

Japan International Cooperation Agency

**Special Assistance for
the Project Implementation
for
Energy Efficiency and
Renewable Energy
Promoting Project
in Vietnam**

FINAL REPORT

SUMMARY

March 2010

**Japan Consulting Institute
Japan Economic Research Institute Inc.**

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ABBREVIATIONS & ACRONYMS

APP	Asia Pacific Partnership
CDM	Clean Development Mechanism
CIF	Cost, Insurance, and Freight
CIC	Credit Information Center
DAF	Development Assistance Fund
DBJ	Development Bank of Japan
ECC	Energy Conservation Center
EE	Energy Efficiency
EECO	Energy Efficiency Conservation Office
EEREP	Energy Efficiency and Renewable Energy Promoting Project
EIA	Environmental Impact Assessment
FS	Feasibility Study
FSR	Feasibility Study Report
GHG	Greenhouse Gas
HCMC	Ho Chi Minh City
IE	Institute of Energy
JBIC	Japan Bank for International Cooperation
JCI	Japan Consulting Institute
JERI	Japan Economic Research Institute
JICA	Japan International Cooperation Agency
JODC	Japan Overseas Development Corporation
JSBs	Joint Stock Banks
METI	Ministry of Economic, Trade and Industry
MOD	Minutes of Discussions
MOIT	Ministry of Industry and Trade
MOF	Ministry of Finance
MONRE	Ministry of Natural Resources and Environment
MPI	Ministry of Planning and Investment
NEDO	New Energy and Industrial Technology Development Organization
ODA	Official Development Assistance
PMU	Project Management Unit of VDB
RE	Renewable Energy
SAPI	Special Assistance for the Project Implementation
SBV	State Bank of Vietnam
SOCBs	State-Owned Commercial Banks
TOR	Terms of Reference
TSL	Two-Step Loan

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USD	United States Dollars
VND	Vietnamese Dong
VBSP	Vietnam Bank for Social Policies
VDB	Vietnam Development Bank

1 Background and outline of SAPI

1.1 Background and objective

The demand for energy or energy consumption in Vietnam, owing to its rapid industrialization, has been increasing rapidly. Its energy consumption in fact has increased five times from 1990 to 2005 and energy demand is expected to continue its rapid growth. As well, Vietnam is considered less energy efficient than India in terms of primary energy consumption per GDP, which implies that the country has the larger potential to save energy. As well, given the present situation that public awareness on energy-saving has been relatively weak among Vietnamese business leaders, if the public awareness is raised significantly, there will be room for much more energy-saving in Vietnam.

Vietnamese government has so far issued (i) the Decree on Energy Conservation in 2003, (ii) the Prime Minister's Decision No.79/2006/QD-TTg on approval of the National Program on Energy Efficiency and Conservation, (iii) the Prime Minister's Decision No.1855/2007/QD-TTg on approval of National Energy Development Strategy of Vietnam 2020, with a Vision to 2050, and (iv) the Prime Minister's Decision No.158/2008/QD-TTg on the approval of the National Target Program to Respond to Climate Change. The implementation of these policies, however, has just been started and the concept of EE&RE has not been fully diffused among the general public. In this connection, the relevant cooperation from the Japanese government is highly appreciated by the Government of Vietnam.

The main objectives of SAPI are as below:

- To assist the Project Management Unit established at VDB for smoothly implementing EEREP
- To conduct awareness-raising among Vietnamese local enterprises
- To assist cost estimation and implementation of installation planning
- To enhance local enterprises' investments under EEREP by demonstrating the positive effects of energy efficiency and renewable energy investments

1.2 Terms of Reference

SAPI was carried out in accordance with the Minutes of Discussions on the Scope of Work (S/W) for SAPI for EEREP agreed between VDB and JICA in May 2009. The terms of reference (TOR) of SAPI include the following eight components which are divided into financial and technical matters, the former covers TORs 1 - 3 and the latter TORs 4 - 8.

2 Outcomes of each TOR

2.1 TOR-1: To assist in creating the Operation Manual for the Project

2.1.1 Background: VDB's business practices

(1) Business outline of VDB and its position in the banking sector in Vietnam

Vietnam's banking sector comprises five state-owned commercial banks, thirty-eight joint-stock banks, thirty-five foreign bank branches and five joint venture banks, and two development and policy banks. There have been various steps in the liberalization and reform of Vietnam's formal banking sector. The most significant steps include the followings: (i) the deregulation of domestic interest rates on both VND and foreign currency deposits and loans during 1996 to 2002, (ii) the decision in May 2005 to restructure the state-owned commercial banks and have them equitized by 2010, and (iii) the recent decision to permit 100 percent foreign-owned banks to enter the market as per commitment to WTO. As a result, the formal financial markets in Vietnam have grown and diversified rapidly in recent years.

Since 1996, Vietnamese banking sector has gone through liberalization and reforms, and policy lending was accordingly separated from commercial lending and regrouped into specialized institutions, namely, VBSP, which provides support for the poor and other disadvantaged group, and VDB, which lends for large priority projects, especially in infrastructure.

The financial products and services of VDB includes investment lending, post-investment interest subsidy, credit guarantee, export credit, export credit guarantee issuance, export contract bonds issuance and on-lending of ODA funds. Its major clients are (i) state-owned enterprises including ministerial enterprises and enterprises governed by provincial people's committee; and (ii) private enterprises including processing industries of agricultural, forestry and aquaculture products and export products.

The main functions and features of VDB can be summarized as follows: (i) non-profit organization, (ii) obligatory reserve rate of 0% (exempt from minimum reserve requirements), (iii) not required to provide deposit insurance, (iv) payment liquidity will be guaranteed by the Government, (v) exempted from tax and other payments to State Budget, (vi) entitled to mobilize capital by both issuing bonds & deposit certificates and borrowing from Postal Savings, Social Insurance Funds and other domestic and foreign financial institutions, and (vii) permitted to open accounts at the SBV, State Treasury and other domestic and foreign financial/credit

institutions.

VDB is currently under the direct control of the Prime Minister and under the joint supervision of MOF, MPI and SBV.

While, the draft of “Strategy to Develop VDB to 2010 and 2015, Vision to 2020” suggests the medium- to long-term strategy to develop VDB into a self-independent policy-based financial institution, the roles and functions of VDB as a policy-based financial institution have also been considered necessary by both the Government and the domestic business community under the current worldwide economic recession. As a swing strategy, VDB has revised the eligible loan projects stipulated in Decree No. 151/2006/ND-CP dated 20 December 2006 by issuing the Decree No.106/2008/ND-CP dated 19 September 2008 to narrow the target of infrastructure projects which are directly controlled by the Government, and also has requested the Government to allow VDB to provide mid-to long-term working capital necessary for their customers by submitting the revised draft of “Strategy to Develop VDB to 2010 and 2015, Vision to 2020.”

(2) VDB’s internal system and issues

Organization of VDB: VDB has its head office in Hanoi, one representative office in Ho Chi Minh City, two transaction centers, 61 branches across the country. The number of employees is 2,543 (as of May 2009). Under the Project, PMU member departments comprise Foreign Capital Management Department (20 staff) in charge of managing the on-lending of foreign funds, Appraisal Department (14 staff) in charge of technical appraisal of sub projects, Investment Credit Department (38 staff) in charge of financial appraisals of sub projects and International Cooperation Department (13 staff) in charge of foreign affairs and international cooperation.

Credit appraisal practices in VDB: There are mainly two manuals for instructing staff’s lending practices in VDB, namely, Investment Credit Manual (September 2008) and Export Credit Manual (July 2009). In practice, more emphasis has been placed on project analysis than company (i.e. borrower) evaluations, and therefore the Bank is not yet making loan approvals based on a comprehensive analysis of projects and borrowers. Regarding corporate evaluations, VDB loan officer allegedly collects financial statements of the borrower in the last two consecutive years to make the list of financial ratios calculated according to the Investment Credit Manual and makes a comparison of thus acquired results with those of the industry

standards provided by the Credit Information Center (CIC), a public registry under the supervision of SBV. As for project evaluations, VDB loan officers are not used to preparing their own investment plans for the project as well as making a future cash flow projection based on the Bank's own estimation and judgments. In fact, VDB officers have been passively accepting the Project Evaluation Report (prepared generally by independent consulting companies) as part of loan application documents, and have perfunctorily evaluated the adequacy or inadequacy of the provided cash flow estimation.

Approval authority system for loan decision-making: VDB has established an investment credit approval authority system stipulated in the Investment Credit Manual and other relevant regulations. In VDB's daily lending activities, the fundamental roles of loan related departments are to assist or give advises to the General Director, who makes the final loan decisions for Groups A and B projects (or branch General Manager in case of "Group C projects"). Therefore, loan officers at branches and the headquarters are not accustomed to writing the reasons for their judgment regarding the acceptance of loan application in any of the related internal documents. Due to this, the whereabouts of real decision-makings have been left unclear in the past, and accordingly staff involved in monitoring and debt collections seem to have relatively low sense of responsibilities, which reveals a weakness of the Bank. Furthermore, VDB is currently not equipped with an adequate corporate financial data collection and input system, and is in the process of establishing a client data base with the technical assistance provided under JICA's VDB Capacity Development Project.

VDB's decision-making systems for interest rates, maximum loan amount and collaterals: VDB, as a policy-based financial institution, can not make a decision on its interest rates. Decree No.151/2006/ND-CP stipulates that the rates of mid-to long term loans should be set at the same rate as 5-year government bonds + 0.5%. But in practice, VDB adopts the rates which MOF decides from the political point of view. And VDB generally can lend up to a maximum of 70 percent of total project cost according to Decree No.151/2006/ND-CP. In the matter of collateral practice, as a general rule, VDB requires the collateral which fully covers the loan amount. As generally not accepted by commercial banks, VDB accepts loan collaterals using property funded by the loans, but it does not accept other banks attach their security rights on the concerned property. Only in case of co-financing with other banks, VDB allows other banks to attach their security rights on the same property. In such a case, the bank providing the largest loan amount for the project generally gets the first priority security interest

to the concerned property.

2.1.2 Operation Manual for the Project completed in SAPI

SAPI Team achieved the following two purposes of TOR-1: [1] to provide assistance for the drafting of a Project Operation Manual for the Energy Efficiency and Renewable Energy Promoting Project (EEREP); and [2] to revise thus drafted Manual in accordance with the needs of end users (i.e. end borrowers).

[1] Providing assistance for the drafting of a Project Operation Manual for the Energy Efficiency and Renewable Energy Promoting Project (EEREP)

The EEREP Operation Manual comprised the following eight key components:

- (i) Eligible end-borrowers and sub projects, including eligibility criteria for sub projects;
- (ii) Sub project data management methods;
- (iii) Terms and conditions of sub-loans (including loan period, interest rates, collaterals, method of reimbursement of 50% of FS (i.e. Investment Report) preparation fee, etc.);
- (iv) Lending procedures from loan application to disbursement;
- (v) Credit appraisal system, including appraisal methods and procedures;
- (vi) Loan disbursement and debt collection methods, including making clear which department is in charge;
- (vii) Establishment and management of EEREP Special Fund Account as well as the fund management method of EEREP's Revolving Fund Account (including the possibility of using the Fund to cover the costs of technical assistance services); and
- (viii) Monitoring methods.

[2] Revision of drafted EEREP Operation Manual in accordance with the needs of end borrowers

SAPI Team, based on the collected information regarding the end-user needs, such as the needs for (i) access to the medium-term working capital necessary for equipment and facility investments, (ii) preferential interest rates, (iii) loan application assistance for SMEs, and discussed the revision of the Manual accordingly during the second mission to Vietnam in early to mid December 2009. The Operation Manual for the Project has been compiled by the staff of Foreign Capital Management Department.

2.2 TOR-2: To assist PMU for the smooth start up of the Project

2.2.1 Setting up of PMU and Advisory Committee

PMU was officially established by the issuance of the VDB Decision No. 695/QD-NHPT on establishment of project management unit of energy efficiency and renewable energy development sponsored by JICA. PMU is led by Foreign Capital Management Dept. and consisted of the following three departments besides itself: Appraisal Dept., Investment Credit Dept., and International Corporation Dept.

As SAPI Team suggested, PMU members understood clearly their functions necessary for the smooth implementation of the Project. In addition, PMU, in collaboration with SAPI Team, tried to keep relevant staff of VDB informed about the Project, including its concept, procedures, schedule and Operation Manual.

2.2.2 Roles of PMU and Advisory Committee

Detailed responsibilities of PMU member departments are clarified based on an extensive discussion between PMU and SAPI Team.

As for the organization of the first Advisory Committee, SAPI Team and PMU have agreed to hold the first meeting on 26 February 2010 to be chaired by Mr. Trang, PMU Director. The participants will be from relevant organizations including VDB, JICA, MOF, MPI, MOIT, Energy Efficiency and Conservation Office/EECO under MOIT and MONRE. At the meeting, the Committee members will exchange opinions in terms of the line of policies on energy efficiency and renewable energy, and will discuss the formulation of business unit for the Japanese ODA loan project and the scheme for finding out sub projects. Regarding the scheme for finding out sub projects, PMU shall be suggested to make alliances with domestic consultants such as IE, ECC Hanoi and HCMC, etc.

2.3 TOR-3: To Support PMU to create the Program Document

Based on the Decree 131/2006/ND-CP dated November 09, 2006, SAPI Team has been assisting PMU in preparing the ODA Program Document for EEREP to get the approval from the General Director of VDB.

Around 30-page draft Program Document, according to the Government Decree No.

131/2006/ND-CP on Issuance of Regulation on Management and Utilization of Official Development Assistance (Article No. 15, “ODA Program Document”), contains the following eleven items: 1) Rational & background; 2) Overall target; 3) Details of guidelines
4) Total investment cost, funding plan, lending mechanism; 5) Organization structure;
6) Management methodology; 7) Overall plan, implementation plan of first year; 8) Risk assumptions, proposed solutions; 9) Monitoring and evaluation plan; 10) Sustainability of plan after completion; and 11) Management and implementation capacity of executing agency

2.4 TORs - 4 & 5: To Assist PMU for selecting candidate sub projects

The organizations that are related to the energy conservation and renewable energy in Vietnam include the following:

- Ministry of Industry and Trade (MOIT)

MOIT plans energy-saving policies. The Ministry has the “Energy Efficiency and Conservation Office (EECO)” which coordinates among the relevant ministries as the supervisor in the National Management Commission.

- Institute of Energy (IE)

IE, an affiliation of MOIT and EVN, is under the direct control of the Vietnamese government. It participates in various energy projects across the country, executes energy audits, and supports the execution of energy-saving projects. In addition, IE has made the feasibility study of a hydroelectric power project in local area, and has participated in several JICA projects as a local consultant.

- Energy Conservation Center - Hanoi (ECC-Hanoi)

ECC-Hanoi was founded in 2007 by the Hanoi People’s Committee with the approval from MOIT. The Center supports energy conservation projects and makes energy audits, etc.

- Energy Conservation Center - Ho Chi Minh City (ECC- HCMC)

ECC-HCMC was founded in 2002 by the HCMC People’s Committee with the approval from MOIT. The Center has been providing support for energy conservation and renewable energy projects, executing energy audits, and providing information and project engineering services.

2.4.1 Gathering information for candidate sub project

SAPI Team paid the visits to the following agencies in order to collect relevant information. Below are the important excerpts from the interviews.

MOIT-EECO (10 November 2009)

- The new Basic Law on Energy Saving and Efficiency is planned to be approved next May 2010, followed by the issuance of relevant decrees. The law covers renewable energy as well as energy conservation, referring to Japanese Energy Conservation Law. Mr. Okamoto, dispatched from ECCJ at the request of METI, has been working as an advisor assisting its documentation.
- The targets for energy-saving efficiency will be renewed every 5 years: 3-5% for years 2006 to 2010 and 5-8% for years 2011 to 2015. The Law currently sees that the energy management (i.e. calculation, recording, reporting and organization) is important in addition to the energy-saving efficiency.
- In the renewable energy sector, the focus has been put on hydropower and its share is targeted at 2% of all power generation.
- Energy-saving projects provided by MOIT-EECO had been already screened and included on the long list of future candidate projects, and their original data are kept by MOIT-EECO. The data include information similar to those included in FSR and Energy Audit Report, which are not mandatory.
- The projects are usually first approved by MOIT, secondly by MOF and then submitted to VDB for loan applications.
- In terms of evaluating energy-saving project, the first priority is the technology involved and the next is its financial viability.
- Energy audits have been implemented by certified consultants. MOIT has the list of certified consultants. Procedures of the audit, however, are not standardized.
- MOIT can provide SAPI Team with additional information on sub projects upon receipt of a written request for the documents.
- Major sectors that have greatest potential in energy saving in Vietnam are Cement, Steel, Food Processing and Textile industries.
- The Government plans to expand its energy-saving investments 10 times, from US\$ 2 million to 20 million.

IE (16 November 2009)

- Major current activities related to energy system includes the following areas: (i) National renewable energy master plan; (ii) Power Master Plan Period 2006-2015, Perspective up to 2025; and (iii) National Energy Master Plan (in cooperation with JICA Study Team (Japan) in the period up to 2025).
- Regarding the sub project, the adding and updating of the candidate sub projects long list shall be done by IE. The following additional items shall be included: (i) energy consumption before the project, (ii) construction year of existing facility, (iii) types of EE, (iv) project implementation schedule and (v) impediments to project implementation... IE clarified that all the projects listed in the table have been completed energy audit, therefore all projects should have satisfied the EE or RE criteria. Interview was conducted to grasp the current status of proposed candidate sub projects and to further collect information about new projects.
- Regarding EEREP TSL, end borrowers did not have enough information about the terms and condition of EEREP TSL to decide on applying for the EEREP loans while ADB loans were also available.

ECC-HCMC (11 November 2009)

- ECC-HCMC conducts about 100 energy audits per year. Cost for the audit is usually around several thousand US dollars per site, which is to be borne by either the project owner or the project sponsor (such as UNDP).
- Energy Audit Report would become a must to obtain government approvals for any EE/RE projects after the enactment of the new energy saving law in 2012.
- As for its involvement in SAPI project, ECC-HCMC has selected two projects (namely, the sugar plant and the wood processing (furniture) plant) in May 2009 for the long list for SAPI candidate sub projects and five projects (namely, Ben Tre Sugar project, Duo Nhan Wood processing project, Que Han's Gas Processing project, An ethanol manufacturing project and Taxi fuel switch to LPG project) in August 2009 for the short list for SAPI candidate sub projects.
- As a result of the site visits, it was confirmed by SAPI Team that ECC-HCMC has a wide variety of experiences in the field of energy saving and a sufficient capacity to jointly work with overseas entities.

ECC-Hanoi (18 November 2009)

- ECC-Hanoi performed as one of the organizer of ENTEC Hanoi 2009 (The First International Exhibition Fair on Environment and Energy Technology) held from June 18 to 21. Its total number of entrances was approximately 22,000 and the total amount of business contract was about 4 million dollars during the event. There were a total of 100 exhibition booths among which 5 booths were occupied by two Japanese organizations, namely, EECJ and a heat pump organization.
- As for its involvement in SAPI project, ECC-Hanoi has proposed 7 candidate sub projects (namely, 4 textile, and 3 machinery and metal projects).
- EEC-Hanoi currently has 10 energy audit projects which exceed the energy consumption of 1,000 toe and is expecting to conduct the feasibility studies of the five of them. The types of industries include cement, food, shipbuilding and building material. Of these five projects, three projects will complete FS by June 2010 and the rest by September 2010.
- Regarding EEREP TSL, EEC-Hanoi commented that there are many potential borrowers which meet the requirements of EEREP, but end borrowers do not yet have the information of the terms and conditions of EEREP TSL.

2.4.2 Survey of candidate sub project

SAPI Team, based on the information gathered through interviews with IE and MOIT, has made a long list of about a hundred EEREP candidate sub projects. From this list, eight sub projects were selected for on-site survey based on the information gathered from VDB and other relevant agencies and taking into account of the sub projects available in Vietnam. (See table 1)

According to the results of the on-site survey, there are four sub projects to which loan disbursements are anticipated at the inception of EEREP, with the confirmation of each project owner's willingness to borrow under EEREP and the availability of a FS report. (See table 2) The owners of the above four sub projects will submit the loan application forms to VDB.

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Table 1: EEREP candidate sub projects for on-site survey

No	Sector	Name of project	EE/RE technology	CO2 reductions	Total project	Current status
1	Cement	Than Cong Cement Project	a waste heat recovery power generation by introducing a new turbine	15,581	749	Loan disbursement at the inception of EEREP
2	Coal production	Hoa Phat Energy Project	a technology to produce electricity by recovering sensible heat of high temperature flue gas gathered from the coal processing plant by introducing a new turbine	54,584	1,475	Loan disbursement at the inception of EEREP
3	Wood processing	Duc Nhan Wooden Project	New turbines and boilers for a new wood waste firing power station (plans to supply generated electricity to the power grid)	83,850	4,543	Loan disbursement at the inception of EEREP
4	Food processing	Bentre Suger Project	Power generation utilization of surplus bagasse produced from the sugar production process	1,742	104	Loan disbursement at the inception of EEREP
5	Ship building	Nam Trieu Shipbuilding Project	installation of energy-saving air compressor, welding machine, etc.	N.A	160	Under discussion whether or not to implement the project. (Has intention to borrow under EEREP, but FSR to define the total costs is not available yet)
6	Cement	Thai Nguyen Cement	Waste heat recovery power generation through the installation of ORC power plant (a combination of gas turbine and biomass gasification system)	13,592	900	Under discussion whether or not to implement the project. (FSR available, but the owner has not decided to borrow under EEREP)
7	Ceramic production	Bat Trang Village Project	In Bat Trang Village, conversion of coal fired kiln to LPG fired kiln.	3,376	235	Has intention to borrow under EEREP, but FSR not prepared yet (Needs to establish a legal entity)
8	Textiles	Kim Dong Xuang Knitting Project	Project plan is not prepared yet.	N.A	N.A	FSR not prepared yet. Intention to borrow under EEREP is not clear.
Total amount				172,725	8,166	

Table 2: A short list of candidate projects and estimated total borrowing under EEREP

No	Sector	Loan category	EE/RE technology	CO2 reductions	Total project	Loan amount*
1	Cement	EE	Waste heat recovery power generation	15,581	749	631
2	Coal processing	EE	Waste heat recovery	54,584	1,475	1,180
3	Food processing	EE	Biomass power generation	1,742	104	45
4	Wood processing	RE	Wood waste power generation	83,850	4,543	n.a.
合計				155,757	6,871	n.a.

*Figures for loan amounts are based on the information acquired through interviews with VDB.

An overview of EEREP candidate sub projects is shown below.

(1) Thanh Cong Cement (November 11, 2009) in Hai Duong Province

- This factory is a new one equipped with 2-horizontal dry type kilns with suspension pre-heater (SPH) and pre-calciner, of which total calcining capacity is 2,500t-clinker/d (1,250t/d x 2), 750,000t-clinker/y and 1,000,000t-cement/y. From the third year, the production capacity is planned to be increased up to 3,000t-clinker/d, 900,000t-clinker/y and 1,200,000t-cement/y respectively.
- The energy efficiency equipment is planned to be completed at the same time as the completion of No.1 production line, i.e. by end-December 2012. The equipment is a waste heat recovery power generation system which recovers the exhaust heat from kilns and air quenching chambers (AQC) and generates electricity for self-use in the factory. Each one set of SPH boiler and AQC boiler is provide in each kiln line and send the steam generated by total four boilers to one steam turbine/generator for generating 4MW electricity. The amount of this generated electricity corresponds to approximate 30% of the total electricity required in the factory and therefore is able to displace the equivalent electricity from the national grid. Thus, this system can save much energy and reduce greenhouse gas emissions.
- This cement factory was planned and designed by Beijing Office of Krupp in Shanghai China and the waste heat recovery power generation system was also included in their engineering works. The major equipment including the power generation system is imported from China. The FS of factory construction including the power generation system has been done by a cement engineering entity in Vietnam. Environmental Requirements are fully confirmed. VDB has instructed the end-borrower to conduct energy audit.
- This end-borrower seems to desire the financing support from VDB for the installation of the power generation system. Since the system is included in the new factory construction schedule as a package which has been preceded by Chinese company, there seems to be no room for other countries to intervene.

(2) Hoa Phat Energy (November 11, 2009) in Hai Duong Province

- The EEC system, which is a technology to produce electricity by recovering sensible heat of high temperature flue gas gathered from the coal processing plant of 40 x 2 coke ovens, is planned to generate 15MW electricity. Among the generated electricity, 2MW is planned to be used in the factory, 2MW for house-use and the remaining 11 MW is to be sold to Hoa Phat JS Steel Co. which is the same entity located adjacent to this factory and consumes 100MW and more electricity. The technology was imported from China. The design of this coal

processing plant including EEC system was done by Technological Design Institute in Tianjin. Major equipment is also made in China.

- Coal for cokes are blended with domestic coal and imported bituminous coals from Australia, Russia, Indonesia and others. Coke products are sent to global markets through a resale entity. CDM credit is approximately 1 million USD per year and a contract has been made with a Germany entity.
- It is not clear whether the end-borrower is anxious for loan support from VDB.

(3) Duc Nhan Wooden -Refuse Power Generation (November 13, 2009)

The project plan is to build a new wood waste firing power station of 6 MW x 5 Units = 30 MW to supply generated electricity from the power station mainly to the power grid owned by Vietnam Electric Company. The plant is composed of relatively small sized multi number units of medium steam condition power system.

A Chinese engineering firm is appointed to cover engineering works for the project. It is assumed that their familiar and experienced plant design concept has been applied. And major equipments of the plant will be purchased from China.

It is understood that the project design conditions chosen for the project is rather conservative judging from the Japanese current high design standards. However, application of latest high level design concept to this project will be unnecessary, as good enough stable supply of waste wood with lower cost will be expected for the power plant. Further, safety and stable operation of the plant will be more important than saving consumption of the fuel waste wood by applying higher technologies for the plant.

From the technical point of view, plant design is well made and good to be applied as a SAPI project on the condition that good enough environmental facilities are installed to protect the environmental conditions around the plant. Wood waste will be assessed as a kind of renewable clean energy source. Emission reduction of earth warming gases will be realized beyond the power grid that belongs to Vietnam Electric as a result of replacing part of their fossil fuel usage by the clean electricity supplied by the project.

(4) Bentre Suger -Refuse Power Generation (November 12, 2009)

- The project plan is to expand the existing power plant from current capacity of 1.5 MW x 2 = 3.0 MW to 1.5 MW x 3 = 4.5 MW with utilization of surplus bagasse, sugar cane refuses

produced from the sugar production process, which is currently not utilized and damped on the ground surfaces around the factory. Most part of surplus steam and electricity generated from extended system will be sold to the adjacent factory(s).

- Basic design concept of extension of plant is to apply the same technology already applied for the existing plant facilities to the new construction of the equipments. Major equipments of the plant will be purchased from the same manufacturers who supplied the existing equipments.
- It is understood that the project design condition chosen for the project is rather conservative judging from Japanese current high design standards. However, application of latest high design concept to this project will be unnecessary as the supply of waste bagasse will be good enough. Reliable safety operation of the plant will be more important than saving fuel bagasse by applying higher technologies for the new system.
- From the technical point of view, the plant design is well made and good to be applied as a SAPI project. Surplus bagasse will be assessed as a kind of renewable clean energy source. Emission reduction of earth warming gases is assumed to be realized mainly in the adjacent factories which buy clean steam and electricity produced from the project.

(5) Nam Triew Shipbuilding Industry Corporation-Energy Saving (December 8, 2009)

- EA pointed out that this shipyard has twelve energy-saving targets, the major items of which include (i) installation of energy manager system, (ii) installation of air compressor crane, (iii) installation of inverter units on air conditioners and fans, (iv) replacement of conventional lighting, and (v) replacement of power source equipments.
- MOIT selected this shipyard since its annual energy consumption exceeded 1,000 toe. MOIT will bear 50 % of total cost of energy audit (EA). EA has finished in November 2009, but the owner has not yet decided to implement the project. Therefore, the feasibility study report has not prepared yet.
- The opinions of the company staffs were all positive. Mr. Toan, Vice Director of the company expressed his intention to implement all items included in the project. The company officials expressed a positive evaluation regarding the EEREP loan. They have two other options, namely, MOIT grant (Maximum 30% of the project cost or 300,000US\$), which is very difficult to be accepted due to the limited total budget and a complicated application procedure, and commercial bank loans.
- Since this project has completed EA just recently, the detailed plans of the project are currently not available. In addition, the shipbuilding industry is not an energy intensive industry, but one of typical machinery manufacturing industry. The proposed measures therefore seem to be

standard ones based on the current situation of Vietnam, taking also into account the fact that EA has been conducted by ECC-Hanoi, an authorized organization in Vietnam. The actual technical evaluation has to await completion of the feasibility study.

(6) Thai Nguyen Cement (December 08, 2009) in Thai Nguyen Province

- This project, which was introduced by MOIT, concerns the installation of an EE system at the new cement factory (one of the factories of VINAICON) with the production capacity of 1,400,000 t-cement/y to be constructed by end-December 2009. The EE system aims to generate power by utilizing waste heat from the factory's calcining process (with calcining capacity of 4,000t-clinker/y)
- Regarding the EE system, ABB's Organic Rankine Cycle (ORC) power plant, having 5MW rated output and 3MW normal output, is planned to be installed. Its normal output corresponds to approximately 25% of the total electricity consumption (95,000MWh per year). It would result in a CO₂ emission reduction of approximately 13,600 tons per year. The total development cost amounts to VND 152.6 billion; the detailed engineering, supply of equipments and site assembling will all be done in 2010 and the testing and taking-over are scheduled in February 2011.
- With the implementation of the concerned EE system development plan, three members including Dr. Phuong of the An Phuong Investment and Trading Company are planning to start a new energy-saving business service company. However, the project requires further evaluations since the extent of commitments from VINAICON itself has not been clarified yet.
- Regarding ORC technology, although there are not too many commercial applications, it has an advantage to recover heat from lower temperature heat sources. However, in case of heat recovery from the higher temperature heat source like a cement kiln exhaust heat, the conventional type of water-steam Rankine cycle power plant is enough in view of easy operation, maintenance, so on.

(7) Ceramic BAT TRANG Designing & Producing CERAMIC (12 December 2009) in Bat Trang village near Hanoi

- The village reportedly has a total of approx. 500 kilns, and at present about 100 out of them are of old-type, coal-fired kilns. The old-type ones have been gradually converted to the new type kiln to improve productivity and minimize negative impacts of coal-firing on the environment. In the village, a typical kiln has an inside capacity of around 10 m³ and 5-6 m in length/width/height in a box shape and is mostly located in the center of the factory.

- The new-type kilns are designed so that the waste heat gas can be circulated inside the kiln and part of the gas is introduced to the drying room located next to the kiln. Thus the new-type kilns have been contributing to the reduction in defect ratios with better uniformity of the temperature inside the kiln, the reduction in the baking cycle time from 20-30 hours to 8-12 hours per cycle and the reduction of fuel costs.
- Including automation of some manufacturing processes, the conversion costs were estimated at around 800 million VND per factory and Mr. Trong expected to borrow 500 million VND out of them from Vietnam Environmental Protection Fund at the loan rate of 3.6%.
- The project of converting the old-type kilns to the new-type ones in ceramic factories in Bat Trang village is evaluated as appropriate; though the level of the technology is not of an advanced one, it is considered suitable for the factories since it does not require high skills and high investments and also is a proven technology.
- In terms of its eligibility to apply for EEREP TSL, however, the project is evaluated as not appropriate due to the fact that its plan has not yet been designed and fixed, and, more importantly, Mr. Trong, the leader of the project, plans to apply for the loan provided by the Vietnam Environmental Protection Fund.

(8) Dong Xuang Knitting Sole Member (Textile) in Hanoi (9 December 2009)

- Except for the raw materials being imported, the factory has functions of all the downstream processes: spinning, dyeing, weaving and sewing. 80% of the products are exported, and out of them 70% are for Japan market and the rest are for U.S., German, Italian and Swiss markets.
- When visited, the factory had not yet initiated the energy-saving project. Nevertheless, according to the management interviewed, they had concerns over energy saving of their manufacturing processes. The company, in fact, had conducted an energy audit by ECC-Hanoi two years ago.
- So far the management has taken countermeasures for energy saving one by one, including the replacement of some old equipments with new equipments which consume less energy; however, this time they plan to take more thorough measures for energy saving through this project.
- During the visit by SAPI Team to explain about EEREP TSL, the company was advised, to implement another energy audit and FS, since during the past two years there were a significant change in manufacturing processes which had resulted in changes in utilities consumptions.
- The company's project shall be examined when it becomes available with an energy audit report and a FSR in the future.

2.5 TOR-6: To assist PMU in establishing targeted values of indicators to measure the sub project effectiveness

- Minutes of Discussions signed between JICA and the Government of Vietnam in May 22 and June 19, 2009 stipulated that “(The) expected energy consumption effect is more than 20 %, which means the energy consumption amount (TOE/ year) after the completion is expected to be reduced by more than 20 % compared to the amount calculated before the project started.”
- To establish the targeted values of indicators to measure the sub project effectiveness, SAPI Team calculated the efficiency improvements of NEDO model projects and found out that the energy efficiency parameters used by these model projects were not the same kind as those for calculating energy improvement or reduction percentage defined under the MOD.
- SAPI Team, therefore, concluded that such a parameter as “the energy consumption effect of 20 % should be applicable for the energy efficient equipment” should only be applied to the equipments (such as air conditioning, lighting etc.) installed outside the boundaries of industrial plants. SAPI Team concluded that the targeted values should be decided more flexibly for the industrial plant/ facilities included in the EE&RE Equipment List.
- Based on the above conclusion, SAPI Team discussed further with JICA and finally presented the following energy efficiency parameters for EEREP TSL.
 - (i) In principle, the energy consumption amount after the completion of a sub project is expected to be reduced by more than 20 % compared to the amount calculated before the project started based on the existing or conventional equipments and facilities. (Conventional equipments and facilities are those commonly used.)
 - (ii) Technical evaluation will be conducted for a sub project only to the extent that it is financed by EEREP loan.
 - (iii) In cases where the selected equipment/ facility is a new one as well as is considered the most suitable one to be adopted under the Vietnamese circumstances, energy efficiency improvement rate may not necessarily surpass the target of 20%. In such a case, end borrower has to submit a verification report to VDB and to accept on-site inspection by VDB technical expert.
- The technical experts from outside VDB should justify the suitability of each individual project. The appraisal comment should be necessary to add in the appraisal report.
- To calculate the improvement of energy efficiency, the three conditions will affect the result,

namely, (i) project boundary, (ii) baseline energy consumption and (iii) energy sources. Each evaluation should be conducted based on the same conditions as referenced project.

2.6 TOR-7: To assist PMU in composing Technical Appraisal Manual

Technical Appraisal Manual, based on the discussion among SAPI Team members, shall be included in the EEREP Project Operation Manual. Below are the contents to be included under the Technical Appraisal Manual.

(1) Technical experts

The roles and functions of the technical expert of this project management unit (PMU) are as follows.

- (i) To maintain the potential sub project list
- (ii) To maintain the monitoring format
- (iii) To evaluate the monitoring data (Energy consumption)
- (iv) EE&RE screening by the technical appraisal format and eligible criteria

(2) Eligibility criteria for sub project

The technical eligibility criteria are included in the Appendix 3. The technical expert shall fill in the results of appraisal and comments. Below are the eligibility criteria:

- (i) End borrower is a Vietnamese enterprise
- (ii) Primary requirements comprise (a) the project shall have a potential of 20% energy efficiency improvement, (b) the enterprise belongs to the high energy-consuming industry with annual energy consumption of more than 1,000 toe or 3,000,000 kWh, (c) the project plans to utilize a verified energy-saving technology, (d) loan disbursement can be completed by 2012 and (e) an energy audit report has to be submitted to VDB.
- (iii) The secondary requirements is for the concerned sub project to use either (a) the technology included in EE/ RE Equipment List or (b) the technology that is considered adequate according to the Vietnamese standards.

(3) EE&RE List

The EE&RE list is attached in Appendix 8 which is based mainly on the NEDO model projects

conducted in South East Asian countries and China. The energy efficiency parameters and its values of each project are listed as a reference for the appraisal work. The technical expert is requested to evaluate the energy efficiency of the specific sub project by comparing the efficiency parameters and justify the efficiency parameters of the specific project. This list should be updated based on the data of actual sub projects selected for EEREP.

(4) Revision of eligibility criteria

The eligibility criteria stipulated in Appendix 3 may be subject to revision. The expected energy efficiency improvement effect of more than 20% should be applicable for limited equipments/plants. Specific figures should be applied for specific equipments/ processes individually in consideration with the current and future situations in Vietnam.

For instance, the waste heat recovery project by a cement plant to which the SAPI Team conducted a site visit, the expected energy efficiency improvement effect was more than 25% in terms of electricity consumption alone. However, in terms of the entire energy consumption, its expected energy efficiency improvement effect dropped far below the 20% line. As well, referring to the statistics presented by IE at the Hanoi seminar, energy-saving potential of major industrial sectors are as follows: In steel sector, electricity consumption, fuel consumption and the total cost have the saving potential of 9.1%, 3.9% and 5.6%, respectively; and in Beer factory, the figures were 12.1%, 3.7% and 6.2%, respectively.

Technical expert should be responsible to propose the above to PMU.

(5) Energy audit (EA) report

The selecting criteria in the Appendix 3 stipulated the submission of EA report. This clause shall be applied for EE projects, but not for RE projects. Even for EE projects, EA report will not always be available if it is a new project with plant/ equipment not yet started operation. In such cases, feasibility study report shall be used (instead of EA report) for the technical appraisal.

(6) Technical appraisal form format

Technical appraisal form format for some industrial sectors are shown under Appendix 10. The

format varies among sectors, and the items and contents of technical appraisal form include the below:

- (i) Applicant's general information, project costs, the timing of initial loan disbursement, project implementation schedule.
- (ii) As the implementer of the sub project, it is preferable for the end user himself to fill in the following items of technical appraisal form: applicability of sector-specific energy efficiency equipments and technology, energy consumption of the existing facility, the estimated reductions in energy consumption by the installation of a new facility, energy efficiency improvement rate, projected reduction in GHG emissions, etc. And the contents should be easy to read and understand for the VDB staff in charge of credit appraisals.

SAPI Team filled up the Technical Appraisal Form of four candidate sub-projects on a trial-basis. The filled up forms are shown in the Appendix 11.

As for the method to carry out the technical appraisal without disturbing the progress in the loan-application process, the use of the checklist method may be useful. The check list could contribute to a concise and effective appraisal. In addition, by summarizing the results of the check list and making a summery table, the points for the technical appraisal may be understood by VDB staffs and would be accumulate as their know how.

(7) Monitoring

The energy efficiency of the project shall be monitored. The monitoring should be conducted by the end borrower (owner). In principle, the data shall be based on the purchasing bills of energy. The amount of major products shall also be reported by the owner. The same format before the project start shall be submitted by the owner. The energy efficiency improvement shall be evaluated annually by the technical expert and reported to the PMU. The monitoring format is shown in the Appendix 9.

(8) Consultant selection

The technical expert shall be selected on normal purchasing basis, in which the consultant prepares procurement document for requesting price quotations from prospective consulting firms and decide to sign a contract with one of them based on a thorough evaluation. The TOR of the consultant service is specified in the Appendix. 13. The technical experts are selected from the consulting organization like IE and ECCs. The technical appraisal of the loan application of specific sub project should be conducted by the consultant of other organization which prepared EA and/ or FS of the sub project.

2.7 TOR-8: To implement awareness campaign on energy efficiency and renewable energy investments

In order to deepen understanding of the system and the technology related to energy conservation and renewable energy, as well as PR activity of Two Step Loan, the seminars both in Hanoi city and Ho Chi Minh City were organized.

The contents of the seminar are supposed to include the financial aspects and the technical aspects. In terms of the financial aspects, the system of the two step loan for EEREP, procedure and incentive, etc. are to be included. On the other hand, in terms of the technical aspects, the introduction of the technical equipment for EEREP and its incentives are to be included.

Schedule:	January 8 (Friday), 2010 in Hanoi & January 12 (Tuesday), 2010 in Ho Chi Minh City
Host:	VDB (by support of SAPI Team)
Invitee:	staffs in VDB head office and branches; staffs in related government offices; consulting firms relating EERE; end user companies for TSL
Program:	Appendix 12

Below are the questions and requests from the participants of the two seminars as well as the answers and responses to them.

(1) Regarding the terms and conditions of EEREP loans, including the availability of credit guarantees and collateral requirements (Hanoi Seminar)

- **Answer:** Eligible collaterals for EEREP loans are different compared to those provided by commercial banks. Borrowers are permitted to use the assets to be created by the EEREP loans as collaterals. As well, EEREP loan can cover up to 85% of the total project costs, which is quite high compared to a maximum of 50% provided by commercial banks. The maximum repayment period is 20 years, but has to be decided for each project.

(2) Regarding the applicability of EEREP loans for the renewable energy projects implemented as part of the Poverty Reduction Project, which is under the supervision of Provincial People's Committees.

- **Answer:** EEREP loan is not a grant aid. Since the primary eligibility requirement of VDB borrower is financial viability, the Poverty Reduction Project is not considered as eligible.

(3) Are there any authorized institutions for preparing energy audit reports? (HANOI)

- **Answer:** (MOIT—ECCO) MOIT is under no regulation to grant authorizations to institutions that prepare energy audit reports to determine the energy-savings in commercial buildings and enterprises. MOIT currently plans to establish two energy audit centers, which will specialize in training, authorization and energy management.

(4) How to submit a loan application (HANOI)

- **Answer:** A loan application shall be submitted to VDB Head Office or to any of its branch offices. Nevertheless, it is recommended first to submit to a branch office, since all loan applications have to go under the initial screening at the branch. VDB is currently preparing to upload all the necessary information regarding the EEREP loan.

(5) The criteria requiring more than 20% cut in annual energy consumption is too demanding. It is suggested that VDB will avoid using such a fixed percentage for the criteria; the twenty percent requirement seems unattainable. How have you come to this figure? Is the twenty percent criteria applies to the entire plant or to specific equipments? As well, any ESCOs should be allowed to participate in EEREP-funded project as a consultant...

Energy audit reports should be evaluated based on the quality of outputs, not by the brand name of the consulting firm. The attractiveness of EEREP program has diminished greatly by the increase in the preferential interest rates from 6.9% to 9.6%. (HANOI)

- **Answer:** It is true that we should place more emphasis on the quality of energy audit reports. VDB has set aside 6 million USD for consulting services, including those provided by international experts, in order to verify the viability of sub projects. Although many ESCOs may prepare energy audit reports, VDB believes that energy audit should be conducted by a consulting firm which has significant experience. VDB even prefers to have a list of eligible consulting firms. As for the criteria of a 20 % reduction in energy consumption, VDB considers it to be not too high based on the fact that the energy efficiency potential of the industrial sector is around 10-40% in Vietnam. As well, the required percent reduction will not be fixed at 20%. VDB is able to approve loans for the projects with the potential of 10-15% reduction in energy consumption. Interest rate of 9.6% is still lower than those provided by commercial banks. Besides, policy interest rates (preferential rate) are decided annually by MOF, not VDB.

(6) Applicability of EEREP loans to biomass power generation utilizing rice straws and modification of brick kilns. (HCMC)

- **Answer:** Biomass power generation project is eligible under EEREP, whereas brick kiln project is not eligible given relatively small size of the loan.

3 Conclusion and recommendations

3-1 Conclusion

PMU was officially established at VDB Head Office in December 2009 and it has ever since been taking the initiative to steadily prepare for the first disbursement of EEREP sub loans. With the assistance of SAPI Team, PMU has understood the basis structure and procedures of Yen Loan/ EEREP and prepared “Program Document” for its official approval and a draft of EEREP Operation Manual. Five candidate sub projects have been carefully examined by both PMU and SAPI Team. In addition, PMU and SAPI Team have already organized seminars for awareness campaign successfully both in Hanoi and Ho Chi Minh City.

However, due to the two months delay of the Loan Agreement between the Government of Vietnam and JICA, there are still some remaining things for the months ahead. Now PMU aims to make the first disbursement of sub loans in March 2010. PMU is to do the following things step by step: i) organize the first Advisory Committee (on February 2, 2010); ii) get the official approval on “Program Document” from VDB’s General Director (by early-February); iii) complete the final draft of EEREP Operation Manual and issue it officially at VDB (by mid-February); iv) make an official decision on the initial disbursement of sub loans at VDB (by mid-February); v) get the approval on the initial disbursement of sub loans from MOF (by mid-February); and vi) open the Special Fund and Revolving Fund Accounts (by mid-March).

On the other hand, it is recognized that there are mainly three obstacles potentially against the smooth operation of EEREP; i) Because the two main PMU members from Foreign Capital Management Department holds appointments across several ODA projects at VDB, they will be quite busy for achieving all necessary procedures intensively for making the first disbursement of sub loans by March 2010; ii) The marketing activity of PMU and VDB staff need to be strengthened for the sustainability of EEREP; iii) Credit risk management systems and monitoring systems are not yet completely established in VDB, which seems to be currently a weak point of VDB as a financial institution; and iv) PMU members and staff at appraisal department are not technical experts, so they would need to make a reference about EE&RE technology when making appraisal. After the initial disbursement of sub-loans, in order to overcome the above-mentioned potential obstacles, the continuous assistance would have to be made by the consultants in the next phase of EEREP.

3-2 Recommendation

During the field surveys, SAPI Team has taken up the following issues specifically for discussion with the PMU members. Based on the discussion, in order to implement the Project efficiently and effectively, SAPI Team would propose seven essential recommendations and five countermeasure actions.

Examine the appropriateness of VDB's mid-to long-term working capital under EEREP. In Vietnam, commercial banks require exclusive control over customer's property as collateral. Due to this, Vietnamese enterprises seem to face difficult situations in getting mid- to long-term working capital. VDB, however, is not legally allowed to provide mid- to long-term working capital for its investment credit loans. If end borrowers can get mid- to long-term working capital under EEREP, it might be a strong incentive for end borrowers. However, as discussed among PMU members and SAPI Team, it was not recognized as appropriate that the target of EEREP covered mid-to long-term working capital for the following reasons. i) In principal, VDB is prohibited to provide mid-to long-term working capital as of today. Now under the discussion on the draft of "Strategy to Develop VDB to 2010 and 2015, Vision to 2020", VDB has tried to propose to expand its loan products including not only mid-to long-term investment loans but also mid-to long-term working capital, but the answer of the prime minister is not sure as of now. ii) VDB officers seem to practically accept that the total investment project costs include taxes, interest payments, working capital, etc. iii) To some extent, Vietnamese companies can get the short-term working capital from commercial banks without collateral. iv) The projects related to EE&RE are not likely to need additional working capital in particular.

Examine the appropriate interest rate for EEREP sub loan.

EEREP's interest rate for end borrowers (which is currently set at 6.9 % per annum for VND denominated loans) is not differentiated from that of other policy lending program currently provided by VDB. Considering the additional documents (FS report, energy audit report, etc.) required under EEREP, it seems that end borrowers may have little incentive to choose EEREP over others. In Japan, since one of the most important roles of policy-based financial institution is to promote investments that would precede private-sector investments and bring about a so-called "cowbell effect," policy-based financial institutions (including DBJ) have been providing special interest rates that are lower than the basic policy interest rates for special areas such as energy conservation and alternative energy.

With this in mind, SAPI Team, during the field surveys, took up the issue of appropriate interest rate under EEREP and suggested that VDB should make EEREP's interest rate lower than the ordinary interest rates for other VDB loans. Through our discussion with PMU, we came to an understanding that EEREP with maximum loan maturity of 20 years already entails enough incentives for potential sub borrowers since the ordinary VDB loan maturity is up to a maximum of 12 years.

Taking also into account the fact that the mid-to long-term loans are generally in short supply in Vietnam, SAPI Team came to the conclusion that it would be adequate for VDB to keep EEREP's interest rate at the same level as the other VDB loans.

Make the most use of credit appraisal tool generated by JICA TA project. Credit risk management systems are not yet completely established in VDB, which are currently under development with the assistance of JICA's TA project. It is desirable that VDB officers will be able to make the most use of the new credit risk management systems under EEREP. However, given the current situation that the TA project members are still developing customers' database and credit appraisal tool through a trial and error process, it would not be appropriate that VDB officers are compelled to use the incomplete systems as of now. At the same time, according to the results of the recent data collection and input trial conducted by TA Project Team regarding one hundred comparatively good clients of VDB in textile sector, VDB staffs were not able to collect a complete set of the last three year's financial statements (i.e. balance sheet, income statement and cash flow statement) from many clients, except for a few; 27 companies did not provide financial statements at all, and only 13 of the remaining 73 companies did provide cash flow statement for more than one fiscal year. This reveals the fact that ordinary lending procedures have not been strictly followed by all VDB staff.

Therefore, SAPI Team would propose VDB officers to ensure the following: (i) to collect financial statements including cash flow statement (or at least the data on depreciation and the number of employees) of sub borrowers, (ii) to provide thus collected financial data to TA Team and (iii) to get the feedback from TA Project Team regarding the analysis result of the credit appraisal tool as a reference.

Facilitate training programs for realizing a better monitoring practice under EEREP. In

VDB's normal practice, the existing manual requires the officers to evaluate the investment effects by checking the increased number of employees and their annual contributions to the national coffers (i.e. through tax payments). However, under EEREP, much attention should be paid to the technical evaluation on the post-lending monitoring process. In addition, VDB officers should be able to fully take responsibility in monitoring the sub loans' investment effects and sub borrowers' latest financial position on the post-lending process. In order to achieve this goal, SAPI Team would propose to hold the following training program for the VDB officers under EEREP.

- Venue: VDB office (Hanoi, Da Nang, Ho Chi Minh City)
- Date: On the early stage of EEREP
- Form: Seminar
- Target: VDB staff (senior specialist, deputy director)
- Program contents:
 - Introduction of EEREP Scheme & Outline of the EEREP Operation Manual (2H)
 - Basic information on energy efficiency and renewable energy in Vietnam (2H)
 - Monitoring Methodology (2H)
 - Importance and necessity
 - Monitoring process
 - Check points to be examined (Technical and financial aspects)
- Model Timetable
 - 08:30-11:30 Morning Session (3H)
 - 11:30-13:30 Lunch-on meeting (2H)
 - 13:30-16:30 Afternoon Session (3H)

Strengthen the marketing activities for EEREP. In order to find eligible sub projects under the EEREP, VDB would need to establish an extensive local networks with Vietnamese enterprises for constantly receiving necessary information on their updated investment plans. Therefore, SAPI Team would strongly propose the following measures. (i) PMU shall strengthen its networks with local consultants such as IE, ECC-Hanoi, ECC-HCMC, etc.; (ii) VDB branches shall improve their marketing networks with local business community; (iii)

PMU shall conduct regular surveys on enterprises' investment plans all over Vietnam; and (iv) EEREP Advisory Committee members, especially those from MPI and MOIT-EECO, shall be requested to share the information about candidate sub projects and other similar loan programs in Vietnam with PMU members.

Support the small and medium enterprises for establishing the application of TSL.

The cases of ceramic factories in Bat Trang village and the bricks factories, it is anticipated that the TSL application by the project would be difficult, the estimated investment amount per factory is evaluated to be too low as compared with VDB lending criteria regarding the minimum loan amount; it also seems difficult to set up a new entity which can be legally approved and qualify the conditions set by VDB for the TSL applications. Therefore, SAPI Team would propose to support the small and medium enterprises for establishing the application of TSL.

Energy Conservation Effect of the Project

(i) The extent of EE&C Loan

The extent of loan which VDB extends to the end user is not for the individual equipment but for the entire energy efficiency and conservation system. Therefore, the indicator of evaluation of energy conservation effect should be evaluated for the whole EE&C project. On the other hand, the energy audit is conducted for the whole plant or facility, the result of energy conservation effect is equal to the sum of individual energy efficiency and conservation equipments.

(ii) The energy conservation effect of NEDO model project

The Energy Efficiency and Conservation model projects in Southeast Asian countries and China which were supported by NEDO have higher potential to be applied for this loan. SAPI Team has conducted a study on energy conservation effect of these NEDO model projects based on the published information, and found out that almost none of the projects had used "energy conservation effects" as a parameter for the improvement in their efficiency compared with the previous, conventional system or equipment.

(iii) Energy Conservation Potential

Per the material of IE presented in the seminar in Hanoi on January 8, 2010, the energy conservation potential of the energy audited plants were between 3.7 to 13.7% for electricity, between 1.7 to 5% for fuel and between 3.7 to 13.7 % for cost. These results reveal the fact that

to expect the energy conservation effect for a whole plant to reach 20 % seems to be unlikely in these sectors.

On the other hand, per the material of ECC-HCMC presented in the seminar in Ho Chi Minh City on January 12, 2010, the energy conservation effects of some projects using specific measures were reported to be between 10 and 30%.

(iv) The calculation of energy conservation effect

The energy conservation effect shall be calculated inside of the project boundary. If each of the comprising equipments inside the project boundary has the energy conservation efficiency of more than 20% compared with the existing or conventional equipment, the energy conservation efficiency of the entire project is rightly considered to have achieved more than 20% energy efficiency. However in case the project contains equipment of less than 20% energy efficiency, the entire project's energy efficiency may not reach 20% threshold.

(v) The efficiency of energy saving equipment

If the standard energy efficiency values of each kind of energy-saving equipments can be specified, it would become possible for VDB loan officers to suggest end borrowers to select equipments with higher energy efficiency. However, such figures are not specified in the List and it is still difficult for SAPI Team to specify the standard energy efficiency values at this moment.

(vi) Requirement of energy conservation efficiency in this Project

The energy conservation efficiency improvement requirement for a sub project shall be more than 20 % compared with the existing or conventional facilities as a general rule. (The meaning of conventional facility is the facility consisting of general equipments.) The extent of the sub project to be evaluated shall be the same as the extent of the loan application. Energy efficiency and conservation equipments to be introduced by the end borrowers, therefore, shall be those with potential energy efficiency and conservation improvement effects of more than 20% compared with the existing or conventional equipments. However, if thus selected equipment is proved to be the latest model or considered as the most appropriate model in Vietnam, it may not necessarily achieve 20% energy efficiency improvement. In such cases, verification by the end borrower as well as the technical appraisal by the VDB's technical expert shall be required.

In conclusion, SAPI Team would propose the following action plan.

**ENERGY EFFICIENCY AND RENEWABLE ENERGY PROMOTING PROJECT (EEREP)
Draft Final Report**

To whom	Recommended action	When
VDB	<i>Make the most use of credit appraisal tool generated by JICA TA project.</i> To ensure the following: (i) to collect financial statements including cash flow statement (or at least the data on depreciation and the number of employees) of sub borrowers, (ii) to provide thus collected financial data to TA Team and (iii) to get the feedback from TA Project Team regarding the analysis result of the credit appraisal tool as a reference.	Mar 2010-
VDB/ JICA	<i>Relax the requirement of energy conservation efficiency in EEREP.</i> If selected equipment is proved to be the latest model or considered as the most appropriate model in Vietnam, it may not necessarily achieve 20% energy efficiency improvement. In such cases, verification by the end borrower as well as the technical appraisal by the VDB's technical expert shall be required.	Mar 2010-
VDB	<i>Strengthen the marketing activities for EEREP.</i> (i) PMU shall strengthen its networks with local consultants such as IE, ECC-Hanoi, ECC-HCMC, etc.; (ii) VDB branches shall improve their marketing networks with local business community; (iii) PMU shall conduct regular surveys on enterprises' investment plans all over Vietnam; and (iv) EEREP Advisory Committee members, especially those from MPI and MOIT-EECO, shall be requested to share the information about candidate sub projects and other similar loan programs in Vietnam with PMU members.	April 2010-
VDB	<i>Support SME under EEREP.</i> To support the small and medium enterprises (e.g. ceramic factories in Bat Trang village and the bricks factories) for enhancing the application of TSL.	April 2010-
JICA	<i>Facilitate training programs for realizing a better monitoring practice under EEREP.</i> VDB officers should be able to fully take responsibility in monitoring the sub loans' investment effects and sub borrowers' latest financial position on the post-lending process. It is highly recommended that JICA should hold a training program for the VDB officers under EEREP.	Mid 2010

Note: The recommended actions mentioned in the above table should be reflected in the EEREP Operation Manual completed by PMU.