

# OFFICE MEMORANDUM

DATE: March 27, 2001

TO: Mr. Ken King, Assistant CEO, GEF Secretariat  
Att: GEF PROGRAM COORDINATION

FROM: Lars Vidaeus, GEF Executive Coordinator



EXTENSION: 3-4188

SUBJECT: **Croatia: Energy Efficiency Project**  
**Submission for Work Program Inclusion**

Please find enclosed the revised electronic attachment of the above mentioned project brief for work program inclusion. The PDF-B amount has been reflected in the GEF cover sheet.

The proposal is consistent with the *Criteria for Review of GEF Projects* as presented in the following sections of the project brief:

- **Country Drivenness:** The proposed project fits within Croatia's climate change activities (the National Environmental Action Plan and the National Communications to the UNFCCC) -- Section A.4. Policy reforms relevant to the project, mainly pricing reforms, are addressed by IBRD's Enterprise and Financial Sector Adjustment Loan (EFSAL). -- Sections B.3 and C.2. Country commitment and ownership has been demonstrated by the Government's focus on energy efficiency issues in the new energy legislation and by the Government's commitment to meet the key EFSAL condition that, inter alia, includes pricing reforms. The Government has also demonstrated its commitment through their decision to establish a project implementation team and to conduct several pilot energy efficiency feasibility studies. -- Section D.4.
- **Endorsement:** The endorsement letter by the Croatian GEF Operational Focal Point is attached.
- **Program Designation & Conformity:** The project design is consistent with the objectives of GEF Operational Program 5. It supports activities that lead to sustainable "win-win" results that demonstrates local, national and global benefits through removal of barriers to energy efficiency. These barriers are: (i) a lack of development and project financing attributable to perceived risks among lenders and investors; and (ii) a lack of capacity and know-how among key stakeholders. -- Sections B.2 and B.4.1.
- **Project Design:** The project will address these barriers by creating a utility-based energy service company (ESCO). As a core developer of energy efficiency projects ESCO will

promote, develop and finance energy efficiency projects. It will also contract turnkey installation and other project functions to local businesses. End-users will benefit immediately from facility improvements resulting from energy efficiency investments. End-users will be able to pay for the investments from the energy cost savings that the ESCO guarantees -- Section B.4. The project will consist of an IBRD loan, a GEF contingent grant, a GEF partial risk guarantee, and a GEF technical assistance -- Section C.1. Risk analysis and mitigation actions are included in Section F.2. Annex 1 provides the project's logical framework. Global environmental benefits and incremental costs are summarized in Annex 2 and detailed in Annex 4.

- **Sustainability:** As described in Section F.1, the proposed project is sustainable because:
  - the Government's commitment to pricing reforms (see "Country Drivenness");
  - the IBRD and GEF financing modalities are developed and phased to overcome barriers to energy efficiency. *In a first phase*, ESCO will finance energy efficiency projects with the IBRD loan and the syndicated loan to ESCO leveraged by the GEF guarantee facility. *In a second phase*, as ESCO establishes its expertise and end-users benefit from implementation results of the first ESCO-financed projects, local banks will be solicited to finance ESCO-sponsored projects with loans directly to users and leveraged by the GEF guarantee facility. *In a third phase*, as the energy efficiency market further develops, the GEF guarantee facility will be available to leverage commercial loans to finance projects sponsored by other emerging service providers. Lending to users should continue to grow as financial intermediaries gain experience with the performing loans in their portfolios. Flow of funds during implementation and after project completion are in Annex 5.
  - it involves participation by independent actors—financial institutions, energy service and equipment providers, project sponsors, and users—who are pursuing commercially sustainable development of the energy efficiency market. Each actor will retain the specific project risk within its core business competency.
- **Replicability:** The proposed project captures 4% of the potential energy efficiency market in Croatia. Project design includes selection of technologies that are commercially sustainable and that are characterized by: (i) excellent prospects for long-term market penetration once the identified barriers are overcome; (ii) the potential for relatively fast cost reductions; (iii) the public access to high-quality data about performance, cost-effectiveness, etc.; and (iv) the capacity to reduce greenhouse gas emissions. GEF funds in the contingent grant (US\$3.4 million) and guarantee facility (US\$1.6 million) will remain in Croatia after project completion, and will become available to energy efficiency development activities led by ESCO and other emerging market players. If the market grows as anticipated, the financial intermediary involved may be able to establish an energy efficiency investment and guarantee fund that is replenished by energy efficiency companies and matched in some proportion by Government contributions. Such an in-country replication strategy for the GEF funds will be developed during project preparation and specified in the implementation agreement. (see "replication strategy" in Section F.1 and Annex 4).

- The Croatian experience is replicable in other countries of the region (for example, EU accession countries) where domestic commercial financing for energy efficiency could be made responsive to the proposed GEF non-grant modalities (contingent grant and partial risk guarantee). To enhance the replicability of the project, a website on project outcomes and best practices as well as regional workshops involving bilateral and multilateral donors, country officials and private investors are envisaged during implementation and will be financed by the GEF technical assistance funds. The replication strategy beyond Croatia will be firmed up during project preparation.
- **Stakeholder Involvement:** Section D.4 describes the involvement of the Government and the executing agency. It also indicates the positive response received from all potential stakeholders surveyed (project partners, financial institutions and end-users) on the proposed GEF modalities. Efforts are ongoing to inform the public and to engage key stakeholders. Further public participatory activities are envisaged during project preparation and will be funded by Japanese PHRD grant. An NGO will be engaged to develop an outreach program to share information with the UNDP-GEF energy efficiency project and to bring together focus groups of users, project developers, other public, private and non-government stakeholders during both project development and implementation -- Section E.7.
- **Monitoring & Evaluation:** Monitoring and evaluation will build on the methodologies developed for other similar GEF activities in Romania and Poland, with particular attention to deriving guidelines for non-grant GEF mechanisms. Technical assistance has been identified and allocated in the proposed cost structure to develop indicators during the preparation period. In addition, measurement and verification are an essential part of the energy performance contracting process because the energy savings guaranteed by ESCO against a baseline must be confirmed for savings payments to be made. Measurement and verification will be developed at both the project and program levels. Sections B.4.2 and C.1 and Annex 4.
- **Financing Plan:** Details of the project costs, budgets, and financing plan are described in Section C.1. and Table 2 of Section C.1. The project cost is US\$30.4 million. It will be financed with a GEF Contingent Grant Facility - \$3.6 million; GEF Guarantee Facility - \$2.0 million; GEF Technical Assistance - \$1.4 million; IBRD Loan - \$5.0 million; HEP (utility) equity - \$1.0 million; and Private and public investors - \$17.4 million.
- The PCN had provided for US\$5 million in contingent financing, but because we were all unfamiliar with how this was to be shown, it was not included in the total presented in the financing plan. When GEFSEC issued its pipeline entry review sheet, the GEF amount listed was only US\$4.8 million, presumably picking up only the items listed in project costs but not in the financing plan. If all the amounts had been taken into account for - the total GEF funding should have been listed as US\$9.8 million, US\$2.8 million more than is currently requested. The difference reflects the refinement of costs during further preparation.
- **Cost-effectiveness:** The proposed project design has benefited from international experience in utility-based ESCO models, sector works on energy efficiency financing, and

other similar IBRD, GEF and UNDP programs in the region – Sections B.4.2.

Alternatives for project design were evaluated and rejected – Section D.1. Based on the incremental analysis, the cost-effectiveness of the project (excluding replication potential) is US\$1.5 per ton of carbon – see Annexes 2 and 4 for details. This cost-effectiveness figure is at the mid- to upper-range of recent price-cost studies and reflects typical carbon emission credits from energy efficiency projects in industrial economies.

- **Core Commitments and Linkages:** The proposed project is consistent with the Bank's Country Assistance Strategy for Croatia which, inter alia, calls for the use of methods to attract private sectors in areas that have been seen as purely in the public domain -- Section B.1. The proposed project would benefit from the social assessment work conducted under the associated IBRD district heating project, which will provide inputs to design energy efficiency measures in low-income housing -- Section E.5.
- **Consultation, Coordination and Collaboration between IAs:** Consultation has taken place with USAID and an initial list of complementary activities and possible points of coordination have been identified with USAID's SE4 program. For example, USAID will consider financing capacity building for institutional clients to procure energy efficiency services under performance contracting -- Section B.3. Similarly, prior to UNDP-GEF's project submission, consultation has taken place with UNDP and coordination activities were agreed -- Section B.4.3. Further close coordination and information sharing with UNDP will be undertaken during project preparation and implementation. For example, the Bank and the UNDP will seek to select a common financial intermediary to manage the guarantee facility envisaged under each project, following criteria for use of guarantee funds consistent with each project's objectives. Combining oversight of the two facilities in one entity will promote learning, improve both programs' capacity to leverage private lending to the energy efficiency sector and may provide a more effective accountability for the uses and performance of the guarantee funds. The Bank and UNDP projects will be closely coordinated with a view to building expertise and demonstrating to a wide range of customers the short-term economic returns of energy efficiency investments. However, each project is designed to be implemented separately, without relying on the progress of the other. Information sharing with other GEF energy efficiency projects in the region is described in Section D.3.
- **Response to Reviews:**
  - **Responses to GEFSEC comments at time of pipeline entry:**
  - No significant private or public entity is actually developing energy efficiency projects in Croatia. Instead, the Government and donors are focused on identifying barriers to and opportunities in the energy efficiency market (see below). The proposed approach is appropriate in countries such as Croatia where risks are too high for private sector initiative and where public policies can create demand for private services in areas that have been seen as purely in the public domain. Moving forward with energy efficiency projects in the face of distorted tariffs is essential because such projects cut losses to the utility—so long as pricing reforms are carried out. The new Government is committed to enact new legislation, including pricing reforms (key EFSAL condition).

- There is no private or public entity currently developing and implementing energy efficiency investment projects in Croatia. However, there are a number of very valuable pre-feasibility studies, sector-specific market analysis and a broader barrier analysis that have been generated as stand-alone reports. The GEF-UNDP project is also an important complementary activity that will foster delivery of energy efficiency services to the commercial hotel sector in Croatia.
- Among the barriers to energy efficiency project implementation, the proposed project will address the lack of development funding and of know-how, with a view of long-term win-win energy efficiency goals.
- The proposed project will be cost-effective in using lessons learned and specific deliverables from the Poland – GEF Krakow Energy Efficiency Project to the degree they are valuable and relevant. In particular, the terms and conditions, performance milestones, and other elements of the financial intermediary in the Krakow project will be useful in the Croatian context. Replicability of “win-win” is highly likely because: (1) the market potential can accommodate a large number of activities (i.e. no crowding-out resulting from the proposed project); (2) the project will build independent capabilities through project partners; and (3) the GEF funds will remain in country, likely to be leveraged with other Government and private funds, to continue market development.
- Overall abatement opportunities within the system boundary are described in Annex 2, the Incremental Cost Annex, and Annex 4, Technical Background.
- Selection of the financial intermediary to administer the GEF guarantee facility, including due diligence guarantee documents and procedures and criteria for financial intermediaries and other entities, will be developed as part of project appraisal and agreed upon prior to GEF CEO endorsement.
- The project is premised upon performance contracting that requires risk-sharing among the participants, including the project sponsors, the end-users, and financial backers (lenders and equity investors). The “win-win” nature of the project would be demonstrated by the willingness of the utility (HEP), lenders, project sponsors and eventually end-users to commit scarce resources. In addition to the risk-sharing arrangement, and the related incentives, paid-out-of-saving projects using performance-based contracts create a partnership between the end-user, the banks, and the ESCO, all working towards a common objective to reduce the consumer’s utility bill.
- The project aims at creating an economically and environmentally sustainable market for energy efficiency goods and services. The project will establish a core market aggregator and developer, ESCO, to guide development of the market. The ESCO will rely on domestic partners—including service providers, banks, and equipment manufacturers—to exploit project opportunities. Technologies, risk sharing arrangement between project stakeholders, and financing mechanisms are specifically designed to achieve sustainability. In combination with the new legislation that will be enacted (see EFSAL condition), the project will leverage substantial and sustainable private sector financing in energy efficiency investments to tap into the large market potential. The sustainability issues that could

threaten the program's achievements are summarized Section F1. Section F2 identifies its critical risks and notes how they will be addressed.

- The proposed model is a utility-ESCO model in which energy performance contracting is combined with an institution with capabilities to aggregate projects and mobilize investment for the delivery of energy efficiency services. This is distinct from the ESCO model that turns around an independent third-party service provider that secures financing and negotiates performance risks around the performance contract. The barriers to the latter model are delineated in the PCD and in the barrier analysis completed by the Energy Institute. The utility-ESCO model will in fact complement the UNDP-GEF project's focus on developing ESCO capacities through project partnering (i.e. independent delivery of equipment and services under the aegis of the utility EE program).
- A comprehensive monitoring and evaluation plan, both at the program and project level, is briefly described in Annex 4, with details to be defined by appraisal and agreed upon prior to CEO endorsement. The plan will include monitoring and evaluation procedures, including target values of indicators for benchmarking and verification of achieved market penetration and global environmental benefits. Technical assistance will be provided during project implementation for the monitoring and evaluation activities.
- The lessons learned from preparation and implementation of this project will provide a learning ground for others that may want to design and implement similar IBRD/GEF-funded projects. Information provided in project performance reports will serve as a vehicle for dissemination of lessons learned on a regular basis throughout the supervision stage.

➤ ***STAP Review and Responses:***

- STAP Technical Review (completed on February 26, 2001) and responses to STAP comments are in Annex 3. To strengthen the preparatory work already undertaken, STAP Technical Reviewer has recommended further market research analyses covering: (i) an assessment of the market sectors most likely to be areas of successful growth and the development of outreach program and targeted approaches to market stimulation/transformation; and (ii) a review of models from other emerging economies to justify the estimation used for market penetration of performance-based EE measures in Croatia. These further market research will be carried out prior to GEF CEO Endorsement.

**Distribution:**

**Messrs.:** R. Asenjo, UNDP  
A. Djoghlafe, UNEP (Nairobi)  
K. Elliott, UNEP (Washington, DC)  
M. Gadgil, STAP  
M. Griffith, STAP (Nairobi)  
*Y. Xiang, CBD Secretariat*  
*C. Parker/M. Perdomo, FCCC Secretariat*  
*W. Kennedy, EBRD*

cc: Messrs./Mmes. Benmessaoud, Schreiber, (ECSEG); *Shepardson (RC)*; *Sharma, Khanna, Aryal (ENV)*; ENVGC ISC, Relevant Regional Files

## PROJECT BRIEF

### 1. IDENTIFIERS

PROJECT NUMBER	P071461
PROJECT NAME	<b>Croatia: Energy Efficiency Project</b>
DURATION	6 years
IMPLEMENTING AGENCY	The World Bank
EXECUTING AGENCY	Hrvatska Elektroprivreda (HEP, the Croatian electricity utility) for the IBRD Learning and Innovation Loan, GEF contingent grant, and GEF technical assistance; an independent financial intermediary for the GEF guarantee
REQUESTING COUNTRY	Croatia
ELIGIBILITY	Signed United Nations Framework Convention on Climate Change on 11 March 1999
GEF FOCAL AREA	Climate Change
GEF PROGRAMMING FRAMEWORK	Operational Program 5: Removal of Barriers to Energy Efficiency and Energy Conservation

---

### 2. SUMMARY:

The proposed project will make Croatia's economy less energy intensive by creating an economically and environmentally sustainable market for energy efficiency goods and services. The project will establish a utility-based energy service company (ESCO) to guide the development of the market. ESCO will rely on domestic partners—including service providers, banks, and equipment manufacturers—to exploit project opportunities. By creating such an energy efficiency market, the project will also reduce greenhouse gas emissions in Croatia. The project will focus on reducing two barriers to commercially sustainable energy efficiency projects and services: a lack of development and project financing, due to perceived risks among lenders and investors, and a lack of capacity and know-how among key stakeholders. The project will address these barriers through a World Bank (IBRD) Learning and Innovation Loan and a blend of grant and nongrant financing from the Global Environment Facility (GEF). A US\$5.0 million IBRD loan to the national power utility, HEP, will purchase goods and services that support ESCO activities. A US\$3.6 million GEF contingent grant will cover preparation costs for and early investment in the first pipeline of projects. A US\$2.0 million GEF partial risk guarantee will leverage commercial bank lending to ESCO and its projects. GEF technical assistance of US\$1.4 million will support training, monitoring and evaluation, and information and dissemination related to overall market development.

---

### 3. COST AND FINANCING (US\$ MILLION):

GEF:	Contingent grant facility	3.600
	Guarantee facility	2.000
	Technical assistance	1.400
	PDF Block B	<u>0.084</u>
	<b>SUBTOTAL</b>	<b>7.084</b>



<b>COFINANCING:</b>	IBRD loan	5.000
	HEP equity	1.000
	Private and public investors	<u>17.400</u>
	<b>Subtotal</b>	<b>23.400</b>
<b>TOTAL PROJECT COST:</b>		<b><u>30.484</u></b>

**4. OPERATIONAL FOCAL POINT ENDORSEMENT:**

**Name:** His Excellency Božo Kovacevic **Title:** Minister  
**Organization:** Ministry of Environmental Protection and Physical Planning  
**Date of endorsement:** July 25, 2000

**5. IMPLEMENTING AGENCY CONTACT:**

Rachid Benmessaoud  
Senior Energy Specialist, Energy Sector Unit, Europe and Central Asia Region  
Email: rbenmessaoud@worldbank.org  
Tel: (202) 473-2696  
Fax: (202) 477-7977

# CROATIA

# Project Concept Document

## Europe and Central Asia Region

Energy Sector Unit

<b>Date:</b> March 6, 2001 <b>Country Manager/Director:</b> Andrew Vorkink <b>Project ID:</b> P069381 <b>Lending Instrument:</b> Learning and Innovation Loan	<b>Team Leader:</b> Rachid Benmessaoud <b>Sector Manager/Director:</b> Henk Busz <b>Sector:</b> PY—Other Power & Energy Conversion VY—Other Environment <b>Poverty-targeted Intervention:</b> N																																		
<b>GEF Supplement ID:</b> P071461  <b>Instrument:</b> GEF grants	<b>Team Leader:</b> Rachid Benmessaoud <b>Sector Manager/Director:</b> Henk Busz <b>Sector:</b> PY—Other Power & Energy Conversion VY—Other Environment																																		
<b>Project Financing Data</b> <input checked="" type="checkbox"/> <b>Loan</b> <input type="checkbox"/> <b>Credit</b> <input type="checkbox"/> <b>Guarantee</b> <input checked="" type="checkbox"/> <b>Grant</b> <input checked="" type="checkbox"/> <b>Other</b> GEF contingent grant and partial risk guarantee facilities <u><b>For Loans/Credits/Other:</b></u> Total Project Cost: US\$30.4 million Total Bank Financing: US\$5.0 million                                      Cofinancing:        Yes																																			
<b>Financing Plan</b> <input type="checkbox"/> To be defined <table border="1"> <thead> <tr> <th>Source</th><th>Local</th><th>Foreign</th><th>Total</th></tr> </thead> <tbody> <tr> <td>IBRD Loan</td><td></td><td>5.0</td><td>5.0</td></tr> <tr> <td>HEP Equity</td><td>1.0</td><td></td><td>1.0</td></tr> <tr> <td>Public and Private Investors</td><td>17.4</td><td></td><td>17.4</td></tr> <tr> <td>GEF Contingent Grant Facility</td><td></td><td>3.6</td><td>3.6</td></tr> <tr> <td>GEF Guarantee Facility</td><td></td><td>2.0</td><td>2.0</td></tr> <tr> <td>GEF Technical Assistance</td><td></td><td>1.4</td><td>1.4</td></tr> <tr> <td><i>Total</i></td><td><b>18.4</b></td><td><b>12.0</b></td><td><b>30.4</b></td></tr> </tbody> </table>				Source	Local	Foreign	Total	IBRD Loan		5.0	5.0	HEP Equity	1.0		1.0	Public and Private Investors	17.4		17.4	GEF Contingent Grant Facility		3.6	3.6	GEF Guarantee Facility		2.0	2.0	GEF Technical Assistance		1.4	1.4	<i>Total</i>	<b>18.4</b>	<b>12.0</b>	<b>30.4</b>
Source	Local	Foreign	Total																																
IBRD Loan		5.0	5.0																																
HEP Equity	1.0		1.0																																
Public and Private Investors	17.4		17.4																																
GEF Contingent Grant Facility		3.6	3.6																																
GEF Guarantee Facility		2.0	2.0																																
GEF Technical Assistance		1.4	1.4																																
<i>Total</i>	<b>18.4</b>	<b>12.0</b>	<b>30.4</b>																																
<b>Borrower:</b> HEP (IBRD Loan, GEF Contingent Grant, and Technical Assistance) <b>Recipient:</b> Public and private sponsors of energy efficiency projects (GEF Guarantee) <b>Guarantor:</b> Government of Croatia <b>Responsible agencies:</b> HEP (IBRD Loan, GEF Contingent Grant, and Technical Assistance) Independent Financial Intermediary (GEF Guarantee)																																			
<b>Project implementation period:</b> 2002-06																																			

## **A. PROJECT DEVELOPMENT OBJECTIVES AND KEY INDICATORS**

### **A.1. Project objectives**

The proposed project will make Croatia's economy less energy intensive by establishing an economically and environmentally sustainable market for energy efficiency projects and services. It will do so by creating a core developer of energy efficiency projects within HEP, the national power utility. The new energy service company, ESCO, will promote, develop and finance energy efficiency projects. It will also contract turnkey installation and other project functions to local businesses. End-users will benefit immediately from facility improvements resulting from energy efficiency investments. End-users will be able to repay for the investments from the energy cost savings that ESCO guarantees.

All project risks—financial, credit, technical—will be shared among project participants, including ESCO, other energy service companies, energy efficiency equipment providers, commercial banks and other investors, and end users. ESCO will create demand for energy efficiency services and equipment from project participants and demonstrate the viability of performance-based contracting and investments paid for out of energy savings. The market for energy efficiency projects and services is expected to grow during and after the proposed project, and total market potential is much greater than what ESCO can capture on its own.

### **A.2. Key performance indicators (see also Annex 1)**

The performance indicators used to justify Development Objectives ratings during supervision include:

- Increased investment in energy efficiency projects, increased energy savings, and reduced greenhouse gas emissions.
- Market response to and user acceptance of the ESCO offerings.

The performance indicators used to justify Implementation Progress ratings during supervision include:

- Early initiatives generated by project development grants that lead to financial closures.
- Demonstrated risk sharing among ESCO, its clients, and commercial banks.
- Standard financial management and portfolio performance indicators for ESCO.
- Development by ESCO of energy efficiency products and services that deliver a growing range of technologies and reach more types of users.

### **A.3. Global objective and key performance indicators (see also Annex 1)**

The project's global environment objective is to reduce greenhouse gas emissions. Performance indicators for the global objective include:

- The number of projects reaching financial closure and the amount of cofinancing from private capital markets.
- Real reductions in carbon dioxide emissions at the national and project levels.

#### **A.4. Context within UNFCCC national communications**

The project will help Croatia's Government meet its international environmental obligations and has been endorsed by the GEF focal point. Croatia signed the UN Framework Convention on Climate Change on 11 March 1999 and is now completing a national communication on climate change activities. Croatia's National Environmental Action Plan calls for incorporating environmental protection costs in energy prices, encouraging the use of environmentally friendly fuels in thermal and electrical energy generation, and investing in energy efficiency.

#### **A.5. Project processing**

The project is scheduled for appraisal in October 2001 and World Bank Board approval in March 2002.

### **B. STRATEGIC CONTEXT**

#### **B.1. Sector-related Country Assistance Strategy goals supported by the project (see also Annex 1)**

**Document number:** 19280 HR

**Date of latest CAS discussion:** 11 May 1999

The project supports two of the objectives laid out in the Bank's Country Assistance Strategy for Croatia (and updated in the White Paper prepared for the new Government in 2000). The first is making the institutional changes and investments needed to ensure an efficient energy supply in an environmentally sustainable manner at realistic but socially acceptable prices. The second is achieving financial sustainability and efficient operations for public enterprises. The project will support both objectives by:

- Addressing market and institutional failures to promote energy efficiency and protect the environment.
- Increasing energy efficiency among private and public end users, leading to lower energy intensity, lower supply costs, and more affordable and competitive energy services.
- Establishing a utility-based energy service company (ESCO) to develop the market for energy efficiency projects.
- Creating opportunities for private providers of energy efficiency services as partners to ESCO.
- Maximizing local participation by creating incentives that increase funding for energy efficiency projects and mitigate the rigid collateral requirements imposed on these projects by local financiers.
- Managing the transition to competitive and affordable energy services, high consumer demand, efficient and financially viable energy service activity, and adequate management and regulatory oversight.

#### **B.2. GEF Operational Strategy/program objective addressed by the project**

The project is consistent with the objectives of GEF Operational Program 5: Removal of Barriers to Energy Efficiency and Energy Conservation. Section 5.7 of OP5 includes support for activities that remove barriers to achieve local, national, and global benefits.

### **B.3. Main sector issues and Government strategy**

Croatia is undergoing postwar recovery and aspires to energy security and competitive energy markets. Major energy sector restructuring and reform are being developed with support from the World Bank and, more recently, the U.S. Agency for International Development. But implementation has been slow. The sector needs transparent regulation, more competition and private sector participation, increased use of market mechanisms, and tariffs based on production costs. There also need to be concrete programs for increasing energy efficiency and developing renewable energy resources.

Since the war ended, electricity production has increased at all domestic power plants. Electricity imports have also increased dramatically, from 1,220 to 2,376 Gigawatt-hours per year. Demand for electricity and heat will continue to grow. Croatia meets two-thirds of its energy requirements from domestic production, mainly oil and gas. But domestic production of primary fuels is declining, and energy imports will need to increase considerably if economic recovery is to be sustained. Given the large investments needed to rebuild and expand energy infrastructure, the Government faces a big financial burden.

Private financing can ease this burden. In addition, energy resources will have to be used in ways that offer the highest value to the Croatian economy. To that end, energy intensity should be reduced through energy efficiency, conservation, and loss reduction efforts. Tariffs should cover the costs of supply and promote an optimal balance of fuel use while meeting social goals. Restructuring, regulatory reform, and privatization should be pursued to increase competition. And if subsidies are given to disadvantaged groups, they should be transparent and come directly from the Government budget.

Two vertically integrated gas (INA) and power (HEP) utilities dominate the sector. But despite high tariffs, the utilities' financial performance has been deteriorating. Investments have focused on repairing war damages rather than on modernization and expansion, undermining productivity and raising costs for users. This situation worsened in 2000 because of a steep increase in the price of imported fuels, a freeze on domestic energy tariffs (recently lifted), years of underinvestment and decapitalization, and delayed restructuring. In 2000 HEP is estimated to have lost US\$90 million on power and district heating activities. The company's financial situation could be even worse because collection performance is abysmal.

Inefficient heat-only boilers remain the main source of district heating. Design, construction, and installation practices—along with distorted prices and lack of enabling legislation—inhibit the development of less damaging energy supply and end-use facilities. Yet more energy-efficient products and services could save Croatia at least US\$215 million per year in energy costs, based on an expected simple payback of 3 years and cumulative investment cost of US\$650 million over the next six years. Some 25 percent of current energy consumption could be saved by improving primary district heating systems, and 30 percent by incorporating energy efficiency measures in the design, construction, and use of houses and buildings.

The previous Government's draft energy strategy included all key points of the Bank's 1998 Energy Sector Needs Assessment Report for in-depth reform of the Croatian energy sector. The strategy was presented to Parliament in mid-1999 but was not adopted. That strategy's objectives are "to assure an efficient energy supply in an environmentally sustainable manner at realistic but socially acceptable prices and to achieve financial sustainability and efficient operations of public enterprises." The new Government has included similar objectives in its energy action plan, adopted by the Parliament in July 2000.

A draft Energy Law addresses the key issues facing the sector. The draft calls for local authorities to participate in national energy efficiency programs and to establish energy efficiency action plans and report to the federal government on the savings achieved. In addition, the Government has invited USAID, under the SE4 Program, to support energy efficiency efforts. The proposed World Bank–GEF project will coordinate with the SE4 Program and help local authorities fulfill this new mandate.

#### **B.4. Sector issues to be addressed by the project and strategic choices**

##### *B.4.1. Barriers to energy efficiency*

No significant private or public entity is actually developing energy efficiency projects in Croatia. Instead, the Government and donors are focused on identifying barriers to and opportunities in the energy efficiency market. Among the barriers:

- *Lack of development and project financing.* In a survey of over 150 companies, 78% of the respondents cited the lack of development and initial project financing as the main barrier. The risk of development costs for small energy efficiency projects can be quite high, particularly during initial period during which new firms develop capacity and expertise. In addition, the credit-worthiness of end-users, who pledge assets as well as revenues streams for energy efficiency investments, is either weak or unknown. As a result, no financial institutions are known to be pursuing business in the sector, especially after the banking crisis during 1992-97, although several local and international banks have expressed interest in making energy efficiency loans based on the risk-sharing arrangements proposed under the project.
- *Lack of capacity and know-how among key stakeholders.* Service and equipment suppliers (including HEP), lenders, investors, users, and other potential actors are unwilling or unable to learn more about the structure, financing, and benefits of energy efficiency projects. Such knowledge is crucial for the sector to become commercially sustainable.
- *Lack of consumer-driven demand.* Despite the significant potential, users—municipalities, private industries, commercial building owners, residential building occupants—do not have enough information to make decisions about investing in energy efficiency projects.

##### *B.4.2. Strategic choices*

The proposed project will address the first two of these barriers—lack of development and project financing and lack of capacity and know-how—because they can be overcome by creating a utility-based ESCO supported by a contingent grant, guarantee, and technical assistance. Another project sponsored by the United Nations Development Programme (UNDP) and GEF will address lack of consumer-driven demand (see below).

*Choice of utility-based ESCO.* The utility-based ESCO model suits Croatia because it will help organize the market for energy efficiency equipment and services, create business opportunities, mobilize financing, facilitate growth, and remove market barriers. This approach will also complement and promote private initiatives. The expected project finance budget for ESCO is US\$20 million over three to four years, or some 3 percent of the US\$650 million investment cost of the potential market for energy efficiency products and services. HEP owns or manages many of the assets that can benefit from energy efficiency activities, so the utility ESCO model will attract private partners that can serve project needs (for equipment, technical services, engineering, and so on). In doing so, the project will transfer skills and know-how to project partners who can pursue independent initiatives thereafter.

*Choice of markets.* Among its clients and assets, HEP lists municipal buildings, municipal district heating systems, heat-only boiler systems, and municipal street lighting. ESCO's financial capacity will not be able to reach much beyond targeted assets in these sectors. But by creating core demand for energy efficiency equipment and services for near-term project opportunities and contracting other service providers for other market segments, a utility ESCO approach has the best chance of establishing an enduring, self-sustaining market for energy efficiency in Croatia.

*Choice of funding mechanisms.* The selected funding mechanisms will address the barriers identified above:

- The IBRD Learning and Innovation Loan will help cofinance energy efficiency projects carried out by ESCO. The loan will be used to procure capital investment that enable ESCO to perform its obligations under Energy Service Performance Contracts with end-users. IBRD cofinancing will be disbursed in cofinancing arrangements with local banks and will be declining over time to ensure sustainable commercial financing.
- The GEF contingent grant is optimal for providing early funding because if the project succeeds the funds can be recycled to other elements of ESCO's development activities, such as audits and initial investments. Moreover, such activities will increase learning and know-how.
- The GEF partial credit risk guarantee can leverage considerable private financing with relatively little commitment and expense. Commercial lending must be mobilized to finance the ESCO and other project activities introduced by energy service companies, equipment providers, and users.
- GEF technical assistance was chosen to build capacity among stakeholders, including ESCO staff, users, energy service traders, commercial banks, non-government organizations (NGOs), and government agencies. GEF environmental monitoring and reporting costs and dissemination of project results and best practices will also be supported with technical assistance.

#### *B.4.3 Complementarity with proposed UNDP-GEF activity*

The proposed Bank project and the UNDP's "Removing Barriers to Improving Energy Efficiency of the Residential and Service Sectors" offer complementary support for Croatia's energy program (Table 1). Both projects focus on overcoming barriers to energy efficiency, and both will pursue GEF objectives. The Bank and the UNDP will seek to select a common financial intermediary to manage the guarantee facility envisaged under each project, following criteria for

use of guarantee funds consistent with each project's objectives. Combining oversight of the two facilities in one entity will promote learning, improve both programs' capacity to leverage private lending to the energy efficiency sector and may provide a more effective accountability for the uses and performance of the guarantee funds.

The Bank project will support energy efficiency financing by creating a core developer of projects (ESCO), by mobilizing commercial financing and by implementing energy efficiency investments following performance-based contracting principles. The UNDP is proposing transaction-specific contingent grants and other market mechanisms to overcome barriers to implementing specific technologies in identified regions. The UNDP project will provide lessons and best practices for users, drawing on programs that cover an entire service sector (such as tourism) and many residential energy consumers.

The two projects are not duplicative because they target specific sectors, use distinct technologies, work in separate geographic areas, engage different GEF modalities, and contain replicable activities beyond their initial technological and regional specificity. Both projects will be closely coordinated with a view to building expertise and demonstrating to a wide range of customers the short-term economic returns of energy efficiency investments. However, each project is designed to be implemented separately, without relying on the progress of the other.

**Table 1: World Bank and UNDP projects in Croatia**

	<b>World Bank</b>	<b>UNDP</b>
Sector	<ul style="list-style-type: none"> <li>Public buildings (office buildings, hospitals, schools, public residential buildings)</li> <li>Commercial buildings</li> <li>Private residential buildings</li> <li>Public lighting</li> <li>Electricity distribution</li> <li>District heating (heat-only boilers and combined heat and power)</li> </ul> <i>Coverage: nationwide</i>	<ul style="list-style-type: none"> <li>Tourism services (hotels) and some residential sectors</li> </ul> <i>Coverage: Istria and Rijeka regions</i>
Technology	<ul style="list-style-type: none"> <li>Better heating systems and heat demand management (building efficiency)</li> <li>Cogeneration</li> <li>Public lighting systems</li> <li>Integrated end-user efficient energy systems</li> </ul>	<ul style="list-style-type: none"> <li>Electricity, heat, and water consumption in hotel services, including use of solar panels</li> <li>Compact fluorescent lighting and energy-efficient appliances in private residences</li> </ul>
GEF modality	<ul style="list-style-type: none"> <li>Contingent grant</li> <li>Partial risk guarantee backing commercial lenders, end users and other project partners and energy service providers</li> </ul>	<ul style="list-style-type: none"> <li>Contingent grant</li> <li>Partial risk guarantee backing end users</li> </ul>

## **C. PROJECT DESCRIPTION SUMMARY**

### **C.1. Project description and components**

The project has the following four main components.

*Energy efficiency capital investments (US\$23 million, including a US\$5.0 million IBRD LIL Loan):* HEP will use the US\$5 million IBRD loan to procure energy efficiency capital investments—mainly equipment and installation services—for ESCO (Table 2). ESCO will implement these investments under energy performance service contracts. Local banks will



cofinance these investments with commercial loans of US\$6 million to ESCO and US\$11 million to users and service providers. HEP will contribute US\$1 million in equity financing (in kind and in cash). All project financing costs will be repaid from project savings.

*Project development costs and early ESCO activities (GEF contingent grant of US\$3.6 million).* The contingent grant will be used to identify potential customers and to cover initial project financing. These activities are expected to require US\$1.2 million for audit and post-audit project preparation and US\$2.4 million in capital investment at financial closure. These costs will be capitalized in the project financing if and when financial closure occurs. Only if projects do not move to implementation will the contingent grant become unrecoverable and considered an incremental cost to the project activity. The contingent grant will enable ESCO to quickly demonstrate the viability of energy efficiency projects based on performance contracting.

*Enhancing the creditworthiness of ESCO, project developers, and users (GEF partial risk guarantee of US\$2.4 million).* Two distinct credit enhancement facilities, consisting of US\$2.0 million GEF funds matched by US\$ 0.4 million in matching domestic funds, are proposed to address perceived credit risks associated with the project. The facilities will be phased to meet emerging market needs for credit enhancement. First, an ESCO guarantee trust of US\$800,000 in GEF funds addresses the end-user credit risks which ESCO will be exposed to in conducting its business and financing projects directly. The guarantee trust will partially buy down the risk of a larger syndicated loan to ESCO of about US\$6 million and will ensure early involvement of local banks in cofinancing energy efficiency projects. Second, the partial risk guarantee facility works with local banks to share in the end-user credit risk of energy efficiency loans these banks make with their own funds. The partial risk guarantee reserve of US\$1.2 million in GEF funds and US\$0.4 million in matching domestic funds will leverage about US\$11 million in commercial lending for energy efficiency projects.

*Training, information dissemination, outreach, and monitoring and verification (GEF technical assistance of US\$1.4 million).* GEF technical assistance will be available to ESCO staff and project partners, to other energy efficiency businesses, to the financial intermediary executing the GEF guarantee facility, and to appropriate nonprofit or consumer groups.

**Table 2: Project costs (millions of U.S. dollars)**

Component (according to financing mechanism)	Category	Indicative costs		Financing plan				
		Amount	Share of total	IBRD	GEF	HEP	Local banks	Total
Energy efficiency capital investments	Capacity building	23.0	75%	5.0		1.0	17.0	23.0
Project development costs and early ESCO activities (GEF contingent grant )	Barrier removal (lack of early funding and project finance)	3.6	12%		3.6			3.6
Enhancing the creditworthiness of ESCO, project developers, and users (GEF partial risk guarantee)	Barrier removal (lack of commercial lending)	2.4	8%		2.0		0.4	2.4
Training, information dissemination, outreach, and monitoring and verification (GEF technical assistance)	Institutional development	1.4	5%		1.4			1.4
<b>Total</b>		<b>30.4</b>	<b>100%</b>	<b>5.0</b>	<b>7.0</b>	<b>1.0</b>	<b>17.4</b>	<b>30.4</b>

## C.2. Key policy and institutional reforms to be sought

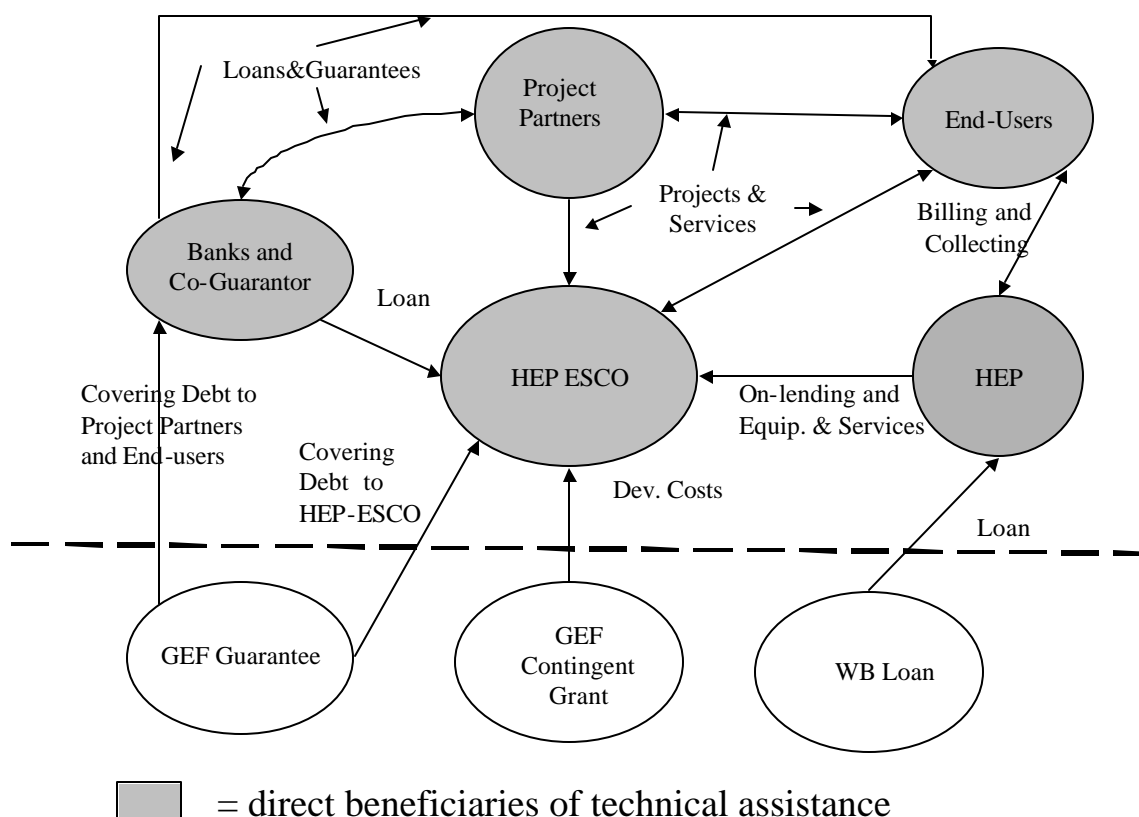
The Bank's ongoing support to the Croatian energy sector is built around the objectives of the Enterprise and Financial Sector Adjustment Loan (EFSAL) covering restructuring of public utilities, preparing for privatization, and establishing a new regulatory framework. The proposed project will build on the pricing policy in the draft energy law, which provides for full cost recovery for energy services and elimination of cross-subsidies among users. By reducing energy intensity and consumption in the targeted areas, the project will help the authorities in setting retail electricity and heat tariffs at the right level.

## C.3. Benefits and target populations

Project benefits include electricity and heat savings that lower energy costs and cut local and global air pollution, and improved quality, affordability, and competitiveness of energy generation and delivery in key markets. Project beneficiaries include users of thermal and electric energy, project partners such as small energy service providers and equipment manufacturers and installers, local and national banks, regional and municipal authorities, and the country as a whole (Figure 1).

The first groups to benefit will likely be residents and small firms in Zagreb and Osijek, because the project will initially focus on those cities. Likely initial projects will involve public lighting and retrofits of public housing, buildings, hospitals, and schools. Early replication is expected to follow in private housing, office buildings, and industry.

**Figure 1: Project participants and beneficiaries**



## **C.4. Institutional and implementation arrangements**

### *C.4.1 Implementation arrangements*

HEP will be the borrower of the IBRD loan, with the sovereign guarantee of Croatia, and will be responsible for repaying it. HEP and ESCO will be the recipients of the GEF contingent grant and part of the GEF technical assistance. HEP will coordinate project activities and assume all fiduciary responsibilities for the use of IBRD and GEF funds. ESCO will be responsible for implementing energy efficiency capital investments and for managing and distributing GEF technical assistance, even for activities benefiting other project partners. ESCO will be assisted by external consultants. A domestic financial intermediary, not yet selected, will act as trustee of the GEF contingent grant and guarantee facilities and will implement related activities.

### *C.4.2 Utility-based ESCO*

ESCO is being created to develop, implement, and finance energy efficiency projects on a commercial basis. Its legal separation from HEP allows ESCO to respond to an untapped market and to seek private participation independently from its parent company. ESCO will build on the many strengths of its parent utility, especially in finance, marketing, billing and collections, and services (street lighting, district heating). ESCO will organize a network of project partners—including a strategic partner that can help build its capacity.

### *C.4.3 Involvement of NGOs, local banks, and local businesses*

General energy efficiency market development activities are needed to build public awareness. A Croatian NGO (to be selected during appraisal) will implement this activity, which will support ESCO's marketing efforts.

ESCO will also arrange a project debt facility with up to three domestic commercial banks. ESCO's energy efficiency projects, and related assets and revenues, will secure these loans. In addition, HEP is guaranteeing part of the first loans. Several commercial banks have expressed interest in lending to ESCO. In addition, local commercial banks will be solicited to finance energy efficiency projects directly to users. This activity will be promoted through a finance guarantee facility.

Energy efficiency businesses, local and international, will be the main implementers of projects developed by ESCO. These businesses will be the target of business development training activities supported by GEF. Further, they will be encouraged to develop energy efficiency projects independently of ESCO.

### *C.4.4 Progress to date and need for additional preparation*

The utility-based ESCO concept is well developed. Local and international consultants have played a large role in project preparation, supported by government agencies, energy efficiency businesses, and financial institutions. HEP management is expected to approve the ESCO business plan in March 2001, at which time ESCO will be legally incorporated.

But additional funding is needed to complete project preparation. The market assessment and project pipeline need to be refined to identify near-term investment requirements. In addition, ESCO needs help in establishing terms of use for GEF funds and setting up an accounting system for grants. Another critical task involves identifying and selecting the escrow agent and financial intermediary. Finally, the project should strengthen information sharing with similar GEF and IBRD activities in Latvia, Lithuania, Poland, and Romania.

## **D. PROJECT RATIONALE**

### **D.1. Project alternatives considered and reasons for rejection**

The option of creating separate and competing ESCOs was considered, but for several reasons it was rejected. First, ESCOs are still a novelty in Croatia, and local banks are reluctant to provide long-term financing to new private businesses and are unable to provide nonrecourse project financing. Second, any new ESCO pursuing energy efficiency projects in Croatia without a track record in performance contracting and without a strong customer base will have trouble getting commercial financing. Finally, developing an ESCO industry would require significant resources for training and capacity building. Moreover, private investors are unlikely to venture equity up-front in such new business activities.

The idea of promoting energy conservation by HEP through consumer rebates or subsidies was rejected for two reasons. First, HEP could not sustain a rebate program at this time. Second, the project sought to avoid dependence on consumer subsidies to implement energy efficiency programs. Instead market mechanisms will be strengthened.

Also rejected was a simple line of credit through financial intermediaries to support energy efficiency investments. Experience with World Bank projects in Poland and elsewhere involving credit lines, including for energy conservation, indicates that such projects have suffered from slow disbursements or cancellation of funds.

### **D.2. Major related projects financed by the Bank and other development agencies (completed, ongoing, and planned)**

Sector issue	Project	Latest supervision rating (Bank-financed projects only)	
		Implementation Progress	Development Objectives
<b>Financed by the Bank</b>			
Financial and enterprise sectors and utilities	Enterprise and Financial Sector Adjustment Loan (EFSAL)	Satisfactory	Satisfactory
	Technical Assistance Loan 1 (TAL1)	Satisfactory	Satisfactory
	Technical Assistance Loan 2 (TAL2)	Satisfactory	Satisfactory
National Environmental Action Plan	IBRD (IDF Grant)	Satisfactory	Satisfactory
<b>Financed by other development agencies</b>			
Power distribution reconstruction and rehabilitation	EBRD - Power Project		
South-East European Energy Efficiency (SE4) Program (*)	USAID	Not Applicable	Not Applicable
Removing Barriers to Improving Energy Efficiency of the Residential and Service	UNDP-GEF	Not Applicable	Not Applicable

Sectors			
---------	--	--	--

Note: (\*) Meetings were held in November 2000 with representatives of USAID's SE4 program, and an initial list of complementary activities and possible points of coordination have been identified.

### **D.3. Lessons learned and reflected in proposed project design**

#### *D.3.1 For the utility ESCO model*

Project design and implementation will draw on utility ESCO models in Canada, Poland, and the United States, and on the Energy Sector Management Assistance Program (ESMAP) on energy efficiency funds. Public utilities in North America have used the ESCO approach to achieve substantial energy savings and to provide valuable services to customers. Transferring this know-how is a critical objective of the training foreseen under GEF's technical assistance. ESMAP shows that utility-based demand-side management programs like the Croatia project are appropriate in countries where risks are too high for private sector initiative and where public policies can create demand for private services. ESMAP also highlights the importance of moving forward with energy efficiency projects in the face of distorted tariffs because such projects cut losses to the utility—so long as price reforms are carried out.

The project will also benefit from other international experience with energy efficiency and environmental investments, and from similar Bank and GEF projects in the region (such as the UNDP-GEF Romania Energy Efficiency Project, UNDP-GEF Removing Barriers to Improving Energy Efficiency of the Residential and Service Sectors in Croatia, and the World Bank – GEF Krakow Energy Efficiency Project in Poland).

#### *D.3.2 For the GEF contingent grant facility*

There is not much experience on which to base expectations about the performance of the GEF contingent grant facility proposed for this project. The recently endorsed Romania Energy Efficiency Project will have a contingent grant facility, providing an opportunity to share information. There will also be opportunities to share information with the Krakow Energy Efficiency Project. Other experience with contingent grants for early project development has been gathered from the International Finance Corporation's (IFC's) Small and Medium Enterprise Program (SME Program).

#### *D.3.3 For the GEF partial risk guarantee facility*

Several IFC programs have taken innovative approaches to incremental risk and leverage of GEF funds with private financing. The SME Program and the Hungary Energy Efficiency Cofinancing Program show what can be achieved with nongrant mechanisms to attract private investors. Lessons from these and other programs are being incorporated in the proposed Croatia project.

### **D.4. Indications of borrower commitment and ownership**

In June 2000 HEP's new senior management reconfirmed HEP's interest in Bank support for the project, including endorsement of the plan for forming and operating the ESCO company. A very capable ESCO management team is now leading this effort. In addition, the Government is formalizing its commitment to energy efficiency improvements in a comprehensive new Energy Law. USAID is currently providing technical assistance support to help finalize the new energy

legislation and set up a new energy regulatory agency. The new Government has also demonstrated its commitment to sector reforms and, in particular, to meeting the key EFSAL condition related to the enactment of regulations providing for an adequate regulatory framework for public utilities and the establishment of regulatory agency(ies). Finally, all potential project partners and financial institutions as well as potential end-users surveyed are eager to cooperate with project implementation.

#### **D.5. Value added of Bank and global support in this project**

Local banks, private and public utility customers, and potential investors are reluctant to move forward in the absence of demonstrable success in developing energy efficiency projects. The Bank's involvement is essential to add credibility to local authorities' efforts to increase energy efficiency and reduce dependence on energy imports. The Bank's involvement will enable an economically and environmentally sustainable market for energy efficiency goods and services to flourish.

GEF's leading role in the project is critical to overcoming barriers to efficient use of energy resources through commercially sustainable activities. Without GEF participation, ESCO will not be able to establish itself as a core developer of projects that benefit project partners and end users. And without GEF participation there will be no significant resources to build knowledge about energy efficiency among users and to address the lack of energy efficiency business experience among firms, banks, and other potential project sponsors. Similarly, GEF nongrant modalities address the risks associated with weak user creditworthiness and other risks in project financing. Ultimately, GEF support will lead to sustainable, long-term reductions in greenhouse gas emissions and help Croatia join modern industrialized nations in efforts to reduce global pollutants.

### **E. ISSUES REQUIRING SPECIAL ATTENTION**

#### **E.1. Economic**

Economic evaluation methodology:

☒ Cost-benefit      ☐ Cost effectiveness      ☒ Incremental cost      ☐ Other [specify]

A cost-benefit analysis will be carried out as part of project preparation. The main economic benefits of the project will be energy savings, reduced energy demand, and improved local and global air quality. The incremental costs and global environmental benefits of the GEF component are estimated in Annex 2 and will be refined during further project preparation.

#### **E.2. Financial**

Financial analyses will be developed for both HEP and ESCO, and financial covenants to support prudent financial management will be agreed to at appraisal. The ESCO business plan is developing project cash flows and accounting treatments with the expectation that HEP will be the borrower of the World Bank loan. The need for reporting and control of ESCO funds and operations will be agreed to at appraisal and included in the Project Implementation Plan.

ESCO corporate operations and project development expenses will be funded from several sources. HEP will cover corporate staff and overhead costs for the first two ESCO operations. ESCO expenses for energy audits and project development will be funded by GEF for the first portfolio of commercial projects, to be implemented over three to four years. Thereafter, those

costs must be funded from ESCO revenue and working capital. GEF funds will also cover costs related to training and development of ESCO business tools.

ESCO projects will be financed with equity, GEF contingent grant, and debt. Equity will come from HEP. Debt will mainly involve domestic commercial bank loans (guaranteed by HEP) plus a loan to ESCO made with part of the World Bank loan to HEP. World Bank loan and GEF funds will be disbursed in accordance with normal Bank procedures. The ESCO's business is being planned so that its capital structure can evolve in several significant ways.

During project preparation, the project team will select a financial intermediary to administer the contingent grant and partial risk guarantee facilities, co-fund the guarantee facility to leverage the GEF component, and act as a trustee for ESCO, project sponsors, and World Bank and GEF. Combining oversight of the two facilities in one entity may provide a more effective accountability for the uses and performance of the contingent grant funds.

Apart from the contingent liability associated with guaranteeing the Bank loan to HEP, the project poses no negative fiscal impacts for the Government. HEP operates on a commercial basis and will be able to generate enough revenue from the ESCO operations to pay the loan.

### **E.3. Technical**

The project will use proven, commercially viable energy efficiency technologies, including for power factor correction, peak load shaving and load management, interior lighting, street lighting, electric motors, heat meters, boiler controls, and small cogeneration systems. Working with its project partners, ESCO will offer equipment and services that can be sold to a broad range of customers.

### **E.4. Institutional**

Critical legal, taxation, and institutional issues for HEP and ESCO are discussed in the ESCO business plan. Additional issues will be worked out during project preparation.

### **E.5. Social**

There are no critical social issues related to the project, as the project's impact is expected to be socially positive. The social assessment and affordability work proposed under an IBRD-financed Croatia District Heating Project will identify issues affecting energy services for the poor and strategies needed to meet their energy needs, and will provide valuable inputs for this project to design energy efficiency programs in low-income housing.

## **E.6. Environmental**

a. *Environmental issues.* No major adverse environmental issues are associated with the project.

b. *Environmental category:* FI (Financial Intermediaries)

c. *Justification/rationale for category rating*

All project components should substantially reduce the use of fossil fuels or replace polluting fuels with cleaner fuels. There may be some minor adverse effects during construction and replacement activities.

d. *Status of Category Assessment:* Not applicable

e. *Proposed actions*

During project preparation the project team will evaluate Croatia's environmental laws and institutions to assess potential environmental issues associated with subprojects to be supported by the project. In addition, an Environmental Management Plan prepared by the borrower will describe the institutional arrangements and procedures for environmental screening and analysis to ensure that subprojects receive scrutiny in compliance with Croatian and World Bank environmental policies and procedures.

f. *Status of any other environmental studies:* Not applicable

g. *Local groups and NGOs consulted:* See section E.7

h. *Resettlement:* None

i. *Borrower permission to release EA:* Not applicable

j. *Other remarks:* None

## **E.7. Participatory approach**

a. *Primary beneficiaries and other affected groups*

Efforts are under way to inform the public and to engage key stakeholders. Further public participatory activities are envisaged during project preparation and will be funded by Japanese PHRD grant. ESCO will be asked to develop an outreach program to share information with the UNDP-GEF energy efficiency project (see above) and to bring together focus groups of users and project developers. An NGO will be engaged to facilitate this activity.

The project's key stakeholder groups are direct beneficiaries (municipal building managers, district heating system managers, housing cooperatives, businesses, public service facilities such as schools, hospitals, and governments), other affected groups (small business associations, energy efficiency service providers, municipal heating system managers, building designers,



manufacturers of energy-efficient equipment and materials, project service providers, financial organizations), and other stakeholders (local advocacy groups, students, officials and key staff of city and regional governments, engineers).

b. *Other key stakeholders:* See above

## **E.8. Checklist of Bank policies**

a. *Safeguard policies (check applicable items):*

<b>Policy</b>	<b>Risk of noncompliance</b>
Environmental assessment (OP 4.01)	Low
Natural habitats (OP 4.04)	Not Applicable
Forestry (OP 4.36)	Not Applicable
Pest management (OP 4.09)	Not Applicable
Cultural property (OPN 11.03)	Not Applicable
Indigenous people (OD 4.20)	Not Applicable
Involuntary resettlement (OD 4.30)	Not Applicable
Safety of dams (OP 4.37)	Not Applicable
Projects in international waters (OP 7.50)	Not Applicable
Projects in disputed areas (OP 7.60)	Not Applicable

b. *Business policies (check applicable items)*

- ☐ Financing of recurrent costs (OMS 10.02)
- ☐ Cost sharing above country three-year average (OP 6.30, BP 6.30, GP 6.30)
- ☐ Retroactive financing above normal limit (OP 12.10, GP 12.10)
- ☒ Financial management (OP 10.02, BP 10.02)
- ☐ Involvement of NGOs (GP 14.70)

c. *Describe issues involved not already discussed above:* Not applicable

## **F. SUSTAINABILITY AND RISKS**

### **F.1. Sustainability and Replicability**

The project will contribute to the sustainability of energy efficiency services in Croatia by creating new and better services, increasing the number and size of new commercially viable projects, and reducing the risks associated with energy efficiency activities. The overall sustainability of the energy efficiency market rests on rational energy pricing and development, including rational tariffs, loss reductions, and privatization. These goals are included in the proposed draft Energy Law.

The proposed project is sustainable because the IBRD and GEF financing modalities are developed and phased to overcome barriers to energy efficiency. *In a first phase*, ESCO will finance energy efficiency projects with the IBRD loan and the syndicated loan to ESCO leveraged by the GEF guarantee facility. The project finance budget for the first phase is US\$15.6 million. *In a second phase*, as ESCO establishes its expertise and end-users benefit from implementation

results of the first ESCO-financed projects, local banks will be solicited to finance ESCO-sponsored projects with loans directly to users and leveraged by the GEF guarantee facility. The project finance budget for the second phase is US\$4.4 million. *In a third phase*, as the energy efficiency market develops, the GEF guarantee facility will be available to leverage commercial loans to finance projects sponsored by other emerging service providers. The project finance budget for the third phase is US\$6.6 million. *In all three phases*, the GEF contingent grant will be available to finance development activities carried out by ESCO and other service providers. The flow of funds during project implementation is presented in Annex 5.

As relevant experience and parameters on specific project transactions become available, the terms and impact of the GEF guarantee in particular will be reviewed regularly and adjusted to local banks' prevailing needs for credit enhancement. This flexibility and periodic re-evaluation of the GEF guarantee will be crucial to ensure that the proposed financing mechanism fits the emerging market conditions and opportunities in energy efficiency financing and enable a competitive participation of commercial banks in financing energy efficiency investments.

The proposed project is also sustainable because it requires participation by independent actors—financial institutions, energy service and equipment providers, project sponsors, and users—who are pursuing commercially viable development of the energy efficiency market, with each actor retaining and adjudicating the specific project risk within its core business competency. Project activity in Croatia will be replicated on a commercial basis after the GEF program ends. Lending to users should continue to grow as financial intermediaries gain experience with the performing loans in their portfolios.

At project completion, the estimated direct cost of the project is about US\$2.0 million in GEF funds. This includes: the cost of management and unrecovered partial guarantee reserves, the lost contingent grants in projects that do not reach financial closure, and the technical assistance for project support – See Annex 4. The estimated balance of funds in the GEF contingent grant (US\$3.4 million) and partial risk guarantee facility (US\$1.6 million) will remain in Croatia after project completion. All remaining GEF funds will become available to energy efficiency development activities led by ESCO and other emerging market players. ESCO will manage and distribute GEF contingent grant funds, with commensurate fiduciary responsibility and accountability. If the market grows as anticipated, the financial intermediary involved may be able to establish an energy efficiency investment and guarantee fund that is replenished by energy efficiency companies and matched in some proportion by Government contributions. Such a replication strategy for the GEF funds will be developed during project preparation and specified in the implementation agreement. The flow of funds after project completion is presented in Annex 5.

The Croatian experience is expected to demonstrate that, as the economy develops and sector reforms are carried out, boosting short-term demand and promoting early commercialization and in-country replication of clean energy efficiency technologies and services has high prospects for long-term market penetration and for reducing greenhouse gas emissions. This experience is also expected to demonstrate the short-term economic returns of energy efficiency investments; the benefits of a 'win-win' relationship between service companies, lenders, and customers, involving financing and risk sharing arrangements under energy performance contracts; the development, training needs and role of key emerging project partners; and the benefits of public access to high-quality data about technologies, services, and project design and performance.

This experience is replicable in other countries of the region (for example, EU accession countries) where domestic commercial financing for energy efficiency could be made responsive to the proposed GEF non-grant modalities (contingent grant and partial risk guarantee). To enhance the replicability of the project, a website on project outcomes and regional workshops involving bilateral and multilateral donors, country officials and private investors are envisaged during implementation and will be financed by the GEF technical assistance funds. The replication strategy beyond Croatia will be firmed up during project preparation.

**F.2. Critical risks (reflecting assumptions in the fourth column of Annex 1 and including availability of GEF partial risk guarantee)**

<b>Risk</b>	<b>Risk rating</b>	<b>Risk minimization measures</b>
<b>Annex 1: From outputs to objective</b>		
Projected savings are not achieved	Substantial	<ul style="list-style-type: none"> <li>• During project development, deploy engineering and financial consultants using best practices</li> <li>• Retain a strategic partner, allowing ESCO to tap the experience of an international partner at or prior to startup</li> <li>• Compare savings predictions against industry benchmarks during project due diligence and as a condition for contingent grant</li> <li>• Share risks among technology providers, service providers, and project sponsors</li> </ul>
Price signals do not motivate service providers and consumers to implement a full range of energy-saving measures	Modest	<ul style="list-style-type: none"> <li>• Adapt energy efficiency projects, particularly performance contracts, to the project's economic circumstances</li> <li>• Continue Bank and other donors' assistance support to finalize the draft energy legislation covering pricing reforms (key EFSAL condition – see Section D.4).</li> </ul>
Energy consumers are not willing to purchase energy efficiency services	Substantial	<ul style="list-style-type: none"> <li>• Offer sales commissions to project partners for successfully closed projects</li> <li>• Have utility introduce savings plans and measures as part of basic service, at no cost to users, with billing and collections through utility collections system</li> <li>• Disseminate information on investment and project successes to consumers</li> <li>• Rely on GEF contingent grant to reduce costs to users by covering project preparation</li> </ul>
Market-based skills are not adapted and used by technically trained specialists	Modest	<ul style="list-style-type: none"> <li>• Provide GEF technical assistance to key ESCO staff and project partners</li> <li>• Select project partners based on skills and capabilities</li> <li>• Retain a strategic partner, allowing ESCO to tap the experience of an international partner at or prior to startup</li> </ul>
Payback periods on financing terms are not acceptable to service providers and consumers	Substantial	<ul style="list-style-type: none"> <li>• Select cost and type of savings measures based on economic attractiveness and taking into account prevailing financing terms</li> <li>• Use partial risk guarantee to enable more flexibility in financing, resulting in more attractive payback periods</li> </ul>
<b>Annex 1: From components to outputs</b>		
HEP does not contribute enough equity financing	Modest	<ul style="list-style-type: none"> <li>• Make investment in energy efficiency projects explicit in HEP development plan, requiring budget allocation for equity stake in ESCO</li> <li>• Commit HEP in-kind equity (purchases of equipment and services) gradually on project-by-project basis</li> <li>• Other sources of equity investment, such as strategic partner, may provide financing</li> </ul>

Local banks are not willing or able to cofinance energy efficiency projects	Substantial	<ul style="list-style-type: none"> <li>Engage one bank for early involvement in a project to demonstrate sales potential</li> <li>Introduce energy performance contract concept to the banking industry during preparation phase</li> <li>Work with local banks to arrange financing for energy efficiency service providers and their clients</li> <li>Provide training and partial risk guarantee to numerous local banks to incite competition based on economically attractive ESCO projects</li> <li>Select a financial intermediary with significant coguarantee or investment capacity and ability to contribute funds to the reserve</li> <li>Assess banks' lending capacity relative to financing requirements for ESCO portfolio</li> </ul>
Public institutions do not view paid-out-of-savings performance contracts as operating budget expenditures	Substantial	<ul style="list-style-type: none"> <li>Work with public administration and management (through HEP contracts and government agencies) to support new accounting for paid-out-of-savings investments</li> <li>Work with Government bodies to support concept, including the Ministry of Economy on draft Energy Law</li> </ul>
HEP management is not cost conscious in the use of contingent grant	Negligible	<ul style="list-style-type: none"> <li>Share costs whenever possible and impose strict oversight and accountability on use of grant funds</li> <li>Require reviews by different parties of initial projects benefiting from grants</li> </ul>
Default rate of energy service providers and end users on guaranteed loans exceeds anticipated level	Negligible	<ul style="list-style-type: none"> <li>Ensure that estimates for structuring guarantees and loans are based on real market figures</li> <li>Monitor default rates during project implementation, checking against projections and comparable market benchmarks</li> <li>Co-share guarantee exposure with strict oversight and accountability for use of guarantee funds</li> <li>Maintain conservative rules and guidelines for guarantee management and have them reviewed by experts with knowledge of Croatian market</li> </ul>
<b>Overall risk rating</b>	<b>Substantial</b>	

## **G. PROJECT PREPARATION AND PROCESSING**

### **G.1. Has a project preparation plan been agreed with the borrower (see Annex 2)?**

Under Preparation.

### **G.2. Advice/consultation outside country department**

Within the Bank:

EASEG team for China—Energy Conservation Project  
 ECSSD—ECA Environment and Social Sustainable Development  
 ENVGC—GEF Coordination Unit  
 Energy Efficiency Thematic Group

Outside the Bank:

Daniel M. Kammen, Associate Professor, University of California at Berkeley

### **G.3. Composition of task team**

Yves Duvivier, Program Team Leader  
Rachid Benmessaoud, Energy Specialist/Task Leader  
Heran Herat, Financial Management Specialist  
TBD, Procurement Accredited Specialist  
Bernard Baratz, Principal Environmental Specialist  
Joumana Freund, Project Team Assistant

### **G.4. Quality assurance arrangements**

The project team is highly qualified in enterprise restructuring, power, district heating, energy efficiency, and utility management. In addition, North American technical advisers with international experience in ESCO development and management, performance contracting, and energy auditing and verification are advising the Bank and HEP and are an integral part of the project preparation team.

### **G.5. Management decisions**

<b>Issue</b>	<b>Action/decision</b>	<b>Responsibility</b>
Not applicable	Not applicable	Not applicable

**Preparation Budget:** **Bank budget:** US\$85,790 for Associated IBRD Project

**GEF budget:** US\$66,100 GEF

**Trust fund:** US\$187,994 (Japanese PHRD Grant)

Rachid Benmessaoud	Henk Busz	Andrew Vorkink
<b>Team Leader</b>	<b>Sector Manager</b>	<b>Country Manager/Director</b>

## Annex 1

### Project Design Summary

Hierarchy of Objectives	Key Performance Indicators	Monitoring & Evaluation	Critical Assumptions
	<b>Sector Indicators:</b>	<b>Sector/ country reports:</b>	<b>(from Goal to Bank Mission)</b>
<b>a. Sector-related CAS Goal:</b> Assuring an efficient energy supply in an environmentally sustainable manner at realistic but socially acceptable prices	<ul style="list-style-type: none"> <li>Reduction in energy intensity measures for Croatia</li> <li>Reduction in air pollution emissions</li> </ul>	<ul style="list-style-type: none"> <li>National and Local Environmental Reports</li> <li>Emission Reduction Monitoring Reports</li> </ul>	<b>Bank Mission:</b> Provision of energy services without significant negative environmental impact.
<b>b. GEF Operation Program:</b> Removal of barriers to energy efficiency and energy conservation	<ul style="list-style-type: none"> <li>Carbon intensity of the economy</li> <li>Reduction in greenhouse gas (CO<sub>2</sub>) emissions</li> </ul>	<ul style="list-style-type: none"> <li>National Communication to the UNFCCC</li> </ul>	<b>GEF Mission:</b> Reduction of greenhouse gas emissions, mainly CO <sub>2</sub>
<b>Project Development Objective:</b>	<b>Outcome / Impact Indicators:</b>	<b>Project reports:</b>	<b>(from Objective to Goal)</b>
To reduce the energy intensity of the Croatian economy through creation of an economically and environmentally sustainable market for energy efficiency goods and services.	<ul style="list-style-type: none"> <li>Energy intensity of key industries and buildings</li> <li>Track record of commercially viable energy efficiency projects and associated energy savings and emission reductions</li> <li>Market response and end-user acceptance of ESCO offerings</li> </ul>	Implementation progress, evaluation and completion reports	Macroeconomic conditions and environmental policies do not discourage energy efficiency
<b>Global Objective</b> Reducing GHG emissions on a continuous basis by overcoming the following barriers to energy efficiency investments: (i) the lack of development and project financing attributable to perceived risks among lenders; and (ii) the lack of capacity and know-how among key stakeholders.	<ul style="list-style-type: none"> <li>Number of win-win energy efficiency projects implemented and amount of cofinancing from private capital markets</li> </ul>	<ul style="list-style-type: none"> <li>Quarterly update on status and use of the GEF Facility</li> <li>Annual Implementation and Performance Evaluation Reports</li> </ul>	<ul style="list-style-type: none"> <li>Macroeconomic conditions and environmental policies do not discourage energy efficiency</li> <li>Energy efficiency gains in Croatia are sustained and grow from proliferation of performance contracting principle</li> </ul>

## Annex 1 Project Design Summary (continued)

Hierarchy of Objectives	Key Performance Indicators	Monitoring & Evaluation	Critical Assumptions
Output from each component:	Output Indicators:	Project reports:	(from Outputs to Objective)
Increased efficiency in energy supply and consumption	<ul style="list-style-type: none"> <li>Affordability of energy services.</li> <li>ESCO profitability and sales volume</li> </ul>	Implementation reports	<ol style="list-style-type: none"> <li>Projected savings are achieved</li> <li>Price signals encourage service providers and consumers to implement a full range of energy saving measures</li> <li>Energy consumers are willing to purchase energy efficiency services</li> </ol>
Increased capacity to assess and select commercially viable energy efficiency projects	<ul style="list-style-type: none"> <li>Number of projects generated and reaching financial closure</li> </ul>		<ol style="list-style-type: none"> <li>Market-based skills are adapted and used by technically trained specialists</li> </ol>
Increased participation of banks in financing	<ul style="list-style-type: none"> <li>Lending volume and cofinancing mix</li> <li>Demonstrated project risk sharing among ESCO, client, and commercial banks reflecting stakeholders' ability to assess and mitigate risk</li> </ul>		<ol style="list-style-type: none"> <li>Financing terms enable payback periods acceptable to the EE service providers and the clients</li> </ol>
Project Components / Sub-components:	Inputs: (budget for each component)	Project reports:	(from Components to Outputs)
Energy Efficiency Capital Investments	US\$26.6 million, including an IBRD Loan of US\$5 million	<ul style="list-style-type: none"> <li>Implementation Progress reports</li> <li>Supervision reports</li> <li>Project management report (PMR)</li> </ul>	<ol style="list-style-type: none"> <li>HEP contributes enough equity financing</li> <li>Local banks are willing and able to cofinance energy efficiency projects</li> <li>Public institutions do not view the paid-out-of-savings performance contracts as debt liabilities but rather as operating budget expenditures</li> </ol>
Project Development Costs and Early Project Investment Component	A GEF contingent grant of US\$3.6 million	Same as above	<ol style="list-style-type: none"> <li>HEP Management is cost conscious in the use of contingent grant</li> </ol>



<b>Hierarchy of Objectives</b>	<b>Key Performance Indicators</b>	<b>Monitoring &amp; Evaluation</b>	<b>Critical Assumptions</b>
Enhancing the Credit Worthiness of Project Developers and End-users	A GEF partial risk guarantee of US\$2.0 million	Same as above	1. Default rate of energy service providers and end-users on the guaranteed loans will not exceed anticipated level
Training, Information Dissemination and Outreach (replication activities), and Monitoring and Verification	A GEF grant of US\$1.4 million	Same as above	None

## Annex 2: Incremental Cost Analysis

### Concept

The proposed project will reduce greenhouse gas emissions in Croatia by creating a market for energy efficiency products and services. Croatia's potential market for energy efficiency projects is estimated at US\$650 million in investment value, yet no projects have been recorded. The proposed project will catalyze resources around a core developer of energy efficiency projects—a utility-based energy service company (ESCO) within HEP, the national power utility. ESCO will show near-term project results based on investment opportunities already identified and facilitate market development through its business and marketing plan. The project—which draws on dedicated funds from the GEF—will foster further market development through partial guarantees of financing for projects proposed by other stakeholders (other energy service and equipment providers, project sponsors, end users). The project will overcome barriers to energy efficiency products and services, reducing Croatia's energy intensity and greenhouse gas emissions.

### Barriers and Modalities

The barriers to a sustainable energy efficiency market in Croatia are (see section B.4.1 for details):

- A lack of development and project financing due to perceived risks among lenders.
- A lack of capacity and know-how among key stakeholders.
- A lack of consumer-driven demand for energy efficiency services.

The proposed project will address the first two barriers. The UNDP's "Removing Barriers to Improving Energy Efficiency of the Residential and Service Sectors" is addressing the third. (See section B.4.3 for details on the complementarity between the two projects.)

The total project investment cost is US\$30.4 million, including funding for ESCO and the market at large. GEF-supported activity will generate US\$26.6 million in project funding or 4% of the US\$650 million potential market (see Table 3 below), US\$20.0 million of which is for ESCO projects. Beyond ESCO projects, extensive replication in the market is expected within two years of project initiation, led by project partners, end users, and project sponsors, and generating US\$6.6 million in project funding.

**Table 3: Sources of Project Investment Funds in the Project**

<b>Sources of Funds:</b>	<b>Amount</b>	<b>% of total</b>
GEF Grant	\$3,600,000	
HEP Cash Equity	\$1,000,000	
HEP In-Kind (through IBRD Loan Proceeds)	\$5,000,000	
<b>Total ESCO Equity Sources</b>	<b>\$9,600,000</b>	<b>36%</b>
Bank loans to ESCO projects leveraged by partial risk guarantee	\$4,400,000	
Syndicated bank loans to ESCO	\$6,000,000	
<b>Total ESCO Debt Sources</b>	<b>\$10,400,000</b>	<b>39%</b>
<b>Total ESCO project funds</b>	<b>\$20,000,000</b>	
Other bank loans to projects leveraged by partial risk guarantee	\$6,600,000	25%
<b>Total Project Investment Funds*</b>	<b>\$26,600,000</b>	<b>100%</b>

Note: (\*) The estimated US\$26.6 million in project funds available for project investment is based on the assumption that ESCO will benefit from 40% of the US\$11 million leveraged by the guarantee facility, plus the US\$6.0 million leveraged by the guarantee of a syndicated loan to ESCO, for a total of US\$10.4 million in debt funding. The remaining 60% of the US\$11 million leveraged by the guarantee facility is not expected to accrue directly to ESCO projects, so it is

separated here. To get back to the total project cost of US\$30.4 million, one must add back in the US\$2.4 million in guarantee funds and US\$1.4 million in technical assistance.

Upon project initiation, ESCO will immediately begin developing its pipeline of energy efficiency projects to demonstrate the economic and technical viability of the activities on the basis of performance contracting. The parent company, HEP, will use internal resources such as billing, collecting, marketing, and engineering capabilities to support ESCO. ESCO will look to the utility's regional electricity and district heating distribution centers for project identification, project partners, sales, and outreach to local businesses and residents. Ultimately, as the restructuring of HEP continues, the utility's regional distribution centers should prove valuable for retraining personnel and developing new businesses in energy efficiency, cushioning the blow of anticipated redundancies among technical staff.

Two GEF non-grant modalities, a contingent grant and a partial risk guarantee, are proposed to address and overcome the barriers noted above. In addition, technical assistance will be targeted toward specific training and program support functions.

#### *Contingent grant*

A contingent grant for US\$3.6 million is proposed to cover the costs of early project development and investment in the ESCO project pipeline. The funds will pay for audit, post-audit, and initial financing of projects in the ESCO pipeline. Croatian lenders and investors are not providing these funds due to the perceived risks associated with an unfamiliar business opportunity involving a potentially long and costly customer decision-making and project sales cycle. Moreover, the absence of early commitments to invest in initial projects does not allow other investors to find early risk-sharing arrangements. In addition, well-prepared projects are more likely to become success stories for the emerging market and to transfer skills with performance-based contracting in project design and implementation. The contingent grant will address both of these early financing gaps. The contingent grant fund is about 8 percent of the proposed project of US\$30.4 million.

As a contingent grant, if the project moves to financial closure, the development costs covered by the GEF will be capitalized in total project costs and repaid through project financing, replenishing the development funds available to ESCO. If the project fails, the grant will be considered an incremental cost of the GEF project.

ESCO will also seek support for the development phase from other sources. For example, HEP and independent project partners that may be providing services and equipment to ESCO will cover many of the marketing costs of early project implementation. On the project structuring side, customers may be aggregated based on "break-up" fees that discourage noncompliance. And technology options can be bundled or packaged to be sold over a shorter timeframe and at lower costs.

#### *Partial risk guarantee*

The second proposed GEF non-grant is a partial risk guarantee for US\$2.0 million. The guarantee will be provided through an US\$800,000 trust available to ESCO to cover commercial bank lending to the new entity, and through US\$1.2 million in a partial risk guarantee facility. The trust will be managed through an escrow agreement among ESCO, the Bank/GEF, and lenders to ESCO. Lenders to ESCO will only be able to draw on the escrow in the case of default by ESCO clients that affects the ESCO's creditworthiness.

The partial risk guarantee facility of US\$1.2 million will be part of a general loss reserve facility available for commercial lending to energy service and equipment companies, end users, and other project sponsors. A financial intermediary will manage the facility under a standalone agreement. The financial intermediary is expected to contribute US\$400,000 to the facility, bringing the total loss reserve amount to US\$1.6 million. The guarantee will

be available for loans to eligible projects, such as those that rely on energy savings for cash flow. Criteria for management and disbursement will be determined during project preparation.

### *Technical assistance*

Technical assistance of US\$1.4 million is needed to transfer energy efficiency know-how to a broad base of stakeholders. This includes business skills for energy service contracting and project development that will be transferred to ESCO, financial institutions, project partners, and other potential energy service providers, enabling them to better service the market. Training will include the provision of business tools to ESCO and independent project partners, training on financial mechanisms to financial intermediaries, and additional training to HEP. In addition, technical assistance for monitoring and reporting on GEF activity will help demonstrate to stakeholders the global and local environmental benefits of energy efficiency activity.

### **Base Case**

No financing of sustainable energy efficiency projects is occurring in Croatia. As a result the base case is no development of the market. But for the sake of potential impact analysis, it is more conservative to assume that some energy efficiency activity, especially in the industrial sector (not targeted by the project), will develop over the coming years as the Croatian economy recovers and foreign investment increases. In this light it is assumed that the “business as usual” scenario of investment would develop 1 percent of the potential market, compared with the project’s estimated 4 percent (Table 4). The base case would reduce emissions by 435,000 tons of carbon dioxide at a cost of US\$6.5 million, for a unit cost of US\$15 a ton.

### **Project Case**

The proposed project consists of energy efficiency project development by ESCO and independent energy efficiency firms. The amount of direct project investments will be US\$26.6 million, reducing emissions by 1.8 million tons of carbon dioxide for US\$15 a ton. The expected US\$26.6 million in project investments will be leveraged by the US\$3.6 million contingent grant and the US\$2.4 million partial risk guarantee facility.

### **Incremental Cost**

The total incremental cost of the project is US\$7.0 million in GEF funds. It comprises the contingent grant (US\$3.6 million), the guarantee facility (US\$2.0 million) and the technical assistance (US\$1.4 million). The incremental reduction in carbon dioxide is 1.3 million tons. Thus, on an incremental cost basis, the associated reductions of the activity may be as low as US\$5.4 per ton of carbon dioxide or US\$1.5 per ton of carbon. This cost-effectiveness figure is at the mid- to upper-range of recent price-cost studies and reflects typical carbon emission credits from energy efficiency projects in industrial economies.

**Table 4: Incremental Cost Matrix**

	<b>Baseline</b>	<b>Project Alternative</b>	<b>Increment</b>
<b>Domestic Benefit</b>	Limited decrease in spending on energy (thermal and electric); some improved client satisfaction and industrial efficiency; lower local harmful emissions.	More widespread and substantial decrease on energy spending (thermal and electric); widespread client satisfaction and improved economic efficiency; lower local harmful emissions.	Lower energy costs, more client satisfaction and efficiency, lower local emissions.
<b>Global Environment Benefit</b>	Base case energy efficiency market developed at 1% of potential leads to maximum of 435,000 tons CO <sub>2</sub> reductions.	GEF case minimum development of 3-5% of potential market for a minimum of 1.8 million tons CO <sub>2</sub> reductions.	About 1.3 million tons CO <sub>2</sub> reductions.
<b>Costs (US\$ million)</b>			
Contingent Grant	0.0	3.6	3.6
Guarantee Facility	0.0	2.0	2.0
Technical Assistance	0.0	1.4	1.4
<b>Total</b>	<b>0.0</b>	<b>7.0</b>	<b>7.0</b>

**Annex 3**  
**STAP Technical Review, Responses to STAP Comments,**  
**and Focal Point Endorsement Letter**

Attachments to Annex 3:

1. STAP Technical Review (completed on February 26, 2001)
2. Responses to STAP Comments

UNIVERSITY OF CALIFORNIA, BERKELEY

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

**ENERGY AND RESOURCES GROUP**

310 BARROWS HALL

UNIVERSITY OF CALIFORNIA

BERKELEY, CA 94720-3050

WWW: <http://socrates.berkeley.edu/erg>

**DANIEL M. KAMMEN**

ASSOCIATE PROFESSOR OF ENERGY AND SOCIETY

DIRECTOR,

RENEWABLE AND APPROPRIATE ENERGY LABORATORY

EMAIL: [dkammen@socrates.berkeley.edu](mailto:dkammen@socrates.berkeley.edu)

TEL: (510) 642-1139 (OFFICE)

FAX: (510) 642-1085

TEL/FAX: (510) 643-2243 (RAEL)

February 26, 2001

To: Rachid Benmessaoud, [rbenmessaoud@worldbank.org](mailto:rbenmessaoud@worldbank.org),

Cc: Michael Ashford, [MAshford@aol.com](mailto:MAshford@aol.com)

From: Daniel M. Kammen

Re: Review of *Croatia Efficiency Project (P071461)*

*Summary*

This is an innovative and economically efficient project that should be supported. The mix of institutional development and public/private sector learning and collaboration that initiating the ESCO will require and then foster is important both in Croatia, and for the wider development of clean energy service agencies globally. The use of direct funding and loan guarantees is an innovative use of funds and resources that, if successful, could greatly extend the resources of the GEF and other funding agencies. The project documents are well developed and generally clear.

*Major Comments:*

The primary concerns with this project plan, as presented in the PCD are:

• *Interaction of the World Bank and UNDP Projects*

The interaction and evolution of the project with respect to the UNDP grant, despite extensive discussion in the document, remains unclear. The two projects, while described as separate, will in fact be run by one entity. The separation of effort (as seen in Table 1) remains vague with respect to the degree that each loan/grant will be used to develop sustainable markets for energy efficiency services. For example, the degree to which the World Bank loan package will be used to address institutional clients versus building a market in the emerging private sector is never fully described in the PCD. The UNDP grant appears more specifically targeted (tourism and residences). As a pair of linked projects operated by HEP, some of the separations within the project then seem to make little sense. Compact fluorescent lighting for residential use (UNDP) would seem to be a logical component of both efforts, but is little mentioned in the World Bank project. Similarly, building efficiency as well as cogeneration

(World Bank) also have important roles to play in hotel and other larger buildings, as well as in some apartment blocks (UNDP). It is thus unclear why some of the ‘divisions of labor’ appear between the two projects. At one level spillovers are of course likely given the single management structure. At the same time, it appears that some distinctions have been made between the project goals, intended technologies, and sectoral coverage to make the projects distinct for the funding agencies. Given the planned, single-agency, structure, a more integrated plan would seem appropriate. Or, if the missions will truly be distinct (doubtful), then separating the implementing agencies – as was considered for the HEP-ESCO itself – may be a way to build added capacity, and even generate some market competition.

· *Financial and Market Uncertainty*

Throughout the PCD, assessments of market growth and ESCO independence are, justifiably, vague. Forecasting the evolution of an ESCO that is both new institutionally, and in a newly post-war nation, are likely to be uncertain. In the document little attention is given to analysis of the market sectors most likely to areas of successful growth. The discussion of the rationale for focusing on institutional clients for energy efficiency make sense due to larger scale of the building that they manage, but may not be the best focus in terms of market experience, returns of ESCO investments, and popularizing the role of energy efficiency. HEP’s record of revenue collection is noted to be have been terrible, which may have influenced this institutional focus. A second level of analysis appears to be needed after the project approval: a more detailed business plan for the HEP-ESCO, which would include both outreach more broadly to the private sector, and targeted approaches to market stimulation/transformation [Duke and Kammen, 1999]. The latter program of market development would naturally done in closer collaboration with a similar plan for the UNDP grant.

*Minor Comments & Clarifications*

Page 5:

Many of the market development features of the ESCO plan will rely on restructuring and stability in the energy sector. There are recent and ongoing international USAID, and World Bank loans and grants in this area, but the success has been limited and mixed. The impact of this on the ESCO plan could be more explicitly discussed.

Page 7:

Little discussion is provided as to the capacity that the HEP-ESCO, or smaller satellite businesses, to perform energy audits. These will be critical to institutions on many scales to realize and then to implement DSM and technology-based improvements in energy efficiency.

Page 7, and 25:

The separation of the World Bank and UNDP projects based on ‘distinct technologies’ does not make sense. The projects will clearly overlap in their goals, some regions of activity, and even in some of the buildings and institutions targeted. Closer collaboration in planning to achieve economies of learning and technology (similarity) would seem to make sense.

Page 8:

The section on ‘Enhancing the Creditworthiness of the HEP-ESCO’ is unclear. The extent of the market exposure and risk of the ESCO is not discussed in relation to the services (and thus the costs) that it will encounter, particularly early in its operational life).

Page 12:

The means for this project to learn and benefit from the GEF Krakow Energy Efficiency project, and others, is unspecified. Will there be staff exchanges? Technology and management plan transfer?



Page 14:

How will the equipment and services be presented, demonstrated, and then sold to customers? This is critical to the success of the ESCO, yet is little discussed. It may need to be part of the post-approval, but pre-implementation, study that I recommended, above.

Page 17:

The ‘high’ risk of not achieving project savings are neither surprising nor overly problematic. The World Bank and UNDP project should, again, be utilized far more as one effort to build expertise and to demonstrate to a wide range of customers that the investment in energy efficiency will provide short-term economic returns.

Page 23:

Market share (estimated at < 6%) is stated without justification. What other models from emerging economies can be used to justify this estimation?

Page 24:

It is stated, somewhat surprisingly, that the ESCO will seek other financial support as well. It is critical that the degree of additional funding that is *essential* to the project versus simply useful needs to be specified, and included in the examination of the risks.

Page 25ff;

The incremental cost calculation is fine given the considerable uncertainty in the project outcomes.

### *References*

- Duke, R. D., Graham, S., Hankins, M., Jacobson, A., Kammen, D. M., Khisa, D., Kithokoi, D., Ochieng, F., Osawa, B., Pulver, S. and Walther, E. (2000) *Field Performance Evaluation of Amorphous Silicon (a-Si) Photovoltaic Systems in Kenya: Methods and Measurements in Support of a Sustainable Commercial Solar Energy Industry*, ESMAP Technical Report No. 005 (World Bank: Washington, DC).
- Duke, R. D., and Kammen, D. M. (1999) “The economics of energy market transformation initiatives”, *The Energy Journal*, **20 (4)**, 15 – 64.

**Annex 3**  
**CROATIA – ENERGY EFFICIENCY PROJECT**  
**STAP Technical Review**

STAP technical review was completed on February 26, 2001.

**Responses to STAP technical reviewer's primary concerns :**

***Primary Concern No. 1:** The interaction and evolution of the project with respect to the UNDP grant, despite extensive discussion in the document, remains unclear. The two projects, while described as separate, will in fact be run by one entity.*

The PCD authors were not clear in stating that the management of the World Bank and UNDP programs is entirely distinct (HEP and UN OPS, respectively), with one exception: a single financial intermediary may be chosen for administration of the risk guarantee components of both projects. Joint administration of the guarantee funds would improve both programs' overall capacity to leverage private lending to the energy efficiency sector.

Beyond this potential joint administration, the programs are complementary in regards to targeted market segment and technologies: the UNDP program targets energy systems for hotels and compact fluorescent lighting for residential use, in Istria and Rijeka; and the World Bank program targets integrated energy efficiency solutions for public and private sector end-users and specific demand-side management measures for municipal energy infrastructure, nationwide. They have a common goal of boosting short-term demand for energy efficiency technologies and services that have high prospects for long-term market penetration as the Croatian economy develops and sector reforms are carried out. Direct communication and information sharing during project preparation and implementation is critical to present energy efficiency options supported by either or both programs to their respective clients.

***Primary Concern No. 2:** In the document, little attention is given to analysis of the market sectors most likely to be areas of successful growth. The discussion of the rationale for focusing on institutional clients for energy efficiency make sense due to larger scale of the building that they manage, but may not be the best focus in terms of market experience, returns of ESCO investments, and popularizing the role of energy efficiency... A second level of analysis appears to be needed after the project approval: a more detailed business plan for the HEP-ESCO, which would include both outreach more broadly to the private sector, and targeted approaches to the market stimulation/transformation [Duke and Kammen, 1999].*

The authors wholly endorse the need for a complete business plan that will prioritize the investment activities of the ESCO and that will include an assessment of the market sectors most likely to be areas of successful growth. The latter will be coordinated with UNDP.

The business plan is currently under preparation. Several iterations of data analysis so far indicate ample technical and basic economic potential in thermal and electrical savings for public sector projects. This information has been adjusted to experts' opinions on expected market penetration. What remains to be done is further economic analysis of projects within those sectors.

The proposed project focuses on both institutional and private sector clients. The need for early successes in performance contracting suggests that institutional customers, with centralized management already reporting to HEP distribution centers, should be taken on first. Using institutional clients initially may not translate into the most profitable undertakings at the outset, but it will boost demand and promote early commercialization and replication

of energy efficiency technologies and services beyond the chosen sector and clients. It would also help the private sector energy service partners and providers to develop and get organized, to receive training, to learn by doing and to access to high-quality data about project design and performance.

Beyond the initial institutional focus, the project also includes building implementation and investment capacities in the private sector through engaging project partners. This will ensure that the institutional bias does not push the ESCO into one sector at the cost of overlooking other economically compelling projects in another sector.

### **Responses to STAP technical reviewers' minor comments and clarifications :**

***Regarding page 5 of the PCD:*** Many of the market development features of the ESCO plan will rely on restructuring and stability in the energy sector. There are recent and ongoing international USAID, and World Bank loans and grants in this area, but the success has been limited and mixed. The impact of this on the ESCO plan could be more explicitly discussed.

ESMAP program's published findings on energy efficiency programs in other countries and regions highlight the importance of moving forward with energy efficiency projects so long as pricing reforms are carried out (see Section D.3.1). While the risk of the new Government not implementing the needed pricing reform as provided in the draft energy law is modest (see Section F.2), energy efficiency measures under performance contracts in particular could be adapted and packaged to fit the project's economic circumstances. After project approval, the authors agree to expand the business plan to assess the risk of a shift in pricing reform policies to the ESCO activities.

***Regarding page 7 of the PCD:*** Little discussion is provided as to the capacity that the HEP-ESCO, or smaller satellite businesses, to perform energy audits. These will be critical to institutions on many scales to realize and then implement DSM and technology-based improvements in energy efficiency.

Audits represent the first stage of the project development cycle. They are critical to marketing and, when properly performed, can set the stage for efficient processing of information during the whole project cycle. Skill and know-how transfer for energy auditing has already begun under the previous Energy Institute program and the pilot feasibility studies completed for HEP by international energy efficiency engineering groups. Undoubtedly, additional auditing capacity will likely be needed in Croatia to meet any significant demand from the ESCO and other project sponsors. The approaches to building capacity for and conducting audits which ESCO will use, as described in the draft business plan, are as follows.

- (a) *Project Partners.* ESCO will organize and qualify a network of energy efficiency (EE) companies to be project implementation partners. Project partners will include: engineering companies, mechanical and electrical contractors, equipment manufacturers and suppliers, service companies and even other ESCOs. Engineering partners will be subcontracted by ESCO to conduct audits as prospective customers are identified. Further, ESCO will establish relationships with project partners who already have projects in advanced stages of development but need ESCO's capacities for contracting, implementation and financing. Thus, HESCO will complement audit and engineering skills existing in several capable EE companies already working in Croatia.
- (b) *HEP.* ESCO will draw on many strengths and capacities of HEP. In the project development these include: marketing of EE/ESCO services to end-users, provision and analysis of customer energy use data to identify EE opportunities; and certain engineering services.
- (c) *Training.* Training needs will be identified at several levels -- for personnel of ESCO, HEP, and project partners -- and will be provided for via the GEF grant. Training will include audit techniques.

International EE audit engineering groups will be retained and their experience tapped as part of this program. ESCO also intends to retain a management consultancy for its first two years of operation with an international ESCO. Audit skills, applied in the context of developing projects on a commercial basis, will be included in the work scope for this consultancy. ESCO will focus and limit initial EE product offerings (including EE technologies) and business methods to those which can be competently delivered, offer compelling customer benefits, and represent a large market; overtime, further products and services will be added as competencies build. Audit skills will be developed first to serve ESCO's initial target markets as defined by end-use technology and end-user sectors. In comparable projects in other countries, energy efficiency centers associated with technical universities have proven successful in developing in-country auditing capacity. The business plan and other preparation activity will examine more closely possible hurdles regarding this issue and technical assistance resources and funds will be directed accordingly.

***Regarding page 7 and page 25 of the PCD:*** *the separation of the World Bank and UNDP projects based on 'distinct technologies' does not make sense. The projects will clearly overlap in their goals, some regions of activity, and even in some of the buildings and institutions targeted. Closer collaboration in planning to achieve economies of learning and technology (similarity) would seem to make sense.*

To avoid confusion, the word "distinct" should be replaced with "complementary," as it best reflects the intended goal of the two programs, which is to ensure that technology and cost options are optimized for end-users irrespective of the funding sources. Sharing information, including business planning, would benefit both programs and achieve economies of learning, technology and services.

***Regarding page 8 of the PCD:*** *The section on 'Enhancing the Creditworthiness of HEP-ESCO' is unclear. The extent of the market exposure and risk of the ESCO is not discussed in relation to the services (and thus costs) that it will encounter, particularly early in its operational life.*

Subsequent to the STAP comment, the section on 'Enhancing the Creditworthiness of ESCO' has been revised.

Early in its operational life, the ESCO will focus on institutional clients that, inter alia, present a high-degree of ownership concentration (economies in sales, marketing and investments) and that are under severe budget constraints to reduce energy costs. Commercial financing of initial projects will be leveraged based on the balance sheet of HEP or ESCO, and credit enhancement is needed to mitigate the risk of the timing of payments between ESCO and its clients in these initial projects. For later projects, additional credit enhancement is needed to mitigate the risk of client default in the obligations between clients and ESCOs and/or the commercial lenders.

Regarding credit risk associated with ESCO business, two additional points are crucial. First, ESCO borrowings from local banks will be guaranteed by HEP. The HEP guarantee will be sufficient to secure ESCO debt facilities, subject to HEP's management of its overall credit exposure with the several domestic and international commercial banks operating in Croatia. Second, ECO will mitigate its end-user credit risk exposure by collecting customer payments to ESCO via the HEP utility billing and collections mechanism. A "lien-at-the-meter" will be imposed via HEP as a condition of ESCO financing; the customer must maintain current payments to ESCO as a condition of continued utility service. Use of the utility billing and collections mechanism will significantly improve ESCO customer payment performance and mitigate end-user credit risk borne by ESCO.

***Regarding page 12 of the PCD:*** *The means for this project to learn and benefit from the GEF Krakow Energy Efficiency project, and others, is unspecified. Will there be staff changes? Technology and management plan transfer?*

We agree that there is a lack of clear channels for information sharing between the two projects. This is due primarily to the early stages of both projects. Nevertheless, several facets of the Krakow project will be developed

before the Croatia project and will directly inform the Croatia project. This includes among other things: (i) terms and conditions for establishing the guarantee facility; (ii) terms on which to select an appropriate the financial intermediary; (iii) review of the financing needs of each market segment and terms and conditions for the guarantee; and (iv) terms and criteria embedded in contractual agreements that dictate the performance of the financial intermediary. The methods of the district heating utility in Krakow in implementing performance based contracts and leverage information on customers will also inform the Croatia project. As the Krakow project moves forward, the possibility of transferring plans and documents, as well as staff, will be investigated.

**Regarding page 14 of the PCD:** *How will the equipment and services be presented, demonstrated, and then sold to customers? This is critical to the success of the ESCO, yet is little discussed. It may need to be part of the post-approval, but pre-implementation, study that I recommended, above.*

This is a broad question, the answer to which could cover marketing, development, implementation, and financing, all from either ESCO's or the customer's viewpoints.

Overall, ESCO service delivery is a sales-oriented activity. ESCO will use its experience in actual achievement of savings and a four-stage energy audit process to help customers at each stage: (i) identify all energy saving opportunities, including what might be prohibitively expensive ones; and (ii) decide on the attractiveness of the package, the specific measures to implement and the saving levels that ESCO guarantees, and how much to co-invest, so that the final package suits the needs of the consumer, ESCO and the banks. Contingent grants are provided to help ESCO identify customers and cover initial project development. ESCO will need to focus on development of a sales and marketing plan, backed-up with dedicated resources.

Like auditing, marketing to customers will be conducted through several channels. The primary means for making direct initial sales contacts with potential customers will be, first, by HEP through HEP's customer service department, and, second, by project partners. ESCO core staff will support the marketing efforts of HEP and project partners. To begin the marketing effort, ESCO will organize and coordinate HEP staff and project partner staff. Marketing literature and other selling tools will be provided. HESCO will train these marketing agents on the terms of the ESCO offer over the full project cycle, from initial energy audit, to legal agreements to project financing and implementation. ESCO will also conduct a direct campaign of "high-level" selling to decision-makers which manage multiple facilities, particularly national and local government agencies and officials responsible for schools, hospitals and other government buildings and facilities.

From the customer's perspective, ESCO will offer a turnkey project installation, combined with financing, with the convenience of payment on the energy bill. The customer will execute an Energy Services Agreement (ESA) with ESCO to implement the projects. Projects will be designed to be fully repaid from achieved savings. ESCO will implement projects and provide operations services through subcontracts with selected Project Partners. ESCO will provide project financing from its own equity and debt resources.

**Regarding page 17 of the PCD:** *The 'high' risk of not achieving project savings are neither surprising nor problematic. The World Bank and UNDP project should, again, be utilized far more as one effort to build expertise and to demonstrate to a wide range of customers that the investment in energy efficiency will provide short-term economic returns.*

The two programs are both directed at sustainable, market-oriented energy efficiency project development. The approach requires sales, commercial returns, and tangible benefits for service companies and customers in a 'win-win' relationship. Technical assistance resources and funds will be used to give public access to high-quality data on project design and implementation experience, to ensure capacity transfer and disseminate results.

**Regarding page 23 of the PCD:** *Market share (estimated at < 6%) is stated without justification. What other models from emerging economies can be used to justify this estimation?*

Recent updating of the data analysis now shows an expected market share of 4% or less, depending on the success of performance contracting in more dispersed sectors, such as commercial and industrial end-users. The market penetration / market share percentages are derived from detailed energy consumption data per sector that is adjusted for estimated market penetration and savings by sector. The output of this analysis is included in Annex 4: Technical Background. The market penetration of performance-based EE measures is based on experts' opinions adjusted for an emerging market context.

There are no models from countries in Europe and Central Asia Region that can be used to justify this estimation. However, the authors will pursue other sources (ESMAP; USAID; DOE) to check their respective experiences.

***Regarding page 24 of the PCD:*** *It is stated, somewhat surprisingly, that the ESCO will seek other financial support as well. It is critical that the degree of additional funding that is essential to the project versus simply useful needs to be specified, and included in the examination of the risks.*

As currently conceived, the necessary funding requirements for early project development (US\$3.6 million or about 8% of the total US\$30.4 million in project costs) are essential to the project, and the project risks and mitigation measures have been identified and discussed. The authors' intention regarding other sources of funding for early project development is only meant to indicate potential sources of leveraging through HEP and independent project partners. Failure of ESCO not receiving support for project development from other funding sources will not affect the overall achievement of the project's objectives.

## Annex 4

### GEF Financing Modality: Technical Background

#### Direct Cost Components

The total incremental cost of the project is US\$7.0 million in GEF funds. However, the expected direct cost of the project, as calculated below, is US\$1.98 million. It includes reasonable estimates of transaction costs and payments made to cover losses under the contingent grant and partial risk guarantee, and technical assistance costs. The balance of GEF funds (US\$5.02 million) will remain in the country for leveraging and replication of the activity after project completion. The direct cost of the project is broken out in Table 5.

**Table 5: Direct Cost of the GEF Project Activity**

Partial guarantee costs	US\$400,000
Contingent grant costs	US\$180,000
Technical assistance costs	US\$1,400,000
<b>Total</b>	<b>US\$1,980,000</b>

The *cost of the partial risk guarantee* is based on an assumed five-year disbursement schedule of the anticipated US\$17 million in debt financing efficiency projects (Table 3). To simplify the analysis, we assume that the projects have five-year lives and the disbursements are made over a five-year period. The guarantee reserve is 20 percent of outstanding debt, an assumption made based on discussions with financial intermediaries in Croatia. To be conservative, we assume a high default rate of 15 percent. The resulting worst-case payout of the guarantee reserve is in year five, totaling about US\$332,000. The cost of managing the funds is expected to be 3 percent of the total, or US\$63,000—a high percentage for facility management fees relative to market rates, but reasonable given the small total and the unique characteristics of the use of funds. The total cost of management and losses from the guarantee facility is expected to total US\$400,000.

To calculate *the cost of the contingent grant funds* (US\$3.6 million), we assumed a conservative default rate of 5 percent of the development costs and financial closure investments made by ESCO. This totals US\$180,000.

The *training and monitoring and verification costs* covered by the technical assistance include the following items:

**Table 6: Technical Assistance Costs**

ESCO training and business tools	US\$50,000
International management consultancy for ESCO	US\$550,000
HEP training in support of ESCO	US\$60,000
Independent ESCO business training	US\$90,000
Training on energy efficiency mechanisms for financial intermediaries	US\$50,000
Subtotal, training	US\$800,000
Market development and public information dissemination	US\$100,000
Program reporting, monitoring and verification	US\$500,000
<b>Total training, market development, and program reporting</b>	<b>US\$1,400,000</b>

## Issues Regarding Non-Grant Modalities

The project's non-grant modalities—US\$3.6 million in contingent grant financing and US\$2.4 million in guarantee reserves—are unique in the way they are targeted to the specific financing needs of the ESCO financing plan. The contingent grant is dedicated to development costs and early investment requirements of projects undertaken by ESCO. The guarantee mechanism will address the perceived risks of lending to ESCO and the perceived risks of investing in energy efficiency projects. Because the modalities are tailored to project needs in this way, and because they are relatively small, there is fairly high potential for overburdening them with administrative and transaction costs. Thus we are proposing the following management structure for the modalities. The final structure will be determined during project preparation.

*For the guarantee facility*, there are two important oversight issues: management of the US\$1.2 million project guarantee facility for commercial lenders and oversight of the US\$800,000 ESCO guarantee. For the first, initial discussions with the Croatian Guarantee Agency (HGA) have revealed an opportunity for a co-guarantor relationship with own funds to augment the GEF portion of US\$400,000. A reserve ratio requirement of 20 percent means that the combined US\$1.6 million guarantee facility will leverage up to US\$11 million in project debt (see Table 11). Whether or not the HGA is selected as the guarantee facility manager, co-funding of the reserve will be a criterion for selecting a facility administrator. For oversight of the ESCO guarantee, the purpose of the US\$800,000 reserve is to guarantee initial syndicated lending to ESCO as part of its overall capitalization. To reduce transaction costs, the funds should be placed under management with a simple trust arrangement among the World Bank–GEF, the intermediary, and ESCO. The trustee entity may be the same as the guarantee facility manager because the conditions for disbursement of each component are likely to be similar.

*For the contingent grant modality*, management of the funds will likely be placed with ESCO, based on specific terms and conditions for commitment relative to the ESCO's project activities. The funds will be placed directly with ESCO because:

- The amount is relatively small, and placing the funds with ESCO cuts transaction and administrative costs.
- The ESCO project activities supported by the grant will benefit the market by creating demand for energy efficiency services and equipment from project partners, so the benefits will be replicated without the need for third-party administration.
- Grants that are repaid in the form of capitalized development costs will be revolved into further development as a condition of ESCO management of the modality.

ESCO is unlikely to squander the grant funds on bad projects, because it is motivated by the need to demonstrate early successes to its investor, HEP, and to attract strategic investors.

## Risk Sharing

The strong linkages among project stakeholders are typical of more complex project financing structures (see Figure 1). Such a risk sharing is crucial to energy efficiency market development. For example, project partners will increasingly assume technical performance risks as the market develops. The growing role of project partners will enable the market to expand beyond the ESCO's capacity constraints while allocating technical performance risk to new entities who can better manage project implementation. HEP is also investing its own funds in ESCO, beyond on-lending the IBRD Loan. Finally, partial risk guarantees for commercial bank participation ensure that there are no incentives for loans to unworthy projects.

## Leveraging and Replication

Leveraging of GEF funds with private investment and other resources occurs at several levels of the proposed project. For example, the incremental cost of the project, US\$7.0 million, is leveraging an additional project



financing of US\$23.4 million, or almost 3.4 times the incremental cost. On another level, the estimated direct cost of the guarantee facility, US\$400,000, and contingent grant, US\$180,000, is leveraging US\$17 million in project debt financing, or 29 times the direct cost.

The total project investment figure, US\$30.4 million, does not include the entire expected market impact of the GEF components. In particular, not included here is the further market development that will be supported by continued use of the balance of the GEF contingent grant (US\$3.4 million) and partial risk guarantee (US\$1.6 million), which will remain after the project concludes, most likely with ESCO and in a revolving fund, respectively. Following the same leveraging effect as the original project (see Table 3 above) and assuming that the ESCO equity and IBRD loan funds remain in the project investment pool, the remaining US\$3.4 million contingent grant and US\$1.6 million partial risk guarantees result in up to US\$16.9 million in additional energy efficiency investments. This replication effect alone will reduce emissions by over 1 million tons of carbon dioxide at US\$15 a ton. Thus, the estimated total reduction for the project, including leveraging and replication, is approximately 2.3 million tons of carbon dioxide.

### Exit Strategy

The exit strategy for the GEF guarantee facility will be to leave the funds in a revolving facility with the selected financial intermediary. This is another reason the HGA is considered a good candidate: it has ministerial-level representation in the Government of Croatia, which is planning to expand its portfolio from small- and medium-size guarantees to larger firms in more differentiated sectors. Similarly, the contingent grant funds will become part of the ESCO's standby development and investment cost fund, replenished by performing projects. During preparation the project will investigate how project partners and other stakeholders can start contributing to both the guarantee reserve and the development and early investment funds, creating national financing mechanisms for sustainable improvements in energy efficiency.

### Potential Global Environmental Benefits of the Project

The estimated greenhouse gas reduction potential of Croatia's market for energy efficiency is 43 million tons of carbon dioxide over the next six years. This estimate is based on the carbon intensity of the current mix of thermal and electrical generation (Tables 7 and 8). Of this the proposed project will account for at least 3 percent, or 1.3 million tons of carbon dioxide. Based on the market value of energy efficiency projects identified here, the cost of reductions is US\$15 per ton of carbon dioxide (Table 8). Based on the incremental cost of US\$7.0 million for the project, the GEF-related cost of reductions achieved is US\$5.4 per ton of carbon dioxide or US\$1.5 per ton of carbon (Table 10).

**Table 7: Carbon Intensity of Electrical Generation**

Plant Type	% of Total Capacity	Electricity Generation * (GWh)	Emissions (1000 tonne CO <sub>2</sub> )	tCO <sub>2</sub> per MWh
Croatia Thermal	33%	4,501	4,056	0.90
Imported Thermal **	21%	2,864	2,581	0.90
Hydropower	46%	6,274	0	0
Nuclear	0%	0	0	0
Total	100%	13,639	6,637	0.487

\* Electricity generation for Croatia Thermal plants is measured. Generation for other plant types are based on their percentage of total capacity. We therefore assume that the mix of generation is the same as the mix of capacity.

\*\* Assuming that the emissions factor for thermal plants outside Croatia is equal to the factor for Croatian thermal plants.

**Table 8: Carbon Intensity of Thermal Generation**

Plant	Heat Generation (TJ)	Emissions (1000 tonne CO <sub>2</sub> )	tCO <sub>2</sub> per TJ	tCO <sub>2</sub> per MWh
TE-TO Zagreb	4,199	577	137	0.495
EL-TO Zagreb	4,238	329	78	0.279
TE-TO Osijek	964	137	142	0.512
GTPP Osijek	193	91	472	1.697
Total	9,594	1,134	118	0.426

**Table 9a: Cost of Greenhouse Gas Reductions in terms of Total Market Value**

Grand Total of the Market Potential	tCO <sub>2</sub> per year	Years	tCO <sub>2</sub> Total Project	US\$/tCO <sub>2</sub>	US\$/tC
	7,235,436	6	43,412,618	US\$15	US\$4.1

**Table 9b: Base Case Greenhouse Gas Reductions**

Base Case (1% of Market Potential)	tCO <sub>2</sub> per year	Years	tCO <sub>2</sub> Base Case	US\$/tCO <sub>2</sub>	US\$/tC
	72,500	6	435,000	US\$15	US\$4.1

**Table 9c: Project Case Greenhouse Gas Reductions**

Project Case (4% of Market Potential)	tCO <sub>2</sub> per year	Years	tCO <sub>2</sub> Project Case	US\$/tCO <sub>2</sub>	US\$/tC
	289,500	6	1,737,000	US\$15	US\$4.1

**Table 9d: Incremental Greenhouse Gas Reductions**

Project Case net of the Base Case	tCO <sub>2</sub> per year	Years	tCO <sub>2</sub> Net Reductions	US\$/tCO <sub>2</sub>	US\$/tC
	217,000	6	1,302,000	US\$15	US\$4.1

**Table 10: Cost of Greenhouse Gas Reductions in terms of GEF Project Incremental Cost**

GEF Project Incremental Cost	Incremental tCO <sub>2</sub> Reductions	US\$/tCO <sub>2</sub>	US\$/tC
US\$7,000,000	1,302,000	US\$5.4	US\$1.5*
*US\$1.5 per tC is at the mid- to upper-range of recent price- cost studies and reflects typical carbon emission credits from energy efficiency projects in industrial economies.			

## Monitoring and Evaluation

Monitoring and evaluation will build on the methodologies developed for the Romania and Krakow energy efficiency projects, with particular attention to deriving guidelines for non-grant GEF mechanisms. Technical assistance has been identified and allocated in the proposed cost structure to develop indicators during the preparation period.

As in all instances of energy efficiency performance contracting, measurement and verification is an essential part of the contracting process because the energy savings guaranteed by ESCO against a baseline must be confirmed in order for savings payments to be made. Energy performance contracting will be a condition of the projects

undertaken by ESCO. Thus it is anticipated that the monitoring and verification already done will be valuable to the GEF process.

**Table 11: Disbursement of Project Debt and Potential Guarantee Payments**

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Year	1	2	3	4	5	6	7	8	9	10
"Disbursement" Rate	10%	20%	25%	25%	20%					
Year 1 Financing Schedule	1,702,400	1,361,920	1,021,440	680,960	340,480					
Year 2 Financing Schedule		3,404,800	2,723,840	2,042,880	1,361,920	680,960	-			
Year 3 Financing Schedule			4,256,000	3,404,800	2,553,600	1,702,400	851,200	-		
Year 4 Financing Schedule				4,256,000	3,404,800	2,553,600	1,702,400	851,200	-	
Year 5 Financing Schedule					3,404,800	2,723,840	2,042,880	1,361,920	680,960	-
Total Client Financing	1,702,400	4,766,720	8,001,280	10,384,640	11,065,600	7,660,800	4,596,480	2,213,120	680,960	-
Guarantee Reserve Requirement (US\$)	340,480	953,344	1,600,256	2,076,928	2,213,120	1,532,160	919,296	442,624	136,192	-
Loss Expected Value (US\$)	51,072	143,002	240,038	311,539	331,968	229,824	137,894	66,394	20,429	-

## Market Analysis

The potential market for energy efficiency projects in Croatia is estimated at US\$650 million in investment costs over the next six years (see Table 11), for a savings value of about US\$215 million per year, based on a three-year simple payback. The public sector electrical and thermal project market is estimated at US\$490 million. This includes district heating system upgrades for Zagreb and Osijek, which are managed by HEP, street lighting projects for the two cities, and public building retrofits addressing thermal energy and electricity losses. Projects in the public sector represent the near-term potential market activity for ESCO. The assumptions and results used in calculating the total economic potential for the market are as follows:

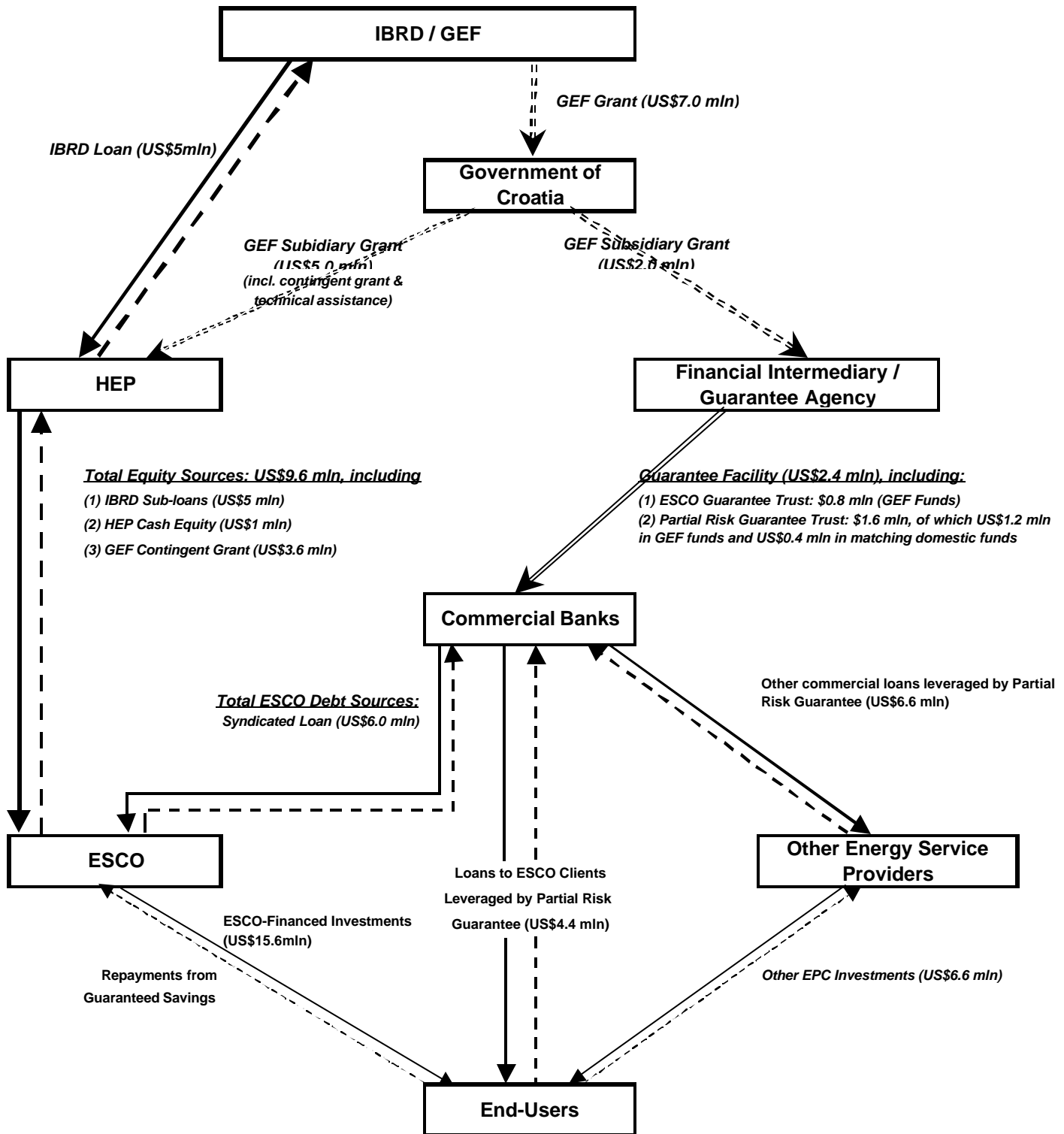
**Table 11: Total Market Estimate with Assumptions**

Sector	ASSUMPTION: Percentage of gross market captured by projects	ASSUMPTION: Percentage savings resulting from projects	Total MWh saved per year (millions)	Estimated investment value (million US\$)
Electricity savings	20% for industrial process and private and public buildings  100% for main street- lighting	20% for industrial process and buildings  50% for street- lighting	1.97	475
Thermal savings for residential, public and commercial buildings	20%	35%	0.58	140
Thermal savings in industrial processes	20%	35%	0.30	35
Total			2.85	650

Sources: (i) KUEN-CTS Study; (ii) Energy Institutes' "HEP ESCO Development Program"; (iii) "Energy in Croatia: Annual Energy Report 1998"; and (iv) Schiller & Assoc. Study, for Osijek and Zagreb.

## CROATIA - ENERGY EFFICIENCY PROJECT

### Flow of Funds for Energy Efficiency Investments DURING PROJECT IMPLEMENTATION



**Total Project Investment Funds (US\$26.6 mln)**

*(incl. ESCO-Sponsored Projects: US\$20.0 mln; and EPC Projects Sponsored by Other Services Providers: US\$6.6 mln)*

*(excl. GEF Funds for Technical Assistance -- US\$1.4 mln)*



## Flow of Funds for Energy Efficiency Investments REPLICATION STRATEGY AFTER PROJECT COMPLETION

