

OFFICE MEMORANDUM

DATE: March 11, 2002

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

FROM: Lars Vidaeus, GEF Executive Coordinator



EXTENSION: 3-4188

SUBJECT: **Croatia: Renewable Energy Resources Project
Submission for Work Program Inclusion**

Please find enclosed the electronic attachment of the above mentioned project brief for work program inclusion. We would appreciate receiving any comments by March 20, 2002.

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 enactment of secondary legislation for renewable energy, are being supported during preparation (GEF PDF-B Grant), will be condition for project approval, and will be supported during project implementation. -- Sections B.3, C.2 and C.4.4. The Government has demonstrated its commitment to renewable energy through: its national energy programs; the enactment of the new Energy Law (approved in July 2001) requiring, among other things, a minimum share of renewables in the energy supply mix (yet to be defined in the secondary legislation); and the current effort to develop secondary legislation that, inter alia, codify the Government's stated policy -- Sections B.3, C.2 and D.4. The Croatian Bank for Reconstruction and Development (HBOR) has indicated its agreement to execute the project. -- 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 6: promotion of renewable energy by removing barriers and reducing implementation costs. The barriers include: (i) lack of enabling framework; (ii) lack of development capital and equity financing; and (iii) lack of resource assessment, capacity and knowledge. -- Sections B.2 and B.4.1.
- ***Project Design:*** The strategic choices made in the project design are explained in Section B.4 and the rationale for the project design in Section D. The project description is summarized in Section C.1. The project starts with supporting the Government to codify its national policy for renewable energy -- Section C.4.4. The project will then create financial mechanisms needed by the market and build public-private partnerships in applying these mechanisms to demonstration and follow-on projects. These mechanisms will include GEF contingent grant for co-financing development costs and GEF equity for co-financing implementation cost. The project also provides GEF technical assistance to confirm market potential, build knowledge and implementation capacity, streamline procedures, monitor compliance with minimum share

targets, and inform the public. Lessons learned from Bank and other programs are reflected in the design – Section D.3. 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:*** Croatia has significant renewable resource potential that can be exploited if an enabling legislative and financing framework exists. The GEF involvement is critical in helping open the market and in leaving a sustainable arrangement upon exit, not dependent upon any further credit enhancement or financing mechanisms. As described in Section F.1, the proposed project is sustainable because: (i) the Government is committed to renewable energy in its policy and legislation (see “Country Drivenness”); (ii) it supports creation of the enabling legislation and its implementation; (iii) it provides knowledge and builds capacity among decision-makers and market participants; and (iv) it supports creation of an attractive climate for private investment as well as the financing mechanisms and structure that will entice multiple market participants to seek business opportunities in renewable energy. Project sustainability will depend heavily on having an effective and enforceable policy framework. To ensure sustainability, technical assistance will be provided to the regulator to oversee compliance during implementation. In addition, sustained commitment to and compliance with domestic legislation requiring minimum share of renewables will be driven by the need for compliance with EU directives to gain EU accession, and Croatia’s commitment to international protocols (e.g., Kyoto). Section F.2 identifies critical risks and notes how they will be mitigated.
- ***Replicability:*** The features of the project that allow replication are technology, financing mechanisms, reduction in development cost, and information sharing. See “Replication Strategy” in Section F.2 and Annex 4. Specifically:
 - During implementation, the project will use technologies that: (i) are commercially proven and widely available a short distance in Europe; (ii) have excellent prospects for long-term market penetration once the identified barriers are overcome; (iii) can be produced locally, to ensure wider acceptance and public support; and (iv) have the capacity to reduce greenhouse gas emissions. The financing mechanisms (contingent grant and equity finance) applied to demonstration and follow-on investments will boost short-term demand, test regulatory and commercial procedures, and promote early commercialization and in-country replication of renewable resources. Streamlining procedures and refining them, combined with capacity building among stakeholders will reduce development time and costs. The public access to reliable and high quality data on resource, performance, cost-effectiveness, etc., will enable market knowledge and growth.
 - At project completion, GEF funds in the equity finance facility (US\$2.8 million – net of management costs), managed by HBOR, will be fully invested in operating projects and will remain in Croatia. The invested capital will be returned to the facility through structured exits and can be re-invested to support additional projects led by HBOR and various emerging market players. If the market grows as anticipated, HBOR may be able to establish a renewable energy equity fund that is capitalized by various local and foreign investors. Such an in-country replication strategy for the GEF funds will be developed during project preparation and specified in the implementation agreement.
 - To the extent that this project is successful, the Croatian experience can be easily tailored to other countries of the Region (for example, EU accession countries) having renewable resource potential, where similar Government’s commitment exists but policy and financing barriers hamper implementation.

- ***Stakeholder Involvement:*** Section D.4 describes the involvement of the Government and HBOR (the Executing Agency). It also indicates the positive response received during field missions and three Stakeholder Workshops from all potential stakeholders surveyed (public sector, private developers, local banks, NGOs, and end-users) on the proposed GEF modalities. These stakeholders will be consulted during preparation on further project design, as described in Section C.4.2. This would ensure that the project activities are designed to meet the market needs.
- ***Monitoring & Evaluation:*** Monitoring and evaluation will be developed for measuring the performance of the project (technical assistance, financing mechanisms, investments) and of the program (market transformation/stimulation). Key indicators for the project and program performance are described in Sections A.2 and A.3 and Annex 1, and will be developed during preparation under PDF-B Grant. Technical assistance has been allocated in the proposed project cost structure for monitoring and evaluating these indicators during implementation. In addition, protocol for measurement and verification of emission reductions will be an essential part of the demonstration projects. This will allow for verifying the cost effectiveness of the carbon abatement, and can be disseminated to the public.
- ***Financing Plan:*** Details of the project costs, budgets, and financing plan are described in Section C.1. and Table 3 of Section C.1. The project cost is US\$27.4 million. It will be financed with a GEF Technical Assistance - \$1.6 million; GEF Contingent Grant Facility - \$1.4 million; GEF Equity Facility - \$3.0 million; HBOR Equity Finance - \$1.5 million; Private and Public Equity - \$5.5 million; and Commercial Loans – US\$14.4 million. Since the pipeline entry, and after several in-country consultations, the following key changes were made to the financing plan.
 - *First*, project cost has nearly doubled due to: (i) the increased power capacity and therefore cost of the demonstration projects, to make them commercially viable – from US\$7.6 million to US\$12.8 million; (ii) the inclusion of follow-on project investments (totaling US\$11.4 million over the project implementation period), which previously were omitted from the total cost and financing plan; and (iii) the change in the debt:equity ratio.
 - *Second*, the IBRD loan for the demonstration projects was excluded as local banks and private sector partners have indicated their cofinancing participation along with the GEF, if IBRD can succeed in eliminating the identified barriers. During further project preparation, a Donor Conference will be organized to explore cofinancing interest (equity, grant and loan). If, by appraisal, sufficient cofinancing for the demonstration projects is not forthcoming, an IBRD loan would be envisaged at that time.
 - *Third*, the GEF amount requested is US\$ 6 million to reflect the increased project size. The GEF leveraging is about 1:4.6. The GEF amount of US\$6.0 million would be the same, regardless of whether or not an IBRD loan is considered.
- ***Cost-effectiveness:*** A preliminary estimate of the cost effectiveness of the GEF financing (excluding replication potential) is about US\$10 per ton of carbon. It is on the high range because Croatia has a large hydro generation (40-60% of energy supply) and therefore lower carbon intensity. The latter will likely increase as new generation capacity will be thermal which, in turn, will improve the cost effectiveness. – see Annexes 2 and 4 for details. The cost effectiveness estimate will be finalized by appraisal.
- ***Core Commitments and Linkages:*** The proposed project is consistent with: (i) the Bank's Country Assistance Strategy for Croatia which, inter alia, calls for making the institutional changes and investment needed to ensure energy supply in an environmentally sustainable

manner; and (ii) the Bank's infrastructure objective to work with entities and local government to help them tap private financing sources. -- Section B.1.

- **Consultation, Coordination and Collaboration between IAs:** Consultation and coordination is taking place with: (i) USAID, who is the drafting legislation and the establishment of the regulatory authority; and (ii) UNDP-GEF on solar energy initiative under the UNDP-GEF Removing Barriers to Energy Efficiency Project. See Sections B.3, B.4.3 and D.4.
- **Response to Reviews :**
- **Responses to GEFSEC comments at time of pipeline entry:**
- **Project Design:** The demonstration projects now include biomass and wind energy and exclude small hydro – See Section B.4.2 and D.1. Technical assistance now includes environmental impact assessment and public consultation for small hydro program and a few project sites, the objective of which is to remove barriers to public acceptance and attract private sector for further development. The financing mechanisms that meet the market needs are contingent grants and equity finance; performance grants are not being considered, though performance incentives will be built into equity financing mechanism.
- The Government is currently developing secondary legislation related to renewables, including minimum share of renewables in the energy supply mix, status of privileged producers, connection to grid and tariffs. This legislation will address, among other things, market dominance by the utility monopoly and the absence of market incentives and rules. One of the conditions for approval of the project by the World Bank will be assurance that the enabling framework is either in place (i.e., regulations enacted) or sufficient progress has been made toward enactment, with a time-bound action plan for completion in place and agreed to by the Government. The World Bank will monitor progress of drafting and enactment of secondary legislation throughout the project preparation. This would ensure that serious barriers to development, sustainability and replication will be overcome upfront. To enable this, support to national policy and regulatory framework that started under the Bank's Enterprise and Financial Sector Adjustment Loan (EFSAL; now closed), will continue: (i) during preparation under the Bank's Technical Assistance Loan II (TAL II; ongoing) and the GEF PDF-B Grant; and (ii) during implementation under the proposed project. See Section C.2.
- **Sustainability.** The sustainability of the project is now enhanced by having: (i) a local partner (HBOR – the executing agency) manage and contribute to the equity finance facility; and (ii) a local institution (the Energy Institute) oversee and report to the Government and the public on compliance with the national policy.
- **Replicability.** Successful demonstration projects and the “win-win” relationships that they will entice, are critical for establishing replicable contractual arrangements, financial structure, and licensing procedures. To ensure this, PDF-B funded preparatory activities will assist project participants (incl. HBOR, private developers, local banks, the utility and the regulator) in putting together demonstration projects meeting the replicability criteria.
- **Stakeholder Involvement.** NGOs will play a crucial role in environmental impact assessment and public consultation for small hydro, and in information dissemination. The Energy Institute will be a key stakeholder in monitoring compliance with policy, gathering and disseminating information on technical performance of projects, and assisting local governments in development planning (through regional centers).
- **Monitoring and Evaluation.** 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 as well as target values of indicators for benchmarking and verifying: achieved market penetration, changes in relative costs and prices of renewable energy and conventional power in Croatia, investment flows, risk perception among participants, and global environmental benefits. Technical assistance will be provided during project implementation for the monitoring and evaluation activities.

- Financing Plan. The changes to the financing plan are described above.
- ***STAP Review and Responses:***
- STAP Technical Review (completed on March 9, 2002) and responses to STAP comments are in Annex 3. STAP Reviewer recommends support for this project. To strengthen the preparatory work, STAP Technical Reviewer has recommended further analyses covering: (i) the market dominance of the monopoly utility; (ii) review of biomass energy plan and developing conditions from moving biomass projects from plan to implementation; (iii) the need to design mechanisms to test both the technical quality of projects and entrepreneurial resources; (iv) disaggregation of cost effectiveness by technologies; and (v) development of mechanisms to balance the allocation of GEF equity resources among large and small scale investors. These further analyses will be carried out prior to project appraisal.

Distribution:

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

PROJECT BRIEF

1. IDENTIFIERS

PROJECT NUMBER: P071464
PROJECT NAME: Croatia: Renewable Energy Resources Project
DURATION: 6 years
IMPLEMENTING AGENCY: The World Bank
EXECUTING AGENCY: Croatian Bank for Reconstruction and Development (HBOR)
REQUESTING COUNTRY: Croatia
ELIGIBILITY: UNFCCC signed on March 11, 1999
GEF FOCAL AREA: Climate Change
GEF PROGRAMMING FRAMEWORK: Operational Program 6: Removal of Barriers to Renewable Energy

2. SUMMARY: The objective of the proposed project is to help develop an economically and environmentally sustainable market for renewable energy resources in Croatia. Development of this market will make Croatia's economy less reliant on imported electricity and fossil fuels as well as reduce overall emissions. The project will overcome several policy, financial and technical barriers to implementing renewable energy projects. It will do so by supporting the implementation of a national policy framework that would legally require a minimum share of energy supply to be met from renewable resource, catalyzing investments through creation of critical financial mechanisms, and building knowledge and implementation capacity. A US\$ 1.6 million GEF grant for technical assistance will support policy development and implementation, training, resource assessments, development planning and capacity building. A US\$ 1.4 million GEF contingent grant will cover development costs for investments. A US\$ 3.0 million GEF grant will provide seed capital for equity co-financing of projects. The project is expected to attract associated investment co-financing of US\$ 1.50 million in equity from HBOR, US\$ 14.38 million in commercial bank loans and US\$ 5.55 million in private equity. Total funding for the project is estimated to be US\$27.43 million (not including GEF PDF-B funding).

3. COST AND FINANCING (MILLION US\$)

GEF:	- Project	6.00
	- PDF-B	<u>0.35</u>
	Subtotal GEF:	6.35
COFINANCING:	- HBOR (Croatia Dev. Bank)	1.50
	- Private Equity	5.55
	- Local Banks	<u>14.38</u>
	Subtotal Co-financing:	21.43
TOTAL PROJECT COST (WITH PDF-B)		27.78
TOTAL PROJECT COST (WITHOUT PDF-B)		27.43

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:

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CROATIA
Renewable Energy Resources Project
Project Concept Document
Europe and Central Asia Region
Energy Sector Unit

Date: March 11, 2002 Country Manager/Director: Andrew N. Vorkink Project ID: P071464 Lending Instrument: N/A	Team Leader: Rachid Benmessaoud Sector Manager/Director: Henk Busz Sector: PY—Other Power & Energy Conversion VY—Other Environment Poverty-targeted Intervention: N		
GEF Supplement ID: P071464 Instrument: GEF grants	Team Leader: Rachid Benmessaoud Sector Manager/Director: Henk Busz Sector: PY—Other Power & Energy Conversion VY—Other Environment		
Project Financing Data <input type="checkbox"/> Loan <input type="checkbox"/> Credit <input type="checkbox"/> Guarantee <input checked="" type="checkbox"/> Grant <input type="checkbox"/> Other For Loans/Credits/Other: Total Project Cost: US\$27.43 million Total Bank Financing: N/A Co-financing: Yes			
Financing Plan <input type="checkbox"/> To be defined			
Source Private Equity Croatian Bank for Reconstruction and Development (HBOR) Commercial Banks GEF	Local 5.55 1.50 14.38	Foreign 6.00	Total 5.55 1.50 14.38 6.00
Total	21.43	6.00	27.43
Borrower: N/A Recipient: Public and private sponsors of renewable energy Guarantor: N/A Responsible agencies: HBOR (Croatia Development Bank) Project implementation period: 2003-08			

CROATIA

RENEWABLE ENERGY RESOURCES PROJECT

List of Acronyms

CBA	Cost-benefit analysis
CO ₂	Carbon Dioxide
COP7	7th Conference of the Parties
EE	Energy Efficiency
EFSAL	Enterprise and Financial Sector Adjustment Loan
EMP	Environmental Management Plan
ESCO	Energy Service Company
FI	Financial Intermediaries
GEF	Global Environment Facility
GoC	Government of Croatia
HBOR	Croatian Bank for Reconstruction and Development
HEP	Hrvatska Elektroprivreda
IBRD	International Bank for Reconstruction and Development
INA	Industrija Nafta
ISMO	Independent system and market operator
MoE	Ministry of Economy
NEAP	National Environmental Strategy with Action Plan
NE Fund	National Environmental Fund
PMR	Project Management Report
PPIAF	Public-Private Infrastructure Advisory Facility
RAEL	Renewable and Appropriate Energy Laboratory
RERs	Renewable energy resources
RETs	Renewable energy technologies
TAL I	Technical Assistance Loan One
TAL II	Technical Assistance Loan Two
UNDP	United Nations Development Program
UNFCCC	United Nations Framework Convention on Climate Change

CROATIA
RENEWABLE ENERGY RESOURCES PROJECT

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A PROJECT DEVELOPMENT OBJECTIVES AND KEY INDICATORS

A.1 Project objectives

The objective of the proposed project is to help develop an economically and environmentally sustainable market for renewable energy resources in Croatia. Development of this market will make Croatia's economy less reliant on imported electricity and fossil fuels, reduce overall emissions, and create an attractive climate for private investment, and generate local industry and employment. This project will overcome several barriers, including: policy (e.g., lack of enabling legal framework, inadequate planning capacity, unclear permitting and licensing procedures, unclear land ownership); financial (e.g., lack of understanding of renewable energy in banking and business community, lack of risk capital); and technical (e.g., inadequate resource assessments, potential strain on transmission system). It will do so first by supporting the Government to codify its national policy that would legally require a minimum share of energy supply to be met from renewable resource. The project will then create critical financial mechanisms needed by the market and build public-private partnerships in applying these mechanisms to demonstration and follow-on projects. The project also provides assistance support to confirm market potential, build knowledge and implementation capacity, streamline procedures, monitor compliance with minimum share targets, and inform the public.

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

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

- Increased share of renewable energy in total electricity supply of country (compared to policy targets)
- Demonstrated risk-sharing among private developers, commercial banks, and the buyers.

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

- Number of stakeholders trained;
- Improved access to resource information and public awareness of renewable energy;
- Number of projects supported by development grants that lead to financial closure;
- Successful financing and implementation of two demonstration projects, including use of standard power purchase agreements, and inclusion of commercial bank financing and private equity;
- The number of projects reaching financial closure and the amount of co-financing from private capital markets.

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

The project's global environment objective is to reduce greenhouse gas emissions on a continuous basis by overcoming barriers to implementation of renewable energy. Performance indicators for the global objective include:

- Reductions in carbon dioxide emissions at the national and project levels;
- Development of renewable energy products and services that deliver a growing range of renewable technologies and applications.

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 March 11, 1999 and completed the first national communication on climate change activities in December 2001 and submitted this to the UNFCCC on February 7, 2002. Croatia's National Environmental Strategy with Action Plan (NEAP), completed in 2001, 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 February 2003 and World Bank Board approval in October 2003.

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: June 3, 1999

CAS Progress Report: August 22, 2001

One of the objectives of the Bank's Country Assistance Strategy for Croatia (and updated in the White Paper prepared for the new Government in 2000) is to make the institutional changes and investments needed to ensure renewable energy supply in an environmentally sustainable manner at realistic but socially acceptable prices. The project will support this objective by:

- Creating the enabling policy framework to address market and institutional failures, promote renewable energy and protect the environment;
- Increasing renewable energy supply among private and public end users, leading to lower carbon emissions, less dependence on imported electricity and fossil fuels, and development of new industries;
- Creating opportunities for private providers of renewable energy technology and services.

The project is also in line with the Bank's infrastructure objective to work with entities or local governments to help them tap private financing sources. Finally, the project is expected to make a small but measurable contribution to the economic development in the Adriatic islands, a high priority of the Government of Croatia.

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

The Project is consistent with the objectives of GEF Operational Program 6: Promoting the Adoption of Renewable Energy by Removing Barriers and Reducing Implementation Costs. The Project addresses the objectives in Section 6.4 of OP6 by: a) removing barriers to use of commercial or near commercial renewable energy technologies (RETs); and b) reducing any additional implementation costs that result from a lack of practical experience, low market volumes, or from dispersed nature of applications.

B.3 *Main sector issues and Government strategy*

The objectives of the Government of Croatia (GoC) for the energy sector call for post-war recovery and transition towards energy security through: (i) efficient energy supply in an environmentally sustainable manner at realistic but socially acceptable prices; (ii) demonopolization and liberalization of the energy market; (iii) fostering competition in the energy market where possible through privatization; (iv) establishment of a regulatory framework; and (v) addressing market and institutional failures to promote energy efficiency and renewable energy resources and to protect the environment. Croatia meets two thirds of its energy requirements from domestic production (mainly oil and gas). However, production is declining and energy imports will need to increase dramatically if economic recovery is to be sustained.

Croatia will have to pay full international prices for these imports, and with large investments needed for reconstruction and expansion of the energy infrastructure, the financial burden on Government would be high. This burden is best mitigated through creating an institutional and regulatory environment to attract private financing to the sector. In addition, the scarce energy resources will have to be used in a way that represents the highest value to the Croatian economy. This will require: (i) a more integrated planning approach to development of the sector than existed until now; (ii) creating tariff structures that recover the costs of supply each consumer imposes on the system and that lead to optimum interfuel utilization; and (iii) if subsidies are used for disadvantaged groups, it is best that these be transparent and provided directly from the government budget.

The Croatian electricity sector is dominated by the national utility, Hrvatska Elektroprivreda (HEP). HEP is the only electricity generating company in the country, despite the allowance of independent or private power. HEP is also the transmission and distribution company, operating approximately 22 local distribution areas. HEP's generation is comprised primarily of hydroelectric (46%) and thermal power plants (33%), with imported electricity comprising the rest at 21%. Total capacity installed in the country is approximately 3,600 MW. Because Croatia is no longer receiving electricity from Krsko, the nuclear power plant in Slovenia, all of the imported power is fossil-fuel fired, making this the dominant source of generation in the total mix.

The Croatian government is currently in the process of restructuring the entire energy sector, including electricity. This would result in the unbundling of HEP assets into separate generation, transmission, distribution companies, and an independent system and market operator (ISMO). The distribution companies will likely be able to buy their electricity supply from HEP and independent generators, as well as produce their own supply. Some of this supply may be from renewable energy sources. Financial arrangements are yet to be introduced to allow the ISMO to compensate the distribution companies for the difference between the cost of the renewable energy sources and the avoided generation costs, and to pass this differential cost onto the customers.

The Ministry of Economy (MoE) is responsible for energy policy and strategy. At the request of MoE, the Croatian Energy Institute "Hrvoje Pozar" has developed ten national programs in energy efficiency (EE) and renewable energy resources (RERs), comprising: (i) one program (entitled "PLINCRO") for the development of the gas market in Croatia; (ii) five RERs programs covering solar energy ("SUNEN"), wind ("ENWIND"), biomass ("BIOEN"), geothermal ("GEOEN") and small-hydro plants ("MAHE"); and (iii) four EE programs covering the promotion of energy efficiency in industry, services and public sectors ("MIEE"), the development of small cogeneration plants ("KOGEN"), and increasing energy efficiency in district heating ("KUENcts") and in buildings ("KUENZgrada"). The national programs form an integral part of the Energy Strategy developed by the MoE and already approved by the Parliament. They are timely and therefore deserve immediate support.

A package of five energy legislations was approved in July 2001. The new Energy Law provides, inter alia, for the development of renewable energy resources including a minimum share—to be defined in the secondary legislation—of the energy supply mix of the country to be met from renewable energy. This market share-based policy (also called "Renewable Energy Resource Portfolio Standard") would build sustained interest in the clean energy market and market guarantees for potential clean energy entrants. It also calls for the establishment of a special fund—the National Environmental Fund (NE Fund)—closely tied to the government, to support the national energy programs, including renewables and environmental cleanup. The sources of funding of the NE Fund, as well as its management and operations are to be defined in a separate regulation. Among the sources of funding being considered include environmental taxes. However, these proposals are in an early stage of development, requires further definitions and the timing of the Fund's startup is uncertain. The proposed project will start immediately and will use GEF funding to support the development and implementation of the national policy on renewables and the establishment of market-based mechanisms to achieve the minimum share of renewables. The NE Fund (once operational) and the GEF funding will provide a combination of fiscal-based incentives and market share-based policy incentives.

Croatia has good potential for renewable energy, with a significant resource base, including reasonably good resources in all technologies and excellent resources in some (e.g., biomass). The national energy program managed by the Energy Institute has identified potential resources in the following areas:

Table 1: Technical Potential of Renewable Resources in Croatia

Resource	Technical Potential
Small hydro	150 MW or 700 GWh
Biomass	34 PJ
Geothermal	810 MW _t and 46 MW _e (from discovered fields)
Wind	710 GWh (based on weather data)
Solar	15 PJ (by 2025)

Source: Energy Institute

Croatia has experience with all technologies except wind and has generally very good technical training in its universities and institutions. This experience can be transferred to RE businesses in the future. Because Croatia has in principle agreed to reduce greenhouse gas emissions as an Annex B country under the Kyoto Protocol, it has an additional incentive (beyond energy security, local employment, etc.) to generate clean energy.¹ Finally, there is relatively strong awareness in the country of environmental issues and the need for action in this domain, and keen interest among youth in promoting clean energy as part of Croatia's development (despite a weak network of NGOs).

A number of other on-going activities could complement the proposed project, and provide further momentum for establishing a viable renewable energy market. These include: (a) UNDP-GEF-financed activities, including "Croatia – Removing Barriers to Improving Energy Efficiency of the Residential and Service Sectors," which proposes to develop financing mechanisms for solar energy, among other activities; (b) USAID-financed work on gas and electricity networks and on demonstration zones under SECI initiatives; and (c) development of a National Environmental Action Plan, by the State Directorate for Protection of Nature and Environment, including development of enabling activities and mitigation measures to reduce carbon dioxide emissions, for national communications with the UN-FCCC -- work also financed by UNDP-GEF. Both the Environmental Action Plan and National Communication have been completed as of March 2002.

In December, 2000, the World Bank Project Team conducted a mission in Croatia to identify barriers, address stakeholder concerns, and further define the project design. Three stakeholder workshops – with public sector, private sector, and NGO stakeholders -- were conducted to inform the public and to obtain key information needed for project design. Building on this and previous work, the Project Team continued preparation and conducted two further missions in February 2001 and February 2002, and has developed a recommended course of action and preliminary financing plan for the proposed project.

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

B.4.1 Barriers to renewable energy

No significant private or public entity is actually developing renewable energy projects in Croatia, other than hydroelectric power, which is on a larger scale than those projects typically classified as renewable (less than 10 megawatts). Instead, the Government and donors are focused on identifying barriers to and opportunities in the renewable energy market. Numerous barriers to development of a sustainable renewable energy industry exist in Croatia. Among the barriers::

- *Policy barriers, including lack of an enabling framework for renewable energy.* Until recently, there has been no specific policy for inclusion of renewable energy in the energy mix of the country, and no rules to guide private sector development. Government and utility decision-makers have little understanding of and exposure to renewable energy resources and their costs and benefits, and their integration into the system. As a result, no decisions are made to allow development of the renewable energy sector, impeding progress toward achieving the government's stated strategy objectives. This situation is further exacerbated by non-existent or inadequate development plans, which, combined with land ownership problems, make the permitting process cumbersome and costly. Finally, the current legislation and tariff structure do not provide incentives for HEP to connect renewable resources and enter into long-term power purchase agreements. This will become even more difficult in a reformed and competitive market if provisions are made in the secondary legislation to position renewable energy in the electricity sector.

¹ There is still uncertainty regarding inclusion of certain power generation plants in Croatia's baseline (from Serbia and Bosnia), which may affect Croatia's decision to ratify the Kyoto Protocol. Nevertheless, the government has signed Memoranda of Understanding with both the World Bank and the Dutch Government for trading of emissions offsets.

- *Financial barriers, including a lack of development capital and project finance.* Currently there is little equity capital in Croatia for both development costs and project finance, though some foreign investors appear willing to provide equity investment, subject to a clear legal framework. Croatia has an improving banking sector, though in the past decade it has been reluctant to enter into long-term loans, and has little experience in project finance and almost none in the energy sector. Knowledge gaps among stakeholders and the banking community in particular include assessment of technology and operating risk, reviewing energy contracts and pricing, and appropriate capital structures.
- *Technical barriers, including a lack of resource assessments of renewable energy.* Though some assessments have been conducted by HEP (especially in the hydropower area), there is inadequate information of country-wide resource availability. There is also a potential strain on the transmission system caused by adding intermittent generation to an already large base of non-firm (hydro) power.

B.4.2 Strategic choices

The proposed project will address the policy barriers described above, through assistance to the Croatian Government in developing the analytical foundation for the secondary legislation, and to the Croatian Energy Regulatory Council in implementing the regulations. Financial and technical barriers can be addressed during implementation through early demonstration projects, contingent grants and equity co-financing, and technical assistance.

Choice of partners

The project will work with: (i) the Government to develop the national policy; (ii) the regulator, to oversee compliance and guard against market manipulation and dominance; (iii) Croatian Bank for Reconstruction and Development (HBOR), to bring financial resources and entice local commercial banks into financing; (iv), the national utility, Hrvatska Elektroprivreda (HEP) and/or the unbundled utility companies, to comply with the national policies related to grid-connected applications; (v) the Energy Institute, to formally comment on progress of implementation of national energy plans and of renewable energy in particular; (vi) local governments, to promote and facilitate development of resources; (vii) NGOs, to facilitate public acceptance; and (viii) private sector companies to develop commercially viable projects.

Both HEP and the Energy Institute will play key roles as advisors and partners in the project preparation and implementation. HEP is currently the monopoly for electric energy supply; after unbundling, the Independent System and Market Operator (ISMO) and local distribution companies will be the buyers of renewable energy. HEP also has a great deal of technical know-how, which will assist in the design and implementation of the project.

The Energy Institute, as a research organization and manager of the renewable energy programs for the government, has expertise and critical information on projects and renewable energy potential in general. In addition, the Energy Institute can play a key role in information dissemination², sources of best practice, and networking among energy developers and public sector counterparts. Also, because it is already involved in assisting local governments develop master plans for energy, it has built a base of knowledge and expertise in this critical planning area, and can become a source of information for local governments on these issues in the future.

Choice of technologies. The choices of wind energy and biomass for development of demonstration projects are justified because the resources, after initial assessment by the Croatian Government and institutions, appear to be significant enough to have an impact on the sector, and have already attracted the interest of private developers. In addition, the technologies are proven commercially but face barriers that can be addressed and overcome partially through this project. The time factor is crucial, as the energy sector as a whole is undergoing

² The Energy Institute has implemented state-of-the-art information dissemination technologies at its facilities in Zagreb and is aiming to become a leader in distance learning projects in the energy field through Croatia as well as South Eastern Europe.

restructuring, and demonstration of renewable energy success in the early stages of the restructured market will provide a sound platform for continued growth.

Small hydro-power and geothermal were initially considered in the project concept, again, as a commercially viable technology. However, further discussions led to the conclusion that the barriers hampering development of the resources could not be overcome in the implementation period, for purposes of completing a demonstration project. Rather, these problems – mainly associated with site location, permitting difficulties, and opposition of environmental groups and local communities – would be addressed for small hydro in the project through initial environmental impact assessments and public consultation. This will be done through the technical assistance grant.

Solar power was also excluded from consideration for this project. The barriers associated with solar power appear to be more associated with the lack of manufacturing capacity – which creates higher costs than necessary as most equipment is imported -- and lack of small-scale (consumer) finance programs. A critical barrier to the development of solar power also is the problem of a poorly organized and financed tourism sector, which could provide a great deal of demand. Overcoming the barriers associated with the tourism sector seems too ambitious for this project. UNDP-GEF, however, is supplying modest support to solar as an integral part of energy management for the hotel sector in Istria and Rijeka (see section B.4.3).

Both on-grid and off-grid application of renewable energy were considered for the project. While potential for off-grid application exist (especially in the islands in the Adriatic), Croatia's distribution grid is quite good and extensive. This does not obviate the potential for off-grid applications, especially wind and solar. However, development of the renewable energy market will be affected more profoundly by addressing the policy and commercial barriers associated with developing, financing and implementing projects connected to the grid. Stimulation of the grid-connected market should provide benefits to the off-grid market as well, as familiarity with the technology, operation and costs of RE systems will spread. Finally, on-grid applications provide a benefit for the entire country, and not just the remote islands.

Choice of funding mechanisms. The selected funding mechanisms identified for the project (including both preparation and implementation) were chosen to address specific barriers. These funding mechanisms include:

- The **GEF PDF-B grant** will provide funding during the preparation phase to address policy barriers, including a lack of information regarding costs and benefits of renewable energy in Croatia. The cost-benefit analysis and legislative support will assist the government in developing the necessary secondary legislation, which will create the foundation for a sustainable market in renewable energy.
- The **GEF technical assistance** grant will provide funding for resource assessments, technical and financial training, and capacity building in the renewable energy sector. The technical assistance will address technical barriers stemming from lack of information (resource assessments), and technical problems (transmission system constraints). Training and capacity building will address barriers related to lack of understanding in Croatia of renewable energy technologies and systems, lack of understanding of financing in renewable energy projects, and the need for local coordination in energy planning (regional energy centers). In addition, initial environmental impact assessments and public consultation for small hydro projects will help remove some of the barriers related to developing sites and obtaining permits and land use agreements for that technology. Bottlenecks in the project development process will also be addressed: namely, training to the infant regulatory authority to strengthen its capacity and guide on implementation of reforms and legislation for renewable energy; training of policymakers and assistance for local government in preparing development plans and creating processes for issuing permits and land use agreements. Finally, information dissemination, especially regarding demonstration projects and available financing mechanisms, and GEF environmental monitoring and reporting will be made possible through technical assistance grants.
- The **GEF contingent grant** will address a lack of funding for development costs (such as feasibility studies) in the market, and will promote increased development of projects. Successful projects will return capital to HBOR, allowing for recycling of funds and continued support of development activities.

- A **GEF grant** will be used to capitalize an equity finance mechanism, which will provide needed risk sharing capital for leveraging private equity and commercial lending. Without a strong culture of equity investing in Croatia, it may be difficult to find private entrepreneurs/developers who are willing to take all the equity risk in a particular project. Recently privatized local banks are interested in providing loans to projects, but require at least 30 percent of projects to be equity-financed. Through taking a minority position in projects with a lower hurdle rate for its investment, the GEF equity finance can provide some of the early market risk capital necessary to stimulate additional investment. While some capital exists in the market, most Croatian companies, especially small and medium enterprises, do not have sufficient equity to finance larger-scale projects (5-MW or greater). It is important to support these scale projects in order to achieve lower unit costs, and GEF equity co-financing can provide developers with critical equity co-financing that in turn can help leverage bank financing. Exit strategies for the equity investments will be developed such that returns on investments will cover HBOR’s incremental management costs and returned capital can be recycled for future investments.
- **Private sector financing**. Commercial bank loans and private sector equity (from developers) will provide co-financing, along with GEF equity, for demonstration projects in wind energy and biomass cogeneration. These projects will help to demonstrate the commercial viability of renewable energy and will mobilize capital from the private sector, stimulating the market and building a foundation for future private sector projects. Bringing private equity and debt to project finance for renewable energy is critical for creation of a sustainable market, because the rigor required for private sector investment will eventually help to drive down costs of implementation through better information and risk management.

B.4.3 Complementarity with proposed GEF activity of the United Nations Development Program (UNDP)

The proposed 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 2). Both projects will produce valuable information – such as best practices for developing and financing RE projects – that will be disseminated to Croatia and the Region. The teams preparing both projects are in close consultation and will look for opportunities for cooperation and possibly co-investment.

Table 2: World Bank and UNDP projects in Croatia

	World Bank	UNDP
Sector	<ul style="list-style-type: none"> • Electric power and heat/steam supply • Distributed generation for small business <i>Coverage: nationwide</i>	<ul style="list-style-type: none"> • Tourism services (hotels) and some residential sectors <i>Coverage: Istria and Rijeka regions</i>
Technology	<ul style="list-style-type: none"> • Biomass cogeneration • Wind energy 	<ul style="list-style-type: none"> • Electricity, heat, and water consumption in hotel services, including use of solar panels • Compact fluorescent lighting and energy-efficient appliances in private residences
GEF modality	<ul style="list-style-type: none"> • Technical assistance grant • Contingent grant • Grant used as equity finance 	<ul style="list-style-type: none"> • Technical assistance grant • Contingent grant • Partial risk guarantee backing end users

C PROJECT DESCRIPTION SUMMARY

C.1 *Project description and components*

The project will start with the objective of assisting the government in developing a rational policy framework for renewable energy. This includes defining national goals for implementation of renewable energy, based on a clear understanding of the costs and technical issues related to financing and installing projects. These activities will be started during the project preparation, through PDF-B funding, because of the urgency associated with developing the secondary legislation for the energy sector and for renewables in particular.

Implementation of the project will include three components:

Technical assistance (GEF grant of US\$1.6 million). Technical assistance will include detailed resource assessments, environmental impact and public consultation for small hydro, information dissemination, financial and technical training, and assistance in design of regional energy centers and local development plans. Beneficiaries will include HEP, local governments, NGOs, the banking community, policy-makers, regulatory authority, and private developers.

Pipeline and project development costs (GEF contingent grant of US\$1.4 million). The contingent grant mechanism will be used to identify candidate projects for investment and to cover initial project development cost (feasibility studies). Grants will be made a cost-share basis and will be capitalized in the project financing. Only if projects do not move to implementation will the contingent grant become unrecoverable and be considered an incremental cost to the project activity. Funds that are recovered will be recycled and used in future projects.

Project investments (US\$24.4 million with a GEF grant of US\$3.0 million). An equity finance facility of US\$3.0 million in GEF funds, matched by US\$1.5 million from HBOR, will be created to meet emerging market needs for equity capital. The facility will leverage US\$5.6 million in private equity and US\$14.4 million in commercial lending, for total project investment of US\$24.4 million over a six-year period. US\$12.8 million will be invested in two demonstration projects (wind and biomass) identified during preparation, and US\$11.6 million in follow-on projects identified and developed during implementation.

Total project costs. The total project costs and financing plan are shown below.

Table 3: Financing Plan (US\$ million)

Component (according to financing mechanism)	Category	Indicative Costs		Financing Plan				
		Amount	% of Total	GEF	HBOR	Private Sector	Local Banks	Total
Technical Assistance (grant)	Capacity building and barrier removal	1.60	5.8%	1.60	-	-	-	1.60
Development cost support (contingent grant)	Barrier removal (lack of early -stage project funding)	1.40	5.1%	1.40	-	-	-	1.40
Project Investments (equity finance mechanism)	Barrier removal (lack of equity finance)	24.43	89.1%	3.00	1.50	5.55	14.38	24.43
Total		27.43	100%	6.00	1.50	5.55	14.38	27.43

C.2 Key policy and institutional reforms to be sought

The Bank's ongoing support to the Croatian energy sector is built around: (i) the objectives of the Enterprise and Financial Sector Adjustment Loan (EFSAL; closed on Nov. 30, 2001) covering restructuring of public utilities, preparing for privatization, and establishing a new regulatory framework; (ii) the Bank's Technical Assistance Loan II (TAL II; ongoing) which provides, inter alia, financing support to utility regulation, restructuring and privatization; (iii) the Croatia – Energy Efficiency Project (under preparation), which involves an IBRD Learning and Innovation Loan with GEF co-financing to support energy saving investments implemented by a utility-based energy service company (ESCO) under performance contracting principles; and (iv) an ongoing technical assistance grant from the World Bank - Public-Private Infrastructure Advisory Facility (PPIAF) to the Government, which is aiming at the creation of a modern concession framework and legislation for the participation of the private sector in the development, financing and operation of public infrastructure and public utility services in Croatia. The proposed project will build on policies articulated in the energy law, which call for unbundling of the power utility, creating a minimum share of renewable energy in the supply mix of the country,

strengthening regulation and policy oversight, and creating an attractive framework for private participation through, for example, concessions.

The Energy Law, passed in July 2001, provides general support for the use of renewable energy resources. It is critical that the implementing regulations for renewable energy are prepared with sufficient diligence so as not to allow renewable energy to be “orphaned” in the new, restructured energy sector.

Secondary legislation (or sub-laws) that is needed to codify the national policy on renewable energy includes the following.

- *Croatian strategy of energy development.* The energy strategy must define how to ensure a stable and reliable supply of energy, and specifically notes the use of different renewable energy resources.
- *Rules regarding the national energy programs.* These programs are to ensure meeting of long-term development targets, including investment in renewable energy resources.
- *Rules on renewable energy resources.* These rules will stipulate which renewable energy resources will be used for energy generation, their type, technology and possibilities of their use.
- *Tariff systems.* Rules must be developed for calculation of tariffs, including creation of incentives for renewable energy.
- *Rules on costs of connections of new energy operators and buyers.* The rules will stipulate how this cost should be calculated and passed on to the users that benefit from such connection.
- *Conditions for gaining status of privileged energy operators.* Privileged producers can include those producing from renewable energy, but the decision to be recognized as a privileged producer will be issued by the Energy Regulatory Council.
- *Minimal share of renewable energy resources.* The Croatian government is tasked with prescribing the minimum share of renewable energy (excluding hydro above 5 MW) for the electricity system.

One of the conditions for approval of the project by the World Bank will be assurance that the enabling framework is either in place (i.e., regulations enacted) or sufficient progress has been made toward enactment, with a time-bound action plan for completion in place and agreed to by the Government. The World Bank will monitor progress of drafting and enactment of secondary legislation throughout the project preparation. The project preparation activities described in Section C.4.4 will support the government in the early stages of regulatory design, and the regulatory authority during policy implementation.

C.3 *Benefits and target populations*

Project benefits include the following:

- Increased energy security through reduced imports of electricity and fossil fuel;
- Reduced carbon dioxide, sulfur and NO_x emissions;
- Assistance to Croatian government in complying with Kyoto Protocol and EU Directives on renewable energy;
- Minimal impact on the environment through smaller project size;
- Development of new industries and businesses, including:
 - Project developers/investors;
 - Engineers and consultants;
 - Manufacturing/assembly of equipment;
- Improved environmental image, which could impact the tourism industry;
- Increased foreign direct investment and lending through removal of barriers.

Project beneficiaries include private sector developers, consultants, manufacturers and investors, through improved regulations governing the sector, increased availability of capital, and increased demand for renewable energy; HEP, through development of new business lines and increased security of supply; HBOR, through direct involvement in equity financing and energy sector; Ministry of Finance, through reduced foreign exchange requirements; Ministry of Economy, through access to analytical work supporting secondary legislation;

commercial banks, through increased understanding of project finance and renewable energy risks and finance; local governments, through improved planning capabilities and increased investment; local populations on remote islands, through improved supply of reliable, clean energy; and the country as a whole, through increased local and global environmental benefits, job creation and less reliance on imported energy.

C.4 Institutional and implementation arrangements

C.4.1 Implementation arrangements

HBOR will be the recipient of the GEF grants, and will coordinate the implementation of the overall project. In addition, HBOR will act as financial intermediary for the contingent grant and equity finance mechanisms, and will manage and distribute GEF technical assistance, even for activities benefiting other project partners. External consultants will assist HBOR.

The primary reasons for choosing HBOR as executing agency include:

- As the primary bank concerned with economic development in Croatia, HBOR understands issues related to market development and can help to bring commercial banks into the project as co-financiers;
- HBOR has implemented and managed several large World Bank loans, and is familiar with World Bank procurement and disbursement procedures.

C.4.2 Involvement of NGOs, local banks, local businesses and foreign donors

During project preparation, NGOs will assist in the design of activities to be carried out during implementation including: development planning, development of regional energy centers, information dissemination, and environmental impact assessment and public consultation for small hydro. Local businesses, including developers, manufacturers, and contractors, will be consulted on measures to overcome barriers to renewable energy resources. Local banks will be consulted and involved in the design of the funding mechanisms proposed under the project and of the training program, to ensure that capacity will be built and financial products developed to meet their needs. Also, a Donor Conference will be organized to engage interests and seek co-financing participation.

During project implementation, the Energy Institute will play a key role in: (i) working with local communities on development planning and regional energy center issues; (ii) reviewing technical quality and performance of investment projects; and (iii) reporting to the Government on implementation progress of its national policy on renewable energy, and recommending corrective actions (if any). NGOs will carry out information dissemination activities. Local businesses will carry out project development, financing, and implementation. Consultants will prepare resource assessments and feasibility studies. Many project stakeholders, including the local banks, will benefit from the training activities. Finally, local banks will play key roles in structuring project finance for demonstration and follow-on projects.

C.4.3 Progress to date

The World Bank team has conducted several missions to Croatia for the Renewable Energy Resources Project, including the last mission in February 2001 and the previous mission in December 2000. Project design has been developed and refined, and the following milestones have been achieved:

- Approval by GEF Secretariat for entry into GEF pipeline (November 1999);
- Endorsement by Croatian Minister of Environment (July 2000);
- Stakeholder meetings (private sector, public sector, NGOs) in Croatia (December 2000);
- Preparation and submission of Project Concept Note to the GEF (January 2001);
- Preparation and submission of PDF-B Grant Application to the GEF (February 2001);
- Discussions in Croatia with possible implementing agencies (June 2001 and February 2002).

C.4.4 Project preparation activities

GEF PDF-B Grant (US\$350,000) was approved to cover the costs of additional preparatory work required prior to project effectiveness. This work includes: (i) developing the analytical work that will help define in the legislation the minimum share of renewable energy resources in the supply mix of the country and the incentive structure for development and implementation; (ii) making available to decision-makers adequate information on the economic potential of renewable energy, the economic, financial and environmental costs/benefits of various technologies, and the economic and financial impact on the consumers and the economy; (iii) creating a framework for improving the planning capacity at all government levels; (iv) responding to concerns of utility staff regarding cost and impact of intermittent generation fed into the grid; (v) identifying ways to streamline the permitting and licensing process for wind and small hydro; and (vi) developing the structure, terms and conditions for use of contingent grant and equity finance mechanisms, and assisting in raising additional equity capital and debt financing (foreign and domestic); (vii) developing project implementation plan, including monitoring and reporting. The PDF-B funded activities are detailed in Attachment 2 of Annex 4.

D PROJECT RATIONALE

D.1 Project alternatives considered and reasons for rejection

The use of GEF grant as capital subsidy was considered and rejected because it will not likely stimulate any development of a sustainable market. The proposed equity financing mechanism will provide far greater leverage and help develop the market for a relatively small incremental cost.

An IBRD loan was initially considered to finance demonstration projects. However, this was excluded from the project and additional private sector commercial bank loans were considered instead. The rationale is that the demonstration projects should be financed as commercially viable projects, after overcoming initial hurdles presented by the market, the government, HEP, etc. Complete involvement of commercial banks in the project financing will have a more powerful demonstration effect. Increased interest among the banks in financing these projects has led to the conclusion that the most important issues are related to project risks, adequate contracts for power sales, adequate pricing, and appropriate levels of equity. Co-financing from other banks (i.e., IBRD) does not reduce risk, only total exposure. However, if by appraisal, sufficient cofinancing is not forthcoming for the demonstration project, an IBRD loan would be envisaged.

Among the technologies reviewed for financing as demonstration projects, small hydro power was rejected for several reasons, including extremely long development process, environmental impact risk – including location in sensitive preserved areas, and local and NGO opposition to development. As an alternative, the technical assistance component will assess the environmental impact and public acceptance for small hydro resources in general and for a group of potential sites in particular. The objective of this is to prepare the selected group of potential sites for further development by the private sector after these pass the level of scrutiny that would ensure public acceptance.

Other technology applications rejected include off-grid wind and solar. Impact on the country will be increased through focus on on-grid applications, and will also focus the project on removal of barriers which are most problematic for renewable energy currently. Biomass cogeneration at captive locations was considered the best alternative for that resource, because of complications involved with collection of diverse biomass fuels from different areas for one central plant. Rather, fuel generated on site (such as wood-waste from a sawmill) and under the control of the developer/investor/steam host was considered more likely to succeed, and thus stimulate the market in the near term. Geothermal generation was rejected because of the predominance of Industrija Nafta (INA, the national oil and gas company) in the sector, and the need to focus on projects likely to be developed by private sector entities.

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
Financed by the Bank			
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
Financed by other development agencies			
Power distribution reconstruction and rehabilitation	EBRD - Power Project		
Removing Barriers to Improving Energy Efficiency of the Residential and Service Sectors	UNDP-GEF	Not Applicable	Not Applicable

D.3 Lessons learned and reflected in proposed project design

D.3.1 For the Technical Assistance

Technical assistance will be largely focused on resource assessments, training, capacity building, and removal of policy and institutional barriers. The project will draw on numerous examples of large-scale resource assessments of wind, hydro and biomass, including ESMAP-funded resource assessments in Asian countries. Capacity building will be focused mainly on training in finance, contracts, and technical matters (such as interconnection and wind energy dispatching). Financial and contract training will be based on project finance-based programs, some of which have been sponsored by the U.S. Agency for International Development. Training in wind energy use and interconnection will draw on examples of training programs for the wind industry in countries with large installations of wind energy, such as Germany and Denmark, or laboratories such as the National Renewable Energy Laboratory in the United States.

D.3.2 For the Contingent Grant Facility

Numerous programs have been developed to support early-stage project development funding through use of contingent grants, including: USAID-funded programs managed by organizations including E&Co and Winrock International have disbursed numerous grants on a cost-sharing basis to renewable energy developers in the Philippines, Indonesia, Guatemala, and Brazil among others. Other national programs include cost-sharing grants in India for biomass cogeneration, sponsored by the Ministry of Non-Conventional Energy Sources. While these programs have stimulated development of projects and had some successes (especially in India), some problems have arisen where grants were made prior to establishment of the necessary regulatory and legal framework, therefore projects produced good feasibility studies but had little chance of commercial success because other barriers, such as lack of clear pricing policy, had not been resolved. The proposed project has made continuance based on the condition of adequate policy framework.

D.3.3 For the GEF Equity Mechanism

Several successful private equity funds have operated and financed renewable energy projects, mostly in the wind sector. Expertise will be used during project preparation to guide the design of the terms and conditions for the use of the GEF equity finance facility.

D.3.4 For the Demonstration Projects

The project design for the demonstration projects is based on the concept of an off-balance sheet project finance structure. The technologies to be employed are proven and commercial; the barriers to overcome are primarily financial, contractual and policy-related. Some technical barriers exist, but these are restricted to the interconnection of renewable technologies into the Croatian transmission grid, and are specific to this system. Interconnection issues will be addressed using best practices from other countries regarding grid stability/renewable energy issues. Lessons learned from their experience will be brought into the project.

Financial and contractual issues will be addressed through use of standard project financing structures. There are numerous examples of successfully structured renewable energy projects throughout the world, including the United States, Canada, Central America, India, the Philippines, etc. Development of the wind energy sector, in particular, has shown that bank financed projects with private equity are feasible and attractive in the proper regulatory environment. The biomass cogeneration sector has been very successful, based on clear policies and pricing structures, as well as early-stage support for development. The problems that have existed in India have been related more to lack of adequate equity and bank finance, which has hampered development of the market somewhat.

Policy issues are related to contractual but also include the ability of a developer to define a project site and obtain the necessary permits. This is quite difficult in Croatia, especially in the small hydro area, and some lessons will be brought from similar projects financed in the region, especially Slovenia.

D.4 Indications of borrower commitment and ownership

The Government has demonstrated its commitment to renewable energy through: its national energy programs; the enactment of the new Energy Law in July 2001 requiring, among other things, a minimum share of renewables in the energy supply mix (yet to be defined); and the current effort to develop secondary legislation that, inter alia, implement the Government's stated policy. USAID is currently providing technical assistance support to help finalize the secondary legislation related to electricity and to the set up of the new energy regulatory authority. The 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, the establishment of regulatory agency(ies), and the unbundling and privatization of the power and gas sectors.

HBOR has agreed to act as the executing agency for the project and as the financial intermediary for the contingent grant and equity finance mechanisms. In addition, HBOR will consider contributing its own equity at risk to supplement GEF funds.

Finally, all potential project partners, including developers, manufacturers, contractors, financial institutions, utility, and NGOs surveyed are eager to cooperate with project preparation and implementation.

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

Croatia has significant renewable resource potential that can be exploited if an enabling legislative and financing framework exists. Local banks, private developers and investors, and the public utility are also reluctant to move forward in the absence of demonstrable success in developing renewable energy projects. The Bank's involvement is essential to add credibility to local authorities' efforts to implement needed policy, increase penetration of renewable energy and reduce dependence on energy imports. The Bank's involvement will enable an economically and environmentally sustainable market for renewable energy goods and services to flourish.

The GEF involvement is critical in helping open the market and in leaving a sustainable arrangement upon exit, not dependent upon any further credit enhancement or financing mechanisms. GEF's leading role in the project will be to overcome barriers to development of renewable energy resources through commercially sustainable activities. Without GEF participation, private developers will not be able to develop and finance projects that benefit project partners and the country at large. And without GEF participation there will be no significant resources to build knowledge about renewable energy among entrepreneurs, utility officials and employees,

commercial banks, local government, and other stakeholders. 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.

Finally, while the current restructuring of the energy sector presents challenges to development of this project and renewable energy, it mainly represents a tremendous opportunity. The World bank, through previous activities and with GEF support in project preparation and implementation, will be able to add needed resources, expertise and advice at a critical juncture. By assisting in developing rational secondary legislation that will create a framework for renewable energy, many barriers to the sector will be removed in a relatively short time period and allow for development of the market.

E ISSUES REQUIRING SPECIAL ATTENTION

E.1 Economic

Economic evaluation methodology:

Cost-benefit Cost effectiveness Incremental cost Other [specify]

The proposed project will support the implementation of a national policy framework that will legally require a minimum share of energy supply to be met from renewable energy sources, and that would address the failure of the market to reflect local and global environmental externality costs. The determination of the minimum share for renewable energy will be based on cost-benefit analysis (CBA). The CBA will include development of resource cost curves and will estimate the amount of renewable energy that is economically viable based on the avoided cost of conventional electricity (business as usual scenario) first without consideration of externalities, then with inclusion of local and global externalities. From the CBA, the economic market potential for renewable energy will be derived, and targets for achieving the minimum share over time will be established. The full economic analysis that will be required to develop the secondary legislation will be developed during project preparation (under PDF-B grant) and available by appraisal.

The incremental cost analysis is presented in Annex 2. A preliminary estimate of the cost effectiveness of the GEF financing (excluding replication potential) is about US\$10 per ton of carbon. It is on the high range because Croatia has a large hydro generation base (40-60% of energy supply) and therefore has lower carbon intensity. The latter will likely increase as least-cost expansion generation indicates that new generation capacity will be thermal which, in turn, will improve the cost effectiveness. The cost effectiveness estimate will be finalized by appraisal.

E.2 Financial

A major concern will be the cost of implementing the minimum share policy to the consumer. Therefore, special attention will be given to estimating the financial investment required and their sources, also to estimating the incremental financial investment and financial costs to the consumer (in terms of affordability and willingness to pay). This will support development of financial incentives and tariff reforms, as required by the secondary legislation. Costs and prices of renewable energy resources, and effectiveness of the policy (compliance with minimum share targets) will be carefully monitored during implementation as a basis for corrective actions.

Demonstration projects will be financed with private equity, GEF and HBOR funds channeled through the equity finance mechanism and contingent grant facilities, and commercial loans.

Financial due diligence for the demonstration projects will include, among other things, creditworthiness of the developer (including track record) and of the buyer; business plan (technical and financial *pro forma*); environmental impact assessment (including public consultation and social assessment); permitting and licensing, including status of privileged producer; power sales contract, rules of operation in the market.

The equity finance mechanism and contingent grant facility will provide significant foundations for leveraging additional private equity and commercial debt for the renewable energy market. As financial catalysts, it is important that both be well designed and managed. Poor design and management could result in creating market

distortions, for example, if only large-scale public enterprises were financed through these mechanisms. A significant portion of preparation funds and activities will center around design of these financial facilities in order to create operational guidelines and monitoring procedures that will result in market enabling transactions from multiple energy providers. In addition to general guidelines and procedures for these facilities, different options for investing equity funds will be reviewed during preparation.

The project has no fiscal impact for the Government as there is no borrowing by the Government and the investment projects are financed on a commercial basis.

E.3 Technical

The project will employ proven, commercially viable renewable energy equipment and technologies. Technical issues that are of concern to HEP and others include interconnection of distributed energy into the grid (grid stability); and operation and maintenance of wind power plants. These issues will be addressed during preparation and implementation.

E.4 Institutional

Institutional issues that require attention include:

- Management of the GEF equity funds by HBOR;
- Restructuring of HEP, and possible spin-off of separate independent power company to implement the demonstration projects (similar to the ESCO model for energy efficiency investments proposed in the Croatia Energy Efficiency Project);
- Ownership of the demonstration projects (related to the above);
- Relationship of the central government to local governments in the domain of development planning, permitting and licensing, and creation of regional energy centers.

The GEF equity finance management will be addressed in the preparatory phase during fund design. While restructuring of HEP will be an ongoing effort that will require constant monitoring, the energy law provides the status of privileged producers for renewable sources, which would likely require the unbundled subsidiaries of HEP to buy from these sources. The project will be affected by the changes in HEP, and early in the project the sponsors must address the issue of ownership of the demonstration projects, in order that the projects will have viable owners and buyers after any restructuring. Finally, part of the preparatory work will involve design of local development planning and regional energy centers, which will require addressing the issue of relationships between central and local governments. This issue is one of the key barriers to low-cost implementation of hydro and wind projects.

E.5 Social

There are no critical social issues related to the project. The impact of complying with the minimum share of renewable energy on the consumers—in terms of affordability and willingness to pay—will be assessed during preparation.

E.6 Environmental

1. Environmental issues. The project will result in major positive impacts on the environment, in terms of increased use of renewable energy resources, reduced air pollution and reduced greenhouse gas emissions. No major adverse environmental issues are associated with the project. Environmental issues that exist with respect to renewable investment projects include the following:
 - **For wind**: physical impacts from construction (noise, land acquisition, site preparation and dust) and from operations (noise, avian mortality, site access); and acceptance by local communities based on noise and impairment of the view.
 - **For biomass**: possible deforestation; fire risk associated with stored fuels; particulate emissions, ash disposal and treatment of effluents.

2. Environment category: FI (Financial Intermediaries)
3. 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, replacement and operation activities.
4. Status of Category Assessment: Not applicable
5. Proposed actions. At this point, specific demonstration and other subprojects to be financed by the GEF have not yet been identified. 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 (EMP) 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. All components/sub-projects that have GEF financing will be subject to these policies, and beneficiaries will be requested to prepare EMPs to satisfactorily address environmental issues. Other renewable investments not having GEF financing will follow the Croatian environmental policies and procedures.
6. Status of any other environmental studies: Not applicable
7. Local groups and NGOs consulted: See section E.7
8. Resettlement: None
9. Borrower permission to release EA: Not applicable
10. Other remarks: None

E.7 Participatory approach

E.7.1 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 carried out by NGOs. Part of the preparatory activities under the GEF PDF grant will involve consultation with local governments and NGOs on local development plan design. The project implementation will have a significant component addressing the development of regional energy centers, which will involve local government, NGOs, and other groups in design of a more decentralized, bottom-up approach to energy planning. An NGO will likely be engaged to facilitate this activity. Also, NGOs will play key roles in public consultation regarding impact of small hydro on local communities, and in dissemination of information related to the demonstration projects.

The project's key stakeholder groups are direct beneficiaries (HEP (both central and regional managers and employees), businesses, and central and local governments), other affected groups (small business associations, manufacturers of renewable energy 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).

E.7.2 Other key stakeholders: See above.

E.8 Checklist of Bank policies

E.8.1 Safeguard policies

Policy	Risk of noncompliance
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

E.8.2 Business policies

- 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)

E.8.3 Describe issues involved not already discussed above: Not applicable.

F SUSTAINABILITY AND RISKS

F.1 Sustainability

The project will contribute to the sustainability of renewable energy supply in Croatia by: (i) assisting the Government in achieving its policy objective to renewable energy; (ii) supporting the creation of the enabling legislation and its implementation; (iii) providing knowledge and building capacity among decision-makers and market participants for a better understanding and acceptance of renewable energy; (iv) supporting the creation of an attractive climate for private investment as well as the financing mechanisms and structure that will entice multiple market participants to seek business opportunities in renewable energy and implement the demonstration and follow-on projects.

Project sustainability will depend heavily on having an effective and enforceable policy framework that would legally require a minimum share of renewable energy. The project starts with supporting the Government to develop this framework during project preparation. To ensure sustainability, technical assistance will be provided during implementation to the regulatory authority and other local institutions (such as the Energy Institute) to provide effective regulation and policy oversight, monitor compliance, evaluate market transformation, recommend corrective actions and inform the public. In addition, sustained commitment to and compliance with domestic legislation requiring minimum share of renewables will be driven by the need for compliance with EU directives to gain EU accession, and Croatia's commitment to international protocols (e.g., Kyoto).

In the demonstration projects, private developers will finance renewable energy projects with contingent grants from GEF, private equity, equity from the equity finance mechanism, and commercial bank loans. The project finance budget for the demonstration projects is US\$12.8 million. The equity financing mechanism, through continuing investments in renewable energy projects, will have the most visible long-term impact on the sector. Through leveraging of private equity and debt, the remaining equity finance will result in additional project investment of US\$11.6 million. It is envisioned that most investments will return capital to the equity mechanism, which will allow it to continue to provide a source of equity funds. Successful projects will provide a return on investment (around 10 percent), which will further enhance sustainability. These capital flows can be reinvested in future projects and would result in an additional US\$21.7 million in project finance.

As relevant experience and parameters on specific project transactions becomes available, the terms and impact of the GEF equity will be reviewed regularly and adjusted to local banks' prevailing needs for risk capital sharing. This flexibility and periodic reevaluation of the GEF contingent grant and equity finance mechanisms will be crucial to ensure that these mechanisms fit the emerging market conditions and opportunities in renewable energy financing and enable a competitive participation of commercial banks in financing renewable investments.

The proposed project is also sustainable because it requires participation by independent actors – financial institutions, renewable energy equipment and service providers, project developers, and the utility buyer – who are pursuing commercially viable development of the renewable energy market, with each actor retaining 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 project developers should continue to grow as financial intermediaries gain experience with their loan portfolios and the risks associated with technology and operations.

F.2 *Replicability*

The features of the project that allow replication are technology, financing mechanisms, reduction in development time and cost, information sharing, and exit strategy. Specifically:

- During implementation, the project will use *technologies* that: (i) are commercially proven and widely available a short distance in Western Europe; (ii) have excellent prospects for long-term market penetration once the identified barriers are overcome; (iii) can be produced locally, to ensure wider acceptance and public support; and (iv) have the capacity to reduce greenhouse gas emissions. The *financing mechanisms* (contingent grant and equity finance) applied to demonstration and follow-on investments will boost short-term demand, test regulatory and commercial procedures, and promote early commercialization and in-country replication of renewable resources. Streamlining procedures and refining them, combined with capacity building among stakeholders will reduce *development time and costs*. The *public access* to reliable and high quality data on resource, performance, cost-effectiveness, etc., will enable market knowledge and growth.
- At project completion, the estimated direct cost of the project is US\$3.2 million in GEF funds. This includes: technical assistance (US\$1.6 million); the net loss of US\$1.4 million (out of the total US\$2.2 million in development costs) in contingent grants for projects that do not reach financial closure; and the incremental management cost (US\$0.2 million) of the contingent grant and equity financing mechanisms – see Annex 4. The estimated balance of funds in the equity finance facility (US\$2.8 million – net of incremental management costs) will be fully invested in operating projects and will remain in Croatia after project completion. The invested capital will be returned to the facility through structured exits and can be re-invested to support additional projects led by HBOR and various emerging market players. HBOR will manage and invest the GEF equity funds, with commensurate fiduciary responsibility and accountability (see “Exit Strategy” below). If the market grows as anticipated, HBOR may be able to establish a renewable energy equity fund that is capitalized by various local and foreign investors. Such an in-country replication strategy for the GEF equity funds will be developed during project preparation and specified in the implementation agreement.
- Exit Strategy. The World Bank will review the progress of HBOR in Year 5 of the implementation period, to evaluate its success in making equity investments. In the case of satisfactory progress, where most or all funds from the GEF equity finance mechanism are invested in operating projects, an oversight and review panel will be designated to monitor continued investment by HBOR after project completion. This panel, comprised of NGOs, private sector and government, will periodically review (and report to the public) HBOR's progress in exiting investments and reinvesting in new projects. In the case where little or no equity funds have been invested by Year 5 of the project, or investments made have all failed (the criteria for which will be determined in preparation), remaining GEF equity funds will be returned to the GEF. This should ensure an adequate exit from the project for GEF. Such an exit strategy for the GEF will be developed during project preparation and specified in the implementation agreement.

The Croatian experience is expected to demonstrate that, as the energy sector reforms with incentives for renewables are implemented and as financing is made available, renewable energy technologies have high prospects for long-term market penetration and for reducing greenhouse gas emissions. This experience is also expected to demonstrate the long-term economic and environmental benefits of renewable energy investments; the benefits of a ‘win-win’ relationship between HEP, independent energy providers and lenders, through long-term power purchase contracts; the effects of streamlining procedural issues controlled by the state; and the role of NGOs and benefits of public participation in local energy planning.

To the extent that this project is successful, the Croatian experience can be easily tailored to other countries of the Region (for example, EU accession countries) having renewable resource potential, where similar Government’s commitment exists but policy and financing barriers hamper implementation, where domestic commercial financing for renewable energy could be improved through similar credit and financing enhancement mechanisms, and where policy reforms can pave the way for reduced costs and public acceptance of renewable energy. To enhance the replicability of the project, GEF technical assistance will support dissemination of project outcomes through appropriate channels, including regional workshops involving bilateral and multilateral donors, country officials and private investors. The replication strategy beyond Croatia will be firmed up during project preparation.

F.3 Critical risks (reflecting assumptions in the fourth column of Annex 1)

Risk	Risk rating	Risk minimization measures
Annex 1: From outputs to objective		
Continued bottlenecks in decision-making at state and local government level	High	<ul style="list-style-type: none"> Empower Energy Institute to report to government about the barriers in complying with the government’s stated objective Build capacity and develop procedures to streamline decisions affecting RER implementation
Economically exploitable resources are limited	Modest	<ul style="list-style-type: none"> Maximize implementation of least-cost resources Make information known to public
Private sector not willing or able to finance development costs	High	<ul style="list-style-type: none"> Guarantee market for clean energy entrants through minimum share policy Assist in streamlining procedures for RER development and implementation
Government’s commitment to national energy policy and to attract private investment fails over time	High	<ul style="list-style-type: none"> Prospect for EU accession and Kyoto Protocol will maintain pressure for energy sector reform and for compliance with environmental directives Maintain policy dialog with all stakeholders to ensure commitment to reform
Contracts between project partners are not honored	Substantial	<ul style="list-style-type: none"> Use best practices in development of contracts, due diligence and risk assessment
Projects are not implemented on a cost-effective basis	Modest	<ul style="list-style-type: none"> During project development, deploy engineering and financial consultants using best practices Ensure project sponsors have sufficient equity in project
GEF equity mechanism is invested in only a few projects	High	<ul style="list-style-type: none"> Promote equity mechanism through workshops to generate demand Set criteria for investment diversification Monitor reasons for insufficient commitment and take corrective action
HBOR is not able to successfully exit investments	High	<ul style="list-style-type: none"> Develop strategy during project preparation based on best practices Due diligence on all parties and contracts Educate developers, HBOR on exit mechanisms Monitor exit failure rates and adjust portfolio

Annex 1: From components to outputs		
Lack of cooperation of stakeholders and beneficiaries	Modest	<ul style="list-style-type: none"> • Begin discussions during preparation on project design • Provide training and capacity building
Lack of demand for contingent grants	Modest	<ul style="list-style-type: none"> • Develop pipeline during preparation and promote mechanism through regular stakeholder workshops
Project Implementation Unit at HBOR is ineffective	Modest	<ul style="list-style-type: none"> • Engage consultants to assist in the early phase of implementation • Management fee includes performance-based component
Lack of demand for GEF equity co-financing	Substantial	<ul style="list-style-type: none"> • Promote equity mechanism along with contingent grant facility through workshops with developers and banks • Ensure HBOR co-finance GEF equity mechanism
HBOR is not willing to commit up-front the full or portion of the co-financing amount for the GEF equity mechanism	Substantial	<ul style="list-style-type: none"> • Seek HBOR contribution gradually over time, or for the follow-on projects, as they gain experience with GEF equity financing for demonstration projects • Link transfer of returned GEF equity invested capital to HBOR (during/post implementation) to condition that they contribute equity during implementation for follow-on projects
Private sector does not contribute enough equity and debt financing	Substantial	<ul style="list-style-type: none"> • Identify together with all concerned stakeholders two projects with high probability of closing, and seek commitment letters from developers and banks before World Bank/GEF approval • Provide training to local banks and developers during preparation • Identify a “champion” bank and developer to finance one or two projects • Encourage foreign developers/investors into market, through discussions with donors and other means • Hold donors conference during preparation
HEP does not enter into power purchase agreements at rates that support project investments	High	<ul style="list-style-type: none"> • Ensure legislation is enacted for minimum share RER, tariff incentives for RE, and connection of privileged producers • Engage HEP during analytical work in support of the legislation • Engage HEP as a project developer
Equity finance mechanism structure is not viable and cannot make investments	Modest	<ul style="list-style-type: none"> • Address institutional, financial, and management issues in fund design in preparatory stage using experienced fund design team
Interconnection issues not manageable	Modest	<ul style="list-style-type: none"> • Address these technical issues in preparatory phase using best practices engineering
Equity finance mechanism does not disburse		<ul style="list-style-type: none"> • Develop adequate incentive structures with HBOR
Institutional arrangements for equity finance mechanism are not agreed early in design	Substantial	<ul style="list-style-type: none"> • Work out details of arrangements during preparatory phase – Fund Design Component • Track developments among government ministries to determine potential problem areas
Overall risk rating	Substantial	

G PROJECT PREPARATION AND PROCESSING

G.1 Has a project preparation plan been agreed with the borrower?

Agreement was reached with HBOR during a World Bank mission on February 2002.

G.2 Advice/consultation outside country department

Outside the Bank:

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

Within the Bank:

ECSSD—ECA Environment and Social Sustainable Development

ENVGC—GEF Coordination Unit

G.3 Composition of task team

Rachid Benmessaoud, Energy Specialist/Task Leader

Rick Renner, Renewable Energy Consultant

TBD, Financial Management Specialist

TBD, Procurement Accredited Specialist

TBD, Principal Environmental Specialist

TBD, Project Team Assistant

G.4 Quality assurance arrangements

The project team is highly qualified in enterprise restructuring, power, district heating, renewable energy generation, and utility management. In addition, North American technical advisers with international experience in renewable energy technology, project development and management, and fund design are advising the Bank and HBOR and are an integral part of the project preparation team.

Annex 1 Project Design Summary

Hierarchy of Objectives	Key Performance Indicators	Monitoring & Evaluation	Critical Assumptions
	Sector Indicators:	Sector/country reports:	(from Goal to Bank Mission)
a. Sector-related CAS Goal: Assuring an efficient energy supply in an environmentally sustainable manner at realistic but socially acceptable prices	<ul style="list-style-type: none"> Increased share of renewable energy in total electricity supply of country Reduction in air pollution emissions Increased number of private entities involved in development and financing of projects 	<ul style="list-style-type: none"> National and Local Environmental Reports Emission Reduction Monitoring Reports 	Bank Mission: <ul style="list-style-type: none"> Provision of energy services without significant negative environmental impact.
b. GEF Operation Program: Removal of barriers to renewable energy	<ul style="list-style-type: none"> Same as above Reduction in greenhouse gas (CO₂) emissions 	<ul style="list-style-type: none"> National Communication to the UNFCCC 	GEF Mission: <ul style="list-style-type: none"> Reduction of greenhouse gas emissions, mainly CO₂
Project Development Objective:	Outcome / Impact Indicators:	Project reports:	(from Objective to Goal)
To develop an economically and environmentally sustainable market for renewable energy in Croatia.	<ul style="list-style-type: none"> Increased share of renewable energy in total electricity supply of country (compared to policy targets) Demonstrated risk-sharing among private developers, commercial banks, and the buyers. 	<ul style="list-style-type: none"> Implementation progress, evaluation and completion reports 	<ul style="list-style-type: none"> Macroeconomic conditions, environmental policies, and energy/tariff reform do not discourage renewable energy
Global Objective Reducing GHG emissions on a continuous basis by overcoming policy, financial and technical barriers to renewable energy.	<ul style="list-style-type: none"> Reductions in carbon dioxide emissions at the national and project levels; Development of renewable energy products and services that deliver a growing range of renewable technologies and applications 	<ul style="list-style-type: none"> Quarterly update on status and use of the GEF Facility Annual Implementation and Performance Evaluation Reports 	<ul style="list-style-type: none"> Market for clean energy grows from successfully demonstrated projects and mechanisms

Output from each component:	Output Indicators:	Project reports:	(from Outputs to Objective)
Increased in-country knowledge and improved framework and market for RE development	<ul style="list-style-type: none"> • Number of stakeholders trained • Improved access to resource information and public awareness of renewable energy 	<ul style="list-style-type: none"> • Implementation reports • Same as above 	<ul style="list-style-type: none"> • Decision-making on RER development and implementation, including all required approvals, is done on an informed basis, and in a timely and effective manner • Resource assessments confirm Croatia's large RER potential
Diverse portfolio of projects is under development	<ul style="list-style-type: none"> • Number of projects supported by development grants that lead to financial closure 	<ul style="list-style-type: none"> • Same as above 	<ul style="list-style-type: none"> • Barriers to financing project development costs is overcome
Growing interest in equity and debt financing from local market	<ul style="list-style-type: none"> • Successful financing and implementation of two demonstration projects, including use of standard power purchase agreements, and inclusion of commercial bank financing and private equity • The number of projects reaching financial closure and the amount of co-financing from private capital markets 	<ul style="list-style-type: none"> • Same as above 	<ul style="list-style-type: none"> • Sustained commitment of the government to national policy framework for RER • Sustained commitment of the government for creating and maintaining an attractive climate for private investment • All project contracts are honored • Projects are implemented and operating successfully • GEF equity mechanism is fully invested in multiple projects • HBOR exits from successful investments
Project Components / Sub-components:	Inputs: (budget for each component)	Project reports:	(from Components to Outputs)
Technical Assistance: Resource Assessment, local development plans, and capacity building	<ul style="list-style-type: none"> • GEF grant of US\$1.6 million 	<ul style="list-style-type: none"> • Implementation Progress reports • Supervision reports • Project management report (PMR) 	<ul style="list-style-type: none"> • Cooperation of stakeholders and beneficiaries
Project development support	<ul style="list-style-type: none"> • GEF grant of US\$1.4 million 	<ul style="list-style-type: none"> • Same as above 	<ul style="list-style-type: none"> • Demand for contingent grant on a cost-sharing basis exists
Project investments	<ul style="list-style-type: none"> • US\$24.4 million, with a GEF grant of US\$3.0 million 	<ul style="list-style-type: none"> • Same as above 	<ul style="list-style-type: none"> • Project Implementation Unit at HBOR is established and functioning • Demand for co-financing from GEF equity facility exists • HBOR equity co-financing of GEF equity facility • Private equity and debt cofinancing is available • HEP agrees to purchase power at reasonable rates

Annex 2: Incremental Cost Analysis

Concept

The proposed project will reduce greenhouse gas emissions in Croatia by developing an economically and environmentally sustainable market for renewable energy. Croatia’s potential market for renewable energy projects is estimated at approximately US\$1.2 billion in investment value, yet few projects have been implemented, except by HEP, the national utility. The project aims to reduce or eliminate various barriers to renewable energy implementation and to stimulate the market through technical assistance, support of development costs (contingent grants), and investment in renewable energy projects (grants for an equity financing mechanism, along with co-financing from private equity and commercial debt).

Barriers and Modalities

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

- Policy
- Financial
- Technical

The proposed project will address these barriers through the components and financing mechanisms noted below.

The total project cost is US\$27.4 million. GEF-supported activity will generate US\$25.8 million in project funding or 2.2% of the total market potential. The table below shows project funding.

Table 4: Sources of Project Investment Funds in the Project (US\$ millions)

Sources of Funds:	Amount	% of total
GEF	\$4.40	
HBOR	\$1.50	
Private Equity	\$5.55	
<i>Total Equity Sources</i>	<i>\$11.45</i>	<i>44.3%</i>
Commercial bank loans	\$14.38	
<i>Total Debt Sources</i>	<i>\$14.38</i>	<i>55.7%</i>
Total Project Investment Funds	\$25.83	100.0%

Two GEF non-grant modalities, a GEF contingent grant of US\$1.4 million for project development costs, and a GEF grant for equity financing of US\$3.00 million, are proposed to address financial barriers. In addition, technical assistance will be targeted toward training and policy barriers.

Contingent Grant

A contingent grant of US\$1.4 million is proposed to cover the costs of developing a pipeline of projects as well as early project development costs. The funds will pay for pre-feasibility and feasibility studies on a cost-share basis with private developers. Croatian lenders and investors are not providing these funds due to unfamiliarity with the sector and lack of a clear legal framework for investing. Well-prepared projects, using best practices and

providing high-quality engineering and financial analysis are more likely to become success stories for the emerging market and to transfer skills to consultants and developers. The contingent grant fund is about 5 percent of the total project cost.

As a contingent grant, the development costs covered by the GEF will be capitalized in the total project costs and be repaid through project financing, replenishing the funds for additional projects. If the project fails, the grant will be considered an incremental cost of the GEF project. Contingent grant funds will support projects in two stages – pre-feasibility (at a lower cost) and feasibility. In this way, GEF funds can reach more broadly into the market and also reduce risk, by diversifying into different technologies and with different developers. It is expected that approximately 20 projects can be supported through the facility.

A portion of the contingent grant facility (US\$0.20 million) will be used to support development of a pipeline of candidate projects for the equity finance mechanism. This initial project identification and screening will be carried out during implementation and will provide HBOR with sufficient deal flow to begin making grants following the demonstration projects.

Equity finance mechanism

The second non-grant modality is an equity finance mechanism seeded by US\$3.0 million from a GEF grant. This mechanism will provide needed risk capital for leveraging private equity and commercial bank loans. While some capital exists in the market, most Croatian companies, especially small and medium enterprises, do not have sufficient equity to finance projects on their own. The equity finance mechanism should help to attract private sector equity as well as private sector commercial debt for renewable energy projects, mainly through risk sharing. Without a strong culture of equity investing in Croatia, it may be difficult to find private entrepreneurs/developers who are willing to take all the equity risk in a particular project. Recently privatized local banks are interested in providing loans to projects, but require at least 30 percent of projects to be equity-financed. Through taking a minority position in projects with a lower hurdle rate for its investment, the GEF equity finance can lower overall cost of capital and provide some of the early market risk capital necessary to stimulate additional investment.

Additional equity and debt would be attracted to both demonstration and follow-on projects for two reasons: 1) the demonstration projects in Phase I will be structured as commercially viable projects, and would generate conditions for future projects (feasibility, removal of barriers); and 2) the equity finance mechanism investments will provide confidence to the private sector to invest equity and for local commercial banks to provide debt for future, similar projects.

The equity mechanism will be structured to invest initial funds during project implementation, and recover capital from projects through liquidation of its investments. The capital returned to HBOR can be reinvested in future projects as a revolving fund. Terms and conditions for management of the equity mechanism will be developed during project preparation.

Technical Assistance

Technical assistance of US\$1.6 million is needed for the following reasons:

- To assist the government in developing the legal framework for renewable energy, and the regulator in implementing the policy;
- To reduce hurdles to clearance of projects;
- To transfer renewable energy know-how to a broad base of stakeholders;
- To understand and remove environmental and policy barriers to small hydro;
- To provide planning capacity for local government.

This includes business, finance and technical skills for bankers, renewable energy entrepreneurs and HEP personnel. Training will include the provision of business tools to HEP and independent project partners, training on financial mechanisms to financial intermediaries, and additional training to HEP on interconnection and wind energy technology.

Other TA funds will be used for local development planning and regional energy center development. In addition, funds will be used for preparing initial environmental impact assessments and public consultation on small hydro.

Base Case

No financing of sustainable renewable energy projects is occurring in Croatia. As a result the base case is very little development of the market. Several wind projects are under development now, which may result in about 5 MW of capacity implemented in the next few years. In this light it is assumed that the “business as usual” scenario of investment would develop 0.5% of the potential market, compared with the project’s estimated 2.2%. The base case would reduce emissions by 33,638 tons of carbon dioxide at a cost of US\$6.4 million, for a unit abatement cost of US\$190 per ton CO₂ equivalent.

Project Case

The proposed project consists of renewable energy project development by independent energy firms. The amount of direct project investments for the demonstration projects will be US\$25.8 million (including contingent grants), reducing emissions by 190,793 tons of carbon dioxide at an abatement cost of US\$135 a ton. The demonstration projects will be the first phase, and will reduce emissions by 100,915 tons CO₂. The second phase will consist of follow-on projects developed using remaining funds from the equity finance mechanism as described above. This follow-on phase will generate emissions reductions of 89,878 tons of CO₂.

Incremental Cost

The total incremental cost of the project is US\$6.0 million in GEF funds. It comprises technical assistance (US\$1.6 million), the contingent grant facility (US\$1.4 million), and project investments (US\$3.0 million). The incremental reduction in carbon dioxide is 157,154 tons. Thus, on an incremental cost basis, the associated reductions of the activity is approximately US\$38 per ton of carbon dioxide equivalent (US\$10/tC). This incremental cost of carbon reductions is based on the assumed mix of wind and hydro. However, if examined on a technology-specific basis, the incremental cost for wind only is US\$64/ton CO₂ (US\$17/tC) and biomass US\$27/ton CO₂ (US\$7/tC).

Table 5: Incremental Cost Matrix

	Baseline	Project Alternative	Increment
Domestic Benefit	Some continued development and implementation of renewable energy, mostly small hydro and some wind; slightly lower GHG emissions	Immediate implementation of three projects, creation of capacity within industry and government to implement additional projects; more widespread	Greatly enhanced ability and capacity to implement renewable energy projects; greatly reduced local emissions; creation of new industry
Global Environment Benefit	Slow implementation of renewable energy projects; about 33,638 tCO ₂ reduction over 10 years	Total reduction of 190,793 tCO ₂ , through financing and implementation of 18.9 MW.	Incremental reduction of 157,154 tCO ₂
Costs (US\$ million)			
Technical Assistance	\$0	\$1.6	\$1.6
Contingent Grant Facility	\$0	\$1.4	\$1.4
Equity Finance Mechanisms	\$0	\$3.0	\$3.0
Total	\$0	\$6.0	\$6.0

Annex 3
STAP Technical Review and Responses to STAP Comments

Attachments to Annex 3:

1. STAP Technical Review (completed on March 8, 2002)
2. Responses to STAP Comments

UNIVERSITY OF CALIFORNIA, BERKELEY

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March 8, 2002

To: Rachid Benmessaoud, Rick Renner
Email: rbenmessaoud@worldbank.org, FRenner@aol.com
From: Daniel M. Kammen
Re: Review of: **Croatia Energy Resources Project - revised comments (3/6/02)**
(Project ID: P071464)

Summary:

This project takes an integrated approach to building the institutional capacity to manage and sustain a renewable energy industry and market in Croatia. The mix of public-sector (grants totaling \$6 million) support and private sector market investment (investments and equity totaling at least \$12 million) provides the sort of balance of commitments needed to build market push and demand pull mechanisms. This project team has clarified a number of small items, and at this the project plan is fine. An ongoing issue will be to monitor and facilitate the interactions between, the national utility, Hrvatska Elektroprivreda (HEP), the NGO community, and private sector interests. This relationship is critical to building long-term market stability and hence economic opportunity.

I recommend support for this project.

Major Comments:

Page 6ff: The dominance of Hrvatska Elektroprivreda in Croatia remains a concern. Discussions of re-regulation/unbundling of HEP exist, but the outcome is uncertain. The evolution of a one-provider system, particularly in the aftermath of the war, is certainly understandable. While the professional and entrepreneurial capacity in Croatia exists to diversify away from the single utility model, a range of barriers are likely to exist that will be difficult to anticipate and to counter. Several of these barriers are identified in Section B.4.1, "Barriers to renewable energy". The role of public information and oversight (C.4.2, page 14/15) is an important component of

the project to support and maintain as the project evolves. The fact that these risks are recognized in the Project Brief provides the best chance for vigilance and success.

The large private-sector financing in the project is one indication that a competitive business market *could* emerge in Croatia, but it is insufficient to guarantee this outcome. Section C.4.2 stipulates that both NGOs and the Energy Institute will have input in this process. It is incumbent on the World Bank/GEF staff to monitor this arrangement and be sure that the input and concerns expressed by these organizations is heard and that responsive strategies exist to act on their concerns.

Finally, one added mechanism may exist to codify the commitment to building a clean energy industry. A Renewable Energy Portfolio Standard – frequently considered a policy mechanism relevant to developed country markets – may be quite appropriate in the Croatian setting. The reasons for this include: 1) Government (political) commitment to the REP energy sector; 2) private-sector financing, and the need to build sustained interest in the clean energy market; 3) price guarantees effectively proposed already by the GEF grant. The aspects of the proposed renewable energy grant and market already outline many of the features needed to support a RPS, and the formal codification in Croatia would provide a critical statement of support, as well as market guarantees for potential clean energy entrants.

Greater detail could be added to the biomass energy plan. Biomass facilities can vary greatly in size (from ~ 1 MW to 20+ MW facilities for most developing nation application) and in operational plan. In a recent review, we (Kammen, *et al.*, 2001) identified a range of conditions on both the biomass energy supply and the managing institutions that have proven beneficial in moving biomass energy projects from plan to viable commercial model.

Page 18ff: The cost-benefit analysis is clear, and the project costs are reasonable.

Page 26: “Sustainability Risks”. This section strangely does not examine the risk to the envisioned clean energy market by not designing mechanisms to test for *both* technical quality of the solar, biomass and wind systems (e.g. voluntary or formal certification) and entrepreneurial resources (e.g. through business and financial management training) that are both critical to project survival. This latter point, of substantial risk if market skills are not developed, is reflected in the Table on page 26. This is particularly important if the Croatian market will evolve to be diverse and not dominated by HEP-related entities.

Analysis of incremental cost (Annex II) analysis (page 34ff):

Page 34: Table 9. The 50/50 division of contingent grants between the wind and biomass projects appears arbitrary. Simply based on cost/kW to install new capacity, these technologies are likely to require significantly different amounts of capital to seed investments.

Fund management fees of \$110,000/year, presumably primarily salaries, is reasonable.

Page 36: the calculations for \$/ton for carbon mitigation should be disaggregated to examine different technologies alone. The low carbon costs (table 23) (\$2 – 6/tC) need to be reconciled

with the GHG reduction costs indicated in tables 19 – 21 (Page 42) in terms of economic and political assessment of the chances of achieving the various market potentials.

Minor Comments & Clarifications:

Page 8: As an added indication of renewable energy institutional and human capacity in Croatia, unlike most developing nations, Croatia has in the past housed photovoltaic manufacturing capacity.

Page 12: The Equity Financing Mechanism does not specify the goal or balance of large and small-scale investors anticipated for support. This sort of mechanism can be critical to initiate new investment in a sector such as renewables, but many examples exist where the bulk of the resources go to supporting existing institutions (or spin-offs) of groups like the HEP. This builds market barriers even beyond those that existed initially. Are set-asides or other mechanisms anticipated to avoid this situation?

References:

Awerbuch, S. (2001) "Its not the technology: investing in decentralized alternatives", manuscript in proof.

Duke, R.D., Jacobson, A.,and Kammen D.M. (2002), "Product Quality in the Kenyan Solar Home Systems Market," in press, *Energy Policy*.

Available online at: <http://socrates.berkeley.edu/~rael/qualityshs.pdf>

Kammen, D. M., Bailis, R., and Herzog, A.V. (2001) "Clean Energy for Development and Economic Growth: Biomass and Other Renewable Energy Options to Meet Energy and Development Needs in Poor Nations," UNDP report for the 7th Conference of the Parties to the UN Framework Convention on Climate Change (COP7-UNFCCC): Marakech, Morocco (October 29 - November 9), 111 pages, in press.

Available online at: http://socrates.berkeley.edu/~rael/RAEL_UNDP_Biomass_CDM.pdf

Annex 3
CROATIA – RENEWABLE ENERGY RESOURCES PROJECT
STAP Technical Review

STAP technical review was completed on March 8, 2002.

Responses to STAP Technical Reviewer’s major concerns :

***Major Concern No. 1:** The dominance of Hrvatska Elektroprivreda in Croatia remains a concern. While the professional and entrepreneurial capacity in Croatia exists to diversify away from the single utility model, a range of barriers are likely to exist that will be difficult to anticipate and to counter. Several of these barriers are identified in Section B.4.1, but no clear strategy to circumvent them is presented – aside from vigilance.*

The Government is currently developing the secondary legislation related to renewable energy that includes mandating a minimum share for renewable energy, designation and status of ‘privileged producers,’ rules for connecting third parties to the grid, and implementation of tariffs with incentives for renewables. One of the conditions for approval of the project by the World Bank will be assurance that the enabling framework is either in place (i.e., regulations enacted) or sufficient progress has been made toward enactment, with a time-bound action plan for completion in place and agreed to by the Government. The World Bank will monitor progress of drafting and enactment of secondary legislation throughout the project preparation. This and other secondary legislation, together with Croatia’s compliance with EU accession requirements and international protocols (e.g., Kyoto) are expected to address the market dominance of HEP prior and after it is unbundled. The project will also assist the regulator in overseeing compliance with the policy, including preventing market dominance by the utility(ies). The demonstration projects are expected to pave the way for a collaborative effort of all project partners, including the utility(ies), and to provide assurance about the technical, environmental and commercial viability of renewable energy.

***Major Concern No. 2:** The large private-sector financing in the project is one indication that a competitive business market could emerge in Croatia, but it is insufficient to guarantee this outcome. Can additional mechanisms be introduced to foster open market competition? Section C.4.2 “Involvement of NGOs, local banks, and local businesses” is not sufficiently detailed to permit an evaluation of the degree to which a serious plan to involve and empower the wider energy community in Croatia exists.*

The project team proposes to review further the issue on how to foster open market competition. A preliminary reply follows. Competition in and for the renewable market will depend on the target levels for the minimum share of renewable energy that will be set in the legislation. To ensure open competition, minimum share of renewable should be set at level that the economy can afford after taking into account the costs global externalities. As long as system avoided costs are below to the financial price of renewables, the minimum target will continue to encourage further renewable development and growth opportunities, on a competitive basis. If and when renewable is financially competitive, the minimum target is no longer required, and market forces would sustain renewable growth.

Efforts are under way to inform the public and engage stakeholders. Further participatory activities are envisaged during preparation and will be carried out by an NGO. One of these activities is the development of a plan for involving and empowering the energy community. The development of such a plan will be based on a two-way consultation with the various stakeholders on project design and on their role and responsibilities during project implementation.

Major Concern No. 3: *Finally, one added mechanism may exist to codify the commitment to building a clean energy industry. A Renewable Energy Portfolio Standard – frequently considered a policy mechanism relevant to developed country markets – may be quite appropriate in the Croatian setting.*

The Government's proposal in the Energy Law for a minimum share from renewables is in essence a Renewable Energy Portfolio Standard (for the country as a whole, as opposed to some RPS systems which are set up among states or regions). The Ministry of Economy is currently responsible for prescribing exactly what this minimum will be, and over what time period it will be achieved, etc. The Government's commitment to this will be strengthened by the EU directives calling for a minimum share of renewables, and Croatia's intent to accede to the EU. The World Bank approval of the project will be partly based on milestones achieved towards the establishment of a reasonable minimum share or portfolio standard.

Major Concern No. 4: *Greater detail is needed on the biomass energy plan. Biomass facilities can vary greatly in size (from ~ 1 MW to 20+ MW facilities for most developing nation application) and in operational plan.*

The Project Team recognizes that market data and cost estimates for biomass, and other technologies as well, need further investigation and refinement. Project preparation will include a rigorous and detailed cost analysis of all renewable applications in Croatia, in support of the Government's effort to enact secondary legislation. Data collection and analysis will be partially based on existing projects, which have been reviewed in some detail already by such Croatian institutions as the Energy Institute and Ekonerg. In particular, project pre-feasibility studies were conducted a few years ago on several biomass cogeneration opportunities, and project size ranged from about 2 MW to 25 MW.

Some of the PDF B funding will be used to conduct initial screening for preparation of the demonstration projects. This effort will produce a range of project sizes, fuel types, and costs.

Major Concern No. 5: *The cost-benefit analysis is clear, and the project costs are reasonable.*

Initial descriptions of the cost-benefit analysis to be undertaken during preparation were inadequate, and further details were provided to the reviewer and included in the Project Brief – See Section E.1. In particular, there was some concern regarding the possibility of an “economics as usual” approach. While this was not the intent, the description of the CBA was not defined clearly enough. In the absence of detailed terms of reference (which are under development and which require some input from the Government), the Project Team have described the approach as one being concerned not simply with typical avoided cost analysis, but with inclusion of externalities which capture the environmental benefits, as well as financial/risk benefits, of renewable energy.

Major Concern No. 6: *“Sustainability Risks”. This section strangely does not examine the risk to the envisioned clean energy market by not designing mechanisms to test for both technical quality of the solar, biomass and wind systems (e.g. voluntary or formal certification) and entrepreneurial resources (e.g. through business and financial management training) that are both critical to project survival.*

Technical quality will be reviewed during project preparation and development of demonstration projects, through feasibility studies using best practices for engineering design and operational plans. In follow-on projects, the same standards will be required for feasibility analysis and technical design. Operating performance will be reviewed periodically through monitoring and evaluation protocols created during preparation. In all cases, technical quality should be assured by having rigorous due diligence conducted by all parties involved in co-financing. Namely, HBOR, as an investor using GEF and its own funds, will engage external consultants to review engineering design and operating parameters. Operating performance and technical issues associated with projects will be disseminated to the public through regional energy centers, the Energy Institute, or a combination of both.

The project will continually develop the entrepreneurial resources through training of project developers and the banking community (project finance, risks associated with renewable energy projects, contracts, etc.).

Major Concern No. 7: *The 50/50 division of contingent grants between the wind and biomass projects appears arbitrary. Simply based on cost/kW to install new capacity, these technologies are likely to require significantly different amounts of capital to seed investments.*

The division of contingent grants for the demonstration projects was based on assumptions of development costs in Croatia for each technology. These estimates were based on discussions with developers (in the case of wind energy) and consulting engineers (in the case of biomass). Our assumptions were that each technology would take about US\$400,000 to develop into a financeable project. While this was done partly to simplify the model, it is also based on discussions in Croatia and an understanding of typical costs for feasibility studies. In these cases, we assume the feasibility study cost itself (engineering, site assessment, financial pro formas and environmental impact) will be less for wind (about \$150,000 total) and more for biomass (about \$200,000 total), due to more complex and detailed engineering and fuel analysis. However, we expect that other development costs – such as obtaining permits, licenses, land use agreements, and public acceptance – will be greater for wind than for biomass. This is due partly to the assumption that biomass projects may be developed “inside the fence” – in which case the project sponsor will also own the property, and will not be developing a greenfield project. Legal and other contracting costs should be approximately the same. While there is little experience in Croatia with actual development activities in the biomass area, there are currently at least two wind projects under development. In both cases, developers have indicated costs ranging from \$250,000 to \$500,000, over a period of approximately five years. We expect these costs will go down if several of the barriers on procedural issues are removed.

Major Concern No. 8: *Fund management fees of \$110,000/year, presumably primarily salaries, is reasonable.*

The STAP Reviewer’s initial reaction that costs of \$175,000/year seemed high was addressed by a downward adjustment of overhead and consulting fees incurred by management, and by adjusting the total costs incurred during implementation to reflect years when little or no investment would be made (probably the last year or two of implementation). \$110,000 per year is therefore an average of total costs over six years. The Project Team assumes that during implementation, about three full-time staff will be needed for management of both the contingent grant and equity finance mechanisms. This staff will include a manager with equity investment experience, a financial analyst, and an administrative support person. These costs are approximately 2.5% of committed capital in the equity mechanism, which is in line with typical venture capital fund management fees (2 – 2.5%). When considering the combined contingent grant and equity mechanisms, the management costs are about 1.9% of committed capital, which is quite low. The Project Team consider that these costs, which will be paid from a combination of interest earnings and GEF grant, are incremental to the HBOR. However, HBOR can also use existing staff from other departments, on a part-time basis, to perform services such as credit analysis. This contribution can reflect the cost of managing its own equity.

Major Concern No. 9: *The calculations for \$/ton for carbon mitigation should be disaggregated to examine different technologies alone. The low carbon costs (\$2 – 6/tC) need to be reconciled with the GHG reduction costs in terms of economic and political assessment of the chances of achieving the various market potentials.*

Since the drafting of this comment, the Project Team have changed the carbon intensity figures used in incremental analysis, to reflect the most conservative approach to carbon abatement. This figure, 0.256 tCO₂/MWh, is based on HEP calculations, and is somewhat lower than the range of intensity figures generated for the National Communication to the UNFCCC. This raises the cost-effectiveness figure to about US\$38/ton CO₂ (US\$10/ton carbon). In order to address the concern of the STAP Reviewer, calculations were made for biomass and wind energy separately. Cost effectiveness for carbon abatement for wind energy only, using the incremental cost of US\$6 million, resulted in a figure of US\$47/ton CO₂ (US\$13/tC). For biomass energy, which has a higher capacity factor, the cost-effectiveness increases to US\$24/ton CO₂, or US\$6/tC.

Responses to STAP Technical Reviewers' minor comments and clarifications :

As an added indication of renewable energy institutional and human capacity in Croatia, unlike most developing nations, Croatia has in the past housed photo voltaic manufacturing capacity.

It is correct that Croatia has had recent experience with manufacturing of solar PV, and during the stakeholder workshops conducted in this project, several institutions have noted this as well as some frustration that such capacity no longer exists. In addition, the Energy Institute has estimated that as recently as the 1970s, biomass energy contributed as much as 25% of Croatia's total energy supply (largely heat energy). Finally, HEP and INA both have significant experience with hydropower and geothermal energy. Through well-designed training and capacity building in the project, these human resources and institutional knowledge can be developed to create a strong technical base for renewable, to complement the policy framework and financial mechanisms that will be developed in the project.

The Equity Financing Mechanism does not specify the goal or balance of large and small-scale investors anticipated for support. This sort of mechanism can be critical to initiate new investment in a sector such as renewables, but many examples exist where the bulk of the resources go to supporting existing institutions (or spin-offs) of groups like the HEP. This builds market barriers even beyond those that existed initially. Are set-asides or other mechanisms anticipated to avoid this situation?

The goal of providing some balance in order to avoid market distortions has been briefly addressed in Section E.2, as a result of the comments made by the STAP Reviewer. The specific portfolio balancing and diversification strategies for the equity investing have not yet been defined, but in principle are recognized as critical aspects of the project. These issues will be addressed in the financing mechanisms design component during preparation, and include: (i) balance of investments made in small and large enterprises; (ii) balance of investments made in different technologies; and (iii) balance of investments made in foreign-owned and Croatian-owned enterprises or projects. Best practices will be followed for creation of investment guidelines for equity funds which have market development objectives, such as funds created by the Multilateral Investment Fund of the Inter-American Development Bank, which focus on small- and medium-sized enterprise development.

Annex 4 GEF Financing Modality: Technical Background

Direct Cost Components

The total incremental cost of the project is US\$6.0 million in GEF funds. However, the expected direct cost of the project, as calculated below, is US\$3.2 million (Table 6). This includes technical assistance, contingent grants, and equity financing. The balance of GEF funds (US\$2.8 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 below. Technical assistance costs are shown in Table 7.

Table 6: Direct Cost of the GEF Project Activity

Technical Assistance	\$1,600,000
Contingent grants	\$1,400,000
Management costs (net)	\$200,000
Total	\$3,200,000

The cost of the *contingent grant funds* (US\$1.4 million) was calculated assuming US\$0.2 million for pipeline development, US\$2.0 million in project development costs, and US\$0.8 in capitalized (reimbursed) development costs. This leaves a zero balance at project completion.

The cost of the *equity finance mechanism* (US\$3.0 million) was calculated assuming US\$0.2 million (net) would be used to cover the incremental management costs. To simplify the analysis, we assume that: all capital will be invested within six years; no capital will be returned (investments liquidated) for six years; 70% of investments earn a 10% internal rate of return and 30% fail; interest earned on fund balances will partially cover management fees, estimated at an average of about US\$110,000 per year. An equity model was developed to carry out these calculations.

The *technical assistance* costs include the following items:

Table 7: Technical Assistance Costs

Resource Assessment	\$425,000
Project Information Dissemination	\$75,000
Local Development Plans	\$400,000
Regional Energy Centers	\$250,000
Small hydro EIA & Public	\$250,000
Financial Training	\$100,000
Technical Training	\$100,000
Total	\$1,600,000

Issues Regarding Non-grant Modalities

The project's non-grant modalities are new financial products in Croatia and are addressing a market in its infancy. There is little or no institutional or professional experience in managing

such modalities, and therefore there will be challenges in creating a strong management team that will effectively identify and place investments in renewable energy projects that will both be successful on their own and that will help stimulate the market. In addition, the size of the modalities is quite small, and there is a danger of overburdening the facilities with management costs. Therefore some proposed management structured is proposed below, pending a complete and final structure that will be developed during preparation.

For the contingent grant facility. The grant facility is too small to have a separate staff, therefore we propose that HBOR use one small, dedicated team to manage both the equity and contingent grant facilities. Management of the grant facility will require review of proposals, some basic financial analysis, and monitoring and reporting. This can be done by the same group, and there should be no conflicts associated with management of both facilities.

For the equity finance mechanism. HBOR will manage the grant funds from GEF that will capitalize the equity finance mechanism, and will also contribute some share of its own capital as equity. There are three issues which require special attention in project design: 1) HBOR does not currently have the knowledge or capacity to manage equity investments, nor does it have specific knowledge of the energy business; 2) in order to ensure timely and effective disbursement of funds, and to perform satisfactorily, HBOR needs to have the proper incentive structure; and 3) because management of the funds will require an active role from HBOR (identifying and screening investments, performing due diligence, structuring deals, monitoring and reporting, and negotiating exits), management time can be significant.

HBOR's lack of experience will be partly addressed through training and in the project design itself, during preparation. However, it is likely that some manager with equity experience may be recruited. While traditional incentive packages such as profit-sharing may not be appropriate for this modality, HBOR can benefit from increased capacity and the carry-over of the grant funding itself, should the funds be successfully invested and returned with profit. Regarding management costs, HBOR will likely need new staff but may also use existing staff on an as-needed basis, to reduce salary and overhead costs. This could be especially useful in due diligence and credit analysis, where other bank staff may have sufficient expertise to provide assistance.

Because management costs will be deducted from fund capital (and any accrued interest), it is important that costs be monitored and that some relationship between costs and remaining capital be established. For example, if all funds are disbursed within four years, costs for years five and six should be reduced, as there is not new deal flow or investment activity (though monitoring and reporting will continue).

Risk Sharing

There are multiple co-financing, technical and commercial partners involved in the project, allowing GEF to allocate risk to other parties as well as each other. Namely, private sector developers will share significant risk by providing equity for project investments. Commercial banks will assume risk through lending to the project companies that are formed to develop the demonstration 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\$6.0 million, is

leveraging an additional project financing of US\$21.43 million, or about 3.6 times the incremental cost. Leveraging of total project cost to GEF funding is 4.6:1.

The total project investment figure does not include the entire expected market impact of the GEF components. Further market development will occur as a result of technical assistance (resources assessments, local development planning, training, regional energy centers). It will mostly occur as a result of further financing made available through the equity finance mechanism.

Replication will be achieved in the project primarily through the contingent grant facility and equity finance mechanism. The contingent grants program will allow funds to be made available to private developers of renewable energy projects in the most risky early stages of development. The US\$ 1.4 million initial capital for contingent grants would allow approximately 20 pre-feasibility studies and 6 feasibility studies to be funded during implementation.

Beyond demonstration project investments, the equity finance mechanism will co-invest in additional projects during implementation and leverage both private equity and debt. These amounts are reflected in the total project investment figures. Returns from investments made during implementation are expected to occur in years 7 through 12 of the revolving fund. These returns can be re-invested in new projects. Additional project financing that may occur as a result of re-investment is US\$21.7 million, resulting in approximately 17 MW additional capacity and 170,820 tons additional CO2 reduction.

Table 8 below shows total investment occurring as a result of equity financing from the initial US\$4.5 million capital. Table 9 shows total financing which occurs during the post implementation period.

Table 8: Equity finance mechanism – Implementation Period

<i>Equity Finance Investments</i>	Implementation period						
	<i>Yr. 1</i>	<i>Yr. 2</i>	<i>Yr. 3</i>	<i>Yr. 4</i>	<i>Yr. 5</i>	<i>Yr. 6</i>	<i>TOTAL</i>
Fund Capital Balance	\$ 4,500,000	\$ 2,040,000	\$ 1,342,000	\$ 609,100	\$ 154,555	\$ 87,283	\$ 16,647
Capital Returned						\$ -	
Interest earnings	\$ 225,000	\$ 102,000	\$ 67,100	\$ 30,455	\$ 7,728	\$ 4,364	\$ 436,647
Management Fees	\$ (125,000)	\$ (125,000)	\$ (125,000)	\$ (125,000)	\$ (75,000)	\$ (75,000)	\$ (650,000)
Capital Available for Investment	\$ 4,600,000	\$ 2,017,000	\$ 1,284,100	\$ 514,555	\$ 87,283	\$ 16,647	
Capital Invested from Fund	\$ 2,560,000	\$ 675,000	\$ 675,000	\$ 360,000	\$ -	\$ -	\$ 4,270,000
Additional Private Equity	\$ 3,840,000	\$ 675,000	\$ 675,000	\$ 360,000	\$ -	\$ -	\$ 5,550,000
Total Equity	\$ 6,400,000	\$ 1,350,000	\$ 1,350,000	\$ 720,000	\$ -	\$ -	\$ 9,820,000
Total Debt	\$ 6,400,000	\$ 3,150,000	\$ 3,150,000	\$ 1,680,000	\$ -	\$ -	\$ 14,380,000
Total Investment	\$ 12,800,000	\$ 4,500,000	\$ 4,500,000	\$ 2,400,000	\$ -	\$ -	\$ 24,200,000

Table 9: Equity finance mechanism – Years 7 – 12

<i>Replication Period - Years 7-12</i>							
Equity Finance							
Investments	<i>Yr. 7</i>	<i>Yr. 8</i>	<i>Yr. 9</i>	<i>Yr. 10</i>	<i>Yr. 11</i>	<i>Yr. 12</i>	Total
Fund Capital Balance	\$ 16,647	\$ 246,479	\$ 664,803	\$1,140,543	\$ 1,213,071	\$ 648,724	\$ 56,160
Capital Returned	\$ 854,000	\$ 1,281,000	\$ 1,067,500	\$ 640,500	\$ -	\$ -	
Interest earnings	\$ 832	\$ 12,324	\$ 33,240	\$ 57,027	\$ 60,654	\$ 32,436	\$ 196,513
Management Fees	\$ (125,000)	\$ (125,000)	\$ (125,000)	\$ (125,000)	\$ (125,000)	\$ (125,000)	\$ (750,000)
Capital Available for Investment	\$ 746,479	\$ 1,414,803	\$ 1,640,543	\$ 1,713,071	\$ 1,148,724	\$ 556,160	
Capital Invested from Fund	\$ 500,000	\$ 750,000	\$ 500,000	\$ 500,000	\$ 500,000	\$ 500,000	\$ 3,250,000
Additional Private Equity	\$ 500,000	\$ 750,000	\$ 500,000	\$ 500,000	\$ 500,000	\$ 500,000	\$ 3,250,000
Total Equity	\$ 1,000,000	\$ 1,500,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 6,500,000
Total Debt	\$ 2,333,333	\$ 3,500,000	\$ 2,333,333	\$ 2,333,333	\$ 2,333,333	\$ 2,333,333	\$ 15,166,667
Total Investment	\$ 3,333,333	\$ 5,000,000	\$ 3,333,333	\$ 3,333,333	\$ 3,333,333	\$ 3,333,333	\$ 21,666,667

Exit Strategy

The exit strategy for the GEF with regard to the equity finance mechanism is to leave its initial capital investment of \$3.0 million, less US\$0.20 million for net management costs, in the fund. The balance of funds in the equity finance facility (US\$2.8 million – net of incremental management costs) will be fully invested in operating projects and will remain in Croatia after project completion. The invested capital will be returned to the facility through structured exits and can be re-invested to support additional projects led by HBOR and various emerging market players. HBOR will manage and invest the GEF equity funds, with commensurate fiduciary responsibility and accountability. If the market grows as anticipated, HBOR may be able to establish a renewable energy equity fund that is capitalized by various local and foreign investors.

The World Bank will review the progress of HBOR in Year 5 of the implementation period, to evaluate its success in making equity investments. In the case of satisfactory progress, where most or all funds from the GEF equity finance mechanism are invested in operating projects, an oversight and review panel will be designated to monitor continued investment by HBOR after project completion. This panel, comprised of NGOs, private sector and government, will periodically review (and report to the public) HBOR’s progress in exiting investments and reinvesting in new projects. In the case where little or no equity funds have been invested by Year 5 of the project, or investments made have all failed (the criteria for which will be determined in preparation), remaining GEF equity funds will be returned to the GEF. This should ensure an adequate exit from the project for GEF. Such an exit strategy for the GEF will be developed during project preparation and specified in the implementation agreement.

Potential Global Environmental Benefits of the Project

The estimated greenhouse gas reduction potential of Croatia’s market for renewable energy is 6.6 million tons of carbon dioxide over 10 years. This estimate is based on the carbon intensity of electrical generation system in Croatia, based on the HEP reporting of emissions (0.256 tCO₂/MWh). Of this, the proposed project will account for approximately 2.9%. Based on the

market value of renewable energy projects identified here, the cost of reductions is US\$135 per ton of carbon dioxide. Based on the incremental cost of US\$6.0 million for the project, the GEF-related cost of reductions achieved is US\$38 per ton of carbon dioxide.

Tables 10-15 below show the estimated greenhouse gas reductions and cost of mitigation from different scenarios, including; total market potential; base case; project case; and GEF incremental case. The project case assumes equal shares of wind energy and biomass cogeneration. In order to provide a better understanding of the mitigation costs for each (based on different operating characteristics), Table 12 and Table 13 below show the values for each. In addition, the GEF Incremental Cost table shows the cost-effectiveness if the project focused on either technology exclusively.

Table 10: Cost of Greenhouse Gas Reductions in terms of Total Economic Market Value

Grand Total of the Market Potential	tCO ₂ per year	Years	tCO ₂ Total Project	US\$/tCO ₂	US\$/tC
\$1,170,145,599	655,905	10	6,559,049	178.40	48.66

Table 11: Base Case Greenhouse Gas Reductions

Base Case (0.5% of Market Potential)	tCO ₂ per year	Years	tCO ₂ Base Case	US\$/tCO ₂	US\$/tC
6,400,000	3,364	10	33,638	190.26	51.89

Table 12: Project Case Greenhouse Gas Reductions – Wind Only Scenario

Wind Only	tCO ₂ per year	Years	tCO ₂ Project Case	US\$/tCO ₂	US\$/tC
\$12,915,000	6,360	10	63,598	203.07	55.38

Table 13: Project Case Greenhouse Gas Reductions – Biomass Only Scenario

Biomass Only	tCO ₂ per year	Years	tCO ₂ Project Case	US\$/tCO ₂	US\$/tC
\$12,915,000	12,720	10	127,195	101.54	27.69

Table 14: Project Case Greenhouse Gas Reductions

Project Case	tCO ₂ per year	Years	tCO ₂ Project Case	US\$/tCO ₂	US\$/tC
\$25,830,000	19,079	10	190,793	135.38	36.92

Table 15: Cost of Greenhouse Gas Reductions in terms of GEF Project Incremental Cost

Technology	Incremental Cost	tCO ₂ per year	Years	Incremental tCO ₂ Reductions	US\$/tCO ₂	US\$/tC
Combined	\$6,000,000	15,715	10	157,154	38.18	10.41
Wind only	\$6,000,000	9,356	10	93,557	64.13	17.49
Biomass only	\$6,000,000	22,075	10	220,752	27.18	7.41

Monitoring and Evaluation

Monitoring and evaluation will be developed for measuring the performance of the project (technical assistance, financing mechanisms, investments) and of the program (market transformation/stimulation). Key indicators for the project and program performance will be developed during preparation under PDF-B Grant. Technical assistance has been allocated in the proposed project cost structure for monitoring and evaluating these indicators during implementation. In addition, protocol for measurement and verification of emission reductions will be an essential part of the demonstration projects. This will allow for verifying the cost effectiveness of the carbon abatement, and can be disseminated to the public.

Market Analysis

The total market for renewable energy in Croatia is estimated based on the estimated *technical potential* for the various technologies, which have been developed by the Energy Institute. Technical potential is based on the estimated resources, and does not consider cost or other factors. *Economic Potential* was then estimated using a combination of sources and assumptions. In total, the estimated economic potential – what could feasibly be developed and financed using current pricing assumptions – is about 12.7% of the total technical potential.

Table 16: Technical Potential for Renewable Energy

Total Technical Potential in Croatia	Capacity (MW)	Capacity Factor	Gen (MWh/yr)
Small hydro:	150	0.45	591,300
Biomass:	1,438	0.60	7,555,556
Geothermal electric:	46	0.90	362,664
Geothermal(thermal):	855	0.90	6,740,820
Wind:	270	0.30	710,000
Solar:	1,585	0.30	4,166,667
Total	4,344		20,127,007

Source: Energy Institute

Table 17: Estimated Economic Potential of Renewable Energy

Estimated Economic Potential	Unit Investment (\$/kW)	Total Investment	Capacity (MW)	Capacity Factor	Gen (MWh/yr)
Small hydro:	1,500	28,158,295	19	0.45	74,898
Biomass:	1,280	184,001,364	123	0.60	646,488
Geothermal electric:	1,200	5,520,000	5	0.90	39,420
Geothermal(thermal):	1,200	102,600,000	86	0.90	678,024
Wind:	1,280	294,944,536	230	0.30	604,440
Solar:	3,500	554,921,404	159	0.30	417,852
Total	1,775	1,170,145,599	622		2,461,122

Source: Energy Institute

Assumptions used in developing the economic potential are as follows:

- Small hydro: 74,000 MW was estimated by the MAHE program of the Energy Institute;
- Biomass: economic potential estimated at 10% of technical potential;
- Geothermal electric and thermal: economic potential estimated at 10% of technical potential;
- Wind: estimates taken from HEP's survey of 29 potential wind sites considered feasible;
- Solar: estimates taken from SUNEN program of the Energy Institute.

Attachment 1 to Annex 4 Demonstration Projects

The proposed demonstration projects are wind and biomass power. While some resources assessments have been completed (which show significant technical potential), no projects have been developed for this project. During preparation, a pipeline of possible projects will be developed, and conditions for approval to go forward to the implementation phase will be developed. The objectives and participants as well as the financial structure for the demonstration projects are presented in Tables 19 and 20, respectively.

Table 19: Demonstration Project Matrix

Project Investments	Objective	Implementers	Cost	Funders
<i>Wind Energy</i>	Catalyze market for wind energy by demonstrating technical and commercial aspects (5 MW)	Sponsors, local and international consultants	US\$6.4 million	Private sponsors, GEF equity, Banks
<i>Biomass</i>	Catalyze market for biomass energy by demonstrating technical and commercial aspects (5 MW)	Sponsors, local and international consultants	US\$6.4 million	Private sponsors, GEF equity, Banks

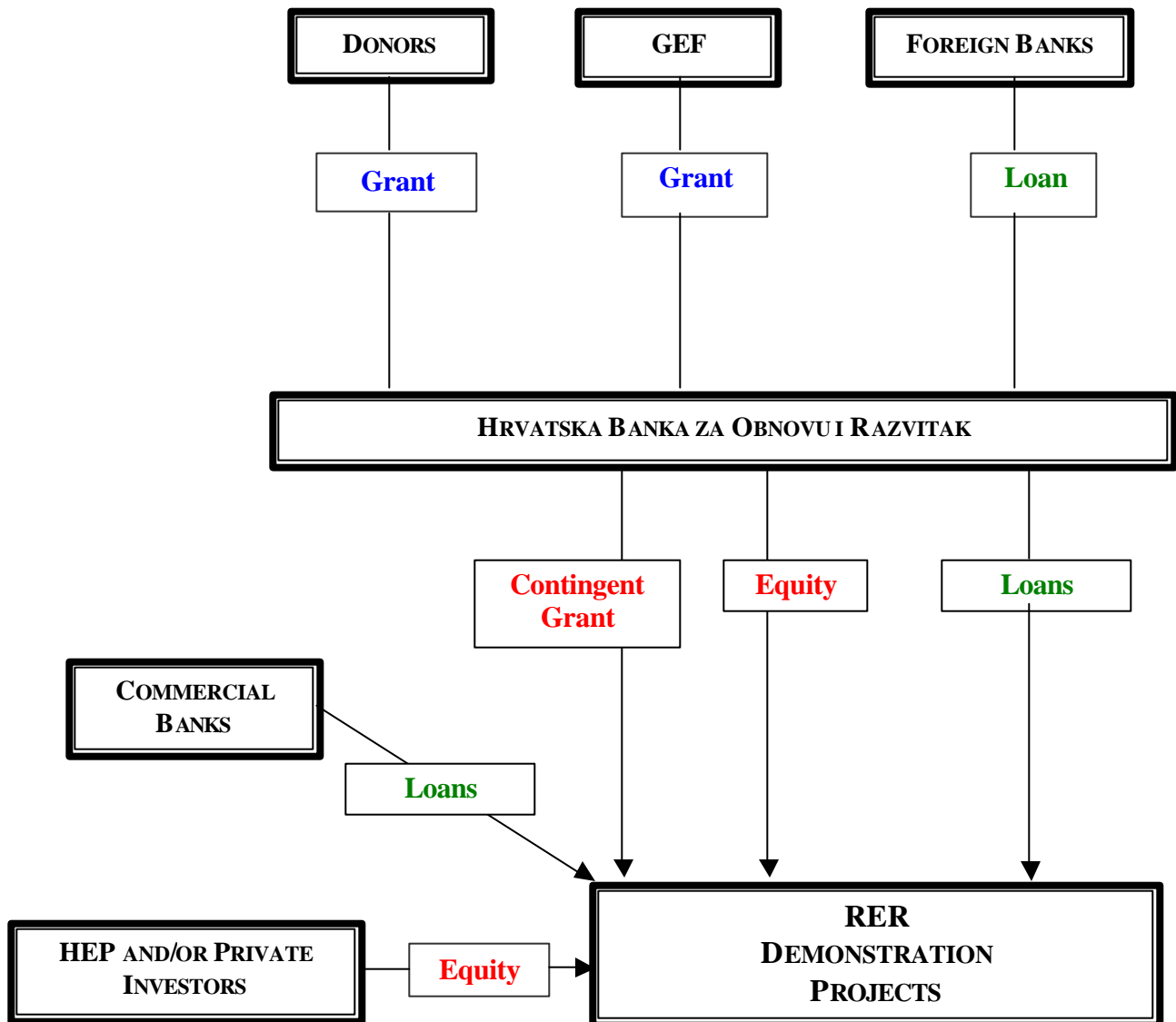
Table 20: Demonstration Project Finance Structure (US\$)

Project	Contingent Grants	Equity finance mechanism	Private Equity	Local Bank Loans	Repayment of Grants	Total
Wind	200,000	1,280,000	1,920,000	3,200,000	(200,000)	6,400,000
Biomass	200,000	1,280,000	1,920,000	3,200,000	(200,000)	6,400,000
Total	400,000	2,560,000	3,840,000	6,400,000	(400,000)	12,800,000

The figures above are estimated costs and estimated breakdowns by source of finance. The total cost of the demonstration projects includes capital costs as well as development costs. The financing parties – equity finance mechanism, private equity, and commercial banks -- will share the full costs of the capital costs. The exact modalities of the structure will be worked out in project preparation and pre-feasibility. Pre-feasibility and feasibility costs will be partially financed by the contingent grant facility, to be repaid upon financial closing. This movement of funds will provide the first demonstrations of the contingent grant and equity facilities.

A possible scheme for project financing of a demonstration project is below:

Figure 1: Project Finance Scheme



Attachment 2 to Annex 4 Project Preparation Activities

Several unresolved issues will be addressed by the PDF-B funded activities. Project preparation activities will be divided into six primary areas:

- ***Cost-benefit analysis.*** This analysis will attempt to address the issue of costs and benefits of renewable energy from the system perspective. However, traditional cost accounting methods will be avoided, as these often do not accurately account for the environmental benefits and relatively low risks of renewable energy. The methodology and terms of reference for this task is being prepared at the time of submission of this project brief. A portion of the budget for this task will also be reserved for developing a pipeline of candidate projects for demonstration project investment.
- ***Development of RE policy for regulatory framework.*** The results of the cost-benefit analysis will be used in the second task to assist legal and regulatory experts develop relevant language for inclusion in the secondary legislation for renewable energy. The experts will work closely with the Ministry of Economy, Croatian Energy regulatory Council, and the Energy Institute to develop regulations, which will create the foundation for a sustainable market.
- ***Design of local development planning.*** This task will focus on design of a program for the implementation phase that will assist local governments in preparation of development plans. The absence of these plans, and other issues such as uncertainty regarding land use agreements, present major barriers to developers. The preparation activities will focus on developing necessary terms of reference for technical assistance to local governments, and will involve consultation from planning experts, the Energy Institute, and NGOs.
- ***Financial mechanisms design.*** This task will develop the terms, conditions, and guidelines for the contingent grant and equity finance mechanisms of the project. Sub-tasks will include development of business plan, target investments, preparation of budgets and financial projections, and operating and investment guidelines. Special attention in the latter will include risk diversification and portfolio balance measures to ensure sufficient allocation of funds to small and medium enterprises and Croatian entities. In addition, adequate incentive structures must be developed to ensure timely and complete disbursement (investment) of funds.
- ***Performance monitoring and global reporting.*** This work will produce a draft report which include indicators and specifications for monitoring project performance, including methods of measuring energy produced from each project and computing their global environmental impact, as well as estimates of the global environmental impact of the project as a whole.
- ***Technical assistance design, project brief, and implementation plan.*** Technical assistance design will include: (i) drafting terms of reference and budgets for TA activities (aside from development planning) such as training, resource assessments, environmental impact assessment for small hydro, and regional energy center development; and (ii) developing project implementation plan, including monitoring and reporting, as well as other documents required for completion of the final GEF and World Bank documents.