

Document of
The World Bank

Report No:

PROJECT APPRAISAL DOCUMENT
ON A
PROPOSED
IN THE AMOUNT OF US\$
TO THE
FOR
SYSTEM EFFICIENCY IMPROVEMENT, EQUITIZATION & RENEWABLES PROJECT

East Asia and Pacific Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective)

Currency Unit = Dong (D)
1 D = US\$0.000067
US\$1 = D15,000

FISCAL YEAR

January 1 -- December 31

ABBREVIATIONS AND ACRONYMS

ADB	Asian Development Bank	MOSTE	Ministry of Science, Technology and Environment
BPT	Bulk Power Tariff	MPI	Ministry of Planning and Investment
BOT	Build, Operate and Transfer	MV	Medium Voltage
CAS	Country Assistance Strategy	PAH	Project Affected Household
CEG	Commune Electricity Group	PAP	Project Affected Person
CFL	Compact Fluorescent Lighting	PC	Power Company
DLC	Direct Load Control	PIP	Project Implementation Plan
DSM	Demand Side Management	PECC	Power Engineering Consultancy Company
EIA	Environmental Impact Assessment	PV	Petrovietnam
EE	Energy Efficiency	RE	Rural Electrification
EIRR	Economic Internal Rate of Return	REAP	Renewable Energy Action Plan
EMF	Electromagnetic force	RARE	Remote Area Renewable Energy
ESCO	Energy Service Companies	RAP	Resettlement Action Plan
ESMAP	Energy Sector Management Assistance Program	RMV	Resident Mission in Vietnam
EVN	Electricity of Vietnam	ROW	Right of Way
FTL	Fluorescent Tube Lights	TOU	Time of Use
GOV	Government of Vietnam	SIDA	Swedish International Development Agency
HCM	Ho Chi Minh	SPP	Small Power Producer
HH	Household	SPPA	Standardized Small Power Purchase Agreement
IFC	International Finance Corporation	TA	Technical Assistance
IDA	International Development Association	UNDP	United Nations Development Programme
IDC	Interest During Construction	VAT	Value Added Tax
IPP	Independent Power Producer		
JBIC	Japan Bank for International Cooperation		
JICA	Japan International Cooperation Agency		
LRMC	Long Run Marginal Cost		
LV	Low Voltage		
MOF	Ministry of Finance		
MOI	Ministry of Industry		

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Country Manager/Director:	Andrew Steer
Sector Manager/Director:	Mohammad Farhandi
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VIETNAM
SYSTEM EFFICIENCY IMPROVEMENT, EQUITIZATION & RENEWABLES PROJECT

CONTENTS

A. Project Development Objective	Page
1. Project development objective	3
2. Global objective	3
3. Key performance indicators	3
B. Strategic Context	
1. Sector-related Country Assistance Strategy (CAS) goal supported by the project	3
2. Main sector issues and Government strategy	4
3. Sector issues to be addressed by the project and strategic choices	10
C. Project Description Summary	
1. Project components	11
2. Key policy and institutional reforms supported by the project	13
3. Benefits and target population	13
4. Institutional and implementation arrangements	14
D. Project Rationale	
1. Project alternatives considered and reasons for rejection	16
2. Major related projects financed by the Bank and other development agencies	19
3. Lessons learned and reflected in the project design	21
4. Indications of borrower commitment and ownership	22
5. Value added of Bank support in this project	23
E. Summary Project Analysis	
1. Economic	24
2. Financial	24
3. Technical	25
4. Institutional	26
5. Environmental	29
6. Social	33
7. Safeguard Policies	36

F. Sustainability and Risks	
1. Sustainability	37
2. Critical risks	37
3. Possible controversial aspects	38
G. Main Conditions	
1. Effectiveness Condition	38
2. Other	38
H. Readiness for Implementation	41
I. Compliance with Bank Policies	42
 Annexes	
Annex 1: Project Design Summary	43
Annex 2: Detailed Project Description	47
Annex 3: Estimated Project Costs	53
Annex 4: Cost Benefit Analysis Summary, or Cost-Effectiveness Analysis Summary	61
Annex 5: Financial Summary for Revenue-Earning Project Entities, or Financial Summary	76
Annex 6: Procurement and Disbursement Arrangements	114
Annex 7: Project Processing Schedule	139
Annex 8: Documents in the Project File	140
Annex 9: Statement of Loans and Credits	141
Annex 10: Country at a Glance	143
Annex 11: Energy Efficiency and DSM Strategy	145
Annex 12: Renewable Energy Strategy	153
Annex 13: Rural Electrification Strategy	175
Annex 14: Power Sector Reform	180
Annex 15: Resettlement Action Plans - Summary	186
Annex 16: Environmental Action Plan - Summary and ISDS	193

MAP(S)

VIETNAM
System Efficiency Improvement, Equitization & Renewables Project

Project Appraisal Document

East Asia and Pacific Region
EASEG

Date: February 1, 2001		Team Leader: Anil Kumar Malhotra						
Country Manager/Director: Andrew D. Steer		Sector Manager/Director: M.Farhandi						
Project ID: P066396		Sector(s): PY - Other Power & Energy Conversion						
Lending Instrument: Specific Investment Loan (SIL)		Theme(s):						
		Poverty Targeted Intervention: N						
Global Supplemental ID: P073778		Team Leader: Susan V. Bogach						
Focal Area: G		Sector Manager/Director: M.Farhandi						
Supplement Fully Blended? No		Sector(s): PP - Electric Power & Other Energy Adjustment						
Project Financing Data								
<input type="checkbox"/> Loan <input checked="" type="checkbox"/> Credit <input type="checkbox"/> Grant <input type="checkbox"/> Guarantee <input type="checkbox"/> Other:								
For Loans/Credits/Others:								
Amount (US\$m): 225.00								
Proposed Terms (IDA): Standard Credit								
Grace period (years): 10		Years to maturity: 40						
Commitment fee: 0.5%		Service charge: 0.75%						
Financing Plan (US\$m):								
	Source	Local	Foreign	Total				
BORROWER		122.90	0.00	122.90				
IDA		10.00	215.00	225.00				
GLOBAL ENVIRONMENT FACILITY		2.25	2.25	4.50				
Total:		135.15	217.25	352.40				
Borrower/Recipient: SOCIALIST REPUBLIC OF VIETNAM								
Responsible agency: ELECTRICITY OF VIETNAM (EVN)/MINISTRY OF INDUSTRY (MOI)								
Electricity of Vietnam, Power Company 1(PC1), Power Company 2 (PC2); Power Company 3 (PC3)								
Address: 18, Tran Nguyen Han, Hanoi, Vietnam								
Contact Person: Dao Van Hung, President								
Tel: 844-8257232		Fax: 844-8249462		Email: vuonghq@evn.com.vn				
Other Agency(ies):								
Ministry of Industry								
Address: 54 Hai Ba Trung, Hanoi, Vietnam								
Contact Person: Hoang Trung Hai, Vice Minister								
Tel: 844-8259887		Fax: 844-8265303		Email: bqlipp-bcn@hn.vnn.vn				
Estimated Disbursements (Bank FY/US\$m):								
FY	2003	2004	2005	2006	2007			
Annual	17.73	123.44	163.30	32.65	15.28			
Cumulative	17.73	141.17	304.47	337.12	352.40			
Project implementation period: 2002-2006								
Expected effectiveness date: 07/01/2002 Expected closing date: 06/30/2007								

* There is an associated GEF DM project, which is expected to submit to the Board in August, 2002. Project Financing for this

associated project is estimated at US\$10.75 million of which GEF: US\$5.25; private end-users: US\$5 million and GoV: US\$0.5 million.

OCS PAD Form: Rev. March, 2000

A. Project Development Objective

1. Project development objective: (see Annex 1)

The overall objectives of the proposed project are to contribute to the Government's poverty alleviation program in rural areas and to improve the overall efficiency of power system services in the country. The proposed project's main development objectives are to (a) **Improve overall system efficiency and reduce investment needs** through (i) optimization of the transmission system to reduce transmission losses; and (ii) reduction of generation capacity increases by effective demand side management; (b) **Enhance energy access for the poor** in remote areas by (i) upgrading 110 kV sub-transmission and the MV distribution lines for rural electrification; (ii) rehabilitation of small hydro plants and construction of a hybrid wind-diesel power plant supplying electricity to rural areas and an island and (iii) development of community-based utilities to provide electricity from renewable energy to remote communes not accessible by the grid; and (c) **Sustain reform of the power sector** through (i) separation of generation, transmission and distribution by institutionalizing transfer pricing and distribution margins; (ii) improvement of corporate governance by instituting more effective financial management and information technology; and (iii) equitization¹ of districts and communes in north, center and southern parts of the country to develop a creditworthy distribution sector. The proposed project is expected to provide energy to about 10,000 households in the remote rural areas of Vietnam, using renewable energy, including some of the poorest and remote communes identified in the government's special commune program.

¹ / Equitization is defined as selling more than 65 percent of shares to non-State shareholders and having no dominant or special State shares. This sale is under Decree No. 103-1999-ND-CP of September 10, 1999 on Transfer, Sale, Management Contract and Lease of State Enterprises.

2. Global objective: (see Annex 1)

The global objective of the renewable energy components is to contribute to reduced greenhouse gas (GHG) emissions by promoting the use of electricity production using renewable resources. The project intends to build institutional capacity for renewable energy, as part of a programmatic approach. It is expected to be followed by the Rural Energy 2 Project (FY04), which will expand renewable energy investment activities based on capacity developed in the SEIER Project.

3. Key performance indicators: (see Annex 1)

The performance indicators established for this Project will focus on: (i) number of additional rural households with electricity (conventional and renewable), as well as indicators of social benefits and income generating impacts; (ii) additional renewable electricity to supply isolated communes; (iii) increased efficiency, reliability and quality of overall power system services; (iv) progress in implementation of reforms and maintenance of financial soundness of EVN and affiliated power distribution companies; (v) development of a program for creation of a creditworthy distribution sector; and (vi) reduction of carbon emissions.

B. Strategic Context

1. Sector-related Country Assistance Strategy (CAS) goal supported by the project: (see Annex 1)

Document number: Report 18375-VN (August 28,1998) –Updated IDA/R2000-66 (May 8, 2000)

Date of latest CAS discussion: May 8 2000

Board discussion: May 30, 2000; CAS update discussion: October 25, 2001

The project is in full compliance with the Bank's Country Assistance Strategy (Report 18375) which sees

IDA's role for the power sector as filling an important niche not covered by other players in the sector and directly assisting the government in its poverty alleviation efforts. The energy sector has contributed substantially to economic growth. Its continued development is essential to sustaining industrial growth and employment generation. The report " Fuelling Vietnam's Development: New Challenges for the Energy Sector" (April, 1999) identifies the key issues and lays out a strategy for the sector. First, IDA lending will shift towards extending access in rural areas. Second, IDA will increase the efficiency in the entire energy chain and create creditworthy institutions as well as improve corporate governance and rationalize sector management. Third, our focus will shift towards mobilization of external financial resources for the sector to ensure the country meeting its energy demands, providing services that will facilitate private participation in the energy sector. This will include advisory services for putting in place a transparent and independent regulatory framework and for promoting private participation in distribution and renewable energy power plants.

The policies and programs that GOV proposes to follow in the sector are in consonance with the Bank's policy guidelines for the power sector. IDA involvement in Vietnam's power sector is intended to assist the country's staged transition to a commercial sector structure and operating environment and in the development of an efficient and equitable energy system. This involvement, commenced under the first four power credits, is helping GOV in (a) strengthening the existing institutions including rural electrification; (b) implementing commercial management practices and structures; (c) developing a credible legal and regulatory system; and (d) facilitating the entry of private sector capital and operators in the sector. In addition, IDA's involvement is influencing the optimal utilization of scarce resources, as well as fostering energy efficiency and good environmental management practices. Sustained involvement in the Vietnamese power sector, through the proposed project, would help consolidate reform efforts and institutional restructuring initiated in earlier projects.

The proposed project is consistent with the CAS focus on reduction of poverty, promoting equitable growth and raising productivity through infrastructure. The proposed project would directly address (i) inadequate rural infrastructure by strengthening transmission and distribution systems providing electricity to the rural households; (ii) electricity for remote areas inaccessible to the national grid by developing commune-based renewable energy hybrid utilities; (iii) improving productivity of infrastructure services by promoting transmission and distribution system efficiency; and (iv) strengthening of institutional capacity to plan and implement programs by improving and financial and commercial management at the distribution level of the system.

1a. Global Operational strategy/Program objective addressed by the project:

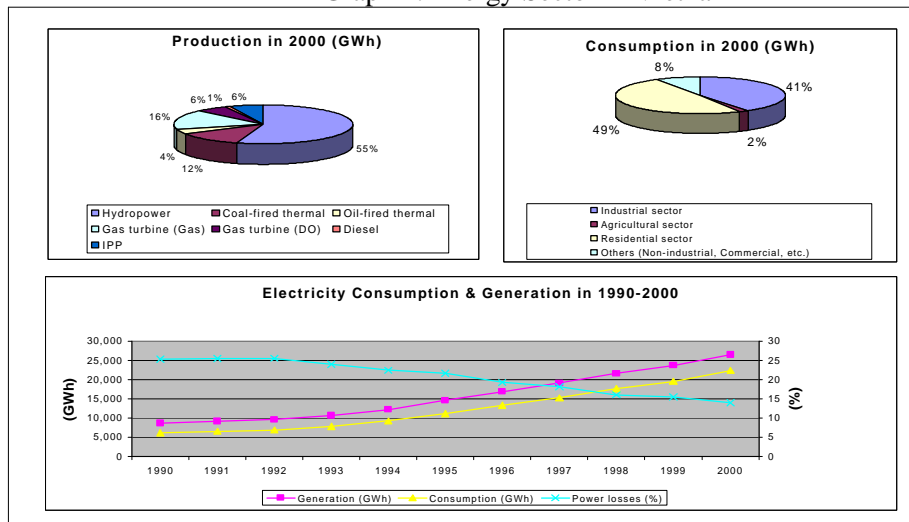
The renewable energy sub-components of the SEIER address GEF Operational Program 6 on Climate Change, promotion of the adoption of renewable energy by removing barriers and reducing implementation costs. The project supports a long-term programmatic approach to strategically develop Vietnam's renewable energy sources, especially small hydro, biomass and solar, based on the Renewable Energy Action Plan (REAP), developed through a participatory process by stakeholders, EVN, Ministry of Industry (MoI) and the Bank and adopted by MoI². The SEIER components will build capacity and develop business models for renewable energy investments. A follow-up project, the proposed Rural Energy 2 Project (FY04), is expected to expand these investments, including co-financing by the private sector and other donors.

² / MoI, EVN, World Bank, *Renewable Energy Action Plan*. 2001, available from the Infoshop.

2. Main sector issues and Government strategy:

Background: The energy sector can provide the essential underpinning to future economic growth in Vietnam. Today it contributes over a quarter of total foreign exchange earnings from oil and coal exports. Energy demand has been growing 13 %, faster than GDP during the last five years. Continued expansion in energy and electricity supply and delivery infrastructure will enable rapid growth in the agricultural and industrial sectors and sustain economic growth. It can help alleviate poverty by providing energy access to the poor and mitigate environmental degradation by encouraging the shift from traditional to commercial energy, as well as making appropriate fuel choices in expanding supplies. New challenges have emerged in the energy sector requiring structural and institutional reforms that are both more difficult and more complex.

Graph 1. Energy Sector in Vietnam



The major sector issues and the Government's strategy to deal with them are described in more detail below:

a. Need for large sector investments and for improvement in overall system efficiency. Over the past five years, electricity demand in Vietnam has increased at 13-15 % per annum. This increase is typical of countries which begin from very low levels of demand. To sustain an economic growth projection of about 6-8% p.a. over the next 5 years, Vietnam needs to increase its electricity supplies at the rate of about 9-11 % per annum, calling for an investment of about US\$ 7.5 billion equivalent over 2000-2005. This investment represents about 5% of the projected GDP. Financing this increase in electricity supplies requires a strategy to: (a) improve the efficiency of existing systems; and (b) maximize the inflow of external sources of capital within prudent limits, as well as, increase the amount of self generated sectoral surpluses for investment. Fundamental reforms of the energy tariffs will be required to ease financing constraints and ensure long term efficiency of investment and resource utilization decisions in the entire economy. Electricity efficiency has two components: supply side and demand side efficiency. Inefficiencies in transmission and distribution include low system power factors, transformer inefficiencies, poor quality cables, lack of system optimization etc. System losses, about 15.5 % in 2000, need to be reduced to 10%. A wide ranging demand side management program would: improve load management for large energy users, introduce building standards, industrial audits to improve lighting and motors and design more efficient public lighting. These measures could reduce demand by about 700 MW and save US\$400 million by 2010. The Government is working towards these goals by : (a) promoting energy conservation and efficiency, (b) increasing and structuring electricity tariffs to raise internally generated surpluses; (c) involving the private sector in power generation and developing natural gas supplies; and (d) promoting

equitization of distribution functions.

Table 1 Load Demand Forecasts 2000-2020

Year	2000	2005	2010	2015	2020
Low Scenario	<i>GWh</i>	<i>GWh</i>	<i>GWh</i>	<i>GWh</i>	<i>GWh</i>
Electricity Generation	26,000	42,031	64,553	96,906	142,113
Capacity (MW)	4,487	7,380	10,680	15,803	22,849
Base Scenario					
Electricity Generation	26,000	46,459	70,437	109,439	167,022
Capacity (MW)	4,487	7,802	11,653	17,847	26,854
High Scenario					
Electricity Generation	26,000	49,009	78,466	126,949	201,367
Capacity (MW)	4,487	8,230	12,982	20,703	32,376

Source: PDP-5 and Bank Staff estimates

b. Low Rural Access to electricity: Rural electrification is a critical element of the Government's program to eliminate poverty and redress imbalances in development. Ambitious rural electrification targets have been established and work has commenced. About 20 million people in Vietnam, representing about 4 million households, still have no access to electricity. Electricity consumption patterns are also skewed, with urban dwellers who account for about 20% of the population accounting for over 80% of the total consumption. Expansion of rural electricity access is crucial for two reasons. First, electricity access will make it possible to improve overall welfare levels by providing reliable lighting sources, improved health care and services. Second, by providing electricity for irrigation and other productive activities (e.g. weaving, etc.) the productivity and incomes of rural residents can be increased. The key issues in rural electricity delivery are: (i) securing adequate resources for investments that are economically justified but not financially viable; (ii) defining and implementing methods for rural grid and off-grid management, maintenance and services that do not overextend central electricity providers and maximize local participation; and (iii) designing tariff structures that recover costs without distorting incentives for local generation and efficiency. The Government is addressing the above issues by: (i) issuing a Rural Energy Policy Paper and preparing national decrees for implementation of rural electrification programs; (ii) nominating MoI to promote, coordinate and manage the renewable energy program for the country; and (iii) working with the World Bank in designing investment projects for rural electrification that would address the issues noted above.

c. Barriers to Renewable Energy: Decentralized electricity production from renewable energy sources can be economically viable. However, the scale of applications is too small to obtain any significant economies of scale in production or sales or to justify establishing the necessary infrastructure to assure sustainability. Work done to prepare the Renewable Energy Action Plan (REAP) identified the following major barriers: (a) lack of policy and institutional mechanisms³; (b) insufficient information about renewable energy technologies, their cost and performance, available to stakeholders at all levels⁴; (c) few commercial businesses to provide renewable electricity equipment and services; (d) lack of credit for renewable energy suppliers, developers of community mini-grids and grid-connected projects, or for household purchase of systems; (e) unavailability of high quality technology⁵; and (f) inadequate resource data⁶. The Government is gradually realizing the potential of renewable energy for decentralized electricity supply and has embarked, with assistance from the Bank, on a programmed approach to renewable energy development by (a) nominating MOI as the central agency for promotion and coordination of renewable energy programs

and (b) developing a Renewable Energy Action Plan (REAP), in consultation with local agencies and donors, which lays out a policy framework and long term program. But much work and capacity building still needs to be undertaken.

d. Managerially and administratively weak sector institutions: Institutions in the Vietnam's energy sector are managerially and administratively weak. Much of this weakness results from inadequate staff skills and organizational systems to operate in an increasingly commercial environment. Moreover, Vietnamese government agencies and power enterprises have been unable to decentralize decision making to front-line staff and exercise administrative/management oversight without interfering, or taking it over themselves. Consequently, there has been a lack of autonomy and associated responsibility in most energy sector institutions, resulting in low productivity. The Government has recognized the problem, and is making slow but steady progress: (a) allowing more decentralization of investment decision, authorizing EVN's management board to decide on investments under \$40 million; (b) training government staff, to upgrade their skills and to familiarize senior officials with alternative models of governance and oversight; (c) initiating plans for the equitization of communes and districts; and (d) commissioning a commune-based utility model to develop local management.

e. Financial Sustainability of the power sector. EVN's financial performance, since its creation in FY95 to date, has been satisfactory on the strength of high demand growth and rapid expansion of the Vietnamese economy. The strong performance was reflected in EVN's financial ratios: from FY96-98, the operating margin averaged 17% and the SFR, 36%. The regional financial and social crisis of FY97/98 severely constrained access to external financing and revenue sources to support Vietnam's development. However, largely due to the continued robust demand for power, EVN sustained its satisfactory financial performance and strong results: from FY98-00, the operating margin averaged 14% and the SFR, 34%. But sustained financial viability of EVN in view of its investment needs is critically dependant on the level of power tariffs in the country.

Table 2 . Investment Needs of the Power Sector 2000-2020 (US\$ million)

No.	List	2000 - 2005	2006 - 2010	2011 - 2020	2000 - 2010	2000 - 2020
I	Power plant	4,125	4,205	9,139	8,329	17,468
II	Power Transmission grid	1,127	1,094	2,628	2,221	4,849
III	Power Distribution network	2,259	1,889	4,380	4148	8,528
	Total	7,511	7,187	16,147	14,698	30,844

Source: PDP-5 and Bank staff estimates

Retail electricity tariffs, currently uniform across Vietnam, are set by the Government, and were rationalized and have been raised periodically since March 1992. Currently, the average tariff is about D 728/kWh, inclusive of the 10% value-added tax (VAT). The most recent estimates of Long Run Marginal Cost (LRMC) for retail tariff are in the range of VND 1125/kWh (US cents 7.5/kWh). The achievement of an average tariff of US cents 7.0/kWh is the development objective of IDA's ongoing tariff and sector dialogue with the Government and key to: (a) satisfactory financial performance of EVN and its compliance with financial covenants; and (b) sustainable health of the power sector. The Government, however, recently delayed the planned tariff increase to US cents 5.6/kWh scheduled to be effective on October 1, 2001 due to concerns for negative economic development after the September 11 attacks. Given EVN's sizable investment plans over the next decade to meet critical power shortage, and the associated increase in projected borrowing, government has recognized that it would be essential to implement the required increases in power tariff in a phased manner to achieve satisfactory financial performance of

EVN, compliance with financial covenants and financial sustainability of the power sector. (For a detailed analysis of the financial performance and projections, refer Annex 5.)

f. Minimizing Pollution and Environmental Degradation. A large share of the energy consumed by Vietnam's population comprises traditional energy sources, such as, fuel wood, charcoal, coal briquettes, rice straw, etc. A rapid shift is required from these traditional sources of energy to modern energy, including electricity. Recent natural gas discoveries offshore provide an opportunity to make environmentally and economically beneficial energy use choices. The Government has recognized the future importance of natural gas and has signed contracts recently for the commercial development of a significant offshore gas field. The development of renewable forms of electricity supply can also play a role in minimizing pollution and environmental degradation.

g. Pace of Power Sector Reform: The Government's vision for the sector and its strategy to bring about greater efficiency and lower cost of electricity have been spelled out in Power Sector Policy Statement in 1997 as part of the *Transmission, Distribution and Disaster Reconstruction Project* (CR 3034-VN). The principal elements of the phased sector reforms, both within EVN and at the level of nationwide legal structure and administration, include: (a) decentralization of management decisions at EVN, (b) improving efficiency in and corporatization of distribution entities, (c) commercialization of transmission operations, (d) preparation of an Electricity Law and supporting secondary regulations, (e) introduction of private sector participation into power generation and small distribution franchises, and (f) improving regulatory procedures for tariff setting at levels that fully cover costs. But pace of reform has been slower than envisaged.

The power sector in Vietnam began its current phase of market focused reforms in 1995 by the establishment of EVN as a state-owned holding company operated under the State Enterprise Law and by removing it from under the then Ministry of Energy. This was done to separate government policy and administration from business activities in the power sector. Regional Power Companies (PC) in charge of distribution were formed as independent accounting units under EVN, separated from central generation and transmission business units. Decentralization of authority in investment decisions for projects to EVN Management Board started in 1999. Separate corporate charters for PCs providing for increased management autonomy were issued in 1999-2000. EVN and all PCs have had their accounts audited annually by international auditors since 1997, and annual reports of EVN were publicly issued since 1999 including their financial statements. In January 2001, EVN introduced generation-transmission internal transfer pricing for all EVN owned power plants as the first step to turn power plants into profit centers..

The reform plan envisages EVN as the key buyer of power generation over the short and medium term. Competition will be encouraged in upstream generation, with a 20% long-term target for private generation through the BOT schemes. The 1992 amendment to the Foreign Investment Law and the following 1993 decree introduced the concept of BOT schemes for infrastructure development, and various decrees issued in 1998 and afterwards amended and supplemented a number of regulations to facilitate BOT projects. Due to innovative nature of concepts in the country and the associated long and overlapping decision making process of government agencies, BOT development in Vietnam has so far not been successful, with few projects being implemented. But the Government has recently issued Investment License (IL) for the 715 MW Phu My 2-2 Project and the 715 MW Phu My 3 Project to international foreign developers. The financial closure of these demonstration projects would further enhance the institutional capacity of the Government and agency officials and serve to encourage private participation for future projects.

Given that the structure and commercial arrangements in the power sector are evolving rapidly and the participation of the private sector is relatively new, the legal and regulatory framework has not developed

adequately to respond to these changes. The current regulatory system for the power sector suffers from two specific drawbacks: (a) the function of government oversight and regulation is not separated from that of sector ownership and management which have been vested in EVN's Management Board; and (b) there is no effective and credible body of sector-specific legislation and regulations. The creation of a credible regulatory entity and an enabling body of regulations for tariff, investment oversight are key priorities in the reform process. There has been ongoing dialogue between the Bank and the Government to promote and implement the reform processes and the Bank has been assisting such reform efforts through a series of IDA credit projects and associated studies.

The thrust and pace of the power sector reform program was reviewed with both MOI and EVN during meetings held in early 2002. MOI confirmed that the government is embarked on a serious and sustained reform of the power sector in order to change from a "command and control" economy to a market based economy. Delays in implementation had occurred in the past due to the need to generate consensus within and outside the government. But now certain fundamental decisions regarding the future structure of the power sector had been made and the pace of reform was expected to increase. These included, inter alia : (i) the encouragement of competition in all sectors of the power industry; (ii) a decision that only transmission would remain a government monopoly while generation and distribution would be subject to competition; (iii) EVN would introduce competition in generation through creation of an internal power pool and the introduction of power transfer pricing and in distribution through bulk power transfer pricing; (iv) an independent system regulator would be introduced into the system gradually; (v) the revised version of the Electricity law would be shortly submitted to the government ; (vi) MOI had also decided to prepare a number of decrees for promulgation even before the passage of the Electricity law including decree 45 on electricity usage (August 2001) including on energy conservation and saving; administration of penalties; inspection; safety; HV corridor right of way; tariff and regulation. It has been decided by government that EVN is to restructure itself into a real holding company under the model of one member limited liability company functioning under the Enterprise Law. The reform would remove the different treatment between public and private businesses and would create more transparent relationship between EVN and its member companies and increase their autonomy. Guidelines and schedules for the restructuring are being decided by the Government. Since competition and diversified ownership are allowed in generation and distribution, EVN has already signed 11 PPAs buying electricity from domestic IPPs with a total capacity of 575 MW and has been negotiating PPAs with 28 others investors. Over the next five years, EVN plans to create joint-ventures with domestic or foreign companies to build and operate power plants, especially in hydropower. EVN will also support IPPs selling electricity directly to customers, especially to rural areas. Internally, EVN has been applying internal transfer pricing between generation and transmission from 2001 in order to give greater autonomy and long term incentives for generation power plants to improve their efficiency, before moving to the next step of an internal power pool. On distribution, EVN has recently completed equitization of 4 enterprises under EVN and PCs and is now starting equitisation in distribution with the first 15 JSC in commune and 1 in district level as pilots for a more ambitious program of equitization.

The Government is currently engaged in the (a) drafting of the decrees on tariffs, safety, grid code, etc. which need to accompany the Electricity Law draft to the National Assembly; (b) reviewing institutional mechanisms to perform the regulatory functions and (c) developing a road map for continuing power sector reforms. (see Annex 12 for update on power sector reform).

³ / E.g. For non-utility supply to the grid, agreement must be reached with EVN on a small power purchase agreement (SPPA) and tariff. For off-grid rural electrification, a mechanism is required to channel an appropriate subsidy to rural communities and regulation is required.

⁴ / A start has been made on making this information through a project called RERID (renewable energy training material to be used under the WB supported Commune-based Rural Infrastructure Project)

⁵ / A start has been made on this through twinning of a Swiss company with Renewable Energy Research Center

⁶ / For small hydro, a number of sites have been identified, but the level of detail on sites of <1MW is inadequate. Data is scant and inconsistent for wind and solar energy.

3. Sector issues to be addressed by the project and strategic choices:

The SEIER is part of a program of investments⁷ in the electricity sub-sector, agreed between the Government and the Bank, to address the above sector issues. Each of the main groups of sub-components (transmission system efficiency improvements, energy efficiency, renewable energy and general institution building) is part of a longer term program. Nevertheless, the GOV prefers to have a series of projects of cross-cutting projects, with different activities to be completed in the same time frame bundled into a single project, rather than an APL. If appropriate policy triggers for follow-up projects are defined in each cross-cutting component, this approach is similar to an APL. The strategic choice was to embed actions on a wide gamut of policy, institutional and sector issues in a series of operational interventions over time. The Project addresses the main sector issues as follows:

a. Need for large sector investments to meet electricity demand. In providing IDA funds of \$ 225 million, the project would contribute to meeting the large financing requirements of the sector. The focus on reduction of transmission and distribution losses will reduce the need for new generation investments. The main thrust of the DSM efforts would be to reduce system and network peak load in order to better rationalize system expansion and capacity enhancement investments, improve service quality and reliability, and improve financial performance. The project will also review the level and structure of tariffs to improve self financing ratios and would assist in defining and implementing tariff reforms that achieve financial and efficiency objectives. Support to distributed generation using renewable energy from small power producers could also relieve some of the investment burden on EVN (see Annex 11 for Energy Efficiency and DSM Strategy).

b. Low Rural Access to Electricity. In line with the Government policy to increase the number of rural households with access to power, the project will finance strengthening MV systems for rural grids to enable additional rural households to connect to the grid. It will also finance the development of about 20 commune-based utilities in the poorest and remote areas that are inaccessible to the grid through project grants from a Remote Area Renewable Energy facility operated by MOI. The project will directly benefit about 10000 households. If successful, the framework established should lead to an expansion of commune-based renewable electricity to another 200 communes in future operations (see Annex 13 for rural electrification strategy).

c. Limited Recognition, Planning and Implementation Capacity for Utilizing Renewable Energy for electricity supply. The Project will support Phase 1 of the REAP, which aims to: (a) develop the necessary regulations/decrees, capacity building activities, and dedicated staff to administer a program at national, provincial and district level; (b) work with MoI and EVN to create an enabling environment for non-utility renewable electricity for remote areas; (c) demonstrate a Remote Area Renewable Electricity (RARE) Fund to finance and support renewable energy-based commune utilities, emphasizing promotion of productive uses; and (d) develop local renewable energy markets, businesses and improved technologies. The Project will focus on supporting institution building and pilot activities, and to lay a foundation for expanding the activities in the Rural Energy 2 Project (FY04). The private sector and other international agencies are expected to assist in investments in the Rural Energy 2 Project, attracted by the framework demonstrated in the SEIER Project.(see Annex 12 for renewable energy strategy).

d. *Managerially and Administratively Weak Sector Institutions* .The project will strengthen EVN and the power companies in financial, accounting and procurement management, through installation of a modern management information system and upgrading of IT staff. It will help EVN in planning and implementing electrification programs which are efficient and effective. It will equitize a number of districts and communes thus helping implement a larger plan for the creation of a creditworthy distribution sector. The project will also assist EVN and the Government to improve the institutional arrangements in the sector and set revenue generation policies to ensure sustainable management and operation (see Annex 14 for power sector reform program).

e. *Pace of Power Sector Reform*. In view of the ongoing efforts under other Bank financed work, this project will not directly address the issue of the lack of a comprehensive legal and regulatory framework but it will continue its effort for the early approval of the new Electricity Law by the National Assembly along with the decrees on the creation of a regulatory agency. Government also plans to complete a power sector reform road map, through technical assistance from ADB, which will provide a stage wise, time bound program for further structural and institutional changes in the sector. The pace of power sector reform will thus be further accelerated through future IDA operations as part of the Poverty Reduction Structural Credit II (FY 2003) and the Rural Energy Project (FY 2004).

f. *Pollution and Environmental Degradation*: The project will not directly address issues of minimizing pollution and environmental degradation but the project's strengthening of the rural distribution system and reduction of transmission and distribution losses will provide electricity to remote areas at reasonable tariffs which may have an impact on the shift from traditional to commercial energy with beneficial effects on the environment. Likewise, DSM and energy efficiency efforts will help to reduce electricity demand and the need for power generation, thus the use of fossil resources, which would result in green house gas reduction.

⁷ / Bank has followed a programmatic approach in developing its overall work program in the energy sector. Bank has provided four credits to the power sector: \$165 million for power sector rehabilitation and expansion (PSREP-2724- 1995); \$ 180 million for a power development project (PDP 2820- 1996) for Phu My 2.1 with an up front conditionality to introduce private power for Phu My 2.2 in order to anchor the reform program and provide a sustainable framework for reform; Transmission, Distribution and disaster reconstruction project (\$ 199 million, FY 99) to strengthen the transmission networks and rehabilitate distribution systems in three cities to reduce losses; and Rural Energy Project (\$150 million, FY 2000) to provide energy to 450,000 rural households. Each of these operations, while focusing on the major objectives, also laid the framework for tackling the sector wide issues indicated in section 2 above. Thus, for e.g., energy efficiency work started with rehabilitation of the distribution networks in the first project, a DSM study was initiated in the second and implementation of the first phase of the DSM study recommendations forms a core action program in the present project (Annex 11). A rural electrification master plan, financed in the Transmission project, helped structure the Rural energy project as well the detailed studies on renewable energy potential which led to the joint development of a Renewable Energy Action plan ; a plan whose first phase is being implemented in the present project (Annex 12)

C. Project Description Summary

1. Project components (see Annex 2 for a detailed description and Annex 3 for a detailed cost breakdown):

Overall system efficiency will be improved by (i) upgrading 500 kV, 220 kV transmission networks and associated substations, including installation of capacitors to selected substations and (ii) reducing system peak load of over 120 MW through implementation of several DSM measures. This component will be supported by an associated DSM and Energy Efficiency Project, financed by GEF⁸ and the private sector.

Rural access will be improved by (i) upgrading and strengthening of 110 kV sub-transmission line and substations; (ii) rehabilitation of 5 existing small hydro power plants and construction of a small scale hybrid wind-diesel power plant for Phu Quoc Island; and (iii) pilot development of about 20 community based hybrid renewable energy grids in remote areas.

Sector reform and institutional development will sought through (i) improvement of management information system; (ii) creation of 1 District and 15 commune level Joint-Stock Distribution Companies; (iii) strengthening of regulation, planning and implementation capacity for renewable electricity ; (iv) training of EVN operational staff and (v) technical assistance.

⁸ / The GEF DSM/EE project is now under preparation and will be submitted to the Board separately. This proposed operation will seek to further DSM impacts as well as catalyze the development of a small and sustainable energy efficiency service market.

Component	Sector	Indicative Costs (US\$M)	% of Total	Bank financing (US\$M)	% of Total	GEF financing (US\$M)	% GEF financing
1. System Efficiency Improvement	Distribution & Transmission	177.80	50.5	109.80	48.8	0.00	0.0
1.1. Upgrading 500 kV and 220 kV transmission systems							
1.2 DSM phase 2 by EVN (9)	Other Power & Energy Conversion	6.00	1.7	5.20	2.3	0.00	0.0
2. Improving rural access	Distribution & Transmission	122.20	34.7	70.70	31.4	0.00	0.0
2.1. Upgrading the 110kV sub-transmission systems for rural electrification programs							
2.2. Rehabilitation of existing small hydro plants and wind-diesel power plant for Phu Quoc Island	Other Power & Energy Conversion	9.20	2.6	8.00	3.6	0.50	11.1
2.3. Community-based hybrid renewable energy grids	Other Power & Energy Conversion	5.80	1.6	4.00	1.8	1.00	22.2
3. Institution building	Institutional Development	14.00	4.0	13.40	6.0	0.00	0.0
3.1. Improvement of management information system							
3.2. Creation of District and Commune level Joint Stock Distribution Companies	Institutional Development	7.00	2.0	7.00	3.1	0.00	0.0
3.3. Strengthening regulation, planning and implementation capacity for renewable energy projects	Institutional Development	3.50	1.0	0.00	0.0	3.00	66.7
3.4. EVN staff training program	Institutional Development	3.00	0.9	3.00	1.3	0.00	0.0
3.5. Technical Assistance		3.90	1.1	3.90	1.7	0.00	0.0
		0.00	0.0	0.0	0.0	0.00	0.0
Global Components		0.00	0.0	0.0	0.0	0.00	
Total Project Costs		352.40	100.0	225.00	100.0	4.50	100.0
Total Financing Required		352.40	100.0	225.00	100.0	4.50	100.0

⁽⁹⁾ / The associated GEF DSM EE project would mobilize an estimated US\$5.25 million in additional GEF support.

2. Key policy and institutional reforms supported by the project:

The Project supports the following key policy and institutional reforms:

The principal institutional reform undertaken as part of the Project will be capacity building to define and implement institutional structures for improving system efficiency, creating a creditworthy distribution sector and sustainable institutions for renewable energy development that: (a) lead to cost-effective electrification systems, maintained and operated in accordance with good international practice; (b) preserve the financial viability of the main power sector entities engaged in rural electricity supply and service provision; and (c) facilitate continued implementation of power sector reforms. These efforts will also strengthen the Governments ability to manage the power sector and help catalyze further private investments.

The Project will support improvement in system efficiency, corporate business and information management system and increased decentralization and commercialization of management through: (a) introduction of government regulation on energy efficiency and DSM; (b) implementation of EVN's comprehensive and modern IT Strategy, designed to maximize IT operational efficiency, enhance overall IT services and facilitate the coordinated use of IT in support of EVN corporate objectives; (c) separating power plants as independent accounting units with explicit, incentive based power purchase agreement with EVN; and (d) introduction of cost based bulk power tariff replacing the internal bulk tariff between EVN and power companies.

It will initiate a program for the creation of a creditworthy distribution sector through (a) the pilot divestiture/ equitization of districts and communes and private participation in the distribution sector; and (b) creation of Commune based mini utilities, managed locally, to provide sustainable energy to the remote areas. This will require the development of institutional capacity and a policy framework for encouraging use of renewable energy to supplement grid supply or serve isolated communities where least cost through (a) promulgation of appropriate Governmental decrees and regulations to create an enabling environment for renewable electricity particularly for the remote areas inaccessible to the grid; and (b) the creation of the Remote Area Renewable Energy (RARE) fund in MOI for the provinces to create a sustainable mechanism for allocating funds and promoting renewable energy development.

3. Benefits and target population:

Investments in the improvement of overall system efficiency and reduction of transmission and distribution losses will benefit consumers over the entire country as it will help reduce the need for increases in power tariffs. Investment in the distribution networks in rural areas will increase the access to electricity on a least cost basis in poor communes which have demonstrated potential for growth. Reinforcement of existing sub-transmission and MV distribution systems will reduce losses and improve reliability and quality of service.

RARE grants will pilot a mechanism to provide resources for remote area development. In the project, commune based utilities in 20 areas will provide electricity to about 10,000 households in the remote areas inaccessible to the grid. But the institutional capacity built will enable expansion of the program to a much larger scale in future projects area in the country.

Combined with other rural development initiatives promoted by the Government of Vietnam and supported by international institutions under the frame "Electricity – Roads – School – Clinics" program

, the project will promote diversification of rural and regional development and thus make an important contribution to decreasing poverty in rural areas.

4. Institutional and implementation arrangements:

a. *Implementation period:* The project would be implemented over the period of 4 years from 2002-2006

b. *Executive agencies and Project Management.* The executing agencies for the project will be EVN, PC1,2,3, PC Dong Nai and MoI.

EVN will be the executing agency for the Sub-component 1-1- Upgrading of 500 kV and 220 kV Transmission systems; Subcomponent 1-2 Demand Side Management Phase 2; Component 3- Sector Reform and Institutional Development (except Subcomponent 3-3). EVN management has delegated the executive responsibilities for the work under its charge to specific project management boards/ units. The EVN's Northern Project Management Board will manage transmission projects in the North, the Central Project Management Board will manage transmission projects in the Center and Southern Project Management Board will manage transmission projects in the South of Vietnam. DSM Center, to be expanded from the existing DSM cell within EVN, will manage DSM Phase 2. The Technology, Environment and Computer Center (TECC) and EVN functional departments will manage the Sector Reform and Institutional Development component.

Power Companies 1,2,3 and PC Dong Nai will be the executing agencies for Component 2- Improving Rural Assess, except for Subcomponent 2.3. PC 1,2,3 will use the existing Project Management Units to manage the projects in their respective territories while PC Dong Nai has established a new PMU to manage the projects in the province. PCs 1, 2 and 3 would also implement the IT strategy and technology for their respective areas through their Data/Computer Centers under overall coordination of the TECC.

MOI will be the executing agency for the Subcomponent 2.3 - Community Based Hybrid Renewable Energy Grids; and Subcomponent 3.3 Strengthening Regulations, Planning and Implementation Capacity for Renewable Energy Projects and to manage these projects, a dedicated PMB has been established within MOI. The PMB will be supported by full-time consultant staff at national and provincial level. Details of the proposed institutional arrangements for the renewables components are found in Annex 12.

The executing agency responsibilities are summarized in the Table below:

	Component	Executing Agency
1.	1. System Efficiency Improvement	
1.1	Transmission system efficiency improvement	EVN- Northern, Central and Southern PMB
1.2	DSM phase 2	DSM cell/center
2.	2. Improving rural access	
2.1	Upgrading the 110 kV sub-transmission and MV distribution system for rural electrification program	PC1,PC 2, PC 3,PC DN PMB's
2.2	Rehabilitation of existing small hydro power plants and Wind-diesel power plant for Phu Quoc Island	PC1, PC2, PC 3 PMB's
2.3	Community-based hybrid renewable energy grids	MOI PMB (renewables)
3	3. Institution building.	
3.1	Improvement of information system management	EVN-Center for Science and technology
3.2	Creation of District or Commune level Joint Stock Distribution Companies	PC1,2 and 3
3.3	Strengthening regulation, planning and implementation capacities for Renewable Energy Projects	MOI-PMB (renewable)
3.4	EVN staff training program	EVN personnel department
3.5	EVN Technical Assistance	EVN

Project co-ordination: EVN will coordinate all projects under EVN and PCs responsibility. MOI's senior management will coordinate Renewable Energy subcomponents under MOI's responsibility.

Project oversight The Ministry of Planning and Investment (MPI) and Ministry of Industry (MoI) will oversee the project implementation including necessary approvals, policy for overall program, management and tariff policy for rural areas, policy for reforming the sector. Ministry of Finance will supervise and advise EVN on the financial matters. The Office of Prime Minister will provide policy guidance to all entities.

Accounting, financial reporting and auditing arrangements

Assessment of the adequacy of the financial management system and of the financial performance of any revenue earning entities and a timetable for measures proposed to improve capabilities: An assessment of the financial performance of the revenue earning entities (EVN, PC 1, PC2, PC2 and PC Dong Nai) has been carried out (See Annex 5A- Financial Summary). An assessment of the adequacy of the project financial management systems has also been carried out (Annex 5B: Review of Financial Management System). The results of the assessment and a corresponding action plan to address measures needed to improve capabilities have been agreed with the agencies and are included in the Annex 5. The Review has concluded that this project meets minimum Bank financial management requirements. In terms of disbursement technique, the Project will be producing Project Management Reports (PMRs); however, traditional disbursement technique will be used as opposed to using the PMR-based disbursement system.

Status of the borrower and the project implementing entities' compliance with audit covenants in existing Bank-financed projects: No outstanding audits or audits issues exist with any of the entities involved in this Project (e.g. EVN, PC1, PC2, PC3, PC Dong Nai and MOI) or with any of the IDA

credit programs involving power companies in Vietnam.

Agreement with the borrower on standard and format for audited financial statements and the timetable for their submission: EVN and PCs' accounts are audited by independent financial auditors acceptable to IDA. The audits are conducted in accordance with international auditing standards and in compliance with the independent auditing regulations of Vietnam. The audit includes a review of EVN's accounting system and internal control and covers a full audit of the consolidated financial statements (balance sheets, income statement and source and application of funds statement) of EVN, and the Special Accounts (SA) related to the IDA credits. The report of the audit for EVN and the Power Companies would be furnished to IDA no later than Jun 30 of each fiscal year. For MOI, project accounts and SA will be audited annually.

Monitoring and evaluation arrangement: Satisfactory procedures for monitoring the progress of the Project in terms of physical execution, environment and social aspects and financial reports have been agreed with implementing agencies, which will furnish quarterly progress reports. EVN, MOI together with IDA will establish the performance indicators by which the Project can be monitored and evaluated. These performance indicators (as indicated in Annex 1) will be confirmed at negotiations. An Implementation Completion Report (ICR) would be drafted by IDA with EVN and MOI's assistance not later than six months after completion of the Project. EVN and MOI would also prepare and make available to IDA its own evaluation reports, including a summary report, which would be attached to the ICR.

Project supervision would focus on: (i) performance indicators; (ii) compliance with financial covenants; (iii) implementation of environment impact mitigation measures and resettlement/compensation; (iv) physical construction; (v) institutional restructuring and sector reform; and (vi) technical assistance subcomponents. The World Bank Office in Vietnam would play a major part in project supervision. Supervision expertise would comprise power engineering, economics, financial analysis, environment and social issues, restructuring and privatization. Four missions annually for a period of 4 years are foreseen, two main supervision missions and two project updating missions, with total estimated 48 staff weeks per year (sw) inputs (on the basis of sharing with other Vietnamese power projects); which are broken down as follows: (i) task team leader, power engineer, economist, financial analyst and financial management specialist-40 sw; (ii) social and environmental specialist-4 sw; (iii) procurement specialist- 8 sw; (iv) sector reform and restructuring specialist and legal expert-4 sw. In addition, given the large number of project elements, additional support of 30 staff weeks from local field operational staff is planned for the project inception and supervision in the first year.

D. Project Rationale

1. Project alternatives considered and reasons for rejection:

The investment components of the project were developed following technical, economic and financial studies that have taken into consideration environmental and social aspects as appropriate.

Improvement of overall system efficiency. Given the rapid increase in power demand over the next decade and the major investment requirements, the Master Plan of the Power Development for Vietnam over the period 2001-2010 (the Master Plan V), approved by the Gov in June 2001, formulated a strategy to reduce financing requirement of power sector through improvement of the efficiency of the existing power system and acceleration of demand side management activities. On the supply side, one of the major targets set by the Master Plan V was to reduce the total system losses from 15.5% in 2000 to about 10% in 2010. To meet this ambitious objective, a consortium of international consultants of BCEOM, Tractebel and System Europe was selected to assist EVN to identify causes and measures to implement cost effective

improvement in system efficiency and technical performance of the power system to allow for optimum utilization of facilities and to improve system reliability, security and quality of service. A number of projects for the years 2003-2006 were identified and ranked based economic analysis and justification. In the transmission system, measures included additions of new lines, substations or expanding substations, installation of capacitors in selected substations, and optimizing both reactive power dispatch and economic power dispatch through optimal power flow. In distribution systems, the installation of efficient transformers and capacitors, replacement of conductors and other measures (i.e. new lines and substations, load balancing, etc.) had payback periods of 1-3 years. Based on the recommendation of the study, high priority projects were screened and then selected to be included in the SEIERP. The chosen projects would reduce bottlenecks of network in Central Region, increase the transfer capacities between 220 kV and 110 kV and increase capacitor capacities in a number of substations. It was identified that one of the particular weak point of the transmission system is the central system due to a limited number of high voltage connections, the absence of power plants and the high load growth forecasted for next 5 years. The additional 500 kV line between Danang and Pleiku via Binh Son, including the installation of a new 500 kV substation at Binh Son and extension of the existing Da Nang Substation, were proposed as high priority projects to eliminate these bottlenecks. An added system-wide advantage will be the reduction of the probability of desynchronisation of the Southern and Northern system and reduction of overall system losses. Another weakness of EVN network is the transfer capacity between 220 kV and 110 kV as most of the generating units are connected to 220 kV leading to a huge power flow being transported via 220/110 kV transformers to MV network to feed the load. To address the issue, a number of 220/110 kV transformer substations are proposed to be expanded under SEIERP. An efficient maintenance management system was also considered additional necessity in order to maintain the transmission and distribution systems in a safe and efficiently performing condition. Each selected project was then verified by detailed feasibility studies which take into accounts all technical, economic, financial, environmental and social aspects of investment.

On the demand side, the strategy is on expanding the current DSM activities to reduce peak load, promote energy conservation and saving. A study by an international consultant was carried out for EVN to identify the DSM phase 2 measures to be included in the SEIERP. The DSM Phase 2 project would result in peak reduction of more than 120 MW and carbon dioxide reduction of 523,500 tons compared with the alternative of simply adding new system capacity only for 1-2 hours of the day to meet the peak demand.

Improving rural access. The Rural Electrification Master plan considered various alternatives for extending rural electrification, including extending the distribution grid, off grid systems and doing nothing. Grid extension was selected as the most attractive alternative in communes where it constitutes the least cost solution and generates adequate economic returns for the communes selected for electrification under the project. But the sub-transmission systems supplying power to the rural areas that are overloaded need to be upgraded to reduce losses and improve quality of power supply. The upgrading of 110 kV sub-transmission systems in Power Companies 1,2,3 and Dong Nai were verified by detailed feasibility studies and were also designed to have minimum environmental and social impacts.

Providing electricity for poorest, remote areas commune. Rehabilitation of 5 existing mini hydro stations in remote areas, belonging to PC 1, PC1 and PC3, were developed based on detailed feasibility studies of each site. For remote communes, renewable energy investments were considered and included where they are demonstrated to be economically viable and least cost compared to conventional means of power supply. For remote areas physically or economically out of reach of the national grid, alternate institutional mechanisms were evaluated including private sector provision. However, given the nascent state of private sector activity in these areas of northern Vietnam, it is likely that the utilities will be most effectively developed and managed by the communes and districts under the overall supervision of the Provincial

authorities. An institutional mechanism, developed on a pilot basis in Moc Chau district under the Rural Energy Project, was selected as the most likely model. This model envisages creation of independent remote hybrid grids operated by local communities. At the central level, MoI would serve as the focal agency for coordinating assistance to be provided, from a the country-wide renewable energy program developed under the Remote Area Renewable Electricity (RARE) facility¹⁰. The RARE facility would provide, through provincial authorities and contractors, capital subsidies to remote communities, to build and operate independent, renewable energy based grids. The selection of the communes will be done on the basis of an acceptable economic rate of return on projects. Communes where there is inadequate no willingness to contribute or pay for local contributions or accept operational management responsibility after construction, or where sub-projects do not yield acceptable returns, will not be included. A larger program was considered to be premature due to lack of institutional capacity in the technical, institutional and financial methods of electrification appropriate to the remote mountain areas and islands of Vietnam and indigent ethnic minorities residing in these areas.

Institutional development of EVN. EVN's corporate business management information system, based on a coherent IT strategy would link EVN and all its affiliated offices and agencies into an integrated management information system. In the first phase, focus would be on financial and accounting systems which would improve the overall efficiency of management of EVN. The investment on FMIS would bring improvement in EVN's planning and control processes, more efficient use of resources and improved decision making and corporate cohesiveness. EVN's IT Strategic Plan for implementing computer systems calls for the purchase of integrated packaged software based solutions. Custom development of computer systems was the alternative approach considered but rejected because of major disadvantages over packaged software solutions. Packaged software-based solutions has been the favored approach adopted by large international organizations, including electricity utilities, because it allows for incorporation of industry standards and business best practices, and hence, a means of introducing these relatively quickly into the company.

Promoting equitization of distribution in districts and communes will provide "on the ground" experience in the development of a program for the creation of creditworthy distribution sector in the country and in the more effective separation of generation, transmission and distribution elements of the power sector. This will also promote the entry of the private sector. A larger program for equitization and privatization was considered to be premature in the absence of an explicit legal framework at this time. The pilot programs under the Project are expected to provide the necessary experience for an enlarged program as soon as the Electricity Law is passed by the government.

¹⁰ / Based on the studies: Renewable Energy Action Plan for Vietnam, funded by ESMAP/ASTAE/PHRD grant, Feasibility study of a Program to Develop Community Scale Hydro-based Mini Grids by international consulting team, Development of a Community Electricity Supply from a Micro Hydro Diesel Hybrid Installation and Battery Charging Service in Na Bo Village, Son La Province Study by Meritec-former Worley International.

2. Major related projects financed by the Bank and/or other development agencies (completed, ongoing and planned). *Note: The U DO rating for Vietnam projects is based on lack of implementation of the agreed on tariff increases. These will be upgraded since a condition of Board presentation will be the implementation of tariff increases.*

Sector Issue	Project	Latest Supervision (PSR) Ratings (Bank-financed projects only)	
		Implementation Progress (IP)	Development Objective (DO)
<p>Bank-financed</p> <p>Improve technical, operational, management and sector efficiency</p> <ul style="list-style-type: none"> · Rationalize power sector institutions; · Commercialize operation of sector entities; · Initiate appropriate legal and regulatory frameworks; · Initiate private sector participation in generation; · Investigate demand-side management and energy conservation options; and · Prepare a rural electrification program. · Unbundle EVN's "transmission" and "generation" functions; · Implement regulatory reforms; · Introduce tariff reforms; · Explore financing of distribution from diversified sources; and · Institutional strengthening and commercialization. · Pilot demand-side management projects and capacity building to plan, design and implementation of DSM projects · Improve rural access · Strategy for rural electrification · Promote renewable energy development for remote areas · Local management and operation of rural grids · Creation of joint stock companies for distribution 	Power Sector Rehabilitation and Expansion Project (Cr. 2724-VN - July, 1995)	S	U
	Power Development Project (CR 2820-VN of February 1996)	S	U
	Transmission, Distribution and Disaster Reconstruction (CR 3034-VN of January 1998)	S	U
	Rural Energy credit (CR 3358-VN of November, 2000)	S	U

· Institutional reform for the creation of a creditworthy distribution sector			
Access, environment	IBRD/GEF India: Renewable Resources Development Project	S	S
Access, environment	IDA/GEF Sri Lanka: Energy Services Delivery Project	S	S
Coal domination, access	IDA/GEF Lao PDR Southern Province Rural Electrification	S	U
Access	IBRD/GEF Argentina: Renewable Energy in Rural Market Project	S	S
Other development agencies			
Other Development Agencies Asian Development Bank (ADB)	· Power Distribution and Rehabilitation (LN 1368-VIE of June 1995) · Central and Southern Vietnam Power and Distribution (LN 28187-VIE of November 1997)		
Japan Bank for International Cooperation (JBIC)	· Construction of Phu My 1 Power Plant (January 1994) · Construction of Pha Lai 2 Power Plant (January 1994) · Construction of Ham Thuan Da Mi Power Plant (January 1994) · Construction of Da Nhim Power Plant (March 1997) · Construction of O Mon Power Plant (March 1998)		
Swedish International Development Agency (SIDA)	· Construction of Song Hinh Power Plant (1995) · Construction of 6 transmission substations for 100 kV (1998) · Extension of transmission substations for 500 kV (1998) · Upgrading distribution network in Central Area (to be signed)		
United Nations Development Program	Nepal Power Development Project, Micro-Hydro Village Electrification Component		

IP/DO Ratings: HS (Highly Satisfactory), S (Satisfactory), U (Unsatisfactory), HU (Highly Unsatisfactory)

3. Lessons learned and reflected in the project design:

IDA's first two operations in the power sector have been completed and two operations are under implementation. Key lessons learned (see ICR for PDP and PSREP) include the following: flexibility in all aspects of project design and implementation by the Bank, Government, and implementing agencies was critical for the successful implementation of these two projects, in light of various delays caused by approval procedures, foreign exchange shortfalls, financial difficulties of suppliers and contractors, lack of sufficient on-time information and guidelines. Good load forecasting is essential to predict the loading levels of transmission and distribution lines and substations, so that their rating is selected appropriately in line with realistic load growth rates. The appointment of an Independent Monitoring Agency to oversee RAP implementation was important in minimizing problems with PAP, and to identify problem areas in particular on land acquisition and compensation issues, thus avoiding protracted disputes. A Procurement Monitoring Group at the corporate level is helpful in streamlining bidding and contract procedures. For quick and smooth start of the project, it is imperative that all the feasibility studies of the project component(s) should be approved by the relevant government agencies before negotiation of the credit. There are no short cuts to the successful completion of a complex project: this includes above-average inputs of IDA resources and a broad skill mix during project design, appraisal, and supervision

For energy efficiency programs, Bank/GEF experience has shown the need for proper incentives for utilities to undertake DSM. Previous operations have also shown the need for strong marketing efforts by DSM units and link them to parallel commercial financing program (*Thailand Promotion of Electricity Energy Efficiency* and *Jamaica DSM Project ICRs*), the need to develop sustainable DSM institutional arrangements given ongoing restructuring plans (*DSM in Thailand: A Case Study, ESMAP Technical Paper No. 8* and *Operating Utility DSM Programs in a Restructuring Electricity Sector, ESMAP Workshop Proceedings*), the need to include distribution utilities in DSM implementation efforts, and design of DSM programs in the local context - all which have been addressed during project preparation. Operational experience has also shown the need for market mechanisms to develop sustainable programs and, in particular, support for energy efficiency project developers/service providers to assist end-users to identify, design, package, mobilize financing, procure, install and commission energy efficiency projects in order to develop sustainable, commercially-oriented programs (*Promoting Energy Efficiency and Renewable Energy: GEF Climate Change Projects and Impacts*).

A Bank review of rural electrification (*Rural Electrification: A Hard Look at Costs and Benefits; OED Precipis, May 1995*) recommends strengthening the economic and financial appraisal of projects, including consideration of alternative energy sources. IDA experience with off grid projects has confirmed the usefulness of demonstration projects in removing information barriers and the importance of community participation and cost recovery. (*Best Practice for Photovoltaic Household Electrification Programs, World Bank Technical Paper No 324, 1996; India Renewable Resources Development, Sri Lanka Energy Services Delivery, Indonesia Solar Home Systems, Indonesia Renewable Energy Small Power*). *Rural energy and development (World Bank Development in Practice, September, 1996)*) recommends five main principles to provide better access: provide for consumer choice, ensure cost reflective pricing, overcome the high first cost barrier, encourage local participation and implement good sector policies. Best practices in rural electrification of an effective implementing agency, with a high degree of operating autonomy and good leadership; clearly defined criteria for selection of priority areas; tariffs set at realistic levels and at a minimum to achieve cost recovery; reduction of costs; lowering entry barriers; have been followed in the project design.

For *renewable energy*, lessons learned from the experience of the World Bank, GEF and other international

and national agencies that support renewable energy technologies in countries of this region – Indonesia, India, Sri Lanka, Cambodia, Laos etc. – have been taken into consideration. Lessons were also taken from bilateral community-based hydro projects in Vietnam. These lessons include the need to: (a) ensure a policy and legal enabling framework; (b) build capacity and support strong institutional set up before developing larger scale investments; (c) understand the market characteristics including willingness and capability of consumers to pay, before implementing projects; (d) provide strong support to first mobilize the community, build capacity, promote productive uses, and then provide strong local support to the community for management of the commune-based utility and operation and maintenance; and (e) support the development of commercial renewable energy businesses, which are the engine for implementing the projects.

4. Indications of borrower and recipient commitment and ownership:

The Government is strongly committed to improving the efficiency of operations of EVN and the power companies and in increasing rural electrification. The Master Plan of Power Sector Development for period 2001-2010, approved by Government in June 2001, has indicated that improvement of efficiency of EVN, reduction of system losses from 18% to 10% to the year 2010 and implementation of energy conservation and saving programs are the primary objectives of EVN in the coming years. All Project components, including DSM activities, have been identified by the Master Plan as priority investment projects in 2001-2005. The Master Plan also indicated the Government ambitious target for rural electrification to achieve 90% of rural households having access to electricity to the year 2010 and about 400 remote isolated communes to be supplied electricity by off-grid systems. The government's strong commitment on rural electrification is also evident from its substantial borrowings from international donors such as OECF, ADF, IDA and ADB. Under the ESMAP/ASTAE/PHRD grant, EVN, MOI together with WB have prepared and published the Renewable Energy Action Plan for Vietnam (REAP) in September 2001. The report will be used as a framework for coordination of activities and mobilization of resource from all entities including international donors. The community based utility subcomponent proposed in the Project is a part of the overall program identified in the REAP. The government has authorized MoI to coordinate all renewable energy programs in the country and to be responsible for the community based utility program.

EVN has demonstrated its commitment and ownership of power projects in Vietnam through a successful collaboration with IDA over the past six years. It has assumed prime responsibility for preparing the proposed Project by (a) setting up a high level steering committee reporting to the Director General of EVN for overseeing the SEIER project; (b) preparing EIA, RAP and draft PIP using technical assistance when required; (c) preparing the feasibility studies for the various components of the Project and (d) delegation to specific units under it for the implementation of the Project; and (e) confirmation of deployment of adequate staff resources and counterpart funds for successful implementation of the Project.

MoI has closely collaborated with IDA on the power sector reform policy dialogue, reaffirmed its commitment to sector reform through its updated Power Sector Policy Statement, the Action Plan for Institutional Reform and the Policy Paper on Rural Electrification. It has also assumed prime responsibility for the technical assistance on Regulatory Framework and Electricity Law under PSREP, implementing the DSM pilot project funded by SIDA in the TDDRP with the assistance from EVN, MoSTE and MoC. For the proposed Project, MOI has (a) obtained GOV approval for execution of the Project; (b) confirmed its commitment to provide adequate staff and resources for Project design and execution.; and (c) set up a project management board for overseeing the project components under its charge.

EVN and MOI have the support from MPI, MOF and the approval of Government for all project

components and the Project as a whole .

Overall the Borrowers and the implementing agencies ownership of and commitment to the Project are assessed to be strong.

5. Value added of Bank and Global support in this project:

The proposed Project will help to improve overall system efficiency, reducing transmission and distribution losses, and reducing investment needs in generation. It will improve electrification services to the rural areas and provide the framework for providing energy to even the most remote communes in the future. It will strengthen the institutional capabilities of the Power companies to undertake complex rural electrification projects in a cost effective manner. It will help MoI to mobilize the private sector in providing electricity supplies from renewable energy sources through development of appropriate policies. It will help EVN and the government to develop an equitization program for creating creditworthy distribution utilities and in sustaining its reform program for the power sector. Additionally, the proposed Project, through improvements envisioned in the information management systems, would promote the development of a more business-focused corporate culture in EVN and improved corporate cohesiveness throughout EVN and the PCs.

With respect to renewable energy, the Bank involvement will continue the participatory process that was used to build support for the Renewable Energy Action Plan and the adoption of a Rural Electrification Policy Paper, which explicitly states that it will include both grid and off-grid electrification. IDA brought experience from other countries to convince the GOV of the economic benefits from renewable development; and will assist MoI in attracting and coordinating efforts by other donors in renewable energy.

The proposed Project will build upon IDA involvement in the energy sector and will (i) contribute to poverty alleviation and the economic development of the rural areas, (ii) help to extend electrification to the rural areas and provide the framework for providing energy to even the most remote communes in the future following sound economic principles and sustainable institutional mechanisms, (iii) strengthen the institutional capabilities of the Power Companies to undertake complex rural electrification projects in a cost effective manner, (iv) lay the foundation for the development of a creditworthy distribution sector with increased local participation and management; and (v) help mobilize the private sector and other donors in providing electricity supplies from renewable energy sources through the development of appropriate policies and creation of effective institutional mechanisms. Many of the donors involved in this sector also continue to rely on the leadership and sustained presence of IDA. IDA's sustained involvement in the Vietnamese power sector, through the Project, is necessary to help consolidate and maintain the momentum of reform efforts and institutional restructuring initiated in the earlier projects and in addressing government concerns about alleviation of poverty in the rural areas of the country.

E. Summary Project Analysis (Detailed assessments are in the project file, see Annex 8)

1. Economic (see Annex 4):

- Cost benefit NPV=US\$435 million; ERR = 28 % (see Annex 4)
- Cost effectiveness
- Incremental Cost
- Other (specify)

Project Component	NPV (US\$ million)	EIRR
	@10% discount rate	
1. 1. Transmission system of EVN	220	26%
1.1a 500 kV Pleiku-Da Nang		
1.1b 220 kV transmission system		
1.2 DSM phase 2	59.9	467%
2.1a 110 kV system PC1	80.1	26%
2.1b 110 kV system PC2	78.8	37.6%
2.1c 110 kV system PC3	32.8	31%
2.1d 110 kV system PC Dong Nai	9	34%
2.2a Rehabilitation of mini hydro power plants in PC1	4.2	32%
2.2b Rehabilitation of mini hydro power plants in PC2 and Wind-diesel power plant for Phu Quoc Island	1.67	19%
2.2c Rehabilitation of mini hydro power plants in PC3	6.2	68%

2. Financial (see Annex 4 and Annex 5):

NPV=US\$ million; FRR = % (see Annex 4)

Project Component	NPV (US\$ million)	FIRR
	@6.5% discount rate	
1. EVN	242	19%
1.1a. 500 kV Pleiku-Da Nang		
1.1b 220 kV transmission system		
1.2 DSM phase 2	79	563%
2.1a PC1	2	6.8%
2.1b PC2	22	12%
2.1c PC3	8.5	11%
2.1d PC Dong Nai	2.1	10.7%

The financial analysis of each project component is conducted, with costs based on: (i) investment cost including duties and taxes during construction; (ii) operation and maintenance costs at 2% of the investment cost ;(iii) cost of incremental energy purchased at bulk purchase price for each power companies and (iv) cost of compensation and for mitigating environmental impacts. The benefits are based on revenue from energy sales (after deducting the losses) at the average sale price for each PC.

Equitization of districts and communes. Based on experience of the pilot project in Lich Hoi Thuong, EVN will develop criteria to appraise proposals for equitization from PCs as well as financial incentives/conditions necessary to ensure the financial viability of the newly formed equitized companies.

Renewables Components. Attention to the tariff and leasing fee required to ensure long term sustainability is an essential part of the project design. Community tariffs must be high enough to pay regular operations and maintenance costs, as well as to pay a fee to finance continuing technical and management support to

the community and major repairs. A Remote Area Renewable Electricity Facility under MoI, will support the development of commune-based mini grids. Financial systems and procedures for the operation of these funds have been prepared and will be agreed with IDA. Financial performance will be closely tied to technical and management support to the commune utility.

Fiscal Impact:

It is expected that the project will contribute about US\$11.4 million to the government budget in the form of taxes.

3. Technical:

All physical components of the Project are based on detailed feasibility studies undertaken by the power engineering consulting companies having experiences in previous similar projects. All the feasibility studies have been approved by Government and Government authorized entities. International consultants were employed under a PHRD grant to assist EVN in the selection of appropriate components, specifications and maintenance management programs. The analysis included measures to decrease losses, improve power quality and ensure continuity of supply through reinforcement and upgrading of transmission lines and expansion of substations, reactive compensation equipment, tap substations, protection equipment and switchgear. The cost estimates for all components have been based on up-to-date figures available to EVN and cross checked with data from similar projects currently undertaken in Vietnam.

For improvement of Management Information System, a detailed study was carried out by an international consultant funded by PHRD. A bilateral funded international consultant is also assisting EVN in preparing the bid documents for the hardware, software and for implementation assistance. International consultants will be employed to assist EVN in implementing this project as well as to assist EVN in executing the DSM project phase 2 and during the execution of the equitization sub-component.

The DSM and renewable energy programs have been developed by EVN and MOI with the assistance of international consultants provided through GEF grants. Consultants will also be retained by MOI for assistance in the execution of the RARE facility and for evaluation of commune grid proposals.

The technical design of the Project is considered to be sound.

4. Institutional:

4.1 Executing agencies:

EVN, created in 1995 by government decree as a state corporation under the State Enterprise Law, is an independent legal entity acting as a holding company overseeing various business units. EVN's organization consists of: (a) a Management Board which is responsible for setting up policy and providing advice to EVN's top executives; (b) a Board of Directors implementing the Management Board's decisions and carrying out day-to-day management; and (c) business units consisting of 16 independent and 22 dependent accounting member units. EVN is under the direct supervision of the MOI, the former Ministry of Energy, but the Management Board is authorized under its Charter and by the State to carry out ownership and control functions on its behalf. The accountabilities arising from EVN's mandate are set out in its Charter and the Regulation of Powers. While EVN has some degree of commercial autonomy, the authority for tariff setting, total borrowing, foreign currency transactions, investment program approval for large projects, and company purchasing continues to rest with the Government.

PC1, PC2 & PC3 were established in July 1995, PC Dong Nai was established in 1999 and they are four of seven independent accounting distribution units of EVN (i.e. PC1,2,3, PC HCM, PC Hanoi, PC Dong Nai PC Hai Phong; the latter was established in 1999). PC1 operates in the northern region, except Hanoi and Hai Phong Cities. PC2 covers the southern region, except HCM City and Dong Nai Province. PC Dong Nai operates in Dong Nai Province. PC3 is in charge of the central region of Vietnam. The PCs are subsidiaries of EVN but they are independent in so far as their operations, including planning, construction and operation of distribution facilities are concerned. The PCs are financially independent accounting business units and are responsible for their financial viability.

MoI is in charge of state management for the industrial sector, including coal and power industries. It has 5 functional departments (for planning and investment, financial and accounting, technology and product quality, organization and personnel, international cooperation), a Ministerial Inspection Board, the Office of the Ministry and two specialized government Management Directorates (for geology and mineral resources and for industrial safety). The Ministry guides and directs 61 provincial Departments of Industry on professional and technical issues. Beside state management functions, MoI has several specific duties in the power sector, including management of BoT contracts on government behalf, coordinating DSM activities, coordinating local governments on developing off-grid power systems to supply electricity to remote isolated areas etc.

4.2 Project management:

EVN has submitted a Project Implementation Plan as required by IDA. EVN will be supervising overall implementation of the Project (except MOI's portions). The International Cooperation Department, reporting directly to the Vice President for Investment and Development, will primarily coordinate and supervise the project execution with assistance from other EVN functional departments such as Planning, Financial and Accounting, Procurement and Appraisal Departments.

The Northern Project Management Board will manage transmission projects in the North, the Central Project Management Board will manage transmission projects in the Center and the Southern Project Management Board will manage transmission projects in the South. These PMBs, established by EVN in 1995 have adequate experience in implementing similar projects. Each Board is headed by a Chairman, assisted by 2 deputies and has 8 functional sections (Planning, Technical, Financial, Environment,

Resettlement, Logistics, Material Storage, Consultant Service and International Cooperation and Procurement). Separate dedicated Project Managers (assisted by specific staff from the functional sections) will be appointed for each project component.

A DSM Center, established from the existing DSM cell within EVN, will develop, coordinate, supervise and evaluate the Phase 2 DSM program. The Center will have seven divisions for load research, DSM program design and planning, program implementation and operation, DSM promotion, marketing and outreach, economic and financial analyses, monitoring and evaluation, and management information systems. Each of the PCs will also establish a DSM cell to implement the DSM programs in their service territories and gather data for EVN's DSM Center.

The Science, Technology, Computer and Environment Center (TECC), a unit of EVN and the central IT team coordinating the network effort, with responsibility for overall network design, implementation and ongoing management, would be responsible for overseeing all information systems and technology throughout EVN. Three Data Centers (in Hanoi, HCMC and Danang) would manage their local information systems, and report directly to TECC. They would also be responsible for: (a) operations of computer equipment; (b) system and database administration; (c) technical and end-user support; and (d) development of small scale local systems.

For Creation of District or Commune JS Distribution Companies Component, EVN will set up a special Working Committee, headed by a Deputy Director of Personnel Department and consisting of staff from functional department of EVN to appraise, assist and supervise equization projects implemented by PCs.

Power Companies 1,2,3 and PC Dong Nai will be the executing agencies for 110 kV Sub-transmission and for rehabilitation of mini hydro power stations. PC1, PC2 and PC3 will use their existing Project Management Units to manage the projects in their respective territories. These PMUs, established in 1999, are in charge of implementing all transmission and distribution projects from 110 kV and below in their respective territories. PMU PC1 is headed by a chairman, assisted by 2 deputies and has 85 staff distributed in 5 functional sections (Planning and Material; Financial and Accounting; Logistics; Project Supervision and Technical; and Project Preparation). The staff of PMU has experience in managing the distribution projects with difference sources of funding including projects funded by IDA (Rehabilitation of Vinh and Halong cities distribution network under TDDRP and Rural Energy Project-Northern component). The Unit is assisted by a local consulting company specialized in power transmission and distribution, the Power Engineering Consulting Company No 1 (PECC1), located in Hanoi. PMU PC2 has similar structure with 25 staff and is assisted by the consulting company PECC3, located in HCM city. PMU PC3 also have similar structure with 20 staff assisted by the consulting company PECC4, located in Nha Trang. Both PMU PC2 and PMU PC3 have experience with similar projects and involved in IDA projects in their territories. PC Dong Nai has established a new PMU to manage 2 projects in the province. The new PMU will also be assisted by the consulting company PECC2, located in Ho Chi Minh city.

PC1, PC2, PC3 will also be the implementing agencies of pilot equization projects in their service areas. Each PC will set up a Working Committee, headed by PC Deputy Director to prepare equization proposals, get them approved and implement the projects.

MoI will set up a new Steering Committee for the overall supervision of the renewable energy sub-components, consisting of representatives from related agencies such as MPI, MoF, MoSTE, EVN, provincial authorities, et al. The Steering Committee will also be responsible for setting regulations for renewable energy funds and supervising its operations. MoI has established a separate Project Management Board for implementation of the Renewable Energy componentsProjects which will have 4-6 professional

staff assisted by full-time consultant staff and be responsible for implementing the Community Based Hybrid Renewable Energy Grids and the technical assistance for Strengthening Regulations, Planning and Implementation of Renewable Energy Projects. The PMB is headed by a Chairman, reporting directly to the Vice Minister for Energy Sector, who will chair the Steering Committee. Implementation arrangements for the renewables components are described briefly in Annex 2 and in more detail in Annex 12.

The aforementioned project management arrangements are acceptable to IDA.

4.3 Procurement issues:

An Assessment of the Agency's Capacity to Implement Project Procurement, based on the assessment carried out for the Rural Energy Project (Cr. 3358-VN) and updated during the Country Procurement Assessment (CPAR), was carried out in October 2001(Details are in Annex 6). The major issues encountered, with mitigating measures are as follows:

- (i) NCB procedures, as contained in Prime Minister's Decree 88CP of September 1, 1999, contain provisions inconsistent with Bank procurement Guidelines. A Supplemental letter for NCB wherein Vietnam agrees to comply with the Bank Guidelines will be included as an integral part of the Credit Agreement.
- (ii) Unrealistic procurement planning. A first year procurement plan for each PMU in addition to detailed procurement plans and implementation schedules are included as part of the appraisal document. The procurement plan and implementation schedules will be regularly updated during implementation.
- (iii) Inadequate capacity of PMUs to prepare bidding documents meeting Bank's requirements. The use of standard bidding documents will be mandatory. Extensive training will be given by EVN as well as RMV.
- (iv) Lack of qualified procurement staff at PC Dong Nai. Special training will be given to selected staff from PCND by EVN and Bank's procurement staff. PC Dong Nai will also avail itself of an experience procurement specialist for a period of at least 6 months to provide hand-on training, as well as consider for its procurement staff to be seconded to PC2 to obtain on-the-job training.
- (v) Prior review thresholds have been selected to include about 94 % of all contracts to ensure substantial compliance with the agreed procurement procedures and satisfactory completion of the overall project. Post reviews will be carried out in one out of five contracts. The first contracts for works or goods for all PMUs will be subject to prior review regardless of value. All GEF-grant funded activities will be subject to prior review.
- (vi) The Bank Procurement Guidelines for the procurement of Goods and Works as well as for the selection of Consultants will be mandatory¹. The applicable Bank's Standard Bidding Documents will be used for the procurement of goods and works. The Borrower may also use the Bank's Trial Edition of Procurements of Goods & User's Guide of December 2001.

The aforementioned procurement arrangements are acceptable to IDA.

¹ / "Guidelines – Procurement under IBRD Loans and IDA Credits", January 1995, revised in January and August 1996, September 1997, and January 1999.

"Guidelines – Selection and Employment of Consultants by World Bank Borrowers", January 1997, revised September 1997 and January 1999.

4.4 Financial management issues:

Financial Performance of EVN and the PC's. EVN's financial performance, since its creation in 1995 and until 2000, has been satisfactory largely because of high growth and rapid expansion of the Vietnamese economy, an increasing consumer base, and higher consumption per customer. A summary of the consolidated financial performance and key financial indicators are presented in Annex 5. Projections of EVN's financial performance during FY 2001-2004 and the assumptions underlying these projections are also presented in Annex 5. The financial projections show that with the tariff adjustments agreed by the Government committee in May, 2001, its projected financial results would be satisfactory and enable it to meet its self financing and debt service coverage ratios.

The past financial results and projections of future performance of PC1,2,3 and Dong Nai are also presented in Annex 5. The financial statistics show that the PC's had reasonably acceptable results of operations. Provide that appropriate actions, including but not limited to adjustment of retail tariffs are taken in a timely manner, the financial projections indicate that they would be able to meet the self financing ratios of 30 % and debt service coverage of 1.5. But it needs to be noted that the PC's financial results are inextricably linked to EVN's by way of the bulk supply tariff and that it is essential that the fixing of the bulk supply tariffs be based on cost reflective and transparent basis in the future. The future financial performance of EVN and the PC's will therefore be critically dependant on government policies on tariffs and other financial policies.

Financial Management and Accountability. EVN has undergone a major transformation in the past few years and fundamental changes in its organizational structure, operations and future strategy. EVN recognizes that to become a modern and efficient electric power utility company, it has to invest in information technology hardware and software by: (a) automating its operation and business systems; (b) acquiring hardware and software capabilities to electronically link its offices and functions throughout its entire organization nationwide; (c) standardizing its management reporting systems; (d) implementing an IT strategic plan; and (e) training its staff. Effective implementation of the strategy will be critical to attain these objectives.

5. Environmental: Environmental Category: B (Partial Assessment)

5.1 Summarize the steps undertaken for environmental assessment and EMP preparation (including consultation and disclosure) and the significant issues and their treatment emerging from this analysis.

a. Transmission and distribution lines and substations. EVN has submitted to the Task Team the EIA for the 500 kV transmission line and substation, EIA for 220 kV transmission lines (no EIA is required for the rehabilitation of six substations since only equipment is being upgraded) and EIA for a new 220 KV substation. PC1, 2, 3 and PC Dong Nai have submitted the EIAs for all components. Separate EIAs have been submitted for rehabilitation of each hydro plant.

According to the EIA's there are minor impacts due to access road construction, mine clearance and very low level of electro- magnetic field (EMF) of less than 5 kV/m outside the ROW. Several mitigation actions have been proposed which include: (i) For the development of access roads and ROW, contractors will employ appropriate techniques to protect the environment during construction, using prototype designs and well-tested guidelines provided by the GOV (Circular 490/1998/TT-BKHCMNT, Decree 54/199.ND-CP and National standard TCVN 11-1984) and the World Bank (Safeguard policies and Environmental Assessment Sourcebook V.3); (ii) To protect forest, reserved land and bio-diversity, transmission routes will be selected carefully with most routes following existing roads connecting the load centers; (iii) EMF is not considered a serious problem with low and medium voltage lines, however nationally accepted

standards (TCVN 11-1984) will be applied for the development of buffer zones; (iv) Mine clearance has been carried out for many years in Vietnam and is necessary before crews begin construction; (v) Soil erosion and disruption of waterways due to the construction of access roads and poles will be minimized by embankment, grass planting, and constructing proper drainage as needed; (vi) The use of PCB based cooling oils for transformers is prohibited and this will be specified in the bidding documents for suppliers of new transformers. EAs have provided confirmation that old transformers, which are still in use in the rehabilitation projects, do not contain PCBs and therefore will not be subject to specific PCBs management plan for oil leakage.

The EIAs also provide (a) analysis of line's impact on habitats; (b) analysis of substation rehabilitation on the downstream ecology; and (c) impacts if any on cultural property. Since the impacts on natural habitats will not be severe, no replanting trees has been proposed in the EIAs but access to natural forests and induced impacts will be monitored. Although three historic and cultural sites have been identified within the ROWs, this has been agreed with the local authorities due to the insignificance of the impacts.

As required by the Government regulation (Circular 490/TT-BKHCMNT), environmental certificates would be obtained for each of the sub-projects and presented at negotiation. The certificates will verify that no PCBs are being used in the existing old transformers and no critical natural habitats nor protected areas will be affected by the transmission lines. In case if there is an issue for PCBs or protected areas, permission from the concerned DOSTEs and DARDs will have to be sought and appropriate specific mitigation plans will be required.

It is noted that no protected areas have been identified in the provided EIAs and the percentage of affected forestland is low in general since the routes have been carefully selected to follow the existing roads as much as possible. Nevertheless, the environmental certificates as mentioned above will verify and confirm that there are no impacts on protected areas or critical natural habitats. The most affected forestland has been found in the 500 kV component, in which the transmission line passes the area of the Kon Plong Forest Complex (KPFC) in Kon Tum province. The KPFC, covering 65,077 ha including protection forest with valuable habitat for biodiversity conservation, is being proposed for a sustainable forestry and conservation. The Borrower has been thus required to discuss with Kon Tum DOSTE and DARD on the impacts that the transmission line may have on the forest in the communes Mang Canh, Hieu and PoE. Permission from Kon Tum DOSTE and DARD will be obtained and mitigation and monitoring plans required, if any, will be provided prior to negotiation.

b. *Commune based hydro and island grids*: Since the sites for these grids are yet to be selected no EIA is necessary at this time. These will be reviewed by the RARE facility and EVN at time of appraisal in accordance with Bank guidelines. The environment procedures have been prepared by MoI with assistance from international and local consultants as part of the RARE operational manual. These procedures will be used to clear environmental aspects of the hydro and island grids.

5.2 What are the main features of the EMP and are they adequate?

The implementation of the EMP contained in the EIA is planned to reduce the negative impacts of the project. The EMP is designed for each PC and each hydro plant. It includes: (a) a mitigation plan which identifies the major issues, how they will be mitigated, at what cost, and who is responsible, (b) a monitoring plan with details of how, at what cost and who is responsible, and (c) a program of institutional strengthening, as necessary to implement the mitigation and monitoring plans.

The mitigation plan includes specific mitigation measures, identifies institutional responsibility and

provides for the mitigation costs to be included in the installation and construction cost for the project.

The monitoring plan has identified monitoring parameters such as dust, noise, deforestation and soil erosion at the construction phase. Noise, oil leakage/spillage, EMF, and ROW clearance are the main monitoring parameters at the operation phase for the transmission line and substation components. Impacts of the hydroplant rehabilitation will be monitored by the level of noise and dust during the construction, while oil leakage and hydrological regime in the downstream areas are the major parameters for the operation phase.

Environmental impacts during construction such as dust, noise, and vibration will be inspected against the national environmental standards by the PMBs under the supervision of DOSTEs. ROW clearance, soil erosion, and oil leakage will be checked periodically (3-6 months) and visually by the PMBs, in collaboration with DOSTEs and DARDs. EMF within the ROWs, as well as water quality in the downstream areas for the hydroplant components, will be measured annually or during big loads by the PMBs against the national standards.

Training need for environmental knowledge and skills have been identified for each PCs and the staff of the Project Management Board at the transmission companies and EVN. Environmental training will also be provided to the local authorities and contractors. The total number of trainees is estimated as approximately 150 persons (Table 5.3) and it is required that at least 4 training courses for each component be undertaken over the project life.

The cost for the monitoring plan and training has been estimated for each PCs and hydro plant. It has been agreed between the Bank and the Borrower that the funding sources for implementing EMPs will come from EVN budget. The cost for the implementation of EMPs is summarized in the Table 5.3 (see Annex 16 for more details), based on the cost calculation provided in the EIAs. This cost table will be updated by the Borrower prior to the negotiation.

Currently EVN has a department of science, technology and environment but the PCs do not have specialized units with environmental responsibility. The provided EIAs have proposed to designate staff in EVN, each PC and PMB with responsibility for environmental issues and to train those staff. Responsibility for the monitoring plan will be given to those designated staff at EVN, PCs and PMB of the transmission companies, with technical supervision provided by the local DOSTEs. The Borrower will provide, prior to the negotiations, an update on the institutional responsibility for the monitoring plan.

5.3 For Category A and B projects, timeline and status of EA:
Date of receipt of final draft: January 2002

Entity	Consultants	Subcomponent	Submission of final draft EA	Training Needs (pax)	Cost of EMP	Public consultation	
						Meetings	Participants
EVN	PECC1	500 kV Transmission line	01/04/2002	20	286,367	28	185
	PECC1	220 kV Transmission 2 new Substations and 6 Substations rehab	01/17/2002	19	102,740	28	152
	PECC1	South Saigon 220kV Substation	12/30/2001	6	15,953	25	190
PC1	PMU	110 kV transmission and 22 Substations	12/30/2001	11	49,023	1	6
	PECC1	Chieng Ngam Hydro (Son La)	12/15/2001	2	13,567	1	11
		Thac Bay Hydro (Lai Chau)	12/15/2001	2	13,567	1	9
PC2	PECC3	110 kV transmission and 15 Substations	12/26/2001	28	41,067	13	92
	PECC1	Ankroet Hydro (Lam Dong)	12/15/2001	2	13,567	1	11
PC DN	PECC3	110 kV transmission and 2 Substations	12/27/2001	7	6,673	2	14
PC3	PECC4	110 kV transmission and 10 Substations	12/30/2001	43	22,733	8	58
	PECC1	An Diem Hydro (Quang Nam)	12/15/2001	2	10,972	1	7
		Kon dao Hydro (Kon Tum)	12/15/2001	2	10,972	1	8
20 Commune -based hydro and island grids		Small-scale hydro and Island grids	No EA required this stage Draft environmental procedure submitted 01/08/2002		0		
Total				143	587,110	110	743

5.4 How have stakeholders been consulted at the stage of (a) environmental screening and (b) draft EA report on the environmental impacts and proposed environment management plan? Describe mechanisms of consultation that were used and which groups were consulted?

Initially the Borrower conducted discussion and agreement with the respective local government agencies with regard to the route alternatives and the location of the substations. Records of those discussions are attached to the EIAs. Further consultations with PAPs, NGOs (such as Women Union, Youth Union, Farmer Union, Fatherland front, Association of the elderly people) and representatives of the local communities have also been carried as indicated in the EIAs. In total, 743 participants were involved in 110 meetings held before January 15, 2002 (Table 5.3.) and records of the meetings have been submitted to the World Bank as supplementary EIAs. No further concerns about environmental impacts and mitigation measures have been raised during the consultation.

Consultation with environmental management agencies is based on the GOV environmental regulation that requires all projects with limited environmental impacts to obtain environmental certificate. According to the Circular 490/1998/TT-BKHCNMT, an environmental certificate will be obtained from relevant

provincial DOSTEs for each SS/TL within the province, whilst the certificate for the 500 kV component will be obtained from MOSTE.

Public disclosure plan: The Borrower has agreed to display draft EIAs. EVN and the PC's have confirmed that EIA's are being displayed at all PMU's, PC and EVN headquarters from January 10,2002. Copies have also sent to the relevant provincial People Committees so that these EIAs/EMPs are displayed in a public place at the provincial public libraries or the provincial Departments of Science, Technology and Environment from January 10,2002.

A full set of EIAs has been sent to the InfoShop for displaying by January 29, 2002. Another set of EIAs has been displayed in the Hanoi VDIC since January 15, 2002.

5.5 What mechanisms have been established to monitor and evaluate the impact of the project on the environment? Do the indicators reflect the objectives and results of the EMP?

The impacts of the projects and the implementation of the mitigation measures will be monitored by the supervision contractors and the power transmission companies. Environmental monitoring reports will be prepared by the power transmission companies as specified in the monitoring plan and be sent to the PCs, EVN, WB and the local authorities including DOSTEs and DARDs.

During construction phase, environmental impacts such as noise, dust and vibration will be inspected against the national environmental standards by the supervision contractor in collaboration with DOSTEs. For the hydroplant rehabilitation component, water quality and water flow in the downstream areas will be monitored during the construction phase and then twice a year. Tree cutting, induced impact due to access to forestlands, soil erosion and any disruption of waterways, oil leakage will be monitored visually and periodically by the transmission companies in collaboration with DOSTEs and DARDs. EMFs will be measured against national standards during big loads or once a year.

The monitoring indicators as described in the EMPs adequately reflect the objectives and results of the EMPs.

The Borrower has agreed that during the implementation of the project, environmental monitoring data will be provided to supervision missions and the local authorities. Copies of Aide Memoires in regard to environmental aspects will also be sent to the local authorities and respective provincial DOSTEs. The transmission companies and the PCs are responsible to report on the compliance with the environmental certificates to the respective local authorities (eg. DOSTEs and DARDs) and they are subject to environmental inspection when required. No independent environmental monitoring will therefore be necessary.

The EIA's and EMP's have been reviewed by IDA and it was concluded that all environmental aspects are satisfactorily addressed and in compliance with all Bank environmental regulations, policies and procedures.

6. Social:

6.1 Summarize key social issues relevant to the project objectives, and specify the project's social development outcomes.

The Project will benefit industrial zones and it will bring electricity to peoples, especially people who are living in the rural and remote mountainous/other isolated areas.

Seven separate RAPs (full RAP for more than 150 PAPs and short RAPs for less than 150 PAPs) were

prepared by Power Company 1 (PC1); Power Company 2 (PC2); Dong Nai Power (PDN); Power Company 3 (PC3); Central Power Management Board (CPPMB); Northern Power Management Board (NPPMB) and Southern Power Project Management Board (SPPMB). RAPs for 500 kV and 220 kV transmission systems; 500 kv substation, upgrading 110 kV sub-transmission networks have been prepared by EVN. All the RAPs have been prepared in consultation with the PAPs and local authorities at different administrative levels. Local authorities agreed with the route selections, resettlement policy proposed for the project. They also will provide adequate institutional arrangement for implementation and grievance redress. *All RAPs are based on the same compensation policy which fully satisfies the requirements of the World Bank OD 4.30 on Involuntary Resettlement* (a summary is provided in Annex 15). Evaluation and monitoring systems for compensation, livelihood restoration will be set up by PCs and PMUs in consultation with IDA.

A Resettlement Policy and Ethnic Minority Frameworks has been developed in accordance with OD 4.30 and OD 4.20 of the World Bank for the component of community based hybrid renewable energy grids which has not been designed at this time. If land acquisition is required for and Ethnic Minorities will be affected by this subcomponent, RAP and IPDP will be prepared by MOI based on these policy frameworks as part of the RARE Operation Manual and cleared by the Project Team.

The results of census and inventory surveys show that two subproject components would require land acquisition: (i) upgrading 500 kV and 220 kV transmission systems; and (ii) upgrading 110 kV sub-transmission networks supplying rural areas. No land acquisition for rehabilitation of existing small hydro plants will be required. Every effort has been made through design, construction measures and construction schedules to reduce unnecessary involuntary resettlement and adverse impacts on assets, especially in the areas of Ethnic Minorities where subprojects may be located. Therefore, *the project is not expected to require any major resettlement*. The Project, however, does entail land acquisition and resettlement impacts due to construction of new lines and substations. The linear nature of the project does not create conditions for potential community-wide social impacts. Though the number of PAPs is high, all the subprojects will cause low-intensity impacts and PAPs are scattered along the lines. Most impacts on land will be temporary and permanent acquisition will occur only in correspondence of towers/poles and substations. Impacts on houses will be mostly partial and generally will not require the relocation of the PAPs outside their residential/garden plots. About 29,152 PAPs will be affected in different impacted categories and of these 188 PAPs will have more than 25% of their farm land permanently acquired for towers/substations construction.

There are 3,230 PAPs of Ethnic Minorities which will be adversely impacted by land acquisition for some subproject components. But the adverse impacts are on individuals and low-intensity. Most of impacts on land of Ethnic Minorities will be temporary, land of very few families of Ethnic Minorities will be permanently acquired for constructing of towers/poles and substations. *There is no household which will have to be relocated to another locality*. These project subcomponent do not cause any culturally specific impact on the affected ethnic minority households and the nature of impacts does not result in community-wide socio-economic effects. However, in order to ensure compliance with Bank OD 4.20 on Indigenous People, the short Indigenous People Development Plans (IPDPs) have been prepared and added as independent annexes in RAP for 500 kV of CPMB and RAP of NPMB. Special provisions to carry out resettlement, rehabilitation and compensation tasks in a fashion sensitive to the cultural/linguistic peculiarities of ethnic PAPs have been developed in these IPDPs

Since compensation at market and substitution rates is assured, the socio-economic impact of the project is expected to be essentially positive.

Each RAP and IPDP will be implemented independently by PC or PMB. Resettlement and IPDP task forces will be divided among central GOV (MOI, EVN and its PCs and PMUs), local authorities and Resettlement Committees at different levels. MOI, EVN and its PCs and PMU will carry out inter-provincial coordination functions. Actual resettlement / rehabilitation tasks in each province will be the responsibility of Local People's Committees at the provincial, district and commune levels.

RAP and IPDP programs will be implemented in such away as to ensure that local authorities and PAPs representatives participate in planning and decision making processes. The PCs and PMUs under EVN will continues the dialogue with local authorities and PAPs during the period of RAP and IPDP implementation.

6.2 Participatory Approach: How are key stakeholders participating in the project?

a. Primary beneficiaries and other affected groups

The project will benefit industrial zones and it will bring electricity to people, especially people who are living in the rural and remote mountainous/other isolated areas. Several meetings were held with a number of provincial, district and commune People's Committees as well as with a number of consumers in rural and remote mountainous / other isolated areas. The meetings, along with detail field surveys, helped minimization of adverse impacts through selection of routes, feedback for the proposed Resettlement Plans and special provisions for adversely affected ethnic minorities, determine the need for electrification and the willingness to contribute to the system extension of the local people. Selection of sites for commune based mini grids will be selected based on direct participation of / consultation with local people and local authorities.

b. Other key stakeholders

IDA's main interlocutors for the project have been Ministries of Finance (MOF), the Ministry of Industry (MOI), the Ministry of Planning and Investment (MPI), EVN, the PCs, the PMUs, the Power Engineering Consulting Companies (PECCs), and the People's Committees of the provinces. The project preparation included many meetings with the affected villages and persons. Consultation with other international donors involved in related activities have continued through-out project preparation. A number of workshops have been held where representatives of all of the major stakeholders and NGOs were invited.

6.3 How does the project involve consultations or collaboration with NGOs or other civil society organizations?

Local groups and NGOs consulted (List the names):

JICA, JBIC, ADF, partners in Development, Viet Nam Women's Union, local authorities and local people.

6.4 What institutional arrangements have been provided to ensure the project achieves its social development outcomes?

The RAP will be implemented by the PC's and an independent external monitor will be appointed to ensure compliance with the policies and procedures.

6.5 How will the project monitor performance in terms of social development outcomes?

A research study to assessing the poverty impacts of rural electrification, funded by SIDA and New Zealand government has been initiated. The baseline study will be completed in 2002 with the follow-up field surveys being done in 2004 and 2006 to determine the social and socio-economics impacts of rural

electrification. IDA has been requested by the donors to chair the Study Steering Committee overseeing this study and provide continuous monitoring of these impacts and development outcomes. The internal and external monitoring and evaluation on RAP implementation will be carried out by PCs, PMUs under EVN and external monitoring agencies for ensuring the improvement or at least the maintenance of the PAPs' pre-project living standards.

For the community-based renewable grids, monitoring and evaluation will include social benefits and income generation resulting from the project. Baseline information will be gathered and performance indicators monitored.

These RAPs have been reviewed by IDA and are in compliance with all Bank regulations, policies and procedures.

7. Safeguard Policies:

7.1 Do any of the following safeguard policies apply to the project?

Policy	Applicability
Environmental Assessment (OP 4.01, BP 4.01, GP 4.01)	<input checked="" type="radio"/> Yes <input type="radio"/> No
Natural Habitats (OP 4.04, BP 4.04, GP 4.04)	<input checked="" type="radio"/> Yes <input type="radio"/> No
Forestry (OP 4.36, GP 4.36)	<input checked="" type="radio"/> Yes <input type="radio"/> No
Pest Management (OP 4.09)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Cultural Property (OPN 11.03)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Indigenous Peoples (OD 4.20)	<input checked="" type="radio"/> Yes <input type="radio"/> No
Involuntary Resettlement (OP/BP 4.12)	<input checked="" type="radio"/> Yes <input type="radio"/> No
Safety of Dams (OP 4.37, BP 4.37)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Projects in International Waters (OP 7.50, BP 7.50, GP 7.50)	<input type="radio"/> Yes <input checked="" type="radio"/> No
Projects in Disputed Areas (OP 7.60, BP 7.60, GP 7.60)*	<input type="radio"/> Yes <input checked="" type="radio"/> No

7.2 Describe provisions made by the project to ensure compliance with applicable safeguard policies.

The bank's safeguard policies on the social and environmental issues are fully considered and addressed during the project preparation. Every effort has been made through design, construction measures and construction schedules to reduce unnecessary involuntary resettlement and adverse impacts on assets. Resettlement and compensation programs are designed to allow the improvement or at least the maintenance of the PAPs' pre-project living standards.

The entitlement/eligibility policy follows Vietnamese laws but was adapted in such a way as to comply with the World Bank OD 4.30 on voluntary resettlement: (i) compensation will be provided at substitution rate/market price, and (ii) PAPs with or without land registration papers will be entitled to full compensation for losses.

The RAP for upgrading 500 kV and 220 kV transmission systems includes a chapter for Ethnic Minorities with the special provisions for PAPs who are vulnerable ethnic minorities and to be adversely affected by the project. The policies of OD 4.20 for Indigenous Minorities will be complied with.

A resettlement policy framework has been developed for the subcomponent of community based hybrid renewable energy grids (since land acquisition can not be anticipated at this time) and this policy will be applied for any subcomponents which may require land acquisition during project implementation. Completion of all the RAPs and IPDP will be a condition for approval of these grants.

Adequate institutional and financial arrangement for RAP and IPDP implementation have been made. An independent external monitor will be appointed to oversee the RAP and IPDP implementation and provide a quarterly report to IDA.

F. Sustainability and Risks

1. Sustainability:

The following key factors are critical to Project sustainability:

a. Institutional: Government implementation of Action Plan for power sector reform; Government approval of EVN's equitization program and MOI/PPC's ability and long-term commitment to manage commune based mini grids and off grid funds for promoting remote areas electrification.

b. Financial: Government commitment to periodically review and adjust tariffs

c. Technical: High standards and quality of transmission lines, substations and distribution system construction and proper maintenance of facilities constructed under the Project. Choice of appropriate technology/maintenance management practice and procedure for renewable electricity projects.

d. Environmental and social. Consultation during project preparation and independent monitoring and evaluation during and after project implementation completion.

e. Market: Growth of demand to make upgrades viable, commune willingness and ability to develop and manage mini grids, potential investor interest in joint stock companies at district and commune levels and potential energy efficiency service providers.

2. Critical Risks (reflecting the failure of critical assumptions found in the fourth column of Annex 1):

Risk	Risk Rating	Risk Mitigation Measure
From Outputs to Objective		
Non availability of counterpart funds	M	Agreement with government to provide local cost financing if required.
Cost of transmission and distribution systems higher than expected	N	Price estimates based on past experience and contingencies included
Adequate and timely availability of land acquisition and compensation payments	M	Detailed RAP and implementation procedures
EVN does not implement tariff increases and change tariff structure leading to low financial rate of return which could affect the capital mobilization to keep the development of the whole program	M	Government Agreement to increase average power tariff to maintain IDA agreed financial ratios is a project conditionality.
From Components to Outputs		
Low management capacity of MoI, PPC	M	Adequate training programs and provision of

and EVN in rural areas		consultants
Lack of long-term commitment of provincial and district authorities in supporting the community-based hybrid renewable energy grid, including coordinating resettlement and compensation	M	Commitment of local authorities a prerequisite in selection of areas
Equitization program implementation capacity	M	Consultants for project design and implementation
Schedule and cost overruns	M	Improve monitoring and supervision capacity in MoI, EVN and PCs
Overall Risk Rating	M	

Risk Rating - H (High Risk), S (Substantial Risk), M (Modest Risk), N (Negligible or Low Risk)

3. Possible Controversial Aspects:

None

G. Main Conditions

1. Effectiveness Condition

Implementation of tariff agreement reached at negotiation with IDA will be a condition for Board presentation.

For effectiveness

- a. Execution of subsidiary loan agreements between the Borrower and EVN, PC1,2,3 and Dong Nai.
- b. Appointment of a consultant for bulk power tariff study and implementation.
- c. Approval of operation manual for Renewable Energy by MoI
- d. Approval of PIP by EVN and PCs
- e. Appointment of a financial management specialist for the MoI PMB by MOI
- f. Provision of training on financial management, procurement and disbursement for the staff of MoI PMB
- g. Adoption of a time-bound action plan by EVN and PCs to strengthen its corporate governance and planning and financial management system
- h. Appointment of independent consultants for monitoring of RAPs

2. Other [classify according to covenant types used in the Legal Agreements.]

Agreements to be reached with MOI, EVN, PC1, PC2, PC3 and PC Dong Nai:

Management Aspects of the Project:

1. EVN would review with IDA its annual investment plan every year, commencing in June 1, 2003 and until the completion of the Project
2. By December 31, 2002, EVN will submit to the State Pricing Committee the transparent and reasonable distribution margins and bulk supply tariffs for independent distribution operators, including PCs and commune electricity groups, based on the study commissioned from International consultants and reviewed with IDA.
3. An independent creditors model will be developed for assessing the financial ratios and performance of EVN by December 31, 2002. EVN would implement the model and integrate these into its corporate planning and financial forecasting systems.
4. EVN, in co-ordination with local authorities would implement programs for equitization of 15 communes and 1 district. Based on the results of this work, a plan for formation of additional entities comprising of individuals/single or multiple commune electricity groups as independent accounting business entities or joint stock cooperatives/companies will be completed by December 31, 2003.
5. EVN will maintain a Steering committee for overall policy co-ordination and management of the project and PC1, PC2 , PC3 and PC Dong Nai will maintain Project Management Units (PMUs) for the management and execution of the Project for the duration of the Project.
6. PC Dong Nai will strengthen its project procurement capacity by training and use of consultants from PC2/EVN for a period of 1 year from start of project.
7. MOI will set up the arrangements for the funding of subprojects under the RARE facility. All subprojects approved for funding will conform to a set of financial, technical and resettlement principles agreed with IDA.
8. MOI will maintain a Steering Committee for overall policy coordination and management of DSM and Renewable energy projects.

Accounts/Audits:

1. EVN, PC1, PC2, PC3 and PC Dong Nai shall appoint independent auditors, acceptable to IDA, and make the audit reports available to IDA within six months after the close of each fiscal year.
2. MoI will appoint independent auditors, acceptable to GEF and IDA, and make audit reports available after the close of each fiscal year.

Monitoring, Review and Reporting:

1. EVN, PC1, PC2 , PC3 and PC Dong Nai shall: (i) carry out satisfactory procedures for monitoring the progress of the Project in terms of physical execution and financial reports, and agreed performance monitoring indicators; (ii) furnish to IDA: (a) quarterly progress reports, 10 days after the end of each calendar quarter; and (b) annual integrated reports, on or about December 31 in each year; (iii) review with IDA by February 28 of each year, the annual report, and, thereafter take all measures required to ensure the efficient completion of each component of the Project and the achievement of the objectives thereof, based on the conclusions and recommendations of the said report and IDA's views; and (iv) submit to IDA,

on or about January 1, 2003 its first quarterly report integrating the result of monitoring and evaluation activities till that date and thereafter carry out a mid-term assessment of Project implementation for the period ending December 31, 2002.

2. EVN shall: (i) make available to IDA its evaluation of the Implementation Completion Report (ICR) prepared by IDA; and (ii) adopt a plan for the operational phase of the Project.

3. EVN shall prepare and furnish to IDA, for its review and comment, its proposed Power Development Program (PDP) by December 31, 2002. Thereafter, EVN shall no later than December 31 in each succeeding year, submit to IDA for its review and comment: (i) a report of the progress in the implementation of the PDP during the preceding 12 month period; (ii) its proposed implementation program for the succeeding 5 years; and (iii) a review of its policy and levels of its electricity tariffs, including proposed adjustments.

4. MoI shall: (i) carry out satisfactory procedures for monitoring the progress of the Project in terms of physical execution and financial reports, and agreed performance monitoring indicators; (ii) furnish to IDA and GEF: (a) quarterly progress reports, 10 days after the end of each calendar quarter; and (b) annual integrated reports, on or about December 31 in each year; (iii) review with IDA by February 28 of each year, the annual report, and, thereafter take all measures required to ensure the efficient completion of each component of the Project and the achievement of the objectives thereof, based on the conclusions and recommendations of the said report and IDA's views; and (iv) submit to IDA, on or about January 1, 2003 its first quarterly report integrating the result of monitoring and evaluation activities till that date and thereafter carry out a mid-term assessment of Project implementation for the period ending December 31, 2004.

Financial Performance:

1. EVN would review by April 30 of every year the adequacy of its tariffs to produce the required self-financing and debt-service coverage obligations with IDA. EVN, PC1, PC2, PC3 and PC (Dong Nai) shall take all actions to ensure that funds generated from internal sources would be equivalent to not less than 30 % of the annual three-year average of their capital expenditures.

2. EVN, PC1, PC2, PC3 and PC Dong Nai shall maintain net revenues at the level of 1.5 times their total estimated debt service requirements.

3. EVN, PC1, PC2 , PC3 and PC Dong Nai shall review with IDA their proposed annual budgets and financial plan for each succeeding three-year period.

4. EVN, PC1, PC2, PC3 and PC Dong Nai shall carry out a time-bound action plan, satisfactory to the Association, to strengthen its corporate governance and planning, its financial management system including accounting system and procedures and internal control system, and shall provide, promptly as needed, the funds, facilities, services, staff training and other resources required for the implementation of said action plan.

5. MoI will review the financial performance of the RARE Facility, and of selected sub-projects, on an annual basis.

Environmental and Resettlement Aspects:

1. EVN, PC1, PC2, PC3 and PC Dong Nai shall coordinate with People's Committee in provinces to carry out the resettlement and rehabilitation of affected persons in accordance with the Resettlement Action Plans for each part of the Project, in a manner satisfactory to IDA.
2. EVN, PC1, PC2, PC3 and PC Dong Nai will engage independent external agencies to monitor the implementation of the RAPs.
3. All sub-projects including the Community-based renewable electricity grids, any additions, revisions, new sub-components etc shall follow Bank policy and procedures for RAP and EIA, under a framework agreed during preparation.

Agreements Reached with the Borrower:

Flow and Utilization of Project Funds:

1. The Borrower shall relend the Credit amount to EVN, PC1, PC2, PC3 and PC Dong Nai for components of the proposed credit under subsidiary loan agreements between the Government and the respective entities under terms and conditions approved by IDA which shall include: (i) interest at a rate of ... % p.a., (**rate to be decided**) repayment over 20 years, including grace period of 5 years for EVN; (ii) interest at a rate 1.0% p.a., repayment over 25 years, including grace period of 7 years for PC1, 2, 3 and PC Dong Nai; and (iii) foreign exchange risk to be borne by EVN, PC1, PC2, PC3 and PC Dong Nai.
2. The Borrower shall provide MOI a sum of \$ 4 million from the Credit for the setting up of Remote Area Renewable Energy Facility to provide grants to about 20 remote communes for commune based renewable energy grids

Management Aspects:

1. The Borrower will require EVN to revalue its fixed assets periodically in accordance with sound and consistently maintained methods of valuation satisfactory to IDA.
2. The Borrower shall take all actions, including but not limited to adjustment of tariffs, so that EVN and the PCs could generate: (i) funds from internal sources equivalent to not less than 30% of the annual 3-year average capital expenditures; (ii) net revenues to cover not less than 1.5 times their debt service requirement; and (iii) comply with other financial covenants, as required under the Credit Agreement.

H. Readiness for Implementation

- 1. a) The engineering design documents for the first year's activities are complete and ready for the start of project implementation.
- 1. b) Not applicable.
- 2. The procurement documents for the first year's activities are complete and ready for the start of project implementation.
- 3. The Project Implementation Plan has been appraised and found to be realistic and of satisfactory quality.
- 4. The following items are lacking and are discussed under loan conditions (Section G):

I. Compliance with Bank Policies

- 1. This project complies with all applicable Bank policies.
- 2. The following exceptions to Bank policies are recommended for approval. The project complies with all other applicable Bank policies.

Anil Kumar Malhotra
Team Leader

M.Farhandi
Sector Manager/Director

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Country Manager/Director

Annex 1: Project Design Summary

VIETNAM: System Efficiency Improvement, Equitization & Renewables Project

Hierarchy of Objectives	Key Performance Indicators	Data Collection Strategy	Critical Assumptions
<p>Sector-related CAS Goal:</p> <p>Reduce the investment needs through alleviating power system bottlenecks and increased efficiency to maintain pace of economic development</p> <p>Reduce rural poverty in Vietnam and raising productivity through expanding rural access to electricity</p> <p>Continuation of power sector reform and restructuring</p>	<p>Sector Indicators:</p> <p>Sector Investment Ratio of GDP to energy use Per capita electricity consumption</p> <p>Rural access to electricity Poverty rate for project areas</p> <p>Government continues to implement sector reform in accordance with 1995 Policy Sector and Strategy Internally generated cash for investments: Sector' self financing ratio</p>	<p>Sector/ country reports:</p> <p>Statistics to be maintained by Government and EVN</p> <p>Community and provincial data/statistics to be maintained</p> <p>IDA monitoring based on annual reports to be maintained by EVN and PCs</p>	<p>(from Goal to Bank Mission)</p> <p>Macroeconomic condition are favorable to sustain demand growth</p> <p>Sector is able to raise the necessary fund from a mix of financing resources</p> <p>Government commitment to reforms remains strong.</p> <p>IDA technical support is sustained and intensified</p>
<p>GEF Operational Program:</p> <p>Promote renewable energy by removing barriers and reducing implementation costs</p>	<p>Government implements expanded renewable energy program through further projects to support Phase 2 of REAP</p>		
<p>Project Development Objective:</p> <p>1. Improving overall system efficiency through optimization of transmission system to reduce losses and remove bottlenecks; rehabilitation of distribution network in rural economic growth centers; and reduce peak demand and electricity consumption through large scale DSM activities</p>	<p>Outcome / Impact Indicators:</p> <p>1. Transmission and distribution system:</p> <p style="padding-left: 40px;">2002 2003 2004 2005 2006</p> <ul style="list-style-type: none"> ● Transmission losses and distribution losses ● Number of T/L fault (time/year/100km) for 500 kV, 220 kV and 110 kV ● Duration of T/L fault (min/year) for 500 kV, 220 kV and 110 kV ● Number of transformer faults (time/year/unit) for 500/220 kV and 220/110 kV ● Duration of transformer faults (min/year/unit) for 500/220 kV and 220/110 kV ● Percentage of 500/220 kV and 220/110 kV transformers loaded >80% ● Energy sales/employee 	<p>Project reports:</p> <p>1. Annual statistics to be maintained by Government and EVN</p>	<p>(from Objective to Goal)</p> <p>Project is completed on time and thereafter well operated and maintained</p>

<p>2. Enhance rural access to electricity by upgrading 110 kV sub-transmission and MV distribution lines for rural electrification; rehabilitating existing mini hydro systems in rural areas; developing community based utility to remote areas, not accessible by grid</p> <p>3. Sustain power sector reform and improve corporate governance through pilot divestiture/equitization of distribution entities; installation of effective and streamlined financial management and information technology; and establishing a framework, mechanism and capacity for renewable energy development and decentralized off-grid rural electrification</p>	<p>2. Rural access 2002 2003 2004 2005 2006</p> <ul style="list-style-type: none"> • Number of household electrified: • Number of off grid community mini systems installed • Number of household electrified with renewables <p>3. Power sector reforms</p> <ul style="list-style-type: none"> • Financial soundness of JS Distribution companies: • Electricity Sales • Customers numbers • Application of FMIS throughout EVN and PCs • Government documents creating sustainable mechanism for decentralized off grid rural electrification and functioning of Off grid Rural Electrification Facility 	<p>2. Statistics to be maintained by Government and EVN Quarterly and Annual Reports to be maintained by EVN and PC Quarterly and annual reports by PMUs in MoI</p> <p>3. Quarterly and Annual reports to be kept by JSDCs and PCs</p>	<p>Government commitment to financial stability of the sector</p> <p>Donor /GEF support for rural electrification and renewable energy development</p> <p>Productive use of electricity is well promoted in newly electrified areas</p> <p>Commitment of government and EVN to equitisation process in larger scale</p>
<p>Global Objective: GEF objective: reduction of GHG emissions through electricity production from renewable energy</p>	<p>CO2 Emissions reduced</p>		
<p>Output from each Component:</p> <p>1.1 Transmission system efficiency increased; bottlenecks and overload are reduced.</p> <p>1.2 DSM activities are implemented in EVN and PCs level</p>	<p>Output Indicators:</p> <p>1.1 Trans. line lengths (km): <u>2003</u> <u>2004</u> <u>2005</u> Transformer capacity (MVA): <u>2003</u> <u>2004</u> <u>2005</u></p> <p>1.2 Capacity and energy saved due to DSM (MW/ GWh) <u>2003</u> <u>2004</u> <u>2005</u> <u>26/10</u> <u>70/41</u> <u>12/84</u> Number of new TOR meters installed: <u>2003</u> <u>2004</u> <u>2005</u> <u>1500</u> <u>3500</u> <u>5600</u> CFL sold: <u>2003</u> <u>2004</u> <u>2005</u></p>	<p>Project reports:</p> <p>Commissioning documentation</p> <p>Quarterly and Annual reports to be maintained by EVN, PC and Project Management Units</p>	<p>(from Outputs to Objective)</p> <p>Government and EVN management is committed to deploy adequate resources for project completion</p> <p>Adequate and timely availability of resources for land acquisition and compensation</p> <p>Suitable implementation arrangements for project related procurement, contracting and construction</p> <p>Expeditious management decision on procurement related</p>

	<u>200,000</u> <u>500,000</u> <u>1 million</u>		issues
2.1 Upgraded 110 kV sub-transmission network for Rural Electrification areas	2.1 Distribution line length (km): <u>2003</u> <u>2004</u> <u>2005</u> Substation capacity (MVA): <u>2003</u> <u>2004</u> <u>2005</u>		Adequate planning and training for project implementation
2.2 Rehabilitated mini hydro grid-connected systems and Wind-diesel power plant for Phu Quoc Island	2.2 Generation capacity rehabilitated (kVA): <u>2003</u> <u>2004</u> <u>2005</u>		
2.3 Installation of community based mini hydro systems for remote areas	2.3 Generation capacity installed (kVA): <u>2003</u> <u>2004</u> <u>2005</u>		
3.1 Installation and application of effective financial information management system for EVN and PCs	3.1 Number of users of FMIS 2003 2004 2005 2006		
3.2 Establishment of JS District and commune level distribution companies	3.2 Number of JSDCs established		
3.3 MoI successfully managing REAP Program nation wide framework for renewable energy development; establishment and functioning of Remote Area Renewable Electricity Facility in 2-3 provinces; EVN purchasing power from renewable energy IPPs;	3.3 Number of SPPs using renewable energy to produce electricity and sell to the grid		
3.4 Master Plan of Training prepared and under implementation	3.4 Number of staff trained		
3.5 Technical Assistance			
Project Components / Sub-components: 1. System Efficiency Improvement 1.1 Transmission systems efficiency improvement 1.2 DSM phase 2 by EVN	Inputs: (budget for each component) 1.1 US\$ 177.8 million 1.2 US\$6 million	Project reports: - Progress reports and disbursement reports - Supervision mission reports	(from Components to Outputs) Government commitment to borrow IDA funds and provide enough counterpart fund to implement projects

<p>2. Improving Rural Access:</p> <p>2.1 Upgrading the 110 kV sub-transmission and MV distribution system for Rural Electrification Programs</p> <p>2.2 Rehabilitation of existing small hydro plants and wind-diesel power plant for Phu Quoc Island</p> <p>2.3 Community-based hybrid renewable energy grids</p>	<p>2.1 US\$122.2 million</p> <p>2.2 US\$9.2 million</p> <p>2.3 US\$5.8 million</p>		<p>Commitment of EVN and provincial authority to project</p> <p>Commitment of local authority in supporting community-based renewable energy grids, coordinating resettlement and compensation</p> <p>Deployment of adequately skilled and manned project management team by EVN, PCs and MoI</p> <p>Ability of local authorities to effectively carry out their tasks</p>
<p>3. Institution Building</p> <p>3.1 Improvement of management information system</p> <p>3.2 Creation of District and Commune level Joint Stock Distribution Companies</p> <p>3.3 Strengthening regulations, planning and implementation capacity for Renewable Energy projects</p> <p>- Renewable Energy Small Producers</p> <p>- Technology/Market Development</p> <p>- Program Management Support</p> <p>3.4 EVN Staff training program</p> <p>3.5 Technical Assistance</p>	<p>3.1 US\$14 million</p> <p>3.2 US\$7 million</p> <p>3.3 US\$3.5 million</p> <p>3.4 US\$ 3 million</p> <p>3.5 US\$3.9 million</p>		<p>Ability and commitment of EVN and PCs to effectively implement pilot equitization</p>

Annex 2: Detailed Project Description

VIETNAM: System Efficiency Improvement, Equitization & Renewables Project

By Component:

Project Component 1 - US\$183.80 million

The component is designed to improve the transmission system efficiency and performance. It would include the following elements: 1.1 Upgrading of the 500 kV and 220 kV transmission networks and 1.2 DSM Phase 2.

Subcomponent 1.1: Upgrading of 550 kV and 220 kV transmission systems. The sub-component is designed to improve the transmission system efficiency and performance through reduction of transmission bottlenecks and weak points, improvement of system security and reliability of power supply. It includes the following elements:

a) *Construction of Pleiku-Da Nang 500 kV transmission line (2 circuit) and Binh Son 500 kV substation; expansion of Pleiku and Da Nang 500 kV substations.* The component includes: (i) the construction of a 280 km long, 500 kV transmission line with four-bundle conductor per phase and an earth wire with optical fiber cable for lightning protection and communication. The transmission line would be routed through the 4 provinces of Gia Lai, Kon Tum, Quang Ngai, Quang Nam and the outskirt of Da Nang city, for the most part along high ways 14, 24, 20, 58 and 1; (ii) the construction of Binh Son 500 kV substation with 500/220 kV transformers capacity of 3 x 150 MVA, 220/110 kV transformer capacity of 250 kVA and an associated communication system; (iii) expansion of the existing substations at Pleiku with additional switching bays and associated equipment and Da Nang substation with an additional 3x150 MVA transformer and switching bays plus associated equipment; (iv) provision of control and dispatch equipment for the system.

(b) *Construction of 220 kV transmission lines and substations* including (i) construction of a 220 kV transmission line of approximately 45 km in length from Thai Binh to Hai Phong, (ii) expansion of the 220 kV substation at Nha Trang, (iii) expansion of the 220 kV substation at Quang Ninh, (iv) expansion of the 220 kV substation at Soc Son, (v) expansion of the 220 substation at Viet Tri, (vi) construction of a 220 kV substation at Yen Bai and associated connections, (vii) construction of a 220kV substation at Bac Ninh and associated connections, (viii) construction of a 220kV substation at South Sai Gon and associated connections, (ix) installation of 493 MVAR of 110 kV capacitors in 10 existing substations in northern part of Vietnam, and (x) installation of 145 MVAR of 110 kV capacitors in 4 existing substations in central part of Vietnam;

(c) *Carrying out resettlement and rehabilitation of Affected Persons* by (i) CPPMB under Part A(1)(a) above; (ii) NPPMB under Part A(1)(b)(i)(vi)(vii) above; and (iii) SPPMB under Part A(1)(b)(viii); and

(d) *Provision of consulting services* for: (i) preparation of detailed design, bidding documents and project management support for Part A(1)(a) of the Project, (ii) improvement of maintenance work for the power systems under Part A (1)(a) and (1)(b) of the Project, and (iii) design, creation and implementation of joint stock company model for a hydroelectric power project.

Total costs: US\$ 177.8 million with IDA financing of US\$ 109.7 million.

Subcomponent 1.2: Demand-Side Management Phase 2. This program would seek to achieve 120 MW

in system peak reduction through the implementation of several DSM measures, including: (a) expanded TOU metering in about 4,000 large- and medium-sized customers; (b) introduction of a pilot direct load control program in PC HCMC using ripple control systems to curtail demand in about 2,000 air conditioning and water heating systems; (c) the promotion and distribution of 1 million compact fluorescent lamps (CFLs) to reduce peak loads from lighting end-uses; and (d) the promotion of energy-efficient fluorescent tube lamps (FTLs) through joint EVN-manufacturer marketing efforts. These programs would be supported with additional load research (both facility and end-use levels), DSM marketing, DSM program planning and evaluation, new pilot programs and assessments of DSM business opportunities (e.g., fee-for-service audits, utility-based ESCOs, etc.). The program would be managed by EVN and implemented with support from the PCs. This sub-component will be supported with an associated GEF DSM EE project which is now under preparation and is expected to be submitted to the Board after SEIERP. This proposed operation will seek to further DSM impacts as well as catalyze the development of a small and sustainable energy efficiency service market. Under this associated project, an additional US\$10.7 million will be sought, with US\$5.25 million from GEF, US\$5 million from private end-users and US\$0.5 million from MOI. (A more detailed description of activities covered under this component can be found in Annex 11).

Total cost : US\$6 million with \$5.2 million from IDA, and \$0.8 million from EVN.

Project Component 2 - US\$137.20 million

This component will consist of three main subcomponents (2.1) Upgrading 110 kV sub-transmission networks supplying rural areas; (2.2) Rehabilitation of existing small hydropower plants and new wind-diesel power plant for Phu Quoc Island and (2.3) Community based hybrid renewable energy grids.

Subcomponent 2.1. Upgrading 110 kV sub-transmission networks supplying rural areas

a) Upgrading of 110 kV sub transmission networks including

i) Construction of 110 kV lines and substations in the North-PC1: There are twenty two 110/35-22 kV substations with the total transformer capacity of 450 MVA and associated 110 kV lines with aggregated length of 576 km to be constructed by PC1. Total cost is US\$ 64.3 million with IDA credit of US\$ 35.2 million.

ii) Construction of 110 kV lines and substations in the South-PC2: There are fifteen 110/22 kV substations with total transformer capacity of 330 MVA and associated 110 kV lines with aggregated length of 100 km to be constructed by PC2. The total costs is US\$ 36.7million with IDA credit of \$ 22.3 million.

iii) Construction of 110 kV lines and substations in the Center- PC 3: There are eight 110 /35-22 substations with total transformer capacity of 200 MVA and associated 110 kV lines with aggregated length of 74 km to be constructed by PC3. Total cost is \$17.1 million with IDA credit of \$10.4 million.

iv) Construction of 110 kV lines and substations in Dong Nai: There are two 110/22 kV substations with total transformer capacity of 50 MVA and associated 110 kV lines with aggregated length of 26 km to be constructed by PC Dong Nai. The projects cost US\$4 million with IDA credit of \$2.8 million

This component will also add new, rehabilitate or install capacitors to the existing 110 kV sub-transmission

lines and substations for rural provinces in 4 regions under PCs 1,2 3 and Dong Nai where the strengthening is most needed.

(b) *Carrying out resettlement and rehabilitation of Affected Persons* by (i) PC1 under Part B(1)(a)(i) above, (ii) PC2 under Part B(1)(a)(ii) above, (iii) PC3 under Part B(1)(a)(iii) above, and (iv) PC Dong Nai under Part B(1)(a)(iv) above.

Total costs: US\$122.2 million with IDA financing of US\$70.7

Subcomponent 2.2 Rehabilitation of existing small hydro plants and Wind-diesel power plantsystem for Phu Quoc Island

a) Rehabilitation of existing small hydro plants: PC1, PC2 and PC3 will rehabilitate 5 existing EVN owned mini-hydro plants with an aggregate capacity of 12.4 MW, to increase their capacity to 15.4 MW and extend the life of the facilities by 8-12 years. TA will also be provided to assist EVN with technical design, operation and management of these isolated plants as well as for the preparation and implementation of the wind diesel system. EVN will also consider equitization of these plants. Total cost: US\$ 5.7 million; IDA financing of US\$ 4.5 million and GEF- TA: US\$0.5 million.)

b) Wind power plant in Phu Quoc island: PC2 will construct a local grid including a hybrid wind-diesel power plant supplying electricity to Phu Quoc island based on a detailed feasibility study to be undertaken by PC2 with assistance from international consultants. Estimated costs: US\$3.55 from IDA.

Total costs: US \$ 9.25 million with IDA financing of US \$ 8.05 million

Subcomponent 2.3. Community based hybrid renewable energy grids.

A pilot of a commune-based hydro-hybrid grid has already begun in Na Bo village, Hua Pang Commune, Son La province, as part of the Bank's Rural Energy 1 Project. Under this component, the pilot will be extended to about twenty communes, in 4 provinces. These communes would benefit from Remote Area Renewable Electricity (RARE) capital cost grants and technical assistance. The RARE-assisted commune-based grids would serve about 10,000 households in total, with year round power. Assistance would be provided to train and support the businesses, which would operate and maintain the grids, as well as to stimulate income generating activities and productive activities in the communities. Calculations and pilot project experience show that an investment subsidy close to 90% is needed to bring the average tariff down to the 750-1000 Dong/kWh range, comparable to the tariffs charged to grid connected rural consumers.

In this component, the commune people's committee (CPC) would build apply for a RARE grant to co-finance the facility. If successful, a commune electric utility would be formed to operate the facility. The form of the commune utility could be: (a) a commune electricity cooperative (CEC); (b) a joint stock company (JSC), e.g. owned by the CPC and the Province; or (c) a private investor-owned company (the "BOT"-model). The CEC is taken as the base case. For each RARE grant, there would be a grant agreement between MOI, the Provincial People's Committee (PPC) and the commune utility that would spell out their roles and responsibilities with respect to the RARE assisted grids. The agreement would cover aspects such as ownership, management, procurement, tariff formula, service connection fees, contribution to reserve fund (see below), insurance, responsibilities and rights of all parties, dispute resolution mechanism, etc.

The assets of the generating system and the distribution grid would be jointly owned by the province and the commune utility, in proportion to their contribution. Financing of the capital costs would be as follows: RARE grant to the PPC would fund up to 80% of the capital cost, excluding land, while the PPC, utility and other sources jointly would fund a minimum of 20% of the capital cost. The commune utility would operate and maintain the grid, on a day to day basis, and collect tariffs sufficient to pay the operating expenses, including normal O&M as well as an annual contribution to a reserve fund which would be paid to the PMU, and held in an escrow account to be used to finance insurance, periodic major rehabilitation and grid expansion. After 15 years of satisfactory operation, the PPC's ownership of the grid would be transferred fully to the commune utility.

Implementation of the pilot project would be coordinated and organized at national level by a *Project Management Board (PMB)* at MOI, assisted by full-time consultant staff. The PMB would guide implementation at provincial level, organize technical assistance and training, organize a productive uses promotion program, appraise and approve proposals for RARE grants, authorize payments to contractors, organize technical assistance and training, sign the grant agreements for each commune utility, take fiduciary responsibility for management of the special accounts for IDA and GEF funds, and contract an independent monitor.

The component would be implemented in each province by a *Project Management Unit (PMU)*. The PMU would operate under the supervision of a *Steering Committee (SC)*, under the People's Committee, comprised of Depts. of Planning and Investment, Industry, Agriculture, Education, Health. The SC would approve proposals for feasibility studies and RARE grants and forward them to the PMB. The SC would also ensure that the sector agencies reinforce the development impact of projects through investments in the productive use of electricity. The PMU would consist of an official of the Dept. of Industry and a social mobilizer, supported by full-time consultant staff. The PMU and the district office of MOI would contact potential communities; assist them to prepare proposals for co-financing of feasibility studies and RARE grants; contract for assistance in the establishment of the commune utility; contract for preparation and evaluation of tender documents for construction of the facility; organize the tender; contract for assistance in setting-up and managing the commune utility; contract out major repairs from escrow funds.

Total project cost US\$5.8 million with IDA financing of US\$4 million; GEF-TA: US\$1 million)

Project Component 3 - US\$ 31.40 million

This consists of five subcomponents: (3.1) Improvement of information system management; (3.2) Creation of district and commune level joint stock distribution companies; (3.3) Strengthening regulations, planning and implementation capacity for Renewable Energy Projects in MOI; (3.4) EVN staff training program; and (3.5) Technical Assistance.

Subcomponent 3.1 Improvement of management information system .

The objective of this component is to build a solid background for an modern integrated information system, which provides actual linkage of EVN and all of its affiliates offices and standardization of all systems, allowing EVN management to have access to consolidated data for a wide variety of managerial tasks. The emphasis will be placed on the improving the financial and accounting management system and to strengthen and expand the activities of Technology, Environment and Computer Center to carry out the proposed IT plan. The sub component would serve as first stage on implementing an integrated long-term plan on development of IT system for EVN.

Total costs: US\$14 million with US\$13.4 million IDA financing and US\$ 0.6 million from EVN.

Subcomponent 3.2 Creation of District or commune level Joint-Stock Distribution Companies.

This sub component would help in the creation of 1 joint stock Distribution Company at the district level and 15 joint stock companies at the commune level. It includes investment to upgrade the existing distribution systems, and technical assistance to the establishment and advisory support to the new joint stock companies. This program would enable EVN to evaluate a longer term program of equitization in the distribution sector.

Total costs: US\$ 7 million of IDA financing.

Subcomponent 3.3 Strengthening regulations, planning and implementation capacity for Renewable Energy Projects:

This will consist of three parts, all executed by MoI:

(a) *Support for Establishment of Renewable Energy Program.* This Program would include: (i) preparing decrees and regulations needed to encourage renewable energy rural electrification and small power producers, building on the Rural Energy Policy; (ii) building awareness of renewable energy; and (iii) providing training and support to businesses, Power Companies and government, for planning and implementing renewable electricity projects. Support would also be provided to manage implementation of the renewable energy components of the SEIER project, as well as to support MoI in coordination of renewable energy activities under the REAP funded by other donors. Total cost: US\$2.0; GEF-TA:US\$1.5 million.

(b) *Renewable Energy Small Power Producers.* Technical assistance would be provided for establishment of transparent and streamlined approval and contractual processes; packaging identified mini-hydro projects as SPP projects; designing award procedures and offering sites to interested developers; disseminating information and providing business development services to prospective developers, including sugar mills and rice husk producers; and identifying ways to make available long-term financing including the possible use of guarantees to extend loan terms. Total GEF-TA: US\$ 1 million.

(c) *Renewable Energy Technology/Market Development.* Technical assistance would be provided for a variety of activities related to market and technology development, including resource assessment, market assessment and technology improvement and business development of locally manufactured renewable electricity products (e.g. pico hydro). Total GEF-TA: US\$ 0.5 million

Total costs: US\$ 3.5 million with GEF- TA: US\$3 million and GOV: US\$0.5 million.

Subcomponent 3.4 EVN staff training program.

This component will support a staff training program covering technology, financial, commercial and management of public utilities including deputation of staff to other utilities in the region, specialized training courses etc based on a Training Master plan prepared by EVN.

Total costs with IDA financing of US\$3 million.

Subcomponent 3.5 EVN Technical Assistance

(a) Consulting services for preparation of detailed design, bid documents and project management support for 500Kv line and substations (US\$1 million); (b) Consulting services for the improvement of maintenance work for the whole power system including software; (US\$2.1 million); and (c) Technical assistance for design, creation and implementation of joint stock company model for a hydro project. (US\$800,000).

Total cost: with IDA financing of \$ US\$3.9 million.

Annex 3: Estimated Project Costs

VIETNAM: System Efficiency Improvement, Equitization & Renewables Project

	Local	IDA	GEF	Total
Project Cost By Component	US \$million			
1. System Efficiency Improvement				
1.1 Transmission system efficiency improvement	43.4	99.7		143.1
1.2 Energy Efficiency Programs:				
DSM phase 2 by EVN	0.8	5.2	0.0	6.0
Pilot Commercial Energy Efficiency by MOI	0		0.0	0.0
2. Improving rural access				
2.1 Upgrading the 110 kV sub-transmission and MV distribution system for rural electrification program	38	64.3		102.3
2.2 Rehabilitation of existing small hydro power plants	0.4	7.7	0.5	8.6
2.3 Community-based hybrid renewable energy grids	0.8	4.0	1.0	5.8
3. Institution building.				0.0
3.1 Improvement of information system management	0.5	12.2		12.7
3.2 Creation of District or Commune level Joint Stock Distribution Companies		7.0		7.0
3.3 Strengthening regulation, planning and implementation capacities for Renewable Energy Projects	0.5		3.0	3.5
3.4 EVN staff training program		3.0		3.0
3.5 Technical Assistance		3.9		3.9
Total Baseline Cost	84.4	207	4.5	295.9
Physical Contingencies	4.2	9.0	0.0	13.2
Price Contingencies	4.2	9.0	0.0	13.2
Tax and duties	11.3	0.0	0.0	11.3
Total Project Costs (without IDC)	104.1	225	4.5	333.6
Interest During Construction	18.8	0.0	0.0	18.8
Total Project Costs (with IDC)	122.9	225	4.5	352.4
Total Financing Required	122.9	225	4.5	352.4

Project Cost By Category	Local	IDA	GEF	Total
	US \$million	US \$million	US \$million	US \$million
Works	55.3	12.3	0.0	67.6
Goods	0.5	178.8	0.0	179.3
Services	28.6	12.8	4.5	45.9
Training		3.0		3.0
Total Baseline Cost	84.4	207.0	4.5	295.9
Physical Contingencies	4.1	9.0	0.0	13.2
Price Contingencies	4.1	9.0	0.0	13.2
Tax and duties	11.4	0.0	0.0	11.4
Interest During Construction	18.8	0.0	0.0	18.8
Total Project Costs	122.9	225.0	4.5	352.4
Total Financing Required	122.9	225.0	4.5	352.4

Cost Estimates for EVN

Project Costs by Component	Local	Foreign US\$ million equivalent	Total Cost
<ul style="list-style-type: none"> ○ 500 kV Pleiku-Dung Quat-Danang Transmission line and Associated Substations; ○ 220 kV Transmission Lines and Associated Substations ○ DSM, IT, Training and TA ○ Resettlement and Land Compensation 			
Works	29.7	0.4	30.2
Civil works for S/S	28.8	0.0	28.8
Civil works for T/L	0.9	0.0	0.9
Installation for DSM	0	0.4	0.4
Goods	0.2	108.7	108.9
Conductors and Earth Wire	0	11.4	11.4
Insulators and Fittings	0	5.4	5.4
Steel Towers, Steel Bars and related materials	0	11.9	11.9
Optical Cable	0	2.4	2.4
Substation transformers	0	15.6	15.6
Substation associated equipment and accessories	0	44.6	44.6
Communication equipment	0	1.8	1.8
Other Electrical Equipment	0.2	0.2	0.4
Capacitors and associated equipment	0	6.4	6.4
DSM	0	3.8	3.8
IT	0	5.2	5.2
Services	0.5	14.8	15.4
Engineering Consultant for Design and Bidding assistance and other Services	0.5	11.8	12.3
Training	0	3.0	3.0
Miscellaneous	14.4	0.0	14.4
Eng. and Admin Overheads	9.2	0.0	9.2
Resettlement and Land Acquisition	5.2	0.0	5.2
Total Base Costs	44.8	123.9	168.9
Physical Contingencies	2.2	5.6	7.8
Price Contingencies	2.2	5.6	7.8
Taxes and Duties	7.2	0.0	7.2
Total Project Costs (without IDC)	56.4	135.1	191.7
Interest During Construction	13	0.0	13.0
Total Project Costs for EVN	69.4	135.1	204.7

Cost Estimates for PC1

Project Costs by Component	Local	Foreign US\$ million equivalent	Total Cost
○ 110 kV Transmission line and Associated Substations;			
○ Mini-Hydro gensets			
○ Equitization			
○ Resettlement and Land Compensation			
Works	14.2	2.7	16.9
Civil works for S/S and T/L	14.2	0.0	14.2
Civil works and installation for mini hydro gensets	0	0.6	0.6
Equitization	0	2.1	2.1
Goods	0.3	34.2	34.5
Conductors and accessories	0	2.9	2.9
Insulators and Fittings	0	1.8	1.8
Concrete poles	0	0.8	0.8
Steel Towers, and related materials	0	5.6	5.6
Substation Transformers	0	7.5	7.5
Substation associated equipment and accessories	0	11.6	11.6
Communication Equipment	0	1.7	1.7
Other Electrical Equipment	0.3	1.3	1.6
Hydro gensets, control and protection equipment	0	0.9	0.9
Services	0	0.4	0.4
Engineering Consultant for Design and Bidding assistance and other Services	0	0.4	0.4
Training	0	0.0	0.0
Miscellaneous	6.8	0.0	6.8
Eng. and Admin Overheads	4.2	0.0	4.2
Resettlement and Land Acquisition	2.6	0.0	2.6
Total Base Costs	21.2	36.0	57.2
Physical Contingencies	1.1	1.7	2.8
Price Contingencies	1.1	1.7	2.8
Taxes and Duties	2.8	0.0	2.8
Total Project Costs (without IDC)	26.2	39.4	65.6
Interest During Construction	3.2	0.0	3.2
Total Project Costs for PC1	29.4	39.4	68.8

Cost Estimates for PC2

Project Costs by Component	Local	Foreign	Total Cost
	US\$ million equivalent		
○ 110 kV Transmission line and Associated Substations;			
○ Mini-Hydro gensets			
○ Equitization			
○ Resettlement and Land Compensation			
Works	7.7	3.8	11.5
Civil works for S/S and T/L	7.2	0.0	7.2
Civil works and installation for mini hydro and wind gensets	0.0	1.1	1.1
Equitization	0.0	2.7	2.7
Capacitor installation	0.5	0.0	0.5
Goods	0.0	24.7	24.7
Conductors and accessories	0.0	0.6	0.6
Insulators and Fittings	0.0	0.2	0.2
Concrete poles	0.0	0.2	0.2
Steel Towers, and related materials	0.0	0.7	0.7
Substation Transformers	0.0	4.5	4.5
Substation associated equipment and accessories	0.0	8.6	8.6
Communication Equipment	0.0	0.7	0.7
Other Electrical Equipment	0.0	1.6	1.6
Capacitors and bays	0.0	3.2	3.2
Hydro gensets, control and protection equipment	0.0	0.8	0.8
Wind gensets and other equipment	0.0	3.6	3.6
Services	0.0	0.5	0.5
Engineering Consultant for Design and Bidding assistance and other Services	0.0	0.5	0.5
Training	0.0	0.0	0.0
Miscellaneous	3.3	0.0	3.3
Eng. and Admin Overheads	2.2	0.0	2.2
Resettlement and Land Acquisition	1.1	0.0	1.1
Total Base Costs	11.0	29.0	40.0
Physical Contingencies	0.6	1.1	1.6
Price Contingencies	0.6	1.1	1.6
Taxes and Duties	0.9	0.0	0.9
Total Project Costs (without IDC)	13.0	31.2	44.2
Interest During Construction	1.8	0.0	1.8
Total Project Costs for PC2	14.8	31.2	45.9

Cost Estimates for PC3

Project Costs by Component	Local	Foreign	Total Cost
	US\$ million equivalent		
○ 110 kV Transmission line and Associated Substations;			
○ Mini-Hydro gensets			
○ Equitization			
○ Resettlement and Land Compensation			
Works	3.0	1.3	4.3
Civil works for S/S and T/L	3.0	0.0	3.0
Civil works and installation for mini hydro gensets	0.0	0.1	0.1
Equitization	0.0	1.2	1.2
Goods	0.0	10.0	10.0
Conductors and accessories	0.0	0.4	0.4
Insulators and Fittings	0.0	0.2	0.2
Concrete poles	0.0	0.02	0.02
Steel Towers, and related materials	0.0	0.7	0.7
Substation Transformers	0.0	3.1	3.1
Substation associated equipment and accessories	0.0	3.7	3.7
Communication Equipment	0.0	0.8	0.8
Other Electrical Equipment	0.0	0.6	0.6
Hydro gensets and control equipment	0.0	0.4	0.4
Services	0.0	0.2	0.2
Engineering Consultant for Design and Bidding assistance	0.0	0.2	0.2
Training	0.0	0.0	0.0
Miscellaneous	2.1	0.0	2.1
Eng. and Admin Overheads	1.4	0.0	1.4
Resettlement and Land Acquisition	0.7	0.0	0.7
Total Base Costs	5.1	11.5	16.6
Physical Contingencies	0.3	0.5	0.8
Price Contingencies	0.3	0.5	0.8
Taxes and Duties	0.4	0.0	0.4
Total Project Costs (without IDC)	6.1	12.5	18.6
Interest During Construction	0.7	0.0	0.7
Total Project Costs for PC3	6.8	12.5	19.3

Cost Estimates for PC Dong Nai

Project Costs by Component	Local	Foreign US\$ million equivalent	Total Cost
○ 110 kV Transmission line and Associated Substations; ○ Resettlement and Land Compensation			
110 kV Substations			
Works	0.6	0.0	0.6
Civil works and installation	0.6	0.0	0.6
Equitization	0.0	0.0	0.0
Goods	0.0	2.6	2.6
Conductors and accessories	0.0	0.0	0.0
Insulators and Fittings	0.0	0.0	0.0
Concrete poles	0.0	0.0	0.0
Steel Towers, and related materials	0.0	0.1	0.1
Substation Transformers	0.0	0.6	0.6
Substation associated equipment and accessories	0.0	1.4	1.4
Communication Equipment	0.0	0.2	0.2
Other Electrical Equipment	0.0	0.3	0.3
Services	0.0	0.0	0.0
Engineering Consultant for Design and Bidding assistance and other Services	0.0	0.0	0.0
Training	0.0	0.0	0.0
Miscellaneous	0.2	0.0	0.2
Eng. and Admin Overheads	0.2	0.0	0.2
Resettlement and Land Acquisition	0.0	0.0	0.0
Total Base Costs	0.9	2.5	3.5
Physical Contingencies	0.0	0.1	0.1
Price Contingencies	0.0	0.1	0.1
Taxes and Duties	0.1	0.0	0.1
Total Project Costs (without IDC)	1.0	2.8	3.8
Interest During Construction	0.2	0.0	0.2
Total Project Costs for PC3	1.2	2.8	4.0

Cost Estimates for MOI

Project Costs by Component	Local	Foreign	Total Cost
	US\$ million equivalent		
Works			
Civil works and installation	0.0	4.0	4.0
Goods	0.0	0.0	0.0
Services			
Consulting service	0.0	4.0	4.0
Miscellaneous			
Eng. and Admin Overheads	1.3	0.0	1.3
Duties and Taxes	0.0	0.0	0.0
Total Base Costs	1.3	8.0	9.3
Physical Contingencies	0.0	0.0	0.0
Price Contingencies	0.0	0.0	0.0
Taxes and Duties	0.0	0.0	0.0
Total Project Costs (without IDC)	1.3	8.0	9.3
Interest During Construction	0.0	0.0	0.0
Total Project Costs for MOI	1.3	8.0	9.3

Annex 4: Cost Benefit Analysis Summary
VIETNAM: System Efficiency Improvement, Equitization & Renewables Project

(Monetary Values are in US\$)
 (Base Year 2001)

[For projects with benefits that are measured in monetary terms]

	Present Value of Flows		Fiscal Impact	
	Economic Analysis	Financial Analysis ¹	Taxes	Subsidies
Benefits:	US \$ million	US \$ million	US \$ million	
PC 1	203.1	887.8	2.8	
PC 2	162.4	713.0	0.9	
PC 3	73.0	323.5	0.4	
PC DN	19.8	79.9	0.08	
EVN	784	2,042	7.23	
Whole project	1,261	4,063	11.4	
Costs:	US\$ million	US\$ million		
PC 1	123.0	885.8		
PC 2	83.5	691.0		
PC 3	40.1	315.1		
PC DN	10.7	77.8		
EVN	564.0	1,825		
Whole project	826	3,788		
Net Benefits:	US\$ million	US \$ million		
PC 1	80.1	2.0		
PC 2	78.8	22		
PC 3	32.8	8.5		
PC DN	9.0	2.1		
EVN	220	216		
Whole project	435	274		
IRR: %				
PC 1	26.0%	6.8%		
PC 2	37.6%	12.0%		
PC 3	31.0%	11.0%		
PC DN	34.0%	10.7%		
EVN	26.0%	17.5%		
Whole project	28.0 %	15.0%		

¹/ Financial flow is discounted at a rate of 6.5%

Summary of Benefits and Costs:

Economic benefit: Increase power supply, reduce of losses, and increase the reliability and quality of power supplied.

Financial Benefits: Incremental sale revenue to EVN/ PCs

Fiscal benefits: Incremental tax revenue from EVN/PCs

Financial cost: Components invested by PCs and EVN, including fees and taxes.

Economic cost: Components invested by PCs and EVN during the period 2002-2007, excluding fees and taxes.

A. Economic Analysis

General Approach:

The economic analysis for all project components are carried out using two scenarios (i) "with" the project and (ii) "without" the project.

Main Assumptions:

The following assumption are made for the transmission line and substation: (a) all the costs are expressed in constant 2001 prices, making no adjustment for shadow exchange rate or shadow wage rate, (b) the capital investment costs (presented in Annex 3) are considered over 2002-2007, and the analyses are made over a project economic life of 20 years; (c) the cost for the compensation, land acquisition and cost for environmental rehabilitation are included in the economic cost of the project, (d) the operation and maintenance cost are evaluated at 2% of the investment cost, (e) the input energy bought as input, and sold as the output from the system under the consideration are evaluated by the long run marginal cost (LRMC) at the inlet and outlet of the system, which has been estimated in the Power Development Plan No5. The LRMC (estimated up to the year 2020) values at different level have been estimated as follow: at bus bar of the power station 3.904 USc/kWh, at 500/220 kV level 4.569 USc/kWh, at 110 kV level 5.166 USc/kWh, at medium voltage level 6.551 USc/kWh, and 9.373 USc/kWh at the consumer end; (f) the economic internal rate of return (EIRR) of the project component is the discount rate at which the present values of the cost and benefit streams are equal; (g) the net present values (NPV) are based on the discount rate of 10%, which is approximately the opportunity cost of capital in Vietnam; (h) the unserved energy due to the unreliability of the system is evaluated at 46.865 USC/kWwh (approximately 5 times the LRMC).

For the component of improvement of power supply for the rural areas, the "with" project scenario consists of supply and construction of 110 kV Transmission Systems, including substation and associated transmission lines. Additional assumption for this components are (a) operation and maintenance costs evaluated at 2% of the investment cost; (b) the losses are evaluated at LRMC of 5.166 USc/kWh; (c) the incremental energy attributed to the project evaluated at the LRMC for the development of 110 kV system is equal to 0.597 USc/kWh (the LRMC at the 110 kV less the LRMC at 500/220 kV).

For the component of small hydropower rehabilitation the "with" project consists of the supply of goods and works for the rehabilitation and upgrading of the existing small hydropower station. The main assumption for the economic analysis of this component are: (a) the operation and maintenance costs evaluated at 2 %; (b) the incremental output of the small scale hydropower is estimated at LRMC at the end of the 110 kV transmission system 5.166 USc/kWh. The "without" project scenario is that no investment is made and due to the bad condition and lack of the spare parts, the station will stop operation in few year time.

For the improvement of the transmission system, the "with" project scenario consists of supply and construction of 500kV and 220 kV transmission system. Some specific assumption for this component are (a) operation and maintenance costs evaluated at 1% of the investment cost for the transmission line and

2% for the substation; (b) the losses are evaluated at LRMC of 4.569 US c/kWh (c) the incremental energy attributed to the project evaluated at the LRMC for the development of 110 kV system is equal to 0.665 USc/kWh (the LRMC at the LRMC at 500/220 kV less the LRMC at generation).

For the DSM component the “with “ project consists of series of measure such as installing of Time-of-Use(TOU) Metering, Direct Load Control(DLC), Compact Fluorescent Lamps(CFLs), Fluorescent Tube Lamps(FTLs) and the other supporting activities. The benefits of the investment on the DSM is based on the avoided cost of DSM programs were determined based on construction and operation costs for a gas turbine plant for peak periods (US\$54/kW/year and 7.82 USc/kWh at generation level). Other assumptions include: LRMC of 3.904 USc/kWh (at generation level), 5.166 USc/kWh (at 110 kV level), 9.373 USc/kWh (below 6 kV), average. BST for all PCs 3.33 USc/kWh, economic BST of 5.17 USc/kWh, average retail tariff of 3.33 USc/kWh, T&D losses of 15%.

Improvement of power supply for the rural areas in PC 1 region

The "with" project scenario consist of supply and construction of 110 kV Transmission Systems, including construction and/or upgrading of 22 substations (110/35/22 kV), with total capacity of 450 MVA, and 576 Km of associated transmission lines. The project component will remove the bottleneck between the transmission system and distribution system to increase the power supply from national grid to the rural area in the 14 province of the northern region. The “without” project scenario assumes that no capital investment would be made.

Table 1 present the cash flows for two scenarios for the economic analysis, and based on the above assumptions, the EIRR is estimated at 26 % and NPV at US\$80.1 million.

A sensitivity analysis was carried out for some key parameters: Project cost increases of 20% results in a decrease of EIRR to 19.2 %. In the case the benefits reduce by 20%, then the EIRR will decrease to 17.9%. In the case if the costs increases by 10%, and the benefits decrease by 10% the EIRR will decrease from 26% to 18.6 %.

The analysis shows that the economic rate of return on this project component, in every case is still higher than the 10 % threshold.

Rehabilitation of Small Hydro in PC1 region

The “ with project” scenario consist of supply goods and works for rehabilitation of two small scale hydropower projects, namely Chieng Ngam and Thac Bay. The “without” project scenario assumes that no capital investment would be made, and the two stations could maintain 90% capacity for 5 years, and after that the capacity will decrease to 50 % and stop operation within next 10 years.

Table 2 presents the cash flow for the economic analysis of this component. Based on the above assumption the EIRR of the two plants is estimated at 32 %, and NPV at US\$ 4.2 mill.

A sensitivity analysis was carried out for some key parameters: Project cost increases of 20% results in a decrease of EIRR to 27 %. In the case the load forecast reduces by 20 %, then the EIRR will decrease to 26 %. In the case of simultaneous increase of costs by 20%, and the benefits decrease by 20%, the EIRR will decrease from 32% to 22%. In this worst case the EIRR is still higher than the cut off 10%.

Improvement of Power supply for the rural areas in PC2 region

The "with project" scenario consist of supply and construction of Transmission Systems (110/22 kV), including construction and/or upgrading of 15 substations (110 kV/22 kV), with the total capacity of 330 MVA, and 100 km associated 110 kV transmission lines. The project component will remove the bottleneck between the transmission system and distribution system to increase the power supply from national grid to the rural area in 8 province of the southern region. The "without" project scenario assumes that no capital investment would be made.

Table 3 present the cash flows two scenarios for the economic analysis, and based on the above assumptions, the EIRR is estimated at 37.6% and NPV at US\$78.8 million.

A sensitivity analysis was carried out for some key parameters: Project cost increases of 20% results in a decrease of EIRR to 27.3%. In the case the load forecast reduces by 20%, then the EIRR will decrease to 25.5%. In the case if the costs increase by 10%, and the benefits decrease by 10% the EIRR will decrease from 37.6% to 26.5%.

The analysis shows that the economic rate of return on this project component, in every case is still higher than the 10% threshold.

Rehabilitation of Small Hydro in PC2 region

The "with project" scenario consist of supply and construction of goods and works for rehabilitation of one small scale hydropower project, namely An Kroet Station. The "without" project scenario assumes that no capital investment would be made, and the An Kroet station could remain 80% of its capacity during next 5 years, and further decreases to 30% in subsequent 5 years and will totally stop after that. **Table 4** presents the cash flow for the economic analysis of this project. Based on the above assumptions, the EIRR of the two plants is estimated at 19%, and NPV at US\$1.67 mil.

A sensitivity analysis was carried out for some key parameters: Project cost increases of 20% results in a decrease of EIRR to 16%. In the case the load forecast reduces by 20%, then the EIRR will decrease to 16%. In the case if the costs increase by 20%, and the benefits decrease by 20% the EIRR will decrease from 19% to 13% in this worst assumption the EIRR is still higher than the cut off 10%.

Improvement of power supply for rural areas in PC3 region

The "with project" scenario consist of supply and construction of Transmission Systems, including construction and/or upgrading 8 substations (110/22 kV), with the total capacity of 200 MVA, and construction of 74 km associated 110 kV transmission lines. The project component will remove the bottleneck between the transmission system and distribution system to increase the power supply from national grid to the rural area in 6 provinces in the central region. The "without" project scenario assumes that no capital investment would be made.

Table 5 present the cash flows two scenarios for the economic analysis, and based on the above assumptions, the EIRR is estimated at 31% and NPV at US\$ 32.8 million.

A sensitivity analysis was carried out for some key parameters: Project cost increases of 20% results in a decrease of EIRR to 22.8%. In the case the load forecast reduces by 20%, then the EIRR will decrease to 21.3%. In the case if the costs increase by 10%, and the benefits decrease by 10% the EIRR will decrease

from 31% to 22.2%.

The analysis shows that the economic rate of return on this project component, in every case is still higher than the 10 % threshold.

Rehabilitation of Small Hydro in PC3 region

The “with project scenario consist of supply and construction good and works for rehabilitation of one small scale hydropower project, namely Kon Dao and An Diem Stations. The “without” project scenario assumes that no capital investment would be made, and the Kon Dao station will stop operation in 3 year time, the An Diem station will stop operation in 5 year time. **Table 6** presents the cash flow for the economic analysis of this project.

Based on the above assumption the EIRR of the two plants is estimated at 68 %, and NPV at US\$6.2 mil.

A sensitivity analysis was carried out for some key parameters: Project cost increases of 20% results in a decrease of EIRR to 61 %. In the case the load forecast reduces by 20 %, then the EIRR will decrease to 60 %. In the case if the costs increase by 20%, and the benefits decrease by 20% the EIRR will decrease from 54% to 61%.

Improvement of power supply for rural areas in Dong Nai PC region

The "with" project scenario consist of supply and construction of Transmission Systems, including construction of 2 substations (110 kV/22 kV), with the total capacity of 50 MVA, and 24.5 km of the associated 110 kV transmission lines. The project component will remove the bottleneck between the transmission system and distribution system to increase the power supply from national grid to the rural area in Dong Nai province. The “without” project scenario assumes that no capital investment would be made.

Table 7 present the cash flows for two scenarios for the economic analysis, and based on the above assumptions, the EIRR is estimated at 34 % and NPV at US\$9.0 million.

A sensitivity analysis was carried out for some key parameters: Project cost increases of 20% results in a decrease of EIRR to 20.8 %. In the case the load forecast reduces by 20 %, then the EIRR will decrease to 18.9%. In the case if the costs increase by 10%, and the benefits decrease by 10% the EIRR will decrease from 31% to 19.9%.

The analysis shows that the economic rate of return on this project component, in every case is still higher than the 10 % threshold.

Improvement efficiencies of 500 kV and 220 kV transmission system of EVN

For the 500 kV system , the "with" project scenario consist of supply and construction of 260 km 500 kV transmission line from Pleiku to Da Nang via Binh Son Substation , including expansion of the Pleiku and Da Nang Substations. The “without” project scenario assumes that there will only be a 220 kV double circuit transmission line from Dung Quat to Pleiku. For the 220 kV system, the "with" project scenario consist of supply and construction of Transmission Systems, including construction and/or expansion of 8 substations (220/110/22 kV), with the total capacity of 625 MVA, and 105 km of the associated 220 kV transmission lines. The project component will remove the bottleneck in the transmission system. The

“without” project scenario assumes that no capital investment would be made.

Table 8 present the cash flows two scenarios for the economic analysis, and based on the above assumptions, the EIRR is estimated at 25% and NPV at US\$220 million.

A sensitivity analysis was carried out for some key parameters: Project cost increases of 20% results in a decrease of EIRR to 16.6%. In the case the load forecast reduces by 20 %, then the EIRR will decrease to 14.7%. In the case if the costs increase by 10%, and the benefits decrease by 10% the EIRR will decrease from 26% to 15.7%.

The analysis shows that the EIRR on this project component, in every case, is still higher than the 10% threshold.

Demand Side Management Component

Based on the above mentioned for the DMS, the NPV of the project component is estimated to be US\$ 80.7 millions. The other economic indicators of this component is given in **Table 9**.

The net present value for the total project is estimated at US\$ 460 with an EIRR of 31%.

Sensitivity analysis / Switching values of critical items:

Switching Values of Critical Items to drop EIRR to 10%:

Variable	PC1	PC 2	PC 3	PC DN	EVN	Whole Project
Benefits decrease to	60%	51.5%	51%	55%	72%	65.5%
Cost increase to	164.5%	195%	197%	184%	139%	152%

The economic viability of the project was tested for key project risks and was found to be robust.

B. Financial Analysis

A financial analysis of each project component is conducted with costs based on : (a) investment cost including duties and taxes and interest during construction; (b) operation and maintenance cost at 2 % of investment cost; and (c) revenues from energy sales (after allowing for losses) at the average sales prices for each power company. The financial internal rates of return FIRR’s and NPV’s at 6.5 % discount rate are estimated as follows:

	PC1	PC2	PC3	PC DN	EVN
NPV (US\$ mil.)	2	22	8.5	2.1	216
FIRR %	6.8	12	11	10.7	17.5

Table 1

Economic analysis for 110 kV substations and transmission lines of PC1

PV (i=10%) of Costs	123.0 US\$ mil
PV (i=10%) of Benefits	203.1 US\$ mil

EIRR	26%
NPV (10%)	80.1 US\$ mil

Year	With Project							Without Project							
	Invest 10 ³ \$	O&M 10 ³ \$	Losses GWh	Unserved energy GWh	Losses value 10 ³ \$	Unserved ener. value 10 ³ \$	Total costs 10 ³ \$	Losses GWh	Unserved energy GWh	Incremental energy GWh	Losses value 10 ³ \$	Unserved ener. value 10 ³ \$	Incremental ener. value 10 ³ \$	Total costs 10 ³ \$	Net benefits 10 ³ \$
2002	5,565	0	47.3	9.0	2,442	4,231	12,238	47	9	0	2,442	4,277	0	6,719	-5,518
2003	38,956	0	54.6	9.7	2,818	4,548	46,322	60	11	87	3,084	5,345	425	8,853	-37,468
2004	11,130	1,113	55.1	8.1	2,847	3,797	18,887	94	14	835	4,879	6,764	4,870	16,514	-2,373
2005	0	1,113	52.3	5.6	2,704	2,603	6,420	106	15	996	5,453	7,108	5,817	18,378	11,958
2006	0	1,113	55.7	5.8	2,876	2,733	6,722	116	15	1,127	5,988	7,232	6,580	19,800	13,078
2007	0	1,113	60.9	6.0	3,148	2,834	7,095	126	16	1,263	6,509	7,338	7,367	21,213	14,119
2008	0	1,113	65.6	7.0	3,391	3,286	8,234	135	16	1,377	6,996	7,441	8,020	22,457	14,223
2009	0	1,137	70.3	7.3	3,629	3,426	8,652	145	16	1,560	7,483	7,625	9,084	24,192	15,540
2010	0	1,157	81.3	7.7	4,198	3,597	9,257	157	16	1,765	8,136	7,655	10,251	26,043	16,786
2011	0	1,157	87.4	7.8	4,515	3,668	9,340	169	16	1,876	8,723	7,720	10,861	27,304	17,964
2012	0	1,157	92.6	7.9	4,785	3,700	9,642	180	17	2,001	9,277	7,780	11,552	28,609	18,967
2013	0	1,157	98.3	7.9	5,079	3,725	9,961	191	17	2,131	9,881	7,895	12,260	30,035	20,075
2014	0	1,157	104.1	8.0	5,379	3,756	10,292	203	17	2,265	10,498	7,960	12,992	31,450	21,158
2015	0	1,157	110.2	8.1	5,692	3,775	10,624	216	17	2,395	11,143	8,026	13,685	32,854	22,230
2016	0	1,157	116.7	8.1	6,029	3,797	10,983	229	17	2,534	11,841	8,103	14,428	34,372	23,389
2017	0	1,157	122.3	8.2	6,316	3,821	11,295	240	17	2,596	12,402	8,164	14,807	35,373	24,079
2018	0	1,157	124.8	8.2	6,449	3,838	11,443	245	18	2,639	12,649	8,237	15,070	35,956	24,513
2019	0	1,157	126.7	8.2	6,548	3,856	11,561	248	18	2,650	12,825	8,265	15,146	36,237	24,676
2020	0	1,157	128.4	8.2	6,635	3,856	11,648	252	18	2,662	13,015	8,293	15,227	36,535	24,887
2021	0	1,157	130.3	8.2	6,729	3,856	11,742	256	18	2,675	13,219	8,321	15,314	36,854	25,113
2022	0	1,157	131.4	8.2	6,786	3,856	11,799	258	18	2,689	13,353	8,359	15,396	37,108	25,309
2023	0	1,157	132.5	8.2	6,847	3,856	11,860	261	18	2,703	13,495	8,401	15,484	37,380	25,521
2024	0	1,157	133.8	8.2	6,912	3,856	11,925	264	18	2,719	13,649	8,443	15,578	37,671	25,746
2025	0	1,157	135.2	8.2	6,982	3,856	11,995	267	18	2,736	13,815	8,495	15,679	37,988	25,994

Table 2

Economic Analysis for rehabilitation of Chieng Ngam and Thac Bay Hydropower Stations (PC1)

PV of Cost:			2.2 US\$ mil	EIRR			32%		
PV of Benefits:			6.3 US\$ mil	NPV(i=10 %)			4.2	US\$ mil	
Year	Rehab. Cost	incremental O&M cost	Total Costs	Energy production without rehabilitation	Energy production with rehabilitation	Incremental energy production	Total benefits	Net Benefits	
	US\$ 1,000	US\$ 1,000	US\$ 1,000	MWh	MWh	MWh	US\$ 1,000	US\$ 1,000	
2002	200	0	200	19350	19350	0	0	-200	
2003	1600	0	1600	19350	19350	0	0	-1600	
2004	514	0	514	19350	28000	8650	447	-67	
2005		46	46	17460	28000	10540	544	498	
2006		46	46	15570	28000	12430	642	596	
2007		46	46	10225	28000	17775	918	872	
2008		46	46	9280	28000	18720	967	921	
2009		46	46	8335	28000	19665	1016	970	
2010		46	46	5500	28000	22500	1162	1116	
2011		46	46	5500	28000	22500	1162	1116	
2012		46	46	5500	28000	22500	1162	1116	
2013		46	46	5500	28000	22500	1162	1116	
2014		46	46	5500	28000	22500	1162	1116	
2015		46	46	5500	28000	22500	1162	1116	
2016		46	46	5500	28000	22500	1162	1116	
2017		46	46	0	28000	28000	1446	1400	
2018		46	46	0	28000	28000	1446	1400	
2019		46	46	0	28000	28000	1446	1400	
2020		46	46	0	28000	28000	1446	1400	

Table 3

Economic analysis for 110 kV substations and transmission lines of PC2

NP of Cost	83.5 US\$ mil
NP of Benefits	162.4 US\$ mil

EIRR	37.6%
NPV	78.8 US\$ mil

Year	With Project							Without Project							Net benefits
	Invest	O&M	Losses	Unserved energy	Losses value	Unserved ener. value	Total costs	Losses	Unserved energy	Incremental energy	Losses value	Unserved ener. value	Incremental ener. value	Total costs	
	103 \$	103 \$	GWh	GWh	103 \$	103 \$	103 \$	GWh	GWh	GWh	103 \$	103 \$	103 \$	103 \$	
2002	2,990	0	51.1	8.1	2,641	3,815	9,445	53	10		2,733	4,790	211	7,733	-1,712
2003	20,928	0	57.8	8.4	2,988	3,955	27,871	60	11	71	3,091	5,211	425	8,728	-19,143
2004	5,979	598	55.9	7.4	2,888	3,463	12,929	63	11	404	3,258	5,258	2,414	10,930	-1,998
2005	0	598	45.6	4.1	2,354	1,903	4,854	79	11	782	4,102	5,305	4,671	14,078	9,224
2006		598	50.9	4.1	2,629	1,903	5,129	91	11	888	4,701	5,305	5,301	15,307	10,177
2007		598	56.0	4.1	2,894	1,903	5,394	100	11	1,033	5,188	5,305	6,166	16,659	11,265
2008		598	61.6	4.1	3,184	1,903	5,685	111	11	1,173	5,728	5,305	7,003	18,036	12,351
2009		598	67.9	4.1	3,509	1,903	6,010	123	11	1,329	6,335	5,305	7,937	19,577	13,567
2010		598	77.2	4.1	3,986	1,903	6,487	139	11	1,529	7,200	5,305	9,125	21,631	15,144
2011		598	81.9	4.1	4,231	1,903	6,731	147	11	1,638	7,618	5,305	9,780	22,703	15,972
2012		598	87.0	4.1	4,494	1,903	6,995	156	11	1,757	8,068	5,305	10,488	23,861	16,866
2013		598	90.8	4.1	4,688	1,903	7,189	163	11	1,844	8,407	5,305	11,007	24,719	17,530
2014		598	93.9	4.1	4,852	1,903	7,352	168	11	1,928	8,692	5,305	11,512	25,510	18,158
2015		598	97.0	4.1	5,009	1,903	7,510	174	11	1,986	8,970	5,305	11,858	26,132	18,622
2016		598	99.5	4.1	5,138	1,903	7,639	178	11	2,028	9,201	5,305	12,104	26,611	18,972
2017		598	101.0	4.1	5,218	1,903	7,718	182	11	2,061	9,413	5,305	12,304	27,022	19,304
2018		598	102.4	4.1	5,288	1,903	7,789	185	11	2,080	9,541	5,305	12,417	27,263	19,474
2019		598	103.4	4.1	5,340	1,903	7,840	187	11	2,091	9,639	5,305	12,485	27,430	19,590
2020		598	104.4	4.1	5,394	1,903	7,894	189	11	2,104	9,744	5,305	12,559	27,608	19,713
2021		598	105.5	4.1	5,450	1,903	7,950	191	11	2,117	9,852	5,305	12,636	27,793	19,842
2022		598	106.7	4.1	5,510	1,903	8,011	193	11	2,131	9,970	5,305	12,721	27,996	19,985
2023		598	107.9	4.1	5,573	1,903	8,074	195	11	2,146	10,092	5,305	12,812	28,209	20,136
2024		598	109.2	4.1	5,639	1,903	8,140	198	11	2,162	10,222	5,305	12,908	28,435	20,295
2025		598	110.5	4.1	5,708	1,903	8,209	201	11	2,180	10,358	5,305	13,012	28,675	20,466

Table 4

Economic analysis for Ankroet small hydropower station (PC2)

NP of Cost	1.8 US\$ mil
NP of Benefits	3.5 US\$ mil

EIRR	19%
NPV	1.67 US\$ mil

Year	Rehab. Cost	incremental O&M cost	Total Costs	Energy production with rehabilitation	Energy Production without rehabilitation	Incremental Energy production	Total benefits	Net Benefits
				MWh	MWh	MWh		
2002	581	0	581	12500	12500	0	0	-581
2003	969	0	969	12500	12500	0	0	-969
2004	378	0	378	12500	12500	0	0	-378
2005		38.56	38.56	12500	17600	5100	263.466	224.906
2006		38.56	38.56	12500	17600	5100	263.466	224.906
2007		38.56	38.56	12500	17600	5100	263.466	224.906
2008		38.56	38.56	12500	17600	5100	263.466	224.906
2009		38.56	38.56	12500	17600	5100	263.466	224.906
2010		38.56	38.56		17600	17600	909.216	870.656
2011		38.56	38.56		17600	17600	909.216	870.656
2012		38.56	38.56		17600	17600	909.216	870.656
2013		38.56	38.56		17600	17600	909.216	870.656
2014		38.56	38.56		17600	17600	909.216	870.656
2015		38.56	38.56		17600	17600	909.216	870.656
2016		38.56	38.56		17600	17600	909.216	870.656
2017		38.56	38.56		17600	17600	909.216	870.656
2018		38.56	38.56		17600	17600	909.216	870.656
2019		38.56	38.56		17600	17600	909.216	870.656
2020		38.56	38.56		17600	17600	909.216	870.656

Table 5

Economic analysis for 110 kV substations and transmission lines of PC3

Total NPV (i=10%) of Costs 40.1 US\$ mil								EIRR 31%							
Total NPV (i=10%) of Benefits 73.0 US\$ mil								NPV(10%) 32.8 US\$ mil							
Year	With Project							Without Project							Net benefits 10 ³ \$
	Invest	O&M	Losses	Unservd energy	Losses value	Unservd ener. value	Total costs	Losses	Unservd energy	Incremental energy	Losses value	Unservd ener. value	Incremental ener. value	Total costs	
	10 ³ \$	10 ³ \$	GWh	GWh	10 ³ \$	10 ³ \$	10 ³ \$	GWh	GWh	GWh	10 ³ \$	10 ³ \$	10 ³ \$	10 ³ \$	
2002	1,447	0	23.5	4.0	1,214	1,875	4,535	24	5	8	1,216	2,228	50	3,494	-1,041
2003	10,127	0	23.9	4.0	1,235	1,875	13,236	24	5	32	1,232	2,241	193	3,667	-9,569
2004	2,893	289	22.6	3.2	1,165	1,518	5,866	24	5	157	1,259	2,291	938	4,488	-1,378
2005	0	289	14.6	2.1	753	1,005	2,047	29	5	240	1,492	2,291	1,430	5,214	3,167
2006		289	17.6	2.2	908	1,008	2,206	35	5	302	1,785	2,291	1,803	5,879	3,673
2007		289	20.6	2.2	1,066	1,012	2,367	40	5	365	2,077	2,291	2,180	6,549	4,182
2008		289	23.8	2.2	1,227	1,016	2,532	46	5	430	2,375	2,291	2,567	7,234	4,701
2009		289	26.9	2.2	1,391	1,021	2,701	52	5	496	2,673	2,291	2,961	7,925	5,224
2010		289	30.8	2.2	1,590	1,024	2,904	59	5	573	3,039	2,291	3,423	8,754	5,850
2011		289	34.5	2.2	1,784	1,028	3,899	66	5	649	3,392	2,291	3,875	9,559	5,659
2012		289	38.5	2.2	1,990	1,033	3,312	73	5	730	3,769	2,291	4,357	10,417	7,105
2013		289	42.8	2.2	2,212	1,038	3,540	81	5	817	4,175	2,291	4,879	11,346	7,806
2014		289	46.3	2.2	2,392	1,043	3,725	87	5	890	4,500	2,291	5,312	12,103	8,379
2015		289	49.2	2.2	2,543	1,049	3,881	93	5	957	4,795	2,291	5,715	12,801	8,920
2016		289	52.0	2.2	2,689	1,053	4,031	98	5	1,020	5,084	2,291	6,088	13,464	9,433
2017		289	54.4	2.3	2,812	1,057	4,159	103	5	1,074	5,332	2,291	6,412	14,035	9,877
2018		289	56.6	2.3	2,922	1,061	4,272	107	5	1,123	5,550	2,291	6,705	14,546	10,274
2019		289	57.5	2.3	2,968	1,066	4,324	109	5	1,151	5,644	2,291	6,871	14,806	10,482
2020		289	57.5	2.3	2,968	1,066	4,324	109	5	1,165	5,644	2,291	6,954	14,889	10,566
2021		289	57.5	2.3	2,968	1,066	4,324	109	5	1,176	5,644	2,291	7,021	14,956	10,633
2022		289	57.5	2.3	2,968	1,066	4,324	109	5	1,188	5,644	2,291	7,094	15,029	10,705
2023		289	57.5	2.3	2,968	1,066	4,324	109	5	1,189	5,644	2,291	7,096	15,031	10,707
2024		289	57.5	2.3	2,968	1,066	4,324	109	5	1,189	5,644	2,291	7,096	15,031	10,707
2025		289	57.5	2.3	2,968	1,066	4,324	108	5	1,189	5,557	2,217	7,096	14,869	10,545

Table 6

**ECONOMIC ANALYSIS FOR AN DIEM AND KON DAO SMALL
HYDROPOWER STATIONS**

NP of Cost	0.6 US\$ mil
NP of Benefits	6.9 US\$ mil

EIRR	68%
NPV(i=12%)	6.2

Year	Reha b. Cost	incremental O&M cost	Total Costs	Energy product ion without rehabili tation	Energy production with rehabilitati on	Incremental energy production	Total benefits	Net Benefits
	US\$ 1,000	US\$ 1,000	US\$ 1,000	MWh	MWh	MWh	US\$ 1,000	US\$ 1,000
2002	70	0	70	21500	21500	0	0	-70
2003	390	0	390	21500	21500	0	0	-390
2004	199	0	199	21500	21500	0	0	-199
2005		13.18	13.18	20000	27000	7000	361.62	348.44
2006		13.18	13.18	20000	27000	7000	361.62	348.44
2007		13.18	13.18	0	27000	27000	1394.82	1381.64
2008		13.18	13.18	0	27000	27000	1394.82	1381.64
2009		13.18	13.18	0	27000	27000	1394.82	1381.64
2010		13.18	13.18	0	27000	27000	1394.82	1381.64
2011		13.18	13.18	0	27000	27000	1394.82	1381.64
2012		13.18	13.18	0	27000	27000	1394.82	1381.64
2013		13.18	13.18	0	27000	27000	1394.82	1381.64
2014		13.18	13.18	0	27000	27000	1394.82	1381.64
2015		13.18	13.18	0	27000	27000	1394.82	1381.64
2016		13.18	13.18	0	27000	27000	1394.82	1381.64
2017		13.18	13.18	0	27000	27000	1394.82	1381.64
2018		13.18	13.18	0	27000	27000	1394.82	1381.64
2019		13.18	13.18	0	27000	27000	1394.82	1381.64
2020		13.18	13.18	0	27000	27000	1394.82	1381.64

Table 7

Economic analysis for 110 kV substations and transmission lines of PC Dong Nai

		Total NPV (i=10%) of Costs 10.7 US\$ mil						EIRR 34%							
		Total NPV (i=10%) of Benefits 19.8 US\$ mil						NPV(10%) 9.0 US\$ mil							
Year	With Project							Without Project							Net benefits
	Invest	O&M	Losses	Unservd energy	Losses value	Unservd ener. value	Total costs	Losses	Unservd energy	Incremental energy	Losses value	Unservd ener. value	Incremental ener. value	Total costs	
	10 ³ \$	10 ³ \$	GWh	GWh	10 ³ \$	10 ³ \$	10 ³ \$	GWh	GWh	GWh	10 ³ \$	10 ³ \$	10 ³ \$	10 ³ \$	
2002	377	0	5.7	1.1	293	516	1,185	8	1	0	407	656	0	1,063	-122
2003	2,638	0	6.7	1.1	344	516	3,497	9	1	0	475	656	0	1,131	-2,366
2004	754	75	7.7	1.1	399	516	1,743	11	1	0	556	656	1	1,213	-530
2005	0	75	6.8	0.5	353	234	663	12	1	72	617	656	430	1,703	1,040
2006		75	7.7	0.5	397	234	706	13	1	83	667	656	494	1,817	1,111
2007		75	8.0	0.5	414	234	723	14	1	95	700	656	568	1,925	1,202
2008		75	8.4	0.5	432	234	742	14	1	110	737	656	654	2,047	1,305
2009		75	8.7	0.5	452	234	761	15	1	126	776	656	752	2,184	1,423
2010		75	9.2	0.5	473	234	783	16	1	145	819	656	865	2,340	1,557
2011		75	9.6	0.5	496	234	806	17	1	167	865	656	994	2,515	1,710
2012		75	10.1	0.5	521	234	830	18	1	192	915	656	1,143	2,714	1,884
2013		75	10.6	0.5	548	234	857	19	1	220	968	656	1,315	2,939	2,082
2014		75	11.2	0.5	577	234	886	20	1	246	1,026	656	1,466	3,148	2,262
2015		75	11.8	0.5	608	234	918	21	1	261	1,089	656	1,560	3,305	2,388
2016		75	12.4	0.5	642	234	951	22	1	270	1,156	656	1,612	3,424	2,473
2017		75	13.1	0.5	678	234	988	24	1	270	1,229	656	1,612	3,497	2,510
2018		75	13.9	0.5	718	234	1,027	25	1	270	1,308	656	1,612	3,576	2,549
2019		75	14.7	0.5	760	234	1,070	27	1	270	1,393	656	1,612	3,661	2,592
2020		75	15.6	0.5	806	234	1,116	29	1	270	1,485	656	1,612	3,753	2,638
2021		75	15.6	0.5	805	234	1,115	29	1	270	1,484	656	1,612	3,752	2,637
2022		75	15.6	0.5	805	234	1,115	29	1	270	1,484	656	1,612	3,752	2,637
2023		75	15.6	0.5	805	234	1,115	29	1	270	1,484	656	1,612	3,752	2,637
2024		75	15.6	0.5	805	234	1,115	29	1	270	1,484	656	1,612	3,752	2,637
2025		75	15.6	0.5	805	234	1,115	29	1	270	1,484	656	1,612	3,752	2,637

Table 8

Economic analysis for 500/220 kV substations and transmission lines of EVN

Total NPV (i=10%) of Costs 563.8 US\$ mil
Total NPV (i=10%) of Benefits 784.1 US\$ mil

EIRR 26.0%
NPV(10%) 220.3 US\$ mil

Year	With Project							Without Project							Net benefits 10 ³ \$
	Invest	O&M	Losses	Unservd energy	Losses value	Unservd ener. value	Total costs	Losses	Unservd energy	Incremental energy	Losses value	Unservd ener. value	Incremental ener. value	Total costs	
	10 ³ \$	10 ³ \$	GWh	GWh	10 ³ \$	10 ³ \$	10 ³ \$	GWh	GWh	GWh	10 ³ \$	10 ³ \$	10 ³ \$	10 ³ \$	
2002	14,428	0	263.1	39.4	13,029	18,458	45,915	285	43	0	13,029	20,023	0	33,052	-12,863
2003	62,135	0	266.1	43.4	13,169	20,322	95,625	290	49	38	13,232	23,088	252	36,572	-59,053
2004	38,570	2,886	266.9	47.3	15,394	22,167	79,016	291	53	785	13,276	24,931	5,220	43,428	-35,589
2005	19,429	2,886	240.6	45.0	14,566	21,097	57,977	295	55	2,194	13,458	25,765	14,593	53,816	-4,162
2006	9,715	2,886	253.1	59.2	15,604	27,723	55,928	314	73	3,474	14,338	34,150	23,103	71,591	15,663
2007	0	2,886	253.8	64.2	16,099	30,094	49,078	315	78	5,339	14,389	36,534	35,503	86,426	37,348
2008	0	2,886	254.5	66.7	16,597	31,261	50,744	316	81	6,134	14,446	38,019	40,794	93,259	42,515
2009	0	2,886	255.2	69.4	17,253	32,546	52,685	317	84	7,007	14,495	39,283	46,599	100,376	47,691
2010	0	2,886	257.6	72.6	17,983	34,040	54,908	322	87	7,890	14,722	40,682	52,466	107,870	52,962
2011	2,667	2,939	257.7	76.0	18,765	35,608	59,979	322	90	8,740	14,728	42,171	58,119	115,018	55,039
2012	0	2,939	258.4	79.6	19,575	37,325	59,839	323	93	9,932	14,764	43,806	66,045	124,616	64,777
2013	0	2,939	259.2	82.3	20,542	38,586	62,067	324	95	10,429	14,804	44,458	69,351	128,612	66,545
2014	0	2,939	260.1	84.0	21,669	39,350	63,958	325	96	10,757	14,848	45,172	71,535	131,555	67,598
2015	0	2,939	261.0	85.8	22,024	40,189	65,152	326	98	10,877	14,897	45,956	72,329	133,183	68,031
2016	0	2,939	261.0	87.7	22,024	41,112	66,075	326	100	10,914	14,897	46,816	72,577	134,291	68,216
2017	0	2,939	261.0	89.7	22,024	42,040	67,003	326	102	10,917	14,897	47,760	72,601	135,258	68,255
2018	0	2,939	261.0	89.7	22,024	42,040	67,003	326	102	10,917	14,897	47,760	72,601	135,258	68,255
2019	0	2,939	261.0	89.7	22,024	42,040	67,003	326	102	10,917	14,897	47,760	72,601	135,258	68,255
2020	0	2,939	261.0	89.7	22,024	42,040	67,003	326	102	10,917	14,897	47,760	72,601	135,258	68,255
2021	0	2,939	261.0	89.7	22,024	42,040	67,003	326	102	10,917	14,897	47,760	72,601	135,258	68,255
2022	0	2,939	261.0	89.7	22,024	42,040	67,003	326	102	10,917	14,897	47,760	72,601	135,258	68,255
2023	0	2,939	261.0	89.7	22,024	42,040	67,003	326	102	10,917	14,897	47,760	72,601	135,258	68,255
2024	0	2,939	261.0	89.7	22,024	42,040	67,003	326	102	10,917	14,897	47,760	72,601	135,258	68,255
2025	0	2,939	261.0	89.7	22,024	42,040	67,003	326	102	10,917	14,897	47,760	72,601	135,258	68,255

Table 9. Phase 2 DSM Program Cost and Benefits

Program Components	Estimated Costs (USD million)	IDA (USD million)	GEF (USD million)	EVN (USD million)	Peak Reduction (MW)	Energy Savings (GWh/yr)
<i>Main DSM Programs</i>						
Time-of-Use (TOU) Metering	2.25	2.25	0	0	69.7	0
Direct Load Control (DLC)	0.72	0.60	0	0.12	3.1	0
Compact Fluorescent Lamps (CFLs)	1.79	0.89	0.90	0	33.4	39.0
Fluorescent Tube Lamps (FTLs)	0.81	0	0.75	0.06	14.4	25.2
<i>Supporting Activities</i>						
Expanded load research	0.90	0.90	0	0		
DSM business opportunities	0.25	0	0.25	0		
DSM planning, pilots, M & E	0.80	0.40	0.35	0.05		
Staff, facilities and equipment	0.70	0.16	0	0.54		
TOTAL	8.22	5.20	2.25	0.77	120.5	64.2

**Benefit/Cost Analyses for All DSM Programs (Including Supporting Activities)
(All Costs/Benefits are in million USD)**

Perspective	Economic Analysis			
	Benefits	Costs	NPV	B/C ratio
EVN (Financial)	96.39	19.50	76.89	4.9
PCs (Financial)	27.95	21.77	6.18	1.3
Customers (Financial)	21.17	2.57	18.60	8.2
National (Economic)	88.56	7.82	80.74	11.3

Assumptions: The avoided cost of DSM programs were determined based on construction and operation costs for a gas turbine plant for peak periods (US\$54/kW/year and 7.82 USc/kWh at generation level). Other assumptions include: LRMC of 3.904 USc/kWh (at generation level), 5.166 USc/kWh (at 110 kV level), 9.373 USc/kWh (below 6 kV), ave. BST for all PCs 3.33 USc/kWh, economic BST of 5.17 USc/kWh, ave. retail tariff of 3.33 USc/kWh, T&D losses of 15%,

Annex 5: Financial Summary

VIETNAM: System Efficiency Improvement, Equitization & Renewables Project

Annex 5 A

Financial Assessment of the Sector Utilities

1. The past performance of the implementing agencies, EVN and the PCs, key financial issues and expected future performance are discussed below.

A. Historical Financial Performance

2. Financial Performance of EVN. Since its creation in FY95, EVN's financial performance has been satisfactory on the strength of high demand growth and rapid expansion of the Vietnamese economy. Electricity consumption in FY96-98 grew by 16% per year, which exceeded GDP growth. The strong performance was reflected in EVN's financial ratios: from FY96-98, the operating margin averaged 17% and the self-financing ratio (SFR), 36%. The regional financial and social crisis of FY97/8 severely constrained access to external financing and revenue sources to support Vietnam's development. However, largely due to the continued robust demand for power, EVN sustained its satisfactory financial performance and strong results: from FY98-00, the operating margin averaged 14% and the SFR, 34%.

3. Financial Condition of EVN. The audited consolidated balance sheet of EVN as of FY00 showed total fixed assets of D 61.2 trillion, consisting largely of net fixed assets in generation, transmission, distribution and other assets (except land) of D 23.7 trillion and construction works in progress of D 22.1 trillion. The significant proportion of assets under construction demonstrate on the one hand, a rapidly expanding utility whose growth potential is limited only by its own absorptive and financing capacities, and on the other, by the huge challenge it faces in managing these investment projects. Up until FY96, EVN's fixed assets were largely financed from government equity and no significant long-term debt were incurred. At present, however, financing of new assets come from a near even split of long-term borrowings (D 25.6 trillion) and capital and retained earnings (D 28.4 trillion). The debt equity ratio has been steadily rising from 0.1x in FY96 to 0.9x in FY00. EVN's growing reliance on external long-term debts to finance capital expansion is typical of a young utility and its capital structure is still satisfactorily leveraged. However, the pressure of servicing these debts is beginning to have a significant impact on EVN's cash flow; the debt service coverage ratio (DSCR) has been declining in recent years from its peak of 218x in FY98 to 3x in FY00. Although the ratio recorded is still satisfactory and well below the required minimum of 1.5x imposed by IDA, maintaining a sound financial condition while in an expansive mode would impose an additional challenge to EVN in the future.

4. Audit and Financial Reporting. The consolidated financial accounts of EVN for the year ended December 31, 2000 was qualified by the independent auditors primarily due to the failure of EVN at year-end to eliminate the inter-company receivables and payables with its subsidiary units. Due to the decentralized nature of its accounting system, EVN was not able to fully eliminate year-end balances of D 106.8 billion in receivables and D 169.3 billion in payables with certain PCs. EVN is aware that: (a) the outstanding inter-company accounts have been an audit qualification since FY98; (b) significant amounts of inter-company accounts do not reflect an accurate financial position of EVN; and (c) efforts should be made to eliminate these accounts at year-end or if not possible, to re-state balances to take these into account. In the FY99 audits, inter-company accounts were reconciled to an immaterial difference at year-end, however, adjustments to reconcile the accounts were recorded in FY99 instead of restating the account balances for the years in which the transactions which caused the discrepancies occurred. EVN

has agreed to resolve, once and for all, this outstanding qualification because not only do they distort the true financial position of EVN by under- or over-reporting asset values, but they also prevent the achievement of clean audits. At negotiations, *agreement would be reached so that EVN and the PCs would appoint independent auditors acceptable to IDA and submit audit reports, satisfactory to IDA, within 6 months after the close of each fiscal year.*

5. Financial Performance of the PCs. The financial results of PC1, 2, and 3 in FY00 were satisfactory, despite increasing technical losses and natural calamities experienced in the Central and Southern part of the country. Power sales in GWh terms in FY00 grew by 15.3%, 17.5%, and 16.4%, respectively. As a result of the full effect of the tariff increase which was implemented in September 1999, overall sales performance of the PCs for FY00 exceeded the previous year's by more than 20%. Sales of electricity to the industrial sector increased more than to any other sector, reflecting the industrial sector's high rate of growth. The cost of power purchase from EVN at the bulk supply tariff, which is a significant share of PCs' operating costs (on average 56%), ensure that the PCs are capable of satisfying the financial ratios required under the IDA Credits (paras. 12-13). The operating ratios of the three PCs in FY00 were 96%, 97%, and 95%, respectively, and increased by 3% on average. While PC3 is improving its collection turnover, it continues to struggle with bad debts, since government policy prohibits disconnecting the electricity supply of clients consuming more than 50,000 kWh per month. Collection performance at the other PCs, however, was also satisfactory. Except for the SFR of PC2, the PCs complied with their financial covenants, although SFR of PC2 (at 28%) was slightly below the required level of 30%. *Agreement would be reached that the PCs would be allowed to achieve a 30% SFR and a 1.5x DSCR.*

B. Key financial issues

7. Electricity Tariffs. Retail electricity tariffs (Table 2), currently uniform across Vietnam, are set by the Government, designating EVN to develop a tariff proposal which is reviewed by the Ministry of Industry, and the State Pricing Committee before final approval of the Prime Minister. Existing electricity retail tariffs were rationalized and raised periodically since March 1992. Further upward revisions in the tariffs were implemented in August 1994, June 1995, April 1996, May 1997, and October 1999.

8. Currently, the average tariff of about D 728/kWh, or about USc 5.1/kWh, inclusive of the 10% value-added tax (VAT), is inadequate to recover EVN's costs nor contribute the minimum required to finance investments for rehabilitation of existing systems or expansion. The most recent estimates of Long Run Marginal Cost (LRMC) for retail tariff are in the range of USc 7.5/kWh. The achievement of an average tariff of USc 7.0/kWh is the development objective of IDA's ongoing tariff and sector dialogue with the Government and key to: (a) satisfactory financial performance of EVN and its compliance with financial covenants; and (b) sustainable health of the power sector. At about 90% of LRMC, USc 7.0/kWh, is a reasonable and economic pricing target, considering the Government's social objectives and goals of alleviating poverty through rural electrification, as long as the sector could achieve SFR of 30%.

9. In January 1998, the Bank's Board approved a Credit for the Vietnam Transmission, Distribution and Disaster Reconstruction Project (TDDRP) which was conditioned on the Government's approval to raise electricity tariffs to USc 7.0/kWh by FY99. However, while the Government agreed to the tariff conditionality during Credit negotiations, Credit signing was delayed because of concerns over the impact of the regional financial crisis and the imminent devaluation of the Dong against the US dollar at that time. Agreement was reached after nearly a year to amend the Credit Agreement. The amendment called for raising average retail electricity tariffs according to a progressive schedule and that the necessary increases may be at higher or lower levels than the schedule but in any case should allow EVN to maintain a 30% SFR. In March 1999, EVN proposed the first in a series of three power tariff adjustments: (a) to USc

5.2/kWh by July 1999; (b) USc 6.2/kWh by July 2000; and (c) USc 7/kWh by March 2001. On September 23, 1999, the Government approved the first tariff increase effective October 1, 1999. No further tariff increases were, however, implemented.

10. A second agreement on the phased implementation of electricity tariff adjustments was reached between the Government and the Creditors (ADB and IDA) in May 2001. The Memorandum of Understanding on power sector tariffs called for: (a) average tariffs to increase in stages beginning July 1, 2001 to USc 5.6/kWh until it reaches USc 7.0/kWh in July 2005; (b) waiver of the SFR covenant in FY01-02; (c) declaration of SEIER credit effectiveness conditioned on committed tariff increases; (d) reconfirmation of assumptions used in the tariff projections; (e) consideration of an automatic energy price adjustment and convening a joint team to evaluate the mechanism; (f) improving, through technical assistance, EVN's financial projections; and (g) utilization of an independent creditors' model. The State Bank of Vietnam informed the Creditors on August 13, 2001 that power tariffs would be increased to USc 5.6/kWh with effect from October 1, 2001. The State Pricing Committee had also taken all appropriate actions for the tariff increases and given instructions to EVN and the PCs to prepare the public for these eventuality. However, on September 30, 2001, the Prime Minister announced that the scheduled power tariff increases would be postponed in view of the economic uncertainty over the effects of the September 11 terrorist attacks in the US, and the longer term concerns over the marked slowdown in global demand growth and stagnation of exports, along with its possible impact on the local economy.

11. The Government's socio-economic goals for the country, its concern with balancing fiscal resources for development and consumers' ability to pay for electricity, and competitiveness of Vietnamese industries, are important tariff considerations. The virtual and actual effects of the economic downturn may be short term and the Vietnamese economy may weather the worst fairly easily, but the consequent impact of tariff delays on the power sector would be long term and serious to EVN. While the Government's major reservations over the timing of tariff increases is compelling, the Government has to ensure that the priority financial objectives of the sector are being met. Furthermore, meeting the sector's financing targets, requires not only a rational tariff policy that ensures credit worthy power utilities and guarantees adequate returns to investors, but also one that is set on the basis of LRMC to sustain business and investment activities. *During negotiations, agreement would be reached with the Government that the steps to raise average retail tariffs to not less than \$0.07/kWh by July 1, 2005 according to the schedule approved in May 2001 by the Government and the Creditors, would be undertaken. Furthermore, EVN would review by April 30 of every year the adequacy of its tariffs to produce the required SFR and DSCR obligations to IDA.*

12. **Bulk Power Tariffs.** The PCs receive power from EVN in bulk at several of their grid substations (Table 3). The bulk supply tariff to the PCs as currently applied, is a complicated, iterative process that takes into account the different average revenues per consumers in the various PCs. It is set by EVN to ensure that at the uniform tariff level the following goals are achieved: (a) the financial viability of the PCs and compliance with IDA's financial covenants; and (b) cross-subsidization of rural and agricultural consumers by mainly industrial consumers and of residential consumers by commercial/industrial consumers. The most recent financial projection of the PCs assumed varying levels of bulk supply tariffs to achieve satisfactory financial performance (Table 4.1-4.5). The internal bulk power price is inappropriate because: (a) it is not based on economic criteria; (b) it is not cost-oriented and too low to reflect the actual costs of generation and transmission; (c) lacks a strong incentive for PCs to control costs; and (d) provides the wrong signals toward manpower reduction, productivity and capital expenditures.

13. If the PCs are to be truly independent companies, a bulk power regime is required that encourages economically efficient transaction between entities. Furthermore, the Government is convinced that cost-based retail prices and internal transfer prices would: (a) be essential to raise the required capital for

the power sector, as the current uniform retail tariffs would not attract private investments to the distribution business; (b) ensure that resources are allocated efficiently; and (c) provide incentives to the PCs to operate efficiently and make appropriate decisions on procurement of power from BOT/JV power generation schemes. Several studies were carried out to develop guidelines for the determination and adoption of a commercial bulk power supply tariff between EVN and the PCs. A credit condition under the Rural Energy Project requires EVN to review its existing internal bulk supply tariff and implement, according to a time frame, suitable bulk tariffs that would reflect the true costs of supply, and if needed, a transparent subsidy mechanism. In view of its importance to the sector, recommendations for the ongoing transition of the PCs to marginal-cost-based-bulk supply rates should be implemented. In this context and previous commitments under the TDDRP and Rural Energy Projects, *agreement would be reached with EVN during negotiations to implement by FY03, a phased approach to bulk supply tariffs.*

14. **Power Development and Financing.** The capital investment requirements of EVN and the PCs are estimated at about US\$1.2-1.5 billion a year, which will require not only heavy mobilization of domestic and foreign resources for new projects, but also more efficient management of these projects. Foremost, EVN needs sufficient financing of capital investments, which is expected to increase by 5% p.a. during the projected period. According to EVN's Fifth Power Development Plan (PDP V) approved by the Government in June 2001, EVN expects to meet the power balance during the period FY02-05 by power purchases from IPPs and several new plants coming on stream during the period.

Investment needs of Power Sector

US\$ million

	2000-2005	2006-2010
I. Power Plant	4,125	4,205
II. Transmission	1,127	1,094
III. Distribution	2,259	1,889
Total	7,511	7,187

Source: PDP V, June, 2001

While the donors and multilateral lending agencies plan to remain active in providing funds for investment and technical assistance requirements of the sector, there is declining interest in direct financing of thermal power generation projects and an increased willingness, on the part of the creditors, to focus more on a catalyzing role for private investments. The financing gap emerging between the investment needs of the sector and possible support of the donors and lenders will require serious thinking on the part of the Government in fine-tuning its financing sector priorities and strategies. *Agreement would be reached that EVN would prepare and furnish to IDA for its review and comment: (a) its proposed Power Development Plan; (b) a report on the progress in the program for the succeeding 5 years; and (c) a review of policy and levels of electricity tariffs, including proposed adjustments.*

15. EVN is committed to supplying reliable power and to reducing power distribution losses. However, higher investments are necessary to build new systems, rehabilitate and upgrade the existing system, as well as to build additional reliability. Because of the capital-intensiveness of power systems and the lengthy periods sometimes necessary to construct facilities particularly generating plants and transmission networks, EVN requires efficient and flexible capital planning systems. The ability to limit the use of debt will depend on EVN's skill in managing construction projects and completing new facilities on schedule and within cost estimates. As a recipient of IDA credits since FY96, EVN is gaining operational experience and is capable of managing substantial growth in investment as it develops skills in project cost control, implementation and management. The power sector is evolving and more and more large projects

require EVN to interface with contractors due to projects' construction uncertainties, high technology content, engineering complexities, and inherent project intricacies associated with transmission and rural electrification networks. While EVN is familiar with IDA's procurement guidelines and several attempts have already been made to streamline these with IDA's, EVN's procurement process is still inadequately hampered by inordinate delays and bottlenecks. More serious efforts should be placed in the processing of tenders and awarding of contracts expeditiously. *Agreement would be reached that EVN would strengthen the Procurement Monitoring Group/department to ensure that the procurement procedures for projects are carried out according to agreed schedules.*

16. Appropriateness of Financial Covenants. The Government and IDA agree that the satisfactory financial performance of EVN and its ability to meet financing targets are the priority financial objectives of the sector. These financial goals and the Government's obligation to ensure them are expressed in the financial covenants of the various Credit Agreements. In view of the economic and political pressures caused by tariff adjustments and the fact that complying with the 30% SFR would require unrealistic tariff adjustments (from the current USc 5.1 to USc 6.0/kWh), the Government in May 2001 had proposed that the SFR covenant be reduced to 25%. While IDA is sensitive to the socio-political implications of a drastic tariff increase and its impact on the competitiveness of Vietnamese industries, the rationale for contributing at least a third of investments from internally generated funds is deemed appropriate. This level, which is comparable with that for other power utilities, promotes financial viability and satisfactory financial performance, and puts a premium on prudent financial management. The requirement also addresses the financial sustainability of the power sector, enhancing its ability to attract private financing. Without a creditworthy utility, the cost of financing power projects will remain extremely high and government support will always be needed. Furthermore, the application of an average tariff of USc 7.0/kWh, which corresponds to the 30% SFR level, takes into account pricing efficiency, disciplined use of resources, and cost recovery. Finally, getting electricity prices right is especially urgent in Vietnam, to send proper price signals to consumers and to mobilize massive amounts of investment capital. *At negotiations, agreement would be reached that the Government would: (a) allow EVN to generate funds from internal sources equivalent to not less than 30% of the annual average of its capital expenditure incurred, or expected to be incurred, for the year, the previous year, and the next following year; (b) agree to undertake a periodic review and adjust EVN's tariffs as necessary to ensure the EVN earns 30% SFR; and (c) ensure that EVN maintain a DSCR of at least 1.5 times.*

17. Financial Planning and Forecasting. As a revenue-earning entity, EVN rigorously prepares annual financial projections covering: (a) the income statement, revenues and other income and costs of operation, maintenance, depreciation and interest on borrowed funds; (b) the funds statement showing investment, internal funds surplus, debt service requirements, and sources of financing, including internally generated funds and externally provided loan and equity capital; and (c) the capital expenditure program showing annual investment flows by project. A key element of IDA's financial appraisal is to assess the: (a) reasonableness of these forecasts; (b) appropriateness of tariff levels; (c) sufficiency of internal funds to cover investments and debt service; (d) possibilities for reducing costs and improving performance; and (e) compliance with commitments. Differences exist between the evaluation of projection parameters between EVN and IDA, particularly in the: (a) treatment of internal funds flow surpluses as a proxy for yearly working capital; (b) use of a fixed exchange rate throughout the projected period; (c) treatment of interest during construction; (d) questionable opening balances of accounts; and (e) absence of an interface between the balance sheet and the funds flow statement. *It was agreed that a detailed creditors' financial model be developed to serve as an independent model to be the basis for future financial projection discussions, test sensitivities, and monitor tariff requirements and compliance with key financial covenants.* The financial model, which would be available for review and independent verification by EVN and the relevant government ministries, would follow international accounting standards and calculate the financial ratios as

defined in the respective credit agreements.

18. EVN is seeking technical assistance to improve its forecasting capabilities, particularly its financial projection model, so that it: (a) develops into a financial accounting model; (b) is in accordance with international accounting standards; (c) is readily understood by the creditors and relevant reviewing ministries; (d) better reflects assumptions being used, including foreign exchange fluctuations, local inflation trends, management of working capital and cash flow surplus, and movement of equity funds; (e) allows documentation thereby improving its transparency and permit others to run it; and (f) is an effective corporate planning tool. Consistent, understandable, and uniform financial projections would assist EVN in improving its strategic planning process through which its objectives could be formulated, goals could be set and actions be taken in the short-term. It would also protect both the Borrower (the Government) and the Creditor's accountability and financial standing. *Agreement would therefore be reached that EVN would implement the recommendations of the study to improve its financial projections and to integrate these into its corporate planning and financial forecasting systems.*

C. Financial Prospects

19. The financial projections for FY01-05 and the resulting financial ratios are presented in Table 5.1, Case A. EVN's projections are based on the following key assumptions: (a) tariff levels and schedule that would meet 25% SFR and 1.5x DSCR; (b) energy generation and sales which would follow EVN's PDP under the base case; (c) hydro power frequency at the rate of 65% adjusted flow; (d) gas at the Nam Con Son field available for power generation by FY02; (e) fuel price for coal and oil based on the State Pricing Committee's projections and the gas supply contract with Petro Vietnam; and (f) the VND against the US\$1 would remain steady at VND 14,400 during the projected period.

20. Of particular importance to the financial projections and results are two critical issues. **First**, the yearly SFR targets, which drive the required tariff adjustments in each of the projected years were reduced from 30% to 25%. Hence, the projections called for gradual tariff increases in accordance with the following schedule: (a) USc 5.6/kWh by July 1, 2001; (b) USc 6.0/kWh by July 1, 2002; (c) USc 6.4/kWh by July 1, 2003; (d) USc 6.8/kWh by July 1, 2004; and (e) USc 7.0/kWh by July 1, 2005. Necessarily, higher tariffs (calculated at USc 6.0, 6.0, 6.3, and 6.7/kWh, respectively) would be needed to achieve the 30% SFR target. **Second**, underlying the financial model, are the following non-tariff measures intended to improve EVN's cash flow generation: (a) tax relief via exemption from the 32% profit tax levied on the incremental revenues derived from the tariff increases; (b) tax rebate of the 2.5% Government capital tax; and (c) relaxation of repayment terms on subsidiary loans by extending the repayment terms of three JBIC loans from 20 years to 25 years. The results showed that EVN would not be in compliance with the 30% SFR requirement from FY01-03 (i.e. 25.4%, 25.9% and 26.7%, respectively). It would, however, achieve compliance in the succeeding years at 32.2% in FY04 and 33.2% in FY05. The DSCR would also be complied with in all the years.

21. A plan of action to facilitate the achievement of its overall financial objectives and bring financial covenant compliance was also submitted to complement the phased tariff increases and cash flow relief, which include: (a) control of unit costs by improving operating efficiency and productivity; (b) implementation of the cost-based transfer pricing arrangements beginning FY02 in order to contain costs at the PCs and subsidiaries; (c) more investment efficiency by limiting use of debt, better management of construction projects; (d) equitization of some power plants by FY05; (e) greater reliance on IPPs and SPPs; and (f) careful management and utilization government grants for RE.

22. The financial projections were prepared by EVN and were approved by the Government in August

2001. Even though not fully satisfactory, IDA accepted the slower and phased improvement in financial performance, in view of the sizable amount of the price increases required and the impact of future foreign exchange devaluation, which otherwise would make it impractical to proceed faster. IDA accepted the existing tax regime approved by the Government provided: (a) the relief is in the context of the Government's overall tax reform as it applies to SOEs, in the case of the capital tax exemption; and (b) the reliance on government subsidy would be for a limited period until sufficient cost reductions and revenue increases permit adequate self-financing, in the case of exemptions from profit tax of incremental revenues. In arriving at a suitable compromise between, on the one hand, satisfactory financial performance and cost recovery principles, and, on the other, social dimensions and concerns for stabilizing the economy, IDA agreed to waive the financial covenants for FY01-02 on the basis of the agreed tariff commitments and the plan of action presented by EVN that would achieve satisfactory financial performance and compliance with financial covenants.

23. Agreements were finally reached between the Government and IDA on the following: (a) increase average retail tariffs according to the following schedule: (i) USc 5.6/kWh by July 1, 2001; (ii) USc 6.0/kWh by July 1, 2002; (iii) USc 6.4/kWh by July 1, 2003; (iv) USc 6.8/kWh by July 1, 2004; and (v) USc 7.0/kWh by July 1, 2005; (b) confirm that EVN would be: (i) exempted from payment of the capital tax; (ii) allowed a tax holiday from profit tax corresponding to the incremental revenues from tariff increases; and (iii) granted a 5-year extension in the repayment terms of JBIC subloans; (c) ensure timely implementation of tariff adjustments; (d) EVN seek technical assistance to improve its financial projections; (paras. 18-19) and; (e) Government consider the merit of an automatic energy price adjustment in retail tariffs or an automatic pass-through to consumers of the actual cost of fuel, foreign exchange gains or losses and local inflation.

24. The Government approved the above measures and the State Bank of Vietnam informed the Creditors on August 13, 2001 that power tariffs would be increased to USc 5.6/kWh with effect from October 1, 2001. Actions which were necessary conditions for EVN's satisfactory financial performance and underlying the tariff projections were confirmed: (a) the tax exemption from the 32% profit tax on incremental revenues arising from the proposed tariff increase and the 2.4% tax rebate on the Government's capital usage tax were approved by the Government; (b) the relaxation of the JBIC loan repayment terms have also been implemented, effectively extending EVN's repayment period of its subsidiary loan from 20 to 25 years; and (c) EVN had agreed to seek IDA financing (under the Rural Energy Credit as an adjunct to the Bulk Tariff Study) for a TA to improve its ability to prepare financial projections.

25. Stress Test on the Tariff Scenario. The financial performance of EVN was analyzed under several scenarios (Table 5.2) based on: (a) Case A: EVN's base case, where tariff and non-tariff measures approved by the Government in August 2001 (para. 25) had been implemented; (b) Case B: the current scenario, where the tariff remains unchanged; and (c) Case C: implementation of the agreed tariff profile but delayed timing as follows: (i) case C.1, tariff increase starting January 1, 2002, the rumored possible date of increases; and (ii) case C.2, starting July 1, 2002, the estimated date of loan effectiveness. The tariff scenarios were calculated using EVN's financial model, the results of which were the basis for discussion during the May tariff negotiations and agreements for the MOU. It is important to note that the model has severe distortions, particularly in its treatment of working capital and internal funds surplus (para 18). For consistency, however, the scenarios were run using EVN's model, hence, maintaining EVN's approach to preparing financial projections.

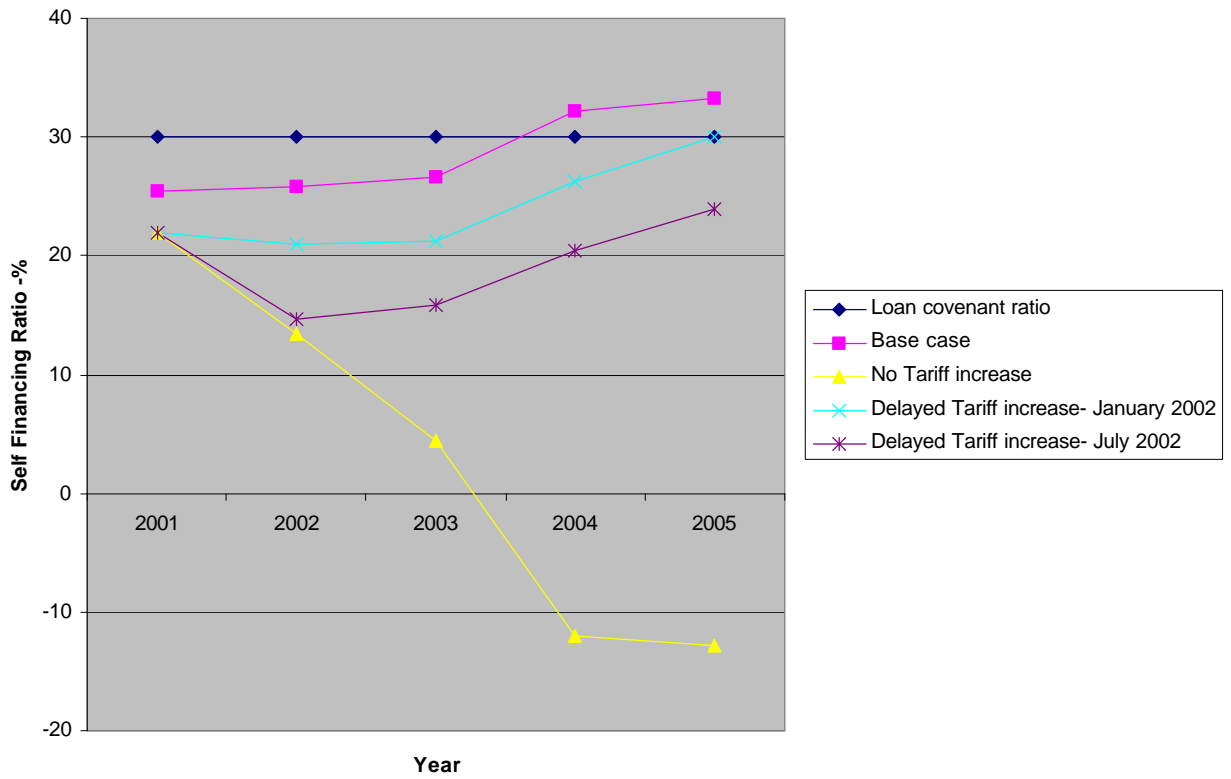
26. Initial assessment of the revenue impact of the unchanged tariff on EVN's finances corresponds to a loss of projected revenues of about VND 500 billion in FY01. In May 2001, it was projected that on the basis of a phased tariff adjustment profile, EVN would have achieved SFR of 25% and DSCR of 1.9x for

FY01 had the tariff been adjusted as agreed to the level of USc 5.6/kWh in July 2001. With no tariff increase in FY01, SFR is expected to be in the order of only 22% and DSCR at 1.8x.

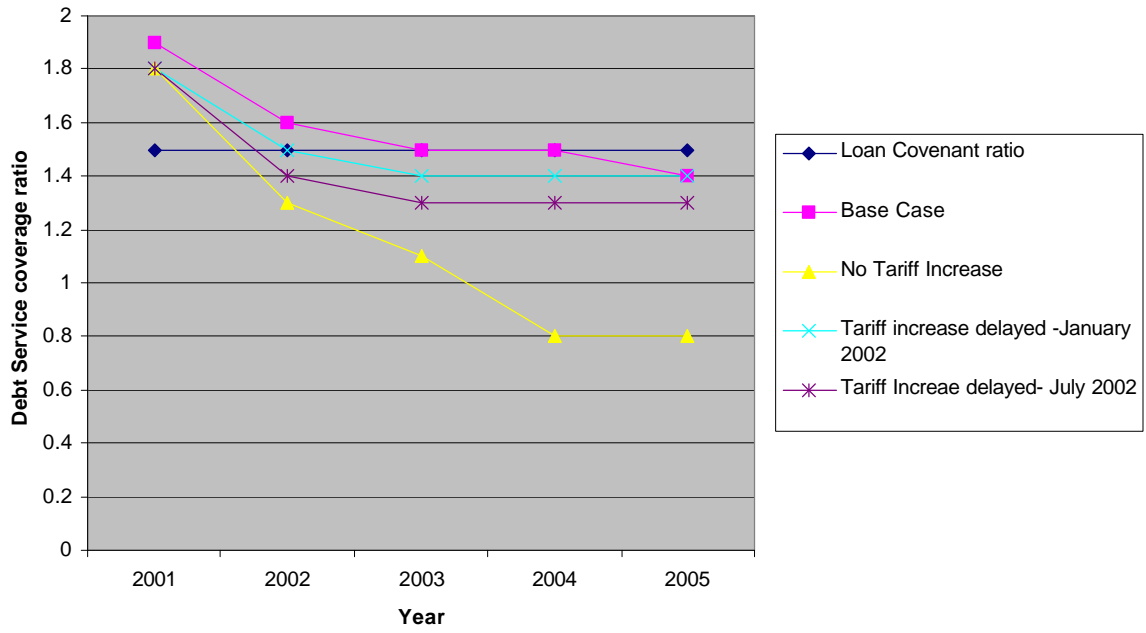
27. The negative SFRs in the outer years under Case B are untenable as EVN would have a negative cash position. One could argue that some fine-tuning of investments is appropriate under these conditions. However, the prospect of demand growth and facing the power balance and critical shortages would have to be addressed. Case C estimated the results of SFR and DSCR if the agreed tariff profile were maintained but the schedule delayed. The results are also not promising with covenant compliance only achievable in the outer years, when tariffs would have been raised to nearly USc 7.0/kWh in FY05. The financial stress test showed that with the status quo or with delayed implementation of the agreed tariff profile, EVN would not be able to achieve from its internally generated funds, sufficient revenues to contribute to investment, and comply with the self-financing ratio covenant of several credit agreements of international lenders. EVN is aware that any delay is a cause for concern as it would jeopardize its immediate financial needs and capacity to pursue its investment program, as well as undermine its ability to comply with financial covenants. EVN's investment program is not particularly flexible and the corresponding financing plan not very diversified making uncertainties risky and unsettling. The bottom line is that some reduction or slowdown in the investment program would become necessary to come to terms with the financing gap.

28. The Government acknowledges that an overdue tariff increase and subsequent increases in accordance with strictly enforced timetables are key to achieving satisfactory financial performance of EVN and compliance with financial covenants. In this regard, there are no differences between Government's views and IDA's. The Bank has requested clarification from the Government on their immediate plan for tariff increases and the status of the May 2001 tariff agreements. The Government's response would be crucial to evaluating EVN's financial prospects, the achievement of the energy projects' development objectives, and further processing of future projects in the pipeline. *Agreement would be reached that the declaration of SEIER Credit effectiveness would be conditioned on implementation of committed tariff increases in accordance with the May 21, 2001 tariff agreement.*

EVN's Self Financing Ratios



EVN' Debt service coverage ratios



**Table 1: Financial Operating Results, FY96-00
(billion Dongs)**

Audited*	EVN					PC1			
	1996	1997	1998	1999	2000	1997	1998	1999	2000
Income Statemt Items									
Revenues	9,236	10,564	13,472	14,122	16,513	2,716	3,258	2,830	3,473
Operating Expenses	6,812	9,378	11,619	11,829	14,584	2,403	3,110	2,648	3,339
Operating Income	2,424	1,186	1,853	2,293	1,927	313	148	182	134
Net Income	1,939	510	1,101	1,088	883	229	121	110	57
Balance Sheet Items									
Total Fixed Assets	26,479	27,542	28,952	36,677	45,959	2,345	2,278	2,532	3,291
Current Assets	12,927	18,626	14,257	14,863	15,209	1,009	857	1,057	1,015
Total Assets	39,407	46,168	43,209	51,540	61,168	3,354	3,135	3,589	4,305
Total Equity	24,731	24,463	25,199	27,091	28,366	2,196	2,049	2,050	2,082
Long-term Liabilities	3,145	5,340	12,825	19,064	25,565	66	51	525	746
Current Liabilities	11,531	16,365	5,186	5,385	7,237	1,092	1,035	1,014	1,477
Total Liabiltis & Equity	39,407	46,168	43,210	51,540	61,168	3,354	3,135	3,589	4,305
Financial Ratios									
Operating Ratio %	73.7	88.8	86.3	83.8	88.3	88.5	95.5	93.6	96.1
Net Income as % of Revenues	21.0	4.8	8.2	7.7	5.4	8.4	3.7	3.9	1.6
Return on Avg Invested Cap.	6.2	2.1	4.4	4.2	3.2	9.3	4.6	5.4	2.8
Debt Equity Ratio (times)	0.1	0.2	0.5	0.7	0.9	0.0	0.0	0.3	0.4
Self Financing Ratio (%)	51.0	30.0	26.0	34.0	42.4	N/A	64	70	50
Debt Service Ratio (times)	13.0	31.0	37.7	8.6	2.6	N/A	328.0	45.1	16.1

Table 1: Financial Operating Results, FY96-00 (con't)
(billion Dong)

Audited*	PC2					PC3					Dong Nai PC	
	1996	1997	1998	1999	2000	1996	1997	1998	1999	2000	1999	2000
Incm Statemt Items												
Revenues	1,983	2,453	3,241	2,479	2,976	826	953	1,249	1,274	1,540	916	953
Operating Expenses	1,752	2,285	3,121	2,298	2,874	724	776	1,192	1,174	1,463	892	937
Operating Income	186	168	120	181	102	102	177	57	100	77	24	16
Net Income	162	138	108	114	34	95	127	51	64	65	16	12
Balance Sheet Items												
Total Fixed Assets	604	719	1,098	1,410	1,833	606	640	1,000	1,136	1,355	71	122
Current Assets	639	1,019	1,062	647	768	442	549	720	740	753	62	76
Total Assets	1,243	1,738	2,160	2,057	2,600	1,048	1,189	1,720	1,876	2,108	133	204
Total Equity	778	934	1,307	1,375	1,678	820	857	913	1,088	1,217	104	166
Long-term Liabilities	30	96	204	335	468	12	36	352	426	494	6	6
Current Liabilities	436	708	649	347	454	216	296	455	362	397	23	32
Total Liabiltis & Equity	1,243	1,738	2,160	2,057	2,600	1,048	1,189	1,720	1,876	2,108	133	204
Financial Ratios												
Operating Ratio %	93.2	93.2	96.3	92.7	96.6	87.7	81.4	95.4	92.2	95.0	97.4	98.3
Net Income as % of Revenues	8.2	5.6	3.3	4.6	1.1	11.5	13.3	4.1	5.0	4.2	1.7	1.3
Return on Avg Invested Cap.	15.0	11.3	6.2	8.5	2.2	9.7	15.8	3.9	6.4	5.6	18.0	8.9
Debt Equity Ratio (times)	0.0	0.1	0.2	0.2	0.3	0.0	0.0	0.4	0.4	0.4	0.1	0.04
Self Financing Ratio (%)	177	53	84	78	28	47	73	15	40	54	na	na
Debt Service Ratio (times)	3.8	118.0	33.4	19.8	5.5	2.5	193.0	30.4	1.4	6.6	na	na

**Table 2: Power Tariffs which apply all over the country
with effect from October 1, 1999¹**

POWER TARIFFS	Pricing Level (Vnd/Kwh)	
	Incl. VAT	Excl. VAT
I. Production		
1. Purchase at low voltage level of 110KV and up		
- Off-peak hours	770	700
- Peak hours	1364	1240
- Low load hours	374	340
2. Purchase at voltage level from 22KV to less than 110KV		
- Off-peak hours	803	730
- Peak hours	1419	1290
- Low load hours	396	360
3. Purchase at voltage level from 6KV to less than 22KV		
- Off-peak hours	847	770
- Peak hours	1474	1340
- Low load hours	429	390
4. Purchase at voltage level of less than 6KV		
- Off-peak hours	880	800
- Peak hours	1529	1390
- Low load hours	451	410
II. Agriculture Irrigation		
1. Purchase at voltage level of 6KV and up		
- Off-peak hours	630	572.72
- Low load hours	250	227.27
- Peak hours	990	900
2. Purchase at voltage level of less than 6KV		
- Off-peak hours	660	600
- Low load hours	260	236.36
- Peak hours	1045	950
III. For clean water and urban drainage		
1. Purchase at voltage level of 6KV and up		
- Off-peak hours	781	710
- Low load hours	385	350
- Peak hours	1375	1250
2. Purchase at voltage level of less than 6KV		
- Off-peak hours	825	750
- Low load hours	396	360
- Peak hours	1463	1330
IV. Hospital, schooling systems		
1. Purchase at voltage level of 6KV and up	770	700
2. Purchase at voltage level of less than 6KV	810	736.36
V. Public lights		
1. Purchase at voltage level of 6KV and up	847	770
2. Purchase at voltage level of less than 6KV	880	800
VI. Administration		
1. Purchase at voltage level of 6KV and up	869	790
2. Purchase at voltage level of less than 6KV	902	820
VII. Residential Use		
- For first 100 kWh	500	454.54
- For the next 50 kWh	704	640
- For the next 50 kWh	957	870
- For the next 100 kWh	1166	1060
- Over 300 kWh	1397	1270

¹ Interministerial circular No. 05/1999/TT-LT/BVGCP-BCN

Table 3

**Bulk Supply Tariffs
(Dong/kWh)**

	1995	1996	1997	1998	1999	2000
PC1	238	299	307	365	313	348
PC2	274	380	424	473	396	410
PC3	163	252	272	372	339	340
PC Hanoi	300	398	448	504	531	556
HCMC PC	350	442	487	545	606	589
PC Hai Phong					489	498
PC Dong Nai					648	644

Table 4.1

Main Assumptions to Financial Projections, FY01-05

	2001	2002	2003	2004	2005
PC1					
Sales of Power (GWh)	6,599	7,332	8,136	9,028	10,016
Average Tariffs, without VAT (VND/kWh)	579	626	648	667	686
Average Tariffs, without VAT (UScent/kWh)	3.94	4.15	4.18	4.22	4.21
Bulk Supply Tariffs (VND/kWh)	333	363	379	395	407
Distribution Losses (%)	11.9%	11.6%	11.3%	11.0%	10.7%
PC2					
Sales of Power (GWh)	4,669	5,235	5,871	6,586	7,387
Average Tariffs, without VAT (VND/kWh)	711	734	763	790	818
Average Tariffs, without VAT (UScent/kWh)	4.83	4.86	4.92	5.00	5.02
Bulk Supply Tariffs (VND/kWh)	394	490	505	537	577
Distribution Losses (%)	11.5%	11.1%	10.6%	10.1%	9.6%
PC3					
Sales of Power (GWh)	2,569	2,895	3,280	3,720	4,223
Average Tariffs, without VAT (VND/kWh)	605	627	648	666	685
Average Tariffs, without VAT (UScent/kWh)	4.11	4.15	4.18	4.22	4.2
Bulk Supply Tariffs (VND/kWh)	345	305	305	285	294
Distribution Losses (%)	9.2%	8.8%	8.5%	8.3%	8.1%
PC Dong Nai					
Sales of Power (GWh)	1,441	1,695	1,966	2,281	2,646
Exchange Rate (VND/US\$)	14,710	15,090	15,500	15,800	16,300

Note:

Bulk Supply Tariffs for 2001 are based on EVN's target price and for 2002-2005 are based on PCs' costs and appropriate profits.

Table 4.2

Financial Projection of Power Company 1 (PC1), FY01-05
(in billion Dong)

	2001	2002	2003	2004	2005
Income Statement Items					
Revenues	3,975	4,755	5,444	6,205	7,068
Operating Expenses	3,531	4,342	4,970	5,679	6,444
Operating Income	444	412	474	525	623
Net Income	240	155	159	158	158
Funds Flow Statement Items					
Internal Source of Cash Generation	588	805	941	1,089	1,305
Borrowings	641	630	758	898	956
Total Source of Cash	1,229	1,435	1,699	1,986	2,260
Capital Expenditures	901	984	1,122	1,299	1,477
Debt Servicing	78	161	241	302	415
Working Capital Increase/Decrease	183	234	276	322	304
Profit Distribution to Reserve Fund	67	55	60	64	63
Total Application of Cash	1,229	1,435	1,699	1,986	2,260
Balance Sheet Items					
Net Fixed Assets	1,933	3,595	4,028	4,509	5,056
Construction in Progress	1,338	1,722	1,777	1,846	1,928
Current Assets	1,015	1,049	1,084	1,134	1,275
Total Assets	4,305	6,386	6,909	7,508	8,279
Equity	2,081	2,224	2,293	2,361	2,425
Long Term Liabilities	746	2,833	3,485	4,243	5,131
Current Liabilities	1,478	1,330	1,131	904	724
Total Debt and Equity	4,305	6,386	6,909	7,508	8,279
Financial Ratios					
Operating Margin	11.2%	8.7%	8.7%	8.5%	8.8%
Profit Margin	6.0%	3.3%	2.9%	2.5%	2.2%
Return on Average Net Fixed Assets	16.5%	5.6%	4.2%	3.7%	3.3%
Debt Service Coverage Ratio	9.3	5.6	4.3	3.9	3.4
Self Financing Ratio	30%	34%	33%	38%	42%
Debt Equity Ratio	0.4	1.3	1.5	1.8	2.1

Table 4.3

Financial Projection of Power Company 2 (PC2), FY01-05
(in billion Dong)

	2001	2002	2003	2004	2005
Income Statement Items					
Revenues	3,626	4,199	4,862	5,608	6,473
Operating Expenses	3,058	3,915	4,508	5,263	6,125
Operating Income	568	284	354	345	348
Net Income	368	152	148	151	155
Funds Flow Statement Items					
Internal Source of Cash Generation	588	414	584	650	672
Borrowings	468	681	189	367	237
Total Source of Cash	1,056	1,095	772	1,018	909
Capital Expenditures	866	893	506	760	637
Debt Servicing	37	57	182	179	178
Working Capital Increase/Decrease	59	86	23	15	29
Profit Distribution to Reserve Fund	95	60	62	64	66
Total Application of Cash	1,056	1,095	772	1,018	909
Balance Sheet Items					
Net Fixed Assets	1,394	2,303	2,879	2,789	3,254
Construction in Progress	1,080	838	443	893	642
Current Assets	736	749	1,057	896	994
Total Assets	3,217	3,897	4,387	4,585	4,898
Equity	1,927	1,996	2,057	2,121	2,186
Long Term Liabilities	926	1,611	1,986	2,065	2,243
Current Liabilities	363	290	344	399	468
Total Debt and Equity	3,217	3,897	4,387	4,585	4,898
Financial Ratios					
Operating Margin	15.7%	6.8%	7.3%	6.1%	5.4%
Profit Margin	10.1%	3.6%	3.0%	2.7%	2.4%
Return on Average Net Fixed Assets	31.1%	8.2%	5.7%	5.3%	5.1%
Debt Service Coverage Ratio	21.4	9.0	3.7	4.2	4.3
Self Financing Ratio	63%	30%	56%	77%	75%
Debt Equity Ratio	0.5	0.8	1.0	1.0	1.0

Table 4.4

Financial Projection of Power Company 3 (PC3), FY01-05
(in billion Dong)

	2001	2002	2003	2004	2005
Income Statement Items					
Revenues	1,778	2,016	2,387	2,786	3,254
Operating Expenses	1,623	1,806	2,150	2,457	2,887
Operating Income	156	210	237	329	367
Net Income	94	98	101	103	106
Funds Flow Statement Items					
Internal Source of Cash Generation	265	414	562	780	910
Borrowings	561	527	608	457	427
Total Source of Cash	826	942	1,170	1,237	1,337
Capital Expenditures	810	852	992	914	897
Debt Servicing	27	61	112	246	295
Working Capital Increase/Decrease	-41	-5	31	39	103
Profit Distribution to Reserve Fund	30	32	35	38	41
Total Application of Cash	826	942	1,170	1,237	1,337
Balance Sheet Items					
Net Fixed Assets	1,511	2,111	2,600	2,731	3,533
Construction in Progress	476	459	570	834	317
Current Assets	698	675	688	710	797
Total Assets	2,685	3,244	3,858	4,275	4,647
Equity	1,262	1,308	1,354	1,400	1,446
Long Term Liabilities	1,046	1,578	2,164	2,552	2,895
Current Liabilities	377	358	340	323	307
Total Debt and Equity	2,685	3,244	3,858	4,275	4,647
Financial Ratios					
Operating Margin	8.7%	10.4%	9.9%	11.8%	11.3%
Profit Margin	5.3%	4.8%	4.2%	3.7%	3.3%
Return on Average Net Fixed Assets	7.6%	5.4%	4.3%	3.9%	3.4%
Debt Service Coverage Ratio	12.3	7.8	5.6	3.4	3.3
Self Financing Ratio	35%	36%	42%	51%	64%
Debt Equity Ratio	0.8	1.2	1.6	1.8	2.0

Table 4.5

Financial Projection of Power Company Dong Nai (PC Dong Nai), FY01-05

(in billion Dong)

	2001	2002	2003	2004	2005
Revenues	1,063	1,251	1,451	1,683	1,953
Operating Expenses	1,034	1,211	1,405	1,632	1,894
Operating Income	29	40	46	51	59
Capital Expenditures	125	103	76	67	47
Operating Margin	2.7%	3.2%	3.2%	3.0%	3.0%

TABLE 5.1 - FINANCIAL PROJECTION OF EVN, FY01-05
(in billion Dong)

	2001	2002	2003	2004	2005
Main Assumptions					
Sales of Power (GWh)	24,860	27,751	31,362	35,202	39,241
<i>Average Tariffs, with VAT (VND/kWh)</i>	<i>773</i>	<i>835</i>	<i>893</i>	<i>950</i>	<i>994</i>
Average Tariffs, with VAT (UScent/kWh)	5.4	5.8	6.2	6.6	6.9
<i>Average Tariffs, without VAT (VND/kWh)</i>	<i>703</i>	<i>759</i>	<i>812</i>	<i>864</i>	<i>903</i>
Average Tariffs, without VAT (UScent/kWh)	4.9	5.3	5.6	6.0	6.3
Transmission and Distribution Losses (%)	15	14.6	14.2	13.8	13.5
Financial Projections					
Income Statement Items					
Revenues	17,467	21,067	25,459	30,413	35,438
Operating Expenses	15,107	17,141	20,533	24,482	27,378
Operating Income	2,360	3,926	4,926	5,931	8,060
Net Income	1,253	2,670	3,487	4,286	6,177
Funds Flow Statement Items					
Internal Source of Cash Generation	7,850	10,060	12,413	15,835	18,572
Borrowings	9,596	10,408	10,588	8,476	8,582
Total Source of Cash	17,446	20,468	23,001	24,311	27,154
Capital Expenditures	13,955	13,890	15,196	15,878	16,555
Debt Servicing	2,955	4,974	6,670	8,744	10,797
Working Capital Increase/Decrease	109	1,123	595	-919	-868
Profit Distribution to Reserve Fund	427	481	540	608	670
Total Application of Cash	17,446	20,468	23,001	24,311	27,154
Balance Sheet Items					
Net Fixed Assets	41,200	46,367	45,737	54,957	59,480
Construction in Progress	25,889	29,643	38,224	36,202	37,771
Current Assets	20,365	27,763	37,884	43,941	49,872
Total Assets	87,454	103,773	121,846	135,099	147,123
Equity	35,871	42,029	46,819	50,760	54,215
Long Term Liabilities	36,781	42,193	42,743	46,592	49,541
Current Liabilities	14,802	19,551	32,284	37,747	43,367
Total Debt and Equity	87,454	103,773	121,846	135,099	147,123
Financial Ratios					
Operating Margin	13.5%	18.6%	19.3%	19.5%	22.7%
Profit Margin	7.2%	12.7%	13.7%	14.1%	17.4%
Return on Average Net Fixed Assets	3.9%	6.1%	7.6%	8.5%	10.8%
Debt Service Coverage Ratio	1.9	1.6	1.5	1.5	1.5
Self Financing Ratio	25%	26%	27%	32%	33%
Debt Equity Ratio	1.0	1.0	0.9	0.9	0.9

TABLE 5.2 : SENSITIVITY ANALYSIS: TARIFF SCENARIOS

	2001	2002	2003	2004	2005
CASE A: EVN Base Case					
Tariff Increase Date	7/1/01	7/1/02	7/1/03	7/1/04	7/1/05
Tariff Increase (Usc/kwh)	5.6	6.0	6.4	6.8	7.0
Average Tariff (Usc/kwh)	5.4	5.8	6.2	6.6	6.9
Average Tariff with VAT (Usc/kwh)	4.9	5.3	5.6	6.0	6.3
Net Revenues (billion VND)	17,467	21,067	25,459	30,413	35,438
Net Internal Cash Generation (billion VND)	3,514	3,715	4,003	5,112	5,544
Self Financing Ratio (%)	25.4	25.9	26.7	32.2	33.2
Debt Service Coverage Ratio (x)	1.9	1.6	1.5	1.5	1.4
CASE B: CURRENT SCENARIO (NO TARIFF INCREASE)					
Tariff Increase Date	n.a.	n.a.	n.a.	n.a.	n.a.
Tariff Increase (Usc/kwh)	n.a.	n.a.	n.a.	n.a.	n.a.
Average Tariff (Usc/kwh)	5.1	5.1	5.1	5.1	5.1
Average Tariff with VAT (Usc/kwh)	4.6	4.6	4.6	4.6	4.6
Net Revenues (billion VND)	16,661	18,533	20,938	23,501	26,194
Net Internal Cash Generation (billion VND)	3,053	1,944	662	(1,915)	(1,325)
Self Financing Ratio (%)	22	13.5	4.4	-12.1	-12.9
Debt Service Coverage Ratio (x)	1.8	1.3	1.1	0.8	0.8
CASE C.1: TARIFF DELAYS					
Tariff Increase Date	1/1/01	1/1/02	1/1/03	1/1/04	1/1/05
Tariff Increase (Usc/kwh)	5.1	5.6	6.0	6.4	6.8
Average Tariff (Usc/kwh)	5.1	5.6	6.0	6.4	6.8
Average Tariff with VAT (Usc/kwh)	4.7	5.1	5.5	5.8	6.2
Net Revenues (billion VND)	16,646	20,347	24,638	29,491	34,934
Net Internal Cash Generation (billion VND)	3,038	3,010	3,197	4,176	5,026
Self Financing Ratio (%)	22.0	21.0	21.3	26.3	30.0
Debt Service Coverage Ratio (x)	1.8	1.5	1.4	1.4	1.4
CASE C.2: TARIFF DELAYS					
Tariff Increase Date	7/1/01	7/1/02	7/1/03	7/1/04	7/1/05
Tariff Increase (Usc/kwh)	5.1	5.6	6.0	6.4	6.8
Average Tariff (Usc/kwh)	5.1	5.4	5.8	6.2	6.6
Average Tariff with VAT (Usc/kwh)	4.7	4.9	5.3	5.6	6
Net Revenues (billion VND)	16,646	19,440	23,818	28,570	33,898
Net Internal Cash Generation (billion VND)	3,038	2,102	2,376	3,254	3,989
Self Financing Ratio (%)	22.0	14.6	15.8	20.5	23.9
Debt Service Coverage Ratio (x)	1.8	1.4	1.3	1.3	1.3

Annex 5B – Review of Financial Management System for SEIER project including institutional assessment for the whole EVN system.

The objective of the review is to assess the suitability of the existing project financial management system as required by the Bank under OP/BP 10.02 with a view to implementing the proposed SEIER project. The scope of the work has been set out in the “*Assessment of Financial Management Arrangement in World Bank-financed Projects-Guidelines to Staff*” issued by the Financial Management Sector Board dated June 30th 2001. The first part of this report focuses on the EVN system at institutional level. The second part focuses on assessment of each individual implementing entities for the SEIER Project.

Executive Summary

Assessment of the adequacy of the financial management system and of the financial performance of any revenue earning entities and a timetable for measures proposed to improve capabilities: An assessment of the adequacy of the project financial management systems has been carried out by the World Bank in Vietnam on October 2001 (Annex 5B). The scope of the work has been set out in the “*Assessment of Financial Management Arrangement in World Bank-financed Projects-Guidelines to Staff*” issued by the Financial Management Sector Board dated June 30th 2001. In Annex 5B, the financial management risks have been addressed using the recent Vietnam Country Financial Accountability Assessment and also have been analysed at a level relevant to SEIER project covering inherent risk, control risks as well as mitigating factors. The results of the assessment and a corresponding action plan to address weaknesses have been agreed with the agencies and are included in the Action Plan. *The Review has concluded that this project meets minimum Bank financial management requirements. In terms of disbursement technique, the Project will be producing Financial Monitoring Reports (FMRs); traditional disbursement technique will be used as opposed to using the FMR-based disbursement system.*

Status of the borrower and the project implementing entities’ compliance with audit covenants in existing Bank-financed projects: No outstanding audit reports exist for any of the entities involved in this Project (e.g. EVN, PC1, PC2, PC3, PC Dong Nai and MoI) or for any of the IDA credit programs involving power companies in Vietnam. *Critical audit issues from previous audits which remain outstanding have been incorporated in the Action Plan for implementing entities to resolve.*

Agreement with the borrower on standard and format for audited financial statements and the timetable for their submission: EVN and PCs’ accounts are audited by independent financial auditors acceptable to IDA. The audits are conducted in accordance with international auditing standards and in compliance with the independent auditing regulations of Vietnam. The audit includes a review of EVN’s accounting system and internal control and covers a full audit of the consolidated financial statements (balance sheets, income statement and source and application of funds statement) of EVN, and the Special Accounts (SA) related to the IDA credits. *The report of the audit for EVN and the Power Companies would be furnished to IDA no later than June 30 of each fiscal year. Likewise MOI, project financial statements and SA will be audited annually.*

1. Review of the Financial Management Systems of EVN

Corporate Governance

1.1 The Government's State-Owned Enterprise (SOE) reform strategy recognizes the importance of corporate governance, reliable financial information, and adequate disclosure in all SOEs. EVN is one of

the largest and more visible SOEs in Vietnam. However, its corporate governance system and overall internal monitoring mechanisms are weak because: (a) it lacks transparency in financial reporting and disclosure; (b) the Board of Directors does not effectively exercise its management oversight functions; (c) the corporate culture lacks orientation towards corporate performance; and (d) the system is compromised by a lack of clarity as to the roles and responsibilities of the members of the management and board committees. Given the commitment of the Government to reform, a successfully strengthened EVN Board could provide a model for other SOEs seeking greater commercial and corporate autonomy as well as accountability.

1.2 A Study conducted by consultants (ADB-financed Bechtel Study, under TA-2897-VIE, 1999) on the Commercialization and Corporatization of EVN noted that a key mechanism of sound corporate governance is reforming EVN's Board, in both form and substance. EVN's Board functions as a non-executive management layer of EVN and has few of the characteristics associated with sound corporate structures. Significant management decisions are referred to the responsible ministries for resolution. The Board comprises four members, none of whom has the decision-making authority granted by any of the key, relevant entities representing the Government (the owner) -- i.e. Office of the Government, MOI (official owner), MPI and MOF. Both operations and capital expenditure programs often come to a halt due to the Board's lack of decision-making authority.

1.3 A modified and expanded Board should be assured of its independence within the framework of detailed guidelines. Members should not be drawn directly from the echelons of the ministries, but rather selected from other professional streams, with the agreement and mandates of the ministries and government entity they represent. Moreover, the Study argued that the role of EVN's Board needs to be redefined in terms of its function as representative of the owner. While some reformulation of the EVN's Board have been undertaken as suggested by the Study, including the installation of a direct-report and operating Internal Audit Department, the board does not have the power or authority to assume the role of a professional, proactive, effective and decision-oriented overseer completely separate from EVN's internal management processes and in order to direct the operations of EVN within the charter and mandate of the Government. This needs to form a key part of governments efforts on SOE reform.

Corporate Planning Function

1.4 Corporate planning is normally the catalyst to achieve integrated planning, that is, a set of viable plans that are consistent between EVN's departments and subsidiaries, comprising its business units. The current planning and budget process at EVN is designed to support EVN's applications for funds from the Government and to provide the Government with a tool to exercise tight financial control. Each EVN business unit is required to submit an annual revenue and expenditure budget and a 5-year budget by September of each year. These budgets are submitted to EVN's President and Chief Executive Officer, who presents the annual budget to the Management Board for approval and to the Prime Minister for endorsement. Once approved, EVN reviews the financial performance of each business units and compares it with the annual budget for the purpose of granting bonuses, usually in the form of cash, to the units.

1.5 The present corporate planning process at EVN is rigid, complex and time-consuming. The process: (a) involves so many participants, each with their own particular set of objectives and interest, (b) is not properly and effectively monitored and evaluated, and (c) suffers from lack of accountability and enforceability, i.e. no penalties/remedies for non-compliance for commitments nor rewards/incentives for good performance. *The establishment of a corporate planning function within EVN, as recommended by the consultant's study, would be a major step in its transformation into a more commercial and transparent enterprise. It would also enhance EVN's attractiveness to private financiers, lenders and*

donors.

Accounting Basis

1.6 The establishment of the charter of EVN in 1995 coincided with the introduction by the Ministry of Finance (MOF) of modifications to the Vietnamese accounting system to make it more in line with Western accounting standards and in 1996, EVN was required by the Government to comply with Decision 1141 on “Business Accounting Policies” . Accordingly, EVN had adopted, for all its business units, uniform accounting policies and procedures, documentation of transactions, and chart of accounts suitable to the power sector. With the letter of approval from the MOF dated 26 April 2001 on the Amendment of Accounting System of EVN, a new guideline on accounting system for the whole of EVN was adopted on 25 May 2001. With this new guideline, the old accounting system following Decision 1141 was amended by the MOF to take into account new features such as: new reporting requirement (Decision 167 dated 25 October 2000), new accounting system for construction project (Decision 214) and, accounting system for Public Expenditure Units (Decision 999).

Accounting Systems and Procedures

1.7 EVN’s financial statements are consolidated based on a combination of financial statements of component entities, including 14 independent accounting entities and 27 dependent accounting entities, 32 sets of financial statements of construction management boards and support administration units, EVN office’s financial statements and the industry’s accounting reports. Accounting for production and transmission of electricity is centralized at EVN and its dependent accounting units applicable to power plants, transmission companies, support and administration units. Power Companies, Power Engineering Consulting Companies, Dong Anh Electrical Equipment Company, Power Telecommunications Companies and Thu Duc Mechanical and Engineering Company are all independent accounting entities. Those using administrative funds for operation apply the accounting system properly tailored for non-profit making entities, and are eventually dealt with in EVN’s consolidated financial statements. The accounting systems of Construction Management Boards, which were established for large investment projects, are established separately to report in accordance with the State’s regulations. The annual reports of the Boards are sent to EVN for consolidation purposes while small construction items, managed at the company level, are incorporated in the financial statement of EVN as a whole.

1.8 EVN’s financial accounts are prepared in accordance with the current financial regulations issued by the MOF and are converted in accordance with international accounting standards (IAS) to comply with IDA’s audit requirements. The existing accounting policies and financial procedures of EVN and its business units have been assessed in light of the Vietnam (VAS) and International Accounting Standards and were found to be adequate. A comparison between major accounting policies under the Vietnamese Accounting System (VAS) and the IAS shows that, to certain extent, the Business Accounting Policies promulgated by MOF for all Vietnamese enterprises and adopted by EVN, conform with IAS. However, it should be noted that certain policies are still at variance with IAS, particularly: (a) accounting for foreign currency/translation; (b) fixed asset capitalization; (c) fixed asset depreciable amount, rate, and method; (d) amortization of intangible assets; (e) amortization of organization expense; (f) long term investment; (g) reporting requirement; (h) accounting framework; and (i) audit. The above variances between VAS and IAS exist not only at EVN but at country level and have been addressed in recent assessments and dialog with Government.

Reporting and Management Information System

1.9 The guidelines for EVN's project development and procedures, accounting systems and practices, information reporting, approval process and decision-making are extensive, and reflect primarily a "top down" centralized approach to management control and decision-making. With the increasing need from donors for good financial indicators, beside the focus on operational purposes such as statistical figures on electricity generation, consumption level and other business indices, attention from EVN have also been paid to the financial aspect by setting up financial indicators/ratios for comparison and analysis.

1.10 EVN's information and business system is becoming more networks oriented with EVN Head Office and PCs and their branches utilizing computers and the network as part of their everyday work, particularly for customer and finance-related software, email and Internet access. This development is likely to increase as centralized financial management systems are introduced and Internet business and e-commerce takes off. Currently, the system has largely been local with internal IT departments building local area networks (LAN) to satisfy local IT needs. At the local level, networks seem to have evolved with little or no strategic planning or thought, with just the necessity to add users to the network for email access as the driving force. No strategic thought has been given to information systems development and consolidation and network direction or management. To be a first class modern utility, EVN requires an equally modern integrated suite of business systems implemented in accordance with a coherent IT strategy. While EVN has introduced significant IT in the last few years, a step change is needed in the use of IT to keep pace with the changes in the utility industry. The development and implementation of an effective IT strategy as a planning and management tool would maximize the operational efficiency of IT, enhance overall IT services and facilitate the coordinated use of IT in support of business objectives. There is a need to consolidate IT resources within EVN for the obvious reasons that consolidation would provide more effective use of scarce financial and manpower resources and bring about greater computing system synergies that would support EVN's corporate requirements and up-to-date business information. The primary areas for initial IT development (already included in the Action Plan) would be: (a) implementing and maintaining an IT strategy; (b) specification, selection, and procurement of common systems; (c) sharing of locally developed systems; and (d) developing interim solutions to other system needs. Under the SEIER Project, a component exists to develop an effective financial management information system to support EVN's business needs.

Internal Control System

1.11 Typical of a government-owned utility, EVN relies heavily on direct supervision, detailed reporting, and authorization from top management for internal control. The external auditors, however, have commented that on the whole, EVN and all its units maintained the system of accounting books and documents in a proper manner following prevailing regulations. No significant non-compliance has been identified against Vietnam accounting regulations in respect of preparing and managing accounting books and documents nor were serious accountability issues noted. Moreover, the auditors commented on the improved quality and speed at which EVN and its units prepared their financial statements, and the concerted efforts made to improve weaknesses in accounting and internal control systems, evidenced by the fact that no Management Letters were issued for some units.

1.12 While EVN, generally, maintained a good internal control system, there are a number of control weaknesses, particularly, in fixed asset management, particularly, the treatment of idle, damaged and slow moving inventory, accounts receivables and payables, and consolidation of financial statements. On the treatment of idle assets, EVN accounts for fixed assets which are deemed obsolete and inventory from the former Eastern European countries or the former Soviet Union (which, due to long storage, are damaged, useless and outdated). These assets should, for capital recovery purposes, be reviewed for use or disposal.

A system to deal with such slow-moving inventory should be implemented and an appropriate level of provisions to write them off should be established. Moreover, under the Rural Energy Project, agreement was reached between IDA and EVN that assets would be revalued periodically in accordance with methods satisfactory to IDA. Such methods required *EVN to have in place a methodology, systems and procedures for periodic revaluation of fixed assets*, specifically to address obsolete and idle assets which have a direct impact on disclosures in the financial statement.

1.13 EVN's construction units have also failed to reconcile and confirm outstanding accounts receivables and payables with customers and suppliers. In some units there is no systematic reconciliation of these long unsettled accounts resulting from inter-company transfers of materials and equipment, business separation and merger, and change of accounting systems or inclusion of all outstanding amounts. This weakness had led to problems associated with the consolidation of EVN's financial statements.

1.14 The only outstanding qualification recorded in the auditor's opinion in FY00 is the failure of EVN at year-end to eliminate the inter-company receivables with its subsidiary units. Due to the decentralization of its accounts, EVN was not able to fully eliminate year-end balances with certain PCs. IDA has emphasized that: (a) the outstanding inter-company receivables have been an audit qualification since FY98; (b) significant amounts of inter-company accounts do not reflect an accurate financial position of EVN; and (c) efforts should be made to eliminate these accounts at year-end or if not possible, to re-state balances to take these into account. In the FY99 audits, inter-company accounts were reconciled to an immaterial difference at year-end, however, adjustments to reconcile the accounts were recorded in FY99 instead of restating the account balances for the years in which the transactions which caused the discrepancies occurred. EVN had agreed to resolve, once and for all, this outstanding qualification of inter-company accounts in order to reflect its true financial position and achieve satisfactory and clean audits. To assist EVN in a more efficient consolidation of financial statements, the Bank, through the proposed SEIER project, would finance efforts to improve EVN's corporate business and information system management with a view to providing actual linkage of EVN and all of its affiliated offices and standardization of all systems. These IT improvements would allow EVN Management to have access to consolidated data for a wide variety of managerial tasks and respond to the recommendation in the Management Letter of the need for EVN to maintain an entirely linked system for transmission of figures and preparation of financial statements by the units.

1.15. An Internal Audit Department was established on 1 March 1998 in accordance with Decision 832 of 28 October 1997 and Circular 52 of 16 April 1998 from the MOF. The Department is headed by a Chief of Internal Audit and five professional accountants transferred from the Finance and Accounting Division. Currently, there are problems with the implementation of a fully functioning internal audit system in EVN and the PCs because: (a) a newly established department, with limited number of personnel, could not perform completely key internal audit functions, i.e. reviewing of accounting books is still done by the Accounting and Finance Division, compliance auditing of business operations and procedures in accordance with EVN rules and regulations is done by Supervisory Board under the Board of Management; (b) lack of training on internal audit techniques; and (c) the function of internal audit is not clearly defined by the MOF. To improve the Internal Audit function, we suggest EVN should follow the recommendation on Internal Audit which was mentioned clearly in items 4.5 in the Final Report prepared by Bechtel International under the TA 2879-VIE funded by the ADB. (see the action plan).

Quality of Staff

1.16 Training of staff is still focused on the technical nature of the electricity business. There is some

training in management, accounting and finance, and organization skills for staff and there is reportedly a training plan. However, this plan has not been presented to IDA for review, although the submission of a training plan providing a detailed program of activities and training courses, participants and cost for staff development is a requirement of the Financial Management Action Plan under the TDDRP. EVN and the PCs agreed to present to IDA for its review and comment, a training plan for its top and middle management who have finance and accounting responsibilities by September, 2002.

1.17 EVN has undergone a major transformation in the past few years and fundamental changes in its organizational structure, operations and future strategy. To keep up with the increasing pace of changes in the sector, EVN is fashioning itself after successful modern utilities in the region and is determined to modernize and improve its business systems. System reliability encompasses both hardware and software components and refurbishing wires and cables alone, without upgrading back office support via updated technology and financial and management systems, will not improve overall system efficiency. EVN recognizes that to become a modern and efficient electric power utility company, it has to invest in IT hardware and software by: (a) automating its operation and business systems; (b) acquiring hardware and software capabilities to electronically link its offices and functions throughout its entire organization nationwide; (c) standardizing its management reporting systems; (d) implementing an IT strategic plan; and (e) training its staff. Under the Rural Energy Project, TA funds were made available to review the current system of EVN's financial, accounting and management information systems. Consultants undertook the study and developed an IT strategic plan, a planning and management tool for the development and deployment of IT and systems in EVN corporate head office, PCs, power plants and transmission companies. The strategy is demanding and at issue is whether the full commitment of EVN management, in terms of manpower and financial resources, necessary for the Plan to succeed could be ensured.

1.18 The TDDRP required that EVN improve its financial management systems through a list of undertakings embodied in the Action Plan for Improving the Financial Management Systems of EVN, PC1, PC2 and HCMCPC. This Plan has been attached to the documents of negotiation in July 1998 and supervised by subsequent IDA missions. *Agreement would be reached with EVN and the implementing agencies (PCs 1, 2,3 and Dong Nai) to continue implementing the outstanding activities under the Action Plan.*

2- Country Issues and Risk Analysis for SEIER project

2.1 At the national level, a CFAA analyzing the general financial management environment and risks in the country has been released in October 2001. The report highlights that: there is clearly a certain degree of fiduciary risk in the use of public resources, given that the budget process is not yet transparent, public access to government financial information is limited, and effective legislative oversight is not fully in place yet. Institutions responsible for ensuring financial accountability are also weak, audit findings are not publicly available as a matter of fact, and the reporting system does not support effective ongoing monitoring. At the present, accountability to citizens for the use of government revenues and for the quality of overall fiscal management does not fully meet the minimum standards of the IMF Fiscal Transparency Code. The Government has committed, however, to take steps to meet these standards. Overall, fiduciary risk will be manageable on on-budget items provided that the Government takes the steps outlined in the CFAA action plan as well as those committed under the PER. The risk is currently high on off-budget items, which may not be subject to standard controls and oversight”.

2.2 At the sub-national level, CFAA report also highlights that there is a lack of adequate skills and experience in accounting and auditing. Although aggregate information from the budget has recently been

made available, data on public financial statements, particularly those of SOEs, are still not available as a matter of course.

2.3 For this particular SEIER project, there are several inherent risks due to the complex project structure with involvement of many different implementing agencies (such as EVN at central level, 3 power companies PC1, PC2, PC3 and a newly established power company in Dong Nai, involvement of the MoI in 2 project components), due to the mix of funding from both IDA credit and from the GEF at both EVN side and MoI side. In addition, the newly-set up power company in Dong Nai and the new PMU in the MoI also increase the level of project inherent risk. However, some mitigating factors exist, for instance, EVN and its power companies already have previous experiences with several World Bank-financed projects, the MoI has also gained some experiences from the current Trust Funds executed by the World Bank. With the recent release by EVN of an official Financial Management Guidelines applicable for all World Bank financed projects implemented within EVN system together with its in-depth trainings already conducted and workshops on that guidelines, the new power company in Dong Nai has already benefited and has sufficient understanding of the World Bank's financial management requirements.

2.4 There is also a certain degree of control risk for SEIER project at both EVN and MoI sides in certain aspects such as: implementing entities, fund flow arrangement, staffing, accounting policy and system, internal and external audit arrangements, reporting, monitoring and information systems. With the issuance of instructions in the Financial Management Guidelines of the EVN to strengthen internal controls in World Bank-financed projects together with regular support and supervision from internal auditor, internal inspector and external auditors, the control risk for SEIER project at EVN side would be manageable. In the MoI side, commitment from management to appoint sufficient and qualified personnel to handle project's accounting and financial reporting functions would be the key criteria to mitigate control risk for SEIER project at MoI side.

3. Assessment of Financial Management System for SEIER project.

Implementing Entities.

3.1 It was agreed that the work under the Project will be executed by (i) PC1,2,3 and Dong Nai through existing PMU's except Dong Nai where a new PMB Dong Nai will be set up; (ii) EVN through existing Northern PMB, Central PMB, DSM/cell center and Center for STCE; and (iii) MOI through a new Renewable Energy PMB and the existing DSM PMU. EVN will set up an overall Steering Committee for all EVN projects and MOI will set up an overall Steering Committee for all MOI projects.

3.2 EVN and the PCs have gained significant experiences with World Bank's requirements on financial management from various IDA funded projects such as (i) Cr.2820-VN: Power Development, which closed on 31 December 1999; (ii) CR.2724-VN: Power Sector Rehabilitation and Expansion, which closed on 30 June 2000; (iii) Cr.3034-VN: Transmission, Distribution and Disaster Reconstruction Project, which became effective on 12 December 1999; and Cr.3358-VN: Rural Energy Project, declared effective on 29 November 2001 and where an official Guidance has been released in May 2001 by EVN on Financial Management and Accounting specifically designed for World Bank funded projects. With the preparation of IAS financial statements by EVN, PCs, PMBs and annual audits by independent auditors, the financial management practice of EVN as a whole has been improved significantly.

Staffing.

3.3 At EVN, the organizational structure under the Rural Energy Project would be used to implement the SEIER Project. The existing PFMCU (Project Financial Management Coordination Unit) and PFMUs (Project Financial Management Unit) at the PCs would likewise be maintained for the SEIER Project. The new PC in Dong Nai was working under PC2 in the past and has just been set up to operate as an independent power company. Therefore, the previous experiences in financial management still can be brought forward. In the Accounting and Finance department in PC Dong Nai, there are 19 staff, of which 13 staff have university degrees. There are 3 staff assigned specifically for capital construction projects under the control of the Chief Accountant and SEIER project will fall under this group. The official Guidance on Financial Management and Accounting for World Bank funded projects was also distributed to PC Dong Nai and its content was included in the training held in August 2001 for the whole EVN including staff of new PMB under PC Dong Nai. From the review, it seems that new PMB in PC Dong Nai have adequate staffing to afford World Bank's requirement for SEIER project.

3.4 At MOI, the executing agency for the Subcomponent 1.2b (Pilot Commercial Energy Efficiency Program); Subcomponent 2.3 (Community Based Hybrid Renewable Energy Grids); and Subcomponent 3.3 (Strengthening Regulations, Planning and Implementation Capacity for Renewable Energy Projects) would be a separate MOI-PMU. To manage the Energy Efficiency Subcomponent, MOI will use the existing PMU for the DSM phase 1 project funded by SIDA under the TDDRP. From project design, no decentralisation on financial payment will be placed in the implementing agencies under the MoI at provincial level (PPMUs). All payment requests will be prepared by PPMUs and will be transferred to the central PMU in the MoI. The MoI will then make payment directly to suppliers/contractors either from Special Account of the GEF or from Special Account of IDA credit. Since the new PMU for SEIER project at MoI was established on 3 July 2001, no clear indication has been made on the proposed key personnel in the PMU to handle accounting and financial management functions for SEIER project. Although the MoI have gained some experiences on World Bank procedures from the previous Trust Funds executed by the World Bank, the financial management capacity of the MoI is still quite limited. Necessary steps on staffing matter for the MoI to fulfill minimum requirement from the World Bank have been included in the Action Plan.

Accounting policy and procedure

3.5 At EVN side, implementing entities in SEIER project (EVN, PC1, PC2, PC3 and PC Dong Nai) will use the existing accounting system for the whole EVN under the new guideline on accounting system which was adopted on 25 May 2001. In this new guideline, the old accounting system following Decision 1141 was amended by the MOF to take into account new features such as: new reporting requirement (Decision 167 dated 25 October 2000), new accounting system for construction project (Decision 214) and, accounting system for Public Expenditure Units (Decision 999). Other financial management arrangements directly related to SEIER project will follow the official Guidance released also in May 2001 by EVN on Financial Management and Accounting for World Bank funded projects. All accounting transactions of SEIER project will be captured as part of PC's existing accounting system by adding more sub-accounts for SEIER project and use the functions of the accounting software for Capital Construction to keep track of project transactions by project activities, project expenditure categories and sources of fund.

3.6 At MoI side, the PMU in the MoI will follow the existing accounting system under Decision #999 to arrange financial management activities for SEIER project. All accounting transactions from special accounts of both IDA and GEF will be recorded centrally in the central PMU. Accounting transactions of SEIER project will be recorded by both project activities, expenditure categories and with clear separation of funding sources.

External Audit Requirements.

3.7 EVN and the PCs have engaged as its external auditor, the Vietnam Auditing Company (VACO), a State-owned company and member of Deloitte Touche Tohmatsu (DTT) since 1996. VACO, which was established in 1991 by the MOF, formed a joint venture with DTT in 1995/96 and reverted to full Government ownership in October 1997 while maintaining its affiliation and close working relationship with DTT. Although VACO has financial audit expertise and is familiar with the Bank's and EVN's requirements, *a formal transparent selection process for an independent auditor will be carried out to select an independent auditor acceptable to IDA to ensure the quality audit.*

3.8 At this time, the entities involved in SEIER project (EVN, PC1, PC2, PC3, and the new entity PC Dong Nai) have complied with all the audit report requirements of the existing legal agreements. There are no overdue audit reports and all reports have been submitted in a timely manner. Significant progress has been made in the FY00 audit to reduce the list and substance of qualifications reported by the auditors. In view of these significant improvements, the FY00 audit report was accepted by IDA for purposes of the implementing agencies' (EVN, PC1, PC2, PC3 and PC HCMC) full compliance with the audit report requirements of the existing Credit and Project Agreements.

3.9 For SEIER project, beside the entity audit reports for EVN itself, PC1, PC2, PC3 and PC Dong Nai, 2 separate sets of project financial statements will be prepared from EVN side and MoI side. EVN side will prepare consolidated financial statements for all of it's components under SEIER project covering all sources of funds including IDA fund and GEF. MoI side will also prepare financial statements for it's components under SEIER project covering all sources of funds including IDA fund and GEF. The format and content of financial statements for SEIER project will follow the standards of the World Bank. The below table summarises audit reporting requirements for SEIER Project:

<i>Audit Report</i>	<i>Due Date</i>
Entities (EVN, PC1, PC2, PC3, PC Dong Nai)	Within 6 months after the end of each fiscal year
Project (2 separate reports from EVN and MoI)	Within 6 months after the end of each fiscal year
SOE (2 separate reports from EVN and MoI)	Within 6 months after the end of each fiscal year
Special Accounts (2 separate reports from EVN and MoI)	Within 6 months after the end of each fiscal year

Financial Monitoring Reports (FMRs)

3.10 In the recent Rural Energy Project, the following Project Management Reports (PMR) in VND (reporting currency) have been prepared for the World Bank. This PMR reporting have been recently introduced and trained widely within EVN and EVN expects to apply PMR reporting for all future projects funded by the World Bank.

Statement1-A:	Project Sources and Uses of Funds
Statement1-B:	Uses of Funds by Project Activities
Statement1-E:	Special Account
Statement2-A:	Output Monitoring Report- Contract Management
Statement3-A:	Procurement Process Monitoring (Goods & Works)
Statement3-B:	Procurement Process Monitoring (Consultants' Services)
Statement3-C:	Contract Expenditure Report (Goods & Works)
Statement3-D:	Contract Expenditure Report (Consultants' Services)

3.11 From the *Guidelines to Staff on Financial Monitoring Reports* (FMRs) issued by OPCS on 30 November 2001, SEIER project will be appraised after January 2002 and therefore can use FMRs to report to the World Bank. Taking into account the familiarisation of EVN with PMR and new flexible feature of FMR reporting, a detail forms of FMRs will be developed on the basis of existing PMR reporting system in EVN projects and agreed with client and Task Team before negotiation. At this stage we can conclude that for SEIER project, both MoI and EVN sides will prepare FMRs reporting and submit to the World Bank on quarterly basis.

Information Systems

3.12 Under the Rural Energy Project, EVN installed a Project Management Report (PMR) accounting software which was reviewed, evaluated and deemed satisfactory by the Bank to be sufficient to produce PMRs with a transparent audit trail and which would facilitate production of reports in an effective and efficient manner. With the grouping function of current accounting software in EVN, the coding for components under SEIER project will be set up and project progress will be monitored by expenditure categories and project activities.

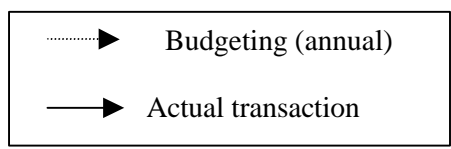
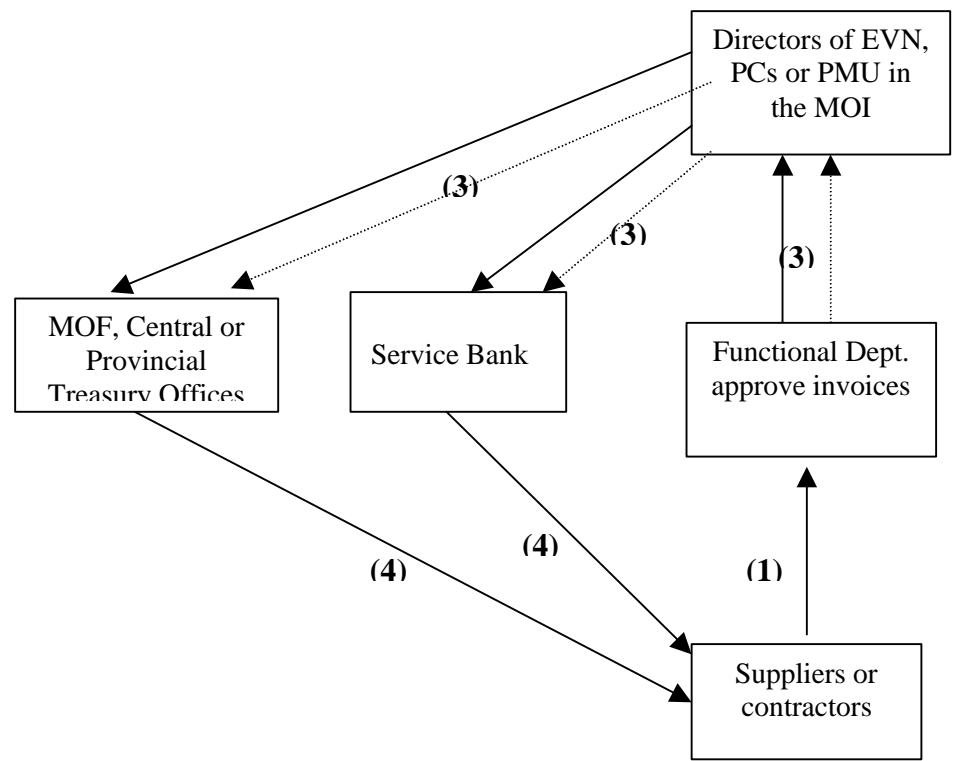
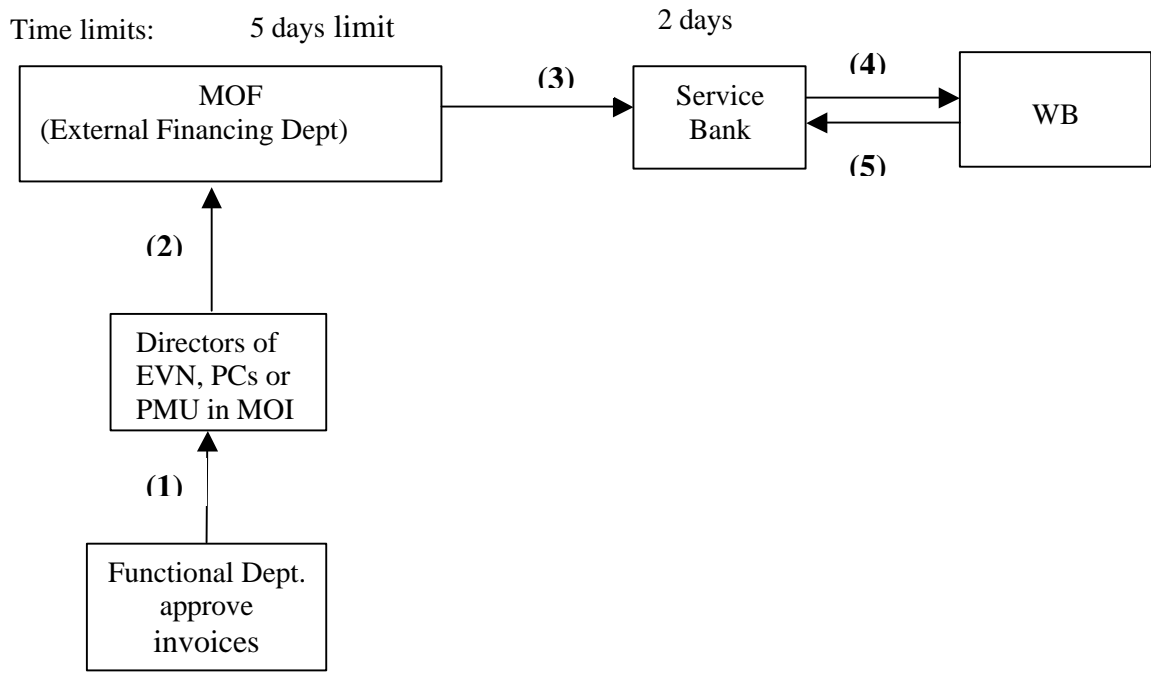
3.13 Following the point in previous paragraph on Financial Monitoring Reports (FMR), the PMR software and procedure will be amended in flexible manner to afford new requirements of the World Bank while still maintaining practicality and flexibility for the SEIER project.

Impact of Procurement Arrangements.

3.14 No other specific issues have been noted from the procurement assessment which could impact the assessment of the financial management system.

Disbursement Arrangements.

A- Initial Deposit and Replenishment to Special Account



Note

A- Initial Deposit and Replenishment to Special Account

- (1) Functional departments in EVN, PCs or in PMU of the MoI check and approve the Withdrawal Applications. After that applications will be transferred to the Directors of implementing entities.
- (2) The Directors of implementing entities (EVN, PCs or PMU in the MoI) approve the Withdrawal Applications then transfer them to the External Financing Department in the Ministry of Finance.
- (3) The External Financing Department in the Ministry of Finance check and approve the Withdrawal Applications. After that applications will be transferred to the Service Banks for approval.
- (4) Service Bank approve the Withdrawal Applications. Project staff bring the fully approved Withdrawal Applications back to World Bank Vietnam office. This will then be sent by pouch to World Bank in Head Quarter requesting initial allocations or replenishments directly to the Special Accounts of each implementing entities.
- (5) World Bank Head Quarter will then check again and transfer money to Special Accounts.

B- Disbursement from Special Account

- (1) Suppliers/contractors send invoices to functional departments of implementing entities requesting for payments.
- (2) Functional departments of implementing entities check, prepare Payment Requests and Payment Authorisations then send the full set of document to the Directors of implementing entities for signature.
- (3) Directors of implementing entities sign in the Payment Requests and Payment Authorisations then send to Treasury Offices for approval.. After approved by the Treasury Offices, document will be sent to Service Banks for approval. In case of Direct Payment, the implementing entities will prepare Withdrawal Applications, get approvals from External Financing Department (MoF) and Service Banks then send to World Bank Head Quarter for direct payment to suppliers/contractors.
- (4) Treasury Offices and Services Banks after checking will proceed with payments directly to suppliers/contractors from counter-part fund (if any) and IDA fund accordingly. In case of Direct Payment, IDA or GEF funds will be paid directly from SEIER's project account in the Head Quarter to suppliers/contractors without going through Special Accounts of implementing entities.

3.15 The IDA Credit will be disbursed against: (i) 100 % of foreign expenditures, or 100 % of local expenditures (ex-factory cost) for goods; (ii) 75 % of local expenditures for other items procured locally; (iii) 95% of expenditures for civil works; and (iv) 100% of expenditures for consulting services.

3.16 For works costing less than US\$ 300,000 equivalent per contract; goods costing less than US\$150,000 equivalent per contract; services provided by consulting firms costing less than US\$100,000

equivalent per contract; services provided by individual consultants costing less than US\$50,000 equivalent per contract; withdrawals from the Credit Agreement would be made on the basis of statements of expenditures.

3.17 Eight Special Accounts will be maintained for SEIER Project. 2 Special Accounts will be opened in EVN (1 for IDA and 1 for the GEF). 4 Special Accounts will be opened in PCs 1,2,3 and Dong Nai. 2 Special Accounts will be opened for the PMU under MOI (1 for IDA and 1 for GEF). Although each of these implementing entities should be responsible for managing and reconciling its own Special Accounts, for the preparation and submission of project financial statements, the first 6 Special Accounts will be consolidated by EVN-PFMCU into a project financial statements for -project components under EVN side, while MOI would be responsible for a financial statements covering the 2 Special Accounts for project components under MoI side. Each of these Special Accounts will be held in US dollar currency at the state-owned commercial bank specified by the Government. Payments out of the Special Accounts are to be made for eligible expenditures in accordance with the Credit Agreement and Bank guidelines. The authorized allocations for IDA accounts would be as follows: (i) US\$1 million for PC1, PC2 and PC3, respectively; (ii) US\$500,000 for PC Dong Nai; (iii) US\$2 million for EVN, and (iv) US\$250,000 for MOI. Replenishment applications would be submitted monthly or when amounts withdrawn equal 50% of the initial deposit, or when the account is drawn by 30% of the authorized allocation, whichever comes first.

3.18 Retroactive financing in the aggregate amount of US\$ 21.7 million, or about 9.6 % of the Credit, would be provided for expenditures made prior to the date of the Credit Agreement but after February 4, 2002, (the appraisal date), for urgently required contracts, goods and works, as well as consulting services. The procurement procedures shall be in accordance with IDA Procurement Guidelines.

3.19 The original source and back up documentation will be retained at point of initiation (e.g. PFMU, PFMCU, etc.) with each respective body rendering approval/authorization retaining copies for filing and audit trail purposes. Disbursement application processing time is estimated to take 45 days from point of initiation (invoice received) to cash payment to suppliers.

Action Plan for Financial Management	Agency	Completion
For EVN		
<i>Corporate Governance</i>		
- Review Bechtel Study for Commercialization and Corporatization Action Plan B for reconstituting and expanding EVN's Board in accordance with international best practice of corporate governance. Upon completion of review, submit proposal to the Government to appoint independent directors consistent with OECD principles	GOV/EVN	By Dec-2004
- Establish a selection process for qualified Board members based on performance criteria and professional qualifications rather than political directives;	GOV/MOI	By Dec-2004
- Train prospective Board members through specially designed overseas seminars and on-site training/advisory activities	GOV/MOI	By Dec-2004
- Improve the role of audit committee to oversee financial reporting process and oversee internal control system consistent with international best practices	GOV/MOI	By Dec-2004
<i>Corporate Planning</i>		
- Review Bechtel Study for Commercialization and Corporatization Action Plan E for establishing the corporate planning function;	EVN	By Dec 2002
- Establish a Corporate Planning Unit (CPU) comprised of a multi-disciplined staff of engineers, economists, finance/accounting specialists, etc from various EVN units;	EVN	By Dec 2003
- Provide training to staff who would have the responsibility for setting up the CPU, its procedures and training of other staff	EVN	By June-2003
<i>Accounting System and Procedures (These are remaining recommendations brought forward from Action Plan of TDDR project)</i>		
- Implement budget control system	EVN	By Dec-2002
- Implement treasury & cash management function	EVN	By Dec-2002
- Implement loan management policies	EVN	By Dec-2002
- Implement account receivable system	PCs	By Dec-2002
- Improve billing and collection system	PCs	By Dec-2002
- Implement account payable system	PCs	By Dec-2002

Action Plan for Financial Management	Agency	Completion
<i>Internal Control System (these are remaining internal control recommendations brought forward from Action Plan of TDDR project and also from Audit Reports and Management Letters of EVN and its PCs for the financial year ended 31 December 2000)</i>		
- Remove the remaining qualifications regarding intercompany balances mentioned in the audit reports of the year 2002	EVN/PCs	By Sept-2002
- Improve the management of fixed assets and depreciation	PCs	By Dec-2002
- Improve the preparation and circulation of initial documents on imported material and commodities at project management units	PCs	By Dec-2002
- Proceed the timely recording of construction in progress of power construction units	PCs	By Dec-2002
- Improve accounting practice on foreign currency transactions	PCs	By Dec-2002
- Improve accounting practice on revenue, income and expenses in auxiliary business activities	PCs	By Dec-2002
- Improve accounting practice on treatment of idle investment assets, damaged and slow moving inventory	PCs	By Dec-2002
- Improve Internal Audit function by implementing the recommendation of Consultant under TA2897-VIE funded by the ADB	EVN/PCs	By Dec-2002
<i>IT strategy</i>		
- Development and implementation of an effective IT strategy as a planning and management tool	EVN	By Dec-2002
Staffing		
- Submit to IDA a staff training plan (EVN) which would include financial management staff	EVN	By Sep-2002
For MoI		
- Appoint a Financial Management Specialist acceptable to the World Bank together with other staffing arrangement at the PMU under MoI	MOI	Effectiveness
- Conduct training on basic project financial management as well as World Bank procedure on financial management, procurement, and disbursement...	MOI, WB	Effectiveness

Annex 6: Procurement and Disbursement Arrangements

VIETNAM: System Efficiency Improvement, Equitization & Renewables Project

Procurement

1. All goods and works financed under the IDA credit shall be procured in accordance with the World Bank's Procurement Guidelines ("*Guidelines – Procurement under IBRD Loans and IDA Credits*", January 1995, revised in January and August 1996, September 1997, and January 1999). All consultant services to be financed under the IDA Credit shall be selected in accordance with the World Bank Consultant Guidelines ("*Guidelines – Selection and Employment of Consultants by World Bank Borrowers*", January 1997, revised September 1997 and January 1999). Specific procurement arrangements are summarized in Tables A and A1. Table B provides the thresholds for procurement methods and prior review, and Table C provides the allocation of Credit Proceeds. A Procurement Plan showing the timing and procurement method for each contract in the procurement process is provided in Attachment 1 to this Annex. Attachment 2 includes a model side letter for NCB procurement. The Assessment of the Agency's Capacity to Implement Procurement is presented as a separate document.
2. For International Competitive Bidding (ICB) for Goods, the Bank's Standard Bidding Documents for Goods (SBDG) will be used¹. For National Competitive Bidding (NCB) for Works, the Sample Bidding Documents for Works prepared by the World Bank Vietnam Country Office is recommended. For the selection of Consultants, the Bank Standard Request for Proposals (July 1997, revised in April 1998 and July 1999) shall be used. Local procurement procedures for works contain some basic differences as compared to the Bank guidelines, especially in connection with the concept of "lowest evaluated costs" and "pass/fail" qualification methodology required under Bank financed projects. But these are being mitigated by measures proposed in para 10. The Bank's Standard Evaluation Form for the Procurement of Goods or Works (April 1996) shall be used for ICB procurement of goods. For selection of consultants, the Bank standard request for proposals (July 1997, revised in April 1998 and July 1999) shall be used. The Bank's Sample Form of Evaluation Report (October 1999) should be used for selection of consulting services.
3. Civil and installation works for transmission lines and substations, will be financed from counterpart funds, and would be contracted to local firms through a competitive bidding process satisfactory to IDA.
4. Since the contracts for the works and goods for the rehabilitation of 15 communes to be equitized, construction and supply equipment for community based- hybrid grids, and rehabilitation of small hydropower will be of small value, these contracts would be procured through NCB for works procedure similar to turn key contracts.
5. ***Procurement of Works***. The total costs of works are estimated at US\$ 73.35 million equivalent. Most of the works (US\$ 60.85 million equivalent) will not be financed by the IDA Credit. An aggregate amount estimated not to exceed US\$ 11.3 million equivalent, will be financed by IDA and procured through NCB. These contracts range from US\$ 100,000 to about US\$ 500,000 equivalent each and would not likely attract foreign contractors. Smaller contracts estimated costs US\$ 50,000 equivalent or less each, amounting to about US\$ 1.2 million in aggregate, may be procured through Small Works procedure on the basis of at least three quotations from qualified bidders, with the contract awarded to the lowest evaluated bidder. A supplemental letter for NCB procurement to waive those areas in Vietnam's public procurement regulations that are inconsistent with the Bank Procurement Guidelines, to be agreed and signed at negotiations, will apply to NCB contracts. The scope of NCB contracts will include civil and installation

works for the mini hydro gensets (US\$ 1.2 million) for equitization works (US\$ 6.1 million), and for civil and installation works for commune-based hydro hybrid renewable energy grids (US\$ 4.0 million).

6. ***Procurement of Goods.*** The total costs of goods is estimated at US\$ 196.5 of which US\$ 195.95 equivalent are to be financed under the IDA Credit. The major part (i.e. US\$ 192.15 million equivalent) is to be procured through ICB which includes equipment for the 500 kV and 220 kV transmission lines and substations (US\$ 109.7 million), the 110 kV transmission lines and substations (US\$ 70.74 million), the hydro gensets and protection equipment and wind gensets (US\$ 6.0 million), and for the procurement of hardware and software for improving information management system (US\$ 5.7 million). International Shopping may be used to procure goods estimated cost to US\$ 50,000 or less per contract in the aggregate amount not exceeding US\$ 3.04 million for equipment of the DSM component. NCB procured goods compact fluorescent lamps and staff equipment estimated to cost US\$ 100,000 or less per contract not exceeding an aggregated amount of US\$ 0.76 million. Domestic preference will be allowed as applicable in accordance with the Bank Procurement Guidelines. As detailed in Attachment 1 to this Annex, 15 ICB packages are expected for the 500 kV components, 12 for the 220 kV components, 28 for the 110 kV components, and 3 for the Information Technology component.

7. ***Procurement of Consulting Services.*** The aggregate amount for consulting services is US\$ 21.05 million of which US\$ 16.55 million will be covered by IDA funds. IDA-financed consulting services include engineering consultancy services for the 500 kV and 220 kV lines (US\$ 1.0 million), US\$ 7.0 for EVN for Information Technology improvement, US\$ 1.1 million for EVN for development of a joint stock company for a hydropower station, and US\$ 2.1 for maintenance improvement at EVN, US\$ 1.5 million for establishing commune joint stock companies in PC1, PC2 and PC3, and US\$ 0.96 million for DSM activities such as marketing and promotion (US\$ 0.32 million), administration (US\$ 0.17 million), technical assistance (US\$ 0.47 million) and the balance of US\$ 3.0 million for training and other activities. GEF-financed consulting services amounting to US\$ 4.5 million, which include TA and training for rehabilitation of mini-hydro facilities (US\$ 0.5 million); TA and training for community renewable energy grids (US\$ 1 million) and TA and training for renewable energy program development (US\$ 3.0 million). Recruitment of the engineering consultants (for 500 kV and 220 kV), information technology, maintenance improvement, and technical assistance will be carried out under the Quality and Cost-Based Selection method (QCBS) or Quality-Based Selection (QBS), as deemed appropriate. Consultants' Qualification (CQ) will be used for the procurement of consultants for training activities and for smaller consulting services for firms not exceeding US\$ 100,000 per contract or US\$ 50,000 per contract for individuals. Under the community based renewable energy component, for the service of independent monitoring of RAP and ethnic minority development plan implementation, single source may be used for contracts not exceeding US\$ 50,000 per contract with an aggregate amount not exceeding US\$ 200,000 since the service is very small and requires specific qualification not widely available in the country.

8. ***Agency Capacity Assessment.*** A Country Procurement Assessment (CPAR) was conducted in October 2001 and a recent assessment of procurement capacity of EVN and the PCs, carried out for the Rural Energy Project, provided the basis for the assessment. More details are found in the document "Assessment of Agency's Capacity to Implement Project Procurement" which is part of the appraisal documents.

9. In general, all the proposed project implementing agencies, except Dong Nai Power Company, have adequate capacity for procurement. Major weaknesses identified in the assessment are: (i) Local NCB procurement procedures inconsistent with Bank Procurement Guidelines; in particular, (ii) inadequate capacity of PCDN to undertake procurement.

10. The following main actions have been proposed to mitigate procurement risk. A Supplemental Letter for NCB Procurement in which the Vietnamese Government agrees to comply with the provisions of the Bank Guidelines for Procurement under IBRD and IDA credits will be included as an integral part of the Credit Agreement. Model Bidding Documents for Works (in Vietnamese), which are an adaptation of the Bank's Standard Bidding Documents for Works for Smaller Contracts, already used successfully in previous Credits - will be used for NCB procurement of works. The Bank's Standard Bidding Documents will be used for ICB procurement of goods. The Bank's Standard Request for Proposals shall be used for major consulting services. EVN and the Bank will provide training to all PMUs in Bank's procurement, specifically procurement of works. In particular, PCDN shall recruit new procurement staff who will be seconded for on-the-job training at PC2's procurement unit. PC2 shall provide the service of an experienced procurement specialist to assist PCDN for a period of at least 6 months. Prior and ex post reviews will cover more than 94 % of the value of the credit. As described in Attachment 1 to this Annex, the first year procurement plan including bidding documents has been prepared for the major components. The procurement plan will be updated regularly during project implementation. As in previous projects, a Procurement Monitoring Group will be established within EVN to coordinate procurement activities and for streamlining bidding and contracting procedures.

Procurement methods (Table A)

Expenditure Category	ICB	NCB	Other/2	N.B.F.	Total Cost
1. Works	0.00	11.30	1.20	60.85	73.35
BF	0.00	(11.30)	(1.20)	0.00	(12.50)
2. Goods	192.15	0.76	3.04	0.55	196.50
BF	(192.15)	(0.76)	(3.04)	0.00	(195.95)
3. Services	0.00	0.00	21.05	0.00	21.05
BF	0.00	0.00	(16.55)	0.00	(16.55)
GEF-financed			4.50		4.50
4. Miscellaneous (administration & engineering overheads, resettlement and land acquisition)	0.00	0.00	0.00	31.31	31.31
BF	0.00	0.00	0.00	0.00	0.00
5. Taxes and Duties	0.00	0.00	0.00	11.39	11.39
BF	0.00	0.00	0.00	0.00	0.00
6. Interest During Construction			0.00	18.80	18.80
BF	0.00	0.00	0.00	0.00	0.00
					0.00
Total	192.15	12.06	25.29	122.90	352.40
BF	(192.15)	(12.06)	(20.79)	0.00	(225.00)
GEF-financed			4.50		4.50

- 1/ Figures in parenthesis are the amounts to be financed by the IDA Credit. All costs include contingencies. Amounts shown are subject to round-off errors.
- 2/ Includes
- o International Shopping for DSM equipment and materials (aggregate amount US\$ 3.04 million)
 - o NCB for CFL and other small DSM equipment available locally (aggregate amount of US\$0.76 million)
 - o Smaller works contracts for rehabilitation of minihydro hydro sets not to exceed US\$ 1.2 million in aggregate.
 - o Consulting Services for engineering services for 500 kV components, for information technology, for developing joint stock companies, for DSM activities, for training, and for maintenance improvement for EVN (with an aggregate amount of US\$ 16.55 million)

Table A1: Consultant Selection Arrangements
(US\$ million equivalent)

Consultant Services Expenditure Category	Selection					Method			Total Cost ¹
	QCBS	QBS	SFB	LCS	CQ	Other	N.B.F.		
A. Firms	14.19	0.70			2.98	0.20		18.07	
BF	(14.19)	(0.70)			(0.83)	0.00		(15.72)	
GEF		1.50			0.65	0.20		2.35	
B. Individuals					2.98	0.00		2.98	
BF					(0.83)			(0.83)	
GEF		1.20			0.95			2.15	
Total	14.19	0.70	0.00	0.00	5.96	0.20	0.00	21.05	
BF	(14.19)	(0.70)	0.00	0.00	(1.66)	0.00	0.00	(16.55)	
GEF		2.70			1.60	0.20		4.50	

1\ Including contingencies

Note: QCBS = Quality- and Cost-Based Selection
QBS = Quality-based Selection
SFB = Selection under a Fixed Budget
LCS = Least-Cost Selection
CQ = Selection Based on Consultants' Qualifications
Other = Selection of individual consultants/single source (per Section V of Consultants Guidelines), Commercial Practices, etc.

N.B.F. = Not Bank-financed

Figures in parenthesis are the amounts to be financed by the Bank Credit.

11. Prior review by IDA of draft tender documents and finalized tender documents, bid evaluation reports, draft contracts and signed contracts, will be carried out for all ICB procurement. For consulting services, prior review of draft terms of reference (TOR) and finalized TOR, cost estimates, selection criteria, consultant shortlists, requests for proposals and final contracts will be carried out. Prior review will also be undertaken for of GEF- financed contracts. Selective post review of one in five contracts will be carried out during project supervision missions together with SOE review.

12. Prior review of procurement decisions by the Bank will include:

- The first NCB work contract from each PMU regardless of value
- All NCB contracts for works exceeding US\$ 300,000 (for DNPC – US\$200,000) equivalent per contract thereafter
- The first ICB goods contract regardless of value from DNPC and all its ICB good contracts exceeding US\$ 150,000 each thereafter
- All ICB goods contracts exceeding US\$ 200,000 each from other PMUs
- All consultant contracts for firms exceeding US\$100,000 per contract and all consultant contracts with individuals exceeding US\$50,000 per contract.
- All contracts for GEF-funded TA components.

Overall, the Bank's prior review is expected to cover more than 94 % of total value of all Bank-funded procurement.

Prior review thresholds (Table B)

Table B: Thresholds for Procurement Methods and Prior Review

Expenditure Category	Contract Value Threshold (US\$ thousands)	Procurement Method	Contracts Subject to Prior Review (US\$ millions)
1. Works	>50	NCB	US\$9.2
	<50	NCB (small works)	US\$1.2 (all contracts)
2. Goods	>100	ICB	US\$ 170.0
	>50	NCB	US\$9.9 million
	<50	IS	All contracts not to exceed US\$3.8 million in aggregate First contract for each PMU
3a. Services	>100 (firms) or >50 (individuals)	QCBS, QBS	US\$ 12.0
	<100 (firms) or <50 (individuals)	CQ	US\$ 6.0
3b Services GEF	>100 (firms) or >50 (individuals)	QBS	US\$2.7
	<100 (firms) or <50 (individuals)	CQ	US\$ 1.6
	<50 (individual)	SS	US\$ 0.2 (single source selection in aggregate)
Total Value of Contracts subject to prior review (IDA Credit)			US\$212.1 (> 94% of the IDA Credit)
Total Value of Contracts subject to prior review (GEF)			US\$4.50 (100% of the GEF funds)

Overall Procurement Risk Assessment

Average

Frequency of procurement supervision missions proposed: Once every six months (includes special procurement supervision for post-review/audits). For Dong Nai once every three months.

Disbursement

Allocation of credit proceeds (Table C)

13. **Allocation of credit proceeds (Table C).** The IDA Credit will be disbursed against: (i) 100 % of foreign expenditures, or 100 % of local expenditures (ex-factory cost) for goods; (ii) 75 % of local expenditures for other items procured locally; (iii) 95% of expenditures for civil works; and (iv) 100% of expenditures for consulting services including training.

14. The estimated annual disbursement is shown in the Project Financing Data on page 1 and detailed in the PIP (available in tem project file). The disbursements are expected begin in the third quarter of 2002 and be completed in the 2nd quarter of 2007 with the commissioning of the 500 kV components.

Table C: Allocation of Credit Proceeds

Expenditure Category	Amount in US\$million	Financing Percentage
Works	12.50	95%
Goods	195.95	100% of foreign expenditures 100% of local expenditure (ex-factory cost) for goods; 75% of local expenditures for other items procured locally
Services (including training)	16.55	100%
Total Project Costs	225.00	
Total	225.00	

Use of statements of expenditures (SOEs):

14. For works costing less than US\$ 300,000 equivalent per contract; goods costing less than US\$ 150,000 equivalent per contract; services provided by consulting firms costing less than US\$ 100,000 equivalent per contract; services provided by individual consultants costing less than US\$50,000 equivalent per contract; withdrawals from the Credit Agreement would be made on the basis of statements of expenditures.

Special account:

15. To facilitate disbursement under the Credit, a Special Account will be established for each one of the implementing agencies with authorized allocations as follows: (i) US\$1 million for PC1, PC2 and PC3; (ii) US\$ 500,000 for PC Dong Nai; (iii) US\$ 2 million for EVN, and (iv) US\$ 250,000 for MOI. Under the GEF components on rehabilitation of mini-hydros by EVN (component 2.2) and Community-based hybrid renewable energy grids under MOI (component 2.3) two separate special accounts will be set up with authorized allocations as follows: (i) US\$250,000 for MOI and (ii) US\$150,000 for EVN. Replenishment applications should be submitted monthly or when amounts withdrawn equal 50% of the initial deposit, or when the account is drawn by 30% of the authorized allocation, whichever comes first.

16. **Retroactive Financing.** Retroactive financing in an aggregate amount of US\$ 21.7 million, or about 9.6 % of the Credit, would be provided for expenditures made prior to the date of the Credit Agreement but after February 2002, (the appraisal date), for contracts urgently required goods and works,

as well as consulting services. The procurement procedures shall be in accordance with IDA Procurement Guidelines.

¹ / The Borrower may also use the Trial Edition of Procurement of Goods & User's Guide of December 2001.

Attachment 1 to Annexe 6 : Project Procurement Plan

The Procurement Plan showing key dates in Gantt-chart form is attached. The following tables are also included: (i) Table D showing key dates for the expected procurement activities in the year of 2002, and (ii) Table E showing a detailed procurement plan and implementation schedule for the entire Project.

Table D. PROCUREMENT PLAN FOR THE FIRST YEAR OF IMPLEMENTATION

Project- Tasks	Duration	Start Date	Finish Date
1. 500 kV line Pleiku-Da Nang		7/1/2002 8:00	6/11/2007 17:00
<u>Consulting service</u>		7/1/2002 8:00	10/20/2003 17:00
Publish EOI in UNDB		7/1/2002 8:00	7/1/2002 8:00
Prepare RFP & Shortlist	2 months	7/1/2002 8:00	8/23/2002 17:00
Approve by EVN	2 months	8/26/2002 8:00	10/18/2002 17:00
Review & approval by IDA	2 weeks	10/21/2002 8:00	11/1/2002 17:00
Publish SNP in UNDB	30 days	11/4/2002 8:00	12/13/2002 17:00
Publish in local newspapers	3 days	12/5/2002 8:00	12/9/2002 17:00
Invitation for Proposal	60 days	12/10/2002 8:00	3/3/2003 17:00
2. 220 kV Projects		2/4/2002 8:00	9/16/2005 17:00
<u>Approval of FS</u>		2/4/2002 8:00	2/4/2002 8:00
<u>Completion of detailed designs</u>	8 months	2/4/2002 8:00	9/13/2002 17:00
<u>Procurement of Goods</u>	570 days	9/16/2002 8:00	11/19/2004 17:00
Preparing Bidding Documents	3 months	9/16/2002 8:00	12/6/2002 17:00
Approval of BD by EVN	45 days	12/9/2002 8:00	2/7/2003 17:00
3. 110 kV Projects by PCs	735 days	3/1/2002 8:00	12/23/2004 17:00
<u>Procurement of Goods</u>	540 days	3/1/2002 8:00	3/25/2004 17:00
Prepare Bidding Document	4 months	3/1/2002 8:00	6/20/2002 17:00
Approval of BD by EVN	2 months	6/21/2002 8:00	8/15/2002 17:00
Approval by IDA	2 weeks	8/16/2002 8:00	8/29/2002 17:00
Publish SPN in UNDB	30 days	8/30/2002 8:00	10/10/2002 17:00
Publish in local newspapers	3 days	10/8/2002 8:00	10/10/2002 17:00
Bid issuance		10/10/2002 8:00	10/10/2002 17:00
Bid preparation	60 days	10/11/2002 8:00	1/2/2003 17:00
4. Consulting service		9/4/2002 8:00	10/20/2003 17:00
Prepare TOR	2 weeks	9/4/2002 8:00	9/17/2002 17:00
Publish EOI in UNDB	2 months	9/18/2002 8:00	11/12/2002 17:00
Prepare RFP & Shortlist	1 mon	11/13/2002 8:00	12/10/2002 17:00
Approval by EVN	20 days	12/11/2002 8:00	1/7/2003 17:00

Table E. Procurement Plan and Implementation Schedule

No of Package	Implementing Agency	Package	Description	Financed By	Procurement Method	Issuance of Bidding Documents or RFPs	Award/signing of Contract	Delivery/ Construction & Commissioning/ Consulting Services (m/d/y)	Expected Package/ Contract/ Lot Value (US\$ mil)	
500kV Pleiku-Dung Quat- Danang T/L and Binh son Substation										
1	Central Power project management Board (EVN)	1	Consultancy services	IDA	QCBS	12/10/02	10/20/03	11/24/03-6/11/07	1.0	
2		2	Steel towers	IDA	ICB	6/1/04	5/16/05	6/16/05-6/16/06	9.9	
3		3	Conductors	IDA	ICB	6/1/04	5/16/05	6/16/05-6/16/06	11.1	
4		4	Insulators and fittings	IDA	ICB	6/1/04	5/16/05	6/16/05-6/16/06	5.6	
5		5	Transformers	IDA	ICB	6/1/04	5/16/05	6/16/05-6/16/06	5.4	
6		6	Substation equipment for Binh Son	IDA	ICB	6/1/04	5/16/05	6/16/05-3/1/07	22.1	
7		7	Substation equipment for connection with Pleiku and Danang Substations	IDA	ICB	6/1/04	5/16/05	6/16/05-3/1/07	16.0	
8		8	Optical cable	IDA	ICB	6/1/04	5/16/05	6/16/05-3/1/07	2.0	
9		9	Communication equipment	IDA	ICB	6/1/04	5/16/05	6/16/05-3/1/07	1.3	
Expansion of 500 kV Danang Substation										
10		1	Transformers	IDA	ICB	6/1/04	5/16/05	6/16/05-3/1/07	3.8	
11		2	Substation equipment	IDA	ICB	6/1/04	5/16/05	6/16/05-3/1/07	3.0	
Expansion of Nha Trang Substation										
12		1	Transformers	IDA	ICB	6/1/04	5/16/05	6/16/05-3/1/07	1.0	
13		2	Substation equipment	IDA	ICB	6/1/04	5/16/05	6/16/05-3/1/07	1.1	
Installation of Reactive compensators										
14	1	Capacitors	IDA	ICB	6/1/04	5/16/05	6/16/05-3/1/07	1.3		
15	2	Electrical equipment	IDA	ICB	6/1/04	5/16/05	6/16/05-3/1/07	0.6		

No of Package	Implementing Agency	Package	Description	Financed By	Procurement Method	Issuance of Bidding Documents or RFPs	Award/signing of Contract	Delivery/ Construction & Commissioning/ Consulting Services (m/d/y)	Expected Package/ Contract/ Lot Value (US\$ mil)	
		220 kV Substation and associated Transmission line								
16	Northern Power project management Board (EVN)	1	Steel Towers	IDA	ICB	4/4/03	1/16/05	2/16/05-9/16/05	3.1	
17		2	Conductors	IDA	ICB	6/1/04	1/16/05	2/16/05-9/16/05	0.9	
18		3	Insulators and fittings	IDA	ICB	6/1/04	1/16/05	2/16/05-9/16/05	0.3	
19		4	Transformers	IDA	ICB	6/1/04	1/16/05	2/16/05-9/16/05	5.2	
20		5	Substation equipment	IDA	ICB	6/1/04	1/16/05	2/16/05-9/16/05	0.6	
21		6	Optical Cable	IDA	ICB	6/1/04	1/16/05	2/16/05-9/16/05	0.7	
22		7	Communication equipment	IDA	ICB	6/1/04	1/16/05	2/16/05-9/16/05	0.6	
			Installation of Reactive compensators							
23			1	Capacitors	IDA	ICB	6/1/04	1/16/05	2/16/05-9/16/05	4.0
24			2	Associated Electrical Equipment	IDA	ICB	6/1/04	1/16/05	2/16/05-9/16/05	1.3
		South Sai Gon 220 kV Substation								
25	Southern Power Project Management Board (EVN)	1	Transformers	IDA	ICB	6/1/04	1/16/05	2/16/05-9/16/05	1.5	
26		2	Substation equipment	IDA	ICB	6/1/04	1/16/05	2/16/05-9/16/05	4.1	
27		3	Communication equipment	IDA	ICB	6/1/04	1/16/05	2/16/05-9/16/05	0.1	

No of Package	Implementing Agency	Package	Description	Financed By	Procurement Method	Issuance of Bidding Documents or RFPs	Award/signing of Contract	Delivery/ Construction & Commissioning/ Consulting Services (m/d/y)	Expected Package/ Contract/ Lot Value (US\$ mil)
Information Technology Improvement									
28	Research Center for Tech., Env. and Comp. (EVN)	1	Consultant services	IDA	QCBS	12/10/02	10/20/03	11/1/03-12/01/05	7.0
29		2	Hardware	IDA	ICB	12/10/02	10/20/03	11/20/03-11/20/04	3.5
30		3	Software	IDA	ICB	12/10/02	10/20/03	11/20/03-11/20/04	2.9
DMS phase II									
31	PMU for DSM (EVN)	1	Consultant services and training	IDA	CQ	8/1/02	3/1/03	4/1/03-6/1/04	0.7 0.3
32		2	TOU meters and End-use measuring equipments	IDA	IS	8/1/02	3/1/03	4/1/03-6/1/04	2.4
33		3	A set of Ripple control equipment (including 2000 receivers)	IDA	IS	8/1/02	3/1/03	4/1/03-6/1/04	0.48
34		4	High quality CFL lamps	IDA	NCB	8/1/02	3/1/03	4/1/03-6/1/04	0.76
35		5	10 sets of Energy Audit equipments	IDA	IS	8/1/02	3/1/03	4/1/03-6/1/04	0.16
Training of EVN's staff									
36	Personnel Dept. (EVN)		Training (the exact scope will be defined by the Master Plan)	IDA	QCBS	8/1/02	5/1/03	6/1/03-6/1/05	3.0
Technical Assistance									
37	EVN	1	Consulting services for development of a Joint Stock Company for a hydropower station	IDA	CQ	8/1/02	4/1/03	5/1/03-6/1/04	1.1
38		2	Consulting services for Improvement of the maintenance services	IDA	QBS	8/1/02	5/1/03	6/1/03-6/1/05	2.1
				Consulting services for renewable energy (GEF)	GEF	QCBS	8/1/02	5/1/03	6/1/03-6/1/05	0.2 0.3

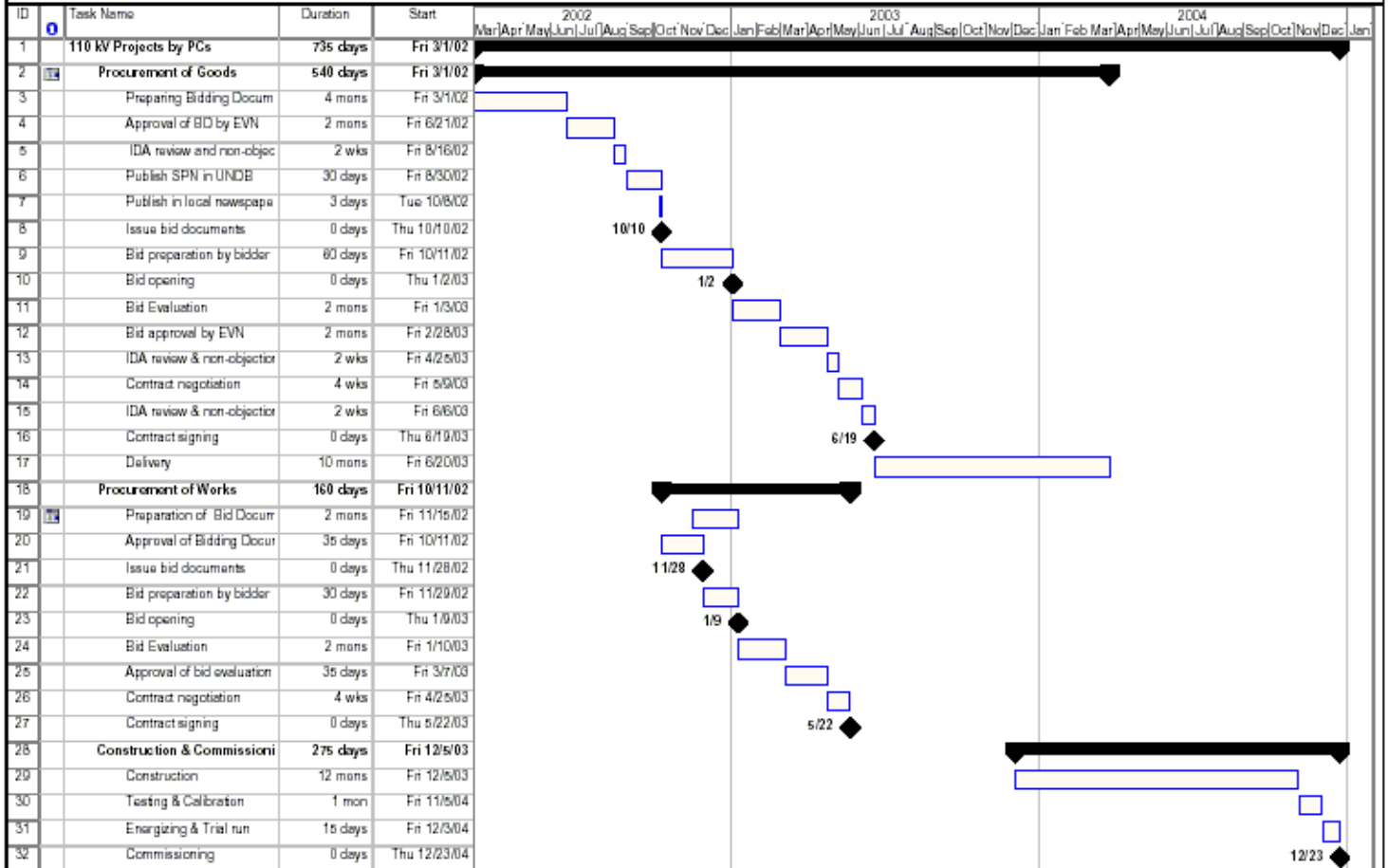
No of Package	Implementing Agency	Package	Description	Financed By	Procurement Method	Issuance of Bidding Documents or RFPs	Award/signing of Contract	Delivery/ Construction & Commissioning/ Consulting Services (m/d/y)	Expected Package/ Contract/ Lot Value (US\$ mil)
110 kV Substation and associated transmission lines									
39	Power Company No1 (PC1)	1	Conductors	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	3.2
40		2	Insulators and fitting	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	1.9
41		3	Concrete poles	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.9
42		4	Steel towers	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	6.1
43		5	Transformers	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	8.0
44		6	Substation equipment (divided into 21 lots)	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	12.4
45		7	Communication equipment	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	1.8
46		8	Other electrical equipment	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	1.8
Rehabilitation of small hydropower									
47		1	Equipment for Chieng Ngam Station	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.5
48		2	Equipment for Thac Bay Station	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.5
49		3	Works for Chieng Ngam	IDA	NCB	10/10/02	6/19/03	7/19/03-12/30/04	0.4
50		4	Works for Thac bay	IDA	NCB	10/10/02	6/19/03	7/19/03-12/30/04	0.3
Establishing Commune Joint Stock Company									
51		1	Consulting Service	IDA	CQ	8/1/02	4/1/03	5/1/03-6/1/04	0.6
52		2	7 contracts for upgrading commune grids (US\$300,000 each) (Turnkey contracts)	IDA	NCB	10/10/02	6/19/03	7/19/03-12/30/04	2.1

No of Package	Implementing Agency	Package	Description	Financed By	Procurement Method	Issuance of Bidding Documents or RFPs	Award/signing of Contract	Delivery/ Construction & Commissioning/ Consulting Services (m/d/y)	Expected Package/ Contract/ Lot Value (US\$ mil)	
110 kV Substation and associated transmission lines										
53	Power Company No2 (PC2)	1	Conductors	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.6	
54		2	Insulators and fitting	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.2	
55		3	Concrete poles	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.2	
56		4	Steel towers	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.8	
57		5	Transformers	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	4.8	
58		6	Substation equipment (divided into 15 lots)	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	9.0	
59		7	Communication equipment	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.8	
60		8	Other electrical equipment	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	1.6	
Reactive compensators										
61			1	Capacitors	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	2.2
62		2	Electrical equipment	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	1.2	
Rehabilitation of Small Hydro										
64		1	Equipment	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.9	
65		2	Works	IDA	NCB	10/10/02	6/19/03	7/19/03-12/30/04	0.9	
Wind Gensets										
66		1	Equipment	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	3.9	
67		2	Works	IDA	NCB	10/10/02	6/19/03	7/19/03-12/30/04	0.3	
Establishing Joint Stock company										
68		1	Consultancy services	IDA	CQ	8/1/02	4/1/03	5/1/03-6/1/04	0.5	
69		2	4 contracts for upgrading commune grids (NCB, turnkey contracts)	IDA	NCB	10/10/02	6/19/03	7/19/03-12/30/04	1.25	
70		3	1 Contract for upgrading district grids (NCB, turnkey contract)	IDA	NCB	10/10/02	6/19/03	7/19/03-12/30/04	1.55	

No of Package	Implementing Agency	Package	Description	Financed By	Procurement Method	Issuance of Bidding Documents or RFPs	Award/signing of Contract	Delivery/ Construction & Commissioning/ Consulting Services (m/d/y)	Expected Package/ Contract/ Lot Value (US\$ mil)	
	Power Company No3 (PC3)	110 kV Substation and associated transmission lines								
71		1	Conductors	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.5	
72		2	Insulators and fitting	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.2	
73		3	Concrete poles	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.03	
74		4	Steel towers	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.8	
75		5	Transformers	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	3.2	
76		6	Substation equipment	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	4.0	
77		7	Communication equipment	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.9	
78		8	Other electrical equipment	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.7	
			Rehabilitation of small hydro							
79		1	Kon Dao (NCB turnkey contract)	IDA	NCB	10/10/02	6/19/03	7/19/03-12/30/04	0.15	
80		2	An Diem (NCB turnkey contract)	IDA	NCB	10/10/02	6/19/03	7/19/03-12/30/04	0.35	
			Establishing commune Joint Stock Company							
81		1	Consulting service	IDA	CQ	8/1/02	4/1/03	5/1/03-6/1/04	0.4	
82		2	4 contracts for upgrading commune grids (NCB, turnkey contracts)	IDA	NCB	10/10/02	6/19/03	7/19/03-12/03/04	1.25	

No of Package	Implementing Agency	Package	Description	Financed By	Procurement Method	Issuance of Bidding Documents or RFPs	Award/signing of Contract	Delivery/ Construction & Commissioning/ Consulting Services (m/d/y)	Expected Package/ Contract/ Lot Value (US\$ mil)
	Power	110 kV substation and connection							
83	Company of Dong Nai (PC DN)	1	Conductors	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.04
84		2	Steel towers	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.1
85		3	Transformers	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.6
86		4	Substation equipment	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	1.5
87		5	Communication equipment	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.2
88		6	Other electrical equipment	IDA	ICB	10/10/02	6/19/03	7/19/03-12/30/04	0.2
		Renewable energy							
89	Ministry of Industry (MOI)	1	20 contract for small hydro (NCB, turnkey contracts)	IDA	NCB	8/1/02	6/19/03	7/19/03-12/1/04	4.0
90		2	4 contracts for consulting services for 4 province (GEF Fund)	GEF	QC QBS	10/10/02	6/19/03	7/19/03-12/1/04	0.7 0.3
91		3	Consulting services for supporting renewable program (may be divided into 7 contracts) (GEF)	GEF	QC QBS SS	10/10/02	6/19/03	7/19/03-12/1/04	0.5 0.8 0.2
92		4	Consulting services for renewable energy small power producer (may be divided into 5 contracts) (GEF)	GEF	QC QBS	10/10/02	6/19/03	7/19/03-12/1/04	0.5 1.0
93		5	Consulting services for renewable energy technology and market development (GEF)	GEF	QC QBS	10/10/02	6/19/03	7/19/03-12/1/04	0.2 0.3

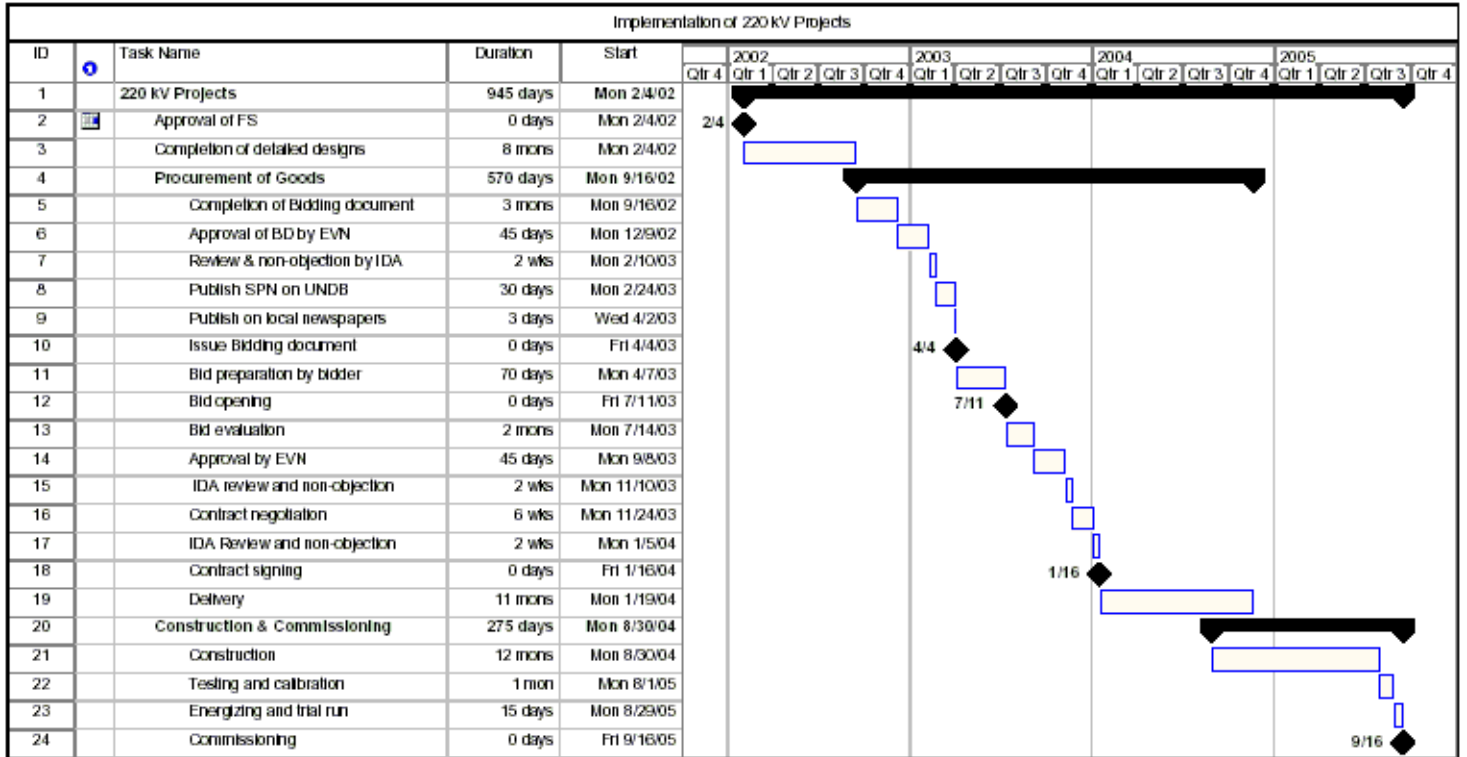
Implementation schedule of 110 KV Projects



Project: 110 KV projects
Date: Tue 5/14/02

Task	[Blue box]	Summary	[Black arrow]	Rolled Up Progress	[Black bar]	Project Summary	[Grey arrow]
Progress	[Black bar]	Rolled Up Task	[Blue box]	Split	[Blue bar]	Group By Summary	[Black arrow]
Milestone	[Black diamond]	Rolled Up Milestone	[White diamond]	External Tasks	[Grey bar]		

Page 1



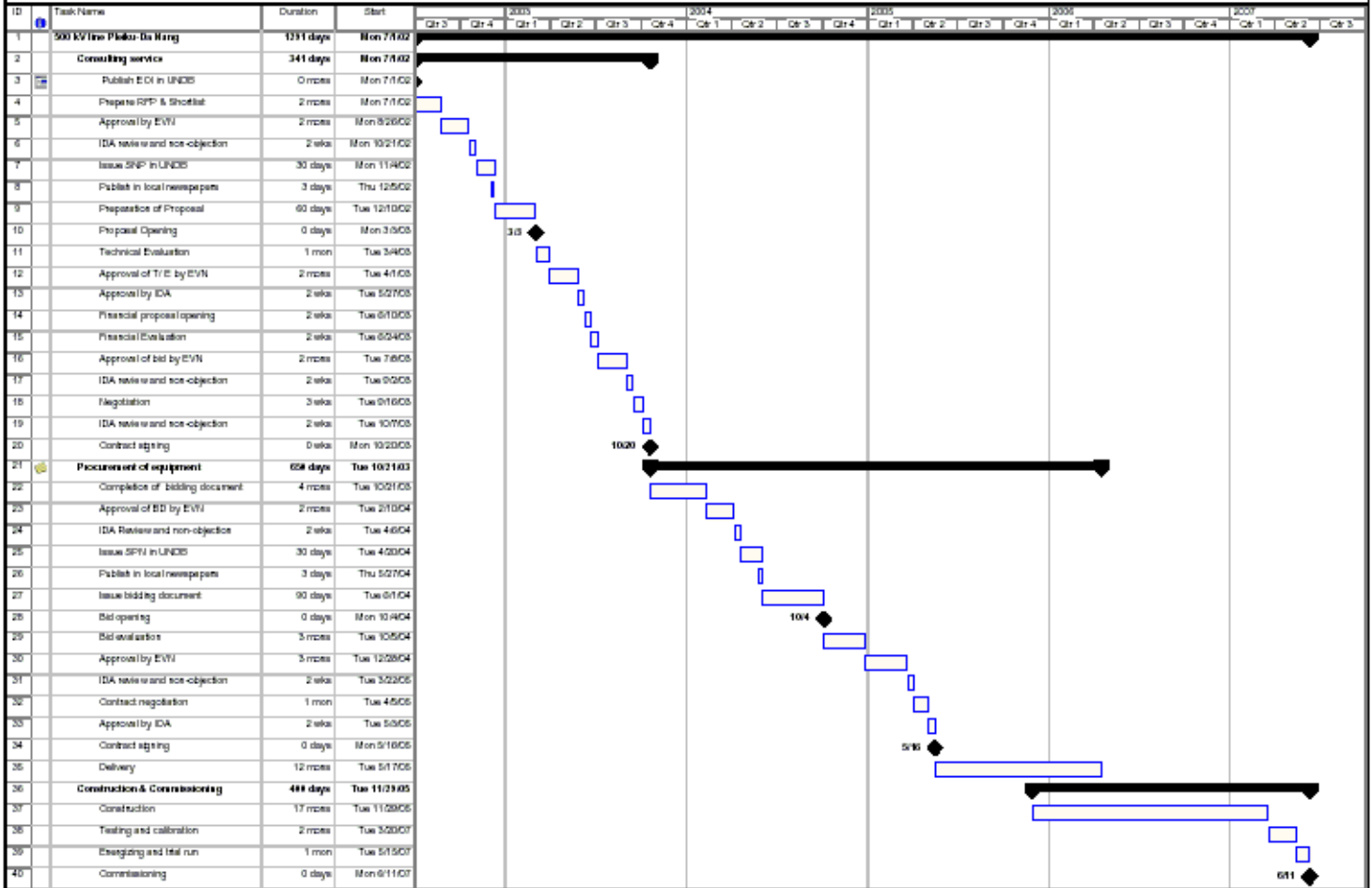
Project: 220 kV Projects Date: Tue 5/14/02	Task		Rolled Up Task		External Tasks	
	Progress		Rolled Up Milestone		Project Summary	
	Milestone		Rolled Up Progress		Group By Summary	
	Summary		Split			

Implementing schedule for Consulting services

ID	Task Name	Duration	Start	2003														
				Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov
1	Consulting service	294 days	Wed 9/4/02	[External Task Bar]														
2	Preparation of TOR	2 wks	Wed 9/4/02	[Task Bar]														
3	Publish EOI in UNDB	2 mons	Wed 9/18/02	[Task Bar]														
4	Prepare RFP & Shortlist	1 mon	Wed 11/13/02	[Task Bar]														
5	Approval by EVN	20 days	Wed 12/11/02	[Task Bar]														
6	IDA review & non-objection	10 days	Wed 1/8/03	[Task Bar]														
7	Publish SNP in UNDB	30 days	Wed 1/22/03	[Task Bar]														
8	Publish in local newspapers	3 days	Fri 2/28/03	[Task Bar]														
9	Invitation for Proposal	40 days	Wed 3/5/03	[Task Bar]														
10	Proposal Opening	0 days	Tue 4/29/03	[Task Bar]														
11	Technical Evaluation	1 mon	Wed 4/30/03	[Task Bar]														
12	Approval of T/E by EVN	20 days	Wed 5/28/03	[Task Bar]														
13	IDA review & non-objection	10 days	Wed 6/25/03	[Task Bar]														
14	Financial proposal opening	10 days	Wed 7/9/03	[Task Bar]														
15	Financial Evaluation	20 days	Wed 7/23/03	[Task Bar]														
16	Approval of bid by EVN	15 days	Wed 8/20/03	[Task Bar]														
17	IDA review & non-objection	7 days	Wed 9/10/03	[Task Bar]														
18	Negotiation	3 wks	Fri 9/19/03	[Task Bar]														
19	Approval by IDA	7 days	Fri 10/10/03	[Task Bar]														
20	Signing contract	0 days	Mon 10/20/03	[Task Bar]														

Project: Consulting service Date: Tue 5/14/02	Task		Milestone		External Tasks	
	Split		Summary		External Milestone	
	Progress		Project Summary		Deadline	

Implementation Schedule of 500 kV Transmission Line Pleiku- Da Nang



Project: 500 kV Transmission Line Pleiku-Da Nang
Date: Tue 5/14/02

Task		Summary		Rolled Up Progress		Project Summary	
Progress		Rolled Up Task		Split		Group By Summary	
Milestone		Rolled Up Milestone		External Task			

Page 1
1 / 1

Attachment 2 to Annex 6

Letter No. ---

SOCIALIST REPUBLIC OF VIETNAM

International Development Association
1818 H Street, N.W.
Washington, D. C. 20433
United States of America

Re: Credit No. ----- VN
(Rural Energy Project)
Procurement Procedures for National Competitive Bidding

Dear Sir or Madame:

We refer to Section I, Part C.3 of Schedule 3 of the Development Credit Agreement (----- Project) of even date herewith between the Socialist Republic of Vietnam (the Borrower) and the International Development Association (the Association), concerning National Competitive Bidding Procedures.

We hereby agree that the procedures to be followed for National Competitive Bidding under said Section I, Part C.3, shall be those set forth in Decree No.88/CP dated September 1, 1999, of the Government of the Socialist Republic of Vietnam, with the clarifications set forth in the Annex to this letter required to comply with the provisions of the Guidelines for Procurement under IBRD Loans and IDA Credits published by the Bank in January 1995 and revised in January and August 1996, September 1997 and January 1999.

Please confirm the agreement on behalf of the Association, to the application of these procedures by signing the form of confirmation below.

Very truly yours,

by /s/

Autl

Representative
CONFIRMED:

INTERNATIONAL DEVELOPMENT
ASSOCIATION

by /s/
Authorized Representative

NATIONAL COMPETITIVE BIDDING

I. Eligibility

1. The definition of “National Competitive Bidding” in Article 3 Section 2 of the Regulations is hereby revised to read “National Competitive Bidding” is a procurement process where it is envisaged that foreign entities would not be interested in participating. However foreign bidders are allowed to participate under National Competitive Bidding procedures without association with domestic firm.

2. Article 10 of the Regulations relate to International Competitive Bidding procedures and, pursuant to Section 3.02 of the Development Credit Agreement, are superseded by the provisions of the “Guidelines for Procurement under IBRD Loans and IDA Credits” published by the Bank on January 1995 and revised in January and August 1996, September 1997 and January 1999. Therefore provisions in the Regulations relating to International Competitive Bidding will not apply.

3. The provisions of Article 23 of the Regulations are hereby clarified to mean that all pre-qualified bidders will be invited to bid.

II. Bidding Documents

1. The following sub-paragraph will be added to the paragraph 3 of the Article 24:

If bidders are invited to bid on the basis of post-qualification, then the bidding documents shall specify the post-qualification criteria, i.e. the minimum level of experience in similar contracts, technical capability and financial resources to effectively carry out the contract as offered in the bid. .

2. The following sub-paragraph will be added to the paragraph 8 of the Article 24:

Bidding documents will also specify the relevant factors in addition to price to be considered in bid evaluation and the manner in which they will be applied for the purpose of determining the lowest evaluated bid. For goods and equipment, other factors which may be taken into consideration include, among others, costs of inland transport and insurance to the specified site, payment schedule, delivery time, operating costs, efficiency and compatibility of the equipment, availability of service and spare parts, and relating training, safety, and environmental benefits. The factors other than price to be used for determining the lowest evaluated bid will, to the extent practicable, be expressed in monetary terms.

III. Advertising

1. The second sentence of the first paragraph of the Article 4 of the Regulations is hereby modified to read that *“Procuring entity shall advertise Invitation for Bids for participation at least 10 days before issuing bidding documents in a newspaper of national circulation. Advertising should indicate that foreign bidders are eligible. “ First and third sentences of this paragraph remain valid.*

IV. **Time for Bid Preparation**

1. The first paragraph of the Article 12 is hereby modified to read that *“time allowed for bid preparation shall be at least 30 days for National Competitive Bidding from the availability of the bidding documents.”*

V. **Bid Opening**

1. The first paragraph of the Article 13 is hereby modified to read that *“Bids shall be opened immediately or promptly after the deadline for submission of bids, as specified in the Invitation for Bids.”*

2. The following sub-paragraph shall be added to the first paragraph of the Article 13:

All bids will be opened at the same time. Bids received after the time stipulated in the Invitation for Bids as well as those not opened and read out at the bid opening including any discounts, will not be considered.

VI. **Bid Evaluation**

1. In lieu of the provisions of Articles 13, 29, 30, 31, 40, 41 and 55 of the Regulations, bid evaluation will be carried out in accordance with the following provisions:

(a) The purpose of bid evaluation is to determine the cost to the Borrower of each bid in a manner that permits a comparison on the basis of their evaluated cost.

(b) If bidders have been invited to bid on the basis of having been pre-qualified, then the bid with the lowest evaluated cost will be selected for award.

(c) If bidders have been invited to bid on the basis of post-qualification, then the Borrower will determine whether the bidder whose bid has been determined to offer the lowest evaluated cost has the capability and resources to effectively carry out the contract as offered in the bid. The minimum criteria to be met will be set forth in the bidding documents, and if the bidder does not meet them, the bid will be rejected. In such case the Borrower will make a similar determination for the next lowest evaluated bidder. Bidders’ technical and financial capacity will be judged separately from the evaluation of bids and will be conducted exclusively under a pass/fail basis. Experience, technical and financial capacity of the bidder to execute the contract will not be considered for purposes of comparison of bids.

(d) The Borrower will ascertain whether the bids: (i) have been properly signed; (ii) are accompanied by the required securities as specified in the bidding documents; (iii) are substantially responsive to the bidding documents; and (iv) are otherwise generally in order. If a bid is not substantially responsive, that is, it contains material deviations from or reservations to the terms, conditions, and specifications in the bidding documents, it will not be considered further. The bidder will not be permitted to correct or withdraw material deviations or reservations once bids have been opened.

(e) In the comparison of bids among bidders, no domestic or regional preferences to bidders will apply and bids will be compared on delivered price inclusive of any prevailing duties.

(f) The bid price and any discounts read out at the bid opening will be adjusted to correct any arithmetical errors.

(g) Under works contracts, Contractors are responsible for all duties, taxes, and other levies, and bidders will take these factors into account in preparing their bids. The evaluation and comparison of bids will be on this basis. Bid evaluation for works will be strictly in monetary terms. If time is a critical factor, the value of early completion to the Borrower may be taken into account according to criteria presented in the bidding documents, only if the conditions of contract provide for commensurate penalties for noncompliance.

(h) Award of the contract will be to the lowest evaluated responsive bidder. Price negotiation with bidders will not be undertaken before award except as provided for below.

(i) Bids may not be rejected for the sole purpose of obtaining lower prices. All bids will not be rejected and new bids invited on the same specifications solely for the purposes of obtaining lower prices, except in cases where the lowest evaluated bid exceeds the cost estimates by a substantial amount. In such cases the Borrower may, as an alternative to re-bidding, negotiate with the lowest evaluated bidder to try to obtain a satisfactory contract, and failing a satisfactory response, with the next lowest evaluated bidder. Rejection of all bids may be permissible when bids are not substantially responsive or there is lack of effective competition.

(j) A bid evaluation report will be prepared by the Borrower's department or agency requesting the bids setting out a record of all bids submitted, the reasons for disqualification of any bids, the criteria, weighting and evaluation of all responsive bids, the recommended award, and, if recommended award is to other than the lowest price bidder, the reasons therefore.

VII. Award of Contract

1. The Article 31 and Article 42 is hereby modified to read as follow:

Eligible bidder having bid substantially responsive to the bidding documents and determined as lowest evaluated shall be recommended for award provided that the bidder has been determined to be qualified in accordance with pre-qualification or post-qualification criteria.

VIII **Bid Security**

1. Article 28 3(c) would not apply.
2. The following sub-paragraph should be added to paragraph 2 of Article 28:

Bid Security will be valid 30 days longer than bid validity.

IX **Procurement of Smaller Contracts**

1. Chapter V is not applicable.

X **Selection of Consultants**

1. Pursuant to Section 3.02 of the Development Credit Agreement, the provisions set forth in Chapter II, superseded by the provisions of the Guidelines: Selection and Employment of Consultants by World Bank Borrowers, dated January 1997 and revised September 1997 and January 1999 (Consultant Guidelines) using Standard Request for Proposal, dated July 1997 and revised April 1998, will apply.

Annex 7: Project Processing Schedule

VIETNAM: System Efficiency Improvement, Equitization & Renewables Project

Project Schedule	Planned	Actual
Time taken to prepare the project (months)		
First Bank mission (identification)	12/01/2000	12/01/2000
Appraisal mission departure	12/01/2001	01/18/2002
Negotiations	03/01/2002	
Planned Date of Effectiveness	07/01/2002	

Prepared by:

Electricity of Vietnam/Ministry of Industry

Preparation assistance:

Bank Missions and Consultants

Bank staff who worked on the project included:

Name	Speciality
Anil Malhotra	Task Team Leader
Rebecca Sekse	Senior Financial Analyst
Kurt Schenk	Senior Power Engineer
Anh Nguyet Pham	Operations Officer
Hung Tien Van	Senior Operations Officer
Ranjit Lamech	Senior Restructuring Specialist
Susan Bogach	Senior Energy Economist
Jon Exel	Renewable Energy Specialist
Anil Cabraal	Senior Renewable Energy Specialist
Jas Singh	Energy Efficiency Specialist
Mary Judd	Senior Anthropologist
Behdad Nowroozi	Senior Financial Management Specialist
Mei Wang	Legal Counsel
Thang Chien Nguyen	Procurement Specialist
Kien Trung Tran	Procurement Analyst
Hong Vu	Operations Officer (Resettlement)
Phuong Thi Thanh Tran	Environmental Specialist
Jitu Shah	Senior Environmental Specialist
Anh Thuy Nguyen	Program Assistant
Arun Shanghvi	Peer Reviewer
Douglas Barnes	Peer Reviewer
H. Ezaki	Peer Reviewer (JBIC)
Quyen Duong Do	Disbursement Analyst

Annex 8: Documents in the Project File*

VIETNAM: System Efficiency Improvement, Equitization & Renewables Project

A. Project Implementation Plan

Project Implementation Plan - December, 2001

B. Bank Staff Assessments

IDA Identification, Pre appraisal and appraisal Mission Aide-Memoires

Project Concept Document

Feasibility study for 500 kV transmission line including EIA and RAP

Feasibility study for 6 220 kV substation rehabilitation

Feasibility study for 220 kV transmission lines including EIA and RAP

Feasibility studies prepared by Pc 1, 2, 3 and Dong Nai for sub-transmission components including EIA and RAP

Feasibility studies for small hydro prepared by PC 1,2 and 3 including EIA

Procurement capacity assessment report

Financial Management System Assessment Report

C. Other

Rural Electrification Development Plan for PC1, Worley International Limited

Rural Electrification in the Northern Province of Vietnam, EdF, July 1994

Pricing Policy- Fichtner-Colenco- computer model for subsidy management *

Financial Issues and strategy- Fichtner-Colenco including computer model/spreadsheet*

Project Financial Management Assessment Report by Fichtner-Colenco

Financial Management Assessments of PCs 1, 2 and 3.

Technical Issues in rural electrification- Stanley Consultants

DSM Assessment for Vietnam, Hagler Bailly

BCEOM-Tractabel Study on system efficiency

Rehabilitation of Grid connected renewable energy- Colenco

Community based hybrid hydro grid- Worley

Pipeline development for new grid connected small hydro projects- Worley International

ESBI study on strategy for information technology

Renewable Energy Action Plan

RAPs and IPDP

1. RAP for 500 kV Pleiku Da Nang transmission line. This includes EMDP as a separate annex
2. RAP for 220 kV project in Northern Vietnam (220 kV Thai Binh-Hai Phong transmission lines and Yen Bai-Bac Ninh substations)
3. RAP for 220 kV South Saigon Substation
4. RAP for 110 kV transmission lines and substations in Northern Vietnam by PC1. This includes EMDP as a separate annex.
5. RAP for 110 kV transmission lines and substation in Central Vietnam by PC3.
6. RAP for 110 kV transmission lines and substation in Southern Vietnam by PC2.
7. RAP for 110 kV transmission lines and substation in Dong Nai Province by PC Dong Nai.

EIA and EMP's

*Including electronic files

Annex 9: Statement of Loans and Credits

VIETNAM: System Efficiency Improvement, Equitization & Renewables Project

07-Dec-2001

Project ID	FY	Purpose	Original Amount in US\$ Millions		Cancel.	Undisb.	Difference between expected and actual disbursements ^a	
			IBRD	IDA			Orig	Frm Rev'd
P059936	2002	Northern Mountains Poverty Reduction	0.00	110.00	0.00	111.30	0.00	0.00
P004850	2001	VIETNAM - POVERTY REDUC.SUPPORT CREDIT	0.00	250.00	0.00	150.90	-0.64	0.00
P042927	2001	VN-MEKONG TRANSPORT/FLOOD PROTECTION	0.00	110.00	0.00	110.28	11.83	0.00
P052037	2001	VN-HCMC ENVMTL SANIT.	0.00	166.34	0.00	163.62	2.00	0.00
P062748	2001	COMMUNITY BASED RURAL INFRASTRUCTURE	0.00	102.78	0.00	102.60	0.00	0.00
P042568	2000	COASTAL Wetl/Prot Dev	0.00	31.80	0.00	27.85	9.50	0.00
P059864	2000	VN-Rural Transport II	0.00	103.90	0.00	85.66	21.34	0.00
P056452	2000	RURAL ENERGY	0.00	150.00	0.00	137.95	68.80	0.00
P051553	1999	VN-3 CITIES SANITATION PROJECT	0.00	80.50	0.00	74.46	10.65	0.00
P004845	1999	MEKONG DELTA WATER	0.00	101.80	0.00	89.12	42.42	0.00
P004833	1999	VN-URB TRAN IMPROVEMENT	0.00	42.70	0.00	34.94	29.33	0.00
P004828	1999	VN-HIGHER EDUC.	0.00	83.30	0.00	71.07	26.68	0.00
P045628	1998	TRANSMISSION & DISTR	0.00	199.00	0.00	162.90	165.61	69.78
P004843	1998	VN-Inland Waterways	0.00	73.00	0.00	61.84	44.38	0.94
P004844	1998	AGRI DIVERSIFICATION	0.00	66.90	0.00	50.98	14.99	0.00
P004839	1998	FOREST PROT.& RUL DE	0.00	21.50	0.00	18.15	9.85	0.19
P004830	1997	VN-WATER SUPPLY PROJECT	0.00	98.61	26.85	35.25	60.45	1.38
P039021	1997	VN-Rural Transport	0.00	55.00	0.00	0.51	3.95	0.00
P004842	1997	VN-Hwy Rehab II	0.00	195.60	0.00	70.14	82.59	0.00
P036042	1996	BANKING SYSTEM MODER	0.00	49.00	0.00	30.69	38.10	30.67
P004841	1996	VN-POPULATION & FAMILY HEALTH	0.00	50.00	0.00	18.79	15.56	0.00
P004838	1996	VN-NATIONAL HEALTH SUPPORT	0.00	101.20	0.00	52.17	51.28	0.00
P004847	1996	RURAL FINANCE	0.00	122.00	0.00	1.26	11.61	0.00
P004834	1995	IRRIGATION REHABILIT	0.00	100.00	0.00	29.09	33.90	0.00
P004832	1994	VN-Highway Rehab	0.00	158.50	0.00	16.64	22.28	20.86
P004835	1994	VN-PRIMARY EDUCATION	0.00	70.00	0.00	6.87	9.56	7.71
Total:			0.00	2693.43	26.85	1715.01	786.00	131.53

VIETNAM
STATEMENT OF IFC's
Held and Disbursed Portfolio
MAY-2001
In Millions US Dollars

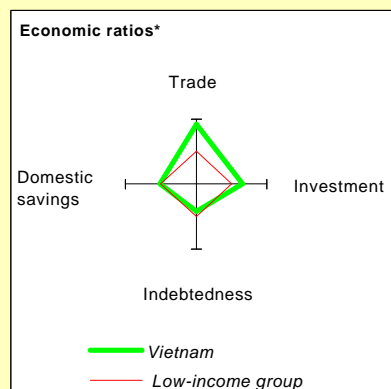
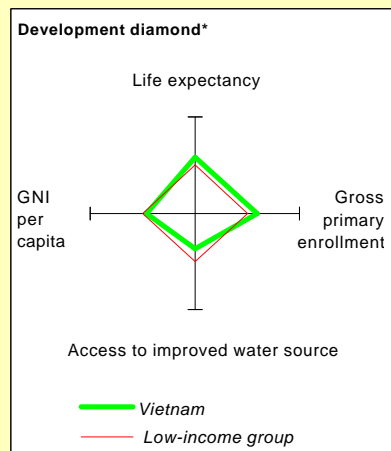
FY Approval	Company	Committed				Disbursed			
		IFC				IFC			
		Loan	Equity	Quasi	Partic	Loan	Equity	Quasi	Partic
1995	Baria Serece Prt	1.00	0.00	0.00	0.20	1.00	0.00	0.00	0.20
1996	Kyoei Steel	8.57	0.00	0.00	0.00	8.57	0.00	0.00	0.00
1998	MFL Vinh Phat	0.30	0.00	0.00	0.00	0.15	0.00	0.00	0.00
1996	Morn.Star Cement	24.88	0.00	0.00	50.18	24.88	0.00	0.00	50.18
1997	NATL	20.00	0.00	0.00	20.00	20.00	0.00	0.00	20.00
1995/97	Nghi Son Cement	21.24	0.00	0.00	17.59	21.24	0.00	0.00	17.59
1996	SMH Glass Co.	8.33	0.00	0.00	2.81	8.33	0.00	0.00	2.81
1996	VILC	0.00	0.75	0.00	0.00	0.00	0.75	0.00	0.00
1996	Vimaflour	5.00	0.00	0.00	1.50	5.00	0.00	0.00	1.50
	Total Portfolio:	89.32	0.75	0.00	92.28	89.17	0.75	0.00	92.28

FY Approval	Company	Approvals Pending Commitment			
		Loan	Equity	Quasi	Partic
1998	BA RIA	24.20	0.00	4.00	49.00
2000	Interflour	8.00	0.00	0.00	5.00
2001	RMIT Vietnam	7.50	0.00	0.00	0.00
	Total Pending Commitment:	39.70	0.00	4.00	54.00

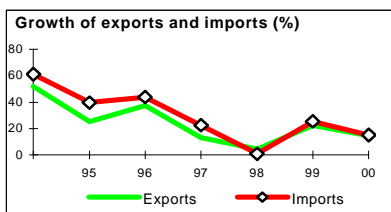
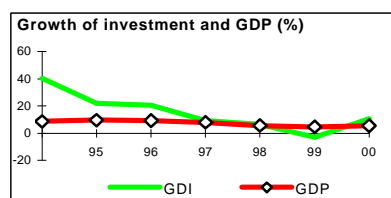
Annex 10: Country at a Glance

VIETNAM: System Efficiency Improvement, Equitization & Renewables Project

POVERTY and SOCIAL	Vietnam	East Asia & Pacific	Low-income		
2000					
Population, mid-year (<i>millions</i>)	78.5	1,853	2,459		
GNI per capita (<i>Atlas method, US\$</i>)	390	1,060	420		
GNI (<i>Atlas method, US\$ billions</i>)	30.4	1,964	1,030		
Average annual growth, 1994-00					
Population (%)	1.5	1.1	1.9		
Labor force (%)	1.7	1.4	2.4		
Most recent estimate (latest year available, 1994-00)					
Poverty (% of population below national poverty line)	37	..	..
Urban population (% of total population)	20	35	32		
Life expectancy at birth (<i>years</i>)	69	69	59		
Infant mortality (<i>per 1,000 live births</i>)	37	35	77		
Child malnutrition (% of children under 5)	37	13	..		
Access to an improved water source (% of population)	56	75	76		
Illiteracy (% of population age 15+)	7	14	38		
Gross primary enrollment (% of school-age population)	114	119	96		
Male	116	121	102		
Female	111	121	86		
KEY ECONOMIC RATIOS and LONG-TERM TRENDS					
	1980	1990	1999	2000	
GDP (<i>US\$ billions</i>)	..	6.5	28.7	31.3	
Gross domestic investment/GDP	..	13.0	25.4	27.4	
Exports of goods and services/GDP	..	26.4	
Gross domestic savings/GDP	..	6.0	
Gross national savings/GDP	
Current account balance/GDP	..	-5.4	4.0	1.6	
Interest payments/GDP	..	0.7	1.1	1.5	
Total debt/GDP	..	359.6	81.1	49.8	
Total debt service/exports	..	8.9	10.0	7.0	
Present value of debt/GDP	75.6	..	
Present value of debt/exports	153.1	..	
	1980-90	1990-00	1999	2000	2000-04
<i>(average annual growth)</i>					
GDP	4.6	7.9	4.8	5.5	6.8
GDP per capita	2.2	6.0	3.5	4.1	5.4
Exports of goods and services	..	23.4	22.6	14.8	..



STRUCTURE of the ECONOMY	1980	1990	1999	2000
<i>(% of GDP)</i>				
Agriculture	..	37.5	25.4	24.3
Industry	..	22.7	34.5	36.6
Manufacturing	..	18.8	17.6	..
Services	..	39.9	40.1	39.1
Private consumption	..	86.5	68.8	66.6
General government consumption	..	7.5	7.1	6.4
Imports of goods and services	..	33.4	..	..
	1980-90	1990-00	1999	2000
<i>(average annual growth)</i>				
Agriculture	4.3	4.8	5.2	4.0
Industry	..	12.1	7.7	10.1
Manufacturing
Services	..	7.8	2.2	5.6
Private consumption	..	10.2	..	..
General government consumption	..	10.9	2.5	..
Gross domestic investment	..	20.2	-3.0	10.9
Imports of goods and services	..	29.4	25.5	15.3

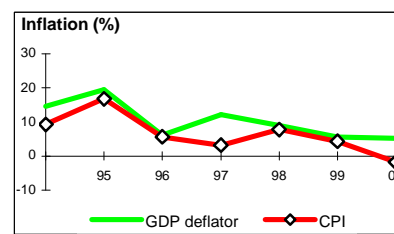


Note: 2000 data are preliminary estimates.

* The diamonds show four key indicators in the country (in bold) compared with its income-group average. If data are missing, the diamond will be incomplete.

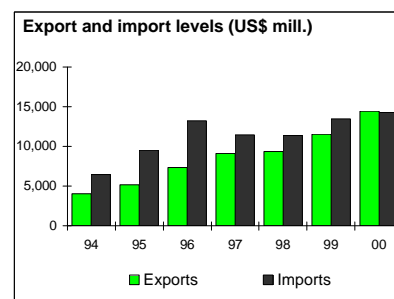
PRICES and GOVERNMENT FINANCE

	1980	1990	1999	2000
Domestic prices				
(% change)				
Consumer prices	..	36.4	4.3	-1.8
Implicit GDP deflator	..	42.1	5.6	5.3
Government finance				
(% of GDP, includes current grants)				
Current revenue	..	14.7	19.6	19.6
Current budget balance	..	0.0	5.9	4.8
Overall surplus/deficit	-0.8	-1.8



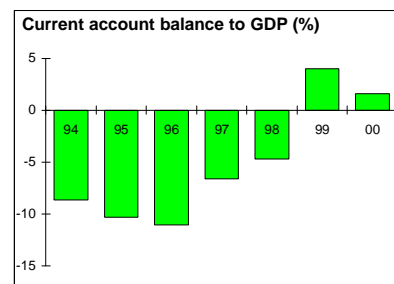
TRADE

	1980	1990	1999	2000
(US\$ millions)				
Total exports (fob)	..	1,731	11,540	14,448
Rice	..	272	969	667
Fuel	..	390	2,092	3,548
Manufactures
Total imports (cif)	..	1,901	13,480	14,259
Food	..	86	..	..
Fuel and energy	..	356	..	..
Capital goods	..	561	..	..
Export price index (1995=100)
Import price index (1995=100)
Terms of trade (1995=100)



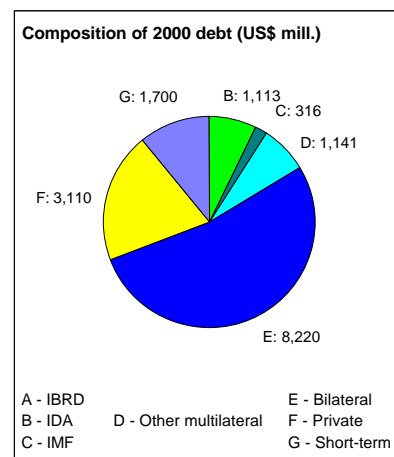
BALANCE of PAYMENTS

	1980	1990	1999	2000
(US\$ millions)				
Exports of goods and services	..	1,913	14,010	17,107
Imports of goods and services	..	1,901	13,480	17,344
Resource balance	..	12	530	-237
Net income	..	-412	-427	-597
Net current transfers	..	49	1,050	1,341
Current account balance	..	-351	1,154	507
Financing items (net)	..	510	130	-412
Changes in net reserves	..	-159	-1,284	-95
Memo:				
Reserves including gold (US\$ millions)
Conversion rate (DEC, local/US\$)	..	6,482.8	13,944.0	14,170.0



EXTERNAL DEBT and RESOURCE FLOWS

	1980	1990	1999	2000
(US\$ millions)				
Total debt outstanding and disbursed	..	23,270	23,260	15,600
IBRD	0	0	0	0
IDA	2	59	989	1,113
Total debt service	..	174	1,410	1,218
IBRD	0	0	0	0
IDA	0	1	8	9
Composition of net resource flows				
Official grants	..	96	257	..
Official creditors	..	-86	839	973
Private creditors	..	0	-781	-717
Foreign direct investment	..	16	1,609	..
Portfolio equity	..	0	0	..
World Bank program				
Commitments	0	0	318	260
Disbursements	1	0	158	175
Principal repayments	0	1	2	2
Net flows	1	-1	156	173
Interest payments	0	0	7	7
Net transfers	1	-1	150	166



Additional Annex 11

Demand Side Management and Energy Efficiency Strategy

A. Background

In 1997, EVN, with World Bank assistance, commissioned the “Demand-Side Management Assessment for Vietnam” to determine the potential for demand-side management (DSM) to assist the power sector to meet the country’s future power resource requirements. The DSM Assessment concluded that DSM had a potentially significant role to play in managing the growth of electricity demand in Vietnam and identified important opportunities for cost-effective electricity savings in a number of sectors and end-use applications. It recommended a two-phased approach for implementing DSM, which would save an estimated 770 MW of capacity and more than 3,550 GWh/yr by the year 2010.

Under the first phase, supported by a SEK 29 million (about US\$3.0 million) Swedish Sida grant and coordinated by MoI, a DSM Cell within EVN was established to build its load research capability, implement a pilot load management and several pilot DSM programs, develop audit capability within EVN, and develop a policy framework for initial and future DSM activities. Ministry of Construction (MoC) is now developing an energy efficiency (EE) building code, and Ministry of Science, technology and environment (MoSTE) is establishing EE lighting and industrial motor standards. It was recommended that Phase II should (i) expand DSM program implementation and evaluation; (ii) develop and introduce DSM regulatory measures for EVN’s subsidiary power companies (PCs); (iii) expand the load management program; (iv) enforce the building code and appliance standards and develop an expanded standards regime; (v) develop financing mechanisms for future DSM activities; (vi) build local capacity to perform full-scale industrial energy audits and investment plans; and (vii) promote private sector participation in providing EE services.

B. Status of DSM/Energy Efficiency Programs

DSM: Since the completion of the DSM Action Plan, EVN has experienced increasing peak demand shortages, making the need for targeted load management and other DSM measures more critical. These system capacity constraints occur during evening peak hours (6-10pm), with daily peak loads 2-3 times off-peak hours, which has resulted in low system load factors and major investment requirements to meet demand for only 1-2 hours of the day. Ongoing efforts to increase grid-based electrification to remote areas will only exacerbate the situation. EVN has instituted a few programs, primarily focused on time-of-use (TOU) metering for large consumers. However, EVN and its PCs lack the investment capital required to fully implement TOU metering for production, commercial, service and agricultural (irrigation) customers with transformer capacity over 100kVA, as the existing tariff regulations allow, and have experienced some customer resistance to TOU metering. A number of customers have even responded by installing stand-by generation units and disconnecting from the grid during peak times to avoid peak pricing and to ensure consistent and reliable power supply. Some of the PCs have procured load control equipment (ripple control technology) to test their viability during peak hours and critical system power shortages, but have been unable to offer any incentives to customers to encourage them to participate in any pilot load control programs. Some of these measures are important first steps but the DSM efforts need to be developed on a more systematic basis, which Phase I efforts are helping to address.

While progress with the first phase of the DSM program is generally satisfactory, it has experienced an

estimated two-year delay, due to a delay in IDA Credit effectiveness, finalization of the grant agreements, and procurement of the four consulting contracts. The delay in procurement was partly due to the approximate 20 percent devaluation of the Swedish Kronor, which significantly reduced the available budget for consulting contracts. As a result, Phase I was only launched in late 2000; thus a substantial expansion of the DSM program (as was recommended in the DSM Assessment report) cannot be justified at this stage. However, a number of key outputs from the Phase 1 program have become available this year, such as a policy framework for utility DSM, various DSM program assessments, and a DSM business plan for EVN, which have offered specific DSM investment options that can be implemented now. Since SEIER will likely only become effective after Phase 1 has been completed, a modest investment under SEIER would ensure that there is no gap in support to the DSM Cell and that viable DSM measures can be launched sooner. It was thus agreed that the DSM Action Plan originally recommended be redesigned as a 3-4 phase program, with a smaller second phase under SEIER. It is expected that subsequent phases would be supported by substantially more IDA/GEF support under future IDA energy projects, based on progress achieved over the next two years.

Energy Efficiency: In addition to the IDA/Sida-supported DSM project, there are a number of complementary programs that have been initiated by other development agencies to further support Vietnam's DSM/EE programs. Through bilateral support, largely from Dutch and German sources, the Master Plan for Energy Conservation & Efficiency (EC&E) Program is under implementation under MoSTE. This program has proposed a broad national level framework to promote energy efficiency, with supporting policy frameworks, mandated energy audits and public auditors, creation of provincial energy conservation centers, a range of technical assistance activities, and creation of a public fund to provide investment support to end-users. The program has already worked to develop an impressive grass-roots network of energy auditors and capability within MoSTE and its provincial DoSTEs and has initiated several pilot efforts in industries. The program has contributed positively to the overall energy efficiency activity over its five years of operation. However, GOV has only provided modest funding to date and the program has been unable to attract the estimated \$20 million required to launch all of its proposed programs. The proposed UNDP-GEF Energy Efficiency Public Lighting Project (PDF B under implementation) would seek to remove barriers to EE in the public lighting sector in Vietnam. Japan, along with the French and other bilateral donors, have made a number of energy audits and EE investments in specific factories, but these audits have not been developed on a programmatic basis and are not at present capable of being replicated or expanded without continued international assistance.

C. Barriers to Energy Efficiency

While substantial opportunities clearly exist for EE improvements, there are a number of key barriers that have prevented the development of any meaningful commercial EE investments in Vietnam to date. These include: (i) *inadequate information*, from end-users, equipment manufacturers/suppliers and service providers (including EVN) on potential EE improvements, costs and benefits of EE equipment, potential low-cost measures, and new technologies/practices; (ii) *lack of technical expertise*, by end-users, manufacturers/suppliers and potential service providers on modern efficient technologies and practices, efficiency potentials, energy audits and inspections, actual performance of EE measures, limited understanding of third party EE services (e.g., ESCOs); (iii) *high capital investment costs*, due to prevailing higher costs of EE equipment as well as limited local manufacturing capability, which currently discourage end-users from selecting high-efficiency equipment despite their overall lower life-cycle costs, particularly given limited abilities of households to purchase EE lighting and current short-term priorities among many Vietnamese firms; (iv) *high project development costs*, due to audits and technical studies required to properly determine investment requirements and ensure appropriate project design, perceived risks of projects developed by auditors with limited track record and technologies/ equipment with limited

tested performance under Vietnamese conditions; (v) *lack of affordable financing*, due to a lack of commercial lending culture in Vietnam, weak banking sector and very limited term lending, restrictive lending terms, dominance of state-owned enterprises (SOEs) and dependence on public budgets for project investment capital, foreign capital requirements for imported EE equipment, relatively small investment sizes for EE, and limited credit available to residential sector; (vi) *poor customer creditworthiness*, due to the poor financial status of many of the SOEs; (vii) *limited interest of end-users*, due in part to a production or core business priority bias, the sometimes limited financial significance of the operating cost reductions from energy savings and the ownership of savings benefits from SOEs/municipal agencies; and (viii) *limited local EE equipment*, given the current manufacturing capability within Vietnam and low domestic demand for high-efficiency products. Collectively, these issues have discouraged any sizeable investments in efficiency measures.

D. Strategy for Future IDA/GEF Support

Based on the systematic analysis of local conditions, energy savings potential, market and other barriers, and models to support EE programs, IDA/GEF will support a phased, 12-year (1998-2010) programmatic approach to efficiency activities in Vietnam. This program has begun with the IDA/Sida DSM project and would continue to build upon initial program results and efforts in 2-3 additional operations. The rationale is to provide a longer-term vision for development assistance, scale-up mechanisms and business models tested in earlier operations, and develop timely intervention mechanisms as programs, markets and reforms develop (see Attachment 1). While the spirit of the original two-phase DSM program will be maintained, it is clear that there also exists scope for supporting efficiency programs outside EVN, particularly where there are potential conflicts with EVN's financial interests and/or activities clearly beyond EVN's mandate. Thus the IDA/GEF assistance program would also include measures to catalyze service companies and manufacturers to provide more EE equipment and services to energy end-users through a variety of business models.

SEIER Project Description (DSM/EE Phase 2)

The DSM/EE component under SEIER represents the second phase of the program and would consist of two components: (i) a second phase DSM component under EVN; and (ii) implementation of a pilot commercial EE program by MoI. For the EVN component, a total investment of US\$8.22 million would be sought to support the continuation of EVN's DSM activities initiated under the IDA/Sida project. \$5.20 million would come from the IDA SEIER credit and \$0.77 million from EVN's internal funds. An associated GEF DSM & EE Project, now under preparation, is expected to provide an additional \$2.25 million in grant funds to EVN to further DSM program impacts and market transformation efforts, test new innovative DSM program models, support monitoring and evaluation efforts and explore additional DSM business opportunities for EVN. A pilot commercial EE component, also supported under the associated GEF project, would require an estimated \$8.5 million in total project financing (\$3 million GEF, \$5 million private sector, \$0.5 million MoI) and would be managed by MoI.

The full second phase DSM/EE program will consist of the following elements:

(i) Phase II DSM Program under EVN: The main focus of this component would be to build upon Phase I DSM results and expand the use of DSM as a tool to help EVN and its PCs better manage loads, load curves and improve load factors. DSM is also viewed as a means to mitigate the effects of ongoing power tariff reforms. The second phase would seek to achieve over 120 MW in system peak reduction and annual energy savings of about 64 GWh through the implementation of several DSM measures (impacts include both the IDA SEIER and associated GEF DSM & EE Projects). The program would be managed

by EVN and implemented with support from its PCs. (Attachment 2 contains a summary of programs costs, sources of funds, savings and cost/benefit analyses.) Future phases, which would seek to develop a large-scale portfolio of DSM measures by EVN and its PCs and may include support to create an ESCO unit under EVN, would be included in subsequent IDA/GEF energy operations. EVN's Phase 2 program would include:

a) TOU Metering: EVN would install 5,600 time-of-use (TOU) meters in about 4,000 large- and medium-sized customers to help rationalize electricity consumption during peak periods. EVN currently has a tariff schedule that allows TOU tariffs for customers with loads over 100 kVA or monthly consumption in excess of 10,000 kWh. EVN has already installed about 4,000 TOU meters and estimates that about 4,000 additional customers would be eligible for TOU meters by 2003. The IDA credit would allow EVN and its PCs to procure and install additional meters in remaining customers that meet the above criteria. The IDA funds would also support customer recruitment and program management.

b) Pilot DLC Program: Under this program, EVN, in collaboration with PC HCMC, would introduce a pilot direct load control (DLC) program using ripple control systems to curtail demand in about 2,000 customer end-use loads (e.g., air conditioning and water heating systems). This would allow EVN to shut-off the equipment for up to a pre-specified number of hours each year (15-minute periods per hour during peak periods for a total not to exceed 30 hours) during system shortages and seasonal peaks. The equipment (central stations, receivers, communication systems) would be purchased with the IDA credit and EVN would use its counterpart funds to pay for program administration and incentives to the program participants (\$25 per receiver/year).

c) CFL Program: Currently, most urban and rural households use 60-100 W incandescent light bulbs. The promotion of compact fluorescent lamps (CFLs), which typically use 12-18 W and provide comparable lumen output to incandescents, could significantly reduce lighting loads, which coincide heavily with EVN's system peaks, and reduce electricity costs for end-users. However, incandescent bulbs typically cost \$0.20-0.40 versus \$3-5 for CFLs. Under this program, EVN would promote sales of 1 million CFLs to Vietnamese households in areas of high loads and network congestion by procuring CFLs in bulk packages and distributing them through their PC branch offices, and possibly lighting retailers and/or community-based NGOs. Over the three-year program period, EVN would use discounts, combined with marketing efforts, to promote the use of the more efficient lamps and these discounts would decline over the program (\$1.50/lamp for the first 200,000 CFLs, \$1.00 for the next 300,000, \$0.60 for the remaining 500,000 CFLs). (Implementation of a pilot CFL program is now underway in Phase I and results and lessons learned would be reflected in the detailed design of this program.) Under the associated GEF project, EVN would test some alternative delivery mechanisms for the CFLs, such as performance-based contracts with various program subcontractors (e.g., PCs, lighting distributor/retailers, NGOs, companies) to market and sell CFLs. EVN would also use GEF funds to expand market penetration of the CFLs by setting-up a small revolving fund to offer interest-free financing to end-users to receive the CFLs and payback the costs over a 6-12 month period through their electric utility bills.

d) FTL Program: Under the associated GEF DSM & EE project, EVN would initiate a program to promote the use of high-efficiency 36 W T-8 fluorescent tube lamps (FTLs), which have about the same lumen output and retail price as conventional 40 W T-12 lamps but consume about 10 percent less electricity. Given the small number of manufacturers of FTLs in Vietnam, EVN would provide a marketing grant to participating manufacturers to support their costs in actively marketing the more efficient lamps and EVN would launch a parallel campaign to educate consumers about efficient FTLs

and ballasts. EVN's internal funds would support project management and administration. The associated GEF project would provide for some additional marketing efforts and help in a revolving fund under the CFL program for providing end-user financing for efficient ballasts and, like the CFL program, would be repaid through customers' electricity bills.

e) Complementary Activities: In addition to the five DSM programs noted above, EVN will *initiate complementary activities to support these efforts*. Under SEIER, such activities will include load research (both facility and end-use levels) to determine customer class and end-use profiles and energy savings potential/impacts, DSM program planning, development and implementation of 1-2 new pilot DSM programs, and support to the DSM Center (equipment, staffing, institutional development). Some complementary measures will also be supported under the associated GEF DSM & EE project, including DSM business opportunities studies (e.g., fee-for-service audits, utility-based ESCOs, etc.) and DSM program monitoring and evaluation.

(ii) Pilot Commercial EE Program: The Phase 2 program will also include *a pilot commercial EE program*, which will be included in the associated GEF DSM & EE Project. This pilot program would seek to test appropriate business models and mechanisms and catalyze a small and sustainable service market to support EE investments in Vietnam. This would be achieved by supporting a small group of commercial service providers or 'project agents' to assist in all phases of EE project identification, development and implementation. These 'project agents' could include energy auditing and engineering firms, equipment leasing companies, equipment suppliers, installation and construction contractors, and energy service companies (ESCOs). Given the state of the industrial sector at present, it has been agreed that the pilot program will initially focus on private commercial buildings, hotels and other office buildings that are able to access financing on their own. The pilot program would be restricted to 4 major cities (Haiphong, Hanoi, Da Nang, and HCMC), in order to better manage and focus market development, training, and project monitoring/administration efforts. EE measures would also be limited to lighting, motor drives and pumps, cooling/heating and electrical supply systems in order to develop simple and replicable technical investment lines, gradually build-up competence among project agents, facilitate the development of technical program standards to help ensure equipment performance and support project evaluation/monitoring, and stimulate the market for EE equipment in these initial areas. (Future phases would seek to build upon successful business models from Phase II, expand the geographical and technical boundaries of the pilot phase, test new and more complex models {e.g., performance contracting}, and develop appropriate local financing mechanisms to support larger-scale investments and pipelines.)

It has been agreed that MoI would manage this 4-year pilot program, which is expected to require about \$3 million in GEF funds and mobilize about \$5 million in private financing. An Administrative Unit or AU (a commercial bank) would be responsible for managing and disbursing the audit and investment grants and MoI would hire a Technical Advisor to assist the AU in assessing the proposals. Through ongoing audit programs within EVN and MoSTE, it is expected that an initial pipeline of investment proposals could be developed over the next 6-12 months. Specific activities under the pilot program are expected to include:

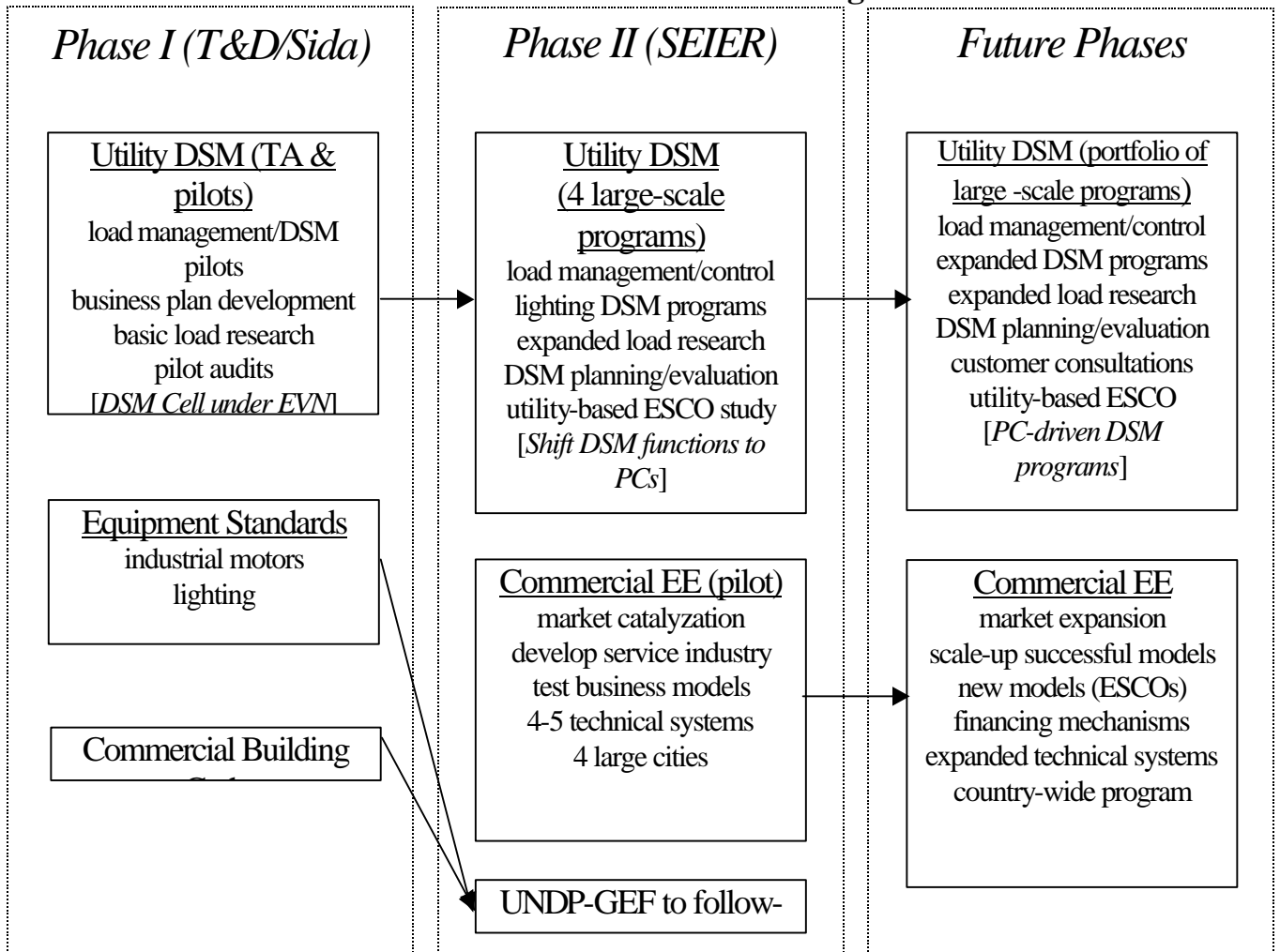
a) Comprehensive Project Agent Training Program: The program would support a major training program to provide basic technical, financial and business knowledge to project agents to facilitate the development and implementation of project proposals as well as some customized technical assistance to develop their marketing and business plans. Technical training would be provided for energy auditing, technical system analyses and recommended efficiency improvements in the four end-use systems targeted, financial analyses of EE investments and technology options, various contractual options for EE services, project management, energy savings verification, etc.

b) Audit and Investment Grants: The program would also provide grant support for energy audits

and subproject grants to project agents and their customers. Once project agents are able to recruit customers, the program would offer full or partial grant reimbursements for energy audits. To ensure that the project agent and customer have incentives to implement the recommendations of the audit report, a portion of the audit payment may be held until the project is under implementation. The GEF grant would also be used to offer some subgrants (e.g., % of investment amount, % of energy saved, or other options) for customers and agents that have fully implemented EE investments and submitted commissioning certificates subject to AU/MoI inspection.

c) Program Marketing, Monitoring and Administration: The program would also offer support for: (i) program marketing (e.g., identification and recruitment of project agents, raising awareness of potential customers of EE services, case study development and dissemination, etc.); (ii) program administration and monitoring (e.g., AU management fees, technical support, program monitoring, post-installation inspections, evaluation and reporting); (iii) technical assistance to MoI and the AU; and (iv) feasibility studies for expanding successful business models, developing more complex models, establishing various financial mechanisms and instruments (e.g., credit lines, dedicated funds, guarantees, supplier credit/leasing arrangements, etc.) to support project pipelines, and further market expansion in future IDA/GEF operations.

Framework for IDA/GEF DSM/EE Program



EVN's Phase 2 DSM Program Cost and Benefits

Program Components	Estimated Costs (USD million)	IDA SEIER (USD million)	EVN (USD million)	Associated GEF Project (USD million)	Peak Reduction (MW)	Energy Savings (GWh/yr)
<i>Main DSM Programs</i>						
Time-of-Use (TOU) Metering	2.25	2.25	0	0	69.7	0
Direct Load Control (DLC)	0.72	0.60	0.12	0	3.1	0
Compact Fluorescent Lamps (CFLs)	1.79	0.89	0	0.90	33.4	39.0
Fluorescent Tube Lamps (FTLs)	0.81	0	0.06	0.75	14.4	25.2
<i>Supporting Activities</i>						
Expanded load research	0.90	0.90	0	0		
DSM business opportunities	0.25	0	0	0.25		
DSM planning and pilots	0.43	0.40	0.03	0		
Program monitoring and evaluation	0.37	0	0.02	0.35		
Staff, facilities and equipment	0.70	0.16	0.54	0		
TOTAL	8.22	5.20	0.77	2.25	120.5	64.2

Benefit/Cost Analyses for All DSM Programs (Including Supporting Activities) (All Costs/Benefits are in million USD)

Perspective	Economic Analysis			
	Benefits	Costs	NPV	B/C ratio
EVN (Financial)	96.39	19.50	76.89	4.9
PCs (Financial)	27.95	21.77	6.18	1.3
Customers (Financial)	21.17	2.57	18.60	8.2
National (Economic)	88.56	7.82	80.74	11.3

Assumptions: The avoided cost of DSM programs were determined based on construction and operation costs for a gas turbine plant for peak periods (US\$54/kW/year and 7.82 USc/kWh at generation level). Other assumptions include: LRMC of 3.904 USc/kWh (at generation level), 5.166 USc/kWh (at 110 kV level), 9.373 USc/kWh (below 6 kV), ave. BST for all PCs 3.33 USc/kWh, economic BST of 5.17 USc/kWh, ave. retail tariff of 3.33 USc/kWh, T&D losses of 15%, discount rates of 10% (economic) and 7% (financial), 10% VAT, exchange rate of US\$1.00 = 15,000 VND.

**Additional
Annex 12**

Renewable Energy Strategy

A. Background

1. Vietnam is well endowed with energy resources, creating the opportunity to provide local industries and households with electricity, and export electricity to neighboring countries. Nevertheless, the power sector is in an early stage, with per capita use of electricity at 309 kWh/year, or less than 26 kWh/month. In 2000, the installed capacity was 6.25 GW, of which hydro accounted for 54 percent, gas turbines 19 percent, diesel 5 percent, fuel oil 3 percent, coal 10 percent and IPPs (fueled by diesel) 9 percent. Power consumption has been growing rapidly over the last decade at 11.8 percent per year. Consumption is expected to triple by 2010, from 27 TWh to 70-78 TWh, straining the ability of the power sector to finance plants. Hydro is expected to remain dominant, although its share will drop to 40 percent. Coal will play an increasing role in the north, and gas resources in the south.

2. The rural electrification progress of EVN and its subsidiaries is a contributor to the growth in electricity consumption. In 2000, 82 percent of the communes and 74 percent of rural households (about 9.5 million) had electricity service from the grid. GOV aims to provide electricity to 90 percent of rural households by 2010 but even with a fast-growing power sector and an aggressive grid expansion program, more than 1000 remote communes or villages, representing about 500,000 households and 2 million people, are outside EVN's plan for connection to the grid by 2010. There are also households in electrified communes that cannot be economically connected to the grid.

3. Renewable energy could play a significant role in providing electricity services to rural Vietnam. A substantial share of households and communities outside of EVN's current electrification plans could be served at a cost similar to the current costs for grid connection (\$400-500 per household), using renewable energy resources such as pico-hydro systems in the North or solar photovoltaic systems in South and Central Vietnam. Decentralized sources of electricity, especially those based on renewable energy, offer the remaining households the only opportunity to experience the benefits of modern lighting, communication, and appliances. Also, renewable electricity plants connected to the grid could cost-effectively supplement grid electricity, reducing losses and improving grid stability by providing generation at the far reaches of the grid.

B. Renewable Energy Potential

4. Table 1 summarizes Vietnam's rich renewable energy potential, which is described in more detail below.

5. Technical potential for *small hydro power* (<10 MW per site) is 0.8–1.4 GW¹. The hydro resources are mainly in the north and central areas, near the border with Laos and Cambodia. About 70–75 percent of the annual runoff is generated in three to four months. There are now about 60 MW of *grid-connected mini hydro* installed at 48 sites, ranging from 100 to 7,500 kW capacity². Six out of the 48 have been reported as not in operation (13 percent) due to equipment failure. Though most of the systems are functioning, there is substantial scope to increase capacity and generation through rehabilitation. All the grid-connected systems were government financed, either directly or through international aid. There are

estimated to be 0.4–0.6 GW of grid-connected mini-hydro potential.

6. More than 300 *commune based small hydro systems* have been installed. The total installed capacity of these systems is about 70 MW, with individual systems ranging from 5 to 200 kW. Most of the systems are installed in north and central Vietnam. A recent review of these systems found that about 200 of them are not operating. Most systems were installed through bilateral grant programs, which paid inadequate attention to the critical need for adequate institutional arrangements to ensure long-term sustainability. At the village level, clear lines of responsibility are needed, which includes an adequate financial motivation such as a salary for the operator, and preferably also includes commercial loads which depend on the system. Small hydro-power-based grids operated as organized businesses (e. g. with paid staff) have a much lower failure rate than informally operated ones. For example, in Dong Nai, of 19 remote area installations, the 10 community-operated systems failed while nine commercially operated systems were working. According to estimates below, there are 0.3–0.6 GW of small hydropower that could be developed for community use.

Table 1: Potential and Current Use of Renewable Energy in Vietnam

Resource	Potential		Current Usage		Geographical potential
	MW	Thousand hh served	MW	Thousand hh served	
Hydro power	800–1,400		110–155		North and center
- pico-hydro	90–150	200–250	30–75	100	North and center
- isolated mini-grids	300–600	300	20	n.a.	North and center
- grid connected mini hydro	400–600	n.a.	60	n.a.	North and center
Off-grid solar PV systems	2	50	0.6	5	South and center
Biomass bagasse, rice husks, and so forth	250–400	n.a.	50	n.a.	South and center
Geothermal	~50–200	n.a.	0	n.a.	Center
Wind power	TBD	TBD	0.2	1	Central coastal region
Total	1,100–1,900	500–600	160–215	106	

n.a. Not applicable.

TBD. To be determined.

7. A *pico-hydro system* is a small family scale generator consisting of a propeller turbine, (100–1,000 w) generator, wires and switches. It is placed in a stream or river near the home. It is estimated that about 100,000–150,000 Chinese-made pico-hydro systems have been sold in open markets on a commercial basis. The further potential for use of these systems is considerable.

8. Vietnam has good constant *solar* resources in the south and center but substantial seasonal fluctuations in the north. Solar radiation levels in the south and central regions average just below 5 kWh per m² and are almost constant during the year, ranging from 4.0 to 5.9 kWh per m². The solar regime in the north exhibits averages around 4 kWh per m², but has wide variation ranging from 2.4 to 5.6. Installations in the north would be more expensive, as they must include extra capacity to compensate for cloudier winter months. Therefore, priority for solar development would be in the center and southern part of the country, where rural electrification is very advanced using grid extension. Vietnam has approximately 650 kW³ or about 5,000 installed solar PV systems divided over three market segments: professional proposals (50 percent), institutional systems like hospitals, community centers and battery charging centers (30 percent), and household systems (20 percent). Most of the systems installed in Vietnam are in operation and of good quality. Almost all of the panels are imported.

9. The main *biomass* sources that can be used to generate electricity are sugarcane bagasse, cane trash, and rice husks. An estimated 2.5 million tons of bagasse (1999) and 3.8 million tons of rice husks (1996) are available⁴. Most of the 43 existing sugar mills are located from Da Nang southward. Only three sugar mills supply power to the grid. The accumulated capacity of larger industrial sugar mills (>1,000 cane tons per day) was expected to increase from 20,500 TCD in 1997 to 98,000 TCD in 2005 according to government plans. This was to be achieved by modernization and expansion of at least seven plants and construction of 12 new ones. Initial estimates show that these modern industrial mills could generate about 120 MW of excess power that could be sold to the grid (an estimated 434 million kWh). The expansion of sugar mills has halted because of a current surplus of sugar. However, even without new mills, an opportunity exists as only 3 out of 43 facilities sell electricity to EVN. There is substantial scope for updating the technology and creating excess generation. Production of electricity from rice husks is also an important but untapped resource.

10. With more than 3,000 km of seashore and 70 percent of the country mountainous, there is likely to be potential for *wind* power. The limited data show averages recorded of about 5 m/s (at a 10-meter height). Potential is indicated by the results of a macro wind mapping study of the Indochina region, showing several pockets of wind speeds higher than 6 m/s, in the mountainous areas that border Laos, coastal provinces south of Da Nang and north of HCM City⁵. No information is available about the *geothermal* resource potential in Vietnam. One developer has estimated that about 200 MW is available in Central Vietnam. Based on their initial assessment they are pursuing a prefeasibility study for three plants generating at least 50 MW of power. Six sites have been identified with total potential capacity estimated at about 100 MW.

C. International Assistance for renewable energy development

11. International Assistance for renewable electricity development has been provided by many international agencies, which have shown strong interest in this area. The World Bank Group has supported the following activities.

- *REAP*. Background studies included creation of a data base on more than 1,100 communes that will not be electrified by EVN in the next five years⁶; a feasibility study for individual systems for households and institutions; a feasibility study for community isolated hydro grids; an institutional and policy background study; and a techno-economic analysis of renewable energy options, based on the site specific commune data base.
- Renewable Energy activities as part of the preparation of the *Rural Energy 1 Project* included a commune based micro-hydro-diesel pilot project in Son La Province; identification of an investment pipeline of 15 projects to rehabilitate grid connected hydro facilities; development of an SPPA and tariff; and a visit of Vietnamese stakeholders to village hydro, solar and grid connected renewable projects in Sri Lanka.
- Projects with support from *IFC and donor Trust Funds* including and IFC support for a commercial solar company (SELCO) that is selling PV systems; preparation of a Master Plan for Rural Electrification (Denmark); preparation of an investment pipeline for new small hydro sites (New Zealand); preparation of a macro level wind resource map for the Indochina region (Netherlands); renewable energy training and awareness material for communes (Netherlands); investment and business plan for micro hydro manufacturing business (Switzerland).

12. Japan is providing assistance for renewable energy activities including a demonstration project of a hybrid system of PV micro-hydro-power through the New Energy and Industrial Technology Development

Organization (NEDO); and preparation of a rural electrification plan for 17 provinces in the north through the use of renewable resources, such as micro-hydro, solar or wind energy (JICA).

13. Sweden (SIDA) has provided support for a Regional Research and Dissemination Program on Renewable Energy Technology for Asia to promote dissemination of technologies through adaptation to local conditions. This program is coordinated by the Asian Institute of Technology and implemented by research agencies in 6 countries. SIDA will consider rural electrification using renewable energy technologies in their assistance program during 2001–2003.

14. Other renewable energy research and development projects have been supported by agencies of Denmark, Finland, France, Germany, China, Japan, Netherlands, Sweden, and Switzerland. While these projects all contribute to national experience, there has been little synergy among the activities.

D. Barriers to renewable energy development in Vietnam

15. Despite ongoing work, considerable barriers and challenges to developing renewable energy in Vietnam remain. The main barriers to renewable energy development are given below⁷.

Policy. MoI's Rural Electrification Policy opens the way by stating that "rural electricity supply will be based on both grid and off-grid systems" and aiming to encourage private sector involvement. Nevertheless, regulations and procedures are required to allow businesses to supply renewable electricity for rural electrification and grid support. For rural electrification, a mechanism is required to channel an appropriate subsidy to rural communities.

Awareness. There is insufficient information available about the technologies, their costs and effectiveness, for potential investors, financing agencies, and for GOV officials at all levels⁸.

Commercial capability. Only Chinese made pico-hydro systems are sold and supported through a fully commercial retail network, in Northern Vietnam. Business capability and the environment for doing business in Vietnam are still developing. More transparent business licensing, regulation and procedures are needed. Publicly and privately owned businesses need to be treated equally with respect to project approvals and access to financing from banks. Import duties on equipment need to be reduced, e.g. for PV.

Financing. Credit is required for companies that might be renewable energy suppliers. Long-term financing is needed for community mini-grids and developers of grid-connected projects. For PV household units, lower cost systems and consumer credit on attractive terms are needed.

High quality technology. Pico-hydro and small hydro generators and controls are of lesser quality than systems available internationally. Import of high quality equipment or the introduction of joint venture investment to improve local quality of equipment is needed to support a major program⁹.

Resource data. During the preparation of the REAP, data was collected on communes that are not to be electrified by EVN and small hydropower. Nevertheless, much remains to be done. For small hydro, a number of sites have been identified, but the level of detail of sites on the size range <1MW is not adequate. Data is scant and inconsistent for wind and solar energy.

E. Renewable Energy development strategy

16. To address these barriers, and help realize Vietnam's renewable energy potential, the Renewable Energy Action Plan (REAP) has been adopted by the Ministry of Industry (MoI), which has also taken responsibility for coordination of its implementation. The REAP, developed jointly by EVN, MoI and the World Bank, provides a framework for international assistance to scale up renewable electricity development for rural electrification and grid supply. The REAP proposes a 10-year program with 2 phases: Phase 1, an institutional and capacity building phase, and Phase 2, an implementation phase.

17. The scale of investment activities proposed in Phase 1 is modest. Phase 1 aims to build, step by step, awareness, demand and capability. The activities would primarily demonstrate business models and create the necessary awareness, confidence and capacities to carry out a larger program in Phase 2. The proposed SEIER Project will support Phase 1 of the REAP. A future project, Rural Energy 2 (FY04), is already proposed by the GOV and the Bank to support scaling up and expanding activities in Phase 2 of the REAP.

18. REAP's goal is that renewable electricity support economic and social development in remote areas by (a) supplying isolated households and communities that cannot be reached economically by the grid; and (b) augmenting grid supply in remote areas. The REAP program follows six *strategic principles*:

(a) *Renewable electricity will be used when it is least cost and economically viable.* There are two areas where decentralized renewable electricity systems are cost-effective in Vietnam:

- To provide electricity services to communes too far away to be reached by the grid, or households in electrified communes that cannot be economically connected.
- To augment electricity supply to the grid, especially in outlying areas. This will help improve grid stability and reduce transmission losses, increasingly important considerations as the grid network expands.

(b) *Renewable electricity will be supplied on a commercial basis, by businesses.* The private sector will be encouraged, but the program will build on Vietnam's strong base of local community electricity units and cooperatives.

(c) *Communities, individual consumers and investors will actively contribute to and participate in the program.* All stakeholders will participate actively in program design, design of management models and implementation and invest in the proposed activities and installations.

(d) *Government will act as a market enabler.* GOV will issue policies and establish the legislation and regulation to support commercial development of renewable electricity. Government assistance will be provided for capacity building in design, engineering, business and finance to support the renewable energy sector and management of the renewable facilities in rural communities. The Government will play an important role in assuring quality and safety, as well as increasing awareness.

(e) *Access to long-term credit will be increased to improve financial viability of businesses and affordability of services.* The program will facilitate provision of credit by commercial banks, so that they gain experience with the renewable electricity business and take it on its financing as a normal activity.

(f) *Limited grant assistance will be provided in recognition of the social and environmental benefits, but will be used carefully.* For grid-connected investment, grant funds would cover higher risk

pre-investment costs, such as feasibility and pre-feasibility studies, information collection, resource assessment, training and capacity building. For off-grid facilities, the capital costs of the facilities would be subsidized, as is now done with grid extension. Grants will be sought from the GEF and others to cover capacity building, and from the GOV and international agencies to cover capital subsidies.

A ten year program

19. Based on a series of consulting studies, and consultations (see Attachment 1), the REAP proposes five major areas of activity (see Table 2 below) in a ten year program.

Table 2: Indicative Physical Achievements and Costs of REAP Program

REAP Component	Phase 1 (0–5 years)		
	Physical Targets		Estimated Cost
	Households (000)	MW	Million US\$
Policy and Institutional Development	-	-	3
Individual Household and Institutional	25–50	-	7–15
Community Isolated Hydro Grids	10–40	-	6–21
Grid-connected Renewable Energy	-	25–51	25–47
Technology Improvement/Resource Assessment	-	-	5
Subtotal	35–90	25–51	46–91
	Total Program (0–10 years)		
	Physical Targets		Total Cost
	Households (000)	MW	Million US\$
Policy and Institutional Development		-	6
Individual Household and Institutional	85–150	-	18–39
Community Isolated Hydro Grids	90–150	-	45–74
Grid-connected Renewable Energy	-	175–251	206–289
Technology Improvement/Resource Assessment	-		10
Total	175–300	175–251	285–418

20. The renewable energy component of the SEIER Project represents the World Bank/GEF contribution to Phase 1 of the REAP, described above. The SEIER Project will support four of them, as shown below (see Table 3). The fifth, individual systems, will be supported in future programs, after work in the SEIER has been completed to develop and demonstrate an improved pico-hydro systems, after experience is gained from SELCO's ongoing solar home system project.

Table 3: Overlap of REAP Phase 1 and SEIER Renewables Component

REAP Component Supported	SEIER 2(ii) Small Hydro Rehabilitation	SEIER 2(iii) Community –based hybrid renewable energy Grids	SEIER 3 (iii) Strengthen Capacity for Renewable Energy		
			Program Management	Small Power Producers	Technology/Market Development
Policy and Institutional Development			X		
Individual Household and Institutional Systems					
Community Isolated hydro grids		X			
Grid-connected Renewable Electricity	X			X	
Technology Improvement/ Resource Assessment and					X

F. SEIER Project components for renewable energy development

Global Objective

21. The global objective of the proposed renewable energy components of the SEIER Project is to contribute to reduction in greenhouse gas emissions by promoting the use of power generation, both grid connected and off-grid, using renewable energy resources. The renewable energy sub-components of the SEIER are consistent with GEF Climate Change Operational Program 6: Promoting the adoption of renewable energy by removing barriers and reducing implementation costs.

Baseline and Barrier Removal Activities by Component

22. This section describes both the baseline case as well as the proposed GEF alternative. In all cases, the GEF Alternative will be *in addition* to the baseline, so that the baseline would proceed with or without the GEF Alternative. Where appropriate in the discussion below, the GEF alternative includes a discussion of both the IDA and GEF financed activities. This underscores the fact that the prospect of GEF investment has catalyzed IDA involvement, and that the combined GEF/IDA financing contributes to the Government’s confidence that the REAP program can succeed. For this reason, the programmatic development of renewable energy as envisioned by the REAP would be very unlikely to occur without GEF support. Only the renewable energy components of the SEIER Project are described here.

a. SEIER Project Component 2 (ii) - Rehabilitation of Small Hydro Plants (Total \$5.5 million; GEF-TA: \$0.5 million; Investment \$5 million of which IDA \$4.5 million)

Baseline

In the baseline case EVN's existing small hydro facilities which currently are out of service or operating inefficiently would remain so. Moreover, currently functioning hydro stations would continue to decline from weak maintenance practices. Some small efforts to develop small-scale power purchase agreements would probably be undertaken, totaling about \$0.05 million over the Phase 1 period.

GEF Alternative

The physical investment, which will be supported by IDA and EVN will consist of rehabilitation of mini-hydro facilities. A recently concluded appraisal of 30 existing, small hydro plants identified 13 plants that could be rehabilitated. Based on economic life cycle costs compared to avoided cost of conventional generation, all 13 projects have economic rates of return above 10 percent, and a majority have EIRRs greater than 30 percent. The aggregate capacity of these 13 plants is estimated to be around 25 MW, and the total investment cost would be about VND 160 billion (US\$11.5 million).

Under the SEIER Project, EVN will rehabilitate five of these plants, (Thac Bay, Chieng Ngam, Kon Dao, An Diem, and An Kroet), with a capacity of 12.4 MW to increase their capacity to 15.4 MW, and extend the existing plant life by 8-12 years (see Table 4). This will result in additional lifetime generation of 752 GWh, and avoided emissions of 189,140 tonnes of carbon.

Management of these systems is particularly difficult for EVN. The sites are in remote areas and retention of staff is difficult. Therefore EVN will consider alternate management methods that give greater incentives to operators and managers to ensure that these plants do run optimally. Options include performance-based Management and Operations Contracts or some form of revenue sharing contracts. In the future, EVN may wish to divest themselves of these small plants through equitization.

Table 4: Characteristics of Grid Connected Mini-Hydro Rehabilitation Projects

Project	Province	Capacity after Rehab.(kW)	Estimated Cost		EIRR (%)
			Billion VND	Million US\$	
Thac Bay	Lai Chau	2,800	7	0.5	
Chieng Ngam	Son La	2,000	22	1.6	
Kon Dao	Kon Tum	600	5	0.4	
Am Diem	Quang Nam	5,640	3	0.2	
An Kroet	Lam Dong	4,400	27	1.9	
Total			64	4.6	

Source: Fichtner and Colenco 2000

Capacity building, would involve an international consulting firm to strengthen small hydro capabilities of local power companies under EVN. The Power Engineering and Construction Companies under EVN have adequate capacity to specify the requirements, prepare bid documents, assist EVN in tendering and in construction supervision. It would however be useful to strengthen their capabilities through hands-on training by a consulting team knowledgeable about the advances taking place in small hydro technologies; environmental and social assessment and mitigation of problems; application of new performance-based contracting methods and new construction management and supervision techniques; and small generation systems control and management. This TA would also assist EVN to equitize these plants if requested.

GEF Incremental Cost

The estimated cost for the GEF Alternative is \$5.5 million of which \$0.5 would be from GEF, \$4.5 million from IDA, and \$0.5 million from EVN.

Incremental Benefit

The domestic benefits of this activity will be the rehabilitation of about 15.4 MW of hydro capacity. The rehabilitated capacity would displace the current marginal generating capacity, which is largely composed of diesel systems. These hydro stations can be expected to displace about 752 TWh of thermal electricity and 189,140 tonnes of carbon over the lifetime of the facilities.

b. SEIER Project Component 2 (iii) - Community Based Hybrid Renewable Energy Grids (*Total \$5.0 million; GEF-TA: \$1 million; Investment \$4.1 million of which \$3.6 million IDA; implemented by MoI*)

Baseline

In the absence of GEF support, the Government would continue to aggressively pursue its rural electrification program with World Bank support. The program would feature grid extension energized by a generation portfolio increasingly dominated by fossil-fired thermal systems. Most villages too far from the main grid would remain unserved in the near-term. A few 'off-grid' villages, would see 'spontaneous' electrification systems installed by enterprising residents. Such systems are generally characterized by insufficient safety measures and high losses, and are based predominantly on diesel generators, owing to their significantly lower capital cost in comparison to micro-hydro. Operation of these diesel-based systems would remain problematic due to high maintenance requirements, including the cost and availability of fuel and other components (oil, filters, overhauls, etc.).

However, some renewable energy activity would continue in the absence of GEF, through bilateral donors. This would mostly be for small independent grids based on renewable energy, mostly small hydro. It is assumed that investments in such schemes would total about \$0.5 million over the Phase 1 period. In the past, these systems received support for the capital investments, but frequently left the ownership in question, and established inadequate arrangements for operation and maintenance. The baseline case, therefore, would continue the poor track record of these systems, which quickly fall into disrepair and are abandoned by the "beneficiary" village. The village is not only left with a failed project, but its confidence in renewable energy solutions also is seriously undermined. Efforts to systematically address the key barriers to renewable energy development described above would be minimal.

GEF Incremental Alternative

EVN has identified more than 1000 communities that will not be electrified by the grid in the next 5 years, mainly in mountainous Northern Vietnam. An economic analysis, using site specific data, showed that only hydro, hydro/diesel hybrids and diesel community grids were economically viable electrification options¹⁰. Financial and economic evaluations were carried out for commune hydro/hybrid grids in 8 representative communes, with small productive loads. The results indicated an EIRR between 10 and 17%¹¹ (see Attachment 1). Analysis also confirmed that the community-scale

hydro-based systems are lower cost options than either grid extension or diesel generation. However, the analysis showed that, without productive load during daytime, it is not justifiable to install a hydro-based commune electricity system. Without productive load, the cost for providing electricity for would be US\$610 per household on a life cycle cost basis, which is higher than the US\$450 per household for a solar PV system or even a diesel based commune system. If small productive loads are available, this picture changes. The hydro-based system would be the least cost option (levelized life-cycle cost of US\$770 compared to US\$1,100 for grid extension, and US\$1,310 for an isolated diesel).

A pilot of a commune-based hydro-hybrid grid has already begun in Na Bo village, Hua Peng Commune, Son La province, as part of the Bank's Rural Energy 1 Project. Under this component, the pilot will be extended to about twenty communes, in 4 provinces. These communes would benefit from Remote Area Renewable Electricity (RARE) capital cost grants and technical assistance for commune-based mini-grids. The RARE-assisted commune-based grids would serve about 10,000 households in total, with year round power. Assistance would be provided to train and support the businesses, which would operate and maintain the grids, as well as to stimulate income generating activities and productive activities in the communities. Calculations and pilot project experience show that an investment subsidy close to 90% is needed to bring the average tariff down to the 750-1000 Dong/kWh range, comparable to the tariffs charged to grid connected rural consumers.

In this component, the commune people's committee (CPC) would build local support, apply for funds to cost-share a feasibility study, and ultimately apply for a RARE grant to co-finance the facility. If successful, a commune electricity utility would be formed to operate the facility. The commune electricity utility could take a number of forms: (a) a commune electricity cooperative (CEC); (b) a joint stock company (JSC), e.g. owned by the CPC and the Province; or (c) a private investor-owned company (the "BOT"-model). The CEC is taken as the base case.

For each RARE grant, there would be a RARE grant agreement between MOI, the PPC and the commune electricity utility that would spell out their roles and responsibilities with respect to the RARE assisted grids. The agreement would cover aspects such as ownership, management, procurement, tariff, service connection fees, escrow account for major rehabilitation, insurance, responsibilities and rights of all parties, dispute resolution mechanism, etc.

In the base case, the RARE-assisted commune hybrid renewable energy grid would be jointly owned by the province and the commune electricity utility, in proportion to their contribution, excluding the cost of the land, the PPC, the commune utility and others would contribute a minimum of 20%. Financing of the capital costs would be as follows: RARE grant to the PPC would fund up to 80% of the grid, excluding cost of the land, the PPC would fund up to 20%, and the commune electricity utility would fund up to 10%, in cash, labor and local materials. The commune electricity utility entity would operate and maintain the grid, on a day to day basis, and collect tariffs sufficient to pay the operating expenses, including normal O&M as well as a "grid maintenance fee" which would be paid to the PMU, and held in an escrow account to be used to finance insurance, periodic major rehabilitation and grid expansion. After 15 years of satisfactory operation, the PPC's ownership of the grid would be transferred fully to the commune electricity utility.

Implementation of the pilot project would be coordinated and organized at national level by a *Project Management Board (PMB)* at MOI, assisted by full-time consultant staff. The PMB would guide implementation at provincial level, organize technical assistance and training, organize a productive uses promotion program, appraise and approve proposals for RARE grants, authorize payments to contractors, organize technical assistance and training, sign the RARE grant agreements for each grid,

take fiduciary responsibility for management of the special accounts for IDA and GEF funds, and contract an independent monitor.

The component would be implemented in each province by a *Project Management Unit (PMU)*. The PMU would operate under the supervision of a *Steering Committee (SC)*, under the People's Committee, comprised of Depts. of Planning and Investment, Industry, Agriculture, Education, Health. The SC would approve proposals for feasibility studies and RARE grants and forward them to the PMB. The SC would also ensure that the sector agencies reinforce the development impact of projects through investments in the productive use of electricity. The PMU would consist of an official of the Dept. of Industry and a social mobilizer, supported by full-time consultant staff. The PMU and the district office of MOI would contact potential communities; assist them to prepare proposals for co-financing of feasibility studies and RARE grants; contract for assistance in the establishment of the commune electric utility; contract for preparation and evaluation of tender documents for construction of the facility; organize the tender; contract for assistance in setting-up and managing the grid ownership entity; contract out major repairs from escrow funds.

Institutional arrangements are described in a RARE operational manual. They are summarized as follows:

A. The *Project Management Board* in MoI will:

- Organize, support and supervise the operations of the provincial PMUs;
- Adopt a detailed operational manual, which will be completed by negotiations;
- Provide manuals and guidelines for the preparation of proposals for co-financing of feasibility studies and commune hydro/hybrid grids, and for tendering procedures;
- Organize training of PMU staff and district officials, involved in the program, of consultants, and of managers and staff of grid ownership entities.
- Process and approve requests for co-financing of feasibility studies or RARE grants for grids;
- Conclude tri-partite agreements for each RARE grid that receives grant support, between MOI, the provincial government and the commune electric utility; Select contractors and consultants according to guidelines in operational manual;
- Select contractors for turnkey installation of hydro/hybrid grids and provision of services;
- Authorize payments from the special account to consultants and to turn-key contractors, subject to confirmation of the work done.
- Hire independent monitor(s) to report on the operation of grids that receive RARE grants with respect to : (a) community satisfaction with electricity service; (b) impact on poverty alleviation and income generation; and (c) implementation of RAP and environment action plan.
- Prepare annual budgets and operate a financial management system for the RARE;
- Prepare annual status reports.

B. The *Steering Committee* under the People's Committee will:

- Approve proposals by CPCs for co-financing of feasibility studies and for RARE grant co-financing for commune hydro/hybrid grids and forward them to PMB;
- Authorize signature by PPC representative of tri-partite agreement for each RARE grant;
- Adopt procedures to ensure that sector agencies reinforce the development impact of RARE by co-financing productive uses;
- Oversee the work of the PMU.
- Ensure budget allocation for and payment of provincial contribution to RARE-assisted commune hydro/hybrid grid; RAP compensation payments; administrative costs in province and district related to RARE pilot program.

C. Provincial Management Unit (PMU) will:

- Supervise district office of MOI;
- Carry out community mobilization activities, or supervise community mobilization activities by consultants hired by Provincial PMU. There should be a (part-time) staff in PMU in charge of community mobilization, training and support. This function could be combined with other responsibilities such as compensation, resettlement, environment etc.
- Supervise the program to promote productive uses in the community.
- Hire a consultant for bidding document preparation, assistance in bid evaluation and supervision of construction works;
- Select and supervise turnkey contractors for procurement of equipment, construction, commissioning and guarantee of service;.
- Select and supervise a technical supervisor to support the commune utility in day to day management, financial operation, and O&M.
- Manage escrow accounts including payment for insurance, selecting and supervising contractors for periodic major repairs, or grid expansion, as needed.

D. Commune People's Committee will:

- Commission feasibility study after obtaining co-financing
- Assist in preparation of feasibility study and prepare proposal for RARE grant

E. Commune electric utility will:

- Sign RARE grant agreement
- Mobilize local contribution to capital costs (10%, in form of local materials or labor)
- Organize and facilitate connection of at least 60 per cent of households
- Manage, operate and maintain the grid, on a day-to-day basis
- Collect tariffs and pay for operation and maintenance, as well as a "major repair fee" to escrow account
- Maintain financial accounts, comply with legal, business procedures.

The physical investments, supported by IDA and the Government, will be carried out through the following activities:

Construction and operation of about 20 community-based hybrid renewable energy grids, in remote communes that cannot be connected to the electricity grid. RARE grants will be used to co-finance the feasibility studies for the grids, and construction of the facilities. Survey, investigation, detailed design of the community-based hybrid renewable energy grids will be carried in close consultation with each Commune People's Electrification Committee. Environmental, social, land acquisition and resettlement aspects will be dealt with according to Bank procedures considered. Labor and materials will be provided as a community contribution to project construction, including clearance of vegetation; excavation of trenches for the penstock pipe; building platforms for the powerhouse; poles. Procurement, construction, supervision of installation and commissioning of each scheme or system will be carried out

The TA activities, for which GEF support is provided are:

GEF support is being sought to provide consultant services to assist MoI, provincial and district authorities with management of the RARE pilot program, including:

Program Management This will include support for organization of the program, technical assistance and capacity building of all project entities, financial and fiduciary management, and monitoring and evaluation of results. development and use of An important additional activity will be publicizing the program and soliciting additional funds from other donor agencies.

Community Mobilization and Support. A community mobilization program will be undertaken in likely communes, to assist the community to understand the concept and build the organizational capacity required. The communes will be offered assistance to prepare business plans, and the opportunity to bid for grant funds. The business plans will demonstrate that the proposed tariff would meet requirements for operations and maintenance, plus major repairs. Particular attention will be paid to defining management responsibilities at commune and provincial levels, operations and maintenance frameworks, technical and safety specifications (see O&M requirements below), and monitoring and evaluation of performance, costs and benefits. Lack of post-implementation service and support has been a common contributor to failure of micro-hydro systems in the past. Accordingly, intensive O&M training and support will be provided during commissioning (when it will be most effective). Access to management and technical advice and support will be provided during operation.

Productive Uses Promotion. A productive uses promotion program will be carried out in each commune, in conjunction with the community mobilization program. The aim of the program will be to identify and assist in the establishment of income generating uses that consume electricity during the daylight hours and do not contribute to the evening peak load. The productive uses are likely to be agricultural processing, timber working, water pumping, battery charging and refrigeration, including replacement of diesel-powered processes with electric motors.

Monitoring and Evaluation (M&E). The M&E program will monitor and evaluate the social and economic benefits as well as the physical implementation, performance, O&M of the program throughout the SEIER project period.

Incremental Cost

The estimated cost of the GEF Incremental Alternative is \$5.0 million, of which \$1 million would come from GEF, \$3.6 million from IDA, and \$0.4 million from the beneficiary community.

Incremental Benefit

Domestic benefits of this program are expected to be significant. These will include electrification of about 10,000 households using renewable-energy-powered grids at about 20 sites with an aggregate capacity of about 2 MW. The capacity building activities, financed with GEF support, will greatly enhance the sustainability of these investments, providing a solid basis for future expansion of the activities in Phase 2 of REAP.

Direct global benefits of this investment will be the displacement of kerosene lighting and diesel/grid charging of automotive batteries for radio and television use, as well as reduction in diesel use for commercial operation of small diesels used for rice milling, etc.. This is estimated at 19,200 – 30,000 tonnes for the program over the expected 20 year life of the mini-hydro investments.

More significant, however, are the demonstration effects that this program will have on justifying

Phase 2, which is targeting service to 80-140,000 households. If the program is successful in attracting additional donor support, this could be expanded to about 350,000 households. Also, this program will provide an important model for village level renewable energy based mini-grid development, being among the first to incorporate this rural electrification approach into its rural electrification program. Therefore, the replication potential for this model should also be counted as a significant global benefit.

c. SEIER Project Component 3.3 Strengthening Regulation, Planning and Implementation Capacity Component. This will consist of three components all executed by MOI. *(Total \$3.5 million of which GEF-TA \$3 million, GOV \$0.5 million)*

The Policy and Institutional Development Component will provide TA to make recommendations to develop policy instruments, regulations, strengthen institutional capacity in renewable energy program development based on the REAP, and mobilize resources from donors and elsewhere, especially within the first two years of the program. It will build on recently introduced policy and regulatory measures, especially the Rural Electrification Policy.

Baseline

In the absence of GEF support, the Government would still make some efforts toward strengthening regulations, planning, and implementation capacity for renewable energy development, primarily with donor support. However, the modest level of such support, which can be expected to amount to no more than \$100,000 in Government and bilateral funds over the project period, would not attract the public and private sector visibility and commitment which the proposed GEF/IDA-supported operation has. As a result, the impact that such investments might gain in terms of progress toward barrier removal would be small in the absence of GEF support, and the necessary enabling environment would not be put in place. Moreover, there would be virtually no support provided to potential non-utility producers. With regard to pico-hydro technology development, the baseline scenario would see continued reliance on poor quality Chinese turbines, with their associated safety, efficiency, and economic issues.

GEF Alternative

The proposed institution building program described below is comprised of a suite of coordinated capacity building activities, which will complement the rural access activities and lay the groundwork for the significant scale-up in Phase 2 of the REAP.

SEIER Project sub Component 3.3 (a) - Renewable Energy Program Management Support
(Total: \$2.0 million, GEF-TA \$1.5 million)

The activities supported in this subcomponent are:

Assistance in Development of Policy Instruments, Decrees and Regulations. The Rural Electrification Policy states MoI's intention to support development of renewable electricity for off-grid rural electrification and for grid supply. It is necessary to develop a number of instruments to implement this intention. This TA activity will assist MoI in developing the necessary instruments, which will build on activities already underway.

Government has an important role to play in creating an enabling environment, because the marketplace does not recognize fully the environmental and social benefits of renewable electricity. As with rural electrification, the government must facilitate investment in renewable electricity in a number of ways. Examples of key policy and regulatory requirements include decrees and regulations, which would set out the following:

Rural Electrification

- rights and responsibilities of national and local governments, service providers, communities, individuals with respect to rural electrification using renewable electricity;
- methodology for determining when renewable electricity is least cost;
- institutional models for community service provision and appropriate regulations developed for their operation;
- appropriate source, level, amount and mechanism for government subsidy of rural electrification with renewable electricity, for community grids and individual systems;
- appropriate design and quality standards and enforcement mechanisms for service, safety and reliability.

Nonutility Renewable Power Generation

- rights and responsibilities of governments, power companies, and project developers, owners and operators with respect to nonutility renewable electricity generation;
- regulatory review and adjudication of the SPPA and tariff, so that implementation is satisfactory to both EVN and developers;
- a procedure for setting the tariff that recognizes avoided capacity, energy and T and D costs;
- targets for purchase of nonutility renewable electricity;
- appropriate design and quality standards and enforcement mechanisms for service, safety and reliability.

Strengthening Capacity for Implementation. Since the national and provincial power development and rural electrification plans have to be approved by MoI, MoI and the PPCs will coordinate planning for grid-connected and off-grid electricity supply. For rural electrification, MoI needs to ensure that the PPCs that have responsibility for planning rural electrification consider all least cost options prior to rural electrification network planning not only grid options. Since off-grid services would not be provided by EVN, it is important that planning be conducted in close cooperation with off-grid and isolated grid service providers. This cooperation occurred during preparation of the REAP where EVN shared data on communes to be electrified. Assistance will be provided to MoI for the following:

- targeted awareness creation and training of government officials (including MPI, MoI and EVN), the business and financial community, and the public about renewable electricity;
- simplifying approval procedures and ensuring that private and public sector companies are treated equally; and
- helping the PPCs to carry out their task of planning renewable electricity provision as part of their rural electrification plans;
- support for a Program Management Unit to assist in implementing the REAP.

SEIER Project sub Component 3.3 (b) – Small Power Producers (TA \$1.0 million GEF)

The capacity has to be built in Vietnam to facilitate development of nonutility markets for small renewable energy power generation projects. To this end, project-funded consultants will be retained to address the following issues:

- Advise EVN on purchasing power under the SPPA;
- Assist MoI in packaging identified mini-hydro and other projects as BOO projects, designing award procedures, and offering sites to interested developers;
- Help sugar production and rice milling associations, as well as the responsible government agencies, to inform and encourage their members to participate in the small power producer program;
- Facilitate contacts between potential project developers, equipment suppliers, engineering service providers, financiers, MoI and EVN and conduct information dissemination;
- Provide matching grant funding to interested renewable energy small power project developers to assist in preinvestment activities;
- Provide business development services to developers to support preparation of conceptual designs, hardware specifications, financial analysis, financing plans, environmental and social assessment and compliance reporting, business planning, and attracting the necessary financing; and
- Help developers to prepare projects for support from clean energy funds, such as the PCF or the CDM

A consultant team is expected to have significant participation of national experts. International experts would be used primarily in an advisory capacity. During the course of this assignment, the national experts will work alongside and in partnership with international experts and thereby strengthen local expertise and capabilities in small power development. When this assignment ends, there will be a substantially improved capability in-country to continue provision of small power development assistance. This approach has been proven to be effective in other countries.

SEIER Project sub Component 3.3 (c) - Technology/Market Development (TA GEF \$0.5 million)

Activities will be developed during preparation, but indicative activities are especially focused on the individual system market not addressed in the above sub-components:

- Technology improvement to improve quality of locally manufactured products, especially pico-hydro systems.
- Market and technology information collection and dissemination, especially for pico-hydro and solar PV systems.
- Resource measurement and assessment, especially for wind.

GEF Incremental Cost

The cost of the Incremental GEF Alternative is estimated at \$1.5 million for Subcomponent a, \$1.0 million for Subcomponent b, and \$0.5 million for Subcomponent c (see Table 5).

Incremental Benefits

The domestic benefits of these activities will primarily be in the establishment of a suitable environment for non-utility development of small-scale renewable energy, including the private sector. This will include establishment of an enabling policy/regulatory policy, as well as development of functional

channels for resource and technology information, the local availability of expertise for developing and implementing renewable energy investments, and access to suitable financing for the investors, as well as their customers who may need to borrow in order to take full advantage of the newly available electricity. In addition, the support for pico-hydro technology development will provide a much-needed improvement in the performance of these units, which will contribute to quality of life improvements as well as potentially to economic development through cottage industries. The program seeks to create a mindset in both public and private sector that small-scale renewable energy investments can make a valuable contribution to Vietnam's least cost capacity expansion plan. Due to an inherently low variability in their operating costs, these renewable energy investments also will help to stabilize electricity generation costs. However, the current nascent state of such private participation and the long lead times needed for the initial projects suggests that there is unlikely to be any significant investment brought to financial closure during the project period. Instead, the project will seek to create a pipeline of investments for development in REAP Phase 2. Pipeline development will extend beyond mini-hydro, to include biomass and possibly also wind if exploitable resources are confirmed.

Global carbon reduction benefits will accrue as the private sector becomes active in small-scale renewable energy provision.

Sustainability

23. The SEIER Project is expected to contribute significantly to the sustainable development and use of renewable energy in Vietnam. Critical elements of the enabling environment, as described in Table 3 below, will be established and be made functional. It should be noted however, that the SEIER Project alone cannot be expected to complete the task of creating a sustainable renewable energy program in Vietnam. Some key barriers, such as improvements in the overall business environment, assuring that good projects have access to credit through local financing institutions, and EVN's full acceptance of small-scale non-utility generators, will take longer than the SEIER Project duration to resolve. Therefore it is expected that a follow-on operation will be needed to solidify the gains of the SEIER Project and expand the impact through significant scale-up as part of Phase 2 of the REAP.

Conclusion

24. The GOV and World Bank have already indicated their commitment to this scale-up effort, through the proposed Rural Energy 2 Project (FY04). Under this project, it is planned to expand the remote area commune-based renewable grids to cover the remaining communes (estimated up to 300), that cannot be connected by the grid to the year 2010. MoI is also tapping the interest of other donors in renewable energy, to support the REAP. SIDA and JICA have already expressed interest in supporting the framework, especially for renewable electricity for independent community systems.

25. The approach of the REAP, developing a long term framework for international assistance to renewables, is considered to be very replicable to other countries. Cambodia is already following this model. The expectation of support from the GEF/IDA was an important contributor to the willingness of GOV to adopt the REAP.

Table 5: Incremental Cost of SEIER Renewables Components

	Baseline	GEF Incremental Alternative	Increment
Domestic Benefits	<p>HH in “not to be electrified” areas will remain unserved except for some isolated bilaterally funded community-based hybrid renewable energy grids– these are not sustainable due to lack of sustained support to the community</p> <p>26 MW of EVN-owned small hydros remain off-line or under capacity. Additional unmeasured “fragile” EVN hydro capacity goes off-line due to inadequate maintenance.</p> <p>Independent Power Producers begin to penetrate market, with largely fossil based systems. Renewable energy IPP’s limited to the three currently connected sugar mills.</p> <p>Barriers to renewable energy development remain largely un-addressed</p>	<p>RARE Fund established to mobilize and support communities in operating community-based hybrid renewable energy grids. Productive uses supported with associated economic benefits</p> <p>Existing EVN hydro capacity remains on-line, “fragile” systems restored to more robust working order, 5 mini-hydro plants, totaling 20 MW rehabilitated</p> <p>Groundwork laid for Independent Power Renewable Energy Production. Initial investments expected in Phase 2 period, with some possibility of Phase 1 investments.</p> <p>Significant progress in addressing renewable energy barrier removal</p>	<p>10,000 hh served through 2 MW of independent hydro powered grids in 20 communes. Basis laid for attracting support of other donors and expansion in phase 2</p> <p>Additional 15.4 MW of grid-connected hydro capacity on-line Reliability of “fragile” capacity improved</p> <p>IPPs use renewable energy resources where they are least cost, helping to stabilize electricity generation costs</p> <p>Elements of enabling policy/regulatory framework in place</p> <p>Functional channel available to non-utility developers for information on renewable energy technology, resources, and market</p> <p>Local expertise available for developing and implementing renewable energy investments</p> <p>Financing channels opened for consumer, business, and developer investments in renewable energy</p> <p>Local manufacture of pico to small hydro equipment is improved</p>

<p>Global Environmental Benefits</p>	<p>Rural electrification relies heavily on diesel gensets for independent and off-grid proposals, with marginal additions of small hydro</p> <p>Market for unimproved individual pico hydro plants remains steady at ~40,000 per year, with high failure rate. Most customers still using kerosene for lighting and remotely-recharged automotive batteries for radio/TV.</p> <p>Fossil-fuel fraction of grid connected generation increases. Net reduction in rated hydro capacity on-line.</p>	<p>Increasing penetration of renewable energy usage for independent grid proposals.</p> <p>Increased pico hydro equipment reliability and efficiency extends market as well as unit lifetime output. Pilot systems in place</p> <p>Net increase in rated hydro & biomass capacity on-line (at least 20 MW from EVN)</p>	<p>Phase 1 target of 2MW aggregate capacity, serving 10,000 households at 20 independent grid sites. 19,200-30,000 tonnes of carbon avoided through displacement of kerosene for light and diesel for rice mills.</p> <p>Potential of Phase 2 scale-up established for village-based renewably-powered independent systems</p> <p>Potential established for replicability in other countries</p> <p>Higher quality equipment demonstrated, and market development begun.</p> <p>752 GWh of fossil-fuelled generation displaced over lifetime of 20 MW of rehabilitated grid-connected hydro plants. 189,140 tonnes of carbon avoided</p>
<p>Cost by Component</p> <p>2.(ii) Rehabilitation of Small Hydro Plants</p> <p>2.(iii)Community-based Hybrid Renewable Energy Grids</p> <p>3.3 (a)Renewable Energy Program Management</p> <p>3.3 (b)Small Power Producers</p> <p>3.3(c)Technology/Market Development</p>	<p>\$0.05 million</p> <p>\$0.5 million</p> <p>\$0.1 million</p> <p>-</p> <p>-</p>	<p>\$5.5 million</p> <p>\$5.0 million</p> <p>\$1.5 million</p> <p>\$1.0 million</p> <p>\$0.5 million</p>	<p>\$0.5 million</p> <p>\$1.0 million</p> <p>\$1.5 million</p> <p>\$1.0 million</p> <p>\$0.5 million</p>
<p>Total GEF Incremental Costs</p> <p>Total Carbon Avoided</p> <p>Average GEF Cost of Carbon Avoided</p>	<p>\$0.65 million</p>	<p>\$14.0 million</p>	<p>\$4.5 million</p> <p>208,350 – 219,140 tonnes</p> <p>\$20.50 – 21.60/tonne</p>

Attachment 1: Cost Benefit Analysis for Community Micro-hydro Grids

For the community-based hydro/hybrid grids, preliminary financial and economic evaluations were carried out for 8 representative communes, with small productive loads. The results indicate an EIRR between 10 and 17%. Meritec, REAP Package D, Feasibility Study of Community Hydro Grids, 2000. Willingness to pay was based on estimates from the Rural Energy 1 Project of US\$0.13 (VND 1820) per kWh, excluding VAT for households, and US\$ 0.37 (VND 5180), excluding VAT for productive loads. Analysis confirmed that the community-scale hydro-based systems are lower cost options than either grid extension or diesel generation. However, the analysis also showed that without productive load during daytime it is not justifiable to install a hydro-based commune electricity system for a typical Vietnamese commune. Without productive load, the cost for providing electricity for would be US\$610 per household on a life cycle cost basis, which is substantially higher than the US\$450 per household for a solar PV system or even a diesel based commune system. If small productive loads are available, this picture changes. The hydro-based isolated system would be the least cost option (levelized life-cycle cost of US\$770 compared to US\$1,100 for grid extension, and US\$1,310 for an isolated diesel). The activities planned to encourage productive uses are therefore critical to the viability of the systems.

Table 6 : Sites / Communes Selected for Financial and Economic Evaluations

No.	Commune / Project	District	Province	No. of Consumers	Hydro Capacity	Diesel Capacity
1.	Tri Nang	Lang Chanh	Thanh Hoa	213	40	30
2.	Muong Lan	Song Ma	Son La	407	90	0
3.	Chieng Phung	Song Ma	Son La	292	60	0
4.	Ngoc Chien	Muong La	Son la	537	110	0
5.	Lung Pu	Meo Vac	Ha Giang	253	60	0
6.	Ngam La	Yen Minh	Ha Giang	253	60	30
7.	Duong Am	Bac Me	Ha Giang	221	50	30
8.	Dai Son	Van Yen	Yen Bai	188	40	0

The financial analysis uses tax inclusive costs, and examines the financial viability from the viewpoint of the co-operative (or mini utility) that owns / operates the community-scale hydro-based system. The financial analysis uses the cost of diesel that would typically be paid in rural district towns plus delivery to remote rural villages / communes (as described in A4 above). Value added taxes and import duties at current applicable rates (VAT = 10 %, import duties = 5 %) are included in the financial analysis.

The economic analysis examines the economic viability of the community-scale hydro-based systems from the country's viewpoint. All taxes (value added taxes, import duties, etc.) are excluded from the analysis. The economic analysis uses the economic price of diesel (as described in A4 above), and shadow factor of 0.85 is applied to local costs

A summary of the results of the financial and economic evaluations is given in Table 7:

Table 7 : Results of Financial and Economic Evaluations

No.	Project / Commune	Hydro / Diesel Capacity	FIRR (Un-subsidised)	EIRR (Un-subsidised)	Capital Subsidy Required to Achieve FIRR of 10% (% of development cost)
1.	Tri Nang	40 / 30 kW	- 6.9%	+ 11.2%	78%
2.	Muong Lan	90 / 0 kW	+ 0.1%	+ 17.1%	54%
3.	Chieng Phung	60 / 0 kW	- 1.4%	+ 15.5%	60%
4.	Ngoc Chien	110 / 0 kW	+ 1.4%	+ 18.8%	48%
5.	Lung Pu	60 / 0 kW	- 2.6%	+ 14.1%	64%
6.	Ngam La	60 / 30 kW	- 5.3%	+ 13.0%	74%
7.	Duong Am	50 / 30 kW	- 7.2%	+ 11.0%	79%
8.	Dai Son	40 / 0 kW	- 4.3%	+ 12.4 %	71%

The capital subsidy required to achieve an FIRR of 10% is calculated, to assesses the financial capacity of the commune utility to cover its O & M costs, provide a margin for unexpected repairs / expenses and to service debt. The analysis calculates the level of subsidy of the development cost required, assuming the remainder of the development cost is funded with a loan bearing an interest rate of 10 %. The capital subsidy includes the total subsidy required, and includes both a community contribution (10%) and grant funding. Thus a 55 % capital subsidy would comprise a 10% community contribution and 45 % grant.

Comparisons with transmission grid extension and with equivalent diesel generation were carried out using equalising discount rate analyses. This confirms the results of the screening, that in all cases, the cost of the selected community-scale hydro-based systems are cheaper options than either grid extension or diesel generation.

Sensitivity analyses carried out for one scheme, Chieng Phung, showed that the capital subsidy required increased from 60% to 65% if capital costs increased by 15%, and to 68% if sales were 15% less than forecast.

It is essential that MoI and EVN should specify the criteria and processes to be followed in the selection of communes. It has been recommended that the criteria should include the following principles: (i) that communes should have actual or potential productive loads and a potential for economic development so as to ensure that energy consumption will be sufficient to justify the investment; (ii) that the connection of communes to the grid or off-grid systems should be the least-cost solution to supply electricity; (iii) that the selection should be done following a process whereby local groups, i.e. local community and households, be required to indicate ownership by active participation; and (iv) that the commune or utility contribute both a share of the equity. and take out a small loan to reinforce ownership.

¹ / Estimated by Hydropower Department of the Institute of Energy.

² / Hydro Power Center. 2000. *Package B: Collection of Basic Information and Mapping Information for Vietnam*. Consultant report to World Bank, Washington, D.C.

³ / Institute of Energy estimate.

⁴ / *Ibid.*

⁵ / Truewind Solutions. 2001. *Wind Resource Atlas of Southeast Asia*. Consultant report to World Bank.

⁶ / Data includes population, number of households, per capita income, village spacing, access to seasonal road, perennial road, health center, school, market, and small hydro potential.

⁷ / See “*Options for Renewable Energy in Vietnam*, ESMAP Technical Report 001. A report on a two day participatory workshop held during preparation of the Renewable Energy Action Plan.

⁸ / A start has been made on making this information through a project called RERID (renewable energy training material to be used under the WB supported Commune-based Rural Infrastructure Project)

⁹ / A start has been made on this through twinning of a Swiss company with Renewable Energy Research Center

¹⁰ / ENTEC, 2000, REAP Package C, *Techno-economic Analysis*.

¹¹ / See *Renewable Energy Action Plan*, section B3.

¹² / Meritec, REAP Package D, Feasibility Study of Community Hydro Grids, 2000.

Additional Annex 13: Rural Electrification Strategy
VIETNAM: System Efficiency Improvement, Equitization & Renewables Project

Rural electrification in Vietnam:

1. By the end of 2000, it was estimated that 82% of communes and 73 % of households in Vietnam had access to electricity. Despite this, in a number of communes, the rate of connection of households still remains below 50 % primarily in the rural areas.

Rural electrification in Vietnam

Power Company	Total of Provinces	Commune				Households have power			
		Total of communes	Total of communes with power	Total of communes without power	% electrified	Total of households	Total number of households connected to grid	Total number of households not connected to grid	% connected
Power Company No. 1	26	5,273	3,771	1,502	71.5	6,287,304	4,948,814	1,338,490	79
Power Company No. 2	19	1,682	1,594	88	94.8	3,449,792	1,765,740	1,703,028	51
Power Company No. 3	12	1,458	1,113	345	76.3	2,092,128	1,354,098	738,030	65
Ha Noi Power Company	1	118	118		100.0	228,618	228,618		100
Ho Chi Minh City Power Company	1	61	61		100.0	201,165	185,052	16,113	92
Hai Phong Power Company	1	174	171		98.3	281,446	275,105	6,341	98
Dong Nai Power Company	1	130	130		100.0	301,034	195,820	105,214	65
Total	61	8,896	6,958	1,938	78.2	12,841,487	8,953,247	3,907,216	69.7

2. Ambitious rural electrification targets have been established and work towards meeting them has commenced. About 20 million people in Vietnam, representing about 4 million households, still have no access to electricity. Electricity consumption patterns are also skewed with urban dwellers who account for about 20% of the population accounting for over 80% of the total consumption. Expansion of rural electricity access is crucial for two reasons. First, electricity access will make it possible to improve overall welfare levels by providing reliable lighting sources, improved health care and services. Second, by providing alternative sources of energy for irrigation and other productive activities (e.g. weaving, etc.) it can increase the productivity and incomes of rural residents. The Government is addressing the issues by: (i) issuing a Rural Energy Policy Paper and preparing national decrees for implementation of the rural electrification programs; (ii) working with the World Bank and other donors in designing investment projects IDA's Rural Energy Project (Cr 3358; FY 2000; \$ 150 million) would provide electricity to 670 communes and about 400,000 households for rural electrification; and (iii) expansion of rural electrification effort by different agencies so that they would provide electricity to 90 % of the rural households by 2010.

Plans for supplying electricity from the national grid till 2010

Unit: Million households

	Total households in 1999	Number of households that have power in 1999	Ratio (%)	Total households by 2010	Number of households that will have power by 2010	Ratio (%)	Additional households to be connected in 2000-2010
PC 1	6.80	5.45	80	8.04	7.48	93	2.03
PC 2	2.09	1.35	65	2.48	2.18	88	0.83
PC 3	3.95	2.15	54	4.67	4.06	87	1.91
Total	12.84	8.95	69.7	15.19	13.73	90	4.78

3. There are today three major issues in rural electrification – one, expanding access to those rural communes that are still unconnected to the national grid though connection is techno-economically feasible; second, providing energy to those remote communes that cannot be connected to the grid in the near future and thirdly, rehabilitating the grids in communes that are connected but have low coverage of households and are extremely inefficient and costly. The first issue was tackled in the \$ 150 million Rural Energy project approved by the Bank board in May 2000, which would connect 670 communes and provide electricity to about 400,000 households over the next 3 years. This also provided the framework for similar investments from other donors (e.g. CdF provided funds for 70 communes in the south). During the preparation of this project, studies were carried out in regard to both the remote communes (Meritec study) and rehabilitation of communes (ECA study) and two pilot projects (Na Bo for remote area renewable energy commune based grid in Son La province and Lich Hoi Thuong joint stock company in Soc Trang province) were initiated in 2000.

4. **Remote area renewable energy based commune grids.** Despite the rapid expansion of the national grid and the aggressive rural electrification program, there will still remain a large number of communes in the remote, mountainous areas without electricity. These communes are some of the poorest in the country and generally are inhabited by ethnic minorities and so have limited ability to pay. The available energy resources are poor or available only for limited periods (e.g. solar). While a number of attempts have been made to provide local sources of energy to households in these areas—solar sets under the IFC-SELCO program, individual pico hydro sets---, there has been no attempt to develop and implement a systematic approach to providing good quality energy services to these remote communities. Many of the existing schemes have failed due to both lack of a sense of ownership and limited local management capabilities. A pilot project was initiated last year in Na Bo for setting up a local community based grid using a hybrid hydro-diesel sources of energy.

5. The Na Bo pilot design was based on a participatory study carried out during 1999-2000. The existing hydro plant, which had fallen into disuse in the absence of adequate local funds for repair and maintenance, was rehabilitated and a community grid was designed and erected. A diesel set was integrated into the system design which could be used during low water periods and for charging of batteries of households that were too far to be connected to the commune grid. The objective of the design was to provide electricity to the community throughout the year so that they could then make investments for more productive uses of electricity. The commune leadership agreed to take over the responsibility of operating and managing the grid, levying and collecting power tariffs at the rate of 700 dong/kWh but requested adequate training and technical support. The People Committee of Son La province, in whom the ownership of the rehabilitated grid was vested, agreed to transfer the ownership to the commune for which the commune agreed to pay a leasing fee of \$ 1000 per year for 20 years. This lease income would be used by the PPC to provide technical assistance to the commune during this period and also be used for promoting similar grids in other remote communes in the province. A rural electricity cooperative has been set up and memoranda of understanding signed between the commune leadership and the PC of the province.

6. It is proposed to build on this model in the SEIER project where a Remote Area Renewable Energy fund would be created in the MOI. The fund would provide grants to the provinces for establishing the remote area commune grids in accordance with established criteria. The criteria would include commune agreement to the model, participation from at least half or two thirds of the households, agreement to pay for operation and maintenance, and formation of a cooperative or joint stock company to manage the commune grid. Technical assistance would be provided to the remote communes which met the criteria to submit proposals for grants to the fund and for building and setting up the commune grid after such approval. The Peoples Committee of the provinces would agree to execute the grant and set up the remote commune grid, and use the lease payments to provide technical assistance to these communes for operation and maintenance for the first 3-5 years. The local community would be responsible for operating and managing the grid and would sign agreements on lines similar to the Na Bo model.

7. Based on the Na Bo model, the RARE fund would be set up as part of the SEIER project using both GEF and IDA funds. The funds would be enough to set up about 20 remote commune renewable energy community grids. Some grant funds would be available for the design and installation of about 4 such grids. If these models are successful, it is proposed to expand the program using donor and IDA funds to cover the remaining remote communes. Alternative management models using joint stock companies or BOT type projects also need to be evaluated for possible expansion of the remote area electrification.

9. Rehabilitation of rural electrified communes. The problems of rehabilitation of existing rural commune grids are more difficult since there are issues of diversified ownership and forms of management that will also need to be resolved. Of the 8891 communes in the country, about 6918 rural communes were connected under the previous programs of the government in the past decades. The essence of this approach was that the national power company (EVN) provided a connection to the center of the commune but the local community, households and provincial governments had to take the responsibility of mobilizing funds, purchasing and installation of the low voltage grid and for its management. While this program was successful in connecting over 6000 communes, it also is the genesis of the problems today. These grids in general were poorly designed and constructed leading to heavy technical losses- varying from 20-50 % in some cases. Since the local grid purchased power at a government fixed price, the cost of these losses had to be recovered from the consumers, leading to high power prices ranging from 1000-2000 dong/kWh (almost 2 to 3 times the nationally prescribed residential tariffs). The local Commune Electricity groups that were formed to manage the grids had neither a legal status nor any financial accountability and controls. In most communes, these groups were unable to find the investments for network expansion since they could not raise any bank funds and local equity was limited. When these grids were in disrepair, there were often no funds for rehabilitation and in some cases even for routine operation and maintenance. Also since the community was to contribute to the construction of the local low voltage grids, only the richer households had access to electricity. In many of these communes, thus less than 50% of the households had access and those that do, pay much higher tariffs than their urban counterparts.

10. In recent months, the National Assembly has been insisting that the government take a far more proactive role in the rehabilitation of these communes and suggested that the power company, EVN, be instructed to take over these 6000 communes, reimburse the original investors, rehabilitate the network and operate the system in the rural areas. But it has been estimated that the rehabilitation of these communes and providing access to a larger number of households would require investments of the order of 3-4 billion dong per commune. For EVN to take over these communes would require a total investment of about \$ 2-3 billion and then to operate them would lead to losses of about 240 dong per kWh of power sold. The design of a program for the rehabilitation of these 6000 communes, given the national implications, therefore, is a far more complicated issue and of particular concern to the financial health of EVN.

11. Studies were carried out by EVN, with Bank financing and support, over the past year to determine the appropriate model of management for these various communes and to develop an appropriate strategy for the rehabilitation of the already connected communes. These included the ECA study on different management models and the Viet Phong/MPDF/Swedpower/Tilleke and Gibbins study on two specific communes in Hiep Luc and Lich Hoi Thuong in Soc Trang. Based on these studies, it was agreed that a local distribution utility with a joint stock company (JSC) model presented a number of advantages. A JSC model would help (a) reduce losses with the rehabilitation of the grids and relocation of the substations; (b) provide better quality of power; (c) by reduction of losses, help reduce tariffs for the consumers; (d) increase coverage in the commune as local contribution will be limited to connection charges; (e) help in the mobilization of additional finance from private consumers, commercial and industrial customers; (f) reduce investment burden on EVN since it will not need to compensate the existing owners of the grid for past investments but can focus on rehabilitation as its contribution as part owner of the JSC and (g) future investments could be made by the JSC using shareholder funds or obtaining loan funds since the JSC would be a legal entity. But the selection of communes would need to conform to certain basic criteria:

- High projected demand-- size and household consumption level – greater than 2000 households/commune and over 30 kWh/month / hh
- High technical losses requiring rehabilitation

- Existing retail tariff are higher than 700 dongs/kWh
- Potential for economic growth- non residential consumption should increase and be about 30 % of total consumption in the next five years
- Investment needs for rehabilitation and expansion are high and cannot be mobilized from local sources
- There is local support for the formation of a joint stock company model in the commune, power service department and provincial authorities.

12. EVN is keen to expand the commune rehabilitation program using the Soc Trang pilot to about 15 communes in different parts of the country as part of the SEIER project. And if successful, this model would be the prime form for the rehabilitation and management of some of the 6918 rural communes using donor and IDA funds in the Rural Energy 2 project planned for FY 04. Again alternative models of management also need to be evaluated in order to mobilize the finances required for the capital investments required as well as for operation and management.

13. The overall strategy for rural electrification would thus comprise three broad programs : (a) expanding access to the rural areas by connection to the national grid wherever it was techno-economically viable; (b) developing local community based grids for remote communes inaccessible by the grid and (c) rehabilitation of existing rural networks requiring additional investment funds by creation of local distribution utilities.

Additional Annex 14: Power Sector Reform in Vietnam – A Status Report VIETNAM: System Efficiency Improvement, Equitization & Renewables Project

1. This annex reviews the status of power sector reform implementation within the policy framework developed and agreed by the Government of Vietnam and the World Bank. The reform objectives, principles, and intermediate reform actions are embodied in various documents and associated agreements – specifically:

- Power Sector Policy Statement of the Ministry of Industry – December 1, 1995. Developed under the Power Development Project Credit (Credit –14893).
- Update to the Power Sector Policy Statement – August 12, 1997. Updated and expanded under the Transmission, Distribution and Disaster Reconstruction Project Credit (Credit-17016)
- Policy on Rural Electrification – May 2000. Developed during the preparation of the Rural Energy Project Credit (Credit -3358).

Sector Objectives

2. The reform policy framework aims to support and facilitate the achievement of the following overarching sector objectives:

- (a) Provide electricity access to the national economy and the entire population of Vietnam.
- (b) Increase the operating/technical efficiency of the electricity sector to optimize the use of scarce investment resources.
- (c) Ensure reliable electricity supply of good quality
- (d) Resolve the mismatch between market-based production costs and State administered prices
- (e) Clearly delineate and separate State management functions and business management functions
- (f) Enable Vietnam to raise the necessary financing for power sector expansion to meet economic growth targets.

The Reform Strategy – A Review of Progress

3. In support of the above sector objectives several reform steps and goals were developed as part of the implementation strategy. The planned reform steps and their progress is reviewed below. As is typical of any reform program in the electricity sector, these intermediate steps all complement each other. Several advisory and technical assistance projects have been implemented by the Ministry of Industry (MoI) and Electricity of Vietnam (EVN) to support preparation and implementation. Given the economic, institutional and political changes occurring in Vietnam, it was recognized that fundamental reforms in the power sector would need to be evolutionary rather than rapid and immediate. In essence, while these reforms were not expected to be easy, they were considered important to embark on a stable reform process.

A. *Electricity Pricing*

4. Financial viability and sustainability of overall power sector operations was intended to be achieved through: (a) progressive increase of retail tariffs and (b) implementation of a regime of cost-reflective bulk supply tariffs (i.e. wholesale electricity tariffs to the distribution companies).

5. With reference to retail tariffs, in 1997, the reform implementation framework intended an increase to an average of 7.0 cents/kWh by 1999. The timing for this increase was, however, delayed by the

government in view of the impact of the East Asian crisis on the country's economy. In a meeting with the GOV in May, 2001, it was agreed that government would (i) raise average tariffs to 5.6 cents/kWh by October, 1, 2001; (ii) progressively raise average retail tariff to about US cents 7.0/kWh by 2005 and (iii) take all measures necessary to realize a self financing ratio of not less than 30% for the electricity sector as a whole with a debt service coverage of 1.5. In addition Government would consider the merit of an automatic energy price adjustment in retail tariffs or an automatic pass-through to consumers of the actual cost of fuel, foreign exchange gains or losses and local inflation. This adjustment, to be applied at reasonable intervals, entails that differences from actual fuel costs, foreign exchange and inflation are compared with "base" rates and through the formula, any differences could be recovered from consumers through the automatic adjustment. A joint team would be set up to evaluate and propose this automatic adjustment mechanism. In addition EVN has developed a plan of action to facilitate the achievement of its overall financial objectives and bring financial covenant compliance which includes: (a) control of unit costs by improving operating efficiency and productivity; (b) implementation of the cost-based transfer pricing arrangements beginning FY02 in order to contain costs at the PCs and subsidiaries; (c) more investment efficiency by limiting use of debt, better management of construction projects; (d) equitization of some power plants by FY05; (e) greater reliance on IPPs and SPPs; and (f) careful management and utilization government grants for RE.

6. For the reform of bulk supply tariffs, the original goal was for gradual phased increases beginning in 1997 to achieve cost-reflective levels by end-2000. These targets were revised and EVN was expected to finalize a plan and begin implementation in 2002. It is now expected that the plan will be prepared by end-2002.

7. Despite the slow pace of increasing retail tariffs the Government of Vietnam and EVN have together successfully managed to avert any major financial problems and maintain an acceptable financial balance. However, there remain substantial risks going forward. EVN has noted that over 40% of its energy sales are sold to residential and agricultural consumers at prices below cost – without any separate Government subsidy. The financial risks are also increasing with a number of new generation investments being financed by the private sector on a BOT basis. The average price of energy from some of the recent base-load BOT projects are in the range of 4.0 cents/kWh – which when contrasted to an average retail tariff of 5.2 cents/kWh indicates an insufficient margin for recovering transmission and distribution costs. With the expected increase in BOT/IPP type generation as a percentage of total incremental capacity (37% of the 7,248 MW of capacity from 2001-2005 is planned to be from BOT/IPP projects), together with the increase in energy volumes supplied at below cost, the growing financial risks to EVN are certainly of concern.

8. To successfully implement and obtain the benefits of the other reform steps discussed below depends critically on reaching a financially adequate retail tariff level and structure, and an efficient bulk supply tariff regime. Future IDA investments have, hence, been conditioned on the government implementing the phased tariff increases agreed to which will maintain the financial health of the sector and EVN compliance with loan covenants with its international lenders.

B. Commercialization and Corporatization of EVN

9. GOV is facilitating the transformation of the power sector enterprises into efficient commercially run entities, which are financially strong and creditworthy, and have management autonomy in operations. The Government strategy includes (i) introducing cost accounting practices in the transmission network operations and facilitating the transition of the transmission business into a profit center (subsequently, it is expected that a separate transmission company would be established as an independent legal entity); (ii)

developing efficient pricing and contractual relationships between the transmission network business unit and the generation stations on the system through a transfer pricing system and (iii) transforming the distribution entities which are currently independent accounting state enterprises into entities that have management and financial autonomy from the EVN State Corporation with the development of more efficient performance incentives based on market based costs. Commercial management practices are being developed in these entities to prepare for separation from the EVN State Corporation structure. Greater delegation of powers and autonomy are also being slowly provided to EVN e.g. EVN has been recently delegated powers for all investments in the transmission systems below 110Kv.

10. There have been steps taken to increase the day-to-day operational autonomy of the PCs through an annual budgeting system that gives PC-managers cost targets and fixed operating budgets that they are expected to work within. Although a positive step, this mechanism still retains much of the management and resource planning responsibility and approval authority within the EVN corporate office. The continued practice of working with bulk supply tariffs that are set by EVN makes the transition to increased operational independence more difficult. Owing to Government regulations on procurement and investment approval it has not been possible to accord the PCs greater autonomy in managing their own financing and investment programs, as these decisions are normally made at the level of EVN and/or MOI.

11. There are plans to implement new financial management systems within EVN. These new financial management systems are intended to streamline the financial oversight of EVN over the PCs and may help in increasing the amount of operational and financial management autonomy of the PCs in the future.

12. There are also plans to begin the process of equitization and diversifying ownership of the PCs – specifically, to expand ownership beyond the central government, and include local governments, state enterprises and perhaps some private sector entities. The government has identified districts and communes that could embark on this process of pilot-equitization and ownership diversification. To achieve an effective implementation of the pilot equitization and ownership diversification of PCs, a new regime of financially adequate distribution margins that can be objectively established, needs to be instituted. EVN and the Government were to have appointed consultants to assist them with this work by December 31, 2000, and begin implementation in 2002. It is now expected that EVN will prepare and submit to the Government Pricing Committee a plan to implement a scheme of transparent and predictable financial margins to distribution companies by the end of 2002. Implementation will begin once this plan is approved in 2003.

C. Restructuring of Generation and Transmission

13. From a sector structure perspective, the core functions of generation, transmission and distribution, which were integrated under direct management of the EVN headquarters, are now being gradually unbundled. The generation power plants are being separated as cost centers and a separate transfer pricing system has been introduced from April 1, 2001 as a first step towards a more competitive market and preparation for competition. EVN also now purchases power from independent power producers at negotiated prices. Hiep Phuoc, Nomura and Amata sold 1633 Gwh to EVN in 2000. EVN generation-transmission core now sells electricity in bulk to seven independent distribution companies which are today independent accounting units.

14. The reform plan also envisaged the separation of the transmission network as an independent accounting unit of EVN. This was viewed as a first step towards separating the costs of generation,

transmission and distribution. This process of transmission separation was to have begun in 1997 and have been completed by 2000. While this has not as yet been achieved, EVN has shifted its focus towards creating each power plant as an separate dependent accounting unit with transparent transfer prices. This step has been taken to increase the pressure of each power plant to control its costs. This is a notable achievement.

15. In August, 2001, the Prime Minister issued a decree on Electricity Activities and Usage (Decree No. 45/2001/ND-CP) which provides a basis for the creation of the National Load Dispatch Center as a separate unit of EVN. This is also a positive reform step towards increasing the independence of system planning and dispatch from other activities of EVN.

16. Decree No. 45/2001/ND-CP does not however provide a basis for separate licensing and accounting separation of generation, transmission, and distribution segments of EVN. In that sense a useful opportunity for these reforms has been missed. It is hoped that these reforms will become possible through the proposed new Electricity Law or through the issuance of a separate decree.

D. Diversification of Ownership Structure

17. The power sector in Vietnam has seen a number of major structural changes in the last decade. Prior to 1995, the country had three independent, but fully government owned power companies- in the North, Center and the South. With the completion of the north-south transmission grid in 1994, the three companies were merged and a new general corporation- EVN was created as an integrated, government owned utility. In discussions with the World Bank, it was agreed that the power sector in the country needed to be gradually unbundled and its ownership diversified.

18. The objectives for promoting private sector participation were to: (i) mobilize additional financial resources in the form of debt and equity financing; (ii) supplement public sector investments; (iii) access the private sector's proven skills in project design, finance, implementation and operation; and (iv) create an environment that fosters competition. The process was expected to achieve: (i) a balanced portfolio mix: power projects financed from the diversified sources would however be consistent with Vietnam's least-cost power plan in terms of size and technology, and with the system's operational needs; (ii) competitiveness: project sponsors would be selected through a competitive bidding process measured in terms of lowest price of electricity delivered; and, (iii) limited recourse project financing: foreign investors would secure financing on a limited recourse basis where project sponsors and lenders would assume commercial and project risks.

19. Government has recently decreed (Government No 95/2001/QD-Ttg dated June 22, 2001) that up to 20 % of maximum capacity of the total power system can be invested by foreign developers in the form of IPP, BOT or joint ventures. A variety of financing structures could be utilized and private participation would be sought in both thermal and hydro generation schemes. This policy is presently under implementation. Investment licenses for two large (715 MW each) power generation projects have been issued to foreign developers in May and September, 2001. And of the total generation capacity planned for the period 2001-2005 of 7248 MW, BOT projects would provide 1512 MW and IPP's 1220 MW.

20. Diversified financing approaches will also be evaluated for distribution operations and government will encourage local and foreign investors to participate in development of distribution grid projects under different forms of IPP, BOT, BT, BTO, joint venture and joint stock company etc. The first pilot for the creation of a commune level joint stock company in Soc Trang province is under implementation. Government approved in August 2001, EVN's proposal for the creation of 15 joint stock distribution

companies at the commune level in association with the private sector and local investors. A pilot program for the equitization of 1 distribution district was also approved for implementation. These two approaches could lead to the development of a creditworthy distribution sector in the country that is independent of the transmission and generation system and is owned by private investors.

E. Implementation of a New Legal and Regulatory Framework

21. Vietnam like most other countries at its level of economic development does not have a consistent framework of laws and regulations covering the different aspects of power sector organization, regulation and operations. The lack of an Electricity Law constrains the preparation and implementation of reforms in: (a) structural organization and licensing; (b) tariff setting; (c) transparent regulation and oversight – all of which limit the ability to achieve long-term reform objectives. To partly overcome these legal deficiencies the practice has been to institute Prime Ministerial decrees on an ad-hoc as needed basis. The Ministry of Industry has worked with various stakeholders to develop a comprehensive overarching Electricity Law. Originally it was expected that the Electricity Law would be presented to the National Assembly in 1998 – a schedule that on hindsight proved extremely optimistic.

22. The drafting of the Electricity Law which commenced in 1996 is now in its 15th draft and number of key issues regarding the organization and responsibilities of the regulatory institution, criteria and objective independence of the tariff setting process, and the separation of roles of the different government agencies, remain key elements of policy that still have not achieved consensus and thus remain unresolved. The current expectation is that the Electricity Law and supporting regulations will be submitted to the National Assembly in 2002. In August, 2001, the Prime Minister, however, issued a decree on Electricity Activities and Usage (Decree No. 45/2001/ND-CP) which incorporates the framework drafted for the Electricity Law but does not incorporate all of the decisions on the issues indicated above. It is expected that government will issue separate decrees for these issues.

23. MOI has been authorized to regularly assess and update load, fuel demand and plans for the long term while MPI is responsible for national energy strategies and policies. Government has also announced its plans for the setting up of a National Energy Policy council to coordinate the energy policies and investments over the country.

An Assessment of Progress and Plans for the Future

24. It has been almost six years since the initial power sector reform policy and strategy was discussed and agreed with the Government of Vietnam. While there has been some progress made in approaching the reform challenges ahead as well as achievements in a few areas, overall progress has fallen short of the initial reform implementation framework and the subsequent updates and revisions to this framework. In this regard it needs to be noted that EVN was created as a separate corporation only in 1995, and hence the challenges facing the sector in the initial stages of reform may well have been underestimated.

25. It must also be recognized that reforming the power sector in an country like Vietnam, which is simultaneously working on multiple economic, legal and political transitions, is extremely challenging. Vietnam has only recently embarked on a transition to a socialist-market economy after decades of centralized planning and control. The timing and implementation of key reform steps that depend on many Government agencies and political consensus is also a non-linear process that is difficult to predict in advance. In addition, institutional capabilities and management skills need to be developed in parallel as an integral part of this reform transition.

26. The thrust and pace of the power sector reform program was reviewed with both MOI and EVN during meetings held on January 30 and 31. MOI confirmed that the government is embarked on a serious and sustained reform of the power sector in order to change from a “command and control” economy to a market based economy. Delays in implementation had occurred in the past due to the need to generate consensus within and outside the government. But now certain fundamental decisions regarding the future structure of the power sector had been made and the pace of reform was expected to increase. These included, inter alia : (i) the encouragement of competition in all sectors of the power industry; (ii) a decision that only transmission would remain a government monopoly while generation and distribution would be subject to competition; (iii) EVN would introduce competition in generation through creation of an internal power pool and the introduction of power transfer pricing and in distribution through bulk power transfer pricing; (iv) an independent system regulator would be introduced into the system gradually; (v) the revised version of the Electricity law would be submitted to the government next week; (vi) MOI had also decided to prepare a number of decrees for promulgation even before the passage of the Electricity law including decree 45 on electricity usage (August 2001); energy conservation and saving; administration of penalties; inspection; safety; HV corridor right of way; tariff and regulation.

27. EVN informed that the Gov has embarked to a large reform program for the state-owned companies. According to the program, EVN is to restructure itself into a real holding company under the model of one member limited liability company functioning under the Enterprise Law. The reform would remove the different treatment between public and private businesses and would create more transparent relationship between EVN and its member companies and increase their autonomy. Guidelines and schedules for the restructuring are being decided by the Government. EVN informed that the power sector structure has been confirmed by government and party document, according to which competition and diversified ownership are allowed in generation and distribution. On generation, EVN has already signed 11 PPAs buying electricity from domestic IPPs with a total capacity of 575 MW and has been negotiating PPAs with 28 others investors. Over the next five years, EVN plans to create joint-ventures with domestic or foreign companies to build and operate power plants, especially in hydropower. EVN will also support IPPs selling electricity directly to customers, especially to rural areas. Internally, EVN has been applying internal transfer pricing between generation and transmission from 2001 in order to give greater autonomy and long term incentives for generation power plants to improve their efficiency, before moving to the next step of an internal power pool. On distribution, EVN has recently completed equitization of 4 enterprises under EVN and PCs and is now starting equitisation in distribution with the first 15 JSC in commune and 1 in district level.

28. So while much has been done in the transformation of the power sector in the last few years, much work still remains to be done. The Government is now embarking on an exercise to develop a detailed reform road-map for stage-wise, time-bound program for further structural and institutional changes in the sector. It is hoped that the Government will renew its commitment to reform and accelerate further the implementation of this reform program.

Additional Annex 15:Resettlement Action Plans and Indigenous People Development Plans

VIETNAM: System Efficiency Improvement, Equitization & Renewables Project

Introduction

1. The VN-System Energy, Equitization & Renewables Project includes three components: (a) System Efficiency Improvement: This component would include of three subcomponents (i) upgrading of 500 kV and 220 kV transmission networks; (ii) DSM phase 2; and (iii) pilot energy efficiency programs;(b) Improving Rural Access: This component would consist of three main subcomponents (i) upgrading 110 kV sub-transmission networks supplying rural areas; (ii) rehabilitation of existing small hydro-plants; and (iii) community based hybrid renewable energy grids; and (c) Sector Reform and Institutional Development.

2. For the ownership and implementation arrangements, seven separate RAPs (full RAP more than 150 PAPs and short RAP for less than 150 PAPs) have been prepared for Power Company 1 (PC1); Power Company 2 (PC2); Dong Nai Power (DNP); Power Company 3 (PC3); Central Power Management Board (CPMB); Northern Power Management Board (NPMB), and Southern Power Management Board (SPMB). *All RAPs are based on the same outline and compensation policy which fully satisfies the requirements of WB OD 4.30 on Involuntary Resettlement.* The results of census and inventory surveys show that there are two subproject components which would require some land acquisition: (i) upgrading 500 kV and 220 kV transmission systems; (ii) upgrading 110 kV sub-transmission networks supplying rural areas; while no land acquisition would be required for the subcomponent of rehabilitation of existing small hydro plants.

3. The subcomponent of community based hybrid renewable energy grids has not been designed at this time yet and therefore land acquisition for this subcomponent (if any) can not be anticipated. Therefore, the Resettlement Policy and Ethnic Minority Frameworks have been developed in accordance with OD 4.30 and 4.20 of the World Bank. If land acquisition is required or any Ethnic Minorities will be affected by this subcomponent, RAP and IPDP will be prepared by MOI based on these policy frameworks and cleared by Project Team.

The text below is a summary of the RAPs and IPDPs.

The Resettlement Action Plan

Objective

4. Every effort has been made through design, construction measures and construction schedules to reduce unnecessary involuntary resettlement and adverse impacts on assets of the PAPs. Resettlement and compensation programs are designed so as to allow the improvement or at least the maintenance of the PAPs' pre-project living standards.

Baseline Information Survey and Project Affected Categorization

5. In order to assess project impacts, about 20% socio-economic survey and 100 % census/inventory of all land and PAPs affected by the project were carried out by consultants during the feasibility study between April to November, 2001. The surveys identified: (i) number of PAPs; (ii) average size of families; (iv) ethnicity; (v) main incomes; (vi) land holding and impacted areas (residential/garden land, agricultural, forested); (vii) structures (houses, substructures); and (viii) crops and trees.

6. Prior to the beginning of the project implementation, a Detail Measurement Survey (DMS) will be carried out. On that occasion the number of PAPs and impacted assets would be confirmed and adjusted as necessary, especially in the case when the time between RAPS preparation and RAPS implementation is long. Finally the detailed measurement surveys will account for changes in impacts due to any line route modifications or to eventual changes in locations of substations.

The Project Impacts

7. Though the number of PAPs is high, all the subprojects will only cause low-intensity impacts and PAPs are scattered along the lines. Most of impacts on land will be temporary, permanent acquisition will occur only in correspondence of towers/poles and substations. Impacts on houses will be mostly partial and generally will not require the relocation of the PAPs outside their residential plots.

8. To minimize the adverse impact of high voltage networks, the GOV enacted the Decree 54/1999/ND-CP, dated July 8th, 1999 (to replace the Decree No. 70/ HDBT dated April, 30, 1987). According to the Decree 54/1999/ND-CP, residential land, productive land and houses/ structures in Right Of Way (ROW) could be used or remain under some restricted conditions (eg trees which were lower than the lines by at least 0.7 m to 6 m, depending on the different voltages of lines could be planted or remain; and existing structures could remain in ROWs of overhead T/Ls which were lower than 220 kv with the two conditions: i) with fired resistant materials; and, ii) metal materials must be connected to the earth as regulated).

By the nature of the project and based on the surveys of the PAPs, the impacted categories are classified as below:

8.1 Temporary Impact within Right of Way (ROW) only during the construction period:

All PAPs who have the agricultural land or forestry land, crops, trees or structures in ROW of transmission line (T/L), surrounding areas of tower/pole foundations.

Category 1 : PAP who has trees, crops, which are damaged by the project during the construction period due to temporary access or conductor stringing.

Category 2 : PAP who has residential, garden, agricultural or forest lands which are temporarily acquired/damaged by the project during the construction period due to temporary access or conductor stringing.

8.2 Permanent Impact:

PAP who own land and properties on it, which will be permanently acquired for the tower/pole foundations, the substation areas, permanent roads for construction and maintenance of the project. All PAPs who have houses, other kinds of structures, or trees in ROW, which need to be removed, demolished or cut respectively.

Category 3 : PAP has houses/structures, which are partially damaged or cut, and the damaged portion will not affect to the safety or using purpose of the entire house or structure (the dismantled areas are less than 25% of total areas), and the lost house/structure portion could be rebuilt in adjacent areas already owned by the PAP. Impact on cleared residential areas would be temporary as it could be reused for restricted purposes.

Category 4 : PAP who has houses, which are partially or totally damaged, and the damaged portion will affect to the safety or using purpose of the entire house or structure (the dismantled areas are more than 25% of total areas), therefore the house need to be totally removed and rebuilt in adjacent areas already owned by the PAPs. Impact on cleared residential areas will be temporary as it can be reused for restricted purposes.

Category 5 : PAP who has houses, which are partially or totally damaged, and the damaged portion will affect to the safety of the entire house or structure, so the house need to be totally removed and rebuild. But PAP who do not have spare residential land for the reconstruction of a house of equal dimensions as the house lost.

Category 6 : PAP who has residential land, agriculture or forestry land which will be acquired permanently for the project, including permanent roads construction and maintenance of the project.

The number of PAPs is summarized in Table 1 below.

Table 1: Number of PAPs to Be Affected by Some Subproject Components

RAP of PC/PMB	Number of PAPs	Affected Houses		Land Acquisition (m ²)	
		Partially	Fully	Temporarily	Permanently
1. PC1	12,467	661	169	16,351,566	196,175
2. PC2	550	2	98	301,803	96,270
3. PC3	816	6	37	950,841	49,898
4. PC Dong Nai	11	1	1	13,971	12,210
5. Central Power PMB	15,034	8	289	2,691,585	216,761
6. Northern Power PMB	233	18	49	397,893	83,115
7. Southern Power PMB	41	0	16	21,980	41,215
Total	29,152	687	650	20,729,639	695,644

Note: these numbers are approximate and will be confirmed at negotiation.

Legal and policy framework

9. According to the RAP policy, all PAPs *with and without legal papers* accounted in the RAP inventories of affected families, or able to prove their residence in affected areas prior to RAP cut-off dates are to be considered as legitimate and therefore eligible to full compensation for their losses. The same applies to PAPs whose incomes are affected by the project. The cut-off dates are the dates of final count of PAPs in each province and specified in RAPs.

10. PAP who moved into the project affected areas after the cut-off dates will be considered as illegal and therefore will not be eligible to compensation and rehabilitation.

11. The Decree No 22/1998 CP-ND of 4/24/1998 of GOV on the compensation for damage when State recover land for national defense, security, national interests and public interests comes close to meeting international standards. However, there are still gaps relative to OD 4.30 on Involuntary Resettlement, which has been used as the basic for the project's compensation policy. Differences between the Decree 22/ 1998 CP-ND and OD 4.30 relate to eligibility and compensation rates. OD 4.30 requires full compensation at substitution cost for land, houses and trees, compensation at market rates for crops and that PAP without legal papers should not be a bar to compensation and rehabilitation. Therefore, project specific waivers of points where the Decree 22/ 1998 CP-ND differs from OD 4.30 would have to be included in the approvals of competent authorities of GOV.

Entitlement and Compensation Policy

12. Entitlements to PAPs varies according to affected categories and types of loss as follows.

- Compensation for crops will be provided at the market rates. Compensation for land, houses, buildings, trees and other assets will be provided at the substitution cost.
- Compensation for land losses less than 25% of total land holding of PAP and all other losses will be provided in cash. Compensation for land losses more than 25% of total land holding of PAP would be provided in terms of "land for land" at equivalent area and quality of land acquired by the project.
- Compensation prices have been defined according to tariffs established by the provinces and based on the decree 87-CP and the Circular 145 of the Ministry of Finance. Since such prices may not correspond to market or substitution rates they have been adjusted as possible with available information as to correspond to these rates. All compensation rates will be reviewed and if necessary adjusted before RAPs implementation.
- Allowances/ Subsidies: all legal PAP are entitled to the following allowances: (i) relocating PAP will be assisted with (a) six months relocating allowance of 30 kg of rice equivalent per person per month; (b) transportation allowance; (ii) rehabilitation assistance for PAPs losing more than 25% of their incomes. The PAPs will be compensated at least one month (for affected trees/crops) and three months (for affected houses) before land clearance for the project. The same is required for subsidies. The allowances will be delivered to the PAP's within the first 5 days of each month of the period of allowance payment.

13. The standard resettlement time table will be as follows:

- (i) Replacement land preparation: the resettlement site development (if required) or plot allocation will be completed at least 05 months before land clearance.
- (ii) Cash compensation and allowances for PAP affected houses/ other structures- at least 3 months before land clearance.
- (iii) Cash compensation for trees, crops to PAPs - 1 month before land clearance.
- (iv) Proposals for rehabilitating PAPs losing more than 25 % of their incomes will be submitted to IDA in the period of RAP implementation for review and clearance.

14. RAPs incorporate agreements reached with the projects provinces on the line alternatives/substation localities, resettlement policy, complaint and redress mechanism. *A condition for negotiations would be the*

submission of GOV approval for RAPs which is acceptable to IDA.

15. Standing validity of entitlement and compensation policy: After project approval, the above entitlement and compensation policy will acquire legal status and will be sanctioned as such following GOV approval.

Implementation Organization

16. Each RAP will be implemented independently by PC or PMB. Resettlement task forces will be divided among central GOV (MOI, EVN and its PCs and PMUs), local authorities and Resettlement Committees at different levels. MOI, EVN and its PCs and PMU will carry out inter-provincial coordination functions. Actually resettlement / rehabilitation tasks in each province will be the responsibility of Local People's Committees at the provincial, district and commune levels.

17. In order to carry out resettlement and compensation tasks effectively, the Resettlement Committees will be established at the provincial and the district levels. The resettlement team/unit will also be formed in each PC and PMU. The task forces will be clearly demarcated between these Committees and teams/units.

18. RAP programs will be implemented in such away as to ensure that local authorities and PAPs representatives participate in planning and decision making processes. The PCs and PMUs under EVN will continues the dialogue with local authorities and PAPs during the period of RAP implementation.

Public Information, Consultation and Participation

19. The PAPs have been and will be fully informed on the details of the relocation/ compensation process through out the entire resettlement process. In particular:

- During the baseline survey, a preliminary information and consultation campaign was undertaken by the project preparation agencies in 2001. In these occassions the PAP's were informed about the project purposes, proposed routes of lines, proposed resettlement and compensation policy and were asked to contribute their opinions. During project implementation, information and consultation tasks will intensify.
- New meetings will be organized in each local community during project implementation and information pamphlets describing in detail the resettlement policy and summarizing the RAPs will be distributed to each PAP. The information will be integrated with a sheet describing the impacts and relative compensation for each affected PAP. Finally, in addition to the pamphlet, public information will be delivered through posters, hung in local administration quarters and in major public places. These public announcement tasks shall be implemented immediately after the Government and Bank approval of the Project is obtained. The information disclosure and dissemination will be done by PCs, PMBs, district resettlement Committees and commune authorities.
- As for consultation and participation, PAPs will be asked to contribute with their ideas to the definition/implementation of the resettlement and rehabilitation components of the project.

Monitoring and Supervision

20. PCs and PMUs under EVN are responsible for internal monitoring. Indicators to be monitored are indicated in RAPs. The PCs and PMUs will collect information from provinces and districts regularly. The

data base will be updated correspondingly. Every three months PCs and PMUs will submit the progress reports to EVN and IDA.

21. The project will also be monitored by the External Monitoring Agencies. Those agencies will be chosen following the submission of the monitoring proposals and relative budgets. The External Monitoring Agencies will prepare a semi-annual reports and submit to PCs, PMUs and the to IDA and detailing: (i) progress in RAPs implementation; (ii) deviations, if any, from RAP provisions and principles; (iii) identification of controversial issues and recommend solutions; (iv) progress on follow-up problems and issues identified in the previous reports; and (v) compilation of data on the resettlement sites and commune receiving resettlers, post resettlement conditions and situations.

Complaints and Grievances

22. Complaints and grievances regarding compensation, rehabilitation will be dealt according to a 3 level procedure. In the first level, it will be dealt with by PCs, PMUs and Commune authorities. If no amicable solution is reached, the complaints may appeal to the district authorities and then to the provincial authorities. As a last resort, the complainants may appeal to District or Provincial Courts. At each level, the complaint must be redressed within 15 days. If the complaints are not redressed satisfactorily, complaints must be submitted to the higher levels no later than 15 days after the complainants have been informed, the complaints submitted later will not be considered. The claim will be dealt with in accordance with the new Ordinance on Complaints and Denunciation of Citizens. All the grievances procedures including those at the Courts will be free of charge to Complainants.

Costs and Budgets

23. The total resettlement cost for RAPs is estimated at US\$ 8,724,240, including costs for IPDPs and contingencies. The costs for each RAP and total cost for RAPs of project is summarized in Table 2 below.

Table 2: Cost of Resettlement

RAP of PC/PMU	Cost estimated (US\$)
1. PC1	2,908,245
2. PC2	790,318
3. PC3	761,615
4. PC Dong Nai	48,048
5. NPPMU	586,700
6. CPPMB	2,996,154
7. SPPMB	633,160
Total (US\$)	8,724,240

The source of the budget for RAP implementation will be the counterpart funds from the executing agencies.

Indigenous People Issues

24. For the subprojects to be located in the areas of Ethnic Minorities, every special effort has been made through design, construction measures and construction schedules to reduce unnecessary involuntary resettlement and adverse impacts on Ethnic Minorities. Nevertheless, some limited adverse impacts on them (land acquisition) are unavoidable and the impacts is summarized as the table 3 below which shows that only 37 PAP's will have their houses fully or partially affected and no PAP will need to be located to another locality.

Table 3: Impacts on Ethnic Minorities

RAP of PC/PMB	Number of PAPs	affected houses		Land Acquisition	
		Partially	fully	Temporarily (m ²)	Permanently (m ²)
1. PC1	2962	0	0	1,117,550 (567 PAPs)	39,235 (291 PAPs)
2. Central Power PMB	268	2	35	1,729,139 (159 PAPs)	139,252 (72 PAPs)
Total	3230	2	35	2,846,689 (726)	178,487 (363)

25. Table 3 shows that the adverse impacts are on individuals and low-intensity, most of impacts on land of Ethnic Minorities will be temporary, very few families of Ethnic Minorities will be permanently acquired land for constructing of towers/poles and substations and there is no household have to be relocated to another locality.

26. The project subcomponents do not cause any culturally specific impact on the affected ethnic minority households and the nature of impacts does not result in community-wide socio-economic effects. However, in order to ensure compliance with Bank OD 4.20 on Indigenous People, independant Indigenous People Development Plans (IPDPs) have been prepared and are attached as the annexes in RAP for 500 kV of CPMB and RAP of NPMB.

27. All PAPs of EM are entitled to compensation and rehabilitation as the policies in RAP. In addition, special provisions to carry out resettlement, rehabilitation and compensation tasks in a fashion sensitive to the cultural/linguistic peculiarities of ethnic PAPs have been developed in IPDPs. The special provisions for ethnic PAPs are i) PAPs who are permanently impacted on agricultural land will be subsidized 500 VND for fertilizer; ii) trainings on crop diversification and agricultural extension; iii) trainings for electric safety (lessons in the primary and secondary schools and villagers in the project areas); iv) credit through VBARD (each eligible PAPs may borrow up to 5 million VND without long term land use right or “red book”); and v) participation in RAP/IPDP preparation and implementation, the languages of EM will be used in meetings.

Additional Annex 16: Environmental Summary
VIETNAM: System Efficiency Improvement, Equitization & Renewables Project

1. **EIA Reports for the Project:** Seven EIAs for sub-station – cum – transmission line (SS/TL) and five EIAs for hydro plants have been submitted to the project team by the Power Companies. EVN has submitted EIAs for the transmission lines and substations that are being implemented directly by EVN.

2. **Major Issues:** A summarized table of the major project components and the related significant issues is presented below:

Entity	Subcomponent	Major impacts and issues
EVN	500 kV Transmission line (313.6 km)	Natural forest in two provinces, largest area affected in Kon Tum High voltage and EMF Maintenance roads and induced impacts of new access roads Erosion and land slide Mine clearance
	220 kV Transmission (54 km) and 6 Substations rehab.	Soil erosion and other temporary disruption during construction due to a dense network of waterways Construction waste disposal Impacts on populated residential areas during construction Oil and grease leakage, waste from the substations Old existing transformers but not containing PCBs Safety measures for workers
	South Saigon Substation	Impact during construction Construction waste disposal
PC1	110 kV transmission (500 and 22 Substations	Natural forest in 5 districts Maintenance roads and induced impacts of new access roads Erosion and land slide Impacts on populated residential areas during construction Impacts on three historic reserves Safety measures for workers
	2 hydro rehabilitation (Son La, Lai Chau)	Water quality during construction Oil and grease leakage

Entity	Subcomponent	Major impacts and issues
PC2	110 kV transmission (15.8 km double-circuit and 81.8 km single circuit) and 15 Substations	Natural forest in one district Soil erosion and temporary disruption in irrigation systems Impacts on populated residential areas during construction Safety measures for workers
	1 Hydro Rehab (Lam Dong)	Old dam (from the 50's) of 15 m high Old equipment from 1956, possible PCBs (subject to double check) Water quality during construction Oil and grease leakage Temporary impacts on tourism areas
PC Dong Nai	110 kV transmission (1 km) and 2 Substations	Erosion and land slide Impacts on populated residential areas during construction Mine clearance Safety measures for workers
PC3	110 kV transmission (14.4 km double-circuit and 59.5 km single-circuit) and 10 Substations	Natural forest (Phong Dien) in Thua thien - Hue province Maintenance roads and induced impacts of new access roads Erosion and land slide Impacts on populated residential areas during construction Mine clearance in Binh Dinh province Safety measures for workers
	2 Hydro rehab (Quang Nam, Cong Tum)	Water quality due to construction, dredging and widening of the spillway Construction waste Oil and grease leakage
20 Communes	Small-scale hydro and island grids	Draft environmental procedures have been submitted Environmental screening checklist includes water quality, temporary disruption water supply, transportation and irrigation system, ecology and natural resources, soil erosion and sedimentation, recreation/aesthetic/cultural value, landscape effects

The EA analysis has shown that the indicated above impacts are minor, temporary and within the national environmental standards. These impacts will be mitigated and monitored as provided in the EMPs.

Several actions have been proposed in the EIAs and these include:

- (i) For the development of access roads, substations, and hydro-plants, contractors will employ appropriate techniques to protect the environment during construction, using prototype designs and well-tested guidelines.
- (ii) To protect forest, reserved land and biodiversity, all transmission and distribution routes will be selected carefully with most routes following existing roads connecting the load centers. No routes will be allowed to pass through protected areas. Permission by appropriate DOSTEs should be sought and specific mitigation and monitoring plan is required if there will be an issue of the routes affecting natural habitats.
- (iii) Soil erosion and landslide will be minimised by increasing number of drain outlets and culverts,

constructing stable embankment, planting grass

(iv) EMF is not a serious problem with low and medium voltage lines, and outside the ROWs for the 500 kV line. Internationally accepted standards will be applied for the development of buffer zones for all transmission lines.

(v) Mine clearance will be carried out before crews begin construction.

(vi) The use of PCB based cooling oils for transformers is prohibited as a loan condition.

Summary of environmental issues have been included in the feasibility studies, which have referred to EIAs for the details. Nevertheless, the implementation of EMPs in the EIAs will be made as a project conditionality to ensure that these actions will be included in the technical design and bid specifications.

3. Public consultation and disclosure

Public consultation. Initial consultation was conducted by the Borrower in the form of discussion and agreement with the respective local government agencies with regard to the route alternatives. Records of those discussions and written agreements are attached to the EIA reports. Further public consultation involving PAPs and representatives of local NGOs (e.g. Women Union, Youth Union, Farmer Union, Fatherland Front Association of the elderly people), as required by the Bank safeguard policies, were conducted before appraisal, January, 2002. No objection to the project nor environmental concerns, other than indicated in the EIAs, have been raised during the consultation process. Records of 110 meetings with local people have been submitted to the World Bank as supplementary EIAs

Public disclosure plan: The Borrower has agreed to display draft EIAs and has sent a formal request to the relevant provincial People Committees so that the EIAs/EMPs are displayed in a public place at the provincial public libraries or the provincial Departments of Science, Technology and Environment from January 10 2002. EVN and the PC's have confirmed that EIA's are being displayed at all PMU's, PC and EVN headquarters from January 10, 2002.

A full set of EIAs has been sent to the InfoShop for displaying by January 22, 2002. Another set of EIAs has been displayed in the Hanoi VDIC since January 15, 2002.

Ensuring environmental certificate: According to the Circular 490/1998/TT-BKHCMNT, an environmental certificate will be attained from relevant provincial DOSTEs for each SS/TL within the province. For the 500 kV transmission line component, the certificate will be obtained from MOSTE. Formal discussion with the environmental authorities will be conducted after finalizing the EIAs and the certificates will be sent to the Bank prior to negotiation.

4. Environmental Management Plan (EMP)

EMPs have been submitted by EVN and the PC's. These have identified institutional responsibility and an estimated budget for implementing the mitigation measures, monitoring plan, and building up the capacity for environmental management and supervision. An implementation plan of EMP has been included in the PIP.

The mitigation plan includes specific mitigation measures, identifies institutional responsibility and

provides the mitigation costs, which will be included in the installation and construction cost for the project.

The monitoring plan has identified monitoring parameters such as dust, noise, deforestation and soil erosion, oil leakage/spillage, EMF, and ROW clearance. For the hydroplants additional monitoring parameters include the change in hydrological regime and water quality in the downstream areas.

Environmental impacts during construction such as dust, noise, and vibration will be inspected against the national environmental standards by the PMBs under the supervision of DOSTEs. ROW clearance, soil erosion, and oil leakage will be checked periodically (3-6 months) and visually by the PMBs, in collaboration with DOSTEs and DARDs. EMF within the ROWs, as well as water quality in the downstream areas for the hydroplant components, will be measured annually or during big loads by the PMBs against the national standards.

Environmental monitoring data will be provided to supervision missions and the local authorities. Copies of Aide Memoires in regard to environmental aspects will also be sent to the local authorities and respective provincial DOSTEs. The transmission companies and the PCs are responsible to report on the compliance with the environmental certificates to the respective local authorities (eg. DOSTEs and DARDs) and they are subject to environmental inspection when required. No independent environmental monitoring will therefore be necessary.

Training need for environmental knowledge and skills have been identified for each PCs and the staff of the Project Management Board in the transmission companies and EVN. Environmental training will also be provided to the local authorities and contractors. Given that EVN and the PCs do not have specialized units with environmental responsibility, environmental training will be provided primarily to the staff who will be designated as environmental contact persons in EVN, PCs and PMB of the transmission companies.

The cost for the implementation of EMPs is summarized in the following table, based on the cost calculation provided in the EIAs:

Environmental Management Plan Revised Costs

		plan	Construction	Operation	building		gency	
EVN	500 kV Transmission line	0	63800	190,000	5,333	<i>259,133</i>	25,913	285,0
	220 kV TL and 6 SS	0	15200	133,333	10,133	<i>158,666</i>	15,867	174,5
	South Saigon 220 kV SS	0	3600	16,667	2,000	<i>22,267</i>	2,227	24,4
PC1	110 kV TL and 22 SS	0	4200	35,000	8,800	<i>48,000</i>	4,800	52,8
	Chieng Ngam Hydro (Son La)	0	4000	6,667	667	<i>11,334</i>	1,133	12,4
	Thac Bay Hydro (Lai Chau)	0	4000	6,667	667	<i>11,334</i>	1,133	12,4
PC2	110 kV TL and 15 SS	0	3000	25,000	9,333	<i>37,333</i>	3,733	41,0
	Ankroet Hydro (Lam	0	4000	6,667	667	<i>11,334</i>	1,133	12,4
PC DN	110 kV TL and 2 SS	0	400	3,333	2,333	<i>6,067</i>	607	6,6
PC3	110 kV TL and 8 SS	0	1600	13,333	14,333	<i>29,267</i>	2,927	32,1
	An Diem Hydro (Quang Nam)	0	2600	6,667	667	<i>9,933</i>	993	10,9
	Kon Dao Hydro (Cong Tum)	0	2600	6,667	667	<i>9,933</i>	993	10,9
	Small-scale hydro grids	0						
Total		0	109,000	450,000	55,601	614,601	61,460	676,00

Note: This cost table will be updated by the Borrower prior to the negotiation. The figures in Italics are not provided but calculated based on an estimation made in the similar components by PC1 and PC2. The cost for capacity building is as it provided in the EIAs, but it could be higher if consider that training should be provided not one time but at least four times during 20-25 year of operation

- (i) The cost for mitigation plan is included in the construction cost
- (ii) The cost for monitoring plan includes the monitoring during the construction phase and operation phase. The latter is calculated for 25 years of operation for transmission lines and 20 years for hydropower plants.

