerland. GATS 2000: Environmental Services*, S/CSS/W/76, 4 May 2001.
[28] WTO, *Communication from Australia. Negotiating Proposal for Environmental Services*, S/CSS/W/112, 1 October 2001.

environmental services. It stresses the importance of liberalizing Mode 3 and calls for increased transparency of national regulations in the sector.

The proposal by **Colombia**[29] suggests the development of a model schedule for the incorporation of new services that are not included in the present classification, but which would be specific to the sector. In particular, Colombia proposes that the following services be included: implementation and auditing of environmental management systems; evaluation and mitigation of environmental impact; and advice in the design and implementation of clean technologies. The proposal urges developed countries to undertake liberalization commitments on Mode 4 so as to allow the movement of natural persons as environmental services suppliers.

Some of the proposals introduced by the developed countries illustrate the kind of trade barriers that, according to them, should be removed through the GATS negotiations: restrictions on equity holdings, requirements for joint training with a local firm, and limitations on the form of establishment. However, some of these limitations may facilitate the strengthening of domestic capacity in the environmental services sector in the host country, especially if it is a developing country. Some qualifications to market access may therefore support the capacity-building efforts of the host country and should not be regarded as trade barriers. In fact, such qualifications contribute to making the "win-win" scenario materialize.

The Doha Ministerial Declaration is adding some additional impetus to trade liberalization in the sector. It instructs countries to

[29] WTO, *Communication from Colombia. Environmental Services*, S/CSS/W/121, 27 November 2001.

negotiate "the reduction or, as appropriate, elimination of tariff and non-tariff barriers to environmental goods and services".[30]

4. Business Opportunities for Developing Countries and Actual or Potential Limitations

A. Business opportunities

Technical expertise, price, quality and reliability of services are the most crucial competitive factors in the environmental industry, but other factors, such as geographical or cultural proximity or the capacity to offer a multidisciplinary package, may also contribute to a company's competitiveness. Most of the developing countries' emerging demand for environmental goods and services is at present met by firms from developed countries, although domestic firms or firms from other developing countries may take over this task in the medium term. Strategies to create or expand business opportunities may include: (a) offering an integrated package of goods and services; (b) offering specialized services; (c) targeting regional markets; and (d) establishing links with foreign companies.

Environmental problems are often specific to given regions. Therefore, solutions should be adapted to the local situation. Firms from developing countries may be in a better position than firms from industrialized countries to address environmental problems peculiar to the developing regions. Moreover, they may be able to offer a range of products and services that compete with those offered by firms from developed countries in terms of cost and simplicity and that are perceived as more appropriate to the needs of the developing countries.

[30] WTO, *Ministerial Declaration. Adopted on 14 November 2001*, WT/MIN(01)/DEC/1, 20 November 2001

Countries in different regions but with similar environmental problems could also acquire technologies and services from companies in developing countries, thereby generating export potential. Examples of services that could be offered include: the management of rainforests; environmental management in resource-extraction industries such as mining, oil and gas or forestry products; the preservation of biologically rich ecosystems; and the reduction of air pollution in the world's largest cities. For example, Brazil, after several failures in addressing deforestation in the Amazon, seems to have identified some policy strategies – such as upholding the rule of law, securing property rights, weeding out corruption and reducing subsidies – that may help to reduce the rate of deforestation and promote economic growth. Public authorities and private firms that have been involved in the process may make their expertise available to countries in Asia or Africa that are also fighting deforestation.

The ability to offer an integrated package of goods and services or to provide multidisciplinary services makes a company more appealing in the market. Transnational waste companies that can provide integrated services are present in both developing and developed countries. The interest in contracting those companies lies in their ability to take care of waste collection, transport, disposal, recycling, composting, waste-to-energy generation, and so on.

Municipalities can be serviced by a single such company performing a series of interrelated activities. In developing countries, some firms are pursuing this business strategy. In Malaysia, a private company whose main business is to operate waste-water plants privatized by the Government is following the example of the British and French water companies and is providing integrated water services domestically and to other countries in the Asia-Pacific region. Another Malaysian company, which operates engineered water-treatment systems, has boosted its capabilities by starting a manufacturing facility. This has given the firm full capacity to not only design but also manufacture its combination of licensed and proprietary water-treatment systems. The company is expanding its

activities in Indonesia and Thailand through acquisition and is moving to the very specialized market of ultra-pure water.

Text box no. 3
The case of Brazil

Brazil was the first country in Latin America to implement a coherent package of environmental legislation. In addition, individual States developed legislation at State level, the most advanced probably being the State of São Paulo, where a public company, CETESB (Companhia de Tecnologia de Saneamento Ambiental), developed the capacity to absorb, adapt and modify environmentally sound technologies imported from the developed countries. CETESB runs training activities aimed at upgrading the technical skills of its personnel, and is responsible for approving large construction projects, after assessing their environmental impact. It runs a number of projects of great importance to the country and the region. With the cooperation of the United States Environmental Protection Agency, and using funds made available by the World Bank, CETESB has started a pilot project with a group of private firms in the State of São Paulo aimed at replacing end-of-pipe technology with cleaner technology. It has undertaken initiatives for importing and adapting to local conditions technology for cleaning up industrial sites, for the management of water resources, and for the incineration of industrial waste. It has also implemented a project to reduce air pollution from mobile sources in São Paulo. The results of these projects are relevant to other countries in the region that share the same problems, i.e. air contamination, especially in large cities, dependence on end-of-pipe technology and a limited capacity to deal with highly sophisticated technology.

CETESB has been providing consultancy services to other Latin American countries (Argentina, Uruguay, Paraguay and Mexico), has opened its training courses to technicians from foreign countries (mainly countries of the region and Portuguese-speaking African countries) and is thinking about developing a marketing strategy to sell (at market price) its services to foreign countries. The income generated by these activities would represent a new source of financing for environmental initiatives in the State of São Paulo. Some private firms are also providing environmental services abroad. The technologies and services provided

by these companies may be more appealing to neighbouring countries than those supplied by firms from developed countries because of their knowledge of environmental problems specific to the region, cultural affinities, a similar language, and greater understanding of the way in which business is carried out in the region. If Brazilian legislation becomes the basis for the development of environmental legislation in other countries of the Southern Common Market, export opportunities for both State-owned and private companies will dramatically increase.

* See Fernando Rei and Oswaldo Lucon in this volume.

However, the provision of integrated packages of goods and services is beyond the capacity of many firms in developing countries. Developing such a capacity may require forging partnerships with firms that offer complementary knowledge and technologies. In particular, by establishing links with companies from industrialized countries, firms from developing countries may be able to acquire state-of-the-art technologies, reach markets that would otherwise be difficult to access, and become part of an international network. For example, an Indonesian group, in partnership with a French water multinational, has won the concession for water management in one section of Jakarta; a California-based integrated environmental firm and its partner from the Republic of Korea have set up a joint venture geared towards treating toxic and radioactive waste and contaminated areas in the Republic of Korea, and plan to offer their services to other emerging markets in Asia. Partnerships between local companies in developing countries and foreign or transnational firms can also be beneficial for the developed partners, since they make it easier for the latter to start up activities in emerging markets, where environmental and business conditions can be quite different from those in developed countries. Partnerships seem to have contributed dramatically to enhancing technical capabilities in developing countries.

B. Actual or potential limitations

Limitations on business opportunities can be identified as relating to: (a) demand conditions; (b) supply-side considerations; (c) policy; and (d) legislation.

(a) With regard to demand conditions, the following obstacles may be noted: (i) relative stagnation of the demand for environmental goods and services in the OECD countries and insufficient financial resources to pay for environmental goods and services in developing countries; (ii) uncertainty related to payment: for firms expanding their activities in developing countries, the main risk is foreign exchange, since payments are made in local currency, and partial payment for services provided is also a risk; (iii) a changing political situation: it may happen that a newly established Government is not able to honour the terms of a contract with a private company; (iv) corruption: the public market can be particularly opaque and therefore difficult to penetrate for foreign firms that do not know the rules of the game; and (v) lack of a reliable legal system to guarantee compliance with the commitments undertaken by the parties.

(b) With regard to supply-side considerations, the following may be noted: (i) difficulties faced by small and medium-sized companies: the environmental industry is heavily represented by small and medium-sized companies that have little inclination to export, especially when faced with large companies that are well established in the international market; and (ii) lack of skilled personnel and lack of financial resources for training, especially in developing countries.

(c) With regard to policy, the following restraints may be noted: (i) preference for local firms and public procurement rules are making it difficult or even impossible in certain cases for foreign firms to deliver environmental goods and services; and (ii) there is a lack of government support in terms of business development, finance and tied aid.

(d) Finally, with regard to legislation, limitations on the movement of natural persons and on a foreign commercial presence may hinder the delivery of environmental services abroad. For instance, there may be time restrictions on the stay of experts in a foreign country, national legislation may impose limitations on imported labour (especially at the middle-management level) or a firm may face limitations related to facility ownership or company control. The regulatory process generally requires firms in the environmental services industry to obtain numerous permits to conduct various aspects of their operations, any of which may be subject to revocation, modification or refusal. The documentation, testing procedures and information-gathering requirements that may be requested for such permits can impair foreign companies' ability to obtain, retain or renew applicable permits in a timely fashion. Legislation may also create strict liability (especially for operations related to the transportation, treatment and disposal of waste), which may constitute a barrier for small companies or for companies with limited experience in this field. The market for environmental liability insurance is restricted, with only a few insurance companies currently offering limited coverage on restrictive terms and at high premiums.

However, new practices are making it possible to overcome some of the limitations included in national legislation. In particular, the use of information technology may reduce the need to spend long periods abroad to deliver a service, since most of the preparatory work (e.g. analysis of relevant legislation of the host country) can be done in the exporting country, thus making it easier to cope with limitations on the movement of natural persons. Also, new business techniques apply in the environmental sector; the build-operate-transfer (BOT) procedure is widely used in water utilities and is also becoming common in the waste segment. Under this procedure, a private firm and a public authority enter into a contract for the design, construction, operation and maintenance of a facility. Once the facility becomes operational, the public authority starts reimbursing the private firm for the costs it has incurred. After refunding capital expenditure, the public entity acquires the ownership of the facility, while it continues to pay the private firm for operating it. In this case,

the role of the private entity changes over time (i.e. from owner to manager), with a parallel modification of its legal obligations and of the limitations it may face.

5. Enhancing Domestic Capacity

A number of conditions must be satisfied if the environmental services sector is to be strengthened. The formulation of appropriate environmental legislation and the setting up of environmental authorities to enforce it are the first steps in addressing environmental problems. The way in which environmental legislation is developed is also crucial: if all the relevant stakeholders, such as the State, enterprises, non-governmental organizations and social groups, are involved, there is more likely to be support for otherwise unpopular decisions. The enforcement of environmental legislation often involves public participation. In Brazil, public hearings on environmental impact assessments initially involved only the parties directly concerned. Subsequently, environmental groups and local organizations began to join the process, making its results more widely acceptable and increasing the democratic participation in environmental policy-making. Choices that imply costs for citizens (e.g. water and waste fees) may become acceptable through the kind of process described.

The availability of ESTs and related know-how is one of the keys to environmental sustainability in developing countries. The constraints that firms face in accessing and utilizing ESTs originate from both the supply and the demand sides. Among the supply-side obstacles are the protection, or lack of appropriate protection, of intellectual property,[31] cost factors, lack of relevant information for

[31]On the one hand, stronger and broader intellectual property rights (as a result of the TRIPS Agreement) would enhance the bargaining position of technology holders vis-à-vis potential licensees. On the other hand, greater protection of intellectual property rights in developing countries may be a necessary condition for the transfer of technology. In practice, however, the

making the right choice, the fact that some ESTs are not yet marketed or marketable, time-consuming licensing procedures which add to the cost of technology, and inadequate policy and incentive measures in technology-producing countries to promote the diffusion of ESTs. On the demand side, some of the major impediments include financial constraints, lack of local capacity, lack of the skills required in order to acquire, adapt and assimilate technologies, lack of awareness and relevant information on available ESTs, and the absence of regulations, policies, incentives and the enforcement instruments to advance the utilization of ESTs.

The issue of affordability is often a major demand constraint, particularly where the economic conditions of the country to which the technology is to be transferred are very different from those of the industrialized countries where the technology has been developed and applied. For example, the size of the market and the less sophisticated distribution systems and marketing channels may mean that production costs per unit will be higher or that a high volume of production cannot be attained. The technology as applied in industrialized countries may well need to be adapted to these different conditions, a process which will also incur additional costs.

Overcoming the initial barriers to the introduction of a new technology may require public-sector funding, as deliberate efforts are required in order to create an economic and policy environment appropriate for the transfer and diffusion of ESTs and to sensitize potential users to the advantages of acquiring, adopting and assimilating ESTs.[32]

environmental industry has not identified intellectual property protection as a major problem.

[32] UNCTAD, in cooperation with UNEP and DESA, "The role of publicly funded research and publicly owned technologies in the transfer and diffusion of environmentally sound technologies", background document for the International Expert Meeting on the role of publicly funded research and

Firms that have innovative and high-quality management are better placed to play a dynamic role in technology absorption. The availability of resources for personnel training is also crucial, since the environmental industry in developed countries represents one of the largest concentrations of technical, engineering, manufacturing and management skills in the world today, but many nations in the developing world lack the technology and educational resources to match this in the short term.

The experience of Brazil confirms that public authorities can greatly contribute to capacity-building. Increased domestic capacities characterize the success stories. In the case described, the local government played a crucial role in providing the appropriate legal framework; it enhanced domestic capacity to acquire, assimilate and adapt technologies, guaranteed that the commercial interests of foreign firms holding intellectual property rights were protected, raised funds from international agencies and developed countries for personnel training, disseminated information to private firms on the advantages of using ESTs, and ensured that environmental policy decisions were the result of a participative process.

Considering that SMEs account for half of the market of environmental services, Governments in developing countries could encourage foreign firms operating in their territories to "adopt" promising domestic SMEs that are – or have the potential to become – suppliers, and assist them in the continuous upgrading of management skills and technology. The specific activities and results of such an effort would be agreed between the foreign and the domestic firms. It could be a time-limited commitment with regular reviews to ensure that specific targets are met. This calls for an investment of time and a commitment by both the foreign and the domestic firms. Possible activities may include the following: engineers and managers from the foreign firm visit the local SME on a regular basis and provide advice;

publicly owned technologies in the transfer and diffusion of environmentally sound technologies, Kyongju, Republic of Korea, 4-6 February 1998.

the foreign company assigns a few staff members to the SME for a limited period; the foreign firm offers access to its internal training programmes to the staff members of the SME; a process of continuous managerial, technological and human-resource improvement is developed and progress is assessed jointly; the foreign firm shares market information and strategy with the SME and provides it with additional business opportunities through business matching and brokering strategic alliances; the foreign firm provides special or favourable pricing for the SME's services, and helps the SME's cash flow through advance purchases and payments, prompt settlements and provision of foreign exchange; the foreign firm provides the SME with long-term financial assistance through the provision of capital and guarantees for bank loans; and funds are established for working capital, infrastructure financing and leasing.[33]

As mentioned, the main thrust of strengthening capacities in developing countries in the environmental services sector is to help them in addressing, and eventually solving, their environmental problems. This should be part of a global effort to achieve sustainable development. Moreover, strengthening capacities in the environmental services sector may lead to additional positive outcomes. For instance, developing countries could aim to make the export of environmental services a profitable activity, since they would be in a much better position to meet environmental requirements in the importing markets and could better satisfy consumers' expectations about the environmental virtues of products and related manufacturing processes. They would become more appealing destinations for foreign direct investments, have easier access to capital and strengthen other domestic sectors. The evidence also shows that countries that have made efforts to improve sanitation and waste collection and to limit air and water pollution have been rewarded by an increase in tourism.

[33] UNCTAD, *World Investment Report 2001. Promoting Linkages*, New York and Geneva, 2001, pp. 213-214.

MODERNIZING THE LIST OF ENVIRONMENTAL SERVICES: OECD PROPOSALS

Dale Andrew[*]

Introduction

In the 1990s, the OECD Industry Committee actively pursued various investigations on the environment industry. In particular, in recognition of the need to improve the collection of consistent information on production, employment, trade, investment and research and development (R&D), the OECD and Eurostat (the European Communities' Statistical Office) set up an informal working group on the environment industry in 1995. The results were published in 1999 in *The Environmental Goods and Services Industry: Manual for Data Collection and Analysis* (hereinafter the *Manual*). Statistical agencies in a number of OECD countries have used this classification to design and carry out new surveys and studies on the environment industry about this rapidly evolving industry[1].

At about the same time, the OECD Joint Working Party on Trade and Environment (JWPTE) undertook to investigate the possibilities of "win-win" situations arising for environmental protection and economic benefits from the liberalization of trade in environmental goods and services. Using the new OECD/Eurostat state-of-the-art *Manual* as its point of departure, the JWPTE incorporated the international trade aspects. A series of studies, first on trade in environmental goods and then on trade in environmental services, led

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[1] This paper draws from a paper on environmental services presented to the UNCTAD Expert Meeting on environmental services held in July 1998. That earlier paper was drafted by Dale Andrew and Rachel Thompson.

to the publication in 2001 of *Environmental Goods and Services: The Benefits of Further Global Trade Liberalisation.*

Although this paper focuses on environmental services, it is important to emphasize that a key aspect of the OECD work on classification issues is the recognition of the *integrated* nature of the environment industry. That is to say, environmental goods and environmental services are used together in addressing particular environmental protection problems. Whereas environmental goods – equipment and technologies – are used to prevent, abate and remediate pollution or conserve natural resources, environmental services are the essential complement to research, design, produce, install, operate and upgrade such environmental equipment and technologies. Recourse to one without the other constitutes only a partial response, leading to diminished environmental performance. Accordingly, a recurring theme in the OECD analysis is the desirability of proceeding with liberalization of both environmental goods and services on a concurrent, and preferably integrated, path.[2]

1. Mapping the environment industry

In the words of one analyst, the environment industry "is less a sector than an agglomeration of providers of many types of goods, services and technologies that are usually integrated into production processes and are often hard to tease out as separate items".[3] It has been experiencing substantial structural changes, including concentration, privatization, moving from end-of-pipe to integrated

[2] This paper focuses on environmental services. For an analysis of the entire environment industry and the international trade in both environmental goods and environmental services, reference should be made to the OECD publication *Environmental Goods and Services: The Benefits of Further Global Trade Liberalisation*, OECD, 2001.

[3] United States Office of Technology Assessment (1994), *Industry, Technology and the Environment: Competitive Challenges and Business Opportunities*, OTA-ITE-586, US Government Printing Office, Washington, DC. p. 149.

and cleaner technologies, and shifts to totally new activities. At the same time, evolving emphases in environmental policy – from pollution control and remediation to policies emphasizing pollution prevention – have had profound impacts on the types of goods and services being used by the industry and entering into international trade. In this regard, the prime objective of the classification contained in the *Manual* is to provide a flexible classification framework for mapping environment industry activities which is currently accurate and useful but which also can be adapted to future needs as the industry evolves.

The complete OECD/Eurostat classification system, with an explanation of each of the three main Groups and each of the categories, is contained in an annex to this paper. An overview and summary illustration of the *Manual'*s approach is provided in table 1 in matrix form. The matrix combines the environment industry business activities of different general kinds (columns) with the related environmental industry classes (rows). These latter classes (rows) correspond to the three large *groups* and the *categories*.

Table 1. Mapping environment activities

Business activities *Environmental classes*	**Production of equipment and specific materials**	**Provision of services**	**Construction and installation of facilities**
POLLUTION MANAGEMENT GROUP			
Air pollution control			
Waste water management			
Solid waste management			
Remediation/clean-up of soil and water			
Noise/vibration abatement			
Monitoring, analysis, assessment			
CLEANER TECHNOLOGIES & PRODUCTS GROUP			
RESOURCE MANAGEMENT GROUP			

Source: OECD, *The Environmental Goods and Services Industry: Manual for Data Collection and Analysis*, 1999.

Services comprise the lion's share of environment business activities. Of the US$ 518 billion estimated as the value of the global environment industry in 2000 (in the OECD publication *Environmental Goods and Services*, 2001, table 2), over two thirds is represented by services. Basic infrastructure services for waste treatment, water treatment and water supply comprise more than half.

2. Challenges in devising a classification for environmental services

As noted in the Introduction, the OECD trade and environment project sought to identify and develop a trade classification for both environmental goods and services. In outlining here the particular problems faced, we focus on the services aspects, while noting where similar issues arise also for goods.

The ***structural diversity*** of the environment industry presents definitional/classification challenges. This is due to its rapid evolution beyond traditional pollution control and remediation/clean-up activities to also incorporate a broader range of pollution management, cleaner technology and resource management activities. In such activities, environmental goods, technologies and services are increasingly offered on an integrated basis, whether "horizontally" through a firm or group of firms bringing together the range of materials and expertise required for undertaking an entire project in a particular environmental media, or "vertically" through firms specializing in, for example, construction and engineering across several environmental media.

There are also wide variations in the ***maturity and sophistication*** of the technology used in the provision of environmental services. A significant part of the industry's value is in water supply, water treatment and solid waste management, utilizing mature and basically low-tech goods and services for hauling and pumping. This low-tech end of the environmental industry overlaps with ordinary "housekeeping" functions common to many industries. As a result, it is difficult to draw a clear boundary around the environmental sector.

These factors contribute to probably the most serious definitional issue – ***multiple use***. Several environmental services, and many goods, have a multiplicity of possible commercial uses, many of which are not environmental. For services, the clearest examples are architectural and design services, engineering, construction and

installation services, land-use advisory services, R&D services, and data monitoring and technical testing services. Industry groups, particularly those organised “horizontally” across several environmental media, also mention surveying services and land and water transportation services as relevant to their environmental project-delivery capacities. It appears to be less difficult to distinguish environmental consultancy, law, education and eco-tourism services from more generic services.

Inevitably the multiple-use factor means that a definition/classification of environmental services for trade negotiations purposes must either exclude certain services with clear environmental uses or run the risk of including some sales, production, trade, etc. – in goods which are of non-environmental use.

Attempting to identify environmental services that embody particular "***cleaner" processes*** is linked to efforts to do so for "cleaner" goods and technologies. For example, a piece of equipment using a cleaner technology will have within it the ***embedded technology***, to which one can point as the "location" of the environmental protection justifying its marking as an environmental good. Cleaner technology, by definition, involves changes in production and processes upstream, rather than using add-ons or other end-of-pipe facilities downstream to separate the harmful effluents after production. Cleaner services, by implication, are those that involve ***embedded skills*** related to the use of cleaner technology, and specialist knowledge relating to upstream processes for environmental protection.

However, defining a "cleaner" service and accompanying technology in practice can be difficult. Two problems present themselves. First, ***dual motivation***. As pollution prevention options can be more economical than equivalent end-of-pipe measures, and pollution is managed as another kind of resource use, reducing costs of (polluting) resources will be factored in along with costs of other resources. In such cases, it is difficult to distinguish environmentally

motivated changes from those changes motivated by economic savings.

The definition of cleaner technologies also raises the issue of ***relativism***. A service incorporating technology that reduces use of resources or reduces pollution today may be relatively dirty in a few years' time as more advanced technologies become available. Maintaining today's "cleaner" technologies and services for an inappropriate length of time on favoured lists for, e.g. investment promotion, could delay innovation or distort investment and trade decisions towards processes that are relatively less clean than those that become available with innovation and technological progress.

3. Identifying environmental services for purposes of international trade

Services are intrinsic to the delivery both of traditional pollution control and remediation/clean-up activities and of newer techniques of pollution management, as well as to installation of cleaner technologies and resource management activities. Increased privatization of traditional environmental services, in particular water and waste treatment services, and a shift in regulatory emphasis and the behaviour of large firms, from end-of-pipe pollution control to pollution prevention and cleaner production, are having a number of important effects. These include expanding the relative importance of services in the environmental industry, stimulating private demand for and supply of environmental services, and accentuating the need for and role of service activities beyond the traditional "core" environmental services.

Furthermore, environmental products, technologies and services are increasingly provided commercially on an integrated basis, whether "horizontally" by a firm or group of firms bringing together the range of materials and expertise required to undertake an entire project for a particular environmental medium (e.g. water, air, habitat)

or “vertically”, for example, by firms specializing in construction and engineering across several environmental media.

Specialist services are therefore important in their own right for the effective utilization of environmental technologies and products in pollution and resource management projects. They are also increasingly integral to these technologies and products. This synergy suggests the desirability of pursuing liberalization of international trade in environmental services in tandem with efforts to liberalize international trade in environmental products and clean technologies.

Traditionally, environmental services have been understood and defined quite narrowly in terms of facilities that provide water and waste treatment services, often by the public sector. However, over the past decade or so, a need has been felt to move beyond this stage, owing to a combination of new regulatory requirements for the management and control of pollution, growing public sensitivity to environmental problems and privatization and liberalization trends which have created private demand for environmental services and tied them more closely to the market.

Perhaps the leading factor has been the shift in regulatory approaches, from end-of-pipe pollution control to pollution prevention through adoption of technologies for cleaner production and products, with the active involvement of the private sector. This has made a broader range of services much more important, especially for the application of design, installation, managerial, environmental auditing and engineering know-how.

In many developing countries, the emphasis on basic environmental services remains, especially for water supply and wastewater treatment, but there is also a shift towards cleaner production in both development cooperation programmes and national initiatives. Cost-effectiveness mainly drives this trend, because of the gap between the environmental needs of developing countries and the financial resources available to satisfy them. UNCTAD has noted that

developing countries have two main priorities: (a) basic human needs relating to drinking and waste water treatment, sanitation and waste management; and (b) coping with the problems of rapid industrialization and urbanization in relation to waste water, urban air pollution, and toxic and hazardous solid waste.[4]

Historically, the private sector has played only a limited role in environmental services (and hence in opportunities for international trade) because Governments largely provided the major public infrastructure services, such as water treatment and waste disposal services. This was mainly for two reasons. First, some environmental services may have the characteristics of public goods, e.g. sanitation and sweeping services for public spaces, which no single firm has an economic incentive to provide. Second, some environmental services may require comprehensive distribution or collection networks and equipment infrastructure, e.g. sewage collection systems, and the high level of investment required tends to create conditions of natural monopoly. Accordingly, until recently Governments provided such services so as to control or subsidize the cost to consumers. These two factors tended to mean that the private sector either chose not to, or was not allowed to, enter the market to provide many of these services.[5]

However, more recently, domestic and international markets for environmental services have begun to emerge. One factor is the increased trade in environment-related equipment and technology, along with associated services, to establish or upgrade industrial and public infrastructure plants, particularly for water treatment, waste management and abatement of air pollution. Another factor is the adoption of worldwide environmental standards, which can generate growth in international environmental goods and services markets, as demonstrated by the Montreal Protocol with respect to replacement strategies for CFCs (chlorofluorocarbons). A third factor has been the

[4] UNCTAD, "Services and the environment", report prepared for the UNCTAD secretariat by Paolo Bifani, UNCTAD/SDD/SER, 6 March 1996.
[5] WTO, *Environmental Services*, S/C/W/46, 6 July 1998.

decision in many countries to begin domestic privatization and to break up monopoly control of public utilities; these trends generate foreign investment and competition in services.

Nevertheless, as with environmental goods, it is difficult to delineate the precise boundaries of the environmental services sector because of definitional problems arising from multiple use and from embedded environmental technologies and skills. This is because some services provided for environmental purposes are also provided in commercial contexts that do not relate directly to improved environmental protection or performance. Examples include architectural and design services, engineering, construction and installation services, land-use advisory services, R&D services, and technical testing and analysis services. Industry groups, particularly those organized "horizontally", also mention activities such as surveying services and land and water transportation services as relevant to their environmental project-delivery capacities; yet these services, too, obviously have non-environmental uses.

As a result, the development of a framework for further liberalization of the environmental industry – as a means of stimulating deployment of urgently needed environmental technology and know-how – requires a fresh look at the definition of environmental services. It is therefore essential to compare the classification system used in the Uruguay Round with today's industry profile, as classified in the *Manual*.

3.1 Shortcomings in the existing GATS classification of environmental services

The classification of environmental services provided by the OECD/Eurostat *Manual* and the Services Sectoral Classification List MTN.GNS/W/120 (hereinafter referred to as that provided by W/120), which is used at the WTO, are very different. The *Manual* reflects an evolving, more integrated industry and identifies environmental services as those provided to measure, prevent, limit, minimize or

correct environmental damage to water, air and soil, as well as problems related to waste, noise and ecosystems. It encompasses services relating to pollution management, including those relating to the construction and installation of facilities for such purposes, and services relating to the installation and utilization of cleaner technologies and products and of technologies and products which reduce environmental risk and minimize pollution and resource use.

For its part, W/120, drawn up in 1990-1991 and derived from the provisional United Nations Central Product Classification (CPC) statistical classification (Provisional CPC), reflects a very traditional view of environmental services as largely public infrastructure services, i.e. services supplied to the general community, and focuses mainly on waste management and pollution control. This view persists in the recent revision of the CPC (CPC Version 1.0). The GATS and CPC classifications are set out in table 2.

Table 2. GATS and CPC classifications of environmental services

GATS Sectoral classification 6	Provisional CPC Division 94	CPC Version 1.0 Division 94
Environmental services	Sewage and refuse disposal, sanitation and other environmental protection services	Sewage and refuse disposal, sanitation and other environmental protection services
A. Sewage services	9401 Sewage services	941 Sewage services 94110 Sewage treatment services 94120 Tank emptying and cleaning services
B. Refuse disposal services	9402 Refuse disposal services	942 Refuse disposal services 94211 Non-hazardous waste collection services 94212 Non-hazardous waste treatment and disposal services 94221 Hazardous waste collection services 94222 Hazardous waste treatment and disposal services
C. Sanitation and similar services	9403 Sanitation and similar services	943 Sanitation and similar services 94310 Sweeping and snow removal services 94390 Other sanitation services
D. Other	9404 Cleaning services of exhaust gases 9405 Noise abatement services 9406 Nature and landscape protection services 9409 Other environmental protection services n.e.c.	949 Other environmental protection services n.e.c.

The environmental services sector, as defined in W/120, was not a focus of the Uruguay Round services market access negotiations. This may account at least in part for the limited sectoral classification used: the main CPC headings were generally carried over to W/120. In some other sectors, such as financial services and telecommunications services, which received much greater attention, W/120 is much more closely related to how companies conduct their business and the services they provide.

Nevertheless, most OECD member States and some developing countries made at least some commitments under one or more of the four W/120 sub-sectors of sewage services, refuse disposal services, sanitation and similar services, and "other" environmental services.[6] It should also be noted that the Uruguay Round services negotiators, in constructing the first multilateral trade framework for services in the early 1990s, sought guidance from the Provisional CPC, which, at the time, was the best available tool. However, the CPC was not developed or intended as a basis for trade negotiations. The GATS negotiators were concerned that the GATS sectoral classification system should be a manageable and practical negotiating tool, readily linkable to national services statistics classifications, while covering commercially significant sectors in international services trade.

Therefore, and as with the CPC system, the GATS sectoral classifications are intended to be self-contained and, insofar as possible, mutually exclusive. A strong feature of recent discussions on whether the GATS classification system should be updated for the mandated new round of GATS negotiations is the widespread view among WTO members, particularly developing countries, that there is a need for stability. Therefore, overhauling of the GATS sectoral classification needs to be justified by significant evolution in the

[6] A description of the scope of existing GATS market access and national treatment commitments for the four GATS environmental services sub-sectors is provided in the OECD publication *Environmental Goods and Services*, 2001, annex IV.

sector concerned, including in the scope of services being traded internationally.

This is indeed the case for environmental services. A close examination of the correlated CPC descriptions indicates that W/120's classification of environmental services is unduly narrow for a number of reasons.

First**,** it is not clearly organized according to the provision of services for specific environmental media (water, solid waste, air, noise, soil, habitat, etc.). Yet many environmental services providers specialize in one or more environmental media and provide comprehensive service packages for those media. Thus, while there is some correlation between the primary environmental media and W/120's main categories of sewage, refuse disposal, sanitation and "other" environmental services, it is only partial, especially in the case of water and solid waste management. For example, there is more to water management, water purification, waste water treatment and water recycling than "sewage services". Furthermore, the W/120 categories of refuse disposal and sanitation services are sub-sets of a missing broader category of solid waste management, in which recycling and sophisticated storage strategies should be core environmental service activities (instead, these services are partially covered elsewhere in W/120).

Second**,** the focus of the W/120 classification is on traditional "end-of-pipe" approaches, with little or no coverage of pollution prevention and sustainable resource management services. As a result, some key services are not explicitly covered in W/120 (e.g. remediation of polluted or contaminated soils and water ecosystems, ecological research and consultancy, collection of paper, plastic, glass and metal waste for recycling, hazardous waste collection and storage).

Third, W/120 covers the services provided in the operation of certain facilities, plant and equipment, but not the design, engineering,

R&D and consulting services that create and upgrade them, or the engineering, installation and construction services and technical testing and analytical services that make them operable. While these services are integral to environmental "value adding" and the international transfer of environmental technology, skills and know-how, they are classified elsewhere in W/120.

Fourth**,** the W/120 classification mainly focuses on utility/infrastructure services supplied to the general community and largely overlooks the provision of environmental services directly to industry. The heterogeneous nature of the entities providing environmental services is also pertinent, insofar as they tend to cut across the "vertical" sectoral lines of the CPC/GATS classifications and involve both public and private sector actors, which may be either "vertical" functional specialists or "horizontal" service providers.

These factors make it desirable to consider ways to modernize W/120 while preserving the "self-contained sectoral structure" of the GATS classification. As a first step in analysing how this could be done, table 3 presents a comparative chart of the OECD/Eurostat classification and the W/120 sectoral list. The OECD/Eurostat classification helps to delineate the boundaries of the sector, in terms of covering services provided for environmental protection, pollution control, remediation or prevention activities and services provided for activities relating to specific environmental media. An effort was made to match practical descriptions/examples of such services to W/120 and the associated Provisional CPC and CPC Version 1.0 codes. This helps to reveal those services that are "uniquely" environmental in nature, as distinct from those services that have "dual" uses (i.e. that have both environmental and non-environmental uses and thus tend to be covered in W/120 under other sectoral headings).

Table 3 gives a picture of environmental services provided directly to industry alongside those provided as "public infrastructure", as well as the range of services that design, install, operate, maintain and

upgrade the equipment and technologies involved, the "support" services involved in R&D, testing, analysis and monitoring, and the range of recycling and remediation services. It makes it clearer how environmental services are actually provided. For example, it covers all of the services involved in build-operate-transfer (BOT) projects for water supply and treatment or for solid waste management, a key means of delivering new environmental services in many parts of the world, particularly in developing countries.

The aim of table 3 is to show the range of services involved in the environmental industry, not to suggest that this should be adopted as a new GATS classification for environmental services. Rather, it provides the overview of the environmental services industry necessary for helping trade policy makers make informed decisions about how to modernize the existing GATS classification.

3.1.1 Modernizing GATS classification of environmental services on the basis of "end use"

In devising modernized GATS classifications, it is essential to maintain clear boundaries between the principal sectors in order to preserve the integrity of GATS specific commitments made under the existing classification system. This is a challenge because of the commercial scope of environmental services provision. "Dual use" is a key issue for determining the boundaries of the environmental services sector. A number of services that, in commercial terms, are regarded as "environmental" in nature also have non-environmental uses, and are provided as such by non-environmental service firms and are classified elsewhere in W/120.

The most frequently occurring services in the latter group include:

- Design, architectural and engineering services;
- Site investigation and surveying services;
- Research and development services;

- Data monitoring and technical testing services;
- Construction, installation and related engineering services;
- Distribution services (regarding aspects of recycling);
- Education and training services provided outside the school and university systems.

From a commercial point of view, therefore, the question arises of the feasibility in the GATS context of constructing a new classification for environmental services that incorporates the "environmental elements" of these services, based on the circumstances in which they have an environmental end use. In practical terms, a service's end use is defined by the customer's purpose and requirements in commissioning a service. This also helps to shape a service's characteristics in terms of the skills and technologies deployed. Thus, services with the same end use and similar characteristics are likely to be directly competitive or substitutable in the market place.

On the face of it, it should be possible to envisage a GATS classification for environmental services that makes possible the incorporation of specifically environmental end-use services, such as design and architecture services for the construction of waste management facilities, environmental education services for public awareness campaigns, computer modelling services and data-gathering and testing services for the monitoring and prevention of maritime pollution. Such an approach would involve providing clear descriptions of the specifically environmental aspect of a service under an environmental services sectoral classification and excluding these from any other "generic" classification in the GATS system.

Table 3. Environmental services: Comparison of OECD/Eurostat and GATS/CPC descriptions and classifications

Service type	Examples/ Descriptions	GATS and Provisional CPC	CPC Version 1.0
(I) Services provided for one or more environmental protection, pollution control, remediation or prevention activity *			
Design consulting and Engineering	Engineering services for environmental plant, equipment and facilities, including consulting services, e.g. feasibility studies, costing • Architecture and design services for environmental plant, equipment and facilities, including related urban planning and landscape architecture • Environmental impact studies	**GATS** 1A (d), (e), (f), (g): architecture, engineering, urban planning, etc., services **CPC** 86711, 86712, 86721, 86722, 86724, 86725, 86726, 86732, 86733, 86741, 86742 **GATS** 6D: other ES **CPC** 9409	83131, 832, 833 94900
Preparation of sites and construction, installation and assembly, repair and maintenance	For environmental facilities, plant and equipment, e.g. sewage and water management, solid and hazardous waste collection and treatment systems, landfill and incineration sites, etc. • Engineering services relating to site preparation; inspection during construction • Surface and subsurface surveying • Site investigation,	Not fully covered by **GATS** 6A-D: operation of the facilities, etc. (see below) **GATS** 1A (e), (f): architecture, engineering) **CPC** 86713, 86714, 86727, 86729 **GATS** 1A (e), (f) **CPC** 86752, 86753 **GATS** 3E: other	83131, 832, 833 83520, 83530

* Services for the operation of systems, plant and facilities for specific environmental media are covered in the second part of this table.

Service type	Examples/ Descriptions	GATS and Provisional CPC	CPC Version 1.0
	formation and clearance • Construction, installation and assembly of environmental utilities, plant and equipment (e.g. laying of sewers and water pipelines, construction of treatment plants, construction of landfills and other disposal sites) • Installing septic systems and disposal fields • Construction and installation work on buildings • Repair and maintenance of machinery and equipment	construction **CPC** 511, 515, 518 **GATS** 3B: construction work for civil engineering **CPC** 51340, 51350 **GATS** 3C: installation and assembly **CPC** 51620, 88590 **GATS** 6A&D: sewage services and other ES **CPC** 9401, 9409 **GATS** 3A, D: building construction, completion and finishing **CPC** 512, 517 **GATS** 1F (n): maintenance & repair of equipment **CPC** 88620	54241, 54251, 541, 542, 543, 544, 545, 546, 547, 548 54342, 86590 94110, 94900 542, 547 87159
Project management services	• Supervision of design, engineering and construction and installation, as an integrated project	**GATS** 1A (f): integrated engineering	83322, 83323, 83329
Environmental research and development	• Scientific and technological activities to develop cleaner products, processes and technologies • Scientific and technological activities to reduce or eliminate	**GATS** 1C: R&D services **CPC** 85101, 85103, 85109, 85202, 85300, 8530	81110, 81130, 81190, 81220, 81300, 8130

Service type	Examples/ Descriptions	GATS and Provisional CPC	CPC Version 1.0
	emissions and improve environmental quality Research to improve knowledge of eco-systems and the impact of human activities on the environment	**GATS** 6D: other ES **CPC** 9409	94900
(l) Services for one or more environmental protection, pollution control, remediation or prevention activity (cont'd.)			
Analytical services, data collection, testing, analysis and assessment	• Environmental monitoring, control and damage assessment services, e.g. acid rain, natural disaster assessment and abatement services • Composition and purity testing and laboratory analysis services (e.g. for health, safety and toxicology purposes) • Computer modelling of pollution effects • Sampling and monitoring of air and water quality • Forestry assessment and damage abatement services	**GATS** 6D: other ES **CPC** 9409 **GATS** 1F (e): technical testing and analysis service **CPC** 86761 **CPC** 75440, 8672 **GATS** 1F (e) **CPC** 8672, 8676, 9409 **GATS** 1F(f): services incidental to agriculture, hunting, forestry **CPC** 881	94900 83561 83139, 8339 8313, 8339, 8351
Remediation and clean-up of soil, surface water and groundwater	Operation of systems or provision of other services to reduce the quantity of polluting materials in soil or water, including	**GATS** 6D: other ES **CPC** 94060	94900

Service type	Examples/ Descriptions	GATS and Provisional CPC	CPC Version 1.0
	surface, groundwater and seawater: • Consultancy and engineering services for assessment • Use of clean-up systems *in situ* or mobile, emergency response, spills cleanup; natural disaster assessment and abatement services • Treatment of water and dredging residues • Specialized treatment of polluted soils: see solid waste management	**GATS** 6B: refuse services **CPC** 9402	94222
Eco-system and landscape protection services	• Consultancy and assessment services for ecological system, nature and landscape protection services, e.g. lakes, coastlines and coastal waters, wetlands, dry land, etc., including fauna, flora and habitats	**GATS** 6D: other ES **CPC** 9406 and 9409	94900
Environmental education, training and information	• Environmental education or training by specialized institutions or specialized suppliers provided outside the	**GATS** 6D: other ES **CPC** 9409	94900

Service type	Examples/ Descriptions	GATS and Provisional CPC	CPC Version 1.0
	school/university system for the general public or specific workplaces, e.g. training courses on environmental protection or operation of environmental facilities • Adult education and specific-subject education courses not defined by level of pupil	**GATS** 5D, E: adult and other education **CPC** 924, 929	929
(II) Services provided for specific environmental media			
Water and wastewater management **(a) Sewage services**	Including "horizontal" services in section (I) • Operation and maintenance of facilities and equipment for sewage removal, sewage treatment and disposal, tank emptying, cleaning and servicing, transport of wastewater	**GATS** 6A&D **CPC** 9401, 9409	94110, 94900
(b) Water for human use	• Potable water collection, purification treatment and distribution through mains	**CPC** 18000, 7139	69210
Solid and hazardous waste management **(a) Refuse disposal services**	Including "horizontal" services in section (I) • Collection and transport, treatment and disposal services for household, commercial and industrial trash,	**GATS** 6B **CPC** 9402	94211, 94212, 94221, 94222

Service type	Examples/ Descriptions	GATS and Provisional CPC	CPC Version 1.0
	rubbish and waste (non-hazardous and hazardous) • Treatment and disposal by incineration, dumping, composting, landfill or storage. Includes waste reduction services and specialized treatment of polluted soils. *Excludes* dealing and wholesale services of waste and scrap – see below		
(b) Recycling services	• Metal waste and scrap recycling services, on a contract or fee basis, e.g. recycling of aluminium and steel • Non-metal waste and scrap recycling services, on a contract or fee basis, e.g. recycling of paper, plastic and glass • Dealing, wholesale and retail services for recycled waste, scrap and other material, e.g. sale of paper, cans or bottles for recycling	**GATS** 1F(i): services incidental to manufacturing **CPC** 88493 **CPC** 88493 **GATS** 4: distribution services **CPC** 62118, 62278, 62113, 63299	86931 86392 61195, 61295, 62495, 62595
(c) Sanitation services	• Street, park, beach and other	**GATS** 6C **CPC** 94030	94310,

Service type	Examples/ Descriptions	GATS and Provisional CPC	CPC Version 1.0
	outdoor sweeping, snow and ice removal, other sanitation services, e.g. drain unblocking *Excludes* disinfecting and extermination services for buildings, etc., and pest control services in connection with agriculture		94390
Air pollution control, including "horizontal" services in section I	Services for the assessment, treatment and/or removal of exhaust gases and particulate matter from both mobile and stationary sources: • Emission monitoring and control services • Concentration monitoring, control and reduction services of pollutants in ambient air, especially in urban areas • Cleaning of exhaust gas systems of vehicles, commercial and industrial buildings and complexes	**GATS** 6D: other ES **CPC** 94040	94900
Noise and vibration abatement, including "horizontal" services in	Services for the assessment, reduction or elimination of noise and vibration both at source and dispersed: • Noise pollution	**GATS** 6D: other ES **CPC** 94050	94900

Service type	Examples/ Descriptions	GATS and Provisional CPC	CPC Version 1.0
section I	monitoring, control and abatement • Design, management, etc., of systems for acoustic and soundproof screening and covering		

Sources: OECD, based on OECD/Eurostat descriptions, GATS Classification List (MTN.GNS/W/120), Provisional CPC and CPC Version 1.0 and APEC environmental services work programme.

However, because of the number of "dual use" services involved in providing environmental services, many countries feel that this would entail unacceptable intrusion into the other GATS W/120 sectoral classifications, particularly those for business and professional services, construction services and education services. These countries suggest that this could have unwanted implications for the stability and predictability (and legal interpretation) of existing specific commitments made by GATS members in these sectors. It would also require development of clear criteria that could be consistently applied for determining when a "dual use" service may be said to be an "environmental" service (that is, used for environmental purposes), as a basis for determining the "likeness" or "unlikeness" of services with environmental end uses and those without. Given the difficulties involved, an alternative approach may be considered, and is outlined below.

3.1.2 The "core" plus "intrinsically related" approach to GATS classification

As an alternative to an "end use" approach, consideration is also being given in the GATS negotiations to using the emerging industry profile, as presented in table 3, to develop general descriptions of "core" environmental services that reflect modern requirements and

commercial realities.[7] This could form the basis for efforts to update the W/120 sectoral classification for environmental services to cover, for example, the range of water-related environmental services, instead of simply "sewage services". Future GATS negotiations in this area could then be undertaken using the updated "core" environmental services classification with due attention being given to the "intrinsically related" (but separately classified) services which are crucial to the delivery of the "core" services. The focus in the first instance would be on securing agreement on the list of services covered and their description, and then on reaching consensus to use it as the basis for a package of commitments. Thereafter, the task of correlating such a package with existing commitments (and associated CPC numbers) would essentially be a technical exercise.

Alongside a modernized list of the "core" environmental services, a list of services could also be drawn up showing the "intrinsically related" (but separately classified) services which are crucial to the delivery of the "core" services. As table 3 illustrates, such a list is likely to need to focus on architectural and engineering services (including design and project management services), computer modelling services, analytical and testing services, and construction services. This second approach to modernizing the existing GATS classification for environmental services has the advantage of not departing significantly from its underlying link to the CPC system or the vertical divisions between sectors.

Whatever the approach adopted, it is clear that the existing classification is inadequate and needs to be supplemented by modernized descriptions, including checklists of updated "core" and "intrinsically related" services, even if the latter continue to be covered by other GATS sectoral classifications.

[7] Table 4 sets out key features of the OECD work and of the various Communications on environmental services submitted by six WTO Members between 1999 and 2001. For full details, reference should be made to the Members' Communications, available at http://www.wto.org.

3.1.3 Implications for developing countries of a broader classification for environmental services liberalization

As UNCTAD's forward-looking work in this sector has already shown, the needs and interests of individual developing countries with regard to environmental services vary considerably, depending on the stage of industrial development, the priority attached to environmental protection, the environmental regulatory framework and domestic financing capabilities. Needs for basic water supply, water and waste treatment are still very great in many developing countries, even those countries that have experienced high growth and industrialization in the past two decades; these in turn having created the need for pollution management and remediation at both industrial and social levels. Thus end-of-pipe environmental solutions may yet be expected to dominate the needs of many developing countries, since some, for example, in Asia, Latin America and North and Southern Africa, also have a need for new and more efficient industrial processes based on cleaner technologies. Redesigning industrial plants nearly always involves savings of energy and other inputs, and concomitantly less pollution and waste.

Nonetheless, the environmental and development benefits of technology and skills generated by open trade and investment are likely to be delivered on the integrated basis described in the preceding sections, specifically through the diffusion of skills and technology inherent in environmental engineering, R&D, analytical and education and training services.

It is considered that the environmental and development benefits of liberalization in environmental services, broadly defined, flow from the following:

1. Trade and foreign investment providing the most direct channel for environmental technology and skills transfer;
2. The resulting competitive price effects helping limited domestic environment budgets go further;

3. The provision of market-based incentives for technological progress and investment in technology, particularly by domestic industry, thereby increasing local capabilities for domestic innovation and adaptation to global product standards, with export-market flow-on and overall indirect welfare gains;
4. Improvement of health and local environmental conditions through increased access to basic infrastructure, such as safe drinking water and waste management.[8]

To this listing may be added another, crucial benefit – *jobs***.** The prevailing pattern in developed markets for exports of environmental equipment and related services involves local hiring of large numbers of workers, rather than the importation of their entire workforce requirements. This applies for both the construction/installation and operation of equipment and physical facilities in particular, and also for a range of specialist professionals with local knowledge and languages. With regard to the latter, developing countries typically possess significant human capital in relevant areas, for example in the engineering profession, natural sciences and business administration.

In these practical terms, a broader classification of environmental services that includes the services that rely on specific environmental technologies and skills and provides for their diffusion more broadly within an economy (i.e. across industry, rather than simply via specific utilities) can therefore help developing countries to improve domestic environmental performance, provide basic services such as potable water and sanitation, extend their broader domestic services capacities and increase their own exports of environmental services.

[8] See the OECD publication *Environmental Goods and Services*, 2001, reporting on a series of case studies of "win-win" benefits from liberalization of water and waste management services markets in developing economies (pp. 53-60 and annex 7).

Table 4. Comparison of OECD proposals made in the WTO to update classification of environmental services

	Objectives	Core services	Related services
OECD[1]	Preserve the self-contained sectoral lines of W/120 Revision of the classification of environmental services: • Modernize the "core" environmental services list • Include a list of "intrinsically related" services Factors to be taken into account: • Organize environmental services according to specific environmental media • Focus not only on traditional "end-of-pipe" approaches, but also on pollution prevention and sustainable resource management services • Focus not only on utility/ infrastructure services but also on the provision of services directly to industry • Consider services that	Update the W/120 sectoral classification and introduce some new items List: • Sewage services> water services for human use and wastewater management • Refuse disposal services> non-hazardous and hazardous solid waste management • Cleaning services for exhaust gases> services for protection of air quality and climate • Noise abatement services-> noise pollution prevention, abatement and control • Nature and landscape services > protection of biodiversity and habitat • New item: remediation and prevention for polluted soil and water • New item: services for sustainable resource use • Update other environmental services	Elaborate a list of "intrinsically related" services which are crucial to the delivery of "core" services • Design, architectural and engineering services • Site investigation and surveying services • Research and development services • Data monitoring and technical testing services • Construction, installation and related engineering services • Distribution services • Education and training services

	Objectives	Core services	Related services
	have dual uses		
EC[2]	Preserve exclusive nature of W/120 while addressing the following problems: new classification of "purely" and "core" environmental services and add "cluster" services (checklist)	New core list: • Water for human use and waste water management • Solid/hazardous waste management • Protection of ambient air and climate • Remediation and clean-up of soil and water • Noise and vibration abatement • Protection of biodiversity and landscape • Other environmental & ancillary services	"Cluster" services: • Business services with an environmental component • R&D with an environmental component • Consulting, contracting and engineering with an environmental component • Construction with an environmental component • Distribution with an environmental component • Transport with an environmental component. • Others with an environmental component.
Australia	Support EC proposal Highlight the fact that the core services presented in the EC proposal closely resemble the first category of the first category of the OECD/Eurostat classification: pollution management activities	See EC	See EC
Colombia	Support EC proposal Take into account private enterprise management approach	See EC	In addition to EC list, consider: • Implementation and auditing of environmental management

	Objectives	Core services	Related services
			systems • Evaluation and mitigation of environmental impact • Advice in the design and implementation of clean technologies
United States	Current classification fails to account for how businesses operate and focuses on "end-of-pipe" clean-up services without considering pollution prevention Support proposals which incorporate the current core list and add environmentally related sectors	Maintain current core list	List of environmentally related services: • Construction • Engineering • Consulting • Professional services • Business services
Canada	Proposal: maintain current core list and consider cluster environmental services	Maintain current core list	Cluster services: • Technical testing and analysis • Scientific and technical consulting • Engineering • Construction
Switzerland	Need to shift from "end-of-pipe" approach to prevention Expand core list and add related services	New core list: • Waste water management • Waste management • Protection of ambient air and climate • Remediation and clean-up of soil and water • Noise and vibration abatement • Protection of biodiversity and landscape • Other environmental and ancillary services	Related services: • Professional services relating to the environment • Research and development relating to the environment • Consultancy, sub-contracting and engineering relating to the environment • Construction relating to the

	Objectives	Core services	Related services
			environment

Source: OECD Secretariat on the basis of *Environmental Goods and Services: The Benefits of Further Global Trade Liberalisation*, OECD (2001) and Communications submitted in WTO: EC-S/CSC/W/25, 28-09-99, S/CSS/W/38, 22-10-00; Australia-S/CSS/W/112, 1-10-01; Colombia-S/CSS/W/121, 27-11-01; United States-S/CSS/W/25, 18-12-00; Canada-S/CSS/W/51, 14-03-01; Switzerland-S/CSS/W/76, 04-05-01.

ANNEX

OECD/EUROSTAT ENVIRONMENTAL GOODS AND SERVICES INDUSTRY MANUAL CLASSIFICATION

A. The "POLLUTION MANAGEMENT" group

Environmental equipment and specific materials

Air pollution control

This class includes any activity that produces equipment or specific materials for the treatment and/or removal of exhaust gases and particulate matter from both stationary and mobile sources. It includes air-handling equipment, dust collectors, precipitators, filters, catalytic converters, chemical treatment and recovery systems, specialized stacks, incinerators, scrubbers, odour control equipment, and environmentally less-damaging specialized fuels.

Wastewater management

This class includes any activity that produces equipment or specific materials for the collection, treatment and transport of wastewater and cooling water. It includes pipes, pumps, valves, aeration equipment, gravity sedimentation equipment, chemical treatment and recovery equipment, biological recovery systems, oil/water separation systems, screens/strainers, sewage treatment equipment, wastewater reuse equipment, water purification equipment and other water handling systems.

Solid waste management

This class includes any activity that produces equipment or specific materials for the collection, treatment, transport, disposal and recovery

of hazardous and non-hazardous solid waste. It includes waste storage and treatment equipment (thermal, biological, chemical), waste collection equipment, waste disposal equipment, waste handling equipment, waste separation and sorting equipment, recovery equipment and recycling equipment. It also includes equipment for outdoor sweeping and watering of streets, paths, parking lots, etc. It includes equipment, technology or specific materials for the treatment of low-level nuclear waste. It excludes materials for the treatment of high-level nuclear waste. Recycling activities exclude production of equipment or specific materials for the manufacture or production of new materials or products from waste or scrap and subsequent use of these materials or products.

Remediation and clean-up of soil, surface water and groundwater

This class includes any activity that produces equipment or specific materials to reduce the quantity of polluting materials in soil and water, including surface water, groundwater and seawater. It includes absorbents, chemicals and bioremediators for cleaning up, as well as cleaning-up systems either *in situ* or in appropriate installations.

Noise and vibration abatement

This class includes any activity that produces equipment or specific materials to reduce or eliminate the emission and propagation of noise and vibration, both at source and dispersed. It includes mufflers/silencers, noise deadening material, noise control equipment and systems vibration control equipment and systems.

Environmental monitoring, analysis and assessment

This class includes any activity that produces equipment or specific materials for the sampling, measurement, and subsequent recording, analysis and assessment of various characteristics of environmental media. It includes measuring and monitoring equipment, sampling

systems, data acquisition equipment, and other instruments or machines for measurement. Environmental information systems, analytical software, specific safety and personal protection for environmental purposes are included.

Other

This class includes any activity that produces equipment or specific materials to measure, prevent, limit or correct environmental damage to air, water and soil, as well as problems related to waste, noise and eco-systems, not included in any other class. These activities should be separately specified and listed.

Environmental services

Air pollution control

This class includes any activity that designs, manages systems or provides other services for the treatment and/or removal of exhaust gases and particulate matter from both stationary and mobile sources.

Wastewater management

This class includes any activity that designs, operates systems or provides other services for the collection, treatment and transport of wastewater and cooling water. It includes design, management or other services for sewage treatment systems, wastewater reuse systems and water handling systems.

Solid waste management

This class includes any activity that designs, operates systems or provides other services for the collection, treatment, management, transport, storage and recovery of hazardous and non-hazardous solid waste. It includes design, management or other services for waste handling (collection, transport, separation, sorting and disposal),

operation of sites, recycling (including collection of waste and scrap), and operation of recycling plants. It includes services for outdoor sweeping and watering of streets, paths, parking lots, etc. Services for the treatment of low-level nuclear waste are included. It excludes services for the treatment of high-level nuclear waste. It also excludes services for the manufacture of new materials or products from waste or scrap and the subsequent use of these materials or products.

Remediation and clean-up of soil, surface water and groundwater

This class includes any activity that designs, manages systems or provides other services to reduce the quantity of polluting materials in soil and water, including surface water, groundwater and seawater. It includes cleaning-up systems either *in situ* or in appropriate installations, emergency response and spills clean-up systems. Treatment of water and dredging residues are included.

Noise and vibration abatement

This class includes any activity that designs, manages systems or provides other services to reduce or eliminate the emission of noise and vibration, both at source and dispersed. It includes design, management or other services for acoustic and soundproof screens and street covering.

Environmental R&D

This class includes any systematic and creative activity concerned with the generation, advancement, dissemination and application of scientific and technological knowledge to reduce or eliminate emissions in all environmental media and to improve environmental quality. It includes non-technological research to improve knowledge about ecosystems and the impact of human activities on the environment.

Environmental contracting and engineering

This class includes any activity that investigates feasibility, designs and manages environmental projects not included elsewhere. It includes multidisciplinary environmental contracting and engineering. Environmental management consulting, other environmental consulting services and environmental audit services are included.

Analytical services, data collection, analysis and assessment

This class includes any activity that designs, manages systems or provides other services to sample, measure and record various characteristics of environmental media. It includes monitoring sites, operating both singly and in networks, and covering one or more environmental media. Health, safety and toxicology studies and analytical laboratory services are included. Weather stations are excluded.

Education, training and information

This class includes any activity that provides environmental education or training or disseminates environmental information, and is executed by specialized institutions or other specialized suppliers. It includes education, training and information management for the general public, and specific environmental workplace education and training. The activities of the general educational system are excluded.

Other

This class includes any activity that provides services to measure, prevent, limit or correct environmental damage to air, water and soil, as well as problems related to waste, noise and eco-systems, not included in any other class (e.g. general public administration, if it provides specific environmental services not elsewhere classified). These activities should be separately specified and listed.

Construction and installation

This class includes any activity for the construction and installation of facilities for: air pollution control; wastewater management; solid waste management; remediation and clean-up of soil, surface water and groundwater; noise and vibration abatement; environmental monitoring, analysis and assessment; other environmental facilities.

B. The "CLEANER TECHNOLOGIES AND PRODUCTS" group

This group includes any activity which continuously improves, reduces or eliminates the environmental impact of technologies, processes or products.

Cleaner/resource-efficient technologies and processes

These are cleaner and resource-efficient technologies which decrease material inputs, reduce energy consumption, recover valuable by-products, reduce emissions, minimize waste disposal problems, or some combination of these.

Cleaner/resource-efficient products

These are cleaner or resource-efficient products which decrease material inputs, improve product quality, reduce energy consumption, minimize waste disposal problems, reduce emission during use, or some combination of these.

C. The "RESOURCE MANAGEMENT" group

Note: In the case of the "Resource Management" group, activities aimed at the production of environmental goods and services and related construction are grouped together for

convenience. However, it is suggested that, wherever possible, information on these items be separately collected and presented under separate headings for equipment, services and construction.

Indoor air pollution control

This class includes any activity that produces equipment, technology or specific materials, designs, constructs or installs, manages or provides other services for the treatment and renewal of indoor air to remove pollutants. It excludes air-conditioning.

Water supply

This class includes any activity that produces equipment, technology or specific materials, designs, constructs or installs, manages or provides other services for water supply and delivery systems, both publicly and privately owned. It includes activities aimed at collecting, purifying and distributing potable water to household, industrial, commercial or other users.

Recycled materials

This class includes any activity that produces equipment, technology or specific materials, designs, constructs or installs, manages or provides other services for manufacturing new materials or products, separately identified as recycled, from waste or scrap.

Renewable energy plant

This class includes any activity that produces equipment, technology or specific materials, designs, constructs or installs, manages or provides other services for the generation, collection or transmission of energy from renewable sources, including solar, wind, tidal, geothermal or biomass sources.

Heat/energy saving and management

This class includes any activity that produces equipment, technology or specific materials, designs, constructs or installs, manages or provides other services to reduce heat and energy use or minimize heat and energy loss (e.g. co-generation). It includes equipment, technology or specific materials to reduce climate change.

Sustainable agriculture and fisheries

This class includes any activity that produces equipment, technology or specific materials, designs, constructs or installs, manages or provides other services for systems which reduce the negative environmental impact of agriculture and fishery activities. It includes biotechnology applied to agriculture and fishery activities.

Sustainable forestry

This class includes any activity that produces equipment, technology or specific materials, designs, constructs or installs, manages or provides other services for programmes and projects for reforestation and forest management on a long-term sustainable basis.

Natural risk management

This class includes any activity that produces equipment, technology or specific materials, designs, constructs or installs, manages or provides other services for systems to prevent or reduce the impact of natural disasters (storms, floods, volcanic eruptions, etc.).

Eco-tourism

This class includes any activity that designs, constructs, installs, manages or provides other services for tourism that involves protection and management of natural and cultural heritage, or

education and interpretation of the natural environment, and that does not damage or degrade the natural environment.

Other

This class includes any activity that measures, prevents, limits or corrects environmental damage to air, water and soil, as well as problems related to waste, noise and eco-systems, which is not included in any other class (e.g. nature conservation, habitats and biodiversity). These activities should be separately specified and listed.

Source: OECD, The Environmental Goods and Services Industry: Manual for Data Collection and Analysis, 1999, annex 1.

THE ENVIRONMENTAL INDUSTRY AND THE PROSPECTS FOR BUILDING CAPACITY IN DEVELOPING NATIONS:

Current situation and trends in the environmental industry and options for developing countries in developing capacity and export competitiveness in environmental services

Grant Ferrier*

Introduction

This paper presents a perspective on the present situation and trends in global markets for environmental goods and services; developments in environmental trade; business approaches of competitors in the environmental industry; and options in exports and imports for developing countries in the global environmental industry.

The provision of environmental services plays a crucial role in establishing and maintaining the quality of life for citizens of every nation of the world. Environmental services also are essential for creating an infrastructure for the operation of commercial and industrial enterprises that serve as the basis of a nation's economy.

While historically the basic environmental services of provision of potable water, sewage and solid waste removal have been provided by the Government as a "public good", these services are increasingly

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being provided by private companies in the developed world. In the developing world, on the one hand many nations are faced with the social realities of the costs of environmental degradation, while on the other hand they encounter the economic realities of paying for the establishment of an infrastructure to provide basic environmental services. This leads to an inevitable central question as to whether Governments should provide environmental services or whether private entities should be encouraged to be in the business of providing basic environmental services to the citizens of a developing nation.

The broader question of privatization of environmental services aside, the main objective of this paper is to provide a perspective on what the environmental industry is, how big it is, and what its main companies, market drivers and trends are, and subsequently to use this perspective to assess how developing countries can strengthen their capacity to address their own environmental problems and potentially export this capacity to other nations.

This paper has the following components:

- Definition and analysis of the environmental industry, with special emphasis on the environmental services segment;
- Size of the global environmental industry by region and segment;
- A listing of the main companies;
- Market drivers of the environmental markets in developing and developed nations;
- Trends in the environmental industry;
- Profiles of selected developing country markets as examples of market evolution and capacity development of environmental industries;
- Opportunities for developing country firms in terms of (a) strengthening their capacity to address and solve their domestic

environmental problems, and (b) becoming international providers and exporters of environmental services;

- Regarding capacity building and potential for export in developing nation environmental industries, the issue of potential reduction of elimination of trade and non-trade barriers to environmental goods and services is addressed.

1. Background on the Environmental Industry

Before presenting and discussing any detailed numbers on the global environmental market, it is vital to go through the exercise of industry definition. Just what is the environmental industry? Environmental Business International Inc. (EBI, San Diego, California, United States) has undertaken the defining, classifying and quantifying of the environmental industry since 1987. Prior to that time the industry had yet to be characterized or analysed as a whole, but existed rather in disconnected segments.

The environmental industry's environmental infrastructure base (primarily through the provision of traditionally municipal services) is certainly not new. While often referred to as an emerging sector, the industry has its roots in water delivery systems (going back to the aqueducts of Rome), sanitation engineering (sewage infrastructure) and waste management (refuse collection).

With the creation of the United States Environmental Protection Agency in 1970 and the introduction of environmental legislation, regulation and enforcement in many other developed economies over the following two decades, new breeds of private business activity emerged. These included air pollution control equipment, environmental consulting and engineering services, sophisticated environmental instrumentation and testing services, hazardous waste management and remediation or clean-up services.

2. Defining the Environmental Industry

Environmental industry activities can be divided into three major categories, depending on the dominant source of revenue generation for the entities in question:

- Service segments are operations that obtain their revenues from collecting fees for services rendered.
- Equipment segments are manufacturers that obtain their revenues from the sale of equipment.
- Resource segments are entities that obtain their revenues from the sale of a resource (like water or energy) or reclaimed materials (like metals or paper).

Table 1 provides a concise yet inclusive definition of the environmental industry, by these three categories and by fourteen business segments. It is worth noting that this evolving structure is lumped into business segments and has always sought to be consistent with traditional industry analysis along the lines of standard industry classification (SIC) or harmonized codes of types of companies. (EBI performs almost 2,000 surveys in its annual "census" of mostly United States environmental companies.) This structure is mostly consistent with OECD guidelines drawn up in the past few years with EBI input, the most important exception being the inclusion of construction costs in OECD's figures.

Table 1. Environmental industry definition and segments

Segment	Description	Examples of clients
Environmental services		
Environmental testing and analytical services	Provide testing of "environmental samples" (soil, water, air and some biological tissues)	Regulated industries, government environmental consultants, hazardous waste and remediation contractors
Wastewater treatment works	Collection and treatment of residential, commercial and industrial wastewaters. Facilities are also known as sewage treatment plants or publicly owned treatment works (POTWs)	Municipalities, commercial establishments and all industries
Solid waste management	Collection, processing and disposal of solid waste and secondary materials	Municipalities and all industries
Hazardous waste management	Manage ongoing hazardous waste streams, medical waste, and nuclear waste handling	Chemical companies Petroleum companies Government agencies
Remediation/industrial services	Physical clean-up of contaminated sites, buildings and environmental cleaning of operating facilities	Government agencies Property owners Industry
Environmental consulting and engineering (C&E)	Engineering, consulting, design, assessment, permitting, project management, O&M, monitoring, etc.	Industry, government municipalities, waste management companies, POTWs

Environmental equipment		
Water equipment and chemicals	Provide equipment, supplies and maintenance in the delivery and treatment of water and wastewater	Municipalities and all industries
Instruments and information systems	Produce instrumentation for the analysis of environmental samples; includes info systems and software	Analytical services, government-regulated companies
Air pollution control equipment	Produce equipment and technology to control air pollution; includes vehicle controls	Utilities, waste-to-energy industries, auto industry
Waste management equipment	Equipment for handling, storing or transporting solid, liquid or hazardous waste. Includes recycling and remediation equipment	Municipalities Generating industries Solid waste companies
Process and prevention technology	Equipment and technology for in-process (rather than end-of-pipe) pollution prevention and waste treatment and recovery	All industries
Environmental resources		
Water utilities	Selling water to end users	Consumers, municipalities and all industries
Resource recovery	Selling materials recovered and converted from industrial by-products or post-consumer waste	Municipalities Generating industries Solid waste companies
Clean energy Sources	Selling power and systems in solar, wind, geothermal, small- scale hydro, energy efficiency and DSM	Utilities All industries and consumers

Source: Environmental Business International Inc. (San Diego, California).

3. Size of the Global Environmental Industry

The global environmental market reached an estimated US$ 522 billion in 2000 (table 2). Although 85 per cent of this market was in

the United States, Western Europe and Japan, these areas have collectively represented only 2-3 per cent annual growth in recent years. In developed nations environmental markets are in a period of transition where market drivers relying on regulations and enforcement have diminished in effectiveness as regards their ability to secure further environmental improvement. New policies emphasizing market instruments, economic policy, information disclosure, voluntary business standards and other measures are slowly being tested as nations seek to achieve more gains in environmental quality, basing policy on sustainability issues rather than regulatory compliance.

Table 2. Size of the global environmental industry by region

	US$ Billion in 2000	
United States	197.7	38%
Western Europe	156.0	30%
Japan	90.7	17%
Rest of Asia	24.6	5%
Mexico	2.3	0.4%
Rest of Latin America	9.4	2%
Canada	13.6	3%
Australia/New Zealand	8.5	2%
Central and Eastern Europe	9.4	2%
Middle East	6.6	1%
Africa	3.4	1%
	522	

In the developing world, the situation is quite different. Most nations lack the basic environmental infrastructure to provide drinking water, wastewater treatment and solid waste management, as well as making little progress in limiting or controlling industrial air pollution, water pollution and hazardous waste generation. These markets exhibit a tremendous need for environmental equipment and services, but in spite of legal structures that are adequate, the political and

economic situation rarely leads to a healthy and consistent environmental market. Nonetheless, strong growth is forecast in transition economy markets and subsequently in developing markets as domestic policy and overseas development assistance programmes combine to create a market out of the tremendous need of those markets.

Ready to respond to the challenge, the world's environmental industry represents one of the largest accumulations of technical, engineering, manufacturing and management skills in the world today. Prospects for growth in demand for these talents, however, do not look as promising as they once did. Initial perceptions that environmental problems in the developing world and transition economies would sustain strong growth are not unfounded. However, many of these nations have been slow to develop functional enforcement mechanisms for their already substantial environmental laws and regulations, and funding for environmental projects in the private and public sectors has often been difficult, this difficulty being exacerbated particularly by regional financial and economic crises.

In the developed world, another factor is in play. Here substantial environmental work has been done and substantial environmental industries have evolved in response to a more cohesive environmental policy. The demand created, however, by the predominantly punitive regulatory systems has levelled off as the major industries which represent the most obvious targets of enforcement activities have reached acceptable measures of compliance. There is little doubt that in advanced environmental economies such as the United States and Germany, the domestic market for equipment and services related to pollution control, compliance and clean-up or remediation has declined in recent years. While these functions represent only 27 per cent of the environmental market in markets such as that in the United States (see below), their decline has driven environmental service companies to seek growth opportunities in the developing world.

By far the largest part of the environmental industry, and an even greater part of its service segments, are represented by designing, building, operating and maintaining environmental infrastructure and

resource systems mostly related to water, wastewater, solid waste and resource recovery (table 3). It is these segments that not only are currently burgeoning in the developing world in terms of demand, but also are the largest sustainable growth areas for environmental service companies in the developed world.

With recovery and stability on the way in Latin America and South-East Asia, broadening demand in the Middle East, Eastern Europe and even parts of Africa, and the emergence of China on the global economic scene, the environmental market outside the developed world looked better in 2000 than it had for a number of years. At the same time, economic prosperity in the United States and strengthening economies in Europe and Japan were creating a generally positive business climate.

The environmental industry itself has globalized to take advantage of these opportunities, but little leadership has been provided by United States companies. In the prominent water, wastewater and solid waste segments—which together represent more than half the global market—the United States environmental industry has lost ground through the outright acquisition of its leading companies (the French firm Vivendi's purchase of U.S. Filter in the water segment) or the divestiture of international assets (sales of foreign operations by BFI and Waste Management in the solid waste segment).

Control of the water and solid waste service segments invariably has an effect on equipment and supply sales, and if the two equipment segments that supply the waste and water infrastructure are added to the service totals, this represents more than two thirds of the global market where the United States environmental industry is losing competitiveness. That industry remains fairly well positioned for the remaining third of the market, however, and has by no means given up on the water and waste segments, but must leverage its comparative advantage in consulting and engineering, remediation, instruments and information technology and services. Opportunities in automation for treatment systems and monitoring, advanced design, biological systems, materials reuse and efficiency, and use of the Internet are all

areas in which United States companies should be in a good position to gain market share.

Table 3. Size of the global environmental industry by segment

Equipment	US$ Billion in 2000	
Water equipment and chemicals	45.1	8.6%
Air pollution control	32.9	6.3%
Instruments & info systems	7.1	1.4%
Waste Mgmt equipment	34.3	6.6%
Process and prevention tech	2.8	0.5%
Services		
Solid waste management	112.7	21.6%
Hazardous waste management	17.1	3.3%
Consulting and engineering	29.2	5.6%
Remediation/Industrial services	27.3	5.2%
Analytical services	3.1	0.6%
Water treatment works	74.1	14.2%
Resources		
Water utilities	81.2	15.6%
Resource recovery	42.2	8.1%
Environmental energy	12.5	2.4%
	522	

4. Global Market Numbers by Segment

As mentioned above, the global environmental industry reached an estimated US$ 522 billion in annual revenues in 2000, according to data compiled and analysed from more than 50 sources by Environmental Business International Inc. Overall growth in 2000 was about 4 per cent, up from 1998 and 1999 growth rates of 2-3 per cent. It is hard, however, to look at the environmental market, or the world

for that matter, as a cohesive unit. Within the environmental industry, variation between segments is considerable, and globally the variation between developed, developing and transition economies—and particularly their environmental markets—is understandably great.

Among industry segments, recent growth has been led more by equipment segments than by their service or resource counterparts. Service markets are in relative decline for a number of reasons relating to fundamental transitions in the industry. Projects and initiatives have shifted from assessment to solutions, from pollution control to pollution prevention, and less waste is generated per unit of output in most major industries. These trends are particularly true in developed nations, although the pace of improvement has slowed recently. In general, customers have become less reliant on service providers to identify and solve all their environmental problems and have moved on to maintaining their own solution system—or obviating the need for any environmental solution at all by a change in process, material or product line.

In developing nations and transition economies, enforcement mechanisms remain inadequate to drive environmental markets to the level they are at in developed nations. Also, a considerable portion of their industrial communities are represented by global multinationals, many of which have adhered to domestic standards and are pursuing longer-term environmental strategies of prevention over control. In other words, the continued globalization of business and liberalization of trade should serve to enhance environmental conditions in the developing world.

A separate factor driving equipment sales more than services is the substantial migration of environmental equipment vendors outside their borders in the past decade. While United States equipment segments make up only 26 per cent of the industry, they account for 58 per cent of exports. Conversely, while service segments account for more than 50 per cent of industry revenues, they represent only 19 per cent of exports (see table 4).

Table 4. 2000 United States environmental industry trade balance

Equipment	US ind	US mkt	Surplus	Exports	Imports	% export
Water equipment & chemicals	19.8	16.7	3.1	5.83	2.7	29%
Air pollution control	17.6	16.1	1.5	3.70	2.2	21%
Instruments & info. systems	3.6	2.5	1.2	1.49	0.3	41%
Waste management equipment	9.9	9.5	0.3	1.77	1.4	18%
Process & prevention technology	1.2	1.3	-0.1	0.07	0.2	6%
Services						
Solid waste management	39.0	39.4	-0.4	0.70	1.1	2%
Hazardous waste management	5.1	5.2	-0.1	0.05	0.2	1%
Consulting & engineering	17.4	15.7	1.7	2.44	0.7	14%
Remediation/industrial services	11.2	11.1	0.1	0.40	0.3	4%
Analytical services	1.2	1.2	0.1	0.06	0.0	5%
Water treatment works	28.4	30.8	-2.4	0.20	2.6	0.7%
Resources						
Water utilities	30.3	32.6	-2.3	0.09	2.4	0.3%
Resource recovery	16.0	13.1	3.0	3.37	0.4	21%
Environmental energy	4.2	2.6	1.6	2.27	0.7	54%
Total	**204.9**	**197.7**	**7.2**	**22.4**	**15.2**	**10.9%**

Source: EBI Inc., San Diego CA, units in $ bil. US ind is revenues generated by US cos worldwide. US mkt is revenues from US customers. Exports do not include ownership of overseas companies but do include repatriated profits.

The globalization of environmental equipment markets has occurred faster than that of services mostly because of the inherent nature of the product—it is easier to export a manufactured product than a consulting project, for instance—and this trend looks likely to persist as environmental export activities in the leading economies gather momentum. It is no secret that Germany, the Netherlands, Denmark and other countries have made a concerted effort to do their best in global markets. “We solved all our problems at home some

time ago", said an executive from a German consulting company at a United Nations meeting in Manila. “That’s why we are all here.”[1]

5. Global Top 50 Companies Reflect National Strengths

As the industry changes, so do its leading players. EBJ’s fifth compilation of the world’s top environmental companies, carried out in 1998 and presented below (table 5), demonstrates how the characteristics of a domestic market can decide which type of environmental company will become dominant. In France, private management of the water and wastewater infrastructure has resulted in its having two of the three largest environmental companies in the world. These two, Vivendi and Suez Lyonnaise des Eaux, have leveraged their considerable capital bases into other segments within the industry with business synergies such as water equipment and chemicals and customer synergies such as municipal solid waste, as well as into many other sectors such as power, telecommunications and real estate. Vivendi’s United States presence includes not only U.S. Filter but also the US$ 400-million Superior Services in solid waste, a deal with the old Chemical Waste Management facilities held by Waste Management in hazardous waste and numerous companies in water equipment and water-related instrumentation. Lyonnaise’s prominent United States holdings include United Water Resources, the second largest private water utility and contract operations firm, and Nalco Chemical, the top water chemical company. In the developing world, both these French giants have established partnerships and investments in water systems in Asia, Africa, Latin America and elsewhere.

Like the French firms, the United Kingdom’s top firms resulted from the privatization of water and wastewater utilities, although this was done in a sweeping gesture in 1989. The United Kingdom has 9 of the top 60 environmental firms in the world, all of which started as water utilities but some of which have diversified into other segments. Germany’s water infrastructure remains for the most part in public

[1] UN-DPSCD, Third Expert Group Meeting on Financial Issues of Agenda 21, 6-8 February 1996, at ADB in Manila.

hands, as in the United States and Japan, and its top environmental firms tend to be in engineering construction (EC) and solid waste. Japan's leading firms are technology- and equipment-oriented or are part of larger conglomerates. Top United States firms are in the more broadly privatized and consolidated solid waste sector, but also include global leaders in EC and consulting and engineering (C&E) and some supply segments, notably instruments.

The global industry continues to consolidate, although not quite so rapidly as other sectors. EBJ's global top 50 in 1994 accounted for 17.5 per cent of global revenues, subsequently moving up to 18.6 per cent in 1995 and reaching 20.6 per cent, or almost US$ 100 billion in 1998.

Table 5. Top 50 global environmental companies in 1998
(Latest year full list is available)

98 RANK	COMPANY	COUNTRY	SEGMENT	98 ENV'L REVENUES US$ MILLIONS
1	Vivendi (Générale des Eaux)	France	Water/SW/HW/WE&C	13 192
2	Waste Management	USA	Solid waste/WME	12 704
3	Suez Lyonnaise des Eaux	France	Water/WE&C/SW	7 254
4	Browning Ferris Industries	USA	Solid Waste	4 746
5	Severn Trent	UK	Water/WW/C&E	3 756
6	SITA (Lyonnaise)	France	Sol/haz. waste	3 152
7	Mitsubishi Heavy Industries	Japan	Incin/APC/water equip.	2 605
8	Ebara Corp	Japan	W/WW/APC/SW/RIS	2 566
9	Bechtel Group Inc.	USA	EC/remed.	2 504
10	Kubota (Ind'l Eq div.)	Japan	Equip.	2 204
11	Thames Water	UK	WU/WTW	2 135
12	Rethmann Entsorgungs	Germany	Solid waste	2 032
13	Betz Laboratories Inc.	USA	Water treatment	1 900
14	Republic Services	USA	Solid waste	1 839
15	Allied Waste	USA	Solid waste	1 576
16	RWE Entsorgung AG	Germany	Solid waste/C&E	1 511
17	Noell Gmbh	Germany	APC/EC/SW/RR	1 500
18	Bilfinger + Berger	Germany	EC	1 432
19	Hitachi Zosen	Japan	WME	1 345
20	Anglian Water	UK	Water	1 336
21	Nalco Chemicals Co.	USA	Water equip./chemicals	1 293
22	United Utilities	UK	Water/WW/equip	1 283
23	Kurita Water Industries	Japan	Equipment	1 236
24	Philip Services	Canada	RR/ind'l svcs	1 200
25	Safety Kleen Corp.	USA	Haz. waste/recycling	1 185
26	Asea Brown Boveri Corp.	Switzerland	APC/WME	1 130
27	Kelda Group (Yorkshire)	UK	WU/WTW/AS/med.waste	1 083
28	IT Corp.	USA	C&E/remed.	1 052

98 RANK	COMPANY	COUNTRY	SEGMENT	98 ENV'L REVENUES US$ MILLIONS
29	American Water Works Co.	USA	WU/WTW	1 018
30	CH2M Hill Cos.	USA	C&E	1 017
31	Fomento de Construcciones y Contratas	Spain	EC/wolid waste	1 000
32	Philipp Holzmann	Germany	Solid Waste/EC	988
33	Takuma (Envl Eq & M/M divs)	Japan	Equip.	983
34	Babcock Borsig (Deutsche Babcock)	Germany	WME/APC	981
35	Hochtief	Germany	EC	921
36	Northumbrian Water	UK	W/WW	908
37	Thermo Electron Corp.	USA	Inst./C&E	850
38	Fluor Daniel Inc.	USA	EC	833
39	Foster Wheeler Corp.	USA	EC	753
40	Southern Water	UK	WEC/WU	751
41	Black & Veatch	USA	C&E/EC	749
42	Linde	Germany	Equip/C&E	726
43	California Energy	USA	Geothermal Power	700
44	ICF Kaiser International Inc.	USA	C&E	670
45	Organo	Japan	Water equip.	666
46	Tsukishma Kikai	Japan	Water/sludge/incin. eq.	639
47	Buderus	Germany	Construction/WEC	602
48	GEA Pref.	Germany	EC	584
49	NEG Micon	Denmark	Wind power systems	580
50	Edelhoff AG&Co	Germany	Solid waste	528
51	Vestas	Denmark	Wind power systems	522
52	Earth Tech	USA	C&E	502
53	Watco SA	Belgium	Solid waste	500

Source: Environmental Business International Inc. (San Diego, CA). Figures are revenues generated for calendar year 1998 in the environmental industry only. This list is a result of data compiled from public sources and independent research conducted by EBI. In some cases, revenues are

approximations derived from executives, analysts and reputable business information sources. Although EBI has made every reasonable effort to be accurate, figures are not the result of internal or external audits and are therefore not guaranteed to be accurate. Errors and omissions are unintentional.

6. Changing Environmental Market Drivers

Over the next 20 years, the world's economy will undergo an important and inevitable shift that will fundamentally change the way in which our environment and our resources are valued and managed. Economic – not environmental – policy will create a larger and enduring framework for sustainable development. The true manifestation of sustainable development lies in the internalization of what economists have historically classified as "externalities": pollution, waste accumulation, contamination and natural resource degradation. In a truly sustainable economy these externalities will be internal to the free market economy and part of the financial equation for all private enterprise and government operations, thus creating an ongoing economic incentive for continuous environmental improvement that is sadly lacking in environmental markets today.

With declining effectiveness of regulation, environmental technology development is increasingly being driven by resource economics rather than by environmental regulation. The international competitiveness of nations will increasingly depend on the appropriate application of environmental technology. Pollution and waste generation are starting to be seen not as just a threat to the environment and public health but as manifestations of inefficient resource use from an economic perspective. In a more sustainable economy, the world's leading economic nations will have the most efficient industries in terms of energy, resources and materials use, and at the same time offer their citizens the highest quality of life – measured not only by economic standards but also by public health and environmental quality.

THE ENVIRONMENTAL INDUSTRY AND PROSPECTS FOR BUILDING CAPACITY IN DEVELOPING NATIONS

The environmental industry on its own cannot usher in the eternity of global sustainable development. Nor can it be solely responsible for creating the framework for demonstrating competitive advantage through environmental quality. But the relative success of the environmental industry in its ability to adjust to delivering on competitive and sustainability goals rather than environmental compliance issues will be instrumental to the competitiveness of all industries in a sustainable economy.

The environmental industry itself is only gradually becoming aware of this aspect of its future, after years of preoccupation with short-term compliance issues. In the long term the environmental industry will be more along the lines of efficient resource management taking the forms of:

- Water resource management, water delivery, wastewater treatment and water reuse and recycling systems;
- Privatization of what traditionally have been municipal environmental services, such as provision of water, wastewater treatment and waste management;
- Transitioning waste management into resource management through resource recovery and recycling systems, as well as designing reusability and recyclability into all products;
- Energy efficiency and more sustainable energy systems from renewable sources;
- Industrial design for pollution prevention and efficiency in the form of life-cycle analysis and design for the environment; and
- Application of analytical and information technology for pollution prevention, process efficiency and operations.

Several European companies provide useful examples of how international business competitiveness was improved as a result of privatization of water utilities and wastewater treatment works. France and the United Kingdom have become by far the most internationally

competitive for providing the integrated package of designing, building, managing and even owning water infrastructure around the world. It is no coincidence that French and British companies have won the major projects in Mexico, Brazil, Malaysia, Taiwan Province of China and elsewhere.

Privatization of the solid waste infrastructure in the United States has effectively made the United States demonstrably the most internationally competitive in this segment. The importance of the three environmental infrastructure segments (solid waste management, resource recovery, water treatment works and water utilities) cannot be overemphasized, because together they represent 60 per cent of the US$ 522-billion global environmental market, and in the developing world almost 70 per cent.

German government statistics indicate that annual investment in environmental protection by Germany's manufacturing sector decreased from a peak of US$ 4.6 billion in 1990 to US$ 2.9 billion in 1995 and has continued to slide ever since. In spite of the fall-off in the domestic market, Germany’s Ministry for Environment states that its environmental industry grew throughout the 1990s, fuelled principally by exports. It maintains that in 1995, Germany was the world leader with 19 per cent of what it called the “export” market (i.e. markets outside Germany but not counting other nations' domestic sales), followed by the United States (18 per cent) and Japan (15 per cent).

Table 6. Relative competitiveness of environmental industries by nation/region

Equipment	USA	Germany	Japan	F & UK	Dev'g	Weight
Water equipment & Chemicals	G	G	GE	**GE**	MP	3
Air pollution control	OG	**E**	**E**	O	MP	3
Instruments & info Systems	**E**	G	G	O	P	3
Waste management Equipment	G	**GE**	OG	O	OM	2
Process & prevention tech.	P	P	**M**	P	P	1
Services						
Solid waste management	G	OG	OM	**EG**	MP	3
Hazardous waste management	**G**	O	O	OG	P	2
Consulting & Engineering	**GE**	OG	M	OG	MP	3
Remediation/industrial Services	**G**	O	M	OM	P	2
Analytical services	**G**	O	O	O	MP	1
Water treatment Works	MP	M	MP	**GE**	MP	4
Resources						
Water utilities	MP	MP	P	**GE**	MP	3
Resource recovery	O	**OG**	O	O	MP	1
Environmental Energy	**OG**	**OG**	**OG**	**OG**	P	2
Rating	111	105	93	111	47	

Source: Environmental Business International, Inc., San Diego, E-excellent, G-good, O-OK, M-mediocre, P-poor. Based on ratings of technology, commercial orientation, management, finance, global presence, government support and labour.

EBI estimates that while Germany's 20-25 per cent of environmental industry revenues generated from outside its borders compares favourably with the 10 per cent for the United States in 1998, Germany's overall export dollars of a little over US$ 9 billion are less than half the US$ 18.9 billion figure for the United States. Lack of uniform segment definitions plague environmental market and export comparisons of government and private data, although this should improve significantly provided that nations remain close to classifications and methodologies agreed upon in a series of OECD-sponsored meetings from 1997 to 1999.

Japan exported 15-20 per cent of its US$ 88-billion environmental industry in 1998 for around US$ 15 billion in international revenues. It has made a concerted effort to promote exports like the others, but also to promote imports to enhance its own environmental industry capacity and manufacturing efficiency. The definition of the environmental market in Japan used by the Ministry of International Trade and Industry (MITI) includes many of the segments used by EBI and in the OECD manual but adds "environmentally safe manufacturing upgrades" (US$ 1.8 billion in 1997) and "new energy and conservation" (US$ 14.8 billion). MITI lists the following areas as markets with immediate potential in Japan: waste reduction, dioxin treatment and analysis, consulting engineering and environment assessment, toxic waste management, plastic recycling equipment, wind power and technology for cleaner vehicles. The worst of Japan's economic decline in the late 1990s, which also impacted on the environmental business, has been left behind and MITI forecasts annual growth in the double digits, paced by both slightly better economic conditions and the many areas of "catch-up" that Japan must still pursue in environmental programmes. Seasoned environmental market observers are less optimistic but still acknowledge that growth could exceed that of the overall Japanese economy for some time, led by remediation, recycling and energy and industrial process efficiency investments stimulated by waste avoidance programmes started as industrial waste disposal costs increase.

7. Market and Policy Evolution Scenarios: Leadership up for Grabs in Resource Productivity

A last frontier for the environmental industry, especially in the light of global policies related to climate change—not to mention the rising price of oil—is the environmental energy or "clean energy" segment. This business segment continues to evolve and includes renewable energy technology and systems, small-scale off-the-grid applications such as microturbines and fuel cells, as well as efficiency technology in power generation, storage and transmission, and an array of high-efficiency energy-consuming devices.

No nation or region has a clear advantage in renewable energy or energy efficiency, although markets increasingly value these types of technologies with the addition of climate change policies, various energy independence policies and, sporadically in bursts, when oil prices are up. Many observers assert that competitiveness in resource productivity related to energy (as well as materials, water and even human resources and information) will be the foundation of industrial and national competitiveness in the future—even more so than information technology and the Internet.

Although we are at the beginning of an Internet era that can revolutionize the way we do business, the Internet revolution may not have the lasting impact of the coming energy revolution. It seems unlikely, however, that equity markets in the short term will give equal recognition to the promise of resource productivity and non-fossil fuel energy sources as they once did to Internet stocks.

Nevertheless, long-term strategists in many United States industries, such as power utilities (Duke Power, PG&E, Florida Power & Light), manufacturing, consumer goods and even multinationals based in traditional fossil fuels (BP/Amoco) have structured investment plans around more sustainable resource economics. As the economics of resource productivity take hold across all industries and around the world over the next two decades, the definition of environmental technology, the environmental industry and especially

what are now viewed as environmental companies will continue to change.

The process of environmental industry evolution has occurred principally in the developed world, and most notably in the United States and Europe. Even in the developing world, many nations have based their environmental standards, programmes and regulations on those already set up in other nations. For instance, the regulatory systems in Canada and Mexico, though unique in their own way, are very much based on the United States' laws and system. In Europe with EU standards becoming more influential, many policies and programmes are "borrowed" from nations which have led the way and through successes and failures have settled on systems that work for them.

Uniformity in environmental policy is a good thing for society and a good thing for the global environmental industry. No one wants a situation where companies can "go elsewhere" so that they can continue to pollute or brazenly exploit resources with impunity. Similarly, companies selling environmental solutions in services and equipment desire some uniformity in demand drivers so that they are not "reinventing the wheel" every time the same problem arises in a different nation. Of course, national sovereignty must always be respected.

The dilemma of the need for both uniformity in environmental policy and some degree of national sovereignty is a crucial issue for the world, and especially the developing world. Examples abound of developing and transition nations overexploiting their resources or "under-regulating" the environment in exchange for short-term economic gain. In March 2002 international controversy brewed as the Brazilian Government proposed to open up significant portions of its undeveloped land to investors with some of the worst track records for "unsustainable" development. At the same time in the United States, the Bush Administration continues openly to admit to, and be subjected to pressure for, relaxation of environmental standards, as a result of which a number of high-level officials of the Environmental Protection Agency have resigned.

Clearly, there is no easy solution to the environment versus economy debate, and it is also clear that this debate will persist in the developed and the developing world in perpetuity. Some policy leaders envision a system based much more on economics and taxation that will "level the playing field" for all nations in terms of pollution and resource use. However, if these economic measures curtail the development aspirations of the developing world and their desire to substantially raise the standard of living for their populations, they will have to be applied carefully.

Perhaps a system of environmental taxes or pollution fees, or unsustainable resource extraction fees, could be retroactively applied, one based on the negative economic impact created by almost a century of unsustainable activity in the developed world. In other words, the United States or Japan has consumed a certain measure of fossil fuels since what is called the Industrial Revolution, and a certain increment in fee or tax could be applied for each unit. The fees raised by such an exercise could be used by developing nations to develop their infrastructure for power, materials, waste, water and other resources using the best technology rather than the cheapest technology – and even drive demand for environmental technology innovation and global environmental technology transfer on a scale certainly not seen today.

Admittedly, solving the world environmental and economic problems is not within the scope of this paper, but in its full extension the issue of capacity development of environmental services in developing nations comes back to the central issue of the future of environmental and economic policy.

8. Review of Markets in Developing Regions

While the objective of uniform environmental policy and markets remains, the reality is that each nation’s environmental market evolves in its own way, affected by social, economic and political issues inside its borders, as well as by some pressure from outside its borders. The following review is included not necessarily to serve as a model or to set examples for markets, but more to capture some fairly recent

trends in environmental markets in selected nations. Much of the research was conducted over a two-year period and some situations may have changed, but again this information is included more for the purpose of illustration rather than to serve as comprehensive analysis.

8.1 Asia's Markets into Recovery

For global markets on a geographical scale, while growth rates may be considerably lower in developed nations, the net gain in additional revenue remains substantially larger because of their larger size. The United States, Western Europe and Japan may all be considered mature markets with little chance of growth higher than 3-4 per cent except in a few niches, but they still represent 85 per cent of the global market—and 72 per cent of the revenue gain from 1999 to 2000, even with Japan's decline in the year 2000. Prior to the late 1990s, however, a larger portion of revenues in global environmental markets was added in transition economies subsequently derailed by regional financial crises in Asia and Latin America.

Emerging environmental markets in South-East Asia, which grew by 15-25 per cent per annum in 1995 and 1996, slowed to a halt and in some cases declined in 1997 and 1998. This turnaround only reinforced the lesson learned in the United States market in 1991 and 1992, namely that environmental markets were certainly not immune from economic down cycles but were in fact vulnerable to them. Adding insult to injury, analysts often contend that environmental markets are quick to fall in down times but are slow to turn around when an economy heats up again.

The outlook for environmental markets in Asia by 2000 looked more promising than in the previous three years, as recovery has come a little sooner than many observers expected. Once the scene of surging economies, South-East Asia is still feeling some effects of its worst financial crisis in decades. Thailand, the epicentre of the financial meltdown in the region starting in 1997, was slow to shake off recession. The Republic of Korea and Indonesia, also among the hardest hit, have taken the bitter pills of economic retrenchment, as

government planners undertook painful austerity measures with drastic cuts in budgetary spending and infrastructure projects.

In spite of the turmoil, many believe that environmental markets are emerging even stronger than before. Asia's highly degraded environmental conditions should be viewed as a long-term business opportunity, in the absence of strong regulatory drivers and enforcement resources. Many Asian countries have a comprehensive set of regulations already in place, and they are being enforced with time-bound targets.

According to Environmental Business International's analysis of Asia's environmental markets, the cash crunch forced decision makers to restructure priorities with the focus on essential infrastructure, such as energy, water supply and sanitation, and waste management. With external assistance, public sector agencies have long-range multi million dollar spending programmes and are encouraging private-sector investments. Multinationals are still pursuing their own internal environmental compliance agendas, and Asia's global exporters are compelled to address ISO requirements.

EBI defines Asia's markets in tiers, taking into account annual GDP growth, environmental imports and investments as a percentage of GDP, evolution of environmental market drivers and barriers, and environmental industry competition. In the first tier is Japan, the world's second largest environmental industry after the United States and a market approaching maturity in many sectors. In the second tier are the newly industrialized economies of Hong Kong (still treated as a unique region of China), the Republic of Korea, Singapore, and Taiwan Province of China. These economies have moved to a slower pace and, in general, the rate of environmental investments is expected to wind down within the next few years.

The third and fourth tiers are where growth will be fastest in the long term. In South-East Asia, China and India opportunities remain in virtually all environmental sectors, although companies have to become increasingly selective over time. In early-stage markets, the public sector is often the instigator as well as the largest customer for

environmental equipment and services. In many ways, however, Malaysia's visionary nationwide approach to heavy private sector participation in its infrastructure is showing how the onus is shifting to the private-sector. But it also demonstrates that Governments must take the initiative in addressing environmental issues if countries are to recapture economic momentum. The time-honoured balance between an all-out attack on environmental problems and maintaining maximal conditions for economic growth in key export sectors is rarely a battle won by the environmentalists, however. The choice of an increment of recovery over an increment of improvement in environmental quality will work to keep opportunities of high commercial value in the most essential areas, such as drinking water, immediate health concerns and clean-up of properties.

8.2 European Regional Overview

It has been an interesting time for Europe. The advent of the euro economy and the forthcoming EU expansion into Eastern bloc countries are historic ventures. It is forecast that Europe's integration will provide the trigger for the economic revitalization of the continent. In spite of financial distress in the Russian Federation and Asia, high unemployment, high taxes and reactions to welfare reform, many remain optimistic that a rising tide in Europe can lift all boats. Proponents of fuller integration also argue that the single currency will lift European business competitiveness.

In the past couple of years there has been renewed attention to the historically lacklustre European economy, but little has translated into positive signs in terms of numbers. One of the main driving forces behind environmental protection in Europe is pressure from the European Commission. In response to mounting scrutiny from the Commission, the pace of national environmental initiatives is quickening and government and private spending on environmental protection has been rising steadily. While important strides have been made in implementing environmental legislation, enforcement remains a key challenge in 2002. But the European Commission is determined to police environmental pledges, and it has shown on a

limited scale that it will resort to infringement proceedings against Member States for non-compliance.

8.3 Central and Eastern Europe

After years of economic contraction, Central and Eastern Europe (CEE) has been experiencing a modest economic turnaround since the mid-1990s. Thanks to structural reforms and stabilization policies, the region boasts a growing private sector, which now accounts for at least half of economic production. Economic growth estimates for the region are in the 3 per cent range.

Vying for membership in the EU, several CEE countries have made initial steps in developing the economic and domestic structures necessary for meeting EU standards. Many of the CEE countries, such as the Czech Republic, Slovenia and Bulgaria, have already laid the general groundwork for environmental legislation, including the adoption of basic principles such as the requirements for polluters to pay, focus on prevention and precautionary measures. However, the regulations are underdeveloped, enforcement remains spotty and the responsible authorities are understaffed. Investors perceive the CEE environmental industry as small and risky. As a result of weak financial markets, problems in accessing credit and finance have perpetuated this view, according to an OECD report.

The CEE's environment industry is primarily composed of young and small to medium-sized firms. According to the results of the survey by the OECD/REC, the industry is about "equally distributed" between manufacturing and services. On average, 30 per cent of companies are involved in water and wastewater, 23 per cent in solid waste management and 21 per cent in air pollution control. This is mainly due to the fact that the main environmental legislation in the region has focused on water, waste and air. Only 8 per cent of companies has provided any equipment and services for remediation, although this is a big issue in the region. Many firms were quite diversified, offering services and products in more than one segment.

Communist-era coal mines, steel mills and chemical plants have left behind massive environmental degradation in Poland. As much as 25 per cent of Poland's industrial discharge into surface waters is still released untreated and only one third of its sewage that flows into the Baltic is treated. For EU membership, Poland will be bound by EU economic and environmental policy. Consequently, environmental protection measures will continue to move at a brisk pace. Environmental expenditures rose from US$ 580 million in 1990 to US$ 1.6 billion in 1996, according to the US & Foreign Commercial Services and the pace has not slowed too much since. In 1999, the Polish Government put forward a 15 billion zloty ($4.35 billion) programme to overhaul the budget-draining (and highly polluting) mining industry. The World Bank estimates that the total cost of complying with existing EU standards in Poland will be $35-$50 billion.

Over 3 per cent of the Czech Republic's GNP is now said to be dedicated to pollution control efforts. The cost of clean-up for the Czech Republic to meet the pollution levels of OECD countries by 2015-2020 is estimated at least $15 billion.

Implementation of Hungary's National Environmental Action Plan, adopted in 1997, is estimated to cost $4 billion. However, as is common in the region, Hungary lacks consistent enforcement. Of the total environmental expenditures in Hungary, 55 per cent is spent on water protection, 16 per cent on air protection and 12 per cent on waste management.

8.4 Latin America's Recovery Is Welcome News for Environmental Companies

Latin America's economic performance in 1999 was far short of projections—from GDP projections of 2.3 per cent growth, final numbers showed that region-wide performance was negative in 1999. The Russian default of August 1998 had a lingering effect into 1999—and was the cause of Brazil's devaluation. Capital flight from the region also exacerbated the situation. The year 2000 was no quite so

bad, but 2001 was hit by the shocking meltdown in Argentina and resulting reverberations which affected the region.

Two facts, however, suggest a reason for some optimism in 2002. First, Brazil—the largest economy and the hardest hit in 1999—has managed some economic recovery since 1999, as well as some growth in its environmental sector. Second, the price of oil has helped a number of economies in a very substantial way—Venezuela, Colombia and especially Mexico are in far better shape today with US$ 20/barrel oil than they would have been with US$ 10/barrel oil. Indeed, Mexico's economic performance is so robust that there is significant reason to believe that it has "decoupled" from the rest of Latin America, and will grow in the 4-5 per cent range in the coming years. There is even talk of Mexico gaining an investment grade credit rating after the results of the June 2000 presidential elections and the fall of the long-ruling party showed the political transparency that lenders like.

From an environmental perspective the economic downturn had a significantly negative impact on projects in the region. At the most basic level, countries focused on exports as the engine of growth, and were not willing to enforce burdensome environmental regulations on industrial producers. In this context, there is little driving the critical issues of regulation and especially enforcement.

Overall economic expectations in Latin America are for positive growth during 2002 of an estimated 2-3 per cent. Latin American growth should be stable, non-inflationary and led by the private sector, all good signs for the environmental sector. The region continues to be a strong importer of products from industrialized countries and remains committed to open market policies' economic pressures. Imports of environmental goods and services continue to comprise an important share of overall demand. Latin America will slowly increase investments in environmental infrastructure as investor confidence returns to the region, and as economic performance improves around the world—thus creating new and better-paying markets for Latin American export commodities.

Regional policy makers, following world trends, are positioning the private sector as a dominant investor in the creation of new environmental infrastructure. This has created a market for concessions and is providing substantial opportunities for firms with operations expertise. Many of these private sector schemes, however, have fallen short of their objectives as the long-term risks obstruct easy financial solution. The region is struggling to create a superior financial model that will allow for far greater investment and hence demand for environmental services and equipment.

On the public sector side, the World Bank and the Inter-American Development Bank continue to be very important players in Latin America's environmental sector. Bi-lateral agencies and particularly Japan's Overseas Economic Cooperation Fund are another important source of environmental investment. The spending programmes of these institutions should be closely monitored, as they are a major driver of environmental business opportunities, and important contributors to precedents for how projects are developed, financed and operated by private and public entities.

Water and wastewater consistently present the largest market segment for environmental companies in Latin America. Opportunities will increasingly centre on the roughly 550 "mid-market" municipal projects, and on niche industrial wastewater projects. Privatization activity will begin in Brazil, and will continue in Colombia and Mexico. Although potable water coverage rates are relatively high in urban areas, rural areas are often badly underserved. At the same time, growing populations in urban centres demand new water supply projects. Most potable water projects are publicly financed, with additional funds coming from the multilaterals and increasingly from Japanese funding. Wastewater treatment coverage levels in Latin America are extremely low and, although the market is immense, investment dollars for this sector have been scarce. Private sector participation in the sector has not materialized, requiring countries to rethink financing strategies and their political approach to privatization. As in the case of potable water, multilateral and bilateral

lending is the driver behind many major projects such as those in Lima, southern Brazil and Mexico City.

J. Paul Oxer, vice president, international development, at Azurix Corp. (Houston, Texas), believes that privatizations will occur in almost all of Brazil's 27 States in the next three years. He says that, overall in Latin America, more than US$ 40 billion of investment is required in collection and treatment infrastructure, and the private sector seems the most logical source for this capital. In Brazil, arguably one of the more advanced nations, still only 40 per cent of wastewater is collected and only 10 per cent of that is treated. In Chile only 3 per cent of wastewater is treated. There is much to gain in system efficiency as well. Most areas have a leakage or technical loss rate of at least 50 per cent (the United States average is 15 per cent). In addition, in the average Brazilian utility, said Oxer, there is an average of seven employees per thousand water connections, compared with 2.2 employees in United States water utilities, themselves not known as paragons of efficiency. Water and wastewater projects undoubtedly yield the most significant business opportunities in Latin America—both for privatization and contract operations of facilities, and for subsequent technology and systems investments in the public and private sector.

According to CG/LA Infrastructure (Washington, DC), among the notable areas of opportunity are:

- The reactivation of Brazil's public water sector investment programmes, and the attempt by BNDES to create a privatization model for the water sector;
- Chile's successful privatization of State water companies, which is driving complementary investments in system improvements;
- Secondary markets, or mid-tier cities, in Mexico and Argentina, where locals have begun to recognize their lack of technical and investment firepower. (Mexico's major projects in Mexico City, Guadalajara and Baja California have been stalled for political

and financing reasons, and Buenos Aires has already been privatized.);

- Spending along the United States/Mexican border;
- Lima's wastewater investment programme financed by the World Bank;
- Several large "clean-up" projects in Brazil financed via World Bank loans;
- Colombia's privatization of its municipal water authorities, led by the successful privatization of Monteria announced in November 1999.

Prominent transactions in Latin America in 1999 and 2000 included:

- The Agosba concession won by Azurix in Argentina in May 1999. The $440-million purchase set a level of expectation and primed the pump for many other of Latin America's water concessions;
- The privatization of Chile's State-owned water companies, including EMOS (near Santiago) to a consortium led by Aguas de Barcelona and Suez Lyonnaise des Eaux, which requires a $175-million investment in the Santiago Sur wastewater treatment facility in the first phase, ESVAL (near Valparaiso) to a consortium led by Chilean electricity company Enersis and the UK's Anglian Water International. At least two other cities are undergoing serious negotiations to privatize their water companies:
- The privatization of Monteria in Colombia won by FCC, which is expected to set a model for 16 projects to follow, with a $35-million concession in San Andres and a $45-million concession in Ibague expected to be awarded in the first half of 2000.

Waste. Municipal and commercial solid waste generated in Latin America is not disposed of according to United States standards, and open landfills are the most common disposal method. A number of countries have attempted to concession new state-of-the-art landfills to the private sector, but have had very limited success to date. The solid waste disposal market is not expected to show much growth in 2002-2005. Many Latin American cities offer concessions to the private sector for the collection of municipal solid waste. An important market also exists in many countries for the collection and disposal of commercial wastes. Major international waste companies, including a couple of United States companies, have captured much of this market, particularly in major urban areas. European firms, particularly French and Spanish ones, are aggressively pursuing this sector, and have proved the most competitive so far.

Although industrialization is driving growth in the Latin American hazardous waste market, the region continues to lag behind in effective third-party treatment solutions. Efforts to develop regional hazardous waste disposal centres have floundered in the face of local political opposition, the high capital costs of such facilities and concerns about the effective enforcement of hazardous waste regulations. In the absence of disposal options, many companies are developing individual solutions to their hazardous waste problems. Most hazardous waste is currently stored on-site, which is not a long-term solution. Current opportunities in the hazardous waste market involve working with industrial and commercial customers to design strategies for effectively reducing the amount of hazardous waste generated, for recycling hazardous waste and for developing on-site treatment facilities. Unfortunately, unclear regulations are hindering the efforts of many companies to design their own on-site treatment solutions.

Air. In air pollution, comprehensive air pollution programmes are under way in many major Latin American cities. These programmes are strongly supported by the multilateral institutions, and focus on the establishment of monitoring networks, vehicle emission reduction programmes and the targeting of industrial point sources. Mexico's

programme is perhaps the most advanced, with its 1995-2000 Mexico City Air Quality Improvement Programme, which is being rolled out to Monterrey, Guadalajara, Toluca and Ciudad Juarez. Vehicles are often the largest contributor to urban air pollution, and are responsible for 80 per cent of air pollution in Buenos Aires, for instance. For vehicles, efforts have focused on the use of cleaner fuels, more stringent emissions requirements and vehicle testing. In industry the main targets include power, mining, petroleum, paper, chemical and automotive industries.

8.5 China: Pieces Falling into Place in the Environmental Market

The development of an environmental industry in China over the first decade of the 21st century should be an interesting case study for domestic and international policy in environment, economics and trade. The 2008 Olympics provide an international spotlight on Beijing, and the Chinese Government has undertaken to make considerable progress before that date. A number of Western environmental firms have reported increased interest and specifically the world's largest environmental consulting and engineering firm, CH2M Hill, has been retained to play an important coordinating role for the environmental aspect of the Olympics, reprising and presumably upgrading a role it played in Australia for the Sydney Olympics. The Olympics, however, should not be the primary driver for environmental quality in a nation of 1.4 billion people. But it does serve as an impetus and pertains to trade issues relating to deficits and surpluses, WTO membership, the "most-favoured-nation" status in the United States and human rights issues.

China's environmental market has been extremely difficult to assess owing to the absence of reliable and consistent qualitative and quantitative data. There are a number of conflicting figures for environmental spending, for instance, and it is not clear what these figures represent. According to the first national survey of China's environmental industry by the National Environmental Protection Agency (NEPA), China had 8,651 environmental firms employing nearly 2 million people in 1998. In 1993, these firms reportedly

generated revenues of Rmb 31.1 billion (US$ 3.7 billion) and profits of Rmb 4 billion (US$ 481 million). Revenue figures are believed to cover all aspects of environment, from garbage collection to environmental infrastructure costs. An official source indicated that the annual environmental investment amounted to Rmb 26.2 billion (US$ 2.4 billion) in 1994, roughly 0.7 per cent of GDP. The same source reported that 1995 spending was around Rmb 20 billion (US$ 2.4 billion) and that investment would exceed this figure in 1996. About Rmb 9.6 billion (US$ 1.15 billion) would come from various central government departments and the rest from local governments and enterprises. According to another report, the Chinese Government spends about Rmb 20 billion (about US$2.3 billion) annually on environmental protection, or about 0.7 per cent of its GNP. According to another report, quoting NEPA Administrator Xie Zhenhua, China invested about US$ 1.2 billion in 1991 and US$ 1.38 billion in 1992. The same report said that China expected to invest US$ 1.84 billion in 1995 and US$ 3.45 billion by 2000.

According to a United States Embassy report entitled "Hard Currency Financing for Environmental Projects in China", approximately 10 per cent of an estimated US$ 15 billion overall market for environmental goods and services in China comes from the bilateral and multilateral lending sources. These are led by the World Bank, the Asian Development Bank, Japan's Overseas Economic Cooperation Fund and bilateral assistance programmes. The same report also stated an estimated 10 per cent comes from foreign investors setting up joint ventures, and another 20 per cent comes from various industrial ministries or the Chinese military for treatment of factories and installations under their control. These sectors offer a "significant" source of contracts for foreign companies in the future, the report said. The remaining 60 per cent of total financing is controlled by city or country governments, usually in the areas of basic sanitation, recycling, potable water and trash removal, but with few opportunities for foreign companies. According to yet another report, China announced that it would spend US$ 4 billion on 62 environmental research projects covering nine major topics (such as clean energy and sustainable agriculture). This will coincide with the

country's Five-Year Plan. This report indicated that about 40 per cent of the funding will come from overseas.

EBI estimated China's total environmental market in 1995 at around US$ 3 billion, which grew to US$ 3.7 billion in 1997, US$ 4.2 billion in 1998 and US$ 5 billion in 2000. The largest segments are water equipment and chemicals at more than US$ 1 billion, followed by the infrastructure segments of water utilities, solid waste management and wastewater treatment works, each of which are in the US$ 600-700 million range. Forecast growth is strong at 10-14 per cent, with these infrastructure supply and service segments leading the way.

9. Potential for Environmental Industry Development in Developing Nations

Given the state of the environmental industry and the great variety of environmental market conditions and drivers in the nations of the world, it is hard to make definitive statements about such a broad topic. Nevertheless, some common themes and recurring situations in many countries allow the following conclusions.

It is clear that needs and demand for environmental services will continue to grow in the developing world for some time, thus providing increasingly good business conditions for environmental service firms.

- Environmental needs do not always translate into market demand for environmental services owing mostly to economics, and so continued involvement of the public sector and international development and funding agencies will be important in maintaining the consistent market demand required in order to attract private environmental companies and investment in environmental industries in developing nations.
- It will be very difficult to create quickly the domestic capacity required by developing nations in order to meet environmental

service needs in their nations, since technology, educated and trained personnel and funding are all necessary.

- Input of resources from developed nations will be crucial for building and accelerating capacity in environmental services in developing nations. Appropriate incentives for foreign businesses in the form of security for return on investment by allowing ownership, partnerships, public-private partnerships and other mechanisms to secure long-term business commitments and investments from foreign companies will result in accelerated capacity development.
- Mechanisms should be encouraged to increase the freer flow of environmental industry exports and imports across borders through trade agreements, and this will accelerate environmental technology transfer among nations.

10. Capacity Building in Environmental Services

Opportunities for developing countries to strengthen capacity in environmental services depend on a few key issues: (a) creating market demand; (b) policy to encourage foreign participation and technology transfer; (c) a clear position on privatization; and (d) education and training to create a competent labour force and selection of contractors. These are discussed in more detail below. It goes without saying that the discussion of these factors focuses on what is unique to the environmental industry, and that there are many factors which apply to all business, such as currency conversion, political stability, safety and security, transparency of the contract selection process and lack of corruption.

(a) Creating consistent market demand is the best way to create environmental industries in nations. The public must be educated, laws must be passed, regulations must be put in place and enforced by empowered regulatory authorities, Governments must be accountable for environmental quality to both their people and the international community, and, most important, industries must have a disincentive to pollute, generate waste or consume resources unsustainably.

Disincentives may be in the form of fines, plant closures or lawsuits, or they may be in the form of economic instruments such as pollution taxes or waste disposal fees. Punitive measures are perhaps easier to enforce, but economic instruments are better for creating an ongoing incentive for continuous environmental improvement. Years of analysis of environmental markets lead to the conclusion that the command-and-control method of punitive environmental policy is the most effective in transitioning a nation from environmentally "deplorable" conditions to conditions can be deemed "acceptable", but that going beyond that "mediocrity of acceptability" requires the implementation of economic instruments. This is the lesson of environmental market evolution in developed nations, many nations now being at the point of flattened demand for environmental services and equipment as basic compliance with most standards has been achieved, but nations do not have the leadership or political will to implement broadly inclusive market instruments. Applying this lesson to the developing world, nations should adopt a hybrid approach that has definitive and harshly punitive measures for those that flout environmental laws and standards, and at the same time should implement measures which charge incremental fees or taxes for each unit of waste and pollution generated. To return to the central point of creating capacity in environmental services, without the best system of market drivers for environmental improvement, companies will face insecure demand and not invest in building capacity in such a market.

(b) Beyond the critical issue of creating market demand through a combination of environmental and economic policy, developing nations can accelerate their capacity development in environmental services by making business more attractive to foreign companies with policy measures relating to ownership, movement of persons and investment credit, and many other policy instruments in customs and commerce.

(c) A critical issue in environmental industry development is the question of privatization. The largest segments of environmental services pertain to waste management, sewage treatment and potable

water supply, and each of these has strong municipal or other public sector ties in their provision. Developing nations can develop business capacity much more rapidly if there is ample incentive for investment and return on investment by private companies (rather than solely relying on donor nations or agencies or in-country funds) through limited or broad forms of privatization. Long-term contract concessions, limited guarantees on rates and payments by the users or "rate base" and other agreements can be concluded. In attracting qualified companies to work on environmental service projects, the position regarding the level of privatization may not be as important as how clear that position is for the company looking at the opportunity. What any business likes is certainty and what the company can plan for; consequently, any uncertainty about contracts and changes in privatization approaches will be sufficient reason for companies not to pursue business in a particular country or city.

(d) Education programmes to create a flow of new generations of environmental engineers and a long list of other professional personnel are important to capacity development. The training of skilled labour is equally important for constructing and maintaining the environmental service infrastructure. Programmes at the vocational level all the way up to advanced university degrees in environmental sciences should be made available to citizens of every country. In many cases, motivated scientists from the developing world have left for better education in the developed world; this may be acceptable if a significant portion of these people return to impart their knowledge in their native markets. Avoiding the "brain drain" is not unique to the environmental industry but applies to many other sectors. Environmental industry employment has a considerable advantage in that a majority of environmental service personnel are not highly qualified and educated people, but merely skilled or unskilled labour. Many multifaceted environmental projects in solid waste, wastewater or remediation clean-ups may involve a foreign company in managing the project but using many local contractors and labourers to construct and operate its designs. Thus another layer of capacity is an ample supply of local contractors certified or at least

proved competent enough to secure subcontracted projects from leading environmental firms from developed nations.

11. Advantages and Disadvantages for Developing Nations in Eliminating Trade Barriers in Environmental Services

Advantages in reducing or eliminating trade and non-trade barriers in environmental services include the following:

- More financial incentive for foreign providers to bring their products and services to developing markets;
- Open markets create more incentive for developed country environmental firms to establish partnerships and joint ventures in developing nations;
- Cheaper access to the best environmental solutions;
- Easier movement of persons allows easier transfer of expertise;
- More momentum towards a uniform global market in some environmental industry segments can lead to more uniform and cost-effective environmental solutions;
- Reducing or eliminating trade and non-trade barriers in environmental services will serve to make export markets more appealing to global environmental companies, but national Governments will have a significant role in ensuring that foreign providers make sustained investments in local communities, and with local governments and local companies to ensure ongoing capacity building in environmental services.

Disadvantages in reducing or eliminating trade and non-trade barriers in environmental services include the following:

- Possibility of over-reliance on foreign supply;
- Possibility of under-investment in capacity by in-country companies grown dependent on foreign expertise;

- Potential for cultural or ethnic clashes related to foreign business or interests being responsible for, and profiting from, essential public services such as water. This could also relate to potential negative perceptions of "environmental imperialism" on the part of foreign experts running projects and systems or "dumping" their old or not so good technology on developing markets;
- Any international business has to deal with these potential negative issues; however, provided that environmental projects are open, public and transparent, these issues can be kept to a minimum.

12. Potential for Developing Nations to Become International Providers and Exporters of Environmental Services

With very broad needs in developing nations for environmental services, prospects would appear promising for early leaders in environmental industry capacity to be able to be regional or international providers by exporting their services.

However, much of international environmental business requires more than just adequate business capacity. It requires experience and talent in many areas and access to capital. International environmental business players need an integrated package of technology, trained personnel, political experience in target markets and, perhaps most of all, direct knowledge of, and access to, project financing and funds. Many long-term environmental contracts in water or waste require that the project developers build in mechanisms for fee collection or development loans to ultimately pay for their services.

The combination of skills required of an international player in environmental services makes it very difficult for entities in developing nations to compete initially. For instance, many American firms very competent in the technical aspects of environmental projects (environmental consulting and engineering firms typically) have little ability in the full-scale project development, construction and management required in integrated environmental infrastructure

projects typical in developing environmental markets. However, potential does exist for developing nations' environmental companies to form partnerships with experienced international environmental industry competitors and then seek involvement in neighbouring countries. Likewise, some opportunities will be available for small companies to execute specific pieces of projects or to work in smaller market niches (air quality monitoring, environmental information systems, industrial water recycling) that are numerous in the environmental industry.

Overall, meeting the demand of in-country markets should be the strong first priority of environmental service industries in developing countries. Surveys of environmental companies have routinely found that the cost of doing business out-of-country is almost twice as high as pursuing domestic opportunities. If capacity is built and demand is strong elsewhere, it is an opportunity worth pursuing, but not many companies will do it.

A nation's environmental industry competitiveness ultimately hinges on what the market demand is in its home country. In other words, the best way to create a highly competitive environmental industry is not to adopt a whole series of industry development policies, but merely to establish a strong consistent demand through a coordinated environmental and economic policy structure to create an incentive for continuous environmental improvement in industry and government.

In conclusion, the objective of the nations of the developing world seeking to better environmental quality on behalf of their people and the objective of the world's leading environmental companies seeking to expand and grow their business are mutually supportive. Reduction or elimination of trade and non-trade barriers in environmental services can only serve to further both of those objectives—and result in the desirable objective of capacity development in environmental services in developing nations—provided that Governments are sufficiently educated about the nature and structure of successful partnerships in environmental service contracts and about market conditions.

ENHANCING DOMESTIC CAPACITY IN THE ENVIRONMENTAL SERVICES SECTOR: THE CASE OF BRAZIL

Fernando Rei and Oswaldo Lucon*

1. Brazil's Unique Conditions

Owing to its size, natural resources volume and industrialization level, Brazil has to continuously handle several diverse environmental problems. On the one hand, it is a country that has about 12 per cent of the world's available freshwater; this allows it to meet most of its energy needs through the utilization of hydroelectricity, a renewable source with a relatively small environmental impact. Brazil also has a relatively high proportion of the world's tropical forests.

The advantages stemming from this relatively favourable scenario of natural resource abundance are evident. On the other hand, there also is the permanent challenge for policy makers to find new development models for the country that do not threaten to jeopardize the sharing of those resources among the different communities or regions, be they rich or poor.

Besides the problem of pollution caused by automobiles, industries, domestic/industrial waste, toxic agricultural products and garbage disposal, there is the problem of the degradation of natural

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wealth. While in the large cities the living conditions are unpleasant from an environmental point of view for most of the population, in the countryside the deterioration and even destruction of both flora and fauna are a threat to biological diversity.

In the last few years, the sustainability concept has gradually been incorporated into the realms of public administration, corporate strategies and Brazilian society's organizations. At the federal level, the first stage in achieving this was the establishment of a National Environmental Secretariat in 1972. This was the true embryo of today's National Environmental System, embodying the Brazilian Federation's, as well as the individual States' environmental agencies.

On 26 February 1997, the Brazilian Federal Government created a Commission for Sustaineble Development Policies and Agenda 21, which was tasked with honouring Brazil's commitments under Agenda 21 and composed of government officials, representatives of private industry and members of civil society. Its goal was the elaboration of environmental action plans aimed at safeguarding the Brazilian ecosystems, and at the same time guaranteeing economic growth and the preservation of natural resources.

Four years later, the São Paulo Secretary for the Environment, Dr. José Goldemberg, established a new approach for environmental protection, based on renewable energy as a driving force for sustainable development and its main implications, such as poverty eradication and the access of small isolated communities to basic infrastructure. The outcome of this policy is the so-called Brazilian Energy Initiative, a commitment to a minimum share of 10 per cent in renewable energy, endorsed on 15 May 2002 by 21 Ministers for the Environment from Latin American and Caribbean countries. This result will be presented in June to the Bali Preparatory Conference for the World Summit on Sustainable Development, to be held in Johannesburg in September 2002.

Brazil was the first Latin American country to introduce and implement a coherent package of environmental laws, and later some of the Federation's States developed their own legislation. Each local agency is individually tasked with local environmental management, as well as with legislation enforcement and auditing each and every local activity or undertaking with a potentially adverse effect on the environment. The most advanced of these agencies is probably that of the State of São Paulo, the Environmental Sanitation Technology Company (Companhia de Tecnologia de Saneamento Ambiental (CETESB)). It is a government-owned institution which has been developing capabilities to absorb, adapt and modify environmentally sound technologies imported from the developed countries. From a humble beginning in 1968, as a quite small State Sanitation Centre, CETESB has gradually evolved into today's complex institution with wide-ranging responsibilities.

By using its own creativity and experience, CETESB has been successful in moving from a model imported from the developed countries to a pioneering performance, managing to find its own way to solve the increasingly challenging environmental issues through indigenous means.

2. CETESB's tasks

Since 1992, and in accordance with Agenda 21, CETESB has been tasked with the promotion of sustainable development in the State of São Paulo through the implementation of a new approach based on a combination of *command and control and pollution prevention.* As a result, it has adopted and stressed the following objectives:

- To stimulate the incorporation of the environmental factor into economic development matrixes, primarily considering the importance of attaining reductions in both waste generation and resource utilization;

- To increase public awareness about environmental issues by the disclosure and dissemination of information concerning environmental quality and emissions status;
- To create new channels to involve society in the implementation of environmental policies and guidelines;
- To establish partnerships with the private and public segments and foster cooperation with national and international organizations;
- To provide training and technology transfer;
- To improve legislation in order to consider the preventive approach;
- To support voluntary environmentally preventive initiatives;
- To motivate the financial institutions to increase investments in cleaner production technologies and pollution prevention projects, also helping develop innovative financial mechanisms; and
- To include the preventive approach to CETESB's actions, providing the company with the means to fulfil its new duties.

The agency's main tasks are the following:

- Environmental quality control: to evaluate air, water and soil quality; to develop and evaluate technical proposals and environmental standards;
- Control of pollution sources: to license and monitor pollution sources;
- Development of environmental technologies: to adapt, develop and utilize appropriate environmental technologies:
- Technology transfer: to disseminate information about and train personnel in environmental protection practices;
- Pollution Prevention (P2): After the 1992 Rio Conference, CETESB set the goal of implementing Agenda 21 and promoting

sustainable development. In the last few years it has implemented a new approach aimed at pollution abatement at the source, by jointly working with the industrial sectors to introduce cleaner manufacturing technologies, through using less aggressive compounds and implementing process changes able to cut pollutant emissions;

- Energy efficiency (E2) and global issues: together with P2, measures relating to climate change mitigation, cleaner energies, energy conservation and ozone layer protection have been implemented since 1994 by a dedicated staff, interacting closely with Federal Government policies and, on many occasions, establishing benchmarks such as greener procurement.

Energy is a key issue in sustainable development in terms of social welfare and production, as well as pollution, climate change and resource depletion. CETESB's approach to energy and the environment has the following main objectives:

- To propose and conduct internal and external energy efficiency (E2) programmes (the internal E2 programme saved 36 per cent of electricity);
- To provide training and awareness;
- To foster the use of new renewable and other cleaner energy sources;
- To support municipalities and other public bodies in terms of E2;
- To suggest improvements in standards and legislation;
- To advise on specific issues, for example financial assistance, nuclear energy, natural gas thermoplants or site recovery and preservation;
- To promote partnerships with concessionaires, small and medium-sized enterprises and other private sector players.

Under Agenda 21, the Government of São Paulo has – together with the applied precautionary approach in enforcement – conducted

several public audiences with sectoral committees, non-governmental organizations, universities and other governmental bodies.

Water resources protection is another main issue, in terms of emissions control, water usage or land use. The polluter-pays principle is currently at the State parliamentary voting stage.

The outcomes of these projects are certainly interesting to countries now experiencing the same problems. In the case of neighbouring countries, CETESB considers the techniques and services supplied could be considered by possible customers to be more attractive, adequate and appealing than those that could be supplied by the developed countries, because of the affinities and similarities among the region's environmental problems and also because of the lower language barrier and Brazil's greater understanding of the way in which businesses are conducted regionally. CETESB has been providing advisory services to other Latin American countries (notably Argentina, Chile, Ecuador, Mexico, Paraguay, Peru, Uruguay and Venezuela). Also, it has been training several technical representatives from Latin American and Portuguese-speaking African countries, and plans to sell their services to many other countries as well. The revenues derived from those activities will help fund further environmental initiatives in the State of São Paulo.

After more than 30 years of innovations, CETESB has achieved two major results: it has become MERCOSUR's reference agency and has become widely recognized as an environmental excellence centre.