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COMMITTEE ON SUSTAINABLE ENERGY

Steering Committee of the Energy Efficiency 21 Project

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FINAL REPORT ENERGY EFFICIENCY INVESTMENT PROJECT DEVELOPMENT FOR CLIMATE CHANGE MITIGATION

Note by the secretariat

This final report of UNECE Energy Efficiency Investment Project Development for Climate Change Mitigation project (ECE-CIS-99-043) has been prepared in accordance with the Memorandum of Understanding between the United Nations Fund for International Partnerships and the United Nations Economic Commission for Europe of 8 June 1999. According to Article IX Information and Reports, UNECE furnished a final report within twelve months after the completion or termination of each Project; the final report includes an assessment of whether and to what extent the Project accomplished its purpose as set out in the applicable Project Document.

GE.06-21778

Final Report on Project Implementation

Project number and title:	ECE-CIS-99-043 Energy Efficiency Investment Project Development for Climate Change Mitigation
Location:	Selected eastern European and CIS countries: Belarus, Bulgaria, Kazakhstan, Russian Federation, and Ukraine
Duration:	Project: three years 9 March 2000 to 9 March 2003 Project Extension: one year 9 March 2003 to 9 March 2004 Exceptional Extension: 6 March 2004 to 30 September 2005

I BACKGROUND AND CONTEXT

1. The inefficient and polluting energy systems in Eastern Europe and the CIS are glaring economic and environmental problems interwoven with promising opportunities for reducing global greenhouse gas emissions. Eastern European economies suffered from the low productivity and living standards associated with inefficient energy use long before central planning came to an end. The barriers that have been addressed by this project reflect the origins of these problems, together with the institutional inertia and initial policy priorities of economic transition. Broadly speaking, most decision makers still lack the confidence experience would give them to promote energy efficiency investments. Energy managers have the technical skills to select, install and maintain the technology needed but generally they still lack expertise in preparing and financing bankable projects. More importantly, both policy makers and their managers are reluctant to consider such investments without a dedicated source of project finance accompanied by a network of committed international partners to advise and encourage them. This project has established such a network.

2. Fortunately, several key features of these barriers also contain opportunities for them to be resolved or at least better managed. Most energy efficiency and some renewable energy investments are inherently cost-effective and self-financing given energy prices that are high enough to reflect the costs of production. The reform of energy prices and subsidies are on the macro-economic agenda in all of the countries that participated in this project. Efficiency improvements are also closely linked to increasing industrial and service sector productivity and rising living standards. Economic output in Eastern European and the CIS is growing at between 5 to 12 per cent annually and foreign direct investment continues to increase. Rationalising the large fixed capital investments in their energy production and consumption infrastructure could help maintain economic growth through productivity gains, attract foreign investments and diminish domestic capital flight. Market economies have abundant examples of every aspect of successful energy efficiency applications including innovative financing models. Indeed, Central European post-economic transition countries also have a growing range of experience in this field that can be readily transferred to their southern and eastern neighbours.

3. The difficulties for Eastern European energy efficiency initiatives in 1999 when the project was approved should be borne in mind when assessing the results of this project. There was very

little information available and the necessary skills were almost non-existent. The investment climate in most participating countries was distinctly unfavorable for energy efficiency investments. But during the last few years, national programmes together with bilateral and international projects have begun to develop the policy reforms and financial engineering skills needed for energy efficiency investments in the Eastern Europe.

4. This project has not only contributed to the improvement of investment conditions, but it has also stimulated and complemented other donors projects and programme with similar goals, such as selected UNDP-GEF projects, European Commission PHARE / TACIS projects, World Bank and EBRD initiatives, as well as a series of bilateral projects. Significant policy reform and capacity building energy efficiency projects are underway or have been completed in many countries including Belarus, Bulgaria, Croatia, Hungary, Kazakhstan, Russian Federation, Romania and Ukraine. While these efforts have produced mixed results, some important conclusions are beginning to emerge. The present project, for example, has demonstrated that it is possible to identify, develop and finance energy efficiency and renewable energy investment projects that will reduce greenhouse gas emissions in Eastern Europe and the CIS. But it has also shown that this is a time consuming and labour intensive process that needs to become much more fluid or business-as-usual in order to succeed on any meaningful scale.

5. The capacity to finance energy efficiency investments repeatedly coupled with the required reforms and capacities would open up a vast market in Eastern Europe and the CIS. The technical potential in Eastern Europe for projects with a payback period of less than five years is estimated to be between US$ 5 and 10 billion. A recent study by the European Commission estimates that the market for energy efficient technology in Eastern Europe is over US$ 200 billion. But the capital investment requirements needed to tap this potential are so large that the private sector needs to participate in financing these projects. While grants, loan guarantees and other innovative financing schemes have an important demonstration value and help local partners to acquire the professional skills they need, only commercial sector finance on a suitable scale can actually deliver significant results.

6. The genuine participation of the private sector in turn will require the formation of a market for energy efficiency and renewable energy in Eastern Europe and the CIS. This market will need to provide opportunities for the commercial sector to make large investments with adequate returns at acceptable risk within a reasonable period of time. The achievements of recent and continuing technical assistance projects in this field have established the framework conditions for an energy efficiency market with one important exception: there is still no adequate source of project finance.

A. Purpose of the project

7. The long-term goal was to promote an investment environment in which self-sustaining energy efficiency projects can be identified, developed and implemented by local teams in municipalities or in energy efficiency demonstration zones. The intention is to replicate successful measures nationally, in Eastern Europe and CIS countries once proven on a limited scale.

8. The project has had three immediate goals to produce measurable results initially over a three-year period. These goals have been achieved and in some cases exceeded by project participants who have produced the outputs quantified in the following sections.

Goal One: Develop communications and skills in 15 locations in the private and public sectors at the local level to identify, develop, finance and implement energy efficiency projects in municipal lighting, hospitals and district heating that meet environmental, health and institutional strengthening priorities.

Goal Two: Strengthen energy efficiency policies in the five participating countries, assisting municipal authorities and national administrations to introduce economic, institutional and regulatory reforms needed to support investments in energy efficiency projects focusing, in particular, in energy efficiency demonstration zones.

Goal Three: Promote opportunities for commercial banks and companies to invest in energy efficiency projects through existing investment funds, or if warranted, through a new fund managed by an international financial services company, assisted by commercial banks in the region

B. Project Implementation

9. The project has been implemented in accordance with a Project Document approved and signed by Mr. Amir Dossal, UNFIP Executive Director and signed by Mr. Yves Berthelot, UNECE Executive Secretary on 9 March 2000. In principle, each of the co-financing partners or their designated representatives participated in the execution of project activities under grants with specified tasks described in the Annexes to the Project Document. Many of the outputs listed in this final report have been partly or completely developed by the co- financing partners working together with the National Coordinators, experts and decision makers from participating countries.

C. Monitoring and Evaluation

10. The reporting, monitoring and evaluation of the project has been consistent with Article IX of the Memorandum of Understanding between the United Nations Fund for International Partnerships and the United Nations Economic Commission for Europe. The project has had a Monitoring and Evaluation Adviser to assist all parties in implementation of the project and to report to UNF/UNFIP. In January 2000, the Steering Committee of this project elected Mr. Glen Skovholt, a former Vice President of Honeywell Inc. to serve as the Monitoring and Evaluation Adviser. Nominated by the Executing Agency and confirmed by UNF/UNFIP, Mr. Skovholt has served in this capacity during the last five years making repeated field review missions, verbal assessments and written annual reports to the Steering Committee (ENERGY/WP.4/2001/4 and ENERGY/WP.4/2003/6) and to United Nations Foundation officers. He will issue a final Project Evaluation Report at the conclusion of the project.

11. The progress of project operations has also been reported to and reviewed by the Steering Committee at its annual sessions. The Evaluation Reports have been used to assess the project, incorporate relevant past experience and find consensus on annual work plans. The achievement of impact can be calculated from data developed for the investment project proposals. These data show the potential reductions of CO2 emissions for all projects and the reductions expected to be achieved from investment project proposals approved for financing.

II. ASSESSMENT OF ACCOMPLISHMENTS OF THE PROJECT

12. In order to launch this project, the UNF provided a US$ 500,000 direct grant to UNECE and offered US$ 750,000 in the form of a 1:1 matching grant. The US$ 750,000 cost-sharing commitments of eight UNECE co-financing partners achieved an immediate leverage of the initial UNF investment. The total budget of US$ 2 million provided by the UNF and its co-financing partners has also returned significantly leveraged benefits, producing some US$ 60 million of energy efficiency investment project proposals.

13. In addition to producing the agreed outputs, the project has also yielded important lessons, which will serve as a foundation for further work. Some key results include:

- 60 pre-feasibility business plans for and investment volume of US$ 60 million of energy efficiency project proposals which would produce an estimated 531,700 tonnes of carbon emissions reductions per year;
- US$ 14.9 million financing approved by the World Bank and other investors for projects in Belarus, Bulgaria, Russian Federation and Ukraine amounting to an estimated 136,300 tonnes of carbon emissions avoided per year;
- An extensive network of energy efficiency officials, experts, business and financial counterparts in 24 participating countries linked by the website www.ee-21.net;
- An interactive website usage pattern with a daily average of 160 visitors consulting some 760 files rising to a peak of 990 files consulted daily during project meetings extending participation via the Internet;
- Some 170 experts trained in business planning and financial engineering for the development of energy efficiency investment projects;
- A set of financial engineering training courses led by experts trained in earlier courses who have successfully attracted financing to energy efficiency investment projects they developed;
- Carbon emissions trading techniques and work methods published as the Carbon Emissions Trading Handbook, a CD-Rom based e-Book which included United Nations Television (UNTV) video footage, emissions reduction calculation software, training course slide presentations animated with video of instructors, case studies and reference materials;
- A prototype training course on financing energy efficiency investment projects through carbon trading using the CD-Rom e-Book Carbon Emission Trading Handbook in which most of the training was provided by recorded lectures and software on the e-Book;

- A Guide for Investors on financing energy efficiency and climate change mitigation projects describing the business and investment climate in selected eastern European countries;
- Five in-depth studies on the experience of multilateral institutions in promoting energy efficiency in economies in transition.

III. TELLING THE UNITED NATIONS STORY

14. As part of its market formation activities, the UNECE project has worked extensively with United Nations Television that filmed and broadcast a four-minute video about the project on CNN World Report in May 1999 based on energy efficiency demonstration zone in Gabrovo, Bulgaria. This four-minute video clip shows the harsh effects of a typical wintertime fuel crisis in Eastern Europe and how the UNECE project addresses the problem including the energy efficiency retrofit of a hospital heating system. A second UNTV video 'Carbon Emissions Trading from Energy Efficiency Investments' was filmed in Geneva, Moscow and New York and disseminated in November 2002 to CNN, EuroNews and EuroVision. It has since been translated to French and broadcast on Swiss television programme Place des Nations in 2003. During 2004 UNTV was provided with additional video footage for an UNDP-GEF film on the results achieved in demonstration zone located in Gabrovo.

IV. BUSINESS COMMUNITY AWARD

15. The e5 European Business Council for Sustainable Energy conferred the 2003 'Climate is Business e-WARD 2003' for the public sector to the UNECE Energy Efficiency 21 Project on 11 December 2003 during the Ninth Conference of Parties (COP9) of the United Nations Framework Convention on Climate Change held in Milan, Italy. The e5 European Business Council for Sustainable Energy represents 120 companies for the renewables, energy efficiency, gas, telecommunications and public transport sectors.

16. An assessment of the accomplishments for the three project goals is given below. Each of the following outputs planned to accomplish the goals come from the original UNECE proposal approved by the UNF and UNFIP Boards in 1999. This is accompanied by an assessment of the outputs and deliverables achieved during project operations. Further details are given in Tables 1 and 2 on the project website www.ee-21-net.

IV. ASSESSMENT OF THE THREE IMMEDIATE GOALS

A. Assessment of Goal One: Develop communications and skills

17. **Planned Output 1.1 A network of energy efficiency managers in participating countries**: Three local teams in selected municipalities in each of 5 countries trained and linked by Internet for communications, information transfer and distance learning including home page.

Outputs Achieved: Improving the energy efficiency of municipal lighting, hospitals and district heating systems requires many experts to make many small technical fixes and apply new energy

management techniques. The most effective way reach a 'critical mass' of expertise needed to accomplish this is by developing multi-disciplinary networks between and within participating countries that can disseminate value-added information. During project operations local teams have been set up in 22 municipalities or energy efficiency demonstration zones in the five participating countries (see Planned Output 2.3 below). The local teams developed some 60 business plans for investment projects in 20 training course sessions (see Planned Output 1.2 below). They participated in the project training sessions, working group meetings and communicated by e-mail and the project website during the development of their investment projects. National Coordinators established or enhanced existing websites.

Project Website: The site www.ee-21.net provides detailed information on activities in the five project countries: Belarus, Bulgaria, Kazakhstan, Russian Federation and Ukraine. It also served all the other countries participating in the project both among UNECE member states and in other regions of the world. The website has had a high volume of use with over 2 million hits per month in May 2005 and more than 5000 visits per month during which some 25,000 files were consulted (www.ee-21.net/usage). In addition, the following websites of National Coordinators were established or extended by their National Participating Institutions.
Belarus: Council of Ministers Committee on Energy Efficiency http://energoeffekt.gov.by
Bulgaria: State Energy Efficiency Agency www.doe.bg Centre for Energy Efficiency www.eneffect.bg
Kazakhstan: Government of the City of Almaty www.mayor-almaty.kz/dec/
Russian Federation: RUSDEM Russian Energy Efficiency Demonstration Zones www.rusdem.com
Nizhny Novgorod Centre for Energy Efficiency www.nice.nnov.ru/indexe.htm
Ukraine: Agency for the Rational Use of Energy and Ecology www.arena-eco.kiev.ua/en/index.htm

While this network was established at the international level between participating countries, each National Co-ordinator developed their own national network. In some cases, national counterparts initiated sub-regional networks. These networks are also served by websites and Internet based communications and information handling systems. For example, in Bulgaria the Centre for Energy Efficiency EnEffect leveraged the impact of project activities and outputs through the Eco-Energy Network linking 54 municipalities and 6 regional associations of municipalities accounting for some two thirds of the Bulgarian population www.ecoenergy-bg.net

In addition, through EnEffect, Bulgaria together with other South-eastern European countries launched the Regional Network for the Efficient Use of Energy and Water Resources www.reneuer.com . This provided for the participation in selected project activities and the dissemination of results to experts from Albania, Bosnia and Herzegovina, Croatia, Former Yugoslav Republic of Macedonia, Moldova, Romania and Serbia and Montenegro.

The project also worked closely with Municipal Network for Energy Efficiency (MUNEE) www.munee.org. This is a programme of the US Agency for International Development USAID, a co-financing partner of the project (see Section 5 page 12) managed by the Alliance to Save Energy

www.ase.org , which seeks appropriate modes for dissemination of positive experience on relatively low-cost energy efficiency improvements in the countries of Central and Eastern Europe and the former Soviet Union.

18. **Planned Output 1.2** Trained experts in project development, finance, business planning: 150 city energy managers, commercial bank managers and experts trained during 6 training courses of 3 sessions each including Internet distance learning sessions.

Outputs Achieved: A series of 20 training courses and selected seminars were held in the five participating countries from May 2001 to October 2003 in which 186 experts were trained in financial engineering and business planning. While some 350 experts participated in these seminars and courses, roughly half of them attended the multi-session training courses that typically lasted for a year. The standard training course on business planning and financial engineering began with the identification of potential projects with respect to agreed project selection criteria. Local teams were accepted to participate in the training course based on projects that met the criteria and were judged to be economically viable. The salary costs or local experts and the expenses in preparing their projects were borne by the municipalities, employers, local authorities or national ministries.

The first session of the courses was to explain business planning and financial engineering emphasising the technical qualities of an energy efficiency project. Local teams were then requested to develop their projects further as homework and return to the second session that was normally held a few months later. The second session was usually devoted to project finance and how to complete the business plans in a common format so that they would be acceptable to financial institutions. The extensive materials used for many of the training courses were
developed by Energy Saving International AS (www.ensi.no) taking into account a UNECE guide developed for this purpose. The third session of the training courses was devoted to presenting the investment projects to sources of financing. In some cases, the third session was overtaken by events when projects were already accepted for financing at an intermediate stage.

19. **Planned Output 1.3** Investment project pipeline: Financial and technical clearance of 30 investment project business plans from training courses by expert teams on lighting, hospitals and district heating for subsequent investment fund submission.

Output Achieved: The training courses on financial engineering and business planning produced some 60 pre-feasibility study investment project proposals for a total investment volume of USD 60 million with a potential of reducing carbon emissions by some 531,700 tonnes of C02 per year. This includes proposals for investments in hospitals, heat supply systems, street and public lighting and municipal buildings. The complete pre-feasibility business plans are available on the project website www.ee-21-net.

B. Assessment of Goal Two: Strengthen energy efficiency policies

20. The energy efficiency polices of participating member states were reinforced with studies, multilateral expert meetings, and consultations with international consultants and the UNECE Regional Adviser on Energy (see Planned Outputs 2.1 and 2.2). The policies have been further strengthened in establishing energy efficiency demonstration zones that provide practical demonstration of policy reforms and energy efficient technologies on a limited scale (see Planned Output 2.3).

21. **Planned Output 2.1** Energy Efficiency and Security Study of Eastern Europe and the CIS: A study of energy efficiency, 3 workshops and a conference based on projections for energy supply, demand, trade and investments prepared with international and CIS experts.

Output Achieved: Under this activity, CIS governments address climate change mitigation while keeping their primary strategic interest firmly in view: promoting energy security by enhancing energy efficiency. Within the framework of this project, of course energy efficiency is also the most cost-effective method of reducing greenhouse emissions and thereby mitigating the risks of climate change. Recognising the strategic interest in energy efficiency policy reforms, the heads of government of CIS member states appointed experts to participate in this activity together with the UNECE Regional Adviser on Energy. Their commitment was formalised in an international agreement on cooperation in the field of energy saving that was reached, endorsed and signed by 10 heads of government of the CIS member states in 2002. The outputs and deliverables achieved under this activity include:

- The report '**Energy Efficiency and Energy Security in the CIS**', ECE Energy Series 17, United Nations, New York and Geneva, 2001;

- The '**First Workshop on Energy Efficiency and Energy Security in the CIS**' held in Minsk (Belarus) 11-12 October 2001;

- The '**Agreement on Cooperation in the Field of Energy Efficiency and Energy Saving Between Commonwealth of Independent States Participating Countries**', signed by the heads of ten CIS governments on 7 October 2002 in Chisinau (Republic on Moldova);

- The '**Second Workshop on Energy Efficiency and Energy Security in the CIS**' held in Kiev (Ukraine) 29-30 October 2002;

- The '**Third Workshop on Energy Efficiency in the CIS**' held in Bishkek (Kyrgyzstan) 8-10 July 2003;

- The report '**Energy Conservation in CIS Countries**', Centre for Energy Policy, Moscow, Russian Federation, November 2003;

- The e-Book '**New Energy Security Threats**' ECE Energy Series 19, United Nations, New York and Geneva, 2003 CD-Rom.

22. **Planned Output 2.2** Guideline to the Preparation of Energy Conservation Laws: A guideline for the formulation and implementation of energy conservation laws for the 5 countries in the project in co-operation with ESCAP.

Outputs Achieved: The Economic and Social Commission for Asia and the Pacific shares a selection of member states with the Economic Commission for Europe, notably those partly or wholly in Central Asia. A joint study produced by ESCAP and UNECE reviewed the energy conservation polices of national energy policies for selected countries.

- '**Guide for the Promotion of Energy Conservation Regulations in Economies in Transition**', ECE Energy Series 16 prepared jointly by the UNECE and ESCAP covering the Russian Federation, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan, New York and Geneva 2000.

Further assistance to national experts, local authorities and national ministries was provided in additional studies, publications and workshops on energy efficiency policy reforms, carbon emission trading and on reforming energy prices. The handbook or carbon emissions trading published by UNECE is a training course contained on a CD-Rom with filmed lectures, PowerPoint presentations, and software for calculating carbon emissions reductions from energy efficiency investment projects and examples of financed projects. The handbook was used in a prototype-training course held on 22 October 2003 in Sofia (Bulgaria) in which local teams from Bulgaria and South-eastern Europe calculated the carbon emissions reductions on five investment project proposals.

- The '**Carbon Emissions Trading Handbook**', ECE Energy Series 20, United Nations, New York and Geneva, 2003 CD-Rom United Nations e-Book;

The international conference '**Restructuring District Heating in Central and Eastern Europe and the CIS**', held by the Alliance to Save Energy, Municipal Network for Energy
- Efficiency (MUNEE), Prague (Czech Republic) 4 November 2002;

- The report '**Reforming Energy Pricing and Subsidies**', ECE Energy Series 21, United Nations, New York and Geneva, 2003.

The publication on reforming energy pricing was developed jointly by the UNECE Committee on Sustainable Energy and the Committee on Environmental Policy and presented to the fifth Ministerial Environment for Europe meeting held in Kiev (Ukraine) on 21-23 May 2003.

23. **Planned Output 2.3** Energy Efficiency Demonstration Zones[1]: At least 15 demonstration zones in the 5 countries established or accelerated in development by city administrations, local authorities with the support of national ministries.

Outputs Achieved: Each participating country nominated at least three municipalities to host project activities at the local level in their countries. Local authorities in the municipalities worked with national ministries of energy or economy to designate experts to take part in project activities, identify potential investment project proposals, participate in and/or host training courses. In addition, demonstration zone teams provided data and relevant information for investment project proposals and verified them before submission to sources of financing. In some cases, national authorities and demonstration zone managers obtained financing directly for their investment projects. The introduction of demonstration zones also stimulated other donors to fund similar programmes such as the UNDP-GEF projects in Gabrovo in Bulgaria and Vladimir in the Russian Federation. This confirmed the conceptual value of integrating energy efficiency policy initiatives with practical applications at the local level. The energy efficiency demonstration zones designated for this project are:
Belarus: Baranovichy, Borovljany, Kedyshko, Vitebsk.
Bulgaria: Blagoevgrad, Bourgas, Pernik, Sofia.
Kazakhstan: Almaty, Atyrau City, Astana.
Russian Federation: Buryatia, Chuvashia, St. Petersburg, Moscow, Nizhny Novgorod, Saratov, Sverdlovsk.
Ukraine: Dniprodzerzhynsk, Mariupol, Slavutch, Zaporizhzya, Yuzhnaya.

C. Assessment of Goal Three: Promote opportunities for commercial banks and companies to invest

24. **Planned Output 3.1** Energy Efficiency Investment Brokerage Service: Presentation of 30 bankable projects to existing investment funds, commercial banks and international financial institutions in accordance with relevant selection criteria and procedures.

Outputs Achieved: The training courses on financial engineering and business planning produced some 60 pre-feasibility studies for investment projects, which were presented to lending institutions. Financing for some 18 projects in Belarus, Bulgaria, Russian Federation and Ukraine has been approved for a total investment volume of US$ 14.9 million that will reduce carbon emission by an

[1] An **Energy Efficiency Demonstration Zone** is a city-scale project, a town, district, or limited area, in which favorable conditions in every sphere are established to stimulate enterprise and initiative in market approaches to energy efficiency, in the same way as an urban or regional economic development zones have been successfully established in western countries. It demonstrates, on a city-wide scale, the combined effect of energy-efficient technology; energy pricing policy; favorable tariff structures; advisory services; information campaigns; metering, monitoring and controls; measurement of changes in emission levels; energy audits; tax incentives, grants and government-guaranteed loan schemes; international technical assistance and trade development programs. The intention is to replicate successful measures nationally once proven on a limited scale.

estimated 136,300 tonnes of CO2 per year. More detailed data on all projects is available at www.ee-21.net.

25. **Planned Output 3.2** Energy Efficiency Investors Guide and Fund Analysis: Preparation of a guide to investors in energy efficiency projects in the 5 countries, appraisal report of a private sector investment fund for energy efficiency projects

Outputs Achieved: While the project provided information on energy efficiency policy reforms to local authorities and national ministries, it has also sought to fill information gaps for investors on the energy efficiency and climate change market in the five participating countries. The outputs under this activity include a careful review of all participating countries with information that can be used in making investment decisions thereby reducing the transaction costs to potential investors. In addition, the technical assistance programmes pursued in each country have been reviewed for all major international organisations and international financial institutions working in these countries. The following publications were issued and seminar hosted by UNECE:

- '**Financing Energy Efficiency Investment Projects**', ECE Energy Series 30, United Nations, New York and Geneva, 2006

- '**Financing Energy Efficiency and Climate Change: A Guide for Investors in Belarus, Bulgaria, Kazakhstan, Russian Federation and Ukraine**', ECE Energy Series 28, United Nations, New York and Geneva, 2005

- '**Energy Sector Investment Strategy for Eastern Europe and the Former Soviet Union**', Alliance to Save Energy, Municipal Network for Energy Efficiency (MUNEE), Washington DC, 2003.

- '**Experience of International Organisations in Promoting Energy Efficiency in Belarus**', ECE Energy Series 22, United Nations, New York and Geneva, 2005

- '**Experience of International Organisations in Promoting Energy Efficiency in Bulgaria**', ECE Energy Series 23, United Nations, New York and Geneva, 2005

- '**Experience of International Organisations in Promoting Energy Efficiency in Kazakhstan**', ECE Energy Series 24, United Nations, New York and Geneva, 2005

26. **Planned Output 3.3** Energy Efficiency Investment Fund: establishment of an investment fund with commercial banks and private investors by an international financial services company, commercial banks in Eastern Europe and international financial institutions.

Outputs Achieved: This project has shown the need to provide a bridge between demonstration investments financed under special conditions in selected Eastern European locations to the establishment of an investment fund that can serve as a vehicle for the large scale participation of private sector investors in partnership with public entities including current and planned GEF projects. A US$ 250 million public-private equity Fund would be able to complement other funding schemes and, as a result, leverage an investment volume of up to US$ 1 billion for energy efficiency and renewable energy projects. Preferably the Fund would attract capital commitments from both the private and public sector at a proportion estimated now to be around 70 per cent private and 30 per cent public.

This would need to be based on lessons from previous funds set up by the European Bank (EBRD) and the International Finance Corporation (IFC) among others. The Dexia-FondElec Energy Efficiency and Emissions Reduction Equity Fund set up by EBRD provided Euro € 71 million for investments in central and Eastern Europe during 2000 to 2004. It provided equity directly to project sponsors and indirectly through Special Purposes Vehicles (SPV) and Energy Service Companies (ESCO) that should be an operating procedure of any new investment fund. The Renewable Energy and Energy Efficiency Fund (REEF) launched by the IFC did not achieve a sufficient deal flow to make any investments. The lack of professionally prepared and financially attractive projects was a shortcoming that has been remedied in subsequent technical assistance projects.

Indeed, the present project has produced about US$ 60 millions of pre-feasibility study business plans during the last five years. This constitutes a clearly defined initial project pipeline with demonstrably bankable projects that reduce greenhouse gas emissions. The World Bank and other investors have approved financing of US$ 14.9 million for projects in Belarus, Bulgaria, Russian Federation and Ukraine. The energy savings calculated in the business plans for which financing has been approved, would produce an estimated 136,300 tons of carbon emissions avoided each year.

In his 2003 report to the Steering Committee, the Monitoring and Evaluation Adviser to the Project, Mr. Glen Skovholt, concluded in his Interim Report that the project had leveraged significant budgetary resources because of the co-financing offered by the UN Foundation and established key partnerships in the public and private sector. These were necessary to identify and develop bankable investment projects, which offer genuine reductions in GHG emissions. The project had provided demonstrable local examples of how such energy efficiency investments can be developed in the countries that could benefit most from financing mechanisms designed for carbon trading (ENERGY/WP.4/2003/6).
Clearly, experience has shown that linking an investment project pipeline to a dedicated investment fund would be the best way, possibly the only way to make progress in this field. The proposed Fund will need to provide senior debt, guarantees and/or equity to SPVs and ESCOs or directly to local banks or project sponsors. It will need to be a separate legal entity managed by experienced fund managers aligned with the proposed project. It would benefit from direct access to the present

UNECE pipeline and target new pre-feasibility study business plans to be developed in a new project.

VI. PROJECT EXTENSIONS AND FUTURE ACTIVITIES

27. This project was originally planned to be completed in March 2003 but was accorded a one-year no-cost extension to March 2004 and an exceptional no-cost extension to be completed in September 2005. These extensions have allowed project participants and the UNECE secretariat to complete planned outputs, notably to publish studies as hard copy books and CD-Rom eBooks. But most importantly the extensions have also allowed the project to conclude its work on Goal 3.3 through the development of a project to launch an investment fund.

28. The new project '**Financing Energy Efficiency Investments for Climate Change Mitigation**' (ECE-INT-04-318) budgeted at US$ 6 million was approved for US$ 2 million funding by the United Nations Foundation and United Nations Fund for International Partnerships on 16 June 2004 in Geneva (Switzerland). It will provide a pipeline of new and existing projects to a dedicated public private partnership investment fund that can provide up to US$ 500 million of debt, equity or both to project sponsors. The UNF/UNFIP Board Decision envisages 1:2 cost-sharing with co-financing partners to provide for the total budget. Part of that co-financing was approved as '**Capacity Building and Support for the Establishment of a Dedicated Fund for Energy Efficiency in Eastern Europe**' for Euro € 2 million (USD 2.6 million) by the Fonds Français pour l'Environnement Mondial (FFEM) French GEF on 30 March 2005 (FFEM Decision 2005.0004) upon the presentation of the French Ministry of Foreign Affairs (MAE).

29. The third co-financing partner is the Global Environment Facility through the United Nations Environment Programme GEF Implementing Agency with the European Bank for Reconstruction and Development as a Co-Executing Agency for establishing the investment fund. The Project Concept Note for 'Financing Energy Efficiency and Renewable Energy Investments for Climate Change Mitigation' (GEF 2619) was approved in February 2005 and then was approved by the GEF Council meeting in November 2005. The GEF commitment
completes the co-financing on this project.

Table 1: Financed Energy Efficiency Investment Projects

Project Title and Description	Investment (US Dollars)	Project Sponsors and Type of Project Finance
Belarus		
1. **Borovljany Control Systems for District Heating Project** Installation of an automatic control system for the Borovljany demonstration zone boiler house at Lesnoy and end-use heat supply controls for 200 consumers.	770,000	Accepted for implementation by the World Bank Belarus Social Infrastructure Rehabilitation Project.
2. **Vitebsk Grosvet** Recontruction of street lighting in the city of Vitebsk, including the installation of new fixtures, automation of the street lighting management and modernising lighting of historic sites.	370,000	Accepted for implementation by the World Bank Belarus Social Infrastructure Rehabilitation Project.
3. **Vitebsk Television Factory** Installation of steam turbines, heat pumps and automatic control system for the Vityaz brand factory which produces 200,000 appliances per year.	2.4 million	Accepted for implementation by the World Bank Belarus Social Infrastructure Rehabilitation Project.
Bulgaria		
4. **Blagoevgrad Street Lighting** Energy efficient street lighting for the municipality	400,000	Energy performance contract
5. **Russe Street Lighting** Street lighting reconstruction	1.4 million	Project has been implemented
6. **Gasification and energy efficiency retrofit of Municipal sites in the city of Dobrich** Implementation of measures for energy efficiency retrofit of the buildings	660,000	The project is financed by leasing company – "Technoterm engineering" from Sofia and is fully implemented.
7. **Heat transfer pipelines reconstruction of Pernik city.** Heat transfer network - Heat production/distribution	3.3 million	75% of the project implemented with a World Bank loan
8. **Energy efficient street lighting Pernik** Street lighting	790,000	The project has been implemented and won the annual award of the Bulgarian Energy Efficiency Network EcoEnergy
9. **Increasing the energy efficiency of the Sofia Municipality buildings** Energy efficiency in buildings	1.8 million	Following the Action plan am ESCo company was established and under a DEMOS project 310 municipal buildings were rehabilitated

Bulgaria		
10. **Nikolskoye Settlement** Boiler station conversion from heavy fuel oil to local fuels	840,000	Accepted for financing by the Leningrad Oblast Environmental Fund and St. Petersburg under the Federal Targeted Programme for EE Economy 2002-05. Implementation completed in 08/04.
11. **Vinnitsy Settlement Raizhilkomhhoz Boiler Station.** Conversion from coal to bio-fuel (wood chips)	230,000	Implementation completed 2003. Federal Funds, local budget funds and 10% local private funds
12. **Krakolje Boiler Station** Conversion from light oil to bio-fuel (wood chips)	80,000	Implementation completed 2003-2004 Federal, local funds, private funds fuel supply.
13. **Vyritsa Settlement** Boiler station conversion from heavy fuel oil to bio-fuel (wood chips)	260,000	Accepted for financing by the Leningrad Oblast Environmental Fund, and the Federal Targeted Programme EE Economy 2002-05. Procurement procedures completed and contracts signed.
Ukraine		
14. **Implementation of energy saving solutions in the exterior lighting systems in the city of Zaporizhzhya** Creation of a modern, efficient and energy saving exterior lighting system	340,000	The project is being partly implemented through municipal funding
15. **Installation of automated temperature controllers in heating systems of Ivano-Frankivsk** Installation of automated temperature controllers in heating systems	280,000	The project is being partly implemented through municipal funding
16. **Ivano-Frankivsk Boiler Plant** Installation of a modern energy efficient co-generation unit	670,000	Fully financed by the district heating utility and municipality, the new co-generation unit put into operation in September 2004.
17. **Upgrades to the lighting and heat supply system of Mariupol city hospital** Reconstruction of temperature control system & replacement of the distribution heat networks at the territory of the hospital	140,000	The project is being partly implemented through municipal funding
18. **Energy efficiency improvements of heating systems in schools of Dniprodzerzhynsk left-bank region** Implementing decentralized heat supply and reducing energy consumption in the buildings	190,000	The project is being partly implemented through municipal funding
TOTAL	14.9 million	

Table 2: Carbon Emission Reduction of Financed Projects (in tonnes per year)

Project Title	Investment (US Dollars)	CO2 savings (t/y)	Unit Cost of CO2 (US Dollars /t/y)
Belarus			
1. Borovljany Control Systems for district Heating Project	770,000	1,000	770
2. Vitebsk Grosvet	370,000	2,600	142
3. Vitebsk Television Factory	2.4 million	24,200	99
Bulgaria			
4. Blagoevgrad Street Lighting	400,000	1,300	308
5. Russe Street Lighting	1.4 million	7,000	200
6. Gasification and energy retrofit of Municipal sites in the city od Dobrich	660,000	11,000	60
7. Heat transfer pipelines reconstruction of Pernik city	3.3 million	34,800	95
8. Energy efficient street lighting Pernik	790,000	9,800	81
9. Increasing the energy efficiency of the Sofia Municipality buildings	1.8 million	20,000	90
Russian Federation			
10. Nikolskoye Settlement	840,000	6,300	133
11. Vinnitsy Settlement Raizhilkomhhoz Boiler Station	230,000	7,100	32
12. Krakolje Boiler Station	80,000	2,600	30
13. Vyritsa Settlement	260,000	2,000	130
Ukraine			
14. Implementation of energy saving solutions in the exterior lighting systems in the city of Zaporizhzhya	340,000	660	515
15. Installation of automated temperature controllers in heating systems of Ivano-Frankivsk	280,000	1,400	200
16. Ivano-Frankivsk Boiler Plant	670,000	3,440	194
17.Upgrades to the lighting and heat supply system of Mariupol city hospital	140,000	570	245
18.Energy efficiency improvements of heating systems in schools of Dniprodzerzhynsk left-bank region	190,000	580	327
TOTAL	14.9million	136,300	109 (Average)