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SURVEY AND ASSESSMENT OF ENERGY-RELATED ACTIVITIES IN THE ESCWA REGION, 1989

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I. RECENT DEVELOPMENTS IN THE ESCWA REGION OIL INDUSTRY

A. International oil market conditions

Developments in the international oil market directly affect the ESCWA region as a whole and have either a direct or indirect bearing on the general economic performance of each country within the region. Oil is not merely a major export commodity of the region, it is the single largest foreign exchange earner in the region and, in many countries, earnings from the international sale of oil account for a significant portion of the total Gross Domestic Product (GDP) in a given year. The major oil producers of the region, Iraq, Kuwait, Qatar, the United Arab Emirates and Saudi Arabia are also important members of the Organization of Petroleum Exporting Countries (OPEC) and together, in that capacity, have had considerable influence on OPEC decisions. Oman also relies on oil for a major portion of its GDP but is not a member of OPEC. Egypt and the Syrian Arab Republic are rapidly developing their oil industries and, while their economies are diversified, oil sold on the international market has become an important source of hard currency for both countries. The Republic of Yemen,[1/] the ESCWA region's least developed country, discovered oil during the eighties and has joined the ranks of oil-exporting countries. Oil revenues are extremely important in the development prospects of this country.

Other ESCWA countries are affected by developments in the international oil market more indirectly. Jordan and Lebanon have no commercially viable oil deposits, but many of their nationals have found employment in oil-producing countries, and the remittances sent to their home countries have positively affected economic growth. In fact, Jordan's recent economic crisis can be partially traced to the decrease in these remittances, which occurred when the fall in oil prices caused a general economic downturn in the Gulf Cooperation Council (GCC) countries. Egypt, the Republic of Yemen and to some extent the Syrian Arab Republic also had nationals working in the GCC countries and Iraq and were affected by international oil market conditions in this manner as well. The level of grants and aid received from the GCC countries are indirectly affected by conditions on the international oil market.

1. Oil prices

Oil prices fluctuated considerably during 1989 but, on average, were higher than the 1988 level. After falling during much of 1988, the spot price of Oman 34, for instance, which had fallen to a low of US$ 10.90/barrel (b), averaged US$ 13.51/b that year. The average spot price for the same crude during 1989 was US$ 16.07/b. Similar price increases were experienced for other types of crude oil during 1989.

Problems of OPEC member countries producing at levels higher than their quota allocation continued during 1989 despite increases in quota levels for the first half of 1989. Figure 1 traces the spot prices of three different types of crude oil produced in the ESCWA region during 1989 by month. In general, prices increased during the first quarter of 1989, immediately following the OPEC meeting in late 1988. Prices then dropped during the second

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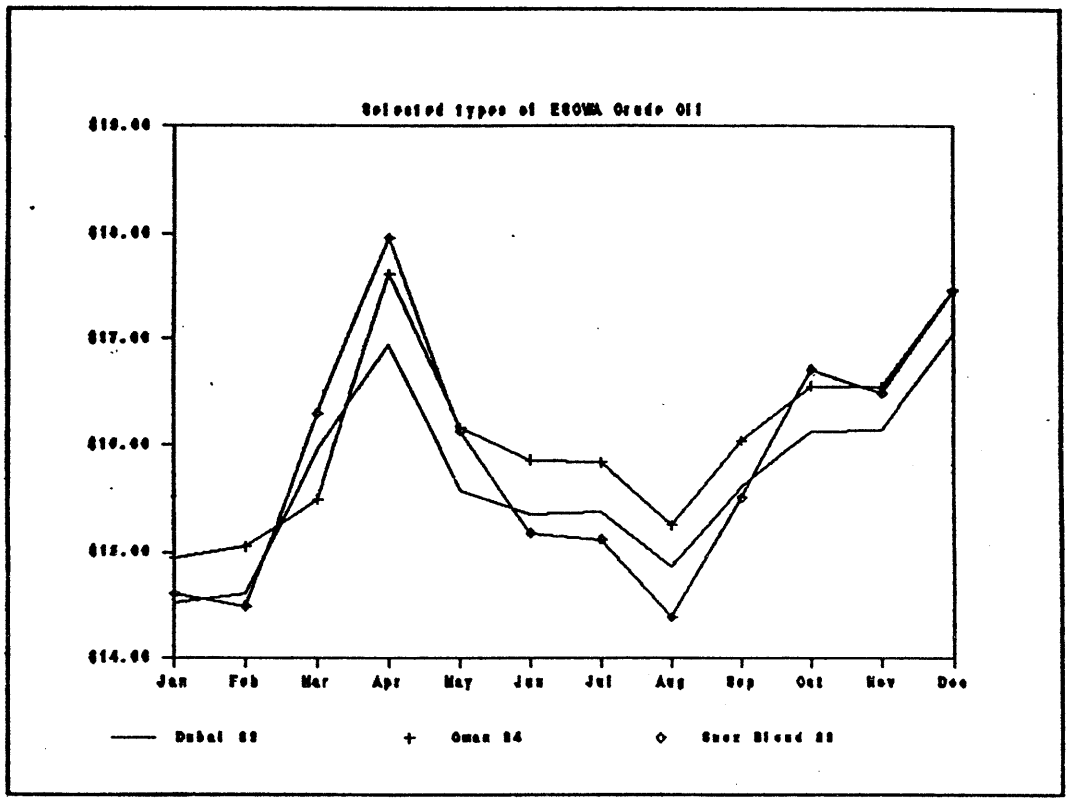
1/ Yemen and Democratic Yemen united in May, 1990. Developments in each during 1989 are considered separately in this report.

quarter of the year as some OPEC members increased production to ensure a greater market share. The increase in prices noted during the latter part of the year is mainly attributed to an increase in the demand for oil.

Various pricing schemes such as netback pricing and formula pricing continued to be used during 1989. Table 1 provides examples of formula, netback and spot prices charged for different types of ESCWA region crude oil.

Figure 1. Spot prices 1989



Formula pricing continued to rise in use, and many producers abandoned the older netback pricing schemes in favour of formula pricing. Formula pricing tends to eliminate differences in price resulting from transportation costs in any given region as well as allowing sellers to charge different prices in different regions. Prices are typically tied to locally produced crude-oil spot prices, such as North Sea Brent in Europe, Alaskan North Slope in the United States, and Dubai and Oman in the Far East. Formula pricing has been attributed to the success which some ESCWA producers have achieved in diversifying their clientele.2/

2/ For more information on formula pricing see Petroleum Intelligence Weekly, 29 January 1990, Special Supplement Issue.

Table 1. Formula, netback and spot oil prices various types of ESCWA region crude oil, 1989 US$/barrel

	Formula prices			Netback prices			Spot prices		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
January	13.8	14.9	14.9	15.0	15.5	15.3	14.5	14.9	14.6
February	13.9	14.8	15.2	14.5	15.1	14.8	14.6	15.1	14.6
March	15.3	16.7	16.9	16.5	17.1	16.8	15.95	15.5	16.3
April	16.8	17.7	17.8	19.4	20.1	19.7	16.9	17.6	18.0
May	15.4	16.4	16.3	18.0	18.7	18.2	15.6	16.2	16.1
June	15.1	15.5	16.0	16.2	16.9	16.5	15.4	15.9	15.2
July	15.1	15.7	16.1	16.1	16.6	16.3	15.4	15.8	15.1
August	14.9	15.1	15.6	15.8	16.3	16.1	14.9	15.3	14.4
September	15.6	16.1	16.3	17.0	17.6	17.4	15.6	16.0	15.5
October	15.8	17.1	16.8	18.2	18.7	18.6	16.1	16.6	16.7
November	15.8	16.9	16.9	18.3	18.7	18.6	16.1	16.5	16.5
December	16.8	18.0	18.0	20.3	20.7	20.8	17.1	17.5	17.5
Average	15.4	16.3	16.4	17.1	17.7	17.4	15.7	16.1	15.9

Source: Oil and Energy Trends, various issues, 1989, 1990.

Notes: (1) Kuwait 31; (2) Arabian Light 34; (3) Dukhan 40; (4) Arabian Light 34; (5) Kirkuk 36; (6) Oman 34; (7) Dubai 32; (8) Oman 34; (9) Suez Blend 33. Formula prices are for oil delivered to Europe.

2. World supply of oil

The world's supply of oil increased during 1989 by 2.6 per cent, as shown in table 2. Overall production increased from 60.9 million barrels per day (mn b/d) to 62.4 mn b/d. Far more interesting, however, are the changes in the composition of suppliers. OPEC production accounted for most of the world's increase in supply, with an increase in production of 11.3 per cent over 1988 levels. Non-OPEC market-economy production decreased by 1.8 per cent due to accidents in the North Sea and declines in the production of the United States. Production by the centrally-planned economies also declined during 1989, by 2.2 per cent.

Table 2. World supply of oil, 000 b/d

	1988	1989	Per cent change
Total ESCWA	12 882	14 009	8.8
Total OPEC	20 737	23 070	11.3
Other Market Economies	24 464	24 031	-1.8
Total Market Economies	45 200	47 101	4.2
Total CPE	15 654	15 343	-2.0
Total World	60 855	62 444	2.6
ESCWA/OPEC	0.62	0.61	-2.2
ESCWA/World	0.21	0.22	6.0

Source: Petroleum Economist, January 1989, p. 4 and January 1990, p. 27; b/d figures converted from tonnes. Jordan's production is excluded. 1988 figures revised from Petroleum Economist, January 1990. CPE refers to Eastern Europe, USSR and China. Note that ESCWA members of OPEC data exclude NGLs.

OPEC countries producing over their quota levels continued to be a problem for the organization during 1989. The member countries met three times during 1989 to resolve the problem, which resulted in falling prices at least part of the year. Each meeting resulted in a higher OPEC production with ESCWA member countries benefitting from higher individual quota levels. Table 3 shows the changes in OPEC quota levels during 1989 and the quota allocation of ESCWA members of OPEC. Throughout most of the year, members of OPEC strove to increase their individual market share at the expense of price maintenance and at the risk of undermining the OPEC agreement. The United Arab Emirates and Kuwait continued to produce over their quota levels and both countries maintained that they would produce in excess of the allotments decided upon in their quotas. Expected price declines normally associated with higher supplies did not materialize in the latter part of the year due to an unexpected increase in demand, in part a result of unusually cold weather.

Oil production levels of most non-OPEC producing countries declined during 1989. The United States of America's output declined from an average of 9.4 mn b/d during the first half of 1989 to 9.0 mn b/d during the second half of the year. The United States of America's production level is expected to continue to decline due to declining reserves and the high cost of developing known reserves. The recently announced energy policy, however, encourages production and exploration.[3/] Net imports of oil and oil products are expected to increase during the nineties in spite of such policies. Oil production levels of the USSR are declining, despite large reserve levels, due

3/ Frank Niering, "Oil Policy After Reagan", Petroleum Economist, February 1990, pp. 59-60.

to technical problems and lack of long-term planning within the industry.[4/] Production levels dropped from an average of 12.5 mn b/d during 1988 to 12.3 mn b/d during the first half of 1989 to 12.1 mn b/d during the latter half of the year.[5/] The USSR has expressed a willingness to work with foreign companies, including Kuwaiti companies, to increase production levels, a development which may positively affect output levels during the nineties.[6/]

Table 3. OPEC quotas affecting ESCWA members of OPEC, 1987-1990, 000 b/d

	1987	1988	Jan.-June 1989	July-Sept. 1989	Oct.-Dec. 1989	Jan.-June 1990	Change Jan.- 1990/ Jan. 1989 (%)
Iraq	1 466	*	2 640	2 783	2 926	3 140	18.9
Kuwait	946	996	1 037	1093	1 149	1 500	44.7
Qatar	285	299	312	329	346	371	18.9
Saudi Arabia	4 133	4 343	4 524	4 769	5 014	5 380	18.9
United Arab Emirates	902	948	988	1 041	1 094	1 095	10.8
ESCWA	7 734	4 642*	9 501	10 015	10 529	11 486	20.9
OPEC	15 800	16 600	18 500	19 500	20 500	22 086	19.4
ESCWA/OPEC (%)	49		51	51	51	52	

Source: Middle East Economic Digest, 8 December 1989, p. 20 and other international sources.

* Iraq refused to accept a production quota during 1988. "ESCWA" refers to ESCWA members of OPEC. 1988 ESCWA figures exclude Iraq.

4/ Petroleum Intelligence Weekly, vol. 19 no. 5, 29 January 1990, pp. 4-5.

5/ Petroleum Economist, February, 1990, p. 72.

6/ Middle East Economic Survey, 12 February 1990, p. 7, Petroleum Economist, January 1990, p. 41, and Petroleum Intelligence Weekly, 4 December 1989, p. 3. Examples include an agreement recently signed with a United States firm to drill deep wells in an existing field and new prospects for joint ventures with foreign companies for exploration.

Recent trends within OPEC include a commitment to increase production capacity by those countries with large reserves and a further move by some OPEC member countries to produce at levels greater than their quotas. Currently, total capacity of OPEC member countries is estimated at 27.6 mn b/d and planned additions to capacity for the group amounts to 8.2 mn b/d.[7/] Increases in capacity are seen as necessary to meet future increases in the demand for oil and desirable as a means of strengthening an individual country's position in the organization. Some OPEC countries, though, will be hampered by lack of financial capital and are looking at innovative financing schemes for such projects. Recent pressures to increase quota levels have come from members with high levels of production capacity.[8/] Some members have questioned the need for quotas at all. Kuwait, an important member of the organization, called for the abolition of quotas.[9/] Such a move would seriously weaken OPEC's influence over international oil prices.

3. World demand for oil

The demand for oil world-wide increased during 1989 by 1.2 per cent, which was less than the increase for the previous year. Table 4 illustrates the demand for oil by consuming region from 1987 through 1989. The largest increase was experienced by non-OECD countries, which are, for the most part, developing countries. Demand for oil grew by 4.3 per cent in non-OECD countries, which was almost the same as the previous year. A significant factor contributing to the high growth in the demand for oil of non-OECD countries was the increase experienced in the Asia and Pacific region. The region as a whole, that is including Japan, consumed 8-9 per cent more oil in 1989, and such growth is expected to continue.[10/] Providing present rates of economic growth continue, the Asia and Pacific region, excluding Japan, is expected to consume 500,000 b/d more during 1990, an amount equal to the increase expected from all developing countries.[11/]

Table 5 shows world demand for oil, excluding the centrally-planned economies, by quarter during 1989. It is interesing to note the significant increase during the fourth quarter of 1989 by the OECD countries. While consumption generally tends to increase during this quarter, due to climatic conditions in consuming countries, it was higher than during the fourth quarter of 1988 as well. This increase allowed a significant expansion of output levels without causing declines in prices. Prices actually increased during the fourth quarter of 1989, as noted earlier. This unexpected strength in demand during the fourth quarter of the year was caused by colder than normal weather in many of the consuming countries and higher growth rates in Japan.[12/]

7/ Wall Street Journal, 22 November 1989, p. 1.

8/ See for instance Middle East Economic Survey, 8 January 1990, p. A5, in which King Fahd's call for a higher quota for Saudi Arabia is reported.

9/ Arab Oil and Gas, 16 February 1990, vol. 19 no. 442, p. 26.

10/ Petroleum Intelligence Weekly, vol. 29, no. 6, 5 February 1990.

11/ See note 10.

12/ IEA, Monthly Oil Market Report, January 1990, p. 2.

Table 4. World demand for oil, 1987-1990, 000 b/d

	1987	1988	1989	1990*	Per cent change 1989/1988	Per cent change 1988/1987
Centrally-Planned Economies	13 491	13 454	13 243	13 300	-1.6	-0.3
OECD	36 000	37 200	37 600	38 000	1.1	3.3
Non-OECD	13 300	13 900	14 500	15 000	4.3	4.5
Market Economies	49 300	51 100	52 100	53 000	2.0	3.7
Total World	62 791	64 554	65 343	66 300	1.2	2.8

Source: IEA, Monthly Oil Market Report, January 1990, p. 11 and Petroleum Economist, January 1990, p. 27.

* Estimate of demand for 1990 based on IEA forecasts.

Table 5. Market economy demand for oil by quarter, 1989, 000 b/d

	Quarter 1	Quarter 2	Quarter 3	Quarter 4	1989 Average
OECD	38 000	36 000	37 000	40 000	37 600
Non-OECD	15 000	14 000	14 000	15 000	14 500
Total	53 000	50 000	51 000	55 000	52 000

Source: International Energy Agency, Monthly Oil Market Report, January 1990 and other international sources.

Forecasts for oil demand to the year 2000 vary but generally agree that demand will increase. Demand depends on a variety of factors, including the price of oil, economic growth rates and the prices of other energy sources. Assuming moderate growth rates in industrialized countries and prices ranging between US$ 10/b-20/b until 1995 and less than US$ 42/b until the year 2000,

one forecast predicts that world oil demand, excluding centrally-planned economies, will grow by 1.5 per cent per year through the year 2000.[13/] Over half of this increase will come from developing countries. Another forecast predicts that world oil demand will grow by 1.3 per cent annually to 1995.[14/] Some forecasts portray different scenarios with varying assumptions. One such forecast with three different scenarios assumes 3 different demand growth rates ranging from 44 per cent to 3 per cent annually.[15/] The United States Department of Energy uses an energy demand growth of 1.2 per cent per year until the year 2010 for its base case forecasts.[16/]

An important recent development which could adversely affect the short- and long-term demand for oil is the growing awareness world-wide of environmental damage caused by the use of hydrocarbon fuels. In part as a result of dire forecasts predicting extreme ecological changes, environmental movements have begun to gain widespread support in major consuming areas and are gaining support in public policy arenas. Even the USSR has a small but active environmental group which has gained access to policy makers.[17/] Recently, original forecasts of sudden and severe climatic changes are under criticism mostly because they were based on simulations from computerized models which did not include all relevant variables.[18/] However, most scientists do agree that adverse environmental consequences will result if present rates of growth in hydrocarbon fuels, including oil, continue. The debate actually centres on the timing and extremity of these consequences.

Oil is not the most advantageous fuel in the hydrocarbon group. It is more environmentally sound than coal, producing 83 per cent of the carbon produced from burning coal for the same energy output. Natural gas, however,

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13/ Conoco, World Energy Outlook, Through 2000, 1989, p. 4. GDP growth in the OECD countries, excluding Japan, is expected to average slightly less than 3 per cent per year, while Japan's GDP is expected to increase by more than 4 per cent annually.

14/ Fereidun Fesharaki, "Oil prices in the short-, medium-, and long-term", Energy Policy, January/February 1990, pp. 66-71.

15/ Fereidun Fesharaki, David Isaak, and Nancy Yamaguchi, World Oil Supply and Demand Outlook to 2000, Petroleum Advisory No. 43, East-West Center, Honolulu, Hawaii, October 1, 1989.

16/ Energy Information Agency, Annual Energy Outlook 1990, Washington, D.C., January 1990, p. 41.

17/ Petroleum Economist, August, 1989, p. 247.

18/ William K. Stevens, "Skeptics are Challenging Dire 'Greenhouse' Views", New York Times, 13 December 1989, p. 1, and Oil and Energy Trends, 15 September 1989, pp. 1-11.

is a cleaner-burning fuel, producing only 57 per cent of the carbon produced from coal.19/ Many solutions centre on the use of natural gas rather than oil and coal, especially for the production of electricity. A new generation of efficient gas turbines has the potential of reducing carbon dioxide emissions from currently used coal-fired plants by about 60 per cent, partly as a result of increased energy efficiency.20/ Generally, recommendations focus on increasing energy efficiency and on policies aimed at limiting energy demand growth.21/

Laws and regulations are in force regulating and restricting carbon dioxide emissions, but many countries are in the process of tightening them. Added costs due to environment-related regulations, amounting to US$ 2.8 billion, have been charged against the revenues of six major United States oil companies in 1989.22/ These figures include the US$ 1.38 billion incurred by Exxon in its cleanup of its Alaskan oil spill. While such measures appear to place the burden of environmental control on the producers, a portion of the costs will be passed on to the consumer in the form of higher prices, which will discourage consumption. Actually, in many countries environmental policies are isolated from energy policies, and since policy decisions in each area profoundly affect developments in the other area, they should be coordinated and should complement each other once implemented.23/

4. Oil stock levels

Oil stocks held by OECD countries increased somewhat during 1989 but did not play an influential role in determining price levels as was the case during the latter part of 1988. Table 6 shows oil stocks held by OECD countries on land during the four quarters of 1989 and for the beginning of 1988 and 1990. By January of 1990 oil stocks had dropped somewhat but were still higher than January levels in 1989 and 1988. The number of days' consumption that this amount would satisfy has dropped due to the increase in

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19/ See United Nations Department of International, Economic and Social Affairs, "The International Energy Situation", World Economic Survey 1989, 1989, pp. 106-112, for a detailed analysis of the effects of hydrocarbon fuel use on the environment and the ramifications for the international energy markets.

20/ Gregory H. Kats, "Slowing Global Warming and Sustaining Development", Energy Policy, January/February 1990, pp. 25-33.

21/ Myles R. Allen and John M. Christensen, "Climate Change and the Need for a New Energy Agenda", Energy Policy, January/February 1990, pp. 19-24, and Energy Policy -- Special Issue on Energy and Environment, April, 1989.

22/ Petroleum Intelligence Weekly, 5 February 1990, p. 2, and Oil and Gas Journal, 5 February 1990, p. 30.

23/ See, for instance, S. Owens and C.W. Hope, "Energy and Environment -- the Challenge of Integrating European Policies", Energy Policy, vol. 17, no. 2, April 1989, pp. 97-102.

consumption of oil experienced during 1989. Actually, the increase in stock levels since 1988 results mainly from publicly held oil stock. Those held by companies, although twice as large as publicly held stocks, decreased slightly from 329 mn metric tons in January 1988 to 315 mn metric tons in January 1990.24/

Table 6. OECD oil stocks on land, million barrels and days, as of the first day of each month

	1/88	1/89	4/89	7/89	10/89	1/90
Total stocks	3 328	3 285	3 238	3 299	3 395	3 315
Days' consumption	95	92	97	98	93	92

Source: International Energy Agency, Monthly Oil Market, January 1990.

5. Market restructuring of the international oil market

Market restructuring of the international oil market continued during 1989, with major oil-producing countries, including non-OPEC producers, investigating the possibilities of purchasing downstream facilities in major consuming areas. Advantages of further vertical restructuring are viewed for oil-producing countries in that they will be assured of market outlets for their crude oil production, especially in the event of an oil surplus on the international market. Advantages are also envisaged for consuming countries since producers will have an economic vested interest in the major consuming areas and will work to avert wide oscillations in oil prices. Such vertical integration of the international oil industry would foster a greater degree of energy interdependence between producing and consuming countries and could be an important factor in promoting price stability in the international oil market.25/

24/ International Energy Agency, Monthly Oil Market Report, January 1990, p. 7. Figures changed from metric tons.

25/ John Roberts, The Gulf, Integration, and OPEC: Overseas Downstream Activities, International Research Centre for Energy and Economic Development, Occasional Paper No. 4, University of Colorado, Boulder, Colorado, 1988. This paper discusses the effects of vertical integration on the international oil market and on OPEC and also presents an overview of the recent downstream activities of the GCC countries.

A few ESCWA member countries have been active in this regard during the past few years, with the most notable activity probably being the purchase of considerable shares of British Petroleum by the Kuwait Investment Corporation during the eighties.[26/] Saudi Arabia's purchase of fifty per cent interest in Texaco's Star refineries during 1988 also received considerable publicity. These two countries, along with the United Arab Emirates, are the most active ESCWA member countries in this regard and during 1989 explored additional opportunities of investing in downstream activities in major oil-consuming countries. During 1989 Kuwait was probably in the best position financially of the three countries to pursue such a goal; officials had expressed a desire to diversify their investments on a geographic basis as well as by petroleum products and recently purchased a United Kingdom lubricants company.[27/] Kuwait and Saudi Arabia investigated possibilities in the Far East including Japan.[28/] Kuwait announced plans of establishing a retail network in Thailand, and Saudi Arabia has discussed the possibility of building a refinery in Indonesia. The United Arab Emirates is reported to be interested in the purchase of a ten per cent share in a United States refinery with a total capacity of 130,000 b/d.[29/] These activities actually complement plans for increasing production capacity and projects already underway to improve domestic downstream capabilities.

B. Oil-related developments in the ESCWA region

1. ESCWA region oil reserves in 1989

Oil reserves in the ESCWA region increased moderately during 1989, by slightly over 1 per cent. This increase can be attributed to oil discoveries and oil reserve reassessments in Egypt, Kuwait, Qatar and Saudi Arabia. Oil reserves decreased during 1989 in Democratic Yemen and Bahrain by 11 per cent in each country. Bahrain's decline is attributed to resource depletion. Because of their relatively small size in absolute terms, these decreases had a minor impact on total ESCWA reserve levels. ESCWA's oil reserves accounted for 57 per cent of total world reserves, which was the same as its 1988 share.

2. ESCWA region oil production during 1989

Oil production in the ESCWA region increased by 8.8 per cent during 1989, mostly as a result of production increases of major oil-producing countries attempting to gain a larger share of the international oil market. ESCWA member countries, including non-OPEC countries, produced 61 per cent as much as

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26/ Kuwait was forced to sell a major portion of its shares back to British Petroleum in 1988 after intervention by the British government.

27/ Middle East Economic Survey, 16 October 1989, pp. A10-A12.

28/ Oil and Gas Journal, 22 May 1989, p. 48.

29/ Petroleum Intelligence Weekly, 5 February 1990, p. 1.

OPEC countries, a level slightly lower than during 1988. Since ESCWA's largest producers are OPEC members, this figure may be somewhat misleading. ESCWA's share of the market economy countries' production, which increased during 1989 from 28 per cent to 30 per cent, is more indicative of ESCWA's position as a region of growing importance in the international oil market. Its share of total world production also increased, from 21 per cent to 22 per cent in 1989.

Table 7. ESCWA region proven oil reserves, 1988-1989
million barrels, end of year figures

	1988	1989	Percentage change 1989/1988
Democratic Yemen	3 380	3 000	-11.24
Bahrain	126	112	-11.11
Egypt	4 300	4 500	4.65
Iraq	100 000	100 000	0.00
Jordan	5	5	0.00
Kuwait	94 525	97 125	2.75
Oman	4 071	4 250	4.40
Qatar	3 150	4 500	42.86
Saudi Arabia	254 985	257 559	1.01
Syrian Arab Republic	1 730	1 730	0.00
United Arab Emirates	98 105	98 105	0.00
Yemen	1 000	1 000	0.00
Total ESCWA	565 377	571 886	1.15
Total World	992 420	1 001 572	0.92
ESCWA/World	0.57	0.57	

Source: Oil and Gas Journal, various issues.

Kuwait, Qatar and the United Arab Emirates experienced increases in production equal to or greater than 20 per cent, as shown in table 8, and produced at levels significantly higher than their OPEC quotas. Iraq and Saudi Arabia had modest increases of 7.7 and 1.2 per cent, respectively. Iraq's production level was within its quota during 1989, and while its production capacity was higher than its output levels, officials declared that

it would produce up to capacity only in the event of an OPEC quota breakdown.[30/] Its excess capacity was used as a means of providing flexibility in its exports among various outlets. Though Saudi Arabia produced at levels slightly higher than that allowed by the OPEC quota, its output was far less than its capacity of 6.5-7.5 mn b/d. Officials expressed concern during 1989 that Saudi Arabia's quota was too low and that a quota of 6 mn b/d would be more reasonable.[31/]

Table 8. ESCWA region oil production, 1988-1989, 000 b/d

	1988	1989	Percentage change 1989/1988
Bahrain	43	43	0.0
Democratic Yemen	13	17	30.8
Egypt	888	904	1.7
Iraq	2 572	2 771	7.7
Kuwait	1 436	1 827	27.3
Oman	593	572	-3.4
Qatar	322	402	24.7
Saudi Arabia	5 059	5 121	1.2
Syrian Arab Republic	271	321	18.5
United Arab Emirates	1 524	1 829	20.0
Yemen	161	201	25.0
Total ESCWA	12 882	14 009	8.8
ESCWA/OPEC*	0.62	0.61	
ESCWA/Market Economies	0.28	0.30	
ESCWA/World	0.21	0.22	

Source: Petroleum Economist, January 1989, p. 4 and January 1990, p. 27.

Notes: B/D figures converted from tonnes. Jordan's production is excluded. 1988 figures revised from Pet. Econ. January 1990. CPE refers to Eastern Europe, USSR and China. Note that ESCWA members of OPEC data exclude NGLs. *Refers to all ESCWA countries, not only those which are members of OPEC.

30/ Middle East Economic Survey, vol. 33, no. 1, 9 October 1989.

31/ Middle East Economic Digest, 15 December 1989.

Other ESCWA countries also experienced significant production increases. Democratic Yemen, the Syrian Arab Republic and Yemen increased oil production by 30.8, 18.5 and 25 per cent, respectively. These increases are a result of serious efforts to develop oil discoveries made during the past decade; sales on the international oil market are now an important source of foreign-exchange earnings in each of these countries. Democratic Yemen's production, though small by regional standards, increased substantially during 1989 in spite of limitations on export capacity. All of Democratic Yemen's output is transported by truck, though a new pipeline is under construction. The Syrian Arab Republic's increase in output occurred despite technical problems in the Omar field, which was expected to produce 100,000 b/d; actual production averaged about 30,000 b/d during 1989.32/ Production is expected to reach 100,000 b/d by late 1990 or early 1991. The Syrian Arab Republic is also in the process of developing other recently discovered fields, which will add to its production levels during the coming years.

Egypt's output levels increased slightly, by 1.7 per cent, due to declining output levels in developed fields. Its output level is expected to increase as new discoveries are developed. Oman was faced with similar problems, and its output level decreased by 3.4 per cent during 1989.

3. ESCWA region production capacity

ESCWA countries with significant reserve levels are in the process of upgrading and expanding their production-capacity levels. Major oil-exporting ESCWA countries, which are also members of OPEC, are investing in higher capacities to improve their quota position within the organization. The main criterion for quota allocations within OPEC seems to have changed recently from reserve level to the production capacity. OPEC members with the financial means, including ESCWA countries, are acting to increase production capacity. Other ESCWA countries with oil reserves have produced close to their productive capacities, since oil revenues have played a significant role in the availability of hard currency and the financing of development projects. Table 9 shows the actual production capacity of ESCWA member countries in 1988 and their projected capacity in 1995.

Table 9 shows that total ESCWA production during 1989 was below its productive capacity by over 3 mn b/d mainly due to output levels significantly below capacity by Iraq and Saudi Arabia. Total capacity of ESCWA countries is expected to increase significantly from the 1989 level of 17.8 mn b/d to 23.4 mn b/d, or by 31.5 per cent. This compares favourably with the 17.2 per cent increase expected from OPEC member countries. Iraq's 1989 capacity level represents a notable increase over previous levels and is largely attributable to the 1989 inauguration of the IPSA-2 pipeline. In 1989 Iraq was investing in oilfield development and infrastructure to further increase its capacity, and announced plans to develop the Majnoon field with the participation of foreign firms. Saudi Arabia also sought to increase its production capacity during the 1990s. While some experts doubt it will attain its goal of over 100 mn b/d capacity, projects are currently under way to attain that goal, including expansion of the pipeline system, upgrading and expansion of various

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32/ Petroleum Economist, November 1989, p. 340. Actually, by the end of 1989 production had reached 40,000 b/d in the Omar field.

export terminals, and the development of additional production facilities.[33/] Kuwait, Qatar, and the United Arab Emirates also have major expansion-oriented projects planned.

Table 9. ESCWA region oil production capacity, 000 b/d

	1989 Actual production	1988/1989 Actual production	1995 Estimated capacity
Bahrain	43	43	20
Democratic Yemen	17	13	100
Egypt	904	950	1 100
Iraq	2 771	4 000	4 500
Kuwait	1 827	2 000	2 500
Oman	527	605	650
Qatar	402	500	700
Saudi Arabia	5 121	7 000	10 000
Syrian Arab Republic	321	350	450
United Arab Emirates	1 829	2 200	3 000
Yemen	201	160	350
Total ESCWA	14 009	17 771	23 370
Total OPEC	23 070	29 000	34 000

Source: Various international sources.

Increases in capacity by ESCWA members of OPEC and Iran will meet expected increases in demand during the nineties. The international oil market will rely more on ESCWA-produced oil, not only due to the forecasted increases in demand but to decreases in production from major non-OPEC producing countries as well.

4. ESCWA region oil revenues

ESCWA region oil revenues increased during 1989 due to higher prices on the international oil market and higher output levels in most ESCWA countries. Table 10 compares estimated oil revenues in the ESCWA region in 1989 with those of 1988 and shows that for the region as a whole estimated revenues increased by over 35 per cent, largely due to significant increases in

33/ Middle East Economic Digest, 15 December 1989.

the estimated revenues of the region's major oil producers, namely Iraq, Kuwait, Saudi Arabia and the United Arab Emirates. The magnitude of this increase was significantly greater than the increase in output of 8.8 per cent recorded for the region as a whole during 1989.

The increase in estimated revenues on a country-by-country basis ranged from 14.9 per cent in Oman to 64 per cent in Democratic Yemen. Oman experienced an increase in estimated revenues despite a decrease in its oil output during 1989. Bahrain's oil output remained the same as the 1988 level, but its estimated revenue increased by 25.4 per cent. Egypt's and Saudi Arabia's output increased by less than 2 per cent each, but their estimated oil revenues increased by over 24 per cent. Iraq's increase in estimated revenues of 35 per cent is significantly higher than its increase in output of 7.7 per cent during 1989.

The significant increase in oil revenues during 1989 had a positive effect on the region's general economic activity.

Table 10. ESCWA region estimated oil revenues, US$ bn

	1988	1989	Percentage change 1989/1988
Bahrain	0.23	0.29	25.4
Democratic Yemen	0.07	0.11	64.0
Egypt	4.20	5.23	24.5
Iraq	11.40	15.40	35.1
Kuwait*	6.20	9.80	58.1
Oman	2.92	3.36	14.9
Qatar	1.40	2.20	57.1
Saudi Arabia*	19.50	24.30	24.6
Syrian Arab Republic	1.45	2.15	48.7
United Arab Emirates	6.70	10.30	53.7
Yemen	0.86	1.34	56.8
Total ESCWA	54.93	74.49	35.6

Source: Data for Iraq, Kuwait, Qatar, Saudi Arabia and the United Arab Emirates from Petroleum Intelligence Weekly. Data for other ESCWA countries estimated as the product of price and output.

* Neutral zone revenues divided equally between Kuwait and Saudi Arabia.

C. ESCWA region refining industry

Table 11 shows the number of refineries and refinery capacity in the ESCWA region during 1988 and 1989. Total capacity decreased somewhat during 1989, mainly due to a decrease in capacity experienced by Saudi Arabia. The above figures, however, exclude the 325,000 b/d capacity of Saudi Arabia's Rabigh refinery, which began operations in early 1990.[34/] It is producing mainly fuel oil but at only 50-60 per cent capacity. Its output is designed primarily for export.

Also, the relative stability reflected in the above figures does not show the considerable activity which took place in upgrading existing facilities in the region during 1989. Kuwait recently finished a programme of upgrading and expanding its existing refineries so that three of its refineries operate as one system with a network of pipelines connecting them at an overall cost of US$ 4.7 billion.[35/] It recently invited bids to upgrade the Mina al-Ahmadi refinery which will cost an estimated US$ 100 million.[36/] Iraq reopened its Basra refinery during 1989, which had been closed during the Iraq-Iran conflict. Its capacity is 140,000 b/d, but it started production at only 40,000 b/d and increased to 70,000 b/d one month later.[37/] Iraq has also awarded contracts for the construction of the Musayab refinery, which will have a capacity of 140,000 b/d.[38/]

Plans exist in ESCWA countries which, if fully implemented, will increase refinery capacity considerably. Table 12 shows additions to current refinery capacity currently planned or under construction. Increases in production capacity are mainly aimed at increasing export capacity in major oil-producing countries. The bulk of the region's refined product exports are destined for Japan and the Far East. During 1989 Kuwait, Saudi Arabia and the United Arab Emirates together sold 220,000 b/d of naphtha, 130,000 b/d of kerosene, and 100,000 b/d of gas oil to Japan.[39/] Iraq also began selling refined products to Japan during 1989.

34/ Petroleum Intelligence Weekly, 8 January 1990, p. 3.

35/ Petroleum Economist, May 1989, p. 151. Total capacity increased as a result, and 1988 figures were considerably higher than 1987 figures for refinery capacity.

36/ Middle East Economic Digest, 9 February 1990, p. 21.

37/ Petroleum Economist, May 1989, p. 158.

38/ Middle East Economic Digest, 19 February 1990, p. A5.

39/ Petroleum Intelligence Weekly, 6 November 1989, p. 2.

Table 11. Number of refineries and refinery capacity in the ESCWA region, 1988, 1989

	1988		1989	
	No.	Capacity b/d	No.	Capacity b/d
Bahrain	1	243 000	1	243 000
Democratic Yemen	1	161 500	1	161 500
Egypt	8	489 203	8	489 203
Iraq	8	318 500	8	430 000
Jordan	1	100 000	1	100 000
Kuwait	4	817 000	4	819 000
Lebanon	2	37 000	2	37 000
Oman	1	76 932	1	76 932
Qatar	2	62 000	2	62 000
Saudi Arabia	7	1 375 000	7	1 007 000
Syrian Arab Republic	2	243 744	2	243 744
United Arab Emirates	2	180 000	2	180 000
Yemen	1	10 000	1	10 000
Total ESCWA	40	4 113 879	40	3 859 379

Source: Oil and Gas Journal, various issues and other international sources. Note that data represents end-of-year figures.

Table 12. Refinery capacity planned or under construction in the ESCWA region, (b/d)

Bahrain	40
Egypt	125
Iraq	140
Saudi Arabia	160
United Arab Emirates	300
Yemen	50

Source: Arab Oil and Gas, 16 January 1990, p. 29, and Oil and Energy Trends, December 1989, table 11. Data for Saudi Arabia excludes the recently-opened Rabigh refinery.

Increases in refinery capacity in the major oil-producing countries are also designed to complement the overall strategy of investment in downstream industries worldwide. Kuwait, Saudi Arabia and the United Arab Emirates have additional refinery capacity located outside the region as mentioned above.

D. Oil transport in the ESCWA region

1. Overland systems of transport in the ESCWA region

A major development in overland transportation of oil in the ESCWA region was the opening of Iraq's IPSA-2 pipeline in January 1990.[40/] It runs across Saudi Arabia and was designed to allow Iraq to export from the Red Sea port of Yanbu. The pipeline is 1,575 kilometres and has a capacity of 1.65 mn b/d. It was started during the Iraq-Iran conflict to give Iraq an alternative export outlet but can now play an important role in increasing Iraq's production and export capacity. During 1989 Iraq significantly decreased its use of overland trucks, which enabled it to export oil via Aqaba during the Iraq-Iran conflict.

Plans to increase the Sumed pipeline were approved by Egypt's Ministry of Petroleum and Mineral Wealth.[41/] The pipeline is actually an integral part of oil transport through the Red Sea and the Mediterranean Sea. Its capacity is currently about 1.6 mn b/d, and the expansion will increase it by approximately 14 per cent.[42/] Use of the Sumed pipeline increased considerably during 1989 due to the increase in demand for oil, and production by nearby ESCWA countries increased. The Sumed line operated at greater-than-capacity levels during the year, and fees were increased.

Longer-term plans in the ESCWA region include Saudi Arabia's plans to expand its existing pipeline outlet to the Red Sea and a possible pipeline to the Indian Ocean through Oman.[43/] Kuwait is also considering pipeline outlets to the Red Sea. During 1989 plans for a pipeline to transport oil produced in northern Iraq to export-terminals on the Arabian Sea were under consideration. The capacity of this pipeline will be 880,000 b/d. A second pipeline with a capacity of one million b/d from northern Iraq through Turkey to the Mediterranean Sea is also under consideration.

40/ Petroleum Economist, February 1990, p. 66.

41/ Middle East Economic Digest, 9 February 1990, p. 17.

42/ Middle East Economic Digest, 9 February 1990, p. 17.

43/ Oil and Gas Journal, 22 May 1989, p. 42.

2. Water transport of oil in the ESCWA region

Transportation of oil by sea increased during 1989 as oil demand increased and production by Middle East producers, includig those of the ESCWA region, increased dramatically. ESCWA region producers located on the Arabian Gulf were able to ship oil through the Gulf without the risk associated in previous years with the Iraq-Iran conflict. Table 13 shows the ESCWA region tanker fleet by flag of registration. The region's fleet increased considerably both in number and in capacity measured by the dead-weight tonnage. This increase is partly due to the reflagging of ships already owned in the region as a result of the cessation of hostilities between Iraq and Iran.

Table 13. ESCWA region tanker fleet, 1988 and 1989

Country	1988		1989		Per cent change in DWT	Per cent of world total
	No.	DWT	No.	DWT		
Egypt	7	443 488	8	473 304	6.72	0.19
Iraq	16	1 405 230	17	1 493 010	6.20	0.60
Kuwait	9	418 396	17	1 956 662	367.66	0.78
Lebanon	1	20 880	1	20 880	0.00	0.01
Qatar	2	197 637	2	197 637	0.00	0.08
Saudi Arabia	24	2 711 997	20	2 529 285	-6.74	1.01
United Arab Emirates	15	728 707	15	728 358	-0.05	0.29
Yemen	1	400 219	1	400 219	0.00	0.16
Total ESCWA	75	6 326 554	81	7 799 355	23.28	3.12

Source: World Tanker Fleet Review, various issues. End of year data. By flag of registration.

The state-owned Kuwait Oil Tankers company made a profit of US$ 55 million during the fiscal year ending in June 1989.[44/] This concurred with developments worldwide in the tanker industry due to the increase in demand for oil shipping. The Kuwaiti fleet comprises 30 tankers with a total capacity of 2.56 mn tons.[45/] Kuwait uses tankers to supply the European market with refined products.[46/] Kuwait's fleet is an important part of its strategy to develop a fully integrated operation.

44/ OPEC Bulletin, February 1990, p. 56.

45/ Not all tankers are registered under the Kuwaiti flag.

46/ OPEC Bulletin, February 1990, p. 56.

Iraq increased its oil shipments via the Arabian Gulf during 1989 and had hoped reconstruction currently underway on its Gulf facilities would enable it to further utilize the Gulf waterway as a means of oil transportation during the nineties. Exports from Mina al-Bakr were resumed in June, 1989, and export capacity of this terminal was estimated at 800,000 b/d, though only 350,000 b/d of FAO Blend was exported from it during 1989.47/

II. RECENT DEVELOPMENTS IN THE ESCWA REGION GAS INDUSTRY

A. The ESCWA region and the international gas market

The ESCWA region holds 19 per cent of the world's natural gas reserves and 31 per cent of the market economy gas reserves. International trade is minimal; trade is mostly interregional. The region's reserves increased by 7.8 per cent during 1989 compared to a world-wide increase of only 0.9 per cent. Its significant portion of reserves and modest growth in reserves places the region as a potentially important supplier of natural gas to major consumers. Factors inhibiting such a development until now have included the relatively limited international trade of natural gas, the high investment needed for the infrastructure to transport gas and the geographical location of the ESCWA region. Until recently many experts in the field discounted the region's potential in the international gas market in part because of these factors.48/ However, international demand and supply conditions are changing, and the international trade of natural gas is increasing, a trend from which ESCWA region producers may benefit. By 2010 interregional trade of natural gas is expected to have increased to 266 bn cubic metres (cu m), a figure significantly higher than the 62.5 bn cu m traded in 1987.49/

Natural-gas trade is growing worldwide partly because of increases in demand resulting from the general concern over environment-related issues. Gas is the cleanest-burning fossil fuel, and many governments are encouraging its use over other fuels. Use of natural gas is expected to increase by 93 per cent by 2005 over 1987 levels.50/ During the same period, total energy use will increase by 52 per cent, while oil consumption will increase by a much lower 33 per cent.

47/ Middle East Economic Digest, 19 February 1990, p. A5.

48/ See, for instance, Bijan Mossavar-Rahmani, Natural Gas Trade in Transition, Energy and Environmental Policy Centre, Harvard University, Cambridge, Mass., 1987.

49/ Daniel A. Dreyfus, "Natural gas: examining the availability of supply", OPEC Bulletin, February 1990, p. 17.

50/ Petroleum Economist, March 1990, p. 84.

Other factors which may positively affect the ESCWA region's potential as an international supplier of natural gas are related to political developments in Europe. The European Economic Community (EEC), which will strengthen its economic ties in 1992, will eliminate many trade barriers within its member countries and may eventually develop a regional gas grid. Regulations restricting gas supplies are expected to be lifted and gas consumption encouraged. Currently member states import gas from Norway, the USSR, Libya and Algeria. Europe has been cited as a potential market for Qatari gas, but as yet no firm interest has arisen. However, as consumption increases and if other suppliers cannot meet its needs, Europe may turn to the ESCWA region for additional supplies. The USSR's ability to meet increases in Europe's demand for gas has been questioned as its infrastucture and maintenance problems have become known. Also, political developments in Eastern Europe and the USSR's apparent unwillingness to continue supplying Eastern European countries with (often subsidized) energy will compel many of those countries to purchase supplies from international markets. In many Eastern European countries, public attention has focused on environment-related problems, and these countries may show a preference for natural gas in the future.

The Far East is another potential market for ESCWA region gas. Japan currently imports LNG from the United Arab Emirates. Its demand for LNG is expected to increase, from 42 bn cu m/y in 1989 to 50-60 bn cu m/y in the year 2000.51/ Additional imports from the United Arab Emirates and Qatar are under consideration. World demand for LNG is expected to grow by 50 per cent in the next ten years to reach 90 bn cu m/y by the year 2000 and should be 120 bn cu m/y by 2010.52/ Clearly opportunities exist for ESCWA countries in this field.

Reserves of many ESCWA countries are in excess of their domestic needs. Intraregional trade does exist on a limited basis, and potential for increasing trade exists within the region. The Syrian Arab Republic, Iraq, the United Arab Emirates, and Qatar have the ability to supply nearby countries with relatively modest levels of capital investment.

B. ESCWA region natural gas reserves, production and consumption levels

Gas reserves in the ESCWA region rose during 1989 mainly due to important discoveries in Kuwait, Saudi Arabia and the Syrian Arab Republic. Total reserves increased by almost 8 per cent over 1988 levels, as shown in table 14, and by 25 per cent over 1987 levels. ESCWA's share of total world reserves of gas also rose from 18 per cent in 1988 to 19 per cent in 1989. This figure was only 16 per cent in 1987. ESCWA's share of market economies' gas reserves has also risen steadily, from 26 per cent in 1987 to 29 per cent in 1988 to 31 per cent in 1989. While its importance in the gas market is not of the same magnitude as the international oil market, these figures show that gas is important as a domestic energy source in the region and that the ESCWA region has the potential to become an important region in an integrated international energy market.

51/ G. Vernon Hugh, "LNG -- Continued Market Expansion", Petroleum Economist, December 1989, pp. 367-369.

52/ See note 51, p. 369.

Table 14. ESCWA region gas reserves, 1988, 1989, (bn cu m)

Country	1988	1989	Percentage change 1989/1988
Bahrain	190	183	-3.3
Egypt	325	332	2.2
Iraq	2 690	2 690	0.0
Jordan	28	28	2.0
Kuwait	1 378	1 546	12.2
Oman	272	262	-3.5
Qatar	4 437	4 618	4.1
Saudi Arabia	4 304	5 305	23.3
Syrian Arab Republic	372	600	61.4
United Arab Emirates	5 706	5 686	-0.4
Yemen	156	156	0.0
Total ESCWA	19 857	21 407	7.8
Total Market Economies	67 809	68 691	1.3
Total World	112 003	112 959	0.9
ESCWA/Market Economies	0.29	0.31	
ESCWA/World	0.18	0.19	

Source: Oil and Gas Journal, December 1988, 1989. Yemen 1988 data from PIW, 17 October 1988, p. 8. Oman 1988 data from Petroleum Economist, November 1988, p. 378. The Syrian Arab Republic's 1989 figure from Petroleum Economist, April 1990, p. 133. Jordan 1989 figure from Jordanian officials.

Gas is playing an increasingly important role in many ESCWA countries, and the increase in reserves reflects the importance attached to exploration and development of gas reserves throughout the region. Promoting the consumption of gas in those countries with reserves allows greater amounts of oil to be exported. This strategy is especially important in those ESCWA countries which are not major oil exporters and which rely heavily on the hard currency earned from oil exports to finance development projects and service debt. ESCWA region gas output during 1989 increased by over 7 per cent, which represented a continuation of the trend of annual increases in output during the eighties. While some ESCWA countries experienced modest declines in gas production, significant increases by Qatar, Saudi Arabia and the United Arab Emirates outweighed declines in other countries and contributed to the regional increase in production.

Egypt has been relatively successful with this strategy as it has coped with rising domestic energy demand coupled with an increasing need for the hard currency earned from oil sales on the international market. Egypt's gas production increased by almost 5 per cent during 1989. It has been able to decrease the incidence of flaring, from 16 per cent of gross production in 1985 to 2 per cent in 1988, and is implementing an ambitious project to pipe gas directly to households in its urban areas. Egypt announced that its recent discoveries will allow it to double its gas production from 20 mn cu m/d to 40 mn cu m/d.[53/] A project estimated at US$ 112 million to develop a gas field in the Western Desert was recently approved as a joint venture between Shell Egypt and the Egyptian General Petroleum Corporation.[54/]

Though Iraq's gas production remained stable during 1989, its postwar rebuilding activities included gas development projects. Iraq had re-evaluated its oil and gas reserves in 1988, and gas reserves increased by over 250 per cent. During 1989, however, reserves remained the same as shown in table 14. Iraq's gas development plans by 1989 included developing a new field of 127 bn cu m in the north of the country called the Anfal field, near Ta'mim.[55/] Iraq is also looking into possibilities of increasing its export of natural gas; potential customers include Turkey and the USSR.[56/]

Jordan's Risha gas field was successfully exploited during 1989, but due to the complex geological structure of the field, its boundaries have not yet been delineated. Reserves were currently estimated at between 14 and 28 bn cu m in 1989, and more wells are planned in an effort to determine the size of the field. Commercial production began in March 1989, and by early 1990 production reached 566 thousand cu m/d. The gas is used to fuel a power plant which provides approximately 15 per cent of the total electricity consumed in Jordan. A study is currently under way to determine how to efficiently utilize Jordan's gas.

Kuwait's gas reserves increased during 1989 by 12 per cent, but production declined slightly. Kuwait's reserves are associated with oil, and its production often falls short of domestic needs. Kuwait continued to import gas from Iraq during 1989 but at lower levels than during 1988.

Gas reserves in Oman declined slightly during 1989, while production decreased by 7 per cent. Gas consumption has been increasing and rose by an estimated 12 per cent in 1989. Consumption of gas is expected to increase by

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53/ Petroleum Economist, May 1989, p. 160.

54/ Middle East Economic Digest, 9 February 1990, p. 16.

55/ OPEC Bulletin, February 1990, p. 50.

56/ See Petroleum Economist, May 1990, pp. 150-151.

Table 15. ESCWA region gas production, 1987, 1988, 1989
(mn cu m)

Country	1987	1988	1989	Per cent change 1989/1988
Bahrain	6 130	5 500	5 491	-0.17
Egypt	6 280	6 920	7 243	4.67
Iraq	3 750	5 730	5 714	-0.27
Jordan			54	
Kuwait	5 300	6 490	6 312	-2.75
Oman	2 260	2 450	2 277	-7.07
Qatar	5 610	6 470	7 258	12.17
Saudi Arabia	26 800	29 100	30 576	5.07
Syrian Arab Republic		720	694	-3.64
United Arab Emirates	19 310	18 640	22 390	20.12
Total ESCWA	75 440	82 020	88 009	7.30

Source: OPEC Annual Statistical Bulletin, 1987, 1988 data: Petroleum Economist, August, 1989, p. 250. 1989 data: Oil and Gas Journal, 19 March 1990, p. 31. Jordan production is an estimate based on information from the Natural Resources Authority.

10 per cent in 1990 and 9.5 per cent in 1991.[57/] Oman has both associated and nonassociated gas reserves, with nonassociated reserves over double the level of associated reserves.[58/] Currently 90 per cent of Oman's production is used for electricity generation, while 10 per cent is consumed by the industrial sector. Oman plans to continue to use gas for further expansion of electricity-generation capacity and encourages additional industrial use of gas. It intends to expand the capacity of its Yibal gas-processing plant. Plans for further utilizing gas include an expansion of the natural gas liquid plant in Yibal and the conversion of a VLCC to a floating offshore methanol plant.[59/] The methanol plant project is a private venture financed with foreign capital and is expected to be completed by 1991. Over 6 bn cu m of gas will be purchased from Oman during a 10-year period. The methanol produced will be exported to the United States and Europe.

57/ Oil and Gas Journal, 22 May 1989, p. 52.

58/ See Arab Oil and Gas, 1 June 1990, p. 14.

59/ Middle East Economic Digest, 15 December 1989, p. 20; and Petroleum Economist, May 1989, p. 156.

Qatar continued its programme of exploiting its significant gas reserves, and production increased by 12 per cent during 1989. Although Qatar has yet to conclude international agreements for the sale of its gas, it may sell gas within the region in the near future. A gas network to serve the GCC countries using Qatari gas is under serious consideration, according to the Qatar General Petroleum Corporation.60/ Meanwhile Qatar is developing its resources for local demand, which is growing rapidly. Gas is being used to supply more electricity as Qatar expands its fully utilized electric power facilities. It is also developing gas-based industries such as fertilizers and petrochemicals.61/ Phase I of the North Field Project is under way and should be completed in late 1990 or early 1991 at a cost of US$ 1.3 billion.62/ During 1989 Qatar also discussed the sale of significant amounts of LNG to Japan.63/ Such a commitment by Japan would allow Qatar to proceed with the second phase of the North Field Project.

Gas reserves in Saudi Arabia increased by 23 per cent during 1989, while production rose by only 5 per cent. Saudi Arabia has experienced recent increases in its demand for gas from industrial and public-sector users. Since much of its gas is associated with oil, and oil-production levels are below those of the early eighties, its gas production has failed to keep pace with the growing demand. Studies are currently under way to assess the domestic demand for gas so that investment decisions can be made.64/ Options include increasing production capacity at the nonassociated Khuff field and importing gas from neighbouring Qatar.

Though gas production declined slightly in the Syrian Arab Republic during 1989, it holds promise for the future, and the Syrian Arab Republic's current policy is to develop its gas reserves for domestic use to allow more oil to be exported. The Syrian Arab Republic intends to use gas for the production of electricity, to satisfy household energy needs, and for industrial uses such as fertilizer, cement and sugar production. Until the recent discovery of significant reserves in the Palmyra region, the Syrian Arab Republic's reserves consisted mostly of associated gas. The Palmyra reserves amount to 25 bn cu m and once developed could produce almost 3 mn cu m/d. The Syrian Arab Republic's domestic needs can be satisfied entirely with its associated gas and the Palmyra reserves, once developed, could be available for export. Actually, officials believe that there may be surpluses of associated gas available for export after all domestic needs are met.

60/ OPEC Review, February 1990, p. 50.

61/ Middle East Economic Digest, 19 January 1990, p. 27.

62/ Oil and Gas Journal, 22 May 1989, p. 51.

63/ Middle East Economic Digest, 29 December 1989, p. 28.

64/ Arab Oil and Gas, vol. 19, no. 449, 1 June 1990, p. 11.

The United Arab Emirate's gas production increased significantly during 1989 as increases in demand were met. Also, much of the country's gas is associated, and increases in oil output resulted in more gas produced. Nevertheless, domestic consumption is increasing, and the United Arab Emirates is looking to neighbouring countries to satisfy additional demand. Expansion of gas-based industries in Abu Dhabi and the planned expansion of Dubai's Jebel Ali industrial area account for recent and expected increases in the demand for gas. The possibility of importing gas from neighbouring countries, including Qatar and Oman, is under consideration.

Yemen is in the process of developing its gas resources for domestic use. The unification of Yemen and Democratic Yemen in early 1990 expanded opportunities in the energy sector in general and in the gas sector in particular. The general strategy of using gas to satisfy local energy needs whenever feasible remains unchanged. Natural gas will be used to produce electricity as Yemen expands and upgrades its system. Also a gas-utilization study is currently under way to determine the best ways of utilizing the gas, including the possibility of supplying gas to cement factories and power plants to replace fuel oil, which is currently imported. Yemen imported LPG from the Aden refinery in Aden despite its relatively high cost. The Aden refinery expects to continue supplying LPG to the united Yemen.

C. Gas transport in the ESCWA region

Gas is transported within the region mainly by trucks and pipelines. As gas use increases in the region, pipelines are increasingly relied upon, and gas projects and gas-based industry plans usually include pipeline schemes. Countries in the ESCWA region committed to developing their gas resources all have pipeline plans. In fact, studies recently completed or under way usually include analyses as to the best location of gas-based industries and electric power plants based in part on pipeline costs. The Syrian Arab Republic and Egypt are currently building pipelines from their gas processing facilities to final users. Yemen also has plans for gas pipelines which depend upon the location of final industrial users. Phase I of Qatar's North Field development project includes pipelines within the country, and the proposed GCC area gas grid would entail a system of gas pipelines.

Gas exported in liquid form from the region is transported by tanker. To reduce its dependence on foreign tankers, the state-owned Kuwait Oil Tankers Company plans to purchase two liquified petroleum gas tankers with a capacity of 78,000 cu m each and three 10,000 DWT tankers which would be available in 1994-95 for the export of ethylene gas.[65/]

65/ Arab Oil and Gas, 16 February 1990, p. 14, and OPEC Review, February 1990, p. 56.

III. OIL AND GAS EXPLORATION IN THE ESCWA REGION

Although exploration and development activity increased worldwide, as shown in table 16, such activity as measured by the number of active rigs in the region declined by 10 per cent. In only two countries of the ESCWA region, Iraq and Oman, did the number of rigs increase. In countries of the region with large reserves and output levels restricted by OPEC quotas, exploration activity has not been a high priority. In fact, additions to reserves made by re-evaluation of existing reserve levels has been much less expensive than the undertaking of costly exploration activity.[66/] Countries of the region with fewer reserves and those which rely on foreign exchange earned from the international sale of oil for development purposes were more likely to promote exploration activities and encourage foreign firms to participate.

Table 16. Active rigs in the ESCWA region (end of year)

Country	1988	1989	Per cent change
Bahrain	1	1	0.00
Egypt	23	14	-39.13
Iraq	27	30	11.11
Jordan	2	2	0.00
Kuwait	5	2	-60.00
Oman	11	20	81.82
Qatar	4	3	-25.00
Saudi Arabia	5	5	0.00
Syrian Arab Republic	31	22	-29.03
United Arab Emirates	12	10	-16.67
Total ESCWA	121	109	-11.01
Total World*	1 954	2 364	20.98
ESCWA Per cent of World*	6.19	4.61	

Source: Oil and Energy Trends, February 1990, table 3; and Arab Oil and Gas, 16 February 1990, p. 21.

* Excludes centrally-planned economies. Figures exclude the Neutral Zone and Yemen.

66/ See Roger Vielvoye, "Middle East: Exploration Slack in Mature Areas, New Producers More Active", Oil and Gas Journal, 22 May 1989.

Though no recent discoveries have been made in Bahrain, it continues to encourage exploratory activity. Officials began negotiations with foreign companies in early 1990 for the award of new exploration licenses.[67/] An agreement for a three-year exploration programme was made with an American firm in the offshore northern coast area.[68/]

Although Egypt showed a significant decline in active rigs operating during 1989, as shown in table 16, it continued to promote exploration activities and reported eight oil discoveries and one gas discovery during 1989. One such discovery in the Gulf of Suez, at a depth of 6,500 feet, is in an area in which oil has never before been discovered. Egypt is also committed to quickly developing its discoveries, and this particular field will have an initial production capacity of 4,300 b/d.[69/] Another oil discovery by Gupco, a joint venture between a foreign company and the Egypt General Petroleum Corporation, was light crude with an expected production of 20,000 b/d.[70/] Furthermore, agreements were signed between 1988 and early 1989 with foreign companies which call for exploration outlays totalling US$ 312 million.

Increases in Iraq's active rigs reflect its commitment to developing its significant reserves though exploration continues and two discoveries were reported in 1989, as shown in table 17.

Jordan's exploration activities are mainly undertaken by the Natural Resources Authority and have been largely devoted to efforts to delineate the boundaries of the Risha gas field. Jordan receives some assistance from Canada though it conducts its own drilling as well. An Austrian firm has undertaken an 18-month exploration programme near the Saudi Arabian border involving seismic work which will cost US$ 2 million.[71/] A Japanese firm has also agreed to conduct seismic surveys in Wadi Sirhan.

Kuwait engages in exploration activity but, with its large levels of reserves and output restrictions placed by OPEC, its incentive is less than other ESCWA countries. Active rigs declined in 1989 and no discoveries were reported.

67/ Arab Oil and Gas, 16 February 1990, p. 21.

68/ Petroleum Intelligence Weekly, 5 February 1990, p. 8.

69/ Arab Oil and Gas, 16 May 1989, p. 18.

70/ Petroleum Economist, August 1989, p. 261.

71/ Arab Oil and Gas, 16 April 1989, p. 22.

Table 17. Oil and gas discoveries in the ESCWA region, 1989

Country	Oil	Gas
Egypt	8	1
Iraq	1	1
Oman		2
Qatar		1
Saudi Arabia	2	
Syrian Arab Republic	1	
Yemen	1	1

Source: Oil and Energy Trends, various issues; the United States Department of Energy, Oil and Gas Exploration and Development Activities, (Washington, D.C.) Fourth Quarter, 1989; and Arab Oil and Gas, 16 May 1989, p. 23.

Notes: Reported discoveries only. May not be commercial. Oil and gas discoveries in Iraq (one oil) Yemen (one oil/gas) and Oman (one gas) were discovered earlier but reported in 1989.

Oman's increases in active rigs are more of an indication of exploration activity. Oman's oil and gas resources are modest compared to other ESCWA countries and its oil fields are shallow. To maintain its present rate of production it must engage in exploration activity to replace mature fields in which output levels will soon decline. Oman's increase in productive capacity during the eighties is largely attributable to its successful exploration program. Petroleum Development Oman (PDO) undertakes exploration activities in the country and planned to drill 50 exploratory wells in 1989.[72/] A gas field was discovered in Oman in 1989 near the Saudi Arabian border containing 10 bn cu m.[73/] The field is relatively deep at 4000 metres and is significant since it has encouraged PDO to concentrate on deeper targets in its search for gas. PDO also conducted seismic surveys in offshore areas during 1989 while a foreign company began drilling wildcat wells in onshore areas.

Qatar also continued exploration activity, but no discoveries were reported in 1989.

72/ Oil and Gas Journal, 22 May 1989, p. 35.

73/ Petroleum Economist, August 1989, p. 259.

Saudi Arabia discovered two oil fields during 1989, as shown in table 17, and made an additional discovery in early 1990 which is reported to include some associated gas as well.[74/] Though its significant increase in reserve levels in 1988 was mainly the result of a re-evaluation of reserves, Saudi Arabia engages in exploration activity. Aramco, at the government's request, has been exploring in areas outside the previous Aramco concession, and industry experts believe that Saudi Arabia will experience another significant increase in reserves as a result.[75/]

The Syrian Arab Republic is encouraging exploration and, despite the decline in rigs during 1989, such activity continued with significant participation of foreign companies. Terms of foreign participation are typically production sharing and are attractive enough to arouse the interest of many foreign firms. At least one discovery was made in 1989 in the northeastern part of the Syrian Arab Republic where development drilling was under way.[76/] This new field is light crude yielding 5,000 b/d.

The United Arab Emirates curtailed its exploration activities during 1989, continuing a trend which began in 1987. The ten remaining rigs are owned by the National Drilling Company. Drilling activity has been minimized and focused on development drilling rather than exploratory drilling.

Yemen and Democratic Yemen encouraged exploration in their countries during 1989 and began to cooperate in exploratory ventures. The Yemen Company for Investment in Oil and Mineral Resources was established to promote cooperation and coordination in exploration in border areas. In early 1990 a foreign consortium was granted a license to explore the area between Ma'arib ad Shabwa.[77/] Seven exploratory wells and seismic surveys will be conducted in this area. The unification of the two countries will strengthen energy-sector activities, including exploration in this area, which is thought to have high potential for discovering oil.

74/ Middle East Economic Digest, 19 January 1990, p. 27.

75/ Oil and Gas Journal, 22 May 1990, p. 34.

76/ Arab Oil and Gas, 16 May 1989, p. 23.

77/ Middle East Times, 16-22 May 1990, p. 7.