



## **UNDP Full Size Project Document**

Government of Ukraine

United Nations Development Programme

Global Environment Facility

### **Removing Barriers to Greenhouse Gas Emissions Mitigation through Energy Efficiency in the District Heating System, Phase 2**

PIMS 3056

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#### **Brief description**

The proposed project addresses a key issue in the reduction of greenhouse gas emissions through large-scale improvements in energy efficiency in Ukraine's communal heat supply sector. These improvements will result from a four-part approach: 1) capacity building to create the basis for systematic energy efficiency activities at the local level; 2) an integrated approach of supply and demand-side improvements to achieve maximum fuel savings and emissions reduction; 3) attraction of external investment resources for an energy efficiency programme in a pilot city (Rivne); and, 4) project-specific replication measures in other parts of the country, including development of relevant procedures, guidelines, information materials and their dissemination, and public awareness-raising through the involvement of NGO's, in particular those concerned with environmental and energy efficiency problems. The project will involve establishing a privately-run energy service company (ESCO) as an innovative mechanism for financing energy efficiency activities in Ukraine at both municipal and regional levels, and, eventually, at the national level.

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## **Acronyms**

ALRA	Association of Local and Regional Authorities
EBRD	European Bank for Reconstruction and Development
EPC	Energy Performance Contract
ESCO	Energy Service Company
GEF	Global Environmental Facility
GHG	Greenhouse Gas
MEEI	Ministry of Economy and European Integration
MEP	Ministry of Environmental Protection
MFE	Ministry of Fuel and Energy
PIR	Project Implementation Review
RM	Rivne Municipality
ROA	Rivne Oblast Administration
SCMH	State Committee for Municipal Housing
tce	Tons of coal equivalent
ToR	Terms of Reference
UNDP	United Nations Development Programme
UNDP-CO	UNDP Country Office in Ukraine

# **1. Elaboration of the Narrative**

## **1.1. Situation Analysis**

### *1.1.1. Context and global significance*

The full-size project was approved in January 2000, but, given the then financial constraints faced by GEF, was split into two phases: the soon to be completed Phase 1 dealing with the setting up of an ESCO in the City of Rivne which, in turn, implemented pilot energy efficiency activities targeting selected municipal district heating facilities. Phase 2, which is the subject of the present proposal, will build upon and consolidate the ESCO experience acquired to address municipal district heating activities at the Rivne City-wide and regional (Oblast) levels.

Ukraine continues to be one of the least energy efficient countries in the world and has the greatest emissions level per unit of GDP among CIS countries. An inventory estimated that total emissions from Ukraine in 2002 were 487 million tons of CO<sub>2</sub> equivalent (the corresponding figure for 2001 was 482 million tons). This results in a per capita emission of 10 tons of CO<sub>2</sub> equivalent per year. Heat supply in the buildings sector accounts for approximately 25% of all fuel consumed in Ukraine, and, therefore, there is a huge potential for energy efficiency improvement in this sector, which Ukraine wants to actively pursue.

Since 1991, the Government of Ukraine has devoted a great deal of attention to the development of the energy sector. The National Energy Programme of Ukraine until 2020, adopted in 1996, articulated the Government's energy policy and its priorities: energy conservation, use of domestic resources, development of renewable energy and targeted investments in strategic areas to reduce energy intensity. In the district heating sector, the programme calls for reconstruction and rehabilitation of existing district heating networks, continued development of district heating systems and combined heat and power plants, promotion of waste heat usage, and construction of new high-efficiency, heat-only boiler plants where appropriate.

In line with the Government's priorities, this project addresses a key issue in the reduction of greenhouse gas emissions through large-scale improvements in energy efficiency in Ukraine's communal heat supply sector. These improvements will result from a four-part approach: 1) capacity building to create the basis for systematic energy efficiency activities at the local level; 2) an integrated approach of supply and demand-side improvements to achieve maximum fuel savings and emissions reduction; 3) attraction of external investment resources for an energy efficiency programme in a pilot city; 4) project-specific replication measures including development of relevant procedures, guidelines, information materials and their dissemination, and public awareness-raising through the involvement of NGO's, in particular those concerned with environmental and energy efficiency problems.

### *1.1.2 Threats, root causes and barriers analysis*

The global environmental objective of reducing overall fossil fuel consumption and associated GHG emissions is to be achieved through the removal of the following main existing barriers to energy efficiency improvement in the communal heat supply sector: 1) difficulties in arranging financing for efficiency projects; 2) institutional constraints; 3) lack of capacity and experience in preparing, implementing and managing energy efficiency projects; 4) high transaction costs for relatively small energy efficiency projects; 5) lack of information about existing opportunities for energy efficiency.

## 1) Difficulties in arranging financing for efficiency projects;

### *a. Activities designed to address barrier*

- An ESCO as a vehicle for local/foreign investors will be established, its profitability demonstrated, and new investors attracted;

### *b. Phase I progress in addressing barrier*

- ESCO-Rivne was incorporated as a closed joint-stock company on 12 November 2003. The company is fully owned by KommunEnergiia (the Oblast's DH Enterprise), MiskSvitlo (the Municipality's lighting company) and company employees.
- The company has investments of USD 1.5 million under 15 Energy Performance Contracts, and receives USD 25,000 in payments for energy efficiency every month in return. The company therefore expects to begin turning a profit on these investments around 5 years.

### *c. Phase II strategy to address outstanding barrier issues*

- There are currently no private shareholders. To address this issue, ESCO-Rivne has modified its foundation documents, converting the closed joint-stock company into an open-stock one.
- ESCO-Rivne has contacted several potential investors, mailed them its Business Plan for 2005 and has had meetings with some of them to provide additional information/answer questions.
- All company information has been posted on the ESCO-Rivne web site ([www.esco-rivne.com](http://www.esco-rivne.com)) for easy access by potential investors.
- Necessary legal and fiscal issues: options for repayment guarantees, currency exchange and transfer procedures, arbitration of disputes, etc.

## 2) Institutional constraints

### *a. Activities designed to address barrier*

- Ability of municipalities to enter into EPC agreements.
- Cross-subsidies in heating tariffs (i.e. low tariffs), making it difficult for a business to make a profit by providing heating services.
- Housing allowance, including heat consumption, reduces the need and cost effectiveness of demand-side investments.

### *b. Phase I progress in addressing barrier*

- So far Rivne Municipality and district heating company are the only clients of ESCO-Rivne. Together, they have identified administrative procedures for entering into an energy performance contract: (1) ESCO-Rivne makes an investment; (2) Rivne Municipality creates a budget line for energy efficiency; (3) ESCO-Rivne estimates the payments it expects to receive from the municipality in energy savings, and the municipality requests and allocates funds to this amount to their budget line; (3) ESCO-Rivne is paid based on actual measurements. (4) Payment from final consumers is collected from KommunEnergiia, and at present does not bear on the EPC contract with Rivne.
- Cross-subsidies have been removed from heat tariffs. Although this does not directly affect the current EPC contracts between Rivne Municipality and ESCO-Rivne, it is an important step in creating the right investment environment.
- Direct billing of consumers is now standard practice. Consumption meters have been installed and payment collection has increased.

*c. Phase II strategy to address outstanding barrier issues*

- Implement consumption billing.
- Complete design and implementation of billing software.
- Design of guarantee instruments to ensure payment by clients.

3) Lack of capacity and experience in preparing, implementing and managing energy efficiency projects.

*a. Activities designed to address barrier*

- Design and implementation of investment plan.
- Training programme for ESCO-Rivne staff in auditing, EPC design, financial planning and preparation of bankable projects.

*b. Phase I progress in addressing barrier*

- City-wide investment plan formulated.
- Bulk of capacity development programme completed.

*c. Phase II strategy to address outstanding barrier issues*

- Organize twinning arrangement with reputable ESCO in a foreign country to tap specific know-how and expertise in managing and operating businesses.
- Provide additional training in bankable project development.

4) High transaction costs for relatively small energy efficiency projects.

*a. Activities designed to address barrier*

- To implement an energy efficiency project, a municipality would have to undertake the steps of feasibility, design, installation, operation and maintenance as separate procurement steps. With EPC they need only undertake one procurement step. The ESCO, with lower overheads, greater experience and intrinsic interest in multiplying energy efficiency projects, is capable to undertake these tasks with higher efficiency and lower overheads.

*b. Phase I progress in addressing barrier*

- ESCO-Rivne is undertaking 15 EPC's where the municipality has been able to pass on the task of feasibility, design, installation, operation and maintenance of equipment to ESCO-Rivne.

*c. Phase II strategy to address outstanding barrier issues*

- Subsequent bundling of several EPC contracts into one contract, for example, for city-wide activities.

5) Lack of information about existing opportunities for energy efficiency.

*a. Activities designed to address barrier*

- Preparation of an investment programme.

*b. Phase I progress in addressing barrier*

- Targeted training, individual outreach to decision-makers and focused consultations.

*c. Phase II strategy to address outstanding barrier issues*

- Provide consultations to interested municipalities and district companies.
- Additional targeted outreach activities.

### *1.1.3. Institutional, sectoral and policy context*

The Rivne Municipality, Rivne District Heating Company, and the Oblast Administration have all strongly supported the idea of establishing ESCO-Rivne to expand energy efficiency activities in the city of Rivne. The reasons for this are several: large budgetary expenditures on the energy bills of institutional buildings and on residential subsidies, high energy intensity of delivered heat, resulting in high heat tariffs, etc. It should be noted that compared to other Ukrainian cities, Rivne has made significant progress in reforming its municipal energy sector. Cross-subsidies in heat energy tariffs for different consumer categories have been eliminated, direct billing of all district heating system customers has been introduced, the payment collection rate has increased to the point where it is now one of the highest in Ukraine, and energy saving has been identified as a priority both by the municipality and by the district heating company. Local authorities are willing to go further in reforming the energy sector to facilitate ESCO-Rivne operations and increase the confidence of private investors. For example, they guarantee full cash payment of heat bills of budgetary institutions, make full payment of existing residential subsidies to the heat supplier, and fix the level of tariffs for the investment amortization period.

An ESCO presents an efficient way to provide for systematic energy efficiency activities. This is because an ESCO is oriented for operation with numerous clients of various types, possesses necessary expertise for project preparation and implementation, is quick and flexible in making decisions about project financing, and is intrinsically interested in multiplying energy efficiency activities through expansion of its customer base. An ESCO suggests win-win solutions for its clients by using EPC mechanisms. It also reduces transaction costs and can tackle a large number of similar and relatively small-scale projects that could not be financed separately using traditional approaches. Thus, the ESCO approach facilitates the access to external financial sources for the owners of smaller projects. EPCs offer ESCO clients attractive long-term financing otherwise currently almost unavailable in Ukraine. Moreover, experience with international joint ventures shows that foreign investors look at the strength of the local partner as a primary criterion for investment decisions.

The ESCO approach complements existing strategies of major investors/lenders. The EBRD has indicated that the project is in line with its current strategy, and recently re-iterated its interest in the project. Furthermore, ESCO-Rivne met with several other private investors (representing both energy companies and investment funds) who have also confirmed their interest in equity participation or provision of lines of credit.

In addition to reflecting national priorities in Ukraine, the proposed project also builds upon the existing goals and activities of UNDP, with environment constituting one of its four priority areas for global activity, both at the country level and in the region. This project will also serve as an innovative approach to district heating efficiency projects, an important part of UNDP-GEF portfolio. Finally, UNDP is assisting local governments in Ukraine in the formulation and implementation of Local Agenda 21 sustainable development strategies at the Oblast (regional) and municipal levels, and energy plans are included in these strategies.

### *1.1.4. Stakeholder analysis*

The Rivne Phase 1 project has benefited from extensive stakeholder involvement (Ministry of Economy and European Integration, Ministry of Environmental Protection, State Committee for Municipal Housing, Rivne Oblast Administration, Rivne Municipality, Association of Local and Regional Authorities, etc.) during its implementation. For Phase 2, the project has the support of several other Municipalities (e.g. Ostrog, Kamenets Podolskiy and Kostopil) and Oblast Administration (Khmelnitsky) to create the necessary policy, institutional and business framework that will enable private sector



participation to implement energy efficiency activities in the municipal district heating sector through the ESCO modality. Discussions have also been held with potential private investors from Austria and Germany, and with overseas lenders who have expressed their interest to participate in the programme. At the national level, the project has the full support of the State Committee for Municipal Housing, the Ministry of Environmental Protection and benefits from the participation of the Association of Local and Regional Authorities, an NGO very active in the environment field.

#### 1.1.5. Baseline analysis

This project is designed to remove barriers to municipal district heating, initially in the Rivne Oblast and eventually throughout Ukraine. In so doing, it will achieve the stated objectives of GEF Operational Program #5: Removing Barriers to Energy Efficiency and Energy Conservation and falls under GEF Strategic Priority 2 (SP 2): Increased access to local sources of financing. As it is unlikely that the project activities would be implemented in the absence of UNDP and GEF support, the project can largely be considered to be incremental.

A detailed assessment of incremental costs is discussed in [ANNEX A](#) of attached Executive Summary. According to the matrix contained in Annex A, the baseline costs of continuing business as usual, with no systematic activity to improve energy efficiency in the heat supply system and buildings in the residential and public sectors, amount to \$2,260,000. Based upon the information provided during the PDF B and revised during implementation of Phase 1, the costs of implementing city-wide energy efficiency measures in the municipal district heating sector in Rivne under Phase 2 are \$23,994,000 (Table 1 below). This makes the incremental costs equal to approximately \$ 21.7 million. Of this incremental amount, GEF is being requested to provide only 25%, i.e. \$ 5,523,400 (including \$ 1,840,000 for Phase 1 and \$ 189,400 for the PDF B).

Outcome	Total Budget (\$)	GEF Component (\$)	Co-financing Component (\$)
<b>Outcome 1:</b> To expand ESCO operations through implementation of Rivne City-wide/Oblast energy efficiency activities.	20,200,000	-	20,200,000
<b>Outcome 2:</b> To facilitate ESCO-Rivne operations through financing of activities having long payback periods.	3,144,000	3,144,000	-
<b>Outcome 3:</b> To reduce perceived investment risks in order to facilitate ESCO-Rivne's expansion of activities.	500,000	300,000	200,000
<b>Outcome 4:</b> Information on replication of project experience, best practices and lessons learned throughout Ukraine and in other CIS countries.	150,000	50,000	100,000
<b>Total</b>	23,994,000	3,494,000	20,500,000

Table 1: Phase 2 Outcomes with costing.

In terms of global benefits, implementation of Phase 2 of the project expects to avoid 2.8 million tons in CO<sub>2</sub> through the life cycle investments made during this phase. Coupled with the nearly 201,600 tonnes of CO<sub>2</sub> reduction to be accrued under investments made under Phase 1, the GEF grant would contribute to the reduction of 3 million tons of CO<sub>2</sub> during the project lifetime, providing a cost effectiveness of GEF funds of \$ 1.84/ton of CO<sub>2</sub> avoided. This figure drops to \$ 1.24/ton of CO<sub>2</sub> avoided if only Phase 2 figures are used. Moreover, project replication potential for the communal heat supply sector in other cities makes up about 64 million tons of CO<sub>2</sub> avoided.

## **1.2. Strategy**

### *1.2.1. Project Rationale and Policy Conformity*

The ESCO approach was identified during project development after considering a number of options. Extensive consultations with stakeholders during the PDF-B phase resulted in the conclusion that an energy efficiency programme in the city of Rivne (and in other cities like it) could not be financed by a direct loan granted to the city (a local government entity) by a foreign commercial bank. Not only would there be a long and cumbersome application procedure, but certain banks (such as the World Bank and EBRD) would require a sovereign guarantee, which would be extremely difficult to obtain from the Government of Ukraine. While an ESCO was seen to address several major issues, a public ESCO business would encounter the same types of delays as UkrEsco (a publicly-owned ESCO whose mandate is to identify and implement energy-saving investments in small and medium-size enterprises and public sector institutions) due to the need to secure a sovereign guarantee, so the project team focused on private sector alternatives. It found that EBRD was already working on a similar scheme to promote private sector-driven municipal ESCOs in Central and Eastern Europe.

One of the main lessons learned in Phase 1 relates to the fact that ESCO-Rivne, although being a private company, is presently owned by primarily public entities. This poses a danger in that these public entities may decide to close the ESCO at any time and claim its assets, unless ESCO ownership is moved to a majority of private shareholders. A second main lesson relates to how Government budgets get allocated, which do not allow public buildings to enter into long-term commitments. Lastly, as noted in the evaluation report, “The most important lesson learned at this point in time is that a project aiming at the implementation of a municipal ESCO must be managed and controlled at the local level”.

ESCO-Rivne, as outlined in its Business Plan for 2005 (Annex 2), provides all services related to the implementation of energy efficiency and saving measures, which a client cannot or is unable to undertake utilising its own funds. These include:

- Conducting energy audits;
- Preparation of proposals for energy saving projects;
- Developing and providing financing arrangements;
- Development of full procurement packages (contracts, technical specifications);
- Procurement of all equipment and services;
- Supervision of contractors' works during construction and installation phase;
- Monitoring and verification of the contract performance during operation;
- Assuming all the risks during project implementation and operation;
- Guaranteeing of the energy savings to the client.

Similar to the case of Phase 1, Phase 2 of the project will continue to be implemented by the Rivne Oblast Administration with the technical and financial support of UNDP. As indicated in the Organigramme (see Section IV, Part II below), the present ESCO-Rivne shareholders are the Rivne Municipality (45.79%),

Oblast Administration (44.86%) and ESCO-Rivne employees who own the remaining balance of shares. To attract additional investors, ESCO-Rivne has been converted from a closed joint stock company into an open joint stock one. This will enable the participation of private investors as shareholders who are not present, as of now. As ESCO-Rivne stocks will be openly traded, an investor, local or foreign, can become a shareholder by purchasing stocks directly. In addition, it is foreseen that a foreign investor may wish to lend funds to ESCO-Rivne and expect a reasonable rate of return. In this case, the foreign investor will channel his funds through his (foreign) bank to a Ukrainian bank which, in turn, will make the loan funds available to ESCO-Rivne. However, in return, the foreign bank will likely want to ensure that the investor will recover his funds at maturity and, for this, it will likely require some form of guarantee: this can be provided by what is indicated in the above figure as a “communal property pledge”. What does this entail? It simply means that the Oblast/City pledges land as collateral to guarantee loan payback by ESCO-Rivne. This “property pledge” has been successfully utilised in Poland, for example, and the Polish experience in this regard will be very useful to ESCO-Rivne.

The intention of ESCO-Rivne is to ensure majority shareholding by private investors. It is a required step to guarantee that ESCO operations are free from local/national political considerations to pursue its commercial goals leading to improvement of energy services delivery in the city. This would provide sufficient confidence to attract debt financing from development and commercial banks. Participation of the Rivne municipality and district heating company as shareholders ensures the necessary market for ESCO operations in the city, and support of the regional government provides for opportunities for further expansion of ESCO activities in the region.

It should be emphasized that the ESCO modality is very innovative for Ukraine and the CIS countries in general. The major challenge has been to attract private investors who have previously been quite reluctant to enter the Ukrainian market. However, the improving financial situation in Rivne, the firm support of the municipality and Oblast, together with the commitments they have already made, has made it possible for ESCO-Rivne to move closer to this goal. Incentives for investors include attractive rates of return, guaranteed market penetration and expansion, lack of significant competition at the present time and risk mitigation measures undertaken by the project. In this respect, GEF involvement has been and continues to be particularly important in that it helps to reduce the risks for leveraging significant private financing for the project.

It is expected that by the completion of the proposed Phase 2, ESCO-Rivne will have developed a sound business footing that will enable it to operate on a sustainable basis as a self-financing commercial entity, thus ensuring achievement of the global environmental objectives set by the project.

#### *1.2.2. Project Goal, Objective, Outcomes and Outputs/activities*

The project objective is to reduce overall fossil fuel consumption and associated GHG emissions by removing barriers to supply and demand side energy efficiency improvements in district heating systems in the main cities of Ukraine. GEF participation will reduce major existing barriers in one pilot city and provide for the replication of defined approaches and measures in other main cities of Ukraine.

#### Project Phases

This project, consisting of Phases 1 and 2, involves two key components: (i) setting up an innovative financial mechanism (the ESCO approach) in a pilot city (Rivne) for implementing energy efficiency activities on a sustainable basis with the capability for self-replication in other Ukrainian cities; and (ii) related capacity building and barrier removal activities including installation and commissioning of energy efficiency measures, shifting to consumption-based billing system, and introduction of regulatory changes to motivate energy saving, including adjustments to the system of allocation of subsidies.

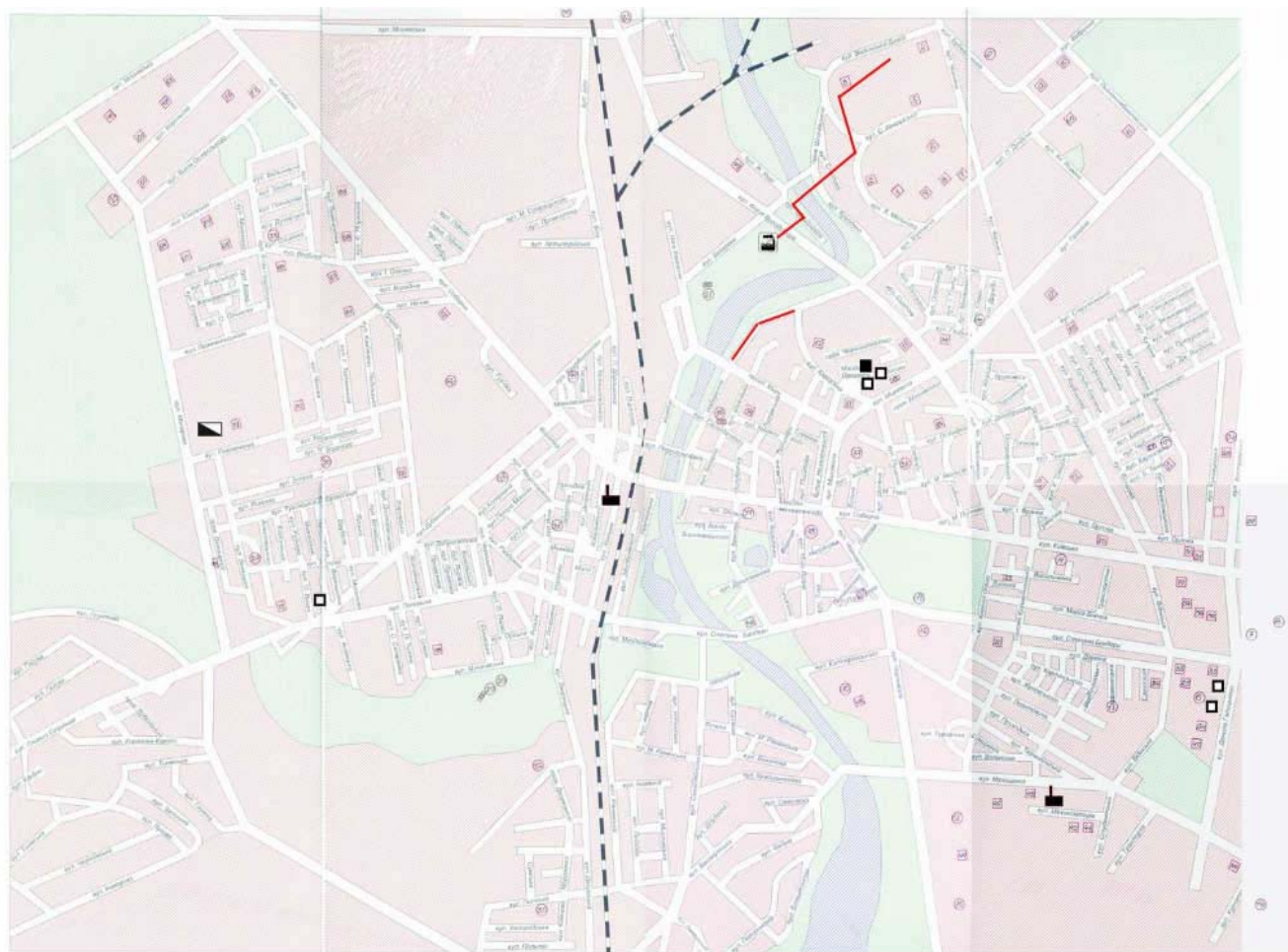
Phase 1 commenced implementation in 2002 and had 2 main objectives: (i) setting up of an ESCO in the City of Rivne as a joint stock company and fully operationalising it by completion of this phase and (ii) implementation of pilot/demonstration activities aimed at introducing energy efficiency measures at a boiler plant, in heat transportation systems and in public/residential buildings, through the design and fine-tuning of Energy Performance Contracts (EPC) and the introduction of consumption-based metering and billing. It is important that the ESCO be a private company and not a public one: a public ESCO, like UkrEsco and as indicated under “Rationale” above, will face the extremely lengthy and difficult task of securing Government guarantees should it were to borrow funds from EBRD, WB, etc.

ESCO-Rivne was legally registered as a private joint stock company on 12 November 2003, under Phase 1 of the present project, with an initial capitalization of \$ 50,000 contributed by the 2 shareholders, viz. MiskSvitlo (50.47%) and KomunEnergiya (49.53%). It has been, since then, implementing energy efficiency activities at the municipal level, as indicated in Table 1 below. All Phase 1 activities, consisting mainly of setting up an ESCO, implementation of pilot activities in Rivne (see Rivne City map below for location of main activities) and formulating a Rivne City-wide strategic plan for energy efficiency improvement, are now almost completed. Thus, the GEF contribution under Phase 1 has enabled ESCO-Rivne to address the legal and regulatory issues related to ESCO operation and facilitated the promotion of private sector initiatives in the area of municipal district heating in the pilot city of Rivne, utilizing the Energy Performance Contract (EPC) mechanism and consumption-based metering and billing. This is documented in the report of the independent evaluation finalized in December 2004

The overall conclusion of the independent evaluation is that Phase 1 project has made significant achievements in improving the overall capacity of ESCO-Rivne for implementing energy efficiency activities in the municipal district heating sector, in strengthening ESCO-Rivne’s technical, administrative and management capabilities and in increasing stakeholder awareness, commitment and participation in expansion of activities. The main findings of the independent evaluation are outlined in Sections 4.3.1, 4.3.2 and 4.3.3 of the evaluation report referred to above. They indicate that all the following benchmarks that needed to be achieved prior to embarking on Phase 2 have been met either “highly satisfactorily or satisfactorily” (ANNEX J) provides, in table form, a summary of these benchmarks):

- Enabling Environment conditions (software billing, accounting, EPC, legislation, regulation, etc.).
- Financial Institutional conditions (full-scale feasibility study for Phase 2, documents for equity/loans, investment promotion materials, investor interest, ESCO financial arrangements, etc.).
- Other Institutional conditions (Pilot municipal ESCO established, operational procedures finalised, terms of partnership with City of Rivne worked out, GHG emission reduced and verified, etc.).

## RIVNE CITY MAP WITH LOCATION OF MAIN ACTIVITIES



Map Legend:

 -Combined Heat and Power Plant 
  -Boiler Plant 
  -Individual Heating Point 
  -Heat Counters 
  -Heating Main

Implementation of the pilot activities under the Phase 1 project provided ESCO-Rivne with the opportunity to demonstrate its solid technical approach and sound financial expertise to manage opportunities for energy efficiency in the municipal district heating sector. Subsequently, its contacts with both local and foreign partners to solicit their participation as potential investors/lenders were met with considerable interest. This has resulted in ESCO Rivne securing commitments and interests from investors/lenders to increase its capital base and its access to lines of credit. At the time of writing ESCO-Rivne has:

1. Capitalization of USD 50,000 MiskSvitlo and KomunEnergiya;
  2. USD 1.5 million in capital from the GEF, which has now been transferred to ESCO-Rivne ownership, and on this it expects to be able extend its credit line to USD 1.5 million.
- Also in connection with Phase 1, the project estimated USD 265,000 in co-financing. In actual fact they received USD 1,014,000 more than this.
3. Secured credit lines of USD 556,000 from local banks (marked as USD 1.5 million in Table 2 because of the increase in collateral of the company, listed under point 2 above);

4. plans to transfer KommunEnergia assets of 14 million within the next year, and which will be used as collateral in the future;
5. project revenues and client payments from energy savings estimated at 2 USD million over the next year from Rivne Municipality, with a further USD 1 million in in-kind resources dedicated from Oblast and City to support these contracts; and
6. been negotiating with ISC Infrastructure Halle, and other private investors (Independent Energy Company, UK) over investments into ESCO-Rivne, conclusion of which is expected in the very near future; and finally
7. initiated negotiations for USD 500,000 in credit lines from ING and Raiffeisen Bank.
8. initiated discussions with the Ministry of Finance, through the Rivne Municipality, to tap into the EUR 5 million allocation from KfW specifically ear-marked for an Energy Efficiency Programme within Ukraine's Energy Sector.

The Phase 2 finances are summarised in Table 2 below.

Name of Co-financier (source)	Classification	Type	Amount (x \$ 1,000)	Status
Rivne City	Government	Cash In kind	8,000 500*	USD 2 million in contracts for 2005 have been budgeted USD 6 million in equipment will be transferred in 2005 USD 0.5 million in ongoing in-kind contributions
Rivne Oblast	Government	Cash In kind	8,000 500*	USD 8 million in equipment will be transferred in 2005 USD 0.5 million in ongoing in-kind contributions
ESCO	Private sector	cash	1,500	Letter of support
Foreign banks	Other internat.	loan	500	Letter of support
Local banks	other	loan	1,500	Letter of support
<b>TOTAL</b>			<b>20,500</b>	

Table 2: Project co-financing

Municipal district heating activities at the Rivne City-wide and regional (Oblast) levels will be targeted under the proposed Phase 2 of the project. In this connection, ESCO-Rivne has formulated its strategic plan. A table of planned activities from this Strategic Plan is attached ([ANNEX G](#) of attached Executive Summary).

The ESCO modality presents an innovative and very promising mechanism to finance large-scale energy efficiency activities in Ukraine. In order to maximize the resources available for replicating the project, proportional returns on GEF funds during the pilot phase (Phase 1) of the project and the city-wide investment (Phase 2) will be placed back into the ESCO as equity for subsequent projects in the municipal sector in Ukraine undertaken by the ESCO-Rivne.

ESCO-Rivne has been successful in developing and implementing the Energy Performance Contract (EPC) mechanism in energy efficiency activities it has undertaken to date. An EPC is, in effect, an



outsourcing arrangement for energy efficiency, where an external contractor (e.g. ESCO-Rivne) takes total responsibility for achieving outcomes. With this mechanism, it is possible to obtain a guarantee that energy savings will be achieved. While there are a number of different types of EPCs, they all share the following common features:

- The EPC contractor enters into a long term (5-10 years) relationship with the client.
- Benchmark energy performance levels are defined and energy efficiency upgrades are identified and implemented by the EPC contractor.
- Risk of non-performance of energy efficiency upgrades is carried by EPC contractor.

Thus, EPCs are a means of achieving energy efficiency that allows the risks and responsibilities of implementation and maintenance of savings to be passed on to the EPC contractor. This is in contrast with traditional energy management techniques which produce recommendations for efficiency improvement which the client has to act on at his/her own risk.

The EPC modality utilized during the implementation of Phase 1 of the project is completely in line with the project brief, formulated in January 2000 as part of PDF-B activities. The brief indicates that the full scale programme implementation (Phase 2) will be “conducted by the ESCO using EPC mechanism on commercial and self-sustainable basis”. The brief further indicates in para. 59 (page 14) that “The GEF funding (\$4,000,000) under the investment program will finance the major part of pilot implementation phase, and also the implementation of longer-payback measures (like pipe replacement and measures in buildings, Ref. [ANNEX H](#) of attached Executive Summary), less economically attractive and more risky to the private investor”. The evaluation clearly brings this out by recommending that ESCO-Rivne focus on shorter payback investments to improve its financial viability. Hence, longer-payback measures such as replacement of heat distribution networks, boiler room reconstruction, installation of radiation screens, etc. ([ANNEX H](#) of attached Executive Summary) will not get sufficient attention unless “incentives” are provided for it to invest in these.

Implementation of Phase 1 has been instrumental in bringing to the surface an additional major barrier to ESCO-driven municipal district heating that was not identified when the project brief was drafted in 2000. This relates to the development of finance guarantee and risk mitigation instruments to reduce ESCO-Rivne investment risks in case of difficulties by clients to make payments as per their EPC contracts. These instruments would be designed to promote and facilitate investments by ESCO-Rivne. Hence, in addition to financing the “implementation of longer-payback measures, less economically attractive and more risky to the private investor”, Phase 2 of the project will also address the issue of setting up finance guarantee and risk mitigation instruments to facilitate ESCO-Rivne operations.

The project’s goal is to address a key issue in the reduction of greenhouse gas emissions through large-scale improvements in energy efficiency in Ukraine's communal heat supply sector. This is proposed to be achieved through the setting up of a municipal district heating ESCO in Rivne City, providing it with technical and capacity development support to become fully operational, to provide it with hands-on experience through the implementation of pilot projects and to assist it in preparing a strategic plan for implementing energy efficiency activities city-wide in Rivne. All these were undertaken during Phase 1.

Under Phase 2, ESCO Rivne will receive additional support to implement a city-wide programme for energy efficiency activities in municipal district heating, to expand its reach beyond the borders of the city, to implement activities which require longer payback periods for which financing may not be readily available, to design and implement finance guarantee and risk mitigation instruments, and to promote the adoption and implementation of project experience and lessons learned throughout Ukraine and in other CIS countries.

The Phase 2 project has four primary outcomes; these, together with the outputs and activities required to achieve them are described in the log frame (Section II, Part II.A). These outcomes and outputs are also summarised below.

**Outcome 1:** ESCO operations are expanded to cover Rivne City-wide/Oblast energy efficiency activities. The outputs necessary to achieve this outcome are:

- Signed EPC contracts for Rivne City-wide energy efficiency activities.
- Opportunities for implementing energy efficiency in Rivne/other Oblast regions identified.
- All works pertaining to City-wide/Oblast projects completed.

**Outcome 2:** ESCO-Rivne operations are facilitated through financing of activities having long payback periods. The outputs for achieving this outcome are:

- Signed EPC contracts for activities having long payback periods.
- All necessary equipment/services for undertaking works procured.
- All works pertaining to projects having long payback periods completed.

**Outcome 3:** ESCO-Rivne operations are promoted through the design of instruments to minimise investment risks.

ESCO-Rivne will assess insurance and guarantee products available on the market, that are expected to address its perceived or real risks against investment in case of difficulties by clients to honour their EPC contracts. The outputs for this outcome are:

- Comprehensive report on risk mitigation instruments compiled.
- Study to determine most appropriate instruments completed.
- Agreements with Banks/insurance companies negotiated and signed.

**Outcome 4:** Project experience/best practices and lessons learned are replicated throughout Ukraine and in other CIS countries.

The project will support the compilation and distribution of best practices and lessons learned and will provide opportunities for broad exposure to other Oblasts and countries in the region. This will be achieved through the following outputs:

- Materials on project experience/best practices and lessons learned prepared.
- Capacity development activities implemented for the management and technical personnel of other municipalities/heat supply companies.
- Project overall results, experiences and lessons learned disseminated at the national and regional levels.
- Consultation/dialogue for replicating project experiences in other cities/Oblasts and leveraging financing for that completed.

### *1.2.3. Project Indicators, Risks and Assumptions*

#### Indicators

Key indicators of the project's success by the end of Phase 2 will include:

- CO<sub>2</sub> emissions are reduced by 2.8 million tons (3 million tons if Phase 1 is included).
- Cumulative energy consumption is reduced by 2 million t.c.e. at project sites.
- Energy performance contracts for Rivne city-wide programme signed and implemented.
- Contracts for consumption based metering and billing signed with Rivne City Apartment Owners Associations.
- ESCO-Rivne has expanded its activities in at least 2 other Oblasts.
- Lessons learned are documented and distributed to potential investors, stakeholders, other Oblast and municipal authorities, etc. through the publications and ESCO-Rivne web site.



Detailed year-by-year indicators are provided in Section II, Part II.B.

#### Assumptions

The assumptions are outlined in the Logical Framework Analysis in [ANNEX B](#) of attached Executive Summary.

#### Risks

The Phase 2 project presents several risks which are discussed below:

**Technical risk**, or the risk of actual emission reduction and energy savings being lower than expected. This is mitigated by the high level of ESCO-Rivne technical expertise as well as by independent technical review provided under Phase 1.

**Implementation risk**, or the risk that the project will not be fully implemented even though necessary resources will have been engaged. This may happen if implementation costs will prove to be higher than expected. This risk is mitigated by accurate cost estimates based on the latest quotations from suppliers and by a 10% contingency allowance added to cost estimates.

**Credit risk**, connected with the client's inability or unwillingness to meet its obligations on EPCs. To mitigate this risk, ESCO-Rivne will introduce sufficient securities (collateral agreements, bank guarantees, third-party insurance, etc.) into each EPC. As a risk mitigation factor, municipal/regional authorities will make necessary commitments, such as keeping tariffs unchanged during investment amortization period, ensuring full and timely payments on heat bills of budgetary institutions and subsidies for residential consumers, etc.

**Price risk**, or changes in prices for energy resources addressed by the project. This risk is mitigated by the fact that the dynamics of gas and heat prices over the next five years was estimated in a conservative way. Based on its experience, the ESCO will introduce fuel cost adjustment provisions into EPCs with its clients to eliminate this factor of uncertainty.

#### *1.2.4. Expected global, national and local benefits*

For the country as a whole, the project will help reduce the level of dependence on external gas supplies and decrease overall fossil fuel consumption and associated GHG emissions by removing barriers to supply and demand side energy efficiency improvements in district heating systems in the main cities of Ukraine. GEF participation will reduce major existing barriers in one pilot city and provide for the replication of defined approaches and measures in other main cities of Ukraine. Successful operation of the Rivne ESCO will facilitate setting up of similar ESCOs in other cities and attracting foreign private capital and experience to Ukraine.

Project implementation provides several domestic benefits. Most essential of them are: positive economic and financial returns from investments, higher level of heat supply service and reliability of district heating system operation, lower air pollution (in particular by NO<sub>x</sub>), creation of incentives to energy savings in public and residential sector, reduction of budgetary expenditures on residential subsidies and institutional buildings' heat bills, improvement of the qualification of district heating company personnel and its management capacity. A successfully operating ESCO will be able to further expand its activity in the region as a whole and implement energy saving measures in the industry and infrastructure sectors, thus achieving additional economic and environmental benefits. Expansion of ESCO-Rivne's activities will contribute to the development of the local energy service market.

In addition to bringing about local, national and global benefits, the project is consistent with Ukraine's national development priorities.

#### *1.2.5. Country Ownership: Country Eligibility and Country Drivenness*

##### Country Eligibility

Ukraine signed the United Nations Framework Convention on Climate Change (UNFCCC) in June 1992, ratified it on 29 October 1996 and became a Party in August 1997. It also signed the Kyoto Protocol in March 1999 and the National Parliament ratified it on 4 February 2004. As a UNDP Programme Country, it is eligible for assistance from UNDP.

##### Country Drivenness

###### (i) National reports/communications to Conventions:

In the area of climate change, Ukraine's First National Communication to UNFCCC prepared in February 1998 identified energy efficiency as one of the important mitigation options for reducing greenhouse gas (GHG) emissions in the country. Ukraine is considered to be one of the large emitters of GHG in the world; its energy input per unit of GDP is 5-7 times higher than in Western Europe and its per capita emissions of 10 tons of CO<sub>2</sub> equivalent per year are among the highest in the world.

In addition, to address the issue of a national policy on climate change, as well as to reinforce the national climate change administrative structure and ensure the fulfilment of obligations under UNFCCC, the Government instituted, in April 1999, the Inter-Ministerial Commission on Climate Change headed by the Deputy Prime Minister. The Commission, which meets on a regular basis, is made up of representatives of the appropriate ministries and departments, the Cabinet of Ministers, Verkhovna Rada (Parliament), the Administration of the President of Ukraine, and the National Academy of Sciences.

###### (ii) National legislation:

Improvement in energy efficiency in municipal district heating on both supply and demand side is an important development objective presently being pursued by the Ukrainian government. Achieving this objective would contribute to lower dependence on imported fuel and reduction in GHG emissions, and have a significant social impact.

Ukraine's strategy in improving the efficiency of its economy in general and of the municipal district heating sector in particular is reflected in a number of legislative and regulatory documents, such as the "Law of Ukraine on Energy Conservation" (1994), National Energy Programme of Ukraine (1996), Comprehensive National Programme on Energy Conservation (1997, revised and supplemented in 2000), decrees of the President and the Cabinet of Ministers of Ukraine. In municipal heat supply, the target for state support was set for priority implementation of the most cost-effective energy efficiency measures to achieve about 4.5 million tons of coal equivalent (t.c.e.) of energy savings over the period 2000-2004, with estimated investment requirements of approx. \$300 million over the same period. Special attention would be devoted to improving efficiency of energy usage in the public sector, with the target of 25% energy consumption reduction in public sector institutions by 2004. Unfortunately, due to state budgetary constraints, these targets are still far from being achieved.

###### (iii) National or Sector developments plans:

The Government's overall objective for development of the energy sector up to 2020 is to reduce the growth in coal consumption and the environmental pollution that coal burning causes. The Government is promoting (i) the introduction of clean coal technologies throughout the entire process of coal production, handling, transportation, and consumption; (ii) where possible, substitution of natural gas, coal field methane, hydropower, and renewable energy for coal; and, (iii) energy efficiency both on the supply and demand side to decrease the growth rate in energy consumption (e.g. specific heat consumption for heating and hot water supply of Ukrainian buildings is 1.5-2.0 times higher than in Western countries with similar climatic conditions).

The main directions defined by the government of Ukraine for fulfilment of the tasks on improvement of energy efficiency include, among others: economic incentives to introduce energy efficiency technologies at enterprises, improving taxation and tariff policy, promoting wide-scale application of leasing operations, obtaining investment support from lending institutions, improvement of the efficiency of heat generation and delivery, mass-scale introduction of energy metering, improvement of subsidy allocation mechanism to create incentives to energy saving by subsidized households, awareness raising through mass media, etc. Also included is support to commercialisation of activities in the area of energy efficiency through the modality of energy performance.

(iv) Linkages:

In addition to reflecting national priorities in Ukraine, the proposed project also builds upon the existing goals and activities of UNDP, with environment constituting one of its four priority areas for global activity, both at the country level and in the region. Finally, UNDP is assisting local governments in Ukraine in the formulation and implementation of Local Agenda 21 sustainable development strategies at the Oblast (regional) and municipal levels, and energy plans are included in these strategies.

The UNDP Ukraine Cooperation Framework for Human Development 2001-2005, under the item "Environment Conservation and Management", indicates that "Pollution control, energy efficiency, waste management and integrated soil management initiatives that promote local and community-level environmentally sound practices will be implemented. In addition, the draft UNDP Country programme for 2006-2010 focuses on 3 thematic areas, viz. (1) Participatory Governance, Rule of Law and Civil Society; 2) Economic and Social Development for prosperity and Human Security and 3) Environment Management and Sustainable Development. Thematic area 3 states, among others "UNDP's support will be focused on addressing the following environmental concerns: mitigation of the climate change, conservation of globally significant biodiversity, land degradation and water management. In doing so, UNDP will promote energy efficiency, clean technologies and environmentally friendly transport.

#### *1.2.6. Sustainability*

From a technical point of view, the viability of energy efficiency in municipal buildings has been proven in several CIS countries, both under GEF and non-GEF support. By addressing the barriers that impede the expansion of energy efficiency in municipal district heating in Ukraine, the Phase 2 project will build upon the predecessor Phase 1 project to assist in first creating a momentum for Rivne city-wide implementation, then a sustainable niche for such activities in neighbouring oblasts and eventually throughout the country. This has been undertaken (Phase 1) through strengthening of the policy, institutional, legal, regulatory and operational capabilities of key national institutions to promote private sector participation for energy efficiency activities in the municipal sector and developing of an energy efficiency awareness programme, accompanied by information dissemination. These efforts should ensure the long-term sustainability of energy efficiency activities in the municipal district heating sector of Ukraine.

From a financial point of view, the efforts made by ESCO-Rivne to solicit the support of investors have met with some success in that it has been able to date to secure expressions of interest from 4 companies in Ukraine (EscoComertz, UkrEsco, UkrMashExport and Parallelito) and 2 companies in Halle, Germany to participate as shareholders. In addition, lines of guarantee amounting to \$ 566,000 have already been secured from such local banks as Avalbank, Privatbank and Ukrgazbank, and discussions are continuing with international banks like EBRD for additional lines of credit of a total of approx. \$ 500,000. In addition, the Phase 2 project will support the setting up of finance guarantee and risk mitigation instruments to protect its investment in case of defaults by clients. The project will evaluate insurance and guarantee products available on the market and recommend appropriate instruments to address ESCO-Rivne's perceived risks against investments.

Furthermore, the project will support the integration of local industries for the provision of equipment and services to the energy efficiency sector.

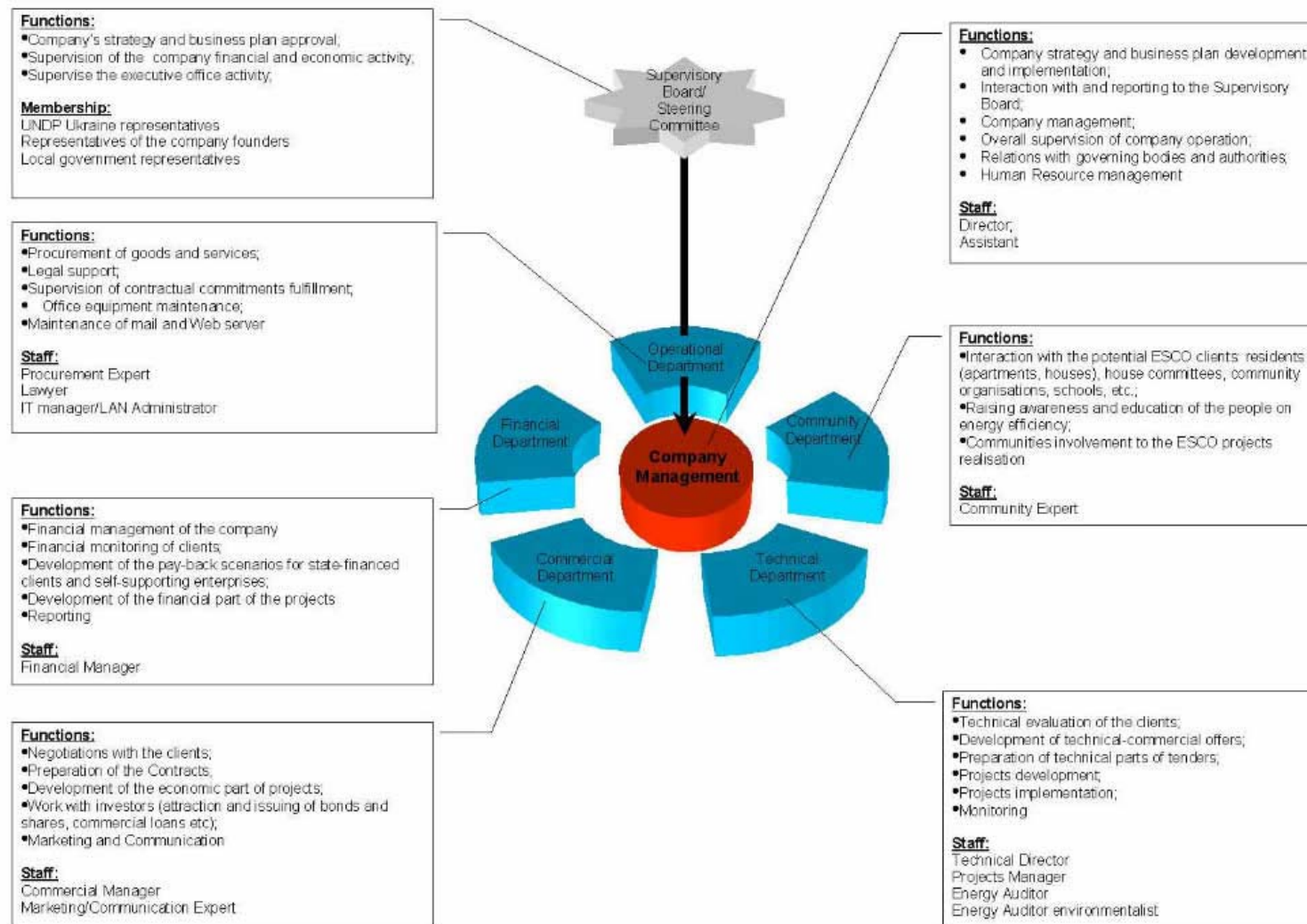
#### *1.2.7. Replicability*

This project is a follow-up to the successful Rivne Phase 1 project and benefits from the expressed interest from the Municipalities in Ostrog, Kamenets Podolskiy and Kostopil to implement similar activities for municipal district heating using the ESCO modality. In this connection, discussions with these municipalities have centred on ESCO-Rivne implementing activities to provide energy efficiency services to municipal buildings. At the present time, the Contract with Ostrog City Water Supply and Sewage Company in the amount of \$ 12,600 is completed and 3 other contracts have been signed respectively with the Water Supply (\$ 7,500) and Sewage Company (\$ 13,200) in the City of Mirgorod in Kamenets Podolskiy and the Heat Supply Company in the City of Kostopil for \$ 2,000. However, on-site works will commence at the end of the heating season in April 2005. Requests have also been received from heat supply companies in Chernovtsy, Dubrovitsa and Ivano-Frankivsk.

For the long term and this is beyond the scope of the present project, there is demonstrated interest from potential private investors to invest in the operations of ESCOs, not only in ESCO-Rivne. However, no concrete plans in this regard have been elaborated yet. Thus, the project's potential for replicability at other municipalities throughout Ukraine is very good. Technical assistance for barrier removal and policy/institutional strengthening to be provided under the project will facilitate such replicability since it will create both at central and regional levels, the required institutional, policy, and technical conditions to enable the mobilization of additional investor interest for the implementation of energy efficiency activities in the municipal district heating sector.

### **1.3. Management Arrangements**

The project will follow the same management procedures pursued during Phase 1 and will be implemented by the Rivne Oblast Administration under the national execution (NEX) modality. For this purpose, the Oblast Administration will designate a National Project Director who will be responsible for the project's direction, planning strategies and efficient overall implementation. The National Project Director will continue to have overall responsibility over ESCO-Rivne which is headed by a Director who has the support of various Departments, as indicated in the diagram on the previous page.



ESCO-Rivne will be supported by a full-time Business Development Adviser, a Project Assistant and a Community Development Adviser responsible for sustainable municipal ESCO development (ToRs are attached). The ESCO-Rivne Director will be responsible for day-to day operations and will also act as a liaison/facilitator among the various local stakeholders and with lenders/investors. The ESCO Director will prepare an updated implementation schedule for the entire project and a detailed work plan for the first 12 months of implementation. Upon completion of the initial 12-month cycle, the Director will prepare implementation work plans for the subsequent 12 months until project completion.

ESCO-Rivne will need the strong support of a Business Development Adviser to assist with attracting new shareholders/investors and expanding municipal ESCO business to other Oblasts in Ukraine. In addition, community participation is vital to the success of the whole municipal ESCO business. It is, therefore, important that the targeted municipal residents be briefed on the complete process and their support secured. The Community Development Adviser will need to maintain very close contact with the local municipal communities to secure their concurrence and support to the activities proposed for implementation and to explain to them the benefits that they would derive from such activities.

In order to accord proper acknowledgement to GEF for providing funding, a GEF logo should appear on all relevant GEF project publications, including among others, project hardware and vehicles purchased with GEF funds. Any citation on publications regarding projects funded by GEF should also accord proper acknowledgment to GEF. The UNDP logo should be more prominent and separated from the GEF logo if possible, as UN visibility is important for security purposes.

#### **1.4. Monitoring and Evaluation Plan and Budget**

##### *1.4.1. General*

A Project Steering Committee, consisting of representatives of the Ministry of Economy and European Integration, Ministry of Environmental Protection, State Committee for Municipal Housing, Association of Local and Regional Authorities, targeted Oblast Administrations, Municipalities, shareholders and UNDP chaired by the Ministry of Economy and Environmental Protection, will provide overall guidance to project execution. The Ministry of Environmental Protection will also supervise and monitor the project as the GEF technical focal point. Private sector investors participating in ESCO investment may be invited to participate in the meetings of the Steering Committee on an ad-hoc basis.

The project will be monitored and evaluated according to standard UNDP/GEF rules for nationally executed projects. For each of the project components, a detailed monitoring plan will be prepared during project inception. And as part of project inception, the Project Logical Framework may be revised; specifically, the detailed indicators will be revisited and adapted as necessary, including measures to track the major external project risks. These indicators will draw upon all sources of information, including those of other donors active in the energy efficiency field in Ukraine. Appropriate and specific performance benchmarks will be established prior to project implementation to effectively monitor project progress and to make crucial management decisions. An annual reporting cycle will be established that will provide progress reports to be shared among all participants in the project. The proposed monitoring and evaluation activities will follow the guidelines contained in the UNDP/GEF Information Kit on Monitoring and Evaluation.

#### *1.4.2. Monitoring and Evaluation*

##### General

The Executing Agency (Rivne Oblast Administration) will be responsible for regularly monitoring progress in project implementation. Progress will be measured against targets set out in the Work Plan and Project Logical Framework, more specifically as per the attached year-by-year objectively verifiable impact indicators. ESCO-Rivne will be required to report relevant progress to the National Project Director and UNDP on a quarterly basis. UNDP CO is obliged to share short progress reports (QOR) with GEF on quarterly basis. Regular monitoring of the project will occur through this reporting mechanism as well as through site visits, as required. Disbursements of UNDP-GEF funds will be dependent upon the project's ability to establish a well designed reporting mechanism (e.g. a MIS-based or other system).

A project Inception Workshop will be organised, within 2 months of project start-up, with the participation of ESCO-Rivne, relevant government counterparts, co-financing partners, UNDP-Ukraine and representation from the UNDP-GEF Regional Coordinating Unit.

A fundamental objective of this Inception Workshop will be to assist ESCO-Rive and the project partners to understand and take ownership of the project's goals and objectives, as well as to finalize preparation of the project's first annual work plan on the basis of the logframe matrix. This will include reviewing the logframe (indicators, means of verification, assumptions), imparting additional details as needed, and, on the basis of this exercise, finalize the Annual Work Plan (AWP) with precise and measurable performance indicators, and in a manner consistent with the expected outcomes for the project.

The Inception Workshop will also provide an opportunity for all parties to understand their respective roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. A report of the Inception Workshop will be prepared by the Project Adviser within 2 weeks of completion of this activity.

Annual Tripartite Review meetings (TPRs), with the participation of the Executing Agency, project team, stakeholders and UNDP, will be held to review progress, identify problems, and agree on solutions to maintain timely provision of inputs/achievement of results. The Project Steering Committee will review annual work plans as well as provide strategic advice on the most effective ways and means of implementation. Reporting to GEF will be accomplished through annual Project Implementation Reviews (PIRs).

In addition to normal Government monitoring, UNDP will have the monitoring and reporting obligation for the programme, in accordance with the GEF Monitoring and Evaluation (M&E) guidelines. In this connection, additional M&E missions will be undertaken by UNDP when this is judged to be required, as for example when there is a need for an intermediate assessment of progress or impact before a decision is made as to the continuation of any given activity. This will be done in collaboration with the Executing Agency as well as with the implementing partners/stakeholders.

Moreover, the project will be the subject of two independent evaluations: the first one will be half way through implementation, and the other at project completion. These independent evaluations will review progress in project implementation and make recommendations, where appropriate, to improve timeliness, relevance and impact of project inputs. They will also assist project stakeholders to draw lessons learned for use in improving the quality of future development interventions with similar activities and could be undertaken in collaboration with other development partners to the project. Such multi-stakeholder and partner evaluations could be a useful learning experience for all parties, where a 360-degree approach could be taken to evaluate all parties' inputs to the project.

The results of the final evaluation will be incorporated in the publication on lessons learned for dissemination both within and outside Ukraine. All reports will be posted on the project web site.

The Government will provide the UNDP Resident Representative In Ukraine with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of UNDP (including GEF) funds according to the established procedures set out in the Programming and Finance manuals. The Audit will be conducted annually by the legally recognized auditor of the Government, or by a commercial auditor engaged by the Government.

#### 1.4.3. Monitoring and Evaluation Budget

The costs for Monitoring, Evaluation and Dissemination activities will be paid for by the project budget, for which \$ 100,000 (see Chapter 3. Total Budget and Work Plan) have been allocated in appropriate budgetary account codes under Outcomes 4 of the total project work plan and budget. This budget allocation includes activities related to preparing quarterly progress reports, undertaking Project Implementation Reviews, Annual Project Reviews, Annual Audits of accounts, mid-term/final evaluations, and organising/participating in Steering Committee Meetings, as required.

The project will be audited annually by Audit firm selected by UNDP Ukraine. The costs for the audit will be paid for by the project budget.

#### INDICATIVE MONITORING, EVALUATION AND REPLICATION WORK PLAN AND CORRESPONDING BUDGET

Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project team Staff time</i>	Time frame
Inception Workshop (IW)	<ul style="list-style-type: none"> <li>Project Adviser</li> <li>ESCO-Rivne</li> <li>UNDP CO</li> <li>UNDP GEF</li> </ul>	5,000	Within first two months of project start up
Inception Report	<ul style="list-style-type: none"> <li>Project Adviser</li> <li>UNDP CO</li> </ul>	None	Within 2 weeks following IW
Measurement of Means of Verification for Project Purpose Indicators	<ul style="list-style-type: none"> <li>Project Adviser will oversee the hiring of consultants /institutions for specific studies</li> </ul>	To be finalized in Inception Phase and Workshop. Indicative cost: 5,000	Start, mid and end of project
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	<ul style="list-style-type: none"> <li>Oversight by Project Adviser</li> <li>Measurements by ESCO-Rivne officers and Implementing Agency</li> </ul>	To be determined as part of the Annual Work Plan's preparation. Indicative cost: 5,000	Annually prior to APR/PIR and to the definition of annual work plans
APR and PIR	<ul style="list-style-type: none"> <li>Project Team</li> <li>UNDP CO</li> <li>UNDP GEF</li> </ul>	None	Annually
TPR and TPR report	<ul style="list-style-type: none"> <li>Government Counterparts</li> <li>UNDP CO</li> <li>Project team</li> <li>UNDP GEF Regional Coordinating Unit</li> </ul>	None	Every year, upon receipt of APR
Steering Committee Meetings	<ul style="list-style-type: none"> <li>Project Adviser</li> <li>UNDP CO</li> </ul>	None	Following Project IW and subsequently at least once a year
Periodic status reports	<ul style="list-style-type: none"> <li>Project Team</li> </ul>	None	To be determined by



Type of M&E activity	Responsible Parties	Budget US\$ <i>Excluding project team Staff time</i>	Time frame
			Project Team and UNDP CO
Technical reports	<ul style="list-style-type: none"> <li>Project Team</li> <li>Hired consultants as needed</li> </ul>	15,000	To be determined by Project Team and UNDP CO
Mid-term External Evaluation	<ul style="list-style-type: none"> <li>Project Team</li> <li>UNDP CO</li> <li>UNDP GEF Regional Coordinating Unit</li> <li>External Consultants (i.e. evaluation team)</li> </ul>	20,000	At the mid-point of project implementation.
Final External Evaluation	<ul style="list-style-type: none"> <li>Project Team</li> <li>UNDP CO</li> <li>UNDP GEF Regional Coordinating Unit</li> <li>External Consultants (i.e. evaluation team)</li> </ul>	25,000	At the end of project implementation
Terminal Report	<ul style="list-style-type: none"> <li>Project Team</li> <li>UNDP CO</li> <li>External Consultant</li> </ul>	None	At least one month before the end of the project
Lessons Learned/Replication Guidelines	<ul style="list-style-type: none"> <li>Project Team</li> <li>UNDP GEF Regional Coordinating Unit (suggested formats for documenting best practices, etc)</li> </ul>	10,000 (lessons learned)  10,000 (replication guidelines)	Yearly  At the end of project implementation
Audit	<ul style="list-style-type: none"> <li>UNDP CO</li> <li>Project Team</li> </ul>	5,000 (average \$1250 per year)	Yearly
Visits to field sites (UNDP staff travel costs to be charged to IA fees)	<ul style="list-style-type: none"> <li>UNDP Country Office</li> <li>UNDP GEF Regional Coordinating Unit (as appropriate)</li> <li>Government representatives</li> </ul>	None	As required
<b>TOTAL INDICATIVE COST</b>  <i>Excluding project team staff time and UNDP staff and travel expenses</i>		US\$ 100,000	

### 1.5. Legal Context

This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of Ukraine and the United Nations Development Programme, signed by the parties on June 18, 1993. The host country implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government co-operating agency described in that Agreement.

The UNDP Resident Representative in Ukraine is authorized to effect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by the UNDP-GEF Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes:

- a) Revision of, or addition to, any of the annexes to the Project Document;
- b) Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;
- c) Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility; and
- d) Inclusion of additional annexes and attachments only as set out here in this Project Document.

## **2. Strategic results framework and GEF increment**

### **2.1. Incremental Cost Analysis**

Please see the [ANNEX A](#) of attached Executive Summary

### **2.2. Logical Framework Analysis**

#### **A: Logical Framework and Objectively Verifiable Impact Indicators**

See please the [ANNEX B](#) of attached Executive Summary

## B: Year-by-Year Objectively Verifiable Impact Indicators

Project Strategy	Indicator Year 1	Indicator Year 2	Indicator Year 3	Indicator Year 4
<b>Objective:</b> To support ESCO-Rivne to implement a city-wide energy efficiency programme in municipal district heating and to expand its activities to cover other cities and Oblasts.			Open competitive bidding by Oblast Administration and Municipality for all energy related projects.	
<b>Outcome 1:</b> To expand ESCO operations through implementation of Rivne City-wide/Oblast energy efficiency activities.	Private investment of \$ 3 million secured. Majority non-Rivne Municipality/Oblast share-holding completed.	Private investment of an additional \$ 5 million secured.	Private investment of an additional \$ 10 million.	Private investment of an additional \$ 2 million secured.
<b>Output 1.1:</b> Signed EPC contracts for Rivne City-wide energy efficiency activities.	EPC contracts, preferably including maintenance and repair, for \$ 5 million signed.	EPC contracts, preferably including maintenance and repair, for an additional \$ 5 million signed.	EPC contracts, preferably including maintenance and repair, for an additional \$ 10 million signed.	
<b>Output 1.2:</b> Opportunities for implementing energy efficiency in Rivne/other Oblast regions identified.	Negotiations with Oblast authorities.	EPC contracts, preferably including maintenance and repair, for 3 million signed.	EPC contracts, preferably including maintenance and repair, for an additional 5 million signed.	EPC contracts, preferably including maintenance and repair, for an additional 7 million signed.
<b>Output 1.3:</b> All works pertaining to City-wide/Oblast projects completed.	End of Year: Year 1 works completed.	End of Year: Year 1 works completed. End of Year 1 company report and accounts prepared + accounts audited. Independent	End of Year: Year 2 works completed. End of Year 2 company report and accounts prepared + accounts audited.	End of Year: Year 3 works completed. End of Year 3 company report and accounts prepared + accounts audited.

Project Strategy	Indicator Year 1	Indicator Year 2	Indicator Year 3	Indicator Year 4
		evaluation of energy savings during Year 1 completed.	Independent evaluation of energy savings during Year 2 completed.	Independent evaluation of energy savings during Year 3 completed.
<b>Outcome 2:</b> To facilitate ESCO-Rivne operations through financing of activities having long payback periods (up to 5 years).				
<b>Output 2.1:</b> Signed EPC contracts for activities having long payback periods.	Signed contracts for \$ 500k.	Signed contracts for an additional \$ 1,000k.	Signed contracts for an additional \$ 1,250k.	Signed contracts for an additional \$ 250k.
<b>Output 2.2:</b> All necessary equipment/services for undertaking works procured.	Signed contracts for equipment and services for \$ 500k.	Signed contracts for equipment and services for an additional 1,000k.	Signed contracts for equipment and services for an additional 1,250k.	Signed contracts for equipment and services for an additional 250k.
<b>Output 2.3:</b> All works pertaining to projects having long payback periods completed.	Implementation of works.	Implementation of works. \$ 500k of actual investment made in Year 1. 15% rate of return achieved during Year 1. 1,100 tce saved during Year 1.	Implementation of works. \$ 1,500k of actual investment made in Years 1 and 2. 17% rate of return achieved during Years 1 and 2. 3,300 tce saved during Years 1 and 2.	Implementation of works. \$ 2,750k of actual investment made in Years 1, 2 and 3. 20% rate of return achieved during Years 1, 2 and 3. 6,050 tce saved during Years 1, 2 and 3.
<b>Outcome 3:</b> To reduce perceived investment risks in order to facilitate ESCO-Rivne's expansion of activities.	Risk mitigation instruments developed. Financial Plan formulated. Agreements with risk instruments			

Project Strategy	Indicator Year 1	Indicator Year 2	Indicator Year 3	Indicator Year 4
	providers in place.			
<b>Output 3.1:</b> Comprehensive report on risk mitigation instruments compiled.	Discussions on risk mitigation products provided by banks and insurance companies completed. Report completed.			
<b>Output 3.2:</b> Study to determine most appropriate instruments completed.	Discussions on most appropriate instruments with ESCO. Report available within first 6 months of project.			
<b>Output 3.3:</b> Agreements with Banks/insurance companies negotiated and signed.	Negotiations between ESCO-Rivne and bank/insurance companies. Agreements signed.			
<b>Outcome 4:</b> Replication of project experience/best practices and lessons learned throughout Ukraine and in other CIS countries.	Project experience compiled, analysed and disseminated. Analysis of business environment for ESCO operation + recommendations for open competition in the sector.	Necessary modifications made in Government budgeting procedures/rules to allow fair and equitable competition in the energy efficiency sector.		

Project Strategy	Indicator Year 1	Indicator Year 2	Indicator Year 3	Indicator Year 4
<b>Output 4.1:</b> Materials on project experience/best practices and lessons learned prepared.	Project experience posted on web site as it becomes available.	Project experience posted on web site as it becomes available.	Project experience posted on web site as it becomes available.	Project experience and best practices compiled 6 months before project end. Report published at least 2 months by project
<b>Output 4.2:</b> Capacity development activities implemented for the management and technical personnel of other municipalities/heat supply companies.		Staff of 3 municipalities and/or heat supply companies participate in capacity development.	Staff of 4 municipalities and/or heat supply companies participate in capacity development.	Staff of 5 municipalities and/or heat supply companies participate in capacity development.
<b>Output 4.3:</b> Project overall results, experiences and lessons learned disseminated at the national and regional levels.	Phase 1 project experience shared in 1 neighbouring country.	Project experience to date shared in 2-3 additional countries.	Project experience to date shared in 2-3 additional countries.	Draft final report disseminated to the stakeholders. Regional seminar organized to present and discuss the results/lessons learned. Public outreach activities through news media.
<b>Output 4.4:</b> Consultations/dialogue for replicating project experiences in other cities/Oblasts and leveraging financing for that completed.				Five expressions of interests to replicate project activities at the national and/or regional level received. Recommendations of final evaluation re. business development and/or legislative change to be put into practice in new

Project Strategy	Indicator Year 1	Indicator Year 2	Indicator Year 3	Indicator Year 4
				activities. Financing leveraged in the additional amount of \$ 20 million to expand and/or continue project activities.

### 3. Total Budget and Work Plan

TOTAL PROJECT WORKPLAN AND BUDGET									
Award ID: tbd									
Award Title: PIMS 3065 CC FP: Removing Barriers to Greenhouse Gas Emissions Mitigation through Energy Efficiency in the District Heating System, Phase 2									
Project ID:									
ProjectTitle: PIMS 3065 CC FP: Removing Barriers to Greenhouse Gas Emissions Mitigation through Energy Efficiency in the District Heating System, Phase 2									
Executing Agency: Rivne Oblast Administration (ROA) - NEX execution									
GEF Outcome/Atlas Activity	Responsible Party (Executing Agent)	Source of Funds	Atlas Budgetary Account Code	ERP/ATLAS Budget Description/Input	Amount (USD) Year 2006	Amount (USD) Year 2007	Amount (USD) Year 2008	Amount (USD) Year 2009	Total (USD)
OUTCOME 2: To facilitate ESCO-Rivne operations through financing of activities having long payback periods.	ROA	GEF	71200	International Consultants	50,000	50,000	50,000	50,000	200,000
			71300	Local Consultants	20,000	20,000	20,000	20,000	80,000
			71400	Contractual Services - Individuals	80,000	80,000	80,000	80,000	320,00
			71600	Travel	25,000	25,000	25,000	25,000	100,000
			72100	Contractual Services -Companies	300,000	250,000	210,000	124,000	884,000
			72300	Materials & Goods	500,000	500,000	300,000	200,000	1,500,000
			72400	Com.& Audio Visual Equipment	3,000	3,000	3,000	3,000	12,000
			72500	Supplies	4,000	4,000	4,000	4,000	16,000
			74200	Audio Visual &Printing Prod.	3,000	3,000	3,000	3,000	12,000
		74500	Miscellaneous Expences	5,000	5,000	5,000	5,000	20,000	
Sub-total									3,144,000
OUTCOME 3: To reduce perceived investment risks in order to facilitate ESCO-Rivne’s expansion of activities.	ROA	GEF	71200	International Consultants	40,000	25,000	25,000	25,000	115,000
			71300	Local Consultants	10,000	10,000	10,000	2,000	32,000
			71400	Contractual Services - Individuals	30,000	30,000	30,000	13,000	103,000
			71600	Travel	20,000	10,000	10,000	10,000	50,000
		Gov	71300	Local Consultants	10,000	10,000	10,000	10,000	40,000
			71400	Contractual Services - Individuals	40,000	40,000	40,000	40,000	160,000
		Sub-total							
OUTCOME 4: Monitoring/Replication of project	ROA	Gov	71300	Local Consultants	3,000	3,000	2,000	2,000	10,000
			71400	Contractual Services - Individuals	12,000	12,000	8,000	8,000	40,000
		GEF	71200	International Consultants		15,000	15,000		30,000



experience/best practices and lessons learned throughout Ukraine and in other CIS countries. Mid-Term/Final Evaluation			71600	Travel	5,000	5,000	5,000	5,000	20,000
		Sub-total							100,000
	TOTAL				1,160,000	1,100,000	855,000	629,000	3,744,000

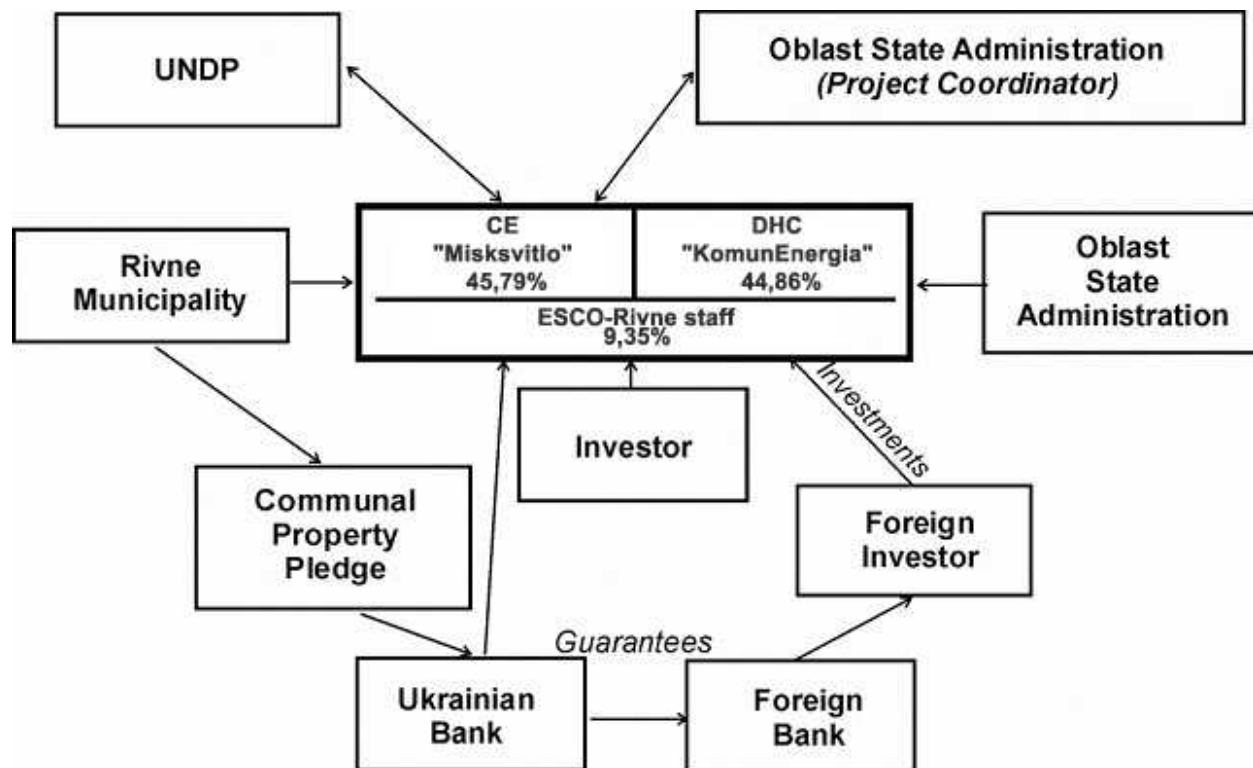
<b>Summary of Funds</b>					
GEF	1,095,000	1,035,000	795,000	569,000	3,494,000
GOVT national (Cash)	65,000	65,000	60,000	60,000	250,000
GOVT (In Kind)	250,000	250,000	250,000	250,000	1,000,000
Others (including local governments)	1,000,000	556,000	500,000	250,000	2,306,000
TOTAL	2410,000	1906,000	1605,000	1129,000	<b>7,050,000</b>

## 4. Additional Information

### 4.1. Other Agreements

Endorsement letter and letters of commitment are attached as [ANNEX D](#) of attached Executive Summary

### 4.2. Organigramme of Project



#### 4.3. Terms of References for key project staff

<b>TERMS OF REFERENCE</b>
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##### 1. Project Adviser

**Post Title:** Project Adviser  
**Organization:** ESCO-Rivne  
**Duty Station:** Rivne, Ukraine  
**Duration:** Full duration of project (estimated at 4 years)

**Duties:**

Under the general direction of the National Project Director and the supervision of the ESCO-Rivne Director, the Project Adviser will:

- Support ESCO-Rivne in developing plans to attract new shareholders/investors and to expand ESCO business to other Cities/Oblasts. As such, the Business Development Adviser will be expected to generate an average of \$ 5 million annually in new business.
- Assist ESCO-Rivne in negotiating new EPC contracts that minimise risks and expand its business opportunities, such as including maintenance and repair.
- Support ESCO-Rivne in its efforts vis-à-vis Municipalities/Oblast Administrations to ensure that a fair market place for ESCO activities is established.
- Assist ESCO-Rivne in formulating ToRs and identifying potential consultants/short-term experts to assist with project implementation (e.g. development of risk mitigation instruments) and supervise their assignments.
- Advise and support ESCO-Rivne in the preparation of the company annual reports, financial reports, implementation of annual audits and development of acceptable standards of business conduct that will facilitate participation by investors.
- Assist ESCO-Rivne in monitoring project performance as per set indicators and preparation of required reports, including the annual PIR.
- Support ESCO-Rivne in ensuring full compliance of project activities with all financial and technical rules, regulations and procedures relevant for the project implementation (both UNDP and national).
- Assist the ESCO-Rivne Director in selection of staff (both project staff and other relevant staff of participating organizations) for local and/or overseas training.
- Ensure liaison with the Project Steering Committee and UNDP office, and ensure that the decisions and recommendations of the Project Steering Committee, and the opinions of UNDP, are fully incorporated within the scope of the project implementation.
- Ensure full liaison with the GEF Operational Focal Point at the Ministry of Environmental Protection.

**Qualifications and Experience:**

- Masters degree in business management, economics, or engineering;
- Minimum of 10 years of professional experience in business development/investment banking, preferably related to district heating;
- Familiarity with structuring financial options for risk assessment and business growth;
- Experience with the design and implementation of energy efficiency programmes and projects, preferably in east/central Europe;
- Extensive experience of cooperation with Ukrainian and foreign governmental organizations and international financial institutions;

- Extensive experience with project management and a demonstrated ability to manage complex technical assistance projects;
- Good computer and interpersonal skills;
- English language skills (both oral and written), in addition to Ukrainian/Russian, essential.

## 2. Community Mobilisation Specialist

**Post Title:** Community Mobilisation/Communication Specialist  
**Organization:** ESCO-Rivne  
**Duty Station:** Rivne, Ukraine  
**Duration:** Full duration of project (estimated at 4 years)

### Duties:

Under the responsibility of the ESCO-Rivne Director, the Community Mobilisation/Communication Specialist will:

- Promote the ESCO concepts and community mobilisation methodologies at municipal, micro-region and community levels;
- Support the residents in forming community organisations (COs) aimed at solving their problems using their own resources, to the extent possible;
- Assist the COs to prepare realistic development plans and to implement them;
- Assist the COs to create and develop community self-help funds and to prepare cost estimates for community initiatives;
- Closely coordinate with local government and non-governmental organisations (NGOs) to successfully implement the initiatives;
- Develop and implement a comprehensive Public Relations (PR) concept for effective dissemination and replication of lessons learned;
- Maintain project media relations for reaching investors, partners and general public audiences through press conferences, project visits and interviews;
- Develop project promotion materials and ensure target distribution of information materials produced;
- Ensure preparation of regular and ad hoc project publications. Promote project through stories, pictures, articles and other PR activities;
- Provide publicity of project events, activities, etc.;
- Plan and organize media events such as press briefings/conferences and draft presentations, press-releases (bi-lingual), etc. to communicate ESCO-Rivne development messages to partners/investors (both national and international);
- Support local authorities at regional and municipal levels to prepare local development plans and programmes that promote good governance and strengthen development activities;
- Assist the regional and municipal administrations in facilitating dialogue and participatory planning and decision making;
- Prepare and implement detailed work plans for social and local resource mobilisation;
- Prepare communication strategy of ESCO-Rivne;
- Develop and implement annual/quarterly communication work-plans as a part of the project work plan;
- Review project activities to determine information support needs;
- Scan press and publications for articles of interest to project and circulate them to project staff;
- Participate in preparation of project reports on PR, media and communication activities;
- Liaise with communication staff of other projects/programmes;
- Participate in further developing and regularly updating/maintaining the ESCO-Rivne website (on the content side);
- Assist in training ESCO-Rivne staff in dealing with the media;

- Act as managerial focal point on the ESCO-Rivne information activities;
- Monitor activities of COs and regularly report to ESCO-Rivne; and
- Perform any other related tasks at the request of ESCO-Rivne management.

**Qualifications and Experience:**

- Graduate degree from a recognised university/institute in Social Sciences, Economics or related field;
- A minimum of 3 years of experience working with communities for development activities;
- Experience in working with government (regional and municipal levels), NGOs and the private sector;
- Familiarity with the social situation in Rivne's communities;
- Good communication and networking skills;
- Excellent interpersonal and conceptual skills for promoting social mobilization concepts and methodologies;
- Experience in organising and conducting training courses and seminars;
- Excellent computer skills; and
- English language skills (written and oral) will be an asset.

**3. Administrative Assistant**

**Post Title:** Administrative Assistant  
**Organization:** ESCO-Rivne  
**Duty Station:** Rivne, Ukraine  
**Duration:** Full duration of project (estimated at 4 years)

**Duties:**

Under the responsibility of the ESCO-Rivne Director, the Administrative Assistant will:

- Assist in maintaining close contacts with the government, executing agency, project partners, and other counterparts through direct contacts, collection and summarizing of information, proposals, incoming and outgoing correspondence, drafting letters, organizing meetings, etc.;
- Provide operational support to project activities;
- Supervise collection of data and other information on project activities; maintain, log, file and update records in prescribed format for subsequent use;
- Contribute to the preparation of status and progress reports by providing information, preparing tables and drafting selected sections. Prepare background material for use in discussions and briefing sessions;
- Assist in monitoring project activities by reviewing a variety of records, including correspondence, reports, project inputs, budgets and financial expenditures in accordance with UNDP requirements. Prepare and file correspondence and materials relevant to the above;
- Assist in preparation of terms of reference for subcontractors and consultants;
- Assist in the organization of and logistical preparation for workshops, seminars, presentations, visiting missions, field trips, etc.

**Qualifications and Experience:**

- Higher education in linguistics, environmental management or other field relevant to the project;
- Experience in interpreting/translating and secretarial/clerical work, preferably connected with environmental issues;
- Experience in coordinating the work of expert groups for the achievement of strategic goals;
- Knowledge of office hardware and software (word processing, spreadsheet, and presentation programmes);
- Good command of Ukrainian, Russian and English.

#### **4.4. Stakeholder Involvement Plan**

The project has been designed initially to undertake energy efficiency in the municipal district heating sector in the City of Rivne, but within the context of a potential larger national programme to accelerate the implementation of energy efficiency measures in municipalities across Ukraine. Stakeholder participation involving the public and private sectors as well as civil society has played an essential role in the implementation of Phase 1 of the project and will continue to play a significant role during the follow-up Phase 2.

At the conceptualization stage of the Phase 1 of the project, the now-defunct State Committee for Energy Conservation, with the support of UNDP, carried out extensive consultations with various stakeholders to solicit their views and support for energy efficiency in the municipal district heating sector. Such consultations were held with Central and Oblast Administrations, investors, project developers, industry associations, financial institutions, donors and others. These focussed on issues of policy, regulations, financing, tariffs, capacity development, technologies, community participation, etc. The experience and the expectations of the stakeholders were considered during project conceptualization and definition.

The preparation of Phase 1 and, subsequently, Phase 2 of the project brought together all key stakeholders during discussions on the thematic area of “Environment Conservation and Management” of the UNDP Ukraine Cooperation Framework for Human Development 2001-2005. In addition, the draft UNDP Country Programme for 2006-2010 envisages support to the Government to meet the objectives of global conventions and mobilise resources from diverse sources for addressing the following environmental concerns: mitigation of the climate change, conservation of globally significant biodiversity, land degradation and water management. In doing so, UNDP will promote energy efficiency, clean technologies and environmentally friendly transport.

The indicative roles of different stakeholders have been identified to minimize project implementation risks, and thereby ensuring its sustainability. Typical roles of different category of stakeholders are discussed below:

The Government Agencies (Ministry of Economy and European Integration, Ministry of Environmental Protection, State Committee for Municipal Housing, Rivne Oblast Administration, Rivne Municipality, Association of Local and Regional Authorities) are expected to facilitate project formulation and implementation. In this connection, they will actively liaise with various departments and institutions, including other Oblast Administrations, financial institutions, banks and project developers. While their capacities to effectively network with various partner institutions would be enhanced through the project, the Government Agencies by themselves, except for ROA, would not implement projects.

ESCO-Rivne will network with Municipalities in other Oblasts, district heating companies, industry associations and existing entrepreneurs to promote energy efficiency implementation measures in the municipal district heating sector, resulting in a rolling projects pipeline for investors and financial institutions.

Government Agencies and concerned departments will ensure an enabling environment for other municipal ESCOs to be set up, especially with regard to providing a conducive business environment for ESCO operation and making recommendations for the necessary modifications in Government budgeting procedures/rules to allow fair and equitable competition in the energy efficiency sector. They would participate in the capacity development programmes planned under the project.

Non-Governmental and Community based Organizations such as the local housing management committees would actively participate in the setting up and management of energy efficiency/demand side management at the consumer level.

Industry comprising of the manufacturers of equipment, technology suppliers and service providers would proactively participate in ensuring quality performance of the projects.

ROA will have direct responsibility for implementation of the project. ESCO-Rivne will be supported by a full-time Business Development Adviser, a Project Assistant and a Community Development Adviser responsible for sustainable municipal ESCO development who, in addition to performing their assigned project management functions, will maintain constant dialogue with the above stakeholders and solicit their assistance and support, as required, to undertake key roles in project implementation.

Table 3 gives an overall plan for stakeholders' involvement. A report detailing the extent and nature of involvement of stakeholder participation will be prepared and submitted periodically to the Project Steering Committee.

Table 3: Plan for Stakeholder Participation

Type of Stakeholder	Contributions to Key Outputs	Frequency (Periodic = once in six months)
Government Agencies	Short/mid/long term perspective plans for implementing energy efficiency in the municipal district heating sector. Active participation in the workshops and other meetings on policy deliberations – energy markets, environmental impact assessments, investment promotion, and other institutional issues.	Periodic
Regulator	Participation in Steering Committee meetings, environmental impact assessment and tariff determination.	Periodic
Financial Institutions and Banks	Innovative financing schemes for replication of and credit lines for operation of the ESCO modality in municipal district heating throughout Ukraine.	Continuous
Technical Institutions	Benchmarking and validation -Performance monitoring and evaluation. Resource for capacity development/information dissemination.	Continuous
Investors	Projects pipeline.	Continuous
NGOs/CBOs	Support to project/Ensure that municipal consumers benefit from project activities and outputs.	Continuous
Bilateral and other donors	Implementation /Replication.	Periodic

## SIGNATURE PAGE

Country: Ukraine

UNDAF Outcome(s)/Indicator(s): “Assistance Area 4: Prosperity Against Poverty, reducing poverty through effectively targeted development and entrepreneurship”. CP Output 1.8: “Institutional capacities and capabilities of municipalities and civil society organizations strengthened through improved policies and practices related to environment and energy services”. Indicator 2: “Decrease in fuel/coal consumption + Indicator 3: “Reduction in harmful essences emissions”.

Expected Outcome(s)/Indicator (s): Output: “Sustainable development policies and practices make the difference”. Service line 3.3: Access to sustainable energy services. Indicator: “Decline in green(house) gas/carbon dioxide emission”.

*(CP outcomes linked to the SRF/MYFF goal and service line)*

Expected Output(s)/Indicator(s): Output: “Institutional capacities and capabilities of municipalities strengthened through improved policies and practices related to energy services and environment”. Indicator: “Number of municipalities engaged in energy-saving and sustainable practices; baseline: 3 cities as of 2005”.

*(CP outcomes linked to the SRF/MYFF goal and service line)*

Implementing partner:  
*(designated institution/Executing agency)*

Rivne Oblast Administration

Other Partners:

Rivne Municipality

Programme Period: 2006-2010  
Programme Component: Energy and Environment for Sustainable Development  
Project Title: **Removing Barriers to Greenhouse Gas Emissions Mitigation through Energy Efficiency in the District Heating System, Phase 2**  
PIMS ID: 3056  
Atlas Award ID: 00042146  
Atlas Project ID: 00048250  
Project Duration: 4 years  
Management Arrangement: National Execution (NEX)

Total budget:	<b>USD 7,050,000</b>
Allocated resources:	
• GEF	USD 3,494,000
• Government	<b>USD 2,000,000</b>
• Government in kind	USD 1,000,000
• Other	<b>USD 556,000</b>

Name

Date

**Agreed by**  
**Ministry of Economy and European Integration of**  
**Ukraine**  
**(Government):**

**Agreed by**  
**Rivne Oblast Administration (Implementing**  
**Partner/Executing agency)**

**Agreed by (UNDP):**



## Annex 1: Executive Summary



# PROJECT EXECUTIVE SUMMARY GEF COUNCIL SUBMISSION FULL SIZED PROJECT

**AGENCY'S PROJECT ID:** 3056  
**GEFSEC PROJECT ID:** 2249  
**COUNTRY:** Ukraine  
**PROJECT TITLE:** Removing Barriers to  
 Greenhouse Gas Emissions Mitigation through  
 Energy Efficiency in the District Heating System,  
 Phase 2  
**GEF AGENCY:** UNDP  
**OTHER EXECUTING AGENCY(IES):**  
**DURATION:** 48 months  
**GEF FOCAL AREA:** Climate Change  
**GEF OPERATIONAL PROGRAM:** OP 5  
**GEF STRATEGIC PRIORITY:** CC-2  
**ESTIMATED STARTING DATE:** August 2005  
**ESTIMATED WP ENTRY DATE:** June 2005  
**IA FEE:** \$382,000

### CONTRIBUTION TO KEY INDICATORS OF THE BUSINESS PLAN

- Avoided CO<sub>2</sub> emissions: 2.8 million tons (under Phase 2 activities)
- Cost effectiveness of GEF funds: \$ 1.24/ton of CO<sub>2</sub> avoided
- Cumulative CO<sub>2</sub> reduction potential (over 20 years): 64 million tons

### RECORD OF ENDORSEMENT ON BEHALF OF THE GOVERNMENT:

V Kruk, First Deputy Minister, Ministry of  
 Environmental Protection, GEF OFP

Date: 14<sup>th</sup> march 2005

FINANCING PLAN (US\$)	
GEF PROJECT/COMPONENT	
Project (Phase II)	3,494,000
PDF B	189,400
Phase I	1,840,000
<b><i>Sub-Total GEF</i></b>	<b>5,523,400</b>
CO-FINANCING	
Phase I	1,320,000
PDF B	95,000
<b><i>Sub-Total Co-financing</i></b>	<b>1,415,000</b>
Phase II:	
UNDP	
Government	2,000,000
Government in kind	1,000,000
Bilateral Donors	
Others	556,000
<b><i>Sub-Total Co-financing (phase II):</i></b>	<b>3,556,000</b>
<b><i>Total Project Financing: (PDF B, phase I and II)</i></b>	<b>10,494,400</b>
Financing for Associated Activities, if any.	
Leveraged Resources, if any.	

This proposal has been prepared in accordance with GEF policies and procedures and meets the standards of the GEF Project Review Criteria for work programme inclusion.

Y. Glemarec

Yannick Glemarec  
Deputy Executive Coordinator  
Date: 21 April 2005

Mr. Geordie Colville, Portfolio Manager  
Project Contact Person  
Tel. and email: +421 2 59 337 408  
geordie.colville@undp.org

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## **PROJECT RATIONALE, OBJECTIVE, OUTCOMES AND OUTPUTS/ACTIVITIES**

### Rationale

The full-size project was approved in January 2000, but, given the then financial constraints faced by GEF, was split into two phases: the recently-completed Phase 1 dealing with the setting up of an ESCO in the City of Rivne which, in turn, implemented pilot energy efficiency activities targeting selected municipal district heating facilities. Phase 2, which is the subject of the present proposal, will build upon and consolidate the ESCO experience acquired to address municipal district heating activities at the Rivne City-wide and regional (Oblast) levels.

Ukraine continues to be one of the least energy efficient countries in the world and has the greatest emissions level per unit of GDP among CIS countries. A recent inventory estimated that total emissions from Ukraine in 2002 were 487 million tons of CO<sub>2</sub> equivalent (the corresponding figure for 2001 was 482 million tons). This results in a per capita emission of 10 tons of CO<sub>2</sub> equivalent per year. Heat supply in the buildings sector accounts for approximately 25% of all fuel consumed in Ukraine, and, therefore, there is a huge potential for energy efficiency improvement in this sector, which Ukraine wants to actively pursue.

Since 1991, the Government of Ukraine has devoted a great deal of attention to the development of the energy sector. The National Energy Programme of Ukraine until 2020, adopted in 1996, articulated the Government's energy policy and its priorities: energy conservation, use of domestic resources, development of renewable energy and targeted investments in strategic areas to reduce energy intensity. In the district heating sector, the programme calls for reconstruction and rehabilitation of existing district heating networks, continued development of district heating systems and combined heat and power plants, promotion of waste heat usage, and construction of new high-efficiency, heat-only boiler plants where appropriate.

In line with the Government's priorities, this project addresses a key issue in the reduction of greenhouse gas emissions through large-scale improvements in energy efficiency in Ukraine's communal heat supply sector. These improvements will result from a four-part approach: 1) capacity building to create the basis for systematic energy efficiency activities at the local level; 2) an integrated approach of supply and demand-side improvements to achieve maximum fuel savings and emissions reduction; 3) attraction of external investment resources for an energy efficiency program in a pilot city; 4) project-specific replication measures including development of relevant procedures, guidelines, information materials

and their dissemination, and public awareness-raising through the involvement of NGO's, in particular those concerned with environmental and energy efficiency problems.

The Rivne municipality, Rivne District Heating Company, and the Oblast Administration have strongly supported the idea of establishing ESCO-Rivne to expand energy efficiency activities in the city of Rivne. The reasons for this are several: large budgetary expenditures on the energy bills of institutional buildings and on residential subsidies, high energy intensity of delivered heat, resulting in high heat tariffs, etc. It should be noted that compared to other Ukrainian cities, Rivne has made significant progress in reforming its municipal energy sector. Cross-subsidies in heat energy tariffs for different consumer categories have been eliminated, direct billing of all district heating system customers has been introduced, the payment collection rate has increased to the point where it is now one of the highest in Ukraine, and energy saving has been identified as a priority both by the municipality and by the district heating company. Local authorities are willing to go further in reforming the energy sector to facilitate ESCO-Rivne operations and increase the confidence of private investors. For example, they guarantee full cash payment of heat bills of budgetary institutions, make full payment of existing residential subsidies to the heat supplier, and fix the level of tariffs for the investment amortization period.

An ESCO presents an efficient way to provide for systematic energy efficiency activities. This is because an ESCO is oriented for operation with numerous clients of various types, possesses necessary expertise for project preparation and implementation, is quick and flexible in making decisions about project financing, and is intrinsically interested in multiplying energy efficiency activities through expansion of its customer base. An ESCO suggests win-win solutions for its clients by using EPC mechanisms. It also reduces transaction costs and can tackle a large number of similar and relatively small-scale projects that could not be financed separately using traditional approaches. Thus, the ESCO approach facilitates the access to external financial sources for the owners of smaller projects. EPCs offer ESCO clients attractive long-term financing otherwise currently almost unavailable in Ukraine. Moreover, experience with international joint ventures shows that foreign investors look at the strength of the local partner as a primary criterion for investment decisions.

The ESCO approach complements existing strategies of major investors/lenders. The EBRD has indicated that the project is in line with its current strategy, and recently re-iterated its interest in the project. Furthermore, ESCO-Rivne met with several other private investors (representing both energy companies and investment funds) who have also confirmed their interest in equity participation or provision of lines of credit. (Annex D – attached separately)

In addition to reflecting national priorities in Ukraine, the proposed project also builds upon the existing goals and activities of UNDP, with environment constituting one of its four priority areas for global activity, both at the country level and in the region. This project will also serve as an innovative approach to district heating efficiency projects, an important part of UNDP-GEF portfolio. Finally, UNDP is assisting local governments in Ukraine in the formulation and implementation of Local Agenda 21 sustainable development strategies at the Oblast (regional) and municipal levels, and energy plans are included in these strategies.

#### Project goal, objective, outcomes and outputs/activities

The project objective is to reduce overall fossil fuel consumption and associated GHG emissions by removing barriers to supply and demand side energy efficiency improvements in district heating systems in the main cities of Ukraine. GEF participation will reduce major existing barriers in one pilot city and provide for the replication of defined approaches and measures in other main cities of Ukraine.

The projected average annual reduction of GHG emissions in the pilot city is estimated at 131,000 tons of CO<sub>2</sub> equivalent (including CO<sub>2</sub> itself, CH<sub>4</sub> and N<sub>2</sub>O), and almost 3 million tons of CO<sub>2</sub> equivalent over the life. As a contribution to this target, the emissions reduction under Phase 1 during the period June through December 2004 was 7,800 tons of CO<sub>2</sub> equivalent<sup>1</sup>. These savings are derived from investments made during the heating season of 2004-2005, and over the lifecycle of these investments expect to accrue around 144,000 tons in CO<sub>2</sub> avoided emissions. Hence phase 2 expects to avoid 2.8 million tons in CO<sub>2</sub> emissions through the life cycle of investments made during this phase. Estimated total replication potential for communal heat supply sector in other cities makes up approx. 64 million tons of CO<sub>2</sub> equivalent. This figure indicates the potential for scale-up if other municipalities follow the model of Rivne, or ESCO-Rivne expands beyond Rivne municipality. The information dissemination component of the project is expected to contribute to this.

### Barrier Analysis

The above global environmental objective is to be achieved through the removal of the following main existing barriers to energy efficiency improvement in the communal heat supply sector: 1) difficulties in arranging financing for efficiency projects; 2) institutional constraints; 3) lack of capacity and experience in preparing, implementing and managing energy efficiency projects; 4) high transaction costs for relatively small energy efficiency projects; 5) lack of information about existing opportunities for energy efficiency.

#### 1) Difficulties in arranging financing for efficiency projects;

##### *a. Activities designed to address barrier*

- An ESCO as a vehicle for local/foreign investors will be established, its profitability demonstrated, and new investors attracted;

##### *b. Phase I progress in addressing barrier*

- ESCO-Rivne was incorporated as a closed joint-stock company on 12 November 2003. The company is fully owned by KommunEnergia (the Oblast's DH Enterprise), MiskSvitlo (the Municipality's lighting company) and company employees.
- The company has investments of USD 1.5 million under 15 Energy Performance Contracts, and receives USD 25,000 in payments for energy efficiency every month in return. The company therefore expects to begin turning a profit on these investments around 5 years.

##### *c. Phase II strategy to address outstanding barrier issues*

- There are currently no private shareholders. To address this issue, ESCO-Rivne has modified its foundations documents, converting the closed joint-stock company into an open-stock one.

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<sup>1</sup> This figure was arrived at through computation of the actual fuel (natural gas in this case) savings over this period and applying the CO<sub>2</sub> emission coefficient per m<sup>3</sup> of natural gas used. The same formula was used to extrapolate the emission reduction for city-wide energy efficiency activities on the basis of fuel saved. These projections will be validated through regular monitoring during Phase 2 and beyond.

- ESCO-Rivne has contacted several potential investors, mailed them its Business Plan for 2005 and has had meeting with some of them to provide additional information/answer questions.
- All company information has been posted on ESCO-Rivne web site for easy access by potential investors.
- Necessary legal and fiscal issues: options for repayment guarantees, currency exchange and transfer procedures, arbitration of disputes, etc.

## 2) Institutional constraints

### *a. Activities designed to address barrier*

- Ability of municipalities to enter into EPC agreements.
- Cross-subsidies in heating tariffs (i.e. low tariffs), making it difficult for a business to make a profit by providing heating services
- Housing allowance including heat consumption, reduces the need and cost effectiveness of demand-side investments

### *b. Phase I progress in addressing barrier*

- So far Rivne Municipality and district heating company are the only clients of ESCO-Rivne. Together, they have identified administrative procedures for entering into an energy performance contract. (1) ESCO-Rivne makes an investment; (2) Rivne Municipality creates a budget line for energy efficiency; (3) ESCO-Rivne estimates the payments it expects to receive from the municipality in energy savings, and the municipality requests and allocates funds to this amount to their budget line; (3) ESCO-Rivne is paid based on actual measurements. (4) payment from final consumers is collected from KommunaEnergia, and at present does not bear on the EPC contract with Rivne.
- Cross-subsidies have been removed from heat tariffs. Although this does not directly effect the current EPC contracts between Rivne Municipality and ESCO-Rivne, it is an important step in creating the right investment environment.
- Direct billing of consumers is now standard practice. Consumption meters have been installed and payment collection has increased.

### *c. Phase II strategy to address outstanding barrier issues*

- Implement consumption billing.
- Complete design and implementation of billing software.
- Design of guarantee instruments to ensure payment by clients.

## 3) Lack of capacity and experience in preparing, implementing and managing energy efficiency projects.

### *a. Activities designed to address barrier*

- Design and implementation of investment plan
- Training programme for ESCO-Rivne staff in auditing, EPC design, financial planning and preparation of bankable projects.

### *b. Phase I progress in addressing barrier*

- City-wide investment plan formulated.

- Bulk of capacity development programme completed.

*c. Phase II strategy to address outstanding barrier issues*

- Organise twinning arrangement with reputable ESCO in a foreign country.
- Provide additional training in bankable project development.

4) High transaction costs for relatively small energy efficiency projects.

*a. Activities designed to address barrier*

- To undertake an energy efficiency project a municipality would have to undertake the steps of feasibility, design, installation, operation and maintenance as separate procurement steps. With EPC they need only undertake one procurement. The ESCO, with lower overheads, greater experience in energy efficiency projects and intrinsic interest in multiplying energy efficiency projects, is capable to undertake these tasks with greater efficiency and lower overheads.

*b. Phase I progress in addressing barrier*

- ESCO-Rivne is undertaking 15 EPC's where the municipality has been able to pass on the task of feasibility, design, installation, operation and maintenance of equipment to ESCO-Rivne.

*c. Phase II strategy to address outstanding barrier issues*

- Subsequent bundling of several EPC contracts into one contract, for example, for city-wide activities.

5) Lack of information about existing opportunities for energy efficiency.

*a. Activities designed to address barrier*

- Preparation of an investment programme

*b. Phase I progress in addressing barrier*

- Targeted training, individual outreach to decision-makers and focused consultations.

*c. Phase II strategy to address outstanding barrier issues*

- Provide consultations to interested municipalities and district companies.
- Additional targeted outreach activities.

## Project Phases

This project, consisting of Phases 1 and 2, involves two key components: (i) setting up an innovative financial mechanism (the ESCO approach) in a pilot city (Rivne) for implementing energy efficiency activities on a sustainable basis with the capability for self-replication in other Ukrainian cities; and (ii) related capacity building and barrier removal activities including installation and commissioning of energy efficiency measures, shifting to consumption-based billing system, and introduction of regulatory changes to motivate energy saving, including adjustments to the system of allocation of subsidies.

Phase 1 commenced implementation in 2002 and had 2 main objectives: (i) setting up of an ESCO in the City of Rivne as a joint stock company and fully operationalising it by completion of this phase and (ii) implementation of pilot/demonstration activities aimed at introducing energy efficiency measures at a

boiler plant, in heat transportation systems and in public/residential buildings, through the design and fine-tuning of Energy Performance Contracts (EPC) and the introduction of consumption-based metering and billing. It is important that the ESCO be a private company and not a public one: a public ESCO, like UkrEsco and as indicated under “Rationale” above, will face the extremely lengthy and difficult task of securing Government guarantees should it were to borrow funds from EBRD, WB, etc.

ESCO-Rivne was legally registered as a private joint stock company on 12 November 2003, under Phase 1 of the present project, with an initial capitalization of \$ 50,000 contributed by the 2 shareholders, viz. MiskSvitlo (50.47%) and KomunEnergiia (49.53%). It has been, since then, implementing energy efficiency activities at the municipal level, as indicated in Table 1 below. All Phase 1 activities, consisting mainly of setting up an ESCO, implementation of pilot activities in Rivne and formulating a Rivne City-wide strategic plan for energy efficiency improvement, are now almost completed. Thus, the GEF contribution under Phase 1 has enabled ESCO-Rivne to address the legal and regulatory issues related to ESCO operation and facilitated the promotion of private sector initiatives in the area of municipal district heating in the pilot city of Rivne, utilizing the Energy Performance Contract (EPC) mechanism and consumption-based metering and billing. This is documented in the report of the independent evaluation finalized in December 2004. The evaluation is available as a separate document.

The overall conclusion of the independent evaluation is that Phase 1 project has made significant achievements in improving the overall capacity of ESCO-Rivne for implementing energy efficiency activities in the municipal district heating sector, in strengthening ESCO-Rivne’s technical, administrative and management capabilities and in increasing stakeholder awareness, commitment and participation in expansion of activities. The main findings of the independent evaluation are outlined in Sections 4.3.1, 4.3.2 and 4.3.3 of the evaluation report referred to above. They indicate that all the following benchmarks that needed to be achieved prior to embarking on Phase 2 have been met either “highly satisfactorily or satisfactorily” (ANNEX J) provides, in table form, a summary of these benchmarks):

- Enabling Environment conditions (software billing/accounting, EPC, legislation/regulation).
- Financial Institutional conditions (full-scale feasibility study for Phase 2, documents for equity/loans, investment promotion materials, investor interest, ESCO financial arrangements, etc.).
- Other Institutional conditions (Pilot municipal ESCO established, operational procedures finalised, terms of partnership with City of Rivne worked out, GHG emission reduced and verified, etc.).

Implementation of the pilot activities under the Phase 1 project provided ESCO-Rivne with the opportunity to demonstrate its solid technical approach and sound financial expertise to manage opportunities for energy efficiency in the municipal district heating sector. Subsequently, its contacts with both local and foreign partners to solicit their participation as potential investors/lenders were met with considerable interest. This has resulted in ESCO Rivne securing commitments and interests from investors/lenders to increase its capital base and its access to lines of credit. At the time of writing ESCO-Rivne has:

9. capitalization of USD 50,000 MiskSvitlo and KomunEnergiia;
  10. USD 1.5 million in capital from the GEF, which has now been transferred to ESCO-Rivne ownership, and on this it expects to be able extend its credit line to USD 1.5 million
- Also in connection with phase I, the project estimated USD 265,000 in co-financing. In actual fact they received USD 1,014,000 more than this.

For phase II:

11. Credit lines of USD 556,000 from local banks (marked as USD 1.5 million in table 2 because of the increase in collateral of the company, listed under point 2 above);
12. plans to transfer KommunEnergi assets of 14 million within the next year, and which will be used as collateral in the future;
13. project revenues and client payments from energy savings estimated at 2 USD million are expected over the next year from Rivne Municipality, with a further USD 1 million in in-kind resources dedicated from Oblast and City to support these contracts; and
14. been negotiating with ISC Infrastructure Halle, and other private investors over the sale of shares in ESCO-Rivne, conclusion of which is expected in May 2005; and finally
15. ESCO Rivne have begun negotiation for USD 500,000 in credit lines from ING and Raiffeisen Bank

These phase II finances are summarised in Table 2.

Municipal district heating activities at the Rivne City-wide and regional (Oblast) levels will be targeted under the proposed Phase 2 of the project. In this connection, ESCO-Rivne has formulated its strategic plan. A table of planned activities from this Strategic Plan have been attached ([ANNEX G](#)).

The ESCO modality presents an innovative and very promising mechanism to finance large-scale energy efficiency activities in Ukraine. In order to maximize the resources available for replicating the project, proportional returns on GEF funds during the pilot phase (Phase 1) of the project and the city-wide investment (Phase 2) will be placed back into the ESCO as equity for subsequent projects in the municipal sector in Ukraine undertaken by the ESCO-Rivne.

ESCO-Rivne has been successful in developing and implementing the Energy Performance Contract (EPC) mechanism in energy efficiency activities it has undertaken to date. An EPC is, in effect, an outsourcing arrangement for energy efficiency, where an external contractor (e.g. ESCO-Rivne) takes total responsibility for achieving outcomes. With this mechanism, it is possible to obtain a guarantee that energy savings will be achieved. While there are a number of different types of EPCs, they all share the following common features:

- The EPC contractor enters into a long term (5-10 years) relationship with the client.
- Benchmark energy performance levels are defined and energy efficiency upgrades are identified and implemented by the EPC contractor.
- Risk of non-performance of energy efficiency upgrades is carried by EPC contractor.

Thus, EPCs are a means of achieving energy efficiency that allows the risks and responsibilities of implementation and maintenance of savings to be passed on to the EPC contractor. This is in contrast with traditional energy management techniques which produce recommendations for efficiency improvement which the client has to act on at his/her own risk.

The EPC modality utilized during the implementation of Phase 1 of the project is completely in line with the project brief, formulated in January 2000 as part of PDF-B activities. The brief indicates that the full scale programme implementation (Phase 2) will be “conducted by the ESCO using EPC mechanism on commercial and self-sustainable basis”. The brief further indicates in para 59 (page 14) that “The GEF funding (\$4,000,000) under the investment program will finance the major part of pilot implementation



phase, and also the implementation of longer-payback measures (like pipe replacement and measures in buildings, Ref. Annex 4 of brief), less economically attractive and more risky to the private investor”. The evaluation clearly brings this out by recommending that ESCO-Rivne focus on shorter payback investments to improve its financial viability. Hence, longer-payback measures such as replacement of heat distribution networks, boiler room reconstruction, installation of radiation screens, etc. ([ANNEX H](#)) will not get sufficient attention unless “incentives” are provided for it to invest in these.

Implementation of Phase 1 has been instrumental in bringing to the surface an additional major barrier to ESCO-driven municipal district heating that was not identified when the project brief was drafted in 2000. This relates to the development of finance guarantee and risk mitigation instruments to reduce ESCO-Rivne investment risks in case of difficulties by clients to make payments as per their EPC contracts. These instruments would be designed to promote and facilitate investments by ESCO-Rivne. Hence, in addition to financing the “implementation of longer-payback measures, less economically attractive and more risky to the private investor”, Phase 2 of the project will also address the issue of setting up finance guarantee and risk mitigation instruments to facilitate ESCO-Rivne operations.

The project’s goal is to address a key issue in the reduction of greenhouse gas emissions through large-scale improvements in energy efficiency in Ukraine's communal heat supply sector. This is proposed to be achieved through the setting up of a municipal district heating ESCO in Rivne City, providing it with technical and capacity development support to become fully operational, to provide it with hands-on experience through the implementation of pilot projects and to assist it in preparing a strategic plan for implementing energy efficiency activities city-wide in Rivne. All these were undertaken during Phase 1.

Under Phase 2, ESCO Rivne will receive additional support to implement a city-wide programme for energy efficiency activities in municipal district heating, to expand its reach beyond the borders of the city, to implement activities which require longer payback periods for which financing may not be readily available, to design and implement finance guarantee and risk mitigation instruments, and to promote the adoption and implementation of project experience and lessons learned throughout Ukraine and in other CIS countries.

The Phase 2 project has four primary outcomes; these, together with the outputs and activities required to achieve them. These are listed in the logframe ([ANNEX B](#)), while the outcomes and outputs are summarised below.

**Outcome 1:** ESCO operations are expanded to cover Rivne City-wide/Oblast energy efficiency activities. The outputs necessary to achieve this outcome are:

- Signed EPC contracts for Rivne City-wide energy efficiency activities.
- Opportunities for implementing energy efficiency in Rivne/other Oblast regions identified.
- All works pertaining to City-wide/Oblast projects completed.

**Outcome 2:** ESCO-Rivne operations are facilitated through financing of activities having long payback periods. The outputs for achieving this outcome are:

- Signed EPC contracts for activities having long payback periods.
- All necessary equipment/services for undertaking works procured.
- All works pertaining to projects having long payback periods completed.

**Outcome 3:** ESCO-Rivne operations are promoted through the design of instruments to minimise investment risks.

ESCO-Rivne will assess insurance and guarantee products available on the market, that are expected to address its perceived or real risks against investment in case of difficulties by clients to honour their EPC contracts. The outputs for this outcome are:

- Comprehensive report on risk mitigation instruments compiled.
- Study to determine most appropriate instruments completed.
- Agreements with Banks/insurance companies negotiated and signed.

**Outcome 4:** Project experience/best practices and lessons learned are replicated throughout Ukraine and in other CIS countries.

The project will support the compilation and distribution of best practices and lessons learned and will provide opportunities for broad exposure to other Oblasts and countries in the region. This will be achieved through the following outputs:

- Materials on project experience/best practices and lessons learned prepared.
- Capacity development activities implemented for the management and technical personnel of other municipalities/heat supply companies.
- Project overall results, experiences and lessons learned disseminated at the national and regional levels.
- Consultation/dialogue for replicating project experiences in other cities/Oblasts and leveraging financing for that completed.

#### Project strategy and approach

One of the main lessons learned in Phase 1 relates to the fact that ESCO-Rivne, although being a private company, is presently owned by primarily public entities. This poses a danger in that these public entities may decide to close the ESCO at any time and claim its assets, unless ESCO ownership is moved to a majority of private shareholders. A second main lesson relates to how Government budgets get allocated, which do not allow public buildings to enter into long-term commitments. Lastly, as noted in the evaluation report, “The most important lesson learned at this point in time is that a project aiming at the implementation of a municipal ESCO must be managed and controlled at the local level”.

ESCO-Rivne, as outlined in its Business Plan for 2005 (attached separately), provides all services related to the implementation of energy efficiency and saving measures, which a client cannot or is unable to undertake utilising its own funds. These include:

- Conducting energy audits;
- Preparation of proposals for energy saving projects;
- Developing and providing financing arrangements;
- Development of full procurement packages (contracts, technical specifications);
- Procurement of all equipment and services;
- Supervision of contractors’ works during construction and installation phase;
- Monitoring and verification of the contract performance during operation;
- Assuming all the risks during project implementation and operation;
- Guaranteeing of the energy savings to the client.

The ESCO-Rivne company structure is provided below.

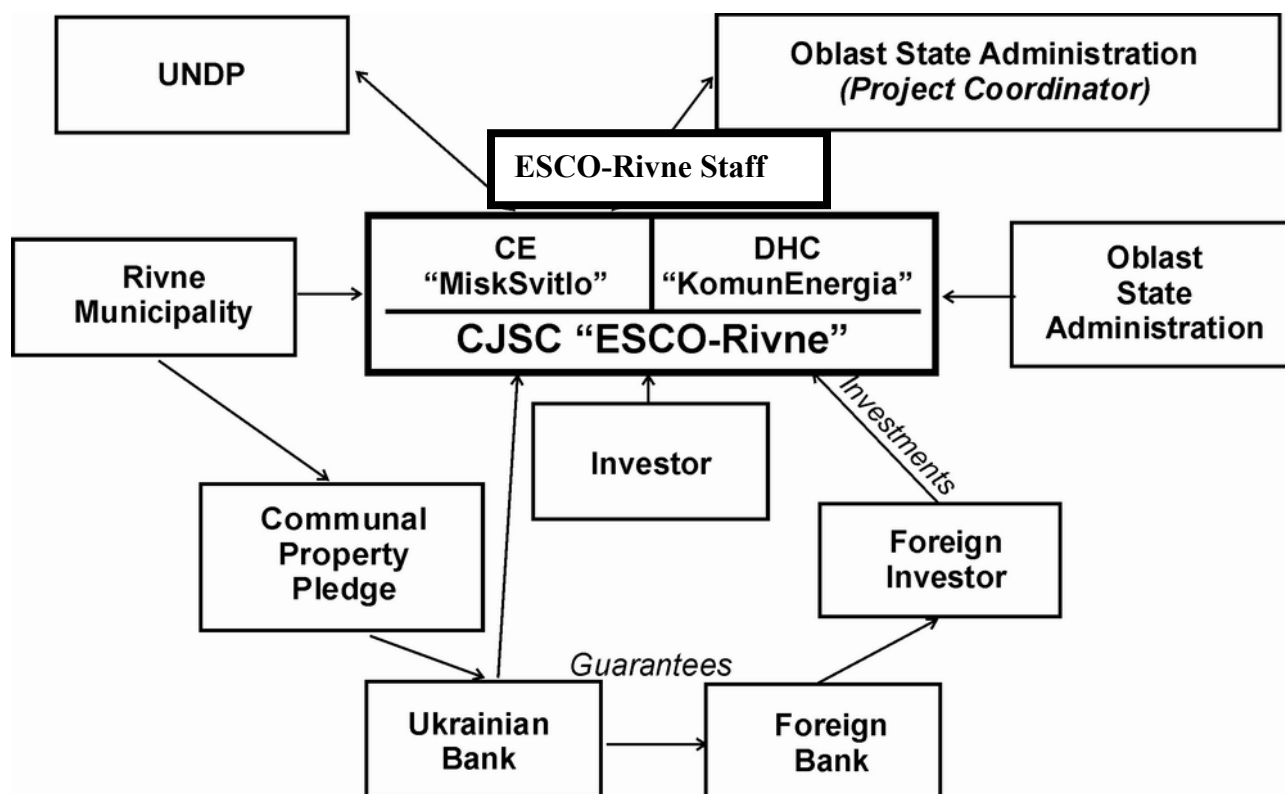


Figure 1: Scheme of operation with the investors

As per the above figure, Phase 2 of the project will continue to be implemented by the Rivne Oblast Administration with the technical and financial support of UNDP. The present ESCO-Rivne shareholders are the Rivne Municipality (45% shareholding), Oblast Administration (44% shareholding) and ESCO-Rivne employees who own the remaining balance of shares. It is important to note that ESCO-Rivne does not currently have any other investors other than the above shareholders. With regard to other investors, the above diagram indicates the plans of ESCO-Rivne. ESCO-Rivne is being converted from a closed joint stock company into an open joint stock one. This will enable the participation of private investors as shareholders who are not present, as of now. As ESCO-Rivne stocks will be openly traded, an investor, local or foreign, can become a shareholder by purchasing stocks directly. In addition, it is foreseen that a foreign investor may wish to lend funds to ESCO-Rivne and expect a reasonable rate of return. In this case, the foreign investor will channel his funds through his (foreign) bank to a Ukrainian bank which, in turn, will make the loan funds available to ESCO-Rivne. However, in return, the foreign bank will likely want to

ensure that the investor will recover his funds at maturity and, for this, it will likely require some form of guarantee: this can be provided by what is indicated in the above figure as a “communal property pledge”. What does this entail? It simply means that the Oblast/City pledges land as collateral to guarantee loan payback by ESCO-Rivne. This “property pledge” has been successfully utilised in Poland, for example, and the Polish experience in this regard will be very useful to ESCO-Rivne.

The intention of ESCO-Rivne is to ensure majority shareholding by private investors. It is a required step to guarantee that ESCO operations are free from local/national political considerations to pursue its commercial goals leading to improvement of energy services delivery in the city. This would provide sufficient confidence to attract debt financing from development and commercial banks. Participation of the Rivne municipality and district heating company as shareholders ensures the necessary market for ESCO operations in the city, and support of the regional government provides for opportunities for further expansion of ESCO activities in the region.

The list of contracts implemented under Phase 1 by ESCO Rivne is provided in Table 1 below. For each one of these, ESCO Rivne undertook a full technical and economic feasibility study which it used to discuss the terms of EPC contracts with the clients. Following signature of the contracts, ESCO Rivne either procured the required equipment and installed them or entered into turn-key agreements with sub-contractors. For the works implemented under Phase 1, ESCO Rivne receives on average \$ \$25,000<sup>2</sup> per month (starting in June 2004) as per the terms of the EPC contracts. Payments are based on energy savings calculated from efficiency gains over a baseline agreed in the EPC from the delivery of heat and power. The monthly payments are fairly steady throughout the year, since through cogeneration of heat and power the unit can generate at full capacity all year round, by selling excess to the grid. If ESCO-Rivne fails to deliver energy savings, or delivers lower savings than expected, payments are reduced accordingly. Conversely if the client fails to pay for energy savings ESCO-Rivne has obtained and can take possession of collateral, including bank guarantees and real estate.

In implementing EPC contracts under Phase 1, ESCO Rivne has developed capabilities to fully understand the technical, economic, financial, legal and environmental issues related to this modality and proposes to continue with it during Phase 2 of the project.

<b>Contract No</b>	<b>Contract name (Description of works)</b>	<b>Amount, US \$</b>	<b>Contractor</b>	<b>Status</b>	<b>Emissions Reduction (tons CO<sub>2</sub>/ yr avoided)</b>
UKR/01/G3 1-2003/87	Installation of the district heating pipelines between boiler plant located at 71 Kn. Volodymyr St. and heat-network chamber (valve room) No. 39 in the city of Rivne	787,542.20	Energoresursi nvest Corp, Lviv, Ukraine	Completed	255.74
UKR/01/G3 1-2003/88	Rehabilitation and renovation of the automation and control system for the boiler units installed in the boiler-house at 71	72,295.00	Spektr-TV, Rivne, Ukraine	Completed	1219.2

<sup>2</sup> Monthly payment of just over USD 7,000 have yet to begin, but as they do, monthly payments will be just over \$ 25,000.

<b>Contract No</b>	<b>Contract name (Description of works)</b>	<b>Amount, US \$</b>	<b>Contractor</b>	<b>Status</b>	<b>Emissions Reduction (tons CO<sub>2</sub>/ yr avoided)</b>
	Kn. Volodymyr St. in the city of Rivne				
UKR/01/G3 1-2003/89	Rehabilitation and renovation of the two boiler units installed in the boiler-house at 71 Kn. Volodymyr St. in the City of Rivne	79,245.60	Kotloenergopr oekt, Kharkiv, Ukraine	Completed	1219.2
UKR/01/G3 1-2003/90	Rehabilitation and renovation of the gas burners for boiler units installed in the boiler-house at 71 Kn. Volodymyr St. in the City of Rivne	33,933.60	Kotloenergopr oekt, Kharkiv, Ukraine	Completed	1219.2
UKR/01/G3 1-2003/91	Arranging of the variable speed drive system for forced draft units of B-25-15 boiler and supply-line pumps in the boiler-house at 71 Kn. Volodymyr St. in the City of Rivne	49,534.00	Spektr-TV, Rivne, Ukraine	Completed	821.6
UKR/01/G3 1-2003/101	Arrangement of individual heat substation in the residential building located at 5 Mitskevicha St., in the city of Rivne	16,338.00	International centre of energy-effective technologies, Kiev, Ukraine	Completed	727.8
UKR/01/G3 1-2003/102	Arrangement of individual heat substation in the residential building located at 7 Mitskevicha St., in the city of Rivne	16,338.00	International centre of energy-effective technologies, Kiev, Ukraine	Completed	727.8
UKR/01/G3 1-2003/104	Reconstruction of central heat substation located at 5 Mitskevicha St., in the city of Rivne	13,744.00	UTEM, Kiev, Ukraine	Completed	34.72
UKR/01/G3 1-2003/156	Installation of individual heating substation in the residential buildings 46 Dubenska St., 42 Kievskaja St., 77 Kievskaja St. in the City of Rivne	19,080.00	Santehrekonst rukcia, Kiev, Ukraine	Completed	34.72
2004/213	1) Performance of the design works related to reconstruction	251,898.72	EnergoEco Consulting,	UNDP inputs	1295.2

Contract No	Contract name (Description of works)	Amount, US \$	Contractor	Status	Emissions Reduction (tons CO <sub>2</sub> /yr avoided)
	of the Rivne Central Municipal Hospital boiler plant, located at 25-a Miryushenka St.(City of Rivne, Ukraine) 2) Procurement of the equipment for the reconstruction of the Rivne Central Municipal Hospital boiler plant, located at 25-a Miryushenka St. (City of Rivne, Ukraine)		Rivne, Ukraine	already provided.	
2004/348	1) Performance of the design works related to construction of the heating network based on the preliminary isolated pipings starting from the crossroads of the Streets of Naberezhna-Kavkaz'ka (from the heating piping-main with diameter 426 mm, that is built from Power Plant at 71 Kn. Vladimira St. through overhead passing over the river Ustya, Rivne city) along the Naberezhna St. towards the existing heating camera, that is located near the house at 19 Mira Ave.) 2)Procurement of the following equipment and materials: Steel pipings preliminary isolated with polyurethane foam with polyethylene covering, diameter 325/450 mm - 970 m; Steel pipings preliminary isolated with polyurethane foam with galvanized spiral-helix covering, diameter 325/450 mm - 270 m;	149,785.00	Energoresursinvest Corp, Lviv, Ukraine	UNDP inputs already provided.	127.86
	Total	1,489,734.12			7768.4

Table 1: ESCO Rivne Phase 1 contracts.

As seen in Table 1, ESCO-Rivne investments under Phase 1 amounted to approx. \$ 1.5 million. On the basis monthly receipts of \$ 25,000, as indicated above, a simple calculation shows that the \$ 1.5 million will have a payback period of around 5 years. This is an average payback period for all the above contracts taken together, thus indicating that some works have a shorter payback period while others have a longer one. As a rule of thumb, rehabilitation works have a shorter payback period (normally less than 2 years) while works requiring extensive reconstruction have longer payback periods; also, energy efficiency measures on the demand side have a shorter payback period. Table 1 also provides information on the energy savings accrued and the emissions avoided under Phase 1 during the period June through December 2004.

It should be emphasized that the ESCO modality is very innovative for Ukraine and the CIS countries in general. The major challenge has been to attract private investors who have previously been quite reluctant to enter the Ukrainian market. However, the improving financial situation in Rivne, the firm support of the municipality and Oblast, together with the commitments they have already made, has made it possible for ESCO-Rivne to move closer to this goal. Incentives for investors include attractive rates of return, guaranteed market penetration and expansion, lack of significant competition at the present time and risk mitigation measures undertaken by the project. In this respect, GEF involvement has been and continues to be particularly important in that it helps to reduce the risks for leveraging significant private financing for the project.

It is expected that by the completion of the proposed Phase 2, ESCO-Rivne will have developed a sound business footing that will enable it to operate on a sustainable basis as a self-financing commercial entity, thus ensuring achievement of the global environmental objectives set by the project.

## **KEY INDICATORS, ASSUMPTIONS AND RISKS**

### Indicators

Key indicators of the project's success by the end of Phase 2 will include:

- CO<sub>2</sub> emissions are reduced by 2.8 million tons.
- Cumulative energy consumption is reduced by 2 million t.c.e. at project sites.
- Energy performance contracts for Rivne city-wide programme signed and implemented.
- Contracts for consumption based metering and billing signed with Rivne City Apartment Owners Associations.
- ESCO-Rivne has expanded its activities in at least 2 other Oblasts.
- Lessons learned are documented and distributed to potential investors, stakeholders, other Oblast and municipal authorities, etc. through the publications and ESCO-Rivne web site.

### Assumptions

The assumptions are outlined in the Logical Framework Analysis at the end of this document.

### Risks

The Phase 2 project presents several risks which are discussed below:

**Technical risk**, or the risk of actual emission reduction and energy savings being lower than expected. This is mitigated by the high level of ESCO-Rivne technical expertise as well as by independent technical review provided under Phase 1.

**Implementation risk**, or the risk that the project will not be fully implemented even though necessary resources will have been engaged. This may happen if implementation costs will prove to be higher than expected. This risk is mitigated by accurate cost estimates based on the latest quotations from suppliers and by a 10% contingency allowance added to cost estimates.

**Credit risk**, connected with the client's inability or unwillingness to meet its obligations on EPCs. To mitigate this risk, ESCO-Rivne will introduce sufficient securities (collateral agreements, bank guarantees, third-party insurance, etc.) into each EPC. As a risk mitigation factor, municipal/regional authorities will make necessary commitments, such as keeping tariffs unchanged during investment amortization period, ensuring full and timely payments on heat bills of budgetary institutions and subsidies for residential consumers, etc.

**Price risk**, or changes in prices for energy resources addressed by the project. This risk is mitigated by the fact that the dynamics of gas and heat prices over the next five years was estimated in a conservative way. Based on its experience, the ESCO will introduce fuel cost adjustment provisions into EPCs with its clients to eliminate this factor of uncertainty.

## COUNTRY OWNERSHIP

### COUNTRY ELIGIBILITY

Ukraine signed the United Nations Framework Convention on Climate Change (UNFCCC) in June 1992, ratified it on 29 October 1996 and became a Party in August 1997. It also signed the Kyoto Protocol in March 1999 and the National Parliament ratified it on 4 February 2004. As a UNDP Programme Country, it is eligible for assistance from UNDP.

### COUNTRY DRIVENNESS

#### (i) National reports/communications to Conventions:

In the area of climate change, Ukraine's First National Communication to UNFCCC prepared in February 1998 identified energy efficiency as one of the important mitigation options for reducing greenhouse gas (GHG) emissions in the country. Ukraine is considered to be one of the large emitters of GHG in the world; its energy input per unit of GDP is 5-7 times higher than in Western Europe and its per capita emissions of 10 tons of CO<sub>2</sub> equivalent per year are among the highest in the world.

In addition, to address the issue of a national policy on climate change, as well as to reinforce the national climate change administrative structure and ensure the fulfilment of obligations under UNFCCC, the Government instituted, in April 1999, the Inter-Ministerial Commission on Climate Change headed by the Deputy Prime Minister. The Commission, which meets on a regular basis, is made up of representatives of



the appropriate ministries and departments, the Cabinet of Ministers, Verkhovna Rada (Parliament), the Administration of the President of Ukraine, and the National Academy of Sciences.

(ii) National legislation:

Improvement in energy efficiency in municipal district heating on both supply and demand side is an important development objective presently being pursued by the Ukrainian government. Achieving this objective would contribute to lower dependence on imported fuel and reduction in GHG emissions, and have a significant social impact.

Ukraine's strategy in improving the efficiency of its economy in general and of the municipal district heating sector in particular is reflected in a number of legislative and regulatory documents, such as the "Law of Ukraine on Energy Conservation" (1994), National Energy Programme of Ukraine (1996), Comprehensive National Programme on Energy Conservation (1997, revised and supplemented in 2000), decrees of the President and the Cabinet of Ministers of Ukraine. In municipal heat supply, the target for state support was set for priority implementation of the most cost-effective energy efficiency measures to achieve about 4.5 million tons of coal equivalent (t.c.e.) of energy savings over the period 2000-2004, with estimated investment requirements of approx. \$300 million over the same period. Special attention would be devoted to improving efficiency of energy usage in the public sector, with the target of 25% energy consumption reduction in public sector institutions by 2004. Unfortunately, due to state budgetary constraints, these targets are still far from being achieved.

(iii) National or Sector developments plans:

The Government's overall objective for development of the energy sector up to 2020 is to reduce the growth in coal consumption and the environmental pollution that coal burning causes. The Government is promoting (i) the introduction of clean coal technologies throughout the entire process of coal production, handling, transportation, and consumption; (ii) where possible, substitution of natural gas, coal field methane, hydropower, and renewable energy for coal; and, (iii) energy efficiency both on the supply and demand side to decrease the growth rate in energy consumption (e.g. specific heat consumption for heating and hot water supply of Ukrainian buildings is 1.5-2.0 times higher than in Western countries with similar climatic conditions).

The main directions defined by the government of Ukraine for fulfilment of the tasks on improvement of energy efficiency include, among others: economic incentives to introduce energy efficiency technologies at enterprises, improving taxation and tariff policy, promoting wide-scale application of leasing operations, obtaining investment support from lending institutions, improvement of the efficiency of heat generation and delivery, mass-scale introduction of energy metering, improvement of subsidy allocation mechanism to create incentives to energy saving by subsidized households, awareness raising through mass media, etc. Also included is support to commercialisation of activities in the area of energy efficiency through the modality of energy performance

1.b.iv Recommendations of appropriate regional intergovernmental meetings or agreements:

At COP-7 held in Marrakech in November 2001, Ukraine officially announced that the country was interested in receiving assistance to create a national system to evaluate anthropogenic emissions as well as

in the transfer of modern technologies that would promote their reduction. In addition, several seminars were held in the country to discuss issues related to carbon emission reduction. For example, the seminar entitled “Kyoto Protocol implementation in Ukraine and at the international level” held in January 2002 endorsed the development of a National Strategy on Climate Change. This Strategy calls for, among others, the implementation of energy efficiency measures in all spheres of the national economy. Furthermore, the Government signed Memoranda of Understanding (MoU) with the Governments of Austria, Canada and USA (and is negotiating additional MoUs with other Governments) for programmes of cooperation on climate change issues.

## **PROGRAM AND POLICY CONFORMITY**

### *Fit to GEF Operational Program and Strategic Priority*

Ukraine signed the UNFCCC in June 1992, ratified it on October 29, 1996, and became a Party in August 1997. As a Party to the Convention, Ukraine has accepted a commitment to formulate, implement, publish and regularly update national and (where appropriate) regional programmes containing measures to mitigate climate change by addressing anthropogenic emissions by sources and removals by sinks of all greenhouse gases not covered by the Montreal Protocol. The Government of Ukraine also signed the Kyoto Protocol in March 1999 and, as indicated above, ratified it on 4 February 2004. The proposed activity is a part of the Government's strategy to fulfil its commitments to the UNFCCC while simultaneously addressing local problems related to the inefficient use of fossil fuel.

As an economy in transition, and in accordance with its commitments to the UNFCCC, the Government of Ukraine has requested support from UNDP/GEF to overcome barriers to the measures reducing GHG emissions, such as improvement of energy efficiency and promotion of the use of renewable energy technologies. Further consultations with the Government of Ukraine identified the removal of barriers to the improvement of demand and supply side energy efficiency in district heating systems as a priority area for GEF financing.

Operationally, the project falls under the GEF Operational Program # 5, "Removing Barriers to Energy Efficiency and Energy Conservation" and within strategic priority S2: Increased access to local sources of financing.

### *Sustainability (including financial sustainability)*

From a technical point of view, the viability of energy efficiency in municipal buildings has been proven in several CIS countries, both under GEF and non-GEF support. By addressing the barriers that impede the expansion of energy efficiency in municipal district heating in Ukraine, the Phase 2 project will build upon the predecessor Phase 1 project to assist in first creating a momentum for Rivne city-wide implementation, then a sustainable niche for such activities in neighbouring oblasts and eventually throughout the country. This has been undertaken (Phase 1) through strengthening of the policy, institutional, legal, regulatory and operational capabilities of key national institutions to promote private sector participation for energy efficiency activities in the municipal sector and developing of an energy efficiency awareness programme, accompanied by information dissemination. These efforts should ensure the long-term sustainability of energy efficiency activities in the municipal district heating sector of Ukraine.

From a financial point of view, the efforts made by ESCO-Rivne to solicit the support of investors have met with some success in that it has been able to date to secure expressions of interest from EscoComertz

and UkrEsco to participate as shareholders. In addition, lines of guarantee amounting to \$ 566,000 have already been secured from such local banks as Avalbank, Pryvatbank and Ukrgazbank, and discussions are continuing with international banks like EBRD for additional lines of credit of a total of approx. \$ 500,000. In addition, the Phase 2 project will support the setting up finance guarantee and risk mitigation instruments to protect its investment in case of defaults by clients. The project will evaluate insurance and guarantee products available on the market and recommend appropriate instruments to address ESCO-Rivne's perceived risks against investments.

Furthermore, the project will support the integration of local industries for the provision of equipment and services to the energy efficiency sector.

### Replicability

This project is a follow-up to the successful Rivne Phase 1 project and benefits from the expressed interest from the Municipalities in Ostrog, Kamenets Podolskiy and Kostopil to implement similar activities for municipal district heating using the ESCO modality. In this connection, discussions with these municipalities have centred on ESCO-Rivne implementing activities to provide energy efficiency services to municipal buildings. At the present time, the Contract with Ostrog City Water Supply and Sewage Company in the amount of \$ 12,600 is completed and 3 other contracts have been signed respectively with the Water Supply (\$ 7,500) and Sewage Company (\$ 13,200) in the City of Mirgorod in Kamenets Podolskiy and the Heat Supply Company in the City of Kostopil for \$ 2,000. However, on-site works will commence at the end of the heating season in April 2005.

For the long term and this is beyond the scope of the present project, there is demonstrated interest from potential private investors to invest in the operations of ESCOs, not only in ESCO-Rivne. However, no concrete plans in this regard have been elaborated yet. Thus, the project's potential for replicability at other municipalities throughout Ukraine is very good. Technical assistance for barrier removal and policy/institutional strengthening to be provided under the project will facilitate such replicability since it will create both at central and regional levels, the required institutional, policy, and technical conditions to enable the mobilization of additional investor interest for the implementation of energy efficiency activities in the municipal district heating sector.

### Stakeholder Involvement

The Rivne Phase 1 project has benefited from extensive stakeholder involvement (Ministry of Economy and European Integration, Ministry of Environment, State Committee for Municipal Housing, Rivne Oblast Administration, Rivne Municipality, Association of Local and Regional Authorities, etc.) during its implementation. For Phase 2, the project has the support of several other Municipalities (e.g. Ostrog, Kamenets Podolskiy and Kostopil) and Oblast Administration (Khmelnitsky) to create the necessary policy, institutional and business framework that will enable private sector participation to implement energy efficiency activities in the municipal district heating sector through the ESCO modality. Discussions have also been held with potential private investors from Austria and Germany, and with overseas lenders who have expressed their interest to participate in the programme. At the national level, the project is driven by the State Committee for Municipal Housing, the Ministry of Environment and the active participation of the Association of Local and Regional Authorities, an NGO very active in the environment field.

### Monitoring and Evaluation

Monitoring and evaluation activities will include standard UNDP/GEF procedures (Annual Project Reports, Tripartite Review meetings, Project Implementation Reviews, Mid-term and Final evaluations, Terminal Report and Audit) and specific procedures that include preparation of technical, investment and annual reports by ESCO-Rivne. The technical reports will present actual figures for energy savings and emissions reduction achieved, determined using the International Performance Measurement and Verification Protocol developed by the U.S. Department of Energy for energy efficiency projects. Feedback collected from project stakeholders will be included into progress reports (submitted to the UNDP Country Office) together with indicators reflecting the overall performance of the project and each of its components. Overall responsibility for monitoring and evaluation tasks will be assumed by the national executing agency assisted by the national implementing agency.

Monitoring and evaluation is particularly important for GEF projects because, in accordance with its mission, the GEF designs and implements more innovative and cutting-edge projects than regular development projects. Monitoring, by continuous collection and analysis of relevant information, allows for the measurement of the progress of the project towards expected results. Monitoring and systematic reporting is mandatory for all GEF projects. The proposed monitoring and evaluation activities follow the guidelines contained in the UNDP/GEF Information Kit on Monitoring and Evaluation.

## **FINANCIAL MODALITY AND COST EFFECTIVENESS**

### **FINANCIAL MODALITY**

The total cost of the project (Phases 1 and 2) is US\$ 27,154,000 that includes \$5,523,400 provided by the GEF funds to cover incremental costs. Under Phase 1, the project has already financed the setting up of ESCO-Rivne and implementation of pilot activities in the amount of \$ 1,840,000 (excluding the PDF-B: \$ 189,400 from GEF and \$ 95,000 as co-financing).

The major part of the project cost (\$23,994,000) is accounted for by the municipal energy efficiency investment programme, consisting of equity participation and lines of credit as per Table 2b below:

<b>Name of Co-financier (source)</b>	<b>Classification</b>	<b>Type</b>	<b>Amount (x \$ 1,000)</b>	<b>Status</b>
Rivne City	Government	Cash In kind	8,000 500*	USD 2 million in contracts for 2005 have been budgeted USD 6 million in equipment will be transferred in 2005 USD 0.5 million in ongoing in-kind contributions

Name of Co-financier (source)	Classification	Type	Amount (x \$ 1,000)	Status
Rivne Oblast	Government	Cash In kind	8,000 500*	USD 8 million in equipment will be transferred in 2005 USD 0.5 million in ongoing in-kind contributions
ESCO	Private sector	cash	1,500	Letter of support
Foreign banks	Other internat.	loan	500	Letter of support
Local banks	other	loan	1,500	Letter of support
<b>TOTAL</b>			<b>20,500</b>	

Table 2a: Co-financing of the project.

Sources of Financing	Types of Financing (x \$ 1,000)				
	Grant	ESCO Equity	Debt Financing	Ongoing Local Co-financing	Total
UNDP/GEF	3,494				3,494
Rivne City		8,000		500 *	8,500
Rivne Oblast		8,000		500 *	8,500
Private investor		1,500			1,500
Foreign banks			500		500
Local banks			1,500		1,500
IFI					
<b>Total</b>	<b>3,494</b>	<b>17,500</b>	<b>2,000</b>	<b>1,000</b>	<b>23,994</b>

Table 2b: Detailed description of estimated co-financing sources.

The planned equity partners and financiers of ESCO-Rivne are: Rivne City, Rivne Oblast, ESCO-company of the Halle City (Germany), ESCO KOMERTS, UkrESCO (Kyiv), Ukgazbank, Pryvatbank, and Avalbank. Other potential partners are: Econoler (Canada) ESCO-company (Austria) and EBRD.

Table 2c below provides a listing of the Outcomes of Phase 2, together with the associated budget for each one of them --- a detailed list of activities necessary for achieving each outcome is provided in [ANNEX B1](#).

Outcome	Total Budget (\$)	GEF Component (\$)	Co-financing Component (\$)
<b>Outcome 1:</b> To expand ESCO operations through implementation	20,250,000	=	20,250,000

Outcome	Total Budget (\$)	GEF Component (\$)	Co-financing Component (\$)
of Rivne City-wide/Oblast energy efficiency activities.			
<b>Outcome 2:</b> To facilitate ESCO-Rivne operations through financing of activities having long payback periods.	3,144,000	3,144,000	-
<b>Outcome 3:</b> To reduce perceived investment risks in order to facilitate ESCO-Rivne's expansion of activities.	500,000	350,000	150,000
<b>Outcome 4:</b> Information on replication of project experience, best practices and lessons learned throughout Ukraine and in other CIS countries.	100,000	-	100,000
<b>Total</b>	23,994,000	3,494,000	20,500,000

Table 2c: Phase 2 Outcomes with costing

Details of on-going ESCO Rivne activities financed by Rivne City and Oblast (\*) are provided in Table 3 below:

Local Co-financing Sources				
Name of Co-financier (source)	Classification	Type	Amount (x \$ 1,000)	Status
City	Humanitarian College	Boiler plant	95	Funds are already allocated in City budget
	Rivne central hospital	Boiler plant	85	Funds are already allocated in City budget
	Measures on heat supply and heating conditions improvement for educational establishment in		320	Funds are already allocated in City budget

Local Co-financing Sources				
Name of Co-financier (source)	Classification	Type	Amount (x \$ 1,000)	Status
	the city of Rivne			
Oblast	Smuga Village gas supply system	Building gas supply system	135	Funds are already allocated in Oblast budget
	Boiler Plants rehabilitation with replacement of burners and conversion from coal to gas	Boiler plant	365	Funds are already allocated in Oblast budget
Sub-Total Co-financing			1,000	

Table 3: Description of on-going, locally financed activities.

As per the approved project brief, the GEF funding (\$3,494,000) under Phase 2 will finance the implementation of longer-payback measures, less economically attractive and more risky to private investors. However, out of this amount, \$ 350,000 will be allocated to the development of finance guarantee and risk mitigation instruments to protect ESCO-Rivne investments from defaults by clients.

#### ANALYSIS OF ALTERNATIVES AND COST EFFECTIVENESS

The ESCO approach was identified during project development after considering a number of options. Extensive consultations with stakeholders during the PDF-B phase resulted in the conclusion that an energy efficiency programme in the city of Rivne (and in other cities like it) could not be financed by a direct loan granted to the city (a local government entity) by a foreign commercial bank. Not only would there be a long and cumbersome application procedure, but certain banks (such as the World Bank and EBRD) would require a sovereign guarantee, which would be extremely difficult to obtain from the Government of Ukraine. While an ESCO was seen to address several major issues, a public ESCO business would encounter the same types of delays as UkrEsco (a publicly-owned ESCO whose mandate is to identify and implement energy-saving investments in small and medium-size enterprises and public sector institutions) due to the need to secure a sovereign guarantee, so the project team focused on private sector alternatives. It found that EBRD was already working on a similar scheme to promote private sector-driven municipal ESCOs in Central and Eastern Europe.

The cost effectiveness of GEF funds up to project completion is computed to be \$ 1.24/ton of CO<sub>2</sub> avoided. However, taking into consideration the huge investment that will follow, the GHG emission reduction cost to the GEF will be significantly reduced.

#### INSTITUTIONAL COORDINATION AND SUPPORT

##### CORE COMMITMENTS AND LINKAGES

In addition to reflecting national priorities in Ukraine, the proposed project also builds upon the existing goals and activities of UNDP, with environment constituting one of its four priority areas for global activity, both at the country level and in the region. Finally, UNDP is assisting local governments in Ukraine in the formulation and implementation of Local Agenda 21 sustainable development strategies at the Oblast (regional) and municipal levels, and energy plans are included in these strategies.

The UNDP Ukraine Cooperation Framework for Human Development 2001-2005, under the item “Environment Conservation and Management”, indicates that “Pollution control, energy efficiency, waste management and integrated soil management initiatives that promote local and community-level environmentally sound practices will be implemented. In addition, the draft UNDP Country programme for 2006-2010 focuses on 3 thematic areas, viz. (1) Participatory Governance, Rule of Law and Civil Society; 2) Economic and Social Development for prosperity and Human Security and 3) Environment Management and Sustainable Development. Thematic area 3 states, among others “UNDP’s support will be focused on addressing the following environmental concerns: mitigation of the climate change, conservation of globally significant biodiversity, land degradation and water management. In doing so, UNDP will promote energy efficiency, clean technologies and environmentally friendly transport.

#### **CONSULTATION, COORDINATION AND COLLABORATION BETWEEN IAS, AND IAS AND EXAS.**

The World Bank in May 1998 made a \$ 200 million loan to Ukraine for a project entitled “Kiev District Heating Improvement Project” with the following objectives: (a) to replace and increase heat production capacity to better meet existing and expected future demand and to improve the reliability and service levels in the Kiev District Heating (DH) system; (b) to extend the life of, increase the efficiency of, and enhance conservation of the Kiev DH system, through rehabilitation and introduction of modern technologies and materials; and (c) to promote sound cost recovery policies and practices and the commercialization and institutional strengthening of project DH companies, to identify the most efficient corporate and institutional structure for provision of DH in Kiev and ways to facilitate the eventual privatization of the service, and to support project implementation. The scheduled completion date is December 2006. In addition, EBRD made a \$ 30 million sovereign loan to state-owned UkrEsco in April 1997 to identify and implement energy-saving investments in small and medium-sized enterprises (SMEs) and public sector institutions. A second EBRD loan of \$ 20 million to UkrEsco was made in May 2005 to continue similar activities. Lastly, EBRD made a loan of \$ 10 million in 2003 to Energy Alliance to finance procurement of co-generation equipment for industrial clients in Ukraine.

During the implementation of Phase 1, ESCO-Rivne met periodically with the World Bank Office in Kiev, Kiev City authorities and UkrEsco to discuss their experience in implementation, lessons learned and to solicit feedback on activities it proposed to undertake. ESCO-Rivne also met with representatives of EBRD for the same purpose whenever they visited Ukraine. These consultations have been very effective, these organisations are briefed on the follow-up Phase 2 and ESCO-Rivne plans to maintain this dialogue. In addition and as indicated earlier (page 16), UkrEsco has expressed interest to participate in ESCO-Rivne as a shareholder and discussions are being pursued towards sealing an agreement in the near future.

#### **Project Implementation Arrangement**

The project will be executed by the Ministry of Economy and European Integration with the support of the Rivne Oblast Administration. The latter will appoint a National Project Director who will assume overall



responsibility for project implementation. A Project Steering Committee consisting of representatives of key stakeholders such as the Ministry of Economy and European Integration, Ministry of Environment, Rivne Oblast and Municipal authorities, representatives of the private sector, apartment owners association, etc. will be established to provide advice and guidance to a Project Management Unit (PMU) that will support ESCO-Rivne. The PMU will be located in Rivne and will consist of a full time Project Manager (and any additional staff, as appropriate) to provide strategic advice to the ESCO-Rivne Director.

Decisions about its own investments and debt resources will be made by the ESCO-Rivne independently, whereas the use of GEF grant funding will be coordinated with the executing agency, UNDP, and local project stakeholders.

## ANNEX A: INCREMENTAL COST ANALYSIS

### *Baseline:*

In the absence of GEF support, energy efficiency in municipal district heating system and buildings will improve slowly, and many technically feasible and financially attractive opportunities will not be realized. The level of locally possible efficiency activities in the city of Rivne is determined by available financing resources envisioned in the “Municipal Comprehensive Energy Efficiency Program for the Period 1999-2010”. The program was adopted by the City Council and introduced by the city mayor's decree #2574-p of December 30, 1988 in pursuance of the Cabinet of Ministers' Decrees #148 of February 5, 1997 "On the Comprehensive National Program on Energy Conservation in Ukraine" and #731 of July 10, 1997 "On Comprehensive Measures for Implementation of the National Energy Program of Ukraine until 2010".

According to the municipal program, expenditures of the city budget and district heating company during proposed investment period (2005-2009) are about \$0.25 million annually or \$1 million over the stated investment period. This amount presents realistic baseline investment level achievable without GEF support.

In the municipal program it is planned to use these resources for a number of projects in the district heating system and the public sector. A major part of the funding should be used to modernize the heat supply system by shutting down some inefficient boiler plants and connecting their load to more efficient plants, replace a number of obsolete boilers by more efficient ones, partially replace heat transmission pipes by pre-insulated ones, and implement some other lower-cost measures. Plans concerning the heat consumption are limited to installing heat meters and controls for a part of consumers.

Estimated potential for cost-effective investments in supply and demand side energy efficiency is about \$ 23.9 million for phase II. So in the absence of the GEF support, limited financial resources would allow to realize only about 1% of the cost-effective potential.

Baseline activities under the outcome 4 replication measures, are practically absent.

### *GEF alternative intervention:*

With GEF assistance, major financial and institutional barriers in the pilot city will be reduced by creating a sustainable ESCO as a business model and a demonstration of how resources from the private sector and international institutions can be leveraged.

Under the suggested phase II energy efficiency investment program (outcomes 1 to 3), all technically feasible and cost-effective opportunities will be realized both in the district heating system and connected buildings. In the district heating system, retrofitting/replacement of generating capacity will be performed. Where it is cost-effective, pipes in transmission/distribution network will be replaced by pre-insulated ones. Based on economic criteria, it is envisioned to eliminate part of group substations and replace them with modern individual substations in buildings. Modern heat supply management system will be introduced. In buildings it is planned to install heat meters and controls, apartment-level hot water meters, heat insulation of pipes and other measures. Billing software, together with meters that have already been installed, will provide incentives for households and budgetary organization to take appropriate steps to improve the energy efficiency of their buildings and to start saving heat and hot water.

Implementation of the phase II investment program will result in reducing about 2.8 million tons of GHG emissions in CO<sub>2</sub> equivalent over the project lifetime. As the investments are realized through commercially viable ESCO-mechanism, the project is sustainable and can be replicated in other Ukrainian cities.

The measures promoting project replication include preparing and making available supporting materials for setting up of ESCOs, providing necessary consultations, information dissemination, awareness raising etc. Project replication potential for communal heat supply sector in other cities makes up about 64 million tons of CO<sub>2</sub> equivalent.

**Domestic benefits:**

Project implementation provides several domestic benefits. Most essential of them are: positive economic and financial returns from investments, higher level of heat supply service and reliability of district heating system operation, lower air pollution (in particular by NO<sub>x</sub>), creation of incentives to energy savings in public and residential sector, reduction of budgetary expenditures on residential subsidies and institutional buildings' heat bills, improvement of the qualification of district heating company personnel and its management capacity. Operating ESCO will be able to further expand its activity to the region as a whole and implement energy saving measures in industry and infrastructure sectors, thus achieving additional economic and environmental benefits. Expansion of ESCO-Rivne its activity will contribute to the development of local energy service market.

For the country as a whole, the project will help reduce the level of dependence on external gas supplies. Successful operation of the Rivne ESCO will facilitate setting up of similar ESCOs in other cities and attracting foreign private capital and experience to Ukraine. Replication of the project in other Ukrainian cities will bring additional domestic and global benefits, although these benefits cannot to be exactly quantified.

*Notes on Calculating Incremental Costs:*

Incremental costs were calculated for 4-year investment period (2005-2009) as a difference between the total phase II project cost (\$23.9 million) and local baseline expenditures over the same period (\$1 million). In this case the incremental costs are \$22.9 million not taking into account cost saving due to reduced gas, electricity and water consumption and avoided O&M and other costs. Comparison of these total incremental costs with the incremental global environmental benefits (CO<sub>2</sub> emissions reduction in the amount of 2.8 million tons) yields incremental specific reduction cost at the level of \$8.14 per tonne CO<sub>2</sub>.

### INCREMENTAL COST MATRIX

Outcome	Benefits/ Costs	Baseline	Alternative	Increment
<p>1. Expand ESCO Operations through implementation of Rivne City-wide/Oblast Energy Efficiency activities</p> <p>2. Facilitate ESCO-Rivne Operations through financing of activities having long payback periods.</p> <p>3. Reduce perceived investment risk in order to facilitate ESCO-Rivne's expansion of activities</p>	Global Environmental Benefits	Slow and limited reduction of GHG emissions (0.19 million tons of GHG reduced over 20 year project period).	Significant GHG emissions reduction (2.8 million tons of GHG reduced over 20 year project period). Leverage of financial resources for large-scale energy saving and emissions reduction activities.	Additional GHG emissions reduction (2.61 million tons of GHG reduced over 20 year project period). Leverage of financial resources for large-scale energy saving and emissions reduction activities.
	Domestic Benefits	Benefits correspond to a low level of energy-efficiency related investments being made.	Benefits correspond to investments facilitated through whole-city investment program. Creation of the pilot city ESCO with the prospect of expanding its activity to other energy efficiency projects in the region (including municipal infrastructure and industry)	Comprehensive retrofitting of municipal DH system. Improved heat comfort level. Consumption-based heat and hot water metering and billing in residential sector and public buildings. Creation of the pilot city ESCO with the prospect of expanding its activity to other energy efficiency projects in the region (including municipal infrastructure and industry)
	Costs	Municipality: \$500,000 Oblast \$500,000 <i>Total (over the 4 year program investment period): \$1,000,000</i>	Municipality: \$8,400,000 Oblast: \$8,500,000 ESCO: \$1,500,000 Foreign banks: \$500,000 Local banks: \$1,500,000 GEF Contribution: \$3,494,000 <i>Total: \$23,894,000</i>	Municipality: \$7,900,000 Oblast: \$8,000,000 ESCO: \$1,500,000 Foreign banks: \$500,000 Local banks: \$1,500,000 GEF Contribution: \$3,494,000 <i>Total: \$22,894,000</i>
4. information on replication of project experience, best practices and lessons learned throughout	Global Environmental Benefits	None	Reduction of GHG emission through replication of the ESCO-approach in other cities.	Reduction of GHG emission through replication of the ESCO-approach in other cities.

Ukraine and in other CIS countries	Domestic Benefits	Slow and spontaneous removing of the institutional and financial barriers without any supervision and sound organizational support.	Expansion of energy saving activities through information dissemination, training, specific cost-reduction measures, new financing mechanisms. Creation of ESCO infrastructure and energy service market development.	Promotion of ESCO activities and their commercial operations based on performance contracting mechanism and creation of energy saving infrastructure in Ukrainian regions.
	Costs	<i>Total: \$0</i>	Municipality: \$100,000 <i>Total: \$100,000</i>	Municipality: \$100,000 <i>Total: \$100,000</i>
Total	Global Environmental Benefits	Existing institutional and financial barriers make energy efficiency investments happen slowly. Limited reduction of GHG emissions (0.19 million tons of GHG reduced over 20 year project period).	Institutional and financial barriers to energy efficiency on municipal level are removed to essential degree. Significant reduction of GHG emissions (2.8 million tons of GHG reduced over 20 year project period).	Institutional and financial barriers to energy efficiency on municipal level are removed to essential degree. Significant additional decrease of GHG emissions (1.61 million tons of GHG reduced over 20 year project period).
	Domestic Benefits	Limited improvement of energy efficiency with low financial, economic and environmental benefits.	Substantial improvement of energy efficiency with considerable financial, economic and environmental benefits.	Significant additional improvement of energy efficiency with essential financial, economic and environmental benefits.
	Costs	Municipality: \$500,000 Oblast: \$500,000 <i>Total: \$1,000,000</i>	Municipality: \$8,500,000 Oblast: \$8,500,000 ESCO: \$1,500,000 Foreign banks: \$500,000 Local banks: \$1,500,000 GEF Contribution: \$3,494,000 <i>Total: \$23,994,000</i>	Municipality: \$8,000,000 Oblast: \$8,000,000 ESCO: \$1,500,000 Foreign banks: \$500,000 Local banks: \$1,500,000 GEF Contribution: \$3,494,000 <i>Total: \$22,994,000</i>

## ANNEX B: PROJECT LOGICAL FRAMEWORK

Project Goal: To address the issue of reducing greenhouse gas emissions through large-scale improvements in energy efficiency in Ukraine's communal heat supply sector.

Project Strategy	Indicator	Baseline	Target	Sources of Verification	Assumptions
<b>Objective:</b> To support ESCO-Rivne to implement a city-wide energy efficiency programme in municipal district heating and to expand its activities to cover other cities and Oblasts.	Agreements with Rivne municipality, other municipalities and oblasts signed.	No major investments in energy efficiency taking place in the district heating sector.	Investment of at least \$ 20 million by end of project. Reduction of almost 2.8 million tons of CO <sub>2</sub> equivalent over the project life cycle.	ESCO-Rivne annual reports, audited financial reports. Project's GHG monitoring and verification reports. Project final evaluation report.	Continued commitment of project partners, including Government agencies, investors and lenders.
<b>Outcome 1:</b> To expand ESCO operations through implementation of Rivne City-wide/Oblast energy efficiency activities.	EPCs for City-wide and Oblast activities signed.	No such investments taking place.	EPCs for least \$ 20 million by the end of project.	Signed EPCs and ESCO-Rivne annual reports.	Clients continue to be convinced of benefits derived to be derived from implementation of energy efficiency activities.
<b>Output 1.1:</b> Signed EPC contracts for Rivne City-wide energy efficiency activities.	Negotiations with City administration.	No such negotiations for investments taking place.	EPCs for at least \$ 5 million signed by first year of project.	Signed EPCs.	
<b>Output 1.2:</b> Opportunities for implementing energy efficiency in Rivne/other Oblast regions identified.	Negotiations with Oblast authorities.	No such negotiations for investments taking place.	EPCs for at least \$ 15 million signed by the end of project.	Signed EPCs.	
<b>Output 1.3:</b> All works pertaining to City-wide/Oblast projects completed.	Implementation of works.	No such activities being implemented.	Completion of works in the Rivne City and Oblast administration buildings as per strategic plan.	Project reports.	

<b>Project Strategy</b>	<b>Indicator</b>	<b>Baseline</b>	<b>Target</b>	<b>Sources of Verification</b>	<b>Assumptions</b>
<b>Outcome 2:</b> To facilitate ESCO-Rivne operations through financing of activities having long payback periods.	EPCs for activities having long payback periods signed.	Lack of funding to support activities having long payback periods.	EPCs for at least \$ 3 million for long payback activities signed by end of project.	Signed EPCs and ESCO-Rivne reports.	Clients willing to have works implemented.
<b>Output 2.1:</b> Signed EPC contracts for activities having long payback periods.	Negotiations with potential clients.	No such investments taking place.	Investment of at least \$ 3.0 million by project end.	Signed EPCs.	
<b>Output 2.2:</b> All necessary equipment/services for undertaking works procured.	Signed contracts for equipment and services.	No such investments taking place.	Procurement of equipment/services for at least \$ 3.0 million by project end.	Signed contracts.	
<b>Output 2.3:</b> All works pertaining to projects having long payback periods completed.	Implementation of works.	No such activities being implemented.	2 km of pipes replaced and 4 residential buildings targeted.	Project reports.	
<b>Outcome 3:</b> To reduce perceived investment risks in order to facilitate ESCO-Rivne's expansion of activities.	Finance guarantee and risk mitigation instruments developed.	No such instruments presently available to ESCO-Rivne.	Agreements in place.	Signed agreements.	Banks/insurance companies willing to provide such instruments.
<b>Output 3.1:</b> Comprehensive report on risk mitigation instruments compiled.	Discussions on risk mitigation products provided by banks and insurance companies.	Not presently available.	Completed within first year of project.	Project report.	
<b>Output 3.2:</b> Study to determine most appropriate instruments completed.	Discussions on most appropriate instruments with ESCO.	Not presently available.	Completed within first 6 months of project.	Project report.	

<b>Project Strategy</b>	<b>Indicator</b>	<b>Baseline</b>	<b>Target</b>	<b>Sources of Verification</b>	<b>Assumptions</b>
<b>Output 3.3:</b> Agreements with Banks/insurance companies negotiated and signed.	Negotiations between ESCO-Rivne and bank/insurance companies.	Not on-going.	Completed within first year of project.	Signed agreements.	Successful negotiations between banks/insurance companies and ESCO-Rivne.
<b>Outcome 4:</b> Replication of project experience/best practices and lessons learned throughout Ukraine and in other CIS countries.	Project experience compiled, analysed and disseminated.	Lack of sufficient information on appropriate ESCO model to pursue in municipal district heating.	Projects initiated in other cities and Oblasts.	Project final report.	Solid growth of ESCO-Rivne is sustained.
<b>Output 4.1:</b> Materials on project experience/best practices and lessons learned prepared.	Project experience and best practices compiled.	Lack of information on best practices and lessons learned.	Completed within 6 months of project end.	Project documentation.	
<b>Output 4.2:</b> Capacity development activities implemented for the management and technical personnel of other municipalities/heat supply companies.	Number of staff and the number of municipalities/heat supply companies that participated in capacity development.	No capacity development programme.	At least a dozen additional municipalities /heat supply companies trained by the end of project.	Project reports.	
<b>Output 4.3:</b> Project overall results, experiences and lessons learned disseminated at the national and regional levels.	Discussions on project results, experiences and lessons learnt prior to dissemination.	No experiences and lessons learnt disseminated.	Draft report disseminated to the stakeholders prior to the end of project. Regional seminar organized to present and discuss the results/lessons learned. Public outreach activities through news media completed by the end the project.	Project reports and publication/web site.	Supportive institutional, legal and regulatory framework.



Project Strategy	Indicator	Baseline	Target	Sources of Verification	Assumptions
<b>Output 4.4:</b> Consultations/dialogue for replicating project experiences in other cities/Oblasts and leveraging financing for that completed.	Number agreements / expressions of interest for project replication at national level. Amount of financing leveraged for actual investments.	No replication and effective follow up of the results of the project.	Five expressions of interests to replicate project activities at the national and/or regional level received by the end of project. Financing leveraged in the amount of \$ 20 million to expand and/or continue project activities by the end of project.	Final evaluation.	

#### ANNEX B1: DETAILED LIST OF ACTIVITIES

Outputs and Activities
<p>Output 1.1: Signed EPC contracts for Rivne City-wide energy efficiency activities.</p> <p>Activities:</p> <ul style="list-style-type: none"> <li>• Negotiate and sign EPC contracts, preferably a single contract combining all the identified targets, with Rivne Municipality for implementing city-wide energy efficiency activities.</li> <li>• Prepare complete feasibility and design studies, inclusive of cost estimates, for all works to be undertaken, as per strategic plan.</li> </ul> <p>Output 1.2: Opportunities for implementing energy efficiency in Rivne/other Oblast regions identified.</p> <p>Activities:</p> <ul style="list-style-type: none"> <li>• Discussions with Rivne/other Oblast authorities to identify additional opportunities for energy efficiency within the region and beyond.</li> <li>• Prepare pre-feasibility studies for selected works.</li> <li>• Initiate preliminary discussions with authorities on works to be implemented and EPCs.</li> </ul> <p>Output 1.3: All works pertaining to City-wide/Oblast projects completed.</p> <p>Activities:</p> <ul style="list-style-type: none"> <li>• Prepare requests for proposals (RFPs) for procurement of equipment and their installation, either as individual contracts or for turn-key installations or a combination thereof.</li> <li>• Prepare technical and financial criteria against which proposals will be evaluated.</li> </ul>

- Issue RFPs and, upon receipt of bids, evaluate them against already prepared criteria.
- Conduct negotiations with successful bidders and sign contract for equipment and/or services.
- Supervise/monitor installation of energy efficiency equipment or implementation of energy efficiency measures.
- Certify completion and acceptance of all works and make arrangements for payment to contractors/sub-contractors.

Output 2.1: Signed EPC contracts for activities having long payback periods.

Activities:

- Negotiate and sign EPC contracts, preferably a single contract combining all the identified targets, with Rivne Municipality for implementing city-wide energy efficiency activities having long payback periods, as per strategic plan.
- Prepare complete feasibility and design studies, inclusive of cost estimates, for all works to be undertaken.

Output 2.2: All necessary equipment/services for undertaking works procured.

Activities:

- Prepare requests for proposals (RFPs) for procurement of equipment and their installation, either as individual contracts or for turn-key installations or a combination thereof.
- Prepare technical and financial criteria against which proposals will be evaluated.
- Issue RFPs and, upon receipt of bids, evaluate them against already prepared criteria.
- Conduct negotiations with successful bidders and sign contract for equipment and/or services.

Output 2.3: All works pertaining to projects having long payback periods completed.

Activities:

- Supervise/monitor installation of energy efficiency equipment or implementation of energy efficiency measures.
- Certify completion and acceptance of all works having long payback periods and make arrangements for payment to contractors/sub-contractors.

Output 3.1: Comprehensive report on risk mitigation instruments compiled.

Activities:

- Formulate a document outlining the various types of risks (default/bankruptcy by clients, fire/flooding at clients' premises, business interruption due to labour disputes, etc.) that ESCO-Rivne should mitigate. This will include a tolerance level for each risk.
- Compile, through discussions with insurance companies, banks and other insurance providers, a comprehensive report on risk mitigation instruments available on the market, together with the associated costs.

Output 3.2: Study to determine most appropriate instruments completed.

Activities:

- Undertake a thorough review of the above comprehensive report to determine the most appropriate risk mitigation instruments for ESCO-Rivne.

- Solicit the assistance and support of ESCO-Rivne’s “foreign twin” in the process to make a final decision on the risk mitigation instruments.

Output 3.3: Agreements with Banks/insurance companies negotiated and signed.

Activities:

- Negotiate the terms and costs of the risk mitigation contracts with the selected banks/insurance companies.
- Sign the appropriate risk mitigation contracts with the insurance providers.

Output 4.1: Materials on project experience/best practices and lessons learned prepared.

Activities:

- Compile project experience and lessons learned from project reports, discussions with ESCO-Rivne/project steering committee and site visits to clients’ premises.
- Draft comprehensive report on project experience/best practices and lessons learned.
- Circulate draft report to project partners/twin partner for review and comments prior to finalisation.

Output 4.2: Capacity development activities implemented for the management and technical personnel of other municipalities/heat supply companies.

Activities:

- Formulate a capacity development programme for the management and technical personnel of other municipalities/heat supply companies.
- Prepare inter-active training materials for participants.
- Participate in the implementation of the capacity development programme.

Output 4.3: Project overall results, experiences and lessons learned disseminated at the national and regional levels.

Activities:

- Disseminate project overall results, experiences and lessons learned at the national and regional levels through direct mailing to potential stakeholders, including posting them on the project web site.
- Implement public outreach activities through the news media.
- Organise a national level seminar to present the lessons learned to stakeholders.

Output 4.4: Consultations/dialogue for replicating project experiences in other cities/Oblasts and leveraging financing for that completed.

Activities:

- Organise consultations with other cities/Oblasts to generate their interest in replication activities.

Initiate discussions with investors to leverage financing for replication.

## **ANNEX C: RESPONSE TO PROJECT REVIEWS**

### **A) CONVENTION SECRETARIAT COMMENTS AND IA/ExA RESPONSE**

N/A

### **B) STAP EXPERT REVIEW AND IA/ExA RESPONSE**

#### **ANNEX C.1. STAP REVIEW**

Igor Bashmakov

**Project Number:** **UKR/98/G41**

**Project Title:** **Removing Barriers to Greenhouse Gas Emissions Mitigation through Energy Efficiency in the District Heating System. Phase 2**

#### **1. General conclusion**

This proposal is sound, reasonable, well-planned, and based on solid economic and technical experience and country knowledge. The proposed approach is a thoughtful implementation of a set of instruments that are and have been recommended by many environmental and economic sources. The reviewer strongly endorses this proposal with some small general and specific reservations and comments (presented below).

#### **2. Rational for the project**

The project objective is to continue reduce overall fossil fuel consumption and associated GHG emissions by removing barriers to supply and demand side energy efficiency improvements in district heating systems in the main cities of Ukraine.

The proposal lists five main existing barriers to energy efficiency improvement in the communal heat supply sector: 1) difficulties in arranging financing for efficiency projects; 2) institutional constraints; 3) lack of capacity and experience in preparing, implementing and managing energy efficiency projects; 4) high transaction costs for relatively small energy efficiency projects; 5) lack of information about existing opportunities for energy efficiency.

I think that the major barrier in mining large-scale energy efficiency improvements potential locked in Ukrainian district heat supply sector is lack of supplier motivation for heat supply costs reduction, short term vision of decision-making, lack of operational freedom for municipally owned heat supply companies, unclear set of indicators – service reliability, quality, efficiency, costs, - which DHS companies are to deliver to owners-municipalities, and as a result insufficient internal efficiency improvement funding and difficulties in accessing external financial sources. That is especially true when investments in district heating systems are considered partly as a result of the absence of visible examples of commercially viable mechanisms operating in the energy efficiency in this area.

The phase 2 of the project involves two key components:

- (i) setting up an innovative financial mechanism (the ESCO approach) in a pilot city (Rivne) for implementing energy efficiency activities on a sustainable basis with the capability for self-replication in other Ukrainian cities; and
- (ii) related capacity building and barrier removal activities including installation and commissioning of energy efficiency measures, shifting to consumption-based billing system, and introduction of regulatory changes to motivate energy saving, including adjustments to the system of allocation of subsidies.

The institutional component should be included in this list if both success and predictability are kept in mind.

### **3. GLOBAL ENVIRONMENTAL BENEFITS**

Ukraine is one of the least energy efficient countries in the world and has the greatest among CIS countries emissions level per unit of GDP. Existence of large scale low costs potential to reduce GHG emissions by improving energy efficiency in Ukraine makes activities in realizing such a potential no longer carrying just benefits for Ukraine, but global benefits as well. As a result, problems in realizing this potential are of global nature. Global benefits are expressed in reduced GHG emission, as well as in numerical environmental, economic and social ancillary benefits.

Implementation of the phase II investment program will result in reducing about 2 million tons of CO<sub>2</sub>.

#### **4. How does the project fit within the context of the goals of the GEF?**

**The project effectively addresses the CC-2 (Increased access to local sources of financing for renewable energy and energy efficiency) and CC1 (Transformation of markets for high volume products and processes) GEF strategic priorities.**

### **5. DOMESTIC BENEFITS**

Ukraine imports much of its energy on the background of the following facts:

- ⇒ Average efficiency for all heat sources is about 70-75%;
- ⇒ Heat supply networks: average heat losses are in the range 20-25%;
- ⇒ Low replacement rates lead to critically low level of heat networks physical reliability and high frequency of failures – 0.6-4 accidents/km/year;
- ⇒ High leakages ratio, lack and low quality of insulation, failure to provide required hydraulic regimes and temperature schedule.
- ⇒ Buildings are as a rule either overheated or under-heated and consume 20-50% extra heat and hot water as potentially needed.

Improving energy efficiency, especially in district heating systems, is a way to substantially reduce the import costs, costs of providing utility services both for cities administrations and residents. Therefore, it must be a top economic priority for local and regional governments, as well as for the Federal government. Rehabilitation of heat and water supply systems not only brings the costs down, but also helps improve heat comfort along with heat supply reliability.

Though many realize, that urgent action is required, they lack a comprehensive plan of action and mechanisms motivating actors to apply energy efficient techniques and practices in their day-to-day work. These policies lack institutional and technical details, technical and organizational specifications for given tasks, as well as economic evaluations of the program components, and financial mechanisms for the program implementation. As a result, actions to be taken to improve energy efficiency are delayed. Given project is directed to identification and removal of those barriers and to setting up ESCOs to mobilize local and foreign capital and expertise.

## **6. Global experience to date and current best practices**

The ESCO business is at least two decades old well-established business in many Western countries. Substantial experience was gained in conducting energy efficiency improvements in district heating systems in Eastern Germany, Czech Republic, Baltic States, and Russia as part of multilateral and bilateral assistance as well as a part of own domestic activities. ESCO-Rinve also have some success at the initial stage of activities and with first implemented projects.

Overall efficiency of district heating systems in Ukraine stays far behind the one in Western Europe. But as experiences of Eastern Germany (Leipzig for example) or Lithuanian experience shows, it is possible to improve this efficiency by about 1% every year with moderate costs.

## **7. Risks and benefits of the approach adopted in the project**

The technical solutions proposed in the project for improving energy efficiency in heat generation, transportation and consumption are reliable and well proven in many countries. There is good deal of experience in application of such technologies in Poland, Czech Republic, Russia, and Baltic States where district heating systems were constructed by similar to Ukrainian designs.

Important issue to keep in mind is to include in the specifications of the project from the very beginning technical components necessary for technical monitoring of energy consumption and efficiency improvements originated by the project related activities. It would then serve as a basis for physical and financial savings evaluations according to the terms of performance contract.

The procedures to evaluate the energy consumption reductions and corresponding GHG emission reductions should be adjusted for whether conditions and for heat load evolution. Say, some clients switching from centrally heat to distributed heat generation would reduce heat demand, but not due to project implementation.

ESCO should advise municipal heating companies on whether it worthwhile to keep all clients connected to the centralized heat network, what are heat load densities by city zones and where heat should be supplied by local or individual sources. Such municipal energy planning alone can bring ahead different vision of heat supply system and reduce significantly both costs and energy consumption. It would also reduce the risk of losing heat clients with potential savings and risk of rehabilitation of district heating network in zoned where effect would be limited.

Major focus of this project is given to setting up an innovative financial mechanism in the pilot city for implementing energy efficiency activities on a sustainable basis with the capability for self-replication in other Ukrainian cities. The phase 2 stresses the necessity to mitigate financial risks by inventing new financial tools for ESCOs. Financial and institutional instruments for project implementation differ from project to project and from locality to locality. So a “menu” of instrument should be developed.

Phase 2 of the project is seeking more financial stability for ESCO. It is expected to attract private investors to district heating improvement projects. Positive side of the proposed mechanism is using ESCO as a project implementation unit with all institutional responsibilities. Corresponding regulation is to be adapted. One possible solution is to set up lease or concession arrangements with the municipality and ESCO to run municipal heat supply system. So ESCO can merge with existing district heat supply company, or replace it as a system operator. This sort of PPP would mitigate financial risks for ESCO in case the payment discipline in Rivne is sufficiently high. In this case all client payments may be used as collateral for potential projects. So I strongly recommend including in the scope of the project the investigation of such a possibility.

Other risks are properly specified and addressed in the proposal.

#### **8. Linkages to other focal areas**

Those linkages are well presented in the proposal.

#### **9. Replicability of the project**

There are two key issues when replicability is discussed: Initial project success and a way success story is told. The scale for project replication is endless at Ukraine where there are thousands of ineffective DHS. To have project replicable a lot should be done at the institutional side. It is not easy, but possible to reach some agreements in one city to have project done. It is much harder to scale the success. So draft regulation at different levels – from the State to municipality is to be developed and tested as a pilot phase in Rivne to be then replicable. The whole technology of institutional work (including tariffs setting methodologies) is to be precisely described. The precision of this technology description with the identification of a room for flexibility left is a key for replication. Not just see and listen, but take those documents adjust them for your needs and act.

## **ANNEX C.2. RESPONSE TO STAP REVIEW**

1) - Is technical monitoring included in all investment specifications?

Yes, the technical monitoring (energy savings actually reached after project implementation) as well as environmental (actual pollutions) is required by each Energy Performance Contract (EPC) concluded by ESCO-Rivne.

2) - Are ESCO's advising municipalities of heat load densities by city zone, and whether heat should be applied by district heating or more autonomous systems?

- Yes, ESCO-Rivne is being used by Rivne Mayor Office and Municipality for heat load measurements and forecasts. There are central heating system currently in operation in Rivne (as well as in all big cities in Ukraine). Where a client asks, ESCO-Rivne can assess the cost of switching from District heating to autonomous heating, and if feasible make the conversion on behalf of the client. This could be when Client is located far from heating supply network (example: City Hospital where new Boiler plant is to be installed)

3) – Has the project developed a menu of financial instruments?

Yes, during the Project did develop a set of different financial instruments to be used by ESCO-Rivne in EPC contracts. However for a time being ESCO-Rivne uses only two of them: revenue from initial UNDP/GEF investments and commercial loan from local bank(s)

4) - Has or will the ESCO merge with the district heating company?

Yes, currently the district heating company KommunEnergia (as stakeholder in ESCO-Rivne) is in the process of reorganization. It is also planned to transfer ownership (and reporting) of DH Company from State level to municipal one. The one of the options which is now under authorities' consideration is to appoint ESCO-Rivne to control DH Company on behalf of Municipality. In this case it is quite possible that in future ESCO-Rivne will be merged with the district heating company. However it is subject of future considerations.

5) - Will the project describe the layers of legislation and regulation and associated institutional arrangements reached during the project?

Yes, during Project implementation we have prepared and submitted to Rivne Authorities suggested changes to local regulation. We have widely disseminated these Drafts during workshops, separate meetings with Ukrainian municipalities and ESCO-Rivne WEB site.

C) GEF SECRETARIAT AND OTHER AGENCIES' COMMENTS AND IA/EXA RESPONSE

N/A



#### **ANNEX D: ENDORSEMENT LETTER AND LETTERS OF INTEREST/SUPPORT**

The letters are attached separately

## ANNEX F: CRITERIA FOR CONTINUATION TO STAGE II: A CHECKLIST

*Overarching condition:* “A sustainable municipal ESCO is fully functional based on cost recovery from its services and investments from the government, local authorities, and the private sector.”

No	Criteria	Status as of end-January 2005
<b>1</b>	<i>Enabling Environment Conditions</i>	
<b>1.1</b>	Software for billing/accounting by consumption of energy developed and in use for all buildings in demonstration project	<ul style="list-style-type: none"> <li>– Specifications for billing software are being developed prior to formulating tender documents. Information on Vladimir accounting and billing system has been sought from Russian authorities.</li> <li>– 4 buildings have now been fitted with metering systems.</li> <li>– Educational/sensitizing campaigns have been initiated.</li> </ul>
<b>1.2</b>	Model energy performance contract (EPC) developed and mechanism tested through pilot measures	<ul style="list-style-type: none"> <li>– 4 different types of EPCs have been developed and , to date, 16 EPCs have been signed.</li> </ul>
<b>1.3</b>	Legislation/regulation allowing the transfer of funds saved through energy efficiency into the municipal ESCO; i.e., cost recovery scheme developed and implemented	<ul style="list-style-type: none"> <li>– Legislation has been amended allowing saved funds to be transferred to the ESCO.</li> </ul>
<b>1.4</b>	Funds allocated by the municipality for energy subsidies adjusted	<ul style="list-style-type: none"> <li>– Completed. The evaluation report indicates that “Funds allocated by the municipal authority for energy subsidies have been adjusted”.</li> </ul>
<b>1.5</b>	Requests from at least 2 other municipalities for services (in the form of an official Letter of Interest)	<ul style="list-style-type: none"> <li>– 3 contracts are now in place for the municipalities of Ostig, Kostopil and Mirgorod.</li> </ul>
<b>2</b>	<i>Financial Institutional Conditions</i>	
<b>2.1</b>	Full-scale feasibility study for Stage II investment project completed, including an analysis of the current business environment in Rivne	<ul style="list-style-type: none"> <li>– Priority directions have identified potential investment of over \$ 25 million in Rivne for the next 5 years.</li> </ul>
<b>2.2</b>	Documents for equity/loan approval processes drafted	<ul style="list-style-type: none"> <li>– The ESCO has USD 50,000 in shareholding from partners</li> <li>– The ESCO has a credit line of USD 565,000. The evaluator estimates they need a credit line of USD 2 million.</li> </ul>
<b>2.3</b>	Investment materials promoting ESCO developed and distributed to potential investors in the relevant language(s)	<ul style="list-style-type: none"> <li>– Materials have been sent. Follow-up ongoing, the latest one being with the Sumitomo Corporation.</li> </ul>
<b>2.4</b>	Commitments by local stakeholders sufficient to attract external investors formulated	<ul style="list-style-type: none"> <li>– Local stakeholder have taken USD 50,000 in shares, and are expected to place USD 14 million in equipment under control of ESCO by end of the</li> </ul>

No	Criteria	Status as of end-January 2005
		year. – The ESCO shareholders have agreed to amend the foundation documents converting the closed joint stock company into an open stock company. Re-registration will be completed in February 2005.
2.5	Investors/financiers for ESCO selected	– Several expressions of interest have been received and are being followed up. See Annex D (attached separately)
2.6	ESCO financial agreements signed	
2.7	Successful transfer of the savings from the UNDP funds into the municipal ESCO	– Transfer of funds is being done on a regular basis. – Transfer of equipment to ESCO will be completed by end-February 2005.
3	<i>Other Institutional Conditions</i>	
3.1	Pilot municipal company established	– Municipal company established in Nov 2003
3.2	Operational procedures of the ESCO finalized	– Completed in December 2004.
3.3	Terms of Partnership with the City of Rivne drafted, signed, and shown to be adhered to during the pilot project	– Partnership signed June 2004, and so far all parties have complied w/ agreements
3.4	Supply-side and demand-side measures installed during the demonstration and verified	– Supply side: In addition to the 2 boilers, rehabilitation of power plant systems: instrumentation and control, frequency modulation, etc. – Distribution system: heat supply manifold has been replaced with one made of pre-insulated pipes; – Demand side: 3 individual distribution points + 1 central distribution point (residential appt. buildings) + 1 distribution point at city hospital.
3.5	Cost performance of energy efficiency measures demonstrated	– Average payback period is 5.9 years, so it is too early to show projects savings have out performed costs
3.6	Energy savings and emission reductions verified independently	– Monitoring by ESCO is done on a quarterly basis. – Energy savings June-Dec. 2004: 7130 tce. – Emission Reduction June-Dec. 2004: 9,992 tons.
3.7	ESCO staff trained in conducting energy audits and capable of conducting audits without external support	– Formulation of training programme completed. On-the-job training being implemented. Additional training under “twinning” arrangement being developed.

# ANNEX G: ESCO-RIVNE STRATEGIC PLAN

Ref No	Project name	What work will be undertaken	Cost of Works US\$ M	Payback period, years	Note
1	District Heating System, including:		15,2		
1.1	Boiler plants	- Renovation and rehabilitation of two existing boilers; - Boiler retrofitting, - new I&C System, - Arranging of the variable speed drives; - Overall automation and dispatch system	9,2		182 boilers with the different capacity from 0.07 to 30.0 gig calories / hour are installed in the boiler-houses
1.1.1	Implementation of heat and electric power on the basis of the boiler plant at Makarova St., 42	Boiler Plant renovation with installation of co-generation units (turbine-generation sets)	Total investments US\$ M 9.2; including: Equipment – US\$ M 4.975;	5 Economic Effect – US\$ M 3.67 annually	Load: Total - 63,01 MW Including: Heating - 34,44 MW; Hot water - 28,57 MW
1.2	Manifold and control (distributive) heat networks		3,4		
1.2.1	Pipelining and replacement of heat network in the Demo Project zone		1,3	7,5	
1.2.2	Replacement of emergency condition heat networks		1	7,5	
1.2.3	Pipelining of heat network from the boiler plant along the Makarova St., 42		1,1	7,5	
1.3	Central Heat Point – CHP		1		
1.3.1	CHP at Kavkaz'ka St., 6	Reconstruction	0,11	4	Rehabilitation with installation of modern plate heat exchangers
1.3.2	CHP at Mitskevicha St., 34	Reconstruction	0,11	4	Switching the boiler-plant into the heating point with independent scheme
1.3.3	CHP at Kikvidze St., 24	Reconstruction	0,11	4	Rehabilitation with installation of modern plate heat exchangers
1.3.4	CHP at Ostafova St., 39	Reconstruction	0,11	4	Rehabilitation with installation of modern plate heat exchangers
1.3.5	CHP at Gagarina St., 3	Reconstruction	0,11	4	Rehabilitation with installation of modern plate heat exchangers

1.3.6	CHP at Strutyn'ska St., 11	Reconstruction	0,11	4	Rehabilitation with installation of modern plate heat exchangers
1.3.7	CHP at Dundycha St., 3	Reconstruction	0,11	4	Rehabilitation with installation of modern plate heat exchangers
1.3.8	CHP at Pukhova St., 17	Reconstruction	0,11	4	Rehabilitation with installation of modern plate heat exchangers
1.3.9	CHP Lyonokombinativska St., 3	Reconstruction	0,11	4	Rehabilitation with installation of modern plate heat exchangers
1.4	Individual Heat Point - IHP		0,6		
1.4.1	Building on Kavkaz'ska St., 3	Arrangement	0,086	6,3	Installation of the IHP
1.4.2	Building on Kavkazska St., 5	Arrangement	0,086	6,3	Installation of the IHP
1.4.3	Apartment house on Directorii St., 6	Arrangement	0,086	6,3	Installation of the IHP
1.4.4	Building on Knyazya Volodymyra St., 37	Arrangement	0,086	6,3	Installation of the IHP
1.4.5	Building on Mitskevitcha St., 11	Arrangement	0,086	6,3	Installation of the IHP
1.4.6	Building on Mitskevitcha St., 9	Arrangement	0,086	6,3	Installation of the IHP
1.4.7	Building on Mitskevitcha St., 9A	Arrangement	0,086	6,3	Installation of the IHP
2	Rehabilitation in outdated apartment and administrative houses		3,9		
2.1	Commercial accounting of heat energy for heating, heating adjustment according to schedule and temperature of external air	Arrangement of modern commercial accounting units of heat energy	2,65	7	
2.2	Renovation (reconstruction) of heat insulation on the pipelines in un-heated buildings		0,28	5	
2.3	Arrangement of radiator screens		0,78	5,5	
	Arrangement of heat insulation on the lifting pipes of hot water supply		0,19	6	
3	Lightning system		0,21		
3.1	Replacement of metering devices of electric energy on multirate arrangement		0,21	1,5	
4	Water supply and water drainage systems		5,0		
4.1	Arrangement of electric power multirate meters on water supply points		0,01	0,8	

4.2	Substation 35/10 construction completion on the Novomytsk water well (supply point) for switching to the Class I energy consumption		<i>Required Capital Investments – 10 000.00 US \$</i>	<i>Common Pay-Back Period – 0,8 of a year</i>	
4.3	Replacement of pumping equipment on boreholes		0,11	0,9	
4.4	Reconstruction of local purifying constructions to increase its capacity up to 30 million.m³/year		<i>Required Capital Investments – 4 521 000.00 US \$;</i>	<i>Common Pay-Back Period – 2.4 years</i>	
4.5	Rehabilitation of the water transport schemes in the buildings on Danyla Galytskogo St., with water swap-in pumps installation in each building (4 pumping units)		<i>Required Capital Investments – 20 000.00 US \$;</i>	<i>Common Pay-Back Period – 1.1 of a year</i>	
4.5	Installation of pumping units with the frequency converter on the water transport pumping station “Noviy Dvir” and water transport station # 1.		<i>Required Capital Investments – 9 000.00 US \$;</i>	<i>Common Pay-Back Period – 0.9 years</i>	
4.6	Rehabilitation of the municipal water-purifying system in Mirgorod		<i>Required Capital Investments – 14 000.00 US \$;</i>	<i>Common Pay-Back Period – 1.2 years</i>	
4.7	Replacement of the pumping units on the water transport station # 1 in Mirgorod		<i>Required Capital Investments – 10 000.00 US \$;</i>	<i>Common Pay-Back Period – 1.5 years</i>	
4.8	Rehabilitation of municipal water-purifying system in Chernomorske (Crimea)		<i>Required Capital Investments – 75 000.00 US \$;</i>	<i>Common Pay-Back Period – 0.9 years</i>	
5	Measures on heat supply quality improvement for educational institutions in the city of Rivne		2,5		
5.1	Construction of boiler-plant for humanitarian gymnasium and kindergarten No 42 in the city of Rivne		0,3	7,5	
5.2	Construction of boiler-plant for secondary school No 27 and kindergarten No 42 in the city of Rivne		0,3	6,5	
5.3	Complex measures on warmth-keeping at educational institutions in the city of Rivne and energy savings/efficiency awareness campaign	Replacement of the window frames in the educational institutions of Rivne with the modern plastic frames. The old frames are in the emergency situation. Warmth-keeping of the last floors.	1,9	7,5	

		Energy savings/efficiency awareness campaign. (Optional courses)			
	Total		25,81		

**ANNEX H:**

## The list of less economically attractive energy saving projects

№	PROJECT NAME	SUM TOTAL OF INVESTMENTS, MILLION OF USD	PAY-BACK PERIOD, YEARS
1.	Manifold and control heat networks	3,4	
1.1	Pipelining and heat network replacement in the project zone	1,3	7,5
1.2.	Replacement of damage heat networks	1	7,5
1.3	Pipelining and heat network from the boiler-room at Makarova St., 42	1,1	7,5
2	Rehabilitation in outdated apartment and administrative houses	3,71	
2.1	Commercial accounting of heat energy for heating, heating adjustment according to schedule and temperature of external air	2,65	7
2.2	Renovation (reconstruction) of heat insulation on the pipelines in un-heated quarters	0,28	5
2.3	Arrangement of radiator screens	0,78	5,5
3	Lightning system	0,21	
3.1	Replacement of accounting units of electrical energy on multirate arrangement of economical bulbs for street lighting	0,21	1,5
4.	Reconstruction of local purifying constructions with the power 30 mln.m./year	4,521	2,4
5.	Measures of improvement of heat supply and common comfortable level for pupils' staying in educational institutions in the city of Rivne	1,9	7,5
6.	The boiler-room building for high school in the city of Rivne	0,3	7,5
	Total	14,04	

Note: CJSC “ESCO-Rivne” considers appropriate to allocate technical assistance funds for all projects listed with the purpose to increase the company attractiveness for outside investors.



**ANNEX I: PROJECT BRIEF**

Attached as a separate file.

**ANNEX J: EVALUATION REPORT**

Attached as a separate file.

**Annex 2: ESCO Rivne Business Plan for 2005**

Attached as a separate file.

### **Annex 3: Response to comments from Council Members**

The below attached Council comments, received for this project, are self-explanatory. No response was required to the comments.

#### **WORK PROGRAM: COMMENTS FROM COUNCIL MEMBERS** (REFERENCE TO GEF/C.25/6)

#### **Ukraine: Removing Barriers to Greenhouse Gas Emissions Mitigation through Energy Efficiency in the District Heating System, Phase 2 [UNDP]**

#### ***COMMENTS FROM SWITZERLAND***

##### **General Comments**

181. The discussed proposal is Phase 2 of a project which was approved in full size in January 2000 but was split into two phases due to financial constraints. In Phase 1, which covered the establishment of a municipal energy service company (ESCO) in the city of Rivne, an evaluation showed demonstration of energy efficiency measures and part of project replication and dissemination activities have been completed successfully. The ESCO-Rivne is established and operational as a private joint stock company. The objective of the proposed Phase 2 of the project is to reduce overall fossil fuel consumption and associated GHG emissions by removing barriers to supply and demand side energy efficiency improvements in district heating systems in the main cities of Ukraine. GEF participation will reduce major existing barriers in one pilot city (Rivne) and provide for the replication of defined approaches and measures in other main cities of Ukraine.

182. Phase 2 should have four main outcomes:

- (a) ESCO operations are expanded to cover Rivne City-wide/Oblast energy efficiency activities;
- (b) ESCO-Rivne operations are facilitated through financing of activities having long payback periods;
- (c) ESCO-Rivne operations are promoted through the design of instruments to minimise investment risks; and
- (d) Project experience/best practices and lessons learned are replicated throughout Ukraine and in other CIS countries.

183. Phase 2 of the project can build on the experiences of Phase 1. A major change in institutional setup has already been implemented under Phase 1 by establishing ownership at the local level and not at the national level as earlier foreseen. Phase 2 is seeking more financial stability for the ESCO. ESCOs have proven to be very efficient instruments for implementing energy efficiency measures on the supply and demand side in Ukraine and in other neighbouring countries with a similar economic situation. The envisaged approach is consistent with GEF's strategic priorities *CC-2 Increased Access*

*to Local Sources of Financing Renewable Energy and Energy Efficiency* under the program #5 *Removing barriers to Energy Efficiency and Energy Conservation*. The project has a high potential for replication and some interested parties have already contacted the project according to the evaluation report on Phase 1. The project is expected to reduce CO<sub>2</sub>-emissions by 2.8 million metric tons (Phase 2 only) with a cumulative CO<sub>2</sub>-emission reduction over 20 years of 64 million metric tons.

### **Main Concerns**

184. There are no major concerns.

### **Conclusions and Recommendations**

185. We recommend the project for endorsement. GEF support to the project is strongly recommended as the project addresses urgent needs by focusing on energy efficiency. In addition, Phase 2 can build on successful implementation of Phase 1 which has already completed some of the most challenging activities of the overall project, has established the ESCO operationally and provided first (positive) implementation experience.

### **COMMENTS FROM USA**

186. Assessment: Support. The project is the second phase of a larger project. The evaluation of phase one recommends continuing the project and highlights remaining barriers to be addressed in phase two. The log frame has a number of strong indicators.