

Project Name VIETNAM-Demand-Side Management & Energy (@)...
Efficiency Project

Region East Asia and Pacific Region

Sector District heating and energy efficiency
services (70%); Power (30%)

Project ID P071019

Borrower(s) STATE BANK OF VIETNAM

Implementing Agency
MINISTRY OF INDUSTRY AND ELECTRICITY
OF VIETNAM
Ministry of Industry
Address: 54 Hai Ba Trung Street, Hanoi
Contact Person: Mr. Pham Manh Thang
Tel: (84-4) 825-8161
Fax: (84-4) 825-8210
Email: Dsmmoi@Hn.Vnn.Vn

Electricity of Vietnam
Address: 18 Tran Nguyen Han, Hanoi
Contact Person: Mr. Pham Quang Huy
Tel: (84-4) 934-7651
Fax: (84-4) 934-7650
Email: Huypq@Evn.Com.Vn

Environment Category C

Date PID Prepared September 23, 2002

Auth Appr/Negs Date October 3, 2002

Bank Approval Date January 21, 2003

1. Country and Sector Background

Energy Sector. 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 at about 13 percent, faster than GDP, over 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 also 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 appropriate fuel choices in expanding commercial supplies. New challenges have emerged in the energy sector requiring structural and institutional reforms that are both more difficult and more complex. First, to meet the economic growth targets, electricity supplies will need to grow to support economic growth rates. But this growth will need to be both efficient and more equitably distributed through aggressive DSM and rural energy programs, as today 79 percent of the rural population consumes less than 20 percent of total electricity. Second, although Vietnam is a resource rich country, it should strive to develop the energy sector along an environmentally

sustainable path. The promotion of more efficient use of electricity and reduction in peak loads will ease constraints on the national system, reduce the need for new generation and system capacity and reduce energy generation requirements leading to corresponding emission reductions. Recent natural gas discoveries offshore also provide an opportunity to make environmentally and economically beneficial energy use choices. Vietnam is also well endowed with renewable energy resources to generate electricity to serve rural communities. However, only a quarter of its hydro resources are developed, and little to none of its other resources. Third, Vietnam has to invest almost 5.3 percent of its GDP, twice the rate of its ASEAN neighbors, in energy infrastructure. Fundamental reform of energy tariffs, with respect to both level and structure, and increased investments in DSM are required to ease financing constraints and ensure long-term efficiency in investment and resource utilization decisions throughout the economy. Since two thirds of the required investments will need to come from overseas development assistance, export credits and foreign direct investments, public financial resources and government guarantees for private investment should be selectively used. Fourth, attracting foreign private investment will require the creation of an enabling environment and legal framework. The Government needs to embark on restructuring and rationalization of the energy state owned enterprises, creating a regulatory system and developing a mechanism to coordinate policy and investment decisions in the energy sector. DSM and Energy Efficiency. From 1992-97, Vietnam experienced unprecedented economic growth, averaging 8.2 percent annually. During this same period, energy demand grew 30 percent faster than GDP and electricity 70 percent faster. The ability of Vietnam to continue to meet such an aggressive economic growth rate will require substantial expansion of the energy sector and, in particular, the electric power sector. The Bank estimates that the power utility, EVN, will experience almost a threefold increase in demand over the next 10 years, from about 30,800 GWh in 2001 to over 70,400 GWh by 2010, with annual demand growth of 13-15 percent. (In 2001, EVN's peak demand increased by some 18 percent over 2000.) Generation-level peak power demand is also projected to increase from the 2001 level of 5,655 MW to more than 16,000 MW by 2010, requiring an associated capital investment of more than US\$15 billion (over \$1 billion per year). EVN is now experiences system capacity constraints during evening peak hours (6-10pm), with daily peak loads 2-3 times those of off-peak hours, which has resulted in periodic brownouts, low system load factors and major investment requirements in capacity enhancements to meet demand for only a few hours of the day. The projected annual increases in electricity demand over the next few years, combined with the ongoing efforts to increase grid-based electrification to remote areas, will only exacerbate this situation. The major contributors to the increase in peak loads and energy consumption are various end uses (motors, process loads, lighting etc.) in large industrial and commercial customers and lighting loads in the residential and small commercial customers. Thus, the GOV and Bank have concluded that it is essential for DSM and EE programs to be developed and strengthened in order to meet the country's resource requirements and minimize the local and global environmental impacts of this growth. In 1997, EVN, with World Bank assistance, commissioned the "Demand-Side Management Assessment for Vietnam," which 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 700 MW of capacity and

more than 3,550 GWh/yr by the year 2010. Under Phase 1, supported by a SEK 29 million (about US\$2.8 million) Swedish Sida grant under the Transmission, Distribution and Disaster Reconstruction Project (Credit 3034-VN), a number of key technical assistance and capacity building activities were initiated, including development of an EVN DSM business plan for Phase 2. As a result of Phase 1 efforts, EVN management has accepted the need for DSM options to complement its large-scale supply-side investments.

Commercial Energy Efficiency: In addition to utility-sponsored activities, there is a small but growing number of commercially-oriented firms that are providing energy services to commercial and industrial customers. These include about six entities that are now developing and implementing energy efficiency projects. A small number of these firms have been pioneering more complex service models to grow their respective businesses and facilitate transactions in energy efficiency during recent years. These models have involved vendor financing of EE equipment costs to allow end-user payments to be staggered based on energy savings over a fixed period; deferred payment (as a lump sum) for equipment after its performance has been demonstrated; phasing EE investments into several smaller projects and using the proceeds of one to finance the next; and basing equipment/service payments on guaranteed performance of energy savings. However, these firms have encountered a number of constraints to business growth which range from limited equity and financing to low awareness and credibility/risk sharing of energy savings. In addition, there are some 40 firms that are interested in entering the market, provided conditions improve and the overall understanding of these projects among end-users is enhanced. Of these, there are eleven local equipment manufacturers, seventeen equipment suppliers (importers and distributors), eight technical services providers (energy auditors, engineering consulting, etc.) and four financial services providers. Some are fully private local firms, some are quasi-public entities, some are research institutes and others are international or joint-venture companies. It was, therefore, concluded by MoI and the Bank that there is considerable opportunity to support this emerging commercial market through GOV/GEF support. As electricity tariffs continue to increase, state-owned enterprise (SOE) reform progresses, and economic and energy demand growth rates persist, it is expected that there will be a greatly expanding market for these emerging businesses to tap.

2. Objectives

The objectives of this project are to: (a) develop and expand demand-side management (DSM) business programs and test new market transformation efforts within the national electric utility, Electricity of Vietnam (EVN); and (b) develop sustainable business models and mechanisms to support energy efficiency (EE) retrofit investments in commercial and industrial facilities. This Project represents the second phase of a longer, 12-year (1998-2010) proposed IDA/GEF-supported DSM and EE program designed to achieve significant and sustainable reductions in energy consumption and peak power demand in Vietnam. The program would, in the course of 3-4 phases, test, develop and scale-up successful and sustainable business models to promote DSM/EE and facilitate investments. The first phase (Phase 1) of this DSM/EE program is now under implementation under the ongoing IDA/Swedish Sida-supported DSM program under the IDA-supported Transmission, Distribution and Disaster Reconstruction Project (Credit 3034-VN).

3. Rationale for Bank's Involvement

The proposed Project, along with the associated SEIER Project, will provide GOV with key support needed to help reduce energy demand and use energy more efficiently. The Bank team has worked very closely with the EVN and MoI counterparts to supervise the first phase for the DSM program and develop this second phase effort. Of particular interest to the GOV is the need for greater investment levels in EE that other programs and donors have been unable to provide or generate so far. Furthermore, the Bank has been able to offer considerable experience on DSM and EE programs elsewhere, particularly in Asia, which has greatly helped the Vietnamese counterparts select elements from other programs suitable to Vietnam. Finally, the Bank actively encouraged the use of a participatory approach to project design, which has allowed the design to better reflect the needs of all stakeholders and will help ensure that the Project impacts are fully realized.

4. Description

The project consists of two components: (i) a second phase DSM component under EVN; and (ii) a pilot commercial EE program under 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 and, specifically, implement four large DSM programs and supporting activities to achieve major reductions in peak load, improve system load factors, transform select lighting markets, and assist customers with ongoing tariff reforms. A US\$5.20 million credit has already been approved under the SEIER Project and additional support would be provided through a US\$2.25 million GEF grant and US\$0.77 million from EVN's internal funds. The MoI component would seek to test and develop business models and mechanisms to support commercial EE services and investments in industrial and commercial facilities, which would require an estimated \$11.02 million in total project financing (\$3.25 million GEF, \$7.32 million private sector, \$0.45 million MoI). Project performance indices will be monitored during implementation of Phase 2 which will then be used as a basis for developing appropriate intervention strategies for future phases and the need for further GEF support. The full second phase DSM/EE program will consist of the following elements: Component 1. EVN's DSM Program (US\$8.22 million). The main focus of this component would be to implement EVN's DSM business plan which was developed as part of the Phase 1 efforts. This component has been designed to achieve over 120 MW in system peak reduction and electricity savings of about 500 GWh through the implementation of several DSM measures. The program would be managed by EVN and implemented with support from its PCs and would include: a) Expanded TOU Metering: EVN and its PCs would procure and install 5,600 TOU meters in about 4,000 large- and medium-sized customer premises to help rationalize electricity consumption during peak periods. This would be combined with a marketing and customer consultation component to assist end-users to better understand the TOU rates and identify options to shift load to off-peak or low-load hours. The associated IDA SEIER credit would support procurement and installation these meters as well as support project marketing and administration. b) Pilot DLC Program: EVN, in collaboration with PC HCMC and PC Hanoi, would introduce a pilot direct load control (DLC) program using ripple control systems to curtail demand of about 2,000 customer end-use loads on a voluntary basis. The equipment (central stations, receivers, communication systems) would be purchased with the associated IDA credit and EVN would use its counterpart funds to

pay for program administration and incentives for participating customers.c) CFL Promotion: EVN would promote sales of 1 million CFLs to Vietnamese households located in areas of high loads and network congestion. EVN would procure CFLs in bulk and distribute them through their PC branch offices, lighting retailers and/or community-based NGOs. Over the three-year program period, EVN would use declining discounts, combined with marketing efforts, to promote the use of the more efficient lamps. GEF funds would be used to test the program in the first year and test alternative delivery/financing mechanisms for the lamps, and associated IDA funds would be used in the second and third years.d) FTL Market Transformation: EVN also plans to promote high-efficiency 18/36 W T-8 fluorescent tube lamps (FTLs), by supporting marketing efforts in conjunction with participating manufacturers to actively market the more efficient lamps. EVN would also launch a parallel campaign to educate consumers about efficient FTLs as well as low-loss electronic ballasts. GEF funds would support the marketing efforts to both the manufacturers and EVN, and EVN's internal funds would support project management and administration.e) Supporting Programs and Technical Assistance: In addition to the four DSM programs noted above, EVN will initiate complementary activities to support these efforts. 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 and policy support, development and implementation of new pilot DSM programs, DSM business opportunities studies, DSM program monitoring and evaluation, and support to the DSM Center (equipment, staffing, institutional development).Component 2. Pilot Commercial EE Program (US\$11.02 million). The project will also include a pilot commercial EE program, which would seek to test appropriate business models and mechanisms to 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" in all phases of EE project identification, development and implementation. Given the existing poor financial conditions among many industrial enterprises, the pilot program will initially focus on private commercial buildings, hotels, other office buildings and selected creditworthy industrial sub-sectors capable of accessing financing on their own. Specific activities under this component would 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, marketing and sales, etc.b) Subproject Audit and Investment Grants: The program would provide subproject grants, to be administered by a local commercial bank or Administrative Unit (AU), for energy audits and investments to project agents and their customers. For the audit grants, the program would offer grant reimbursements for energy audits. As agent capabilities improve and awareness and confidence in EE measures increases, the percentage of audit costs eligible for grant reimbursement will be reduced during the program period. The GEF grant would also provide investment grants (up to 20 percent of project

investment) for customers and agents that have fully implemented the EE investments from the audit report. Initial subprojects would be eligible for the full 20 percent grant if they allow MoI to use the project as a case study for other project agents and end-users. As with the audit grants, these investment grants would be used to reduce barriers to customer skepticism of EE project performance and gradually be reduced as agent reputations and technical expertise improve.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 to project agents and end-users, etc.); (ii) program administration and monitoring (e.g., AU management fees, technical support, program database development and 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.) and support policy reviews to support project pipelines, and further market expansion in future IDA/GEF operations.

5. Financing

Total (US\$m)

BORROWER/RECIPIENT \$1.22

IBRD

IDA

GLOBAL ENVIRONMENT - ASSOCIATED IDA FUND \$5.20

GLOBAL ENVIRONMENT FACILITY \$5.50

LOCAL SOURCES OF BORROWING COUNTRY \$7.32

Total Project Cost \$19.24

6. Implementation

a. Implementation period. 2003-2006.b. Executing agencies. The executing agencies would be EVN and MoI.EVN would assume overall responsibility for Component 1. This would include the development of detailed DSM program designs and implementation plans, preparation of evaluation plans, overall DSM planning functions, analysis of all market and load research data, procurement of all equipment, procurement and management of consultants and contractors, coordination of program implementation with the PCs and other agencies, and reporting to IDA/GEF. Since EVN does not have direct interface with energy consumers, the PCs would have primary responsibility for recruiting customers for the load management programs, installation of meters and DLC receivers, reselling of CFLs and proving data requirements to support EVN's load analysis and evaluation efforts.MoI will maintain overall responsibility for the Component 2. This would include selection and supervision of the AU and technical advisors, procurement and management of all training program consultants, program marketing, monitoring, administration and reporting, and coordination among the various program agents, customers, AU and advisors.

7. Sustainability

Sustainability was a key consideration in the decision to develop the programmatic approach adopted while designing this phased, 12-year program. Initiatives developed under the first phase as well as those

under this Project will be actively supported and further expanded in subsequent phases with Bank/GEF support. The concept is to provide a longer-term vision for development assistance, a framework for scale-up of mechanisms and business models tested in earlier operations, and provisions for developing timely intervention mechanisms as programs, markets and reforms develop. In addition, the program itself would seek market-based, commercial funding for DSM and EE investments. The load management programs under EVN are cost-effective and will help demonstrate to EVN and GOV the potential commercial merits and impacts for further DSM measures to help meet the rapidly growing electricity demand within the country. EVN's market transformation activities are designed to achieve large, sustained impacts on the CFL and FTL lighting markets and the DSM learning grant would, in part, be used to set-up permanent revolving funds that could operate in perpetuity and continue to promote energy-efficient equipment. For the pilot commercial EE program, the focus on improving program agent capability will lead to sustained market activity that will eventually be entirely financed by the private sector. Early successes with participating agents in the program would in turn lead to increased business for them and deepen the level of market activity and momentum. Support may be required in the future to facilitate commercial financing of EE projects, but these future operations would develop local commercial lending and, thus, eventually replace the need for any further Bank/GEF support in this market.

8. Lessons learned from past operations in the country/sector

For EVN's DSM program, Bank/GEF experience has shown the need for proper incentives for utilities to undertake DSM, thus EVN's programs have been restricted to those that directly coincide with their system peak. Previous operations have also shown the need for strong marketing efforts by DSM units, role of manufacturer agreements and linkages to parallel commercial financing programs, the need to develop sustainable DSM institutional arrangements given ongoing restructuring plans, 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. For the pilot commercial EE program, operational experience has also shown the need for market mechanisms to develop sustainable programs and, in particular, support for EE 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, replicable, commercially-oriented programs. The program design has also taken into account the need to develop parallel marketing efforts to end-users, select a few demonstrations for wider dissemination, and keeping a clear focus on transactions and investments.

9. Environment Aspects (including any public consultation)

Issues : None.

10. Contact Point:

Task Manager
Jas Singh
The World Bank
1818 H Street, NW

Washington D.C. 20433
Telephone: (202) 458-0140
Fax: (202) 522-1648

11. For information on other project related documents contact:

The InfoShop
The World Bank
1818 H Street, NW
Washington, D.C. 20433
Telephone: (202) 458-5454
Fax: (202) 522-1500
Web: [http:// www.worldbank.org/infoshop](http://www.worldbank.org/infoshop)

Note: This is information on an evolving project. Certain components may not be necessarily included in the final project.