

**Socialist Republic of Vietnam
Vietnam Electricity (EVN)**

**Socialist Republic of Vietnam
Expert for Improvement Plan of Transmission/
Distribution Network**

Project Completion Report

August 2014

**Japanese International Cooperation Agency
Tokyo Electric Power Co., Inc.**

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Table of Contents

CHAPTER 1 INTRODUCTION	1-1
1.1. BACKGROUND OF THE STUDY.....	1-1
1.2. PURPOSE OF THE PROJECT	1-1
1.3. TARGET AREAS OF THE STUDY	1-2
1.4. EXECUTING AGENCIES	1-2
1.5. THE STUDY CONTENTS.....	1-4
CHAPTER 2 OUTLINE OF THE PROJECT PLAN AND ITS FEASIBILITY	2-1
2.1. PURPOSE AND CONTENTS OF JICA LOAN PROJECT.....	2-1
2.2. PROJECT PLAN'S OUTLINE AND SCOPE	2-2
2.3. PROJECT IMPLEMENTATION AND OPERATION & MAINTENANCE MANAGEMENT STRUCTURE .	2-5
2.4. VALIDITY OF THE PROJECT SCOPES	2-12
CHAPTER 3 EVALUATION AND RANKING FOR SUB-PROJECTS.	3-1
3.1. METHODOLOGY OF EVALUATING SUB-PROJECTS	3-1
3.2. CLASSIFICATION OF SUB-PROJECTS	3-2
3.3. CRITERIA SETTING	3-3
3.4. EVALUATION RESULTS (TECHNICAL, ECONOMIC, BENEFIT TO JAPANESE FIRMS).....	3-11
3.5. RANKING OF SUB-PROJECTS AND FUNDS.....	3-18
3.6. SP PROJECT SHEETS WITH GIS LOCATION MAPS	3-29
3.7. IMPLEMENTATION SCHEDULES.....	3-31
3.8. POSSIBILITY FOR INSTALLMENT OF JAPANESE MATERIAL	3-33
3.9. INFORMATION ABOUT ENVIRONMENTAL AND SOCIAL CONSIDERATIONS	3-35
CHAPTER 4 PROGRESS IN ELECTRICITY MARKET LIBERALIZATION.	4-1
4.1. STREAMLINING OF THE POWER SECTOR REFORM (LIBERALIZATION) ROAD MAP	4-1
4.2. STREAMLINING OF ACTION PLANNING TOWARD VWEM INTRODUCTION	4-8
4.3. DONORS' ASSISTANCE WITH POWER SECTOR LIBERALIZATION	4-14
CHAPTER 5 ISSUES TOWARDS MARKET LIBERALIZATION AND IDENTIFICATION OF POSSIBLE TECHNICAL ASSISTANCE MENUS.	5-1
5.1. STREAMLINING OF POLICY ISSUES AND PROPOSAL ON A POSSIBLE ASSISTANCE MENU	5-1
5.2. STREAMLINING OF TECHNICAL ISSUES AND PROPOSAL ON A POSSIBLE ASSISTANCE MENU ..	5-2

**CHAPTER 6 CONCLUSION AND PROPOSAL ON THE METHODOLOGY FOR
EX-POST EVALUATION ON JICA LOAN PROJECT 6-1**

6.1. BIG PICTURE AND ADEQUACY OF THE PROJECT PLANNING 6-1

6.2. SETTING CRITERIA AND RANKING BASED ON THE CRITERIA 6-1

6.3. MOVEMENT OF POWER MARKET LIBERALIZATION AND POSSIBILITY ON TECHNICAL
ASSISTANCE FOR ITS SMOOTH IMPLEMENTATION 6-2

6.4. OPERATION AND EFFECTIVENESS INDICES 6-2

List of Acronyms

ABC	Aerial Bundled Cable
ACSR	Aluminum Cable Steel Reinforced
ADB	Asian Development Bank
AFD	l'Agence Française de Développement
AIS	Air Insulated Switchgear
BOT	Built-Operate-Transfer
BST	Bulk Sales Tariff
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CBM	Condition Based Maintenance
CD	Conceptual Design
CPC	Central Power Company
DD	Detailed Design
DEP	Distribution Efficiency Project
DPO	Development Policy Operation
EIA	Environmental Impact Assessment
EIRR	Economic Rate of Return
EMS	Energy Management System
EPTC	Electric Power Trading Company
ERAV	Electricity Regulatory Authority of Vietnam
EVN	Vietnam Electricity
FIRR	Financial Internal Rate of Return
FS	Feasibility Study
GIS	Gas Insulated Switchgear
GIS	Geographic Information System
Genco	Generation Company
GZTACSR	Gap Type ultra Thermal resistant Aluminum alloy steel reinforced
HCMCPC	Ho Chi Minh City Power Company
HPC	Hanoi Power Company
ICB	International Competitive Bidding
ICD	International Cooperation Department
IRD	International Relations Department
JICA	Japan International Cooperation Agency
IEE	Initial Environmental Examination
IPP	Indigenous Peoples Plan
IRR	Internal Rate of Return
IUCN	International Union for Conservation of Nature
KfW	Kreditanstalt für Wiederaufbau
LC	Large Customer
LCB	Local Competitive Bidding
NLDC	National Load Dispatch Center
LV	Low Voltage
MO	Market Operator
MOIT	Ministry of Industry and Trade
MV	Middle Voltage
NPC	Northern Power Company
NPT	National Power Transmission
PC	Power Company
PMB	Project Management Boards
PMU	Project Management Unit
PPMB	Power Project Management Boards
PPA	Power Purchase Agreement
RAP	Resettlement Action Plan

TA	Technical Assistance
SB	Single Buyer
SCADA	Supervisory Control And Data Acquisition
SO	System Operator
SOE	State Owned Enterprise
SP	Sub-Project
SW	Switch
TA	Technical Assistance
TBM	Tool Box Meeting
TEP	Transmission Efficiency Project
UNDP	United Nations Development Programme
USTDA	United States Trade and Development Agency
VCGM	Vietnam Competitive Generation Market
VND	Vietnamese Dong
VWEM	Vietnam Wholesale Electricity Market
WB	World Bank

Interest Rates

In this Report, interest rates applied are as follows:

- USD1=JPY102.6
- USD1=VND21,036

Chapter 1 Introduction

1.1. Background of the Study

In Vietnam's regional power transmission and distribution network, in general, overloading of power facilities in cities alongside steady power demand growth becomes patent. It is likely that power distribution and substation facilities do not secure any comfortable operational margin for day-to-day supply reliability. Therefore, in normal operation, overloaded facilities may increase risks not only for causing more energy losses but also for leading to faults. Once an actual network accident occurs, it would take considerable time to recover from the accident. In order to cope with this situation, it is required to properly reinforce power network facilities for efficient and stable power supply.

In addition, the Government of Vietnam has committed to undertaking electricity market liberalization in recent years, steadily achieving enforcement of the Electricity Act for sector unbundling, approval of the Roadmap for Power Sector Reform, and introduction of the competitive power generation market (a single buyer model). In 2014, along with the Roadmap, it is envisaged that the Government will start with the pilot introduction of a competitive electricity wholesale market toward the full commissioning year of 2022. The proposed regional power transmission and distribution reinforcement will assist the Government's commitment to power market liberalization by de-bottlenecking the network*.

* The maximum amount of electric power flow of the electricity facilities (transmission and distribution substation equipment), are limited by the capacity of each facilities. Therefore, even though the new power source will be interconnected by the introduction of competitive power generation market, introduction amount is limited by the upper limit of power grid facilities capacity. For this reason, the securing of adequate power grid capacity will lead to the condition of liberalization of electric power market.

1.2. Purpose of the Project

The Vietnam Electricity (EVN) Group has submitted a list of 75 network reinforcement projects ("sub-projects" or "SPs") out of pipeline projects, for which the executing agency has already made fundamental project documents available, in order to apply for a proposed ODA Loan, "Second Power Transmission and Distribution Network Development Project/ Power Sector Loan 3" (or the "Project"). This technical assistance assignment (the "Study") will assist the Government with loan preparation through the formulation of project prioritization criteria setting and the discussion on the prioritization for the implementation of the proposed Japanese ODA Loan.

EVN Group plans to reinforce regional transmission and distribution networks with the use of the proposed JICA ODA Loan. In addition, with special emphasis on power sector

liberalization, the Study will also explore the possibility of future JICA assistance on power sector policy/market development in Vietnam, summarizing power sector policy requirements and identifying necessary policy actions in Vietnam.

Under the circumstances, the Japanese Government needs to understand the issues on power sector policy formulation and implementation that the Government of Vietnam faces, to identify the responsibilities and roles of related agencies, to summarize policy goals to be achieved and policy milestones, and to discuss possible assistance by preparing a set of specific assistance menus based on actual needs in Vietnam.

1.3. Target areas of the Study

There are five service areas in Vietnam. Five regional power corporation (“PCs”) under EVN Group’s management, NPC (Northern Power Corporation), HPC (Hanoi Power Corporation), CPC (Central Power Corporation), Southern Power Corporation (SPC) and HCMCPC (Ho Chi Minh Power Corporation) supply electricity within their own jurisdictions. The Study assists EVN with preparation of the Project by reviewing each of the FS summaries for all 75 SPs, confirming technical and economic feasibility of the SPs, setting criteria for prioritization, and discussing prioritization. The target area of the Study is nationwide in Vietnam.

1.4. Executing Agencies

Executing Agencies of the Project are EVN Headquarters, NPC, HPC, CPC, SPC and HCMCPC. EVN Headquarters is the contact point and coordinator among EVN PCs for the Study.

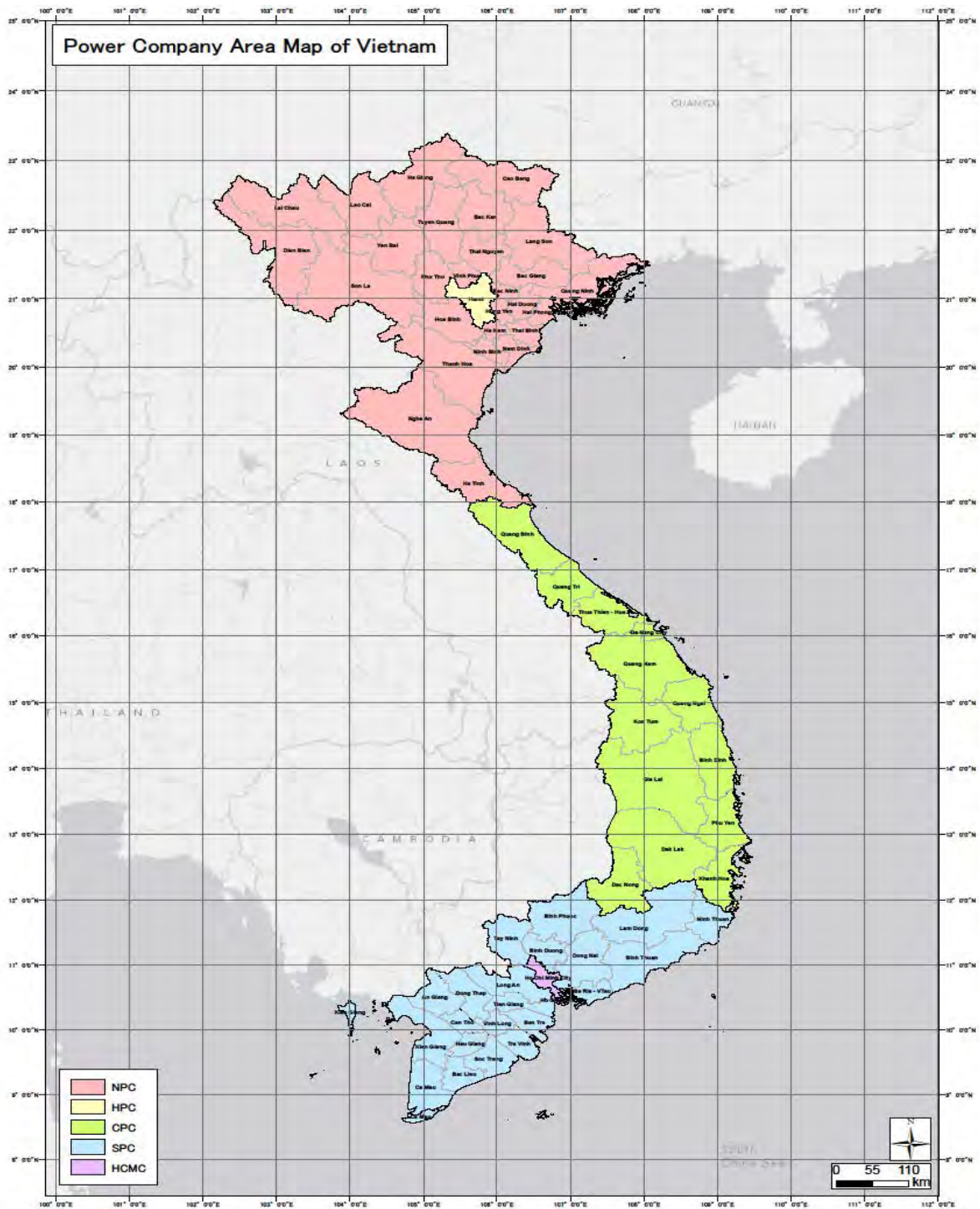


Exhibit 1-1 PC Area Map

1.5. The Study Contents

Tokyo Electric Power Co., Inc. (TEPCO), as a Consultant retained by JICA, carries out the Study including field visits to Vietnam by undertaking the following scope of work.

- Formulation of the Work Plan
- Review of related existing documents and information
- Prioritization of SPs
 - Formulation of draft criteria for SP prioritization and finalization of the criteria in consultations with EVN
 - Collect and review required information along the criteria for prioritization and formulation of SP summary sheets that reflect the results of the evaluation.
 - Prioritizing and ranking of SPs
 - Based on the ranking, formulation of effective implementation schedules, financing plans for JICA ODA Loan execution by fiscal year and by foreign/local currency splits, for the entire Project as well as each of the PCs
 - Assistance to EVN with formulation of financial and economic benefits in the forms of FIRR and EIRR and with formulation of operational/effectiveness indices to evaluate the Project retroactively
- Collection and review of information on environmental and social considerations of the Project
- Collection and review of information on power market liberalization in Vietnam
- Other issues such as exploration of possibility of utilization of Japanese technologies for the Project and identification of tangible benefits to Japanese firms located in Vietnam from the implementation of the Project

Chapter 2 Outline of the Project Plan and its Feasibility

2.1. Purpose and Contents of JICA Loan Project

According with the rapid economical growth and rising awareness of customers, the issues below are highlighted.

- Constraints on the power supply capability of grids due to continued overloading
- High frequency of outage and prolonged outage
- Social impacts in terms of safety and landscape

In order to deal with above-mentioned issues, EVN set the common targets for all of PCs with the measures to materialize the targets as follows.

- Solution of the facilities overloading
 - Enhancement of facility capacity, and enhancement of the transmission line capacity or transformer capacity at the substation corresponding new demand (like large-scale industrial parks, etc.).
 - Enhancement of transmission capacity at the existing distribution line that corresponds to the growth of demand
- Improvement of supply reliability
 - For the shortening of the recovery time of outage caused by distribution line faults and the planned outage by construction work, the new section switch to the MV distribution lines, new construction of the interconnection line to the other feeder and the interconnection switch
 - The installation of the lightning arresters to prevent lightning fault, and the Replacement of the bear conductor for the insulation conductor/ Air bundle cable to prevent grounding fault that caused by tree touching to the electric conductor.
- Reduce transmitting loss
 - New installation of the substation and the transmission line to reduce the transmission loss on the distribution line by shortening the total distribution distance.
 - The loss reduction by larger diameter of the electric conductor
 - Improvement of the voltage quality and reduce loss at the end part of the long distance distribution line (new installation of the transformers , and shortening of the LV line transmission distance)
- Mitigation in the Social Environment (for Safety, and for landscape etc.)
 - Ensuring the transmission line ground clearance and regulatory compliance, by rebuilding steel towers and concrete pillars
 - Prevention of electrocution incidents by construction workers who touch the hot conductors in urban areas and of similar incidents in residential areas by replacing the bare conductors with ABC (Aerial Bundled Cable).

2.2. Project Plan's Outline and Scope

EVN has submitted a list of approximately 75 network reinforcement projects (“sub-projects”) out of pipeline projects, for which the executing agency already made fundamental project documents available, in order to apply for a proposed ODA Loan “Second Power Transmission and Distribution Network Development Project/ Power Sector Loan 3”.

The PCs constitute Northern Power Corporation (NPC), Central Power Corporation (CPC), Southern Power Corporation (SPC), Hanoi Power Corporation (HPC), and Ho Chi Minh City Power Corporation (HCMCPC).

The voltage classes of the facilities covered in the SPs range from 0.4kV to 220kV. The scopes of the SPs consist of new construction and/or reinforcement/rehabilitation of transmission, substation, and distribution facilities, and/or a combination of some of these facilities. The number of SPs by PC, Voltage, and the type of facilities are tabulated in Table 2-1.

Table 2-1 Number of SPs by PC, Voltage, and Type of Facilities*

Name of PC		NPC	HPC	CPC	SPC	HCMCPC	Total
220kV	T/L	-	-	-	-	-	-
	S/S	-	-	-	2	-	2
110kV	T/L	6	5	-	3	-	14
	S/S	18	8	-	10	1	37
MV, LV*		11	-	7	4	-	22
Total Number of SPs		35	13	7	20	3	75

T/L: Transmission Line, S/S: Substation

* Scope of some SPs constitutes a combination of transmission, substation, and distribution; however, the number of the SPs for each facility type was counted taking the primary portion of the SP into consideration.

** Both 35kV and 22kV distribution facilities are shown as MV (Medium Voltage), while 0.4kV distribution facilities as LV (Low Voltage).

Outlines of the SPs by PC are summarized in Table 2-2.

Feasibility of the SPs is to be described in Section 2.4, “Scope of the Project and Feasibility”.

Table 2-2 Outline of the SPs by PC

Name of PC		NPC	HPC	CPC	SPC	HCMCPC
Area		11 Prefectures	9 Districts	1 City, 5 Prefectures	13 Prefectures	6 Districts
New Construction of Transmission line	220kV	-	-	-	0.579km	9.1km
	110kV	97.219km	7.3km	-	124.035km	0.5km
Reinforced Transmission	220kV	-	-	-	-	-

Line (Addition of Circuits, • Conductor Replacement)	110kV	35km	53km	-	-	-
Number of New Substations (Newly installed Capacity)	220kV	-	-	-	3 substations (1,500MVA)	1 substation (500MVA)
	110kV	14 substations (1,220MVA)	2 substations (252MVA)	-	13 substations* (1,408MVA)	1 substation (63MVA)
Number of Substations Reinforced (Reinforced Capacity)	220kV	-	-	-	-	-
	110kV	5 substations (175MVA)	6 substations (378MVA)	-	-	-
New Construction of Distribution Line	35kV	110.3km (175.6km)*	-	-	-	-
	22kV	243.882km (345.982km)*	-	335.261km	141.820km	-
	0.4kV	-	-	705.903km	498.487km	-
Reinforcement of Distribution Line (Addition of Circuits, • Conductor Replacement)	35kV	238km	-	-	-	-
	22kV	1,298.933km	-	644.199km	68.912km	-
	0.4kV	-	-	323.784km	305.548km	-
New Installation/Reinforcement of Transformers (Reinforced Capacity)		1,520 units (1,533 units)* (414,480kVA) (418,220kVA)*	-	380 units (52,862kVA)	684 units (12,380kVA)	-

*The values include the construction volume of distribution equipment as the parts of transmission SPs.

The following items are the principal features of this project to achieve the objectives above:

■ Transmission Facilities

- Replacement of conductor (to that of larger diameter) as well as addition of circuits for alleviation of overloaded transmission lines
- Construction of new overhead/underground transmission lines connecting between the newly built substations, which will supply power to the new loads such as industrial parks and the existing transmission lines
- Securing the necessary ground height of conductors to conform to the regulations and public safety by replacing the existing towers with higher ones in order to correspond to

land development under the right-of-way as well as the land nearby

■ Substation Facilities

- Remedy of the constantly overloaded existing transformers, which is led by the rapid growth of the power demand in the supply area, by replacing the existing ones with those of larger capacities and/or installing additional transformers
- Securing the power supply capacity by installation of the new substations to cope with the foreseeable lack of power supply at the existing substations, which is expected to be led by the emergence of new loads in the industry parks, high load factors of the existing transformers and rapid growth of the power demand estimated in the national and provincial power development plans.
- Preparation for commencement of unmanned operation and remote control of the substations by adopting the SCADA system in newly constructed and reinforced substations.

■ Distribution Facilities

- Alleviation of the overloaded distribution feeders (MV and LV) and transformers even under the normal operation condition as the result of power demand growth in the supply area through replacement of the conductors with those of larger diameters and replacement of the transformers with those of larger capacities.
- Installation of the new MV lines and transformers to cope with the increase in the future power demand as well as extension of the existing LV lines.
- Prevention of electrocution incidents by construction workers who touch the hot wires in urban areas and of similar incidents in residential areas by replacing the bare conductors with ABC (Aerial Bundled Cable).
- Comprehensive measures such as installation of section switches to MV trunk lines, reduction of restoration time in the case of outages through introduction of interconnection lines and switchgears, prevention of lightning outages by installation of arresters, and replacement of bare conductors with ABC to prevent grounding faults from occurring by tree touching, to improve the customer satisfaction level as a result of a reduction in the duration of the power outages

Projects type in ODA loans are only construction work, and there are no repair work. It should be noted that the classification of construction and repair work in the PC, is shown in Table 2-3.

Table 2-3 Classification of Construction and Repairing

SP Type Construction Type		Transmission	Substation	Distribution
Construction	New Construction	<ul style="list-style-type: none"> • Construction of new transmission lines, which includes selection of the line route and securing of the right-of-way 	<ul style="list-style-type: none"> • Construction of new substations at the new location 	<ul style="list-style-type: none"> • Construction of new distribution lines (MV, LV), which includes selection of the line routes. • Extension of existing MV and/or LV, including installation of new transformers
	Reinforcement	<ul style="list-style-type: none"> • Conductor replacement (with larger diameter or the same diameter with larger transmission capacity; replacement (erection) of poles/steel towers may be included) • Additional circuits 	<ul style="list-style-type: none"> • Replacement of transformers with larger capacities • Additional installation of transformer(s) 	<ul style="list-style-type: none"> • Conductor replacement (with larger diameter or the same diameter with larger transmission capacity) • Replacement of transformers with larger capacities • Additional installation of transformer(s)
Repairing*		<ul style="list-style-type: none"> • Replacement of a part of equipment which has deteriorated due to aging and/or that has damage affecting the proper operation of the power system 	<ul style="list-style-type: none"> • Replacement of a part of equipment (except for transformers) which has deteriorated due to aging and/or that has damage affecting the proper operation of the power system 	<ul style="list-style-type: none"> • Replacement of a part of equipment which has deteriorated due to aging and/or that has damage affecting the proper operation of the power system

2.3. Project Implementation and Operation & Maintenance Management Structure

2.3.1. Project Implementation Entities

These PCs were established in 2010 through management integration of the former 11 regional power distribution companies. The PCs exclusively operate the distribution system (110kV, MV, and LV) and retail electricity in their supply area.

National Power Transmission Corporation (NPT), which is 100% state-owned one member Limited Liability Company under EVN as same as five PCs, is responsible for development and management of 500kV and 220kV power network system. Exceptionally, however,

HCMPC owns and operates some of 220kV transmission and substation facilities. EVN's direction to HCMPC, of which service area the specific 220kV transmission and substation facilities are located, made it possible for HCMPC to develop and operate 220kV facilities on behalf of NPT, which has faced severe shortage of capital for investment in recent years. SPC is also instructed to construct and operate 220kV transmission and substations on an exceptional basis.

The profiles of the 5 PCs are shown in Table 2-4.

Table 2-4 Profiles of each PC

Name of PC		NPC	HPC	CPC	SPC	HCMPC
Supply Area	Number of Provinces	27	3	13	21	1
	Population (thousand persons) ^{*3}	32,402	7,865	13,939	27,906	7,682
Power Sales (GWh)		33,580 ^{*2}	10,588 ^{*3}	11,090 ^{*2}	36,740 ^{*2}	17,651 ^{*2}
Number of Customers (million customers)		5.51 ^{*5}	2.00 ^{*3}	3.08 ^{*2}	5.88 ^{*3}	1.83 ^{*4}
Transmission Line ^{*1}	220kV	-	-	-	-	OH: 6.33km UG: 0.59km
	110kV	7,041km	695km	3,053km	4,170km	OH: 600.92km UG: 33.51km
Substation ^{*1}	220kV	-	-	-	-	5 substations (1,250MVA)
	110kV	186 substations (10,772MVA)	34 substations (3,418MVA)	93 substations (3,766MVA)	160 substations (9,879MVA)	49 substations (4,955MVA)
Distribution Line ^{*1}	MV	60,189km ^{*6}	OH: 5,331km UG: 2,437km	24,768km	50,070km	OH: 4,202.2km UG: 1,644.8km
	LV	121,824km			76,771km	OH: 3,676.4km UG: 1,489.9km
Power Loss		6.09% ^{*5}	7.30% ^{*3}	7.00% ^{*2}	5.64% ^{*3}	4.95% ^{*2}

Source: Study Team formulated based on annual reports and interviewing with PCs

The detailed values of MV/LV/Overhead/Underground line length shown on the table were given by PCs by June 2014.

*1: As of June 2014

*2: As of 2013

*3: As of 2012

*4 As of 2011

*5: As of 2009

*6: 10kV and 6kV included

Basically, in the organization of each PC, the Chairman & General Director controls 4 Deputy General Directors, who take charge of Technique, Construction Investment (or

Construction Management), Sales (or Power Business), Telecommunication & IT, or Production. Under the management of these deputy general directors, the functional departments of the headquarters of PCs, subsidiaries (local power companies) and affiliated companies fulfill their own functions. The Project Management Unit (PMU) or similar units that manage SP project implementation in each PC, the load dispatch center, the high voltage power network center, and the electrical testing center (company) alike are ranked besides the functional units. Exhibit 2-1 shows the organizational chart of HPC as an example.

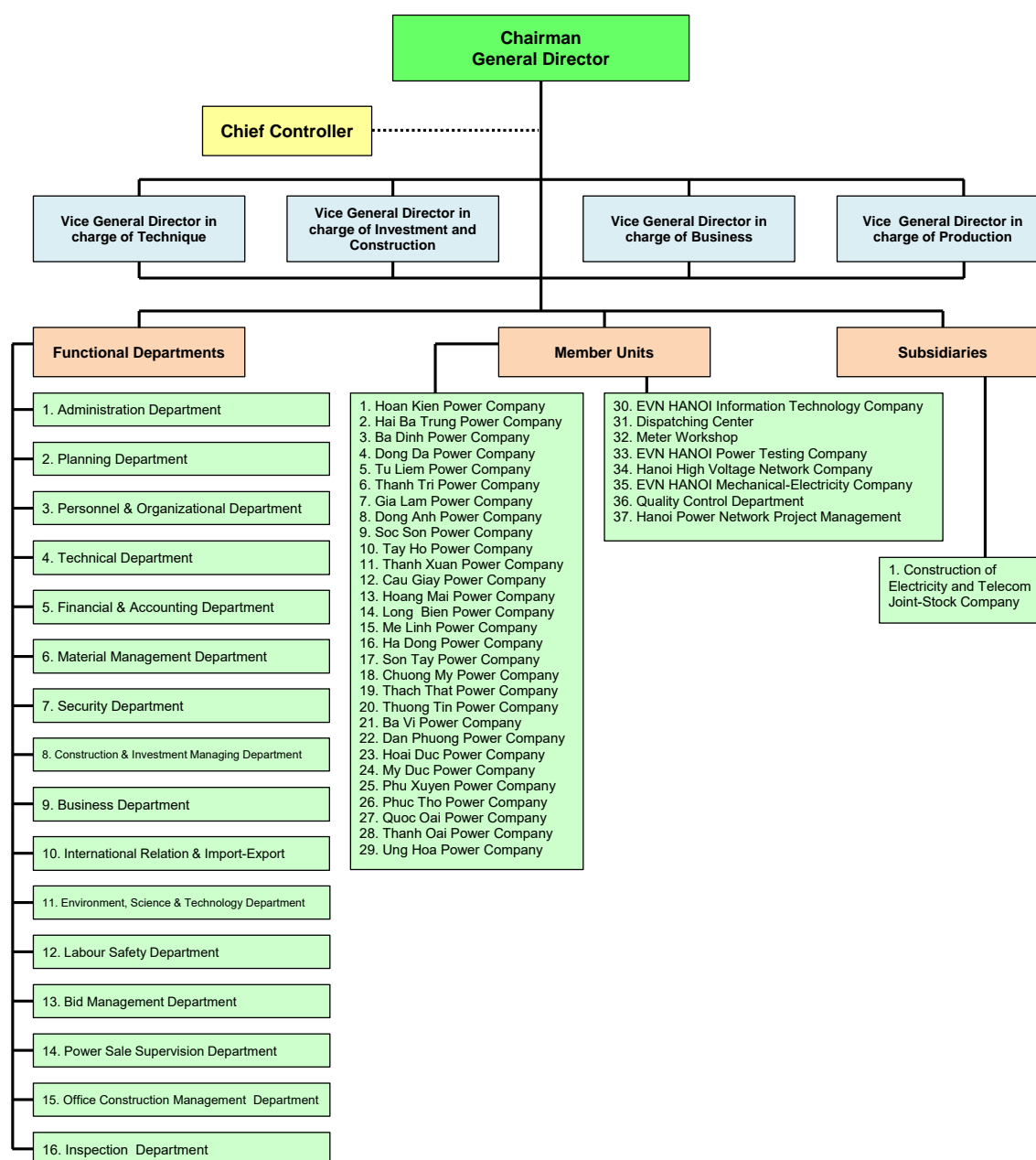


Exhibit 2-1 Organizational Chart of PC (HPC)

Each PC has abundant experience in project implementation of transmission and distribution facility development financed by a variety of donors such as the World Bank, Asian Development Bank, KfW, etc. as well as by its own fund. Basically, there is no cause for concern about project implementation, hence no advanced technologies are planned to be applied to each of the SPs.

As for SPC, two of proposed SPs are 220kV new substation construction projects and it has no experience in implementing 220kV SPs in the past. In this regard, it is necessary to confirm the capacity of SPC in terms of design audit and construction supervision in the project appraisal stage.

2.3.2. Project Implementation Structure

In the project implementation stage, each PC is responsible for comprehensive implementation management of SPs. Exhibit 2-2 shows the general organizational structure of PC's headquarters.

Project Management Unit (PMU) or similar organizations with different names by PC, which are in charge of comprehensive project management on behalf of PC, are under the direct control of Chairman and Deputy Directors. PMU or the similar organizations perform their own functions in close coordination with relevant functional departments (planning department, international relations department, financial & accounting department, investment management department, technical department, etc.) of the headquarters.

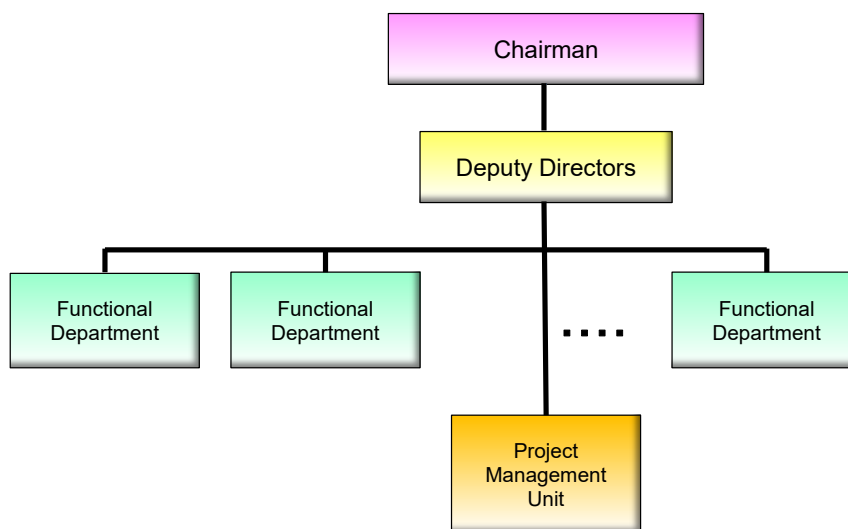


Exhibit 2-2 Management Structure relevant to SP Implementation Management

PMU and similar organizations have, although there are some differences in the structures, their own functional departments/divisions under the direct control of Director and Deputy Directors such as Administration Department, Planning Department, Materials Department,

Technical Department, Finance & Accounting Department, Supervision Management Department, Site Clearance & Compensation Department, etc. Exhibit 2-3 shows the organizational structure of the Power Project Management Board (PPMB) of Ho Chi Minh City for example.

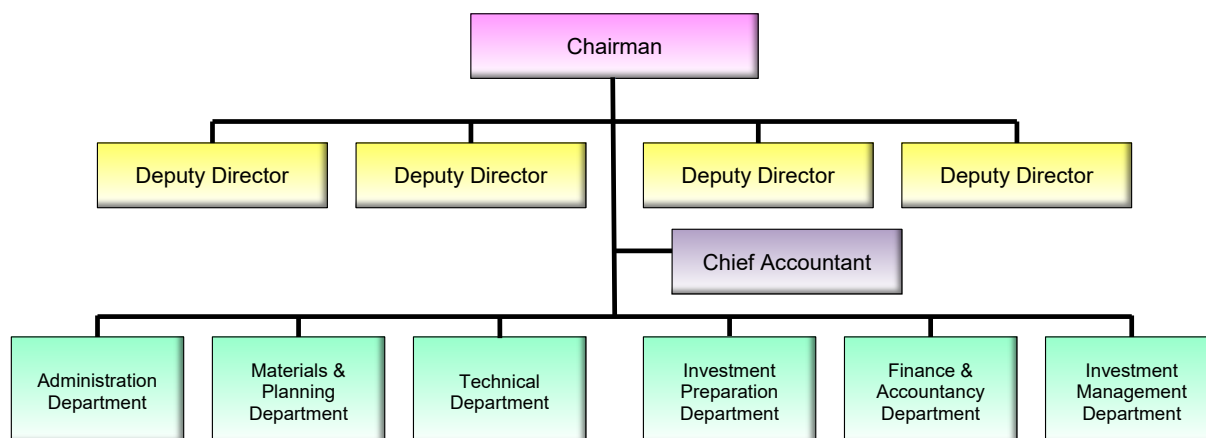


Exhibit 2-3 Organizational Structure of HCMC PC's PPMB

Table 2-5 shows the roles of Functional Departments in PC's Headquarters and PMU in SP Implementation Process in terms of project management. There is no specific functional department which solely takes responsibility on control over the project management as a whole. PMU (for HPC) and PPMB (HCMCPC) perform the function on behalf of their headquarters.

Table 2-5 Roles of Functional Departments in PC's Headquarters and PMU in SP Implementation Process

Tasks	Condition	Responsible Department(s)/ Units				
		NPC	HPC	CPC	SPC	HCMCPC
Overall Control of Project Management in NPC's Headquarters		Construction Management Department	Power Network Project Management Board (PMU)	Construction Management Department	Investment & Administration Department	Relevant functional departments of HCMCPC (International Relations Dept, Planning Dept, Finance & Accounting Dept, Investment Management Dept and Engineering Dept.)
Detailed Design (Technical Design)		Construction Management Department	- Technical Department - Investment and Construction Management Department	Central Network Project Management Unit (PMU)	Southern Power Project Management Unit (PMU)	Power Project Management Board of Ho Chi Minh City (PPMB)
Preparation of Tender Documents		PMBs	- PMU - Tender Management Department	ditto	International Relations Department	ditto
Tender of Contractor	ICB	N/A	Tender Evaluation Team organized by members of functional departments in HPC's HQ (technical, financing, legislation, etc.), PMU	N/A	ditto	ditto
	NCB	PMBs (Tender Management Department is the coordinator of the Bidding Appraisal Team)	ditto	PMU	ditto	ditto
Equipment Procurement	ICB	ditto	ditto	International Relation Department with members from other functional departments of EVNCPC	ditto	ditto
	NCB	ditto	ditto	ditto	ditto	ditto
Construction Supervision	110kV	PMBs	PMU	ditto	PMU	ditto
	MV, LV					
Project Implementation Monitoring	110kV	ditto	- PMU - Planning Department - Financing & Accounting Department	ditto	ditto	Investment Management Dept
	MV, LV					
Land Acquisition		ditto	PMU in coordination with local authorities	ditto	ditto	PPMB
Environmental and Social Considerations		ditto	- PMU - Department of Science, Technology and Environment	ditto	ditto	ditto
Execution of Operation & Management of the facilities after completion of Sub-projects	110kV	Northern Grid Company (NGC)	Hanoi High Voltage Network Company	CPC Central Grid Company	Southern High-Voltage Grid Company	High Voltage Power Network Company
	MV, LV	Operation & Maintenance Department of Provincial Power Companies	Operation & Maintenance Department of Provincial Power Companies	Operation & Maintenance Department of Provincial Power Companies	Operation & Maintenance Department of Provincial Power Companies	Operation & Maintenance Department of Provincial Power Companies

2.3.3. Operation and Maintenance

Operation and maintenance of the transmission/substation/distribution facilities after completion of the SPs is dealt with by the network companies, which are subsidiaries of each PC. According to the meeting with HCMCPC, the inspection interval of the main equipment of substations (transformers, circuit breakers, etc.) is that recommended by the manufacturers which supplied the equipment. The PC does not have their own inspection intervals set based on the condition of equipment. It is necessary to confirm whether the other PCs have their own rules for setting appropriate inspection and maintenance intervals as well as maintenance methods for each kind of equipment at the appraisal stage.

2.3.4. Equipment Procurement for the Project

The primary equipment expected to be used for the project is summarized in Table 2-5. The equipment for the transmission SPs (conductors, insulators, and grounding wire) and that for the distribution SPs (poles, conductors, and insulators) are omitted from Table 2-5.

Basically, all of the five PCs procure the necessary equipment for the SPs by way of International Competitive Bidding (ICB). The principal suppliers of the equipment are as follows:

■ Transmission Material

- Steel Tower: Onshore procurement available
 - 10 Local manufacturers (Names of the manufacturers not available)
- Conductor: Onshore procurement available
 - LS VINA Cable (Vietnam)
 - CADIVI (Vietnam)
 - 8 other local manufacturers
- Insulator (polymer insulator): Offshore procurement
 - MacLean China (China)
 - Isoelectric (Italy)
- Ground Wire: Onshore procurement available
 - LS VINA Cable (Vietnam)

■ Substation Material

- Transformer (220/110kV): Onshore procurement available
 - Dong Anh Electrical Equipment Manufacturing, JSC (Vietnam)
- Transformer (110/22kV): Onshore procurement available
 - EEMC (Vietnam)
 - EEMP (Vietnam)
 - Dong Anh Equipment Manufacturing, JSC (Vietnam)
 - Vinacomin (Vietnam)

- ABB (Vietnam)
- Circuit Breaker (110kV): Offshore procurement
 - ABB (China)
 - ALSTOM/AREVA (India)
 - Siemens (India)
- VT, CT: Offshore procurement
 - Emek (Turkey)
 - Trench (China)
 - ABB (India)
 - ALSTOM/AREVA (India)
 - Nirou Trans (Iran)
 - Artech (Spain)
- Surge Arrester: Offshore procurement
 - Cooper Power Systems (USA)
 - Siemens (China)
 - Toshiba (China)
 - Tyco Electronic (France)
- Distribution Material
 - Transformer (22kV/0.4kV): Onshore procurement available
 - THIBIDI (Vietnam)
 - EEMC (Vietnam)
 - ABB (Vietnam)
 - Dong Anh Electrical Equipment Manufacturing (Vietnam)
 - VinaTAKAOKA Electrical Equipment (Vietnam)
 - Recloser: Offshore procurement
 - Nulec* (Australia)*Currently under Schneider group
 - Cooper Industries (USA)
 - ABB (Vietnam)
 - Shinsung Industrial Electric (South Korea)

2.4. Validity of the Project Scopes

The project is regarded as valid in that such multiple effects as alleviation of overloaded transmission/substation/distribution facilities, which have been the bottlenecks to stable power supply in the extensive regions of Vietnam; enhancement of the power supply capacity responding to the growth of the power demand for both consumer and industrial use in the future; strengthening of the financial standing of the PCs by means of transmission and distribution loss reduction, which has been one of the obstacles against securing the

management foundation in the movement of electricity liberalization; improvement in the power quality through reduction in the number of grounding faults and in the duration of power interruptions as well as resolution of voltage drop; and the ensuring of public safety by making the facilities conform to the technical criteria are anticipated through implementation of the SPs.

The scopes of the SPs include reinforcement of transmission and distribution facilities (new construction, replacement of conductors with those of larger diameter, construction of interconnection lines), reinforcement of substation facilities (new construction of substations and capacity enhancement), and improvement in insulation performance (replacement of bare conductors with cables, raising the tower height). The expected effects of the SPs, which would resolve the challenges that the PCs face, are shown in Table 2-6. In the table, the circles “o” denote the measures which are expected to have effects.

Table 2-6 Expected Effects of the Project

Issues Measures	Overloading	Transmission /Distribution Loss	Power Supply Reliability	Public Safety
Reinforcement of Transmission /Distribution Facilities	o	o	o	—
Reinforcement of Substation Facilities	o	o	o	—
Improvement of Insulation Performance	—	—	o	o

- Enhancement of capacity in the transmission facilities, the distribution facilities, and the substation facilities :

The overloading and transmitting losses will be reduced by the enhancement of the facilities capacity. In addition, with increasing capacity, facility operation rate is also reduced.

In addition, with the increase in the installed capacity, facility operation rate will be reduced, if the failure occurs at the distribution line, it is possible to power supply by switching to the other distribution line by disconnecting the faulty equipment/ section, through a preliminary capacity of sound facilities, it is expected that the supply reliability improved.

- Improvement of Insulation performance:

By using insulating conductor and ABC of the overhead distribution line, are directly expected that the prevention of outage caused by wildlife/ trees contact to the electric conductor, and reduction of the disaster caused by the electric shock of the construction workers and public person.

Chapter 3 Evaluation and Ranking for Sub-Projects

3.1. Methodology of Evaluating Sub-Projects

To formulate a set of prioritization criteria for evaluation of approximately 120 small-sized projects (“sub-projects” or “SP”) for implementation of the Plan in line with power demand, industrial locations, and investment promotion, and to actually prioritize the sub-projects based on the agreed criteria.

Specifically, to index and weight the following parameters in order to evaluate the sub-projects with a unified and objective scale. A set of draft criteria and respective weighting will be presented in advance to the Vietnamese side and agreed/optimized in consultation with JICA and EVN in the form of the final set of criteria with respective weighting by reflecting local requirements.

- State of existing facilities such as commissioned Month/Year, level of supply reliability (outage time/frequency), loss rates, reference to the regulated permissible voltage level, voltage fluctuation, power quality (flickers), etc.
- Urgency of facility reinforcement based on power supply-demand situations such as peak load status and facility load/plant factor, etc.
- Consistency with national power system development plan
- Existence of important end-users such as hospitals, police stations, firefighter stations, broadcasting facilities, etc.
- Evaluation of economic/financial effects of sub-projects
- Benefits to industrial clusters (such as industrial parks) including Japanese firms through improvement in supply reliability, improvement of power quality
- Status of feasibility studies and the maturity of project documents in terms of design, cost estimate, and land acquisition plan
- Adverse environmental and social impacts such as wetland, protected forests, national parks, endangered species, archeological sites, indigenous population and the like
- Capacity for renewable energy integration

The Team will summarize the prioritized sub-projects into a ranking list with an image of the list attached below. In addition to quantitative results computed with points and weights of a pre-agreed set of indices, all the sub-projects will be generally evaluated in terms of sub-project specific characteristics that are not fully covered by such indices and finalized into the final ranking of prioritized sub-projects.

Table 3-1 Image of the List of Prioritized Sub-projects

Name	Index1* Weight	Index2* Weight	Index3* Weight	.....	Score	Special Notes	Final Rank
SP#1	3*2	1*1	1*1	.....	Total Points	Bonus scores complementarities with other sub- projects	1
SP#2	....	....	....	.....	.....	.....	2
SP#3	....	....	....	.....	.....	.....	3
....						
SP#n							

A set of draft indices will be consulted upon with EVN and JICA and finalized together with allocated points and weights, taking into consideration actual local requirements. Possible candidate indices are shown in the following Exhibit.

3.2. Classification of Sub-Projects

All the SPs are numbered in accordance with the rules described below.

- “Name of PC” – “Voltage Class” – “Serial Number”
- Name of the PCs: NPC, HAN, CPC, SPC, HCM
- Voltage class in the main component: A-220kV, B-110kV, C-MV/LV

For example, SPC-B-02 means 110kV project No.2 in Southern Power Company.

3.3. Criteria Setting

Table 3-2 Setting Criteria

Item to be evaluated	Evaluation Criteria	Point	Weight
• Load Factor • Peak Load Status	Load factor at peak time (against the short-term limit) Urgency for facility reinforcement	>120% 3 points Between 100% and 120% 2 points <100% 1 point	2
• Loss Rates	Average Load Factor	>90% 4 points Between 80% and 90% 3 points Between 70% and 80% 2 points Between 60% and 70% 1 point <60% 0 points	2
• Power Quality	Reference to the regulated permissible Voltage Range	Not complied 2 points Complied 1 point	1
• Consistency with higher planning	Compliance with a national-level (220kV over) power system plan Peak Load Factor of higher voltage system related to sub-project	<60% 5 points Between 60% and 70% 4 points Between 70% and 80% 3 points Between 80% and 90% 2 points >90% 1 point	1
• Important connections with special considerations	Existence of important connections such as hospitals to respective S/S and feeders	Exist 2 points Absent 1 point	1
• Renewable Energy Integration	Existence of interconnected large-scaled RE development plan	Exist 2 points Absent 1 point	1
• Project Economy	Sub-Project FIRR	>30% 3 points Between 20% and 30% 2 points <20% 1 point	2
• Benefits to Japanese tenants	Number (#) or Contracted Capacity (kW) of Japanese tenants connected with proposed lines & substations	More than 10 units or 500kW 3 points Between 5/250kW and 10/500kW 2 points Less than 5 units or 250kW 1 point	2
• Maturity of Project Preparation	Progress of Feasibility Study including design, cost estimate and land acquisition	FS Approved 3 points FS Draft Completed 2 points Pre-FS only 1 point	2
• Maturity of Project Summary Report	Elaboration of contents for easy understanding of the following items: 1) Scope and investment amount 2) Necessity of sub-project 3) Effect of sub-project (Comparison of situation between before and after project)	3 items are well described 3 points 2 out of 3 items are well described 2 points 1 out of 3 items is well described 1 point None of 3 items is well described 0 points	1
• Maturity of Socio-environmental Impact Analysis	EIA Approval Status	EIA not required/Approved 3 points Under preparation/yet to be approved 2 points EIA required but not started yet 1 point	1

Item to be evaluated	Evaluation Criteria	Point	Weight
·Environmental Considerations	Impact on forest	0 ha 1.5 points Under 50 ha 1.0 points 50 - 100 ha 0.5 points Over 100 ha Exclude	1
	Impact on protected area	No passage through protected area and endangered species 1.5 points Limited impacts on protected area or endangered species 1.0 points Considerable impacts on protected area or endangered species 0.5 points	
·Social Considerations	Resettlement	0 1.5 points 1-50 1.0 points 50-200 0.5 points Over 200 Exclude	1
	Land acquisition	0 ha 1.5 points Under 50 ha 1.0 points Over 50 ha 0.5 points unknown 0.5 points	
·Opportunities for Japanese manufacturers to participate in ICB for Equipment Procurement	Existence of equipment with advanced technologies in which Japanese manufacturers have advantages over competitors	Exist 2 points Absent 1 point	2
·Relevance of concurrent Implementation of Sub-Project	Existence of sub-project(s) that has(have) influence on the effect of the sub-project in question	Exist 2 points Absent 1 point	1

* No provision of the required data/information for each evaluation item and/or violation of the data input rules which the JICA Study Team instructed shall be regarded as zero (0) points.

3.3.1. Load Factor

For two of the 220kV substation SPs (hereinafter Type A SP) and fifty-one of the 110kV transmission line & substation SPs (hereinafter Type B SP), the maximum operation rate is evaluated using the criterion indicated in Table 3-3. For SPs of transmission lines and/or substation, the maximum operation rate of existing facilities near the sites of SPs are taken for the evaluation of new installation and for SPs of rehabilitation, the maximum operation rate of facilities to be rehabilitated are used for evaluation. Similarly, for twenty two of the distribution line SPs, the operation of feeders in relevant areas is taken for new constructions and operation rate of feeders to be rehabilitated is taken for rehabilitation projects. The operation rate defined here is the ratio of peak demand to rated capacity of transformers for substations and conductors for transmission lines. Since the reduction of operation rate is closely related to the core purpose of resolving overloading, the evaluation results are weighted with the factor of two.

The definition of facility operation rate, the definition of average operating rate as loss rate in the next section, the Operation target for Peak Load Status, Operation target for Average Load Factor, the higher operation target and corresponding peak loading time for peak

Loading Status, are shown in Attachment 2.

Table 3-3 Load Factor

Load factor at peak time	Point
Over 120% against rated equipment capacity	3
Over 100% and less than 120%	2
Less than 100%	1

3.3.2. Loss Rate (Average Operation Rate)

To evaluate the loss rate in the same manner as 3.2.1, the annual average operation rate of existing facilities near the sites of SPs is taken for the evaluation of new installations and the maximum operation rate of facilities to be rehabilitated is taken for the evaluation of rehabilitation SPs. The evaluation is made based on the criterion indicated in Table 3-4. Similarly, for Type C SPs, the annual average operation rate of feeders in relevant areas is taken as a criterion for new constructions and operation rate of feeders to be rehabilitated is taken as a criterion for rehabilitation projects. With the increase of current flowing on conductors, the copper loss is expected to increase accordingly. Therefore, the average loss rate is taken as a gauge to measure the power loss. The annual average loss is defined as the average of the maximum peak load of each month in 2013. Since the reduction of operation rate is closely related to the reduction of power loss, the evaluation result is weighted with the factor of two.

Table 3-4 Annual average operation rate

Operation Rate	Point
Over 90% against rated equipment capacity	5
80%~90%	4
70%~80%	3
60%~70%	2
Below 60%	1

3.3.3. Power Quality

To evaluate the power quality, the compliance with regulations for each voltage class is used. If power quality complies with the regulations, one point is endowed, since the priority of the implementation of SP is relatively low in this case. Two points are endowed in the case of non-compliance with power quality, since urgency for the implementation of SPs is higher in this case. For 220kV and 110kV SP, it is judged that the power quality complies with the regulations if the voltage on busbar is +/- 5% of nominal voltage.

Table 3-5 Power Quality

Reference to the regulated permissible Voltage Range	Point
Not complied	2
Complied	1

3.3.4. Consistency with Higher Planning

In implementing SPs, their feasibility is lowered with the overloading of higher systems. Or the implementation may be postponed until the rehabilitation of higher systems takes place. In light of this constraint, the level of operation rate of higher systems (500kV systems for 220kV SPs, 220kV systems for 110kV SPs and 110kV systems for distribution SPs) is taken to evaluate the feasibility of each of the SPs. The feasibility of the SP is highest in the case that the operation rate is less than 60%, which is set as a preferable operation target by most of the PCs. The lowest points are assigned in the case that the operation rate of the higher system is more than 90%, since the implementation of SPs is not feasible without rehabilitation on higher systems.

Table 3-6 Consistency with Higher Planning

Operation Rate	Point
Less than 60% against rated equipment capacity	5
60%~70%	4
70%~80%	3
80%~90%	2
Over 90%以上	1

3.3.5. Important Customers

In order to evaluate the positive social impacts of the implementation of SPs, the connection of important customers such as major hospitals in the regions is selected as a criterion. After the implementation of SPs, power supply capacity is strengthened with the possible improvement of power quality, which is to contribute to the improvement of functionality of the customers.

Table 3-7 Social Effects of Project

Connection to Important Customers	Point
Yes	2
No	1

3.3.6. Possible Connection of RE Sources

In order to secure the connection of large renewable energy sources such as wind power and mega-solar (excluding conventional hydropower stations), sufficient power supply capacity on the grid is preferable. With grids strengthened by the proposed SPs, the accessibility of

renewable energy sources will be improved. Therefore, two points are to be put on SPs with possible connection of large renewable energy sources to be expected in the near future.

Table 3-8 Possible Connection of RE Sources

Existence of interconnected large-scaled RE development plan	Point
Yes	2
No	1

3.3.7. Financial Evaluation of Projects

For the evaluation of economic feasibility, FIRR of SP implementation is taken as a criterion. Since the implementation of SPs with higher FIRR is to directly contribute to the strengthening of the financial position of PCs, weight of evaluation is doubled.

Table 3-9 Financial Evaluation of Projects

FIRR	Point
Over 30%	3
20% ~ 30%	2
Below 20%	1

3.3.8. Benefit to Japanese Firms

Benefit to Japanese firms by JICA loan is critical points to be evaluated. Therefore, the evaluation point is doubled.

Table 3-10 Benefit to Japanese Firms

Benefit to Japanese Firms	Point
More than 10 units or aggregated contracted capacity of 500kW	3
Between 5~10 units or between 250kW and 500kW	2
Below 5 units or 250kW	1

3.3.9. Maturity of FS

In order to check the preparedness of SPs, the maturity of FSs for SPs is evaluated. The evaluation is made in three stages, namely, three points are endowed when FS is approved, two points are endowed for the completion of draft FS and one point is endowed for the submission of pre-FS (refer to Table 3-11). Since highly mature FSs ensure the smooth implementation of SPs, evaluation is weighted with the factor of two.

Table 3-11 Maturity of FS

FS Status	Point
FS Approved	3
FS Drafted	2
Pre-FS Only	1

3.3.10. Maturity of FS Summary Report

In order to evaluate the completeness of FSs, the contents of project summary reports are evaluated using a criterion set by Table 3-12. To be specific, the description of 1) scope of SP, investment amount, 2) necessity of SPs and 3) the effect of SPs in project summary reports are checked.

Table 3-12 Maturity of FS Summary Report

Elaboration of contents for easy understanding of defined three items	Point
3 items are well described	3
2 out of 3 items are well described	2
1 out of 3 items is well described	1
None of 3 items is well described	0

3.3.11. Progress of Environment Impact Assessment

Progress of the Environmental Impact Assessment (EIA) is evaluated by Requirement of EIA report, Preparation condition of EIA, and Approved condition. EIA in Vietnam is stipulated in Law on Environmental Protection No.52/2005/QH11 and the EIA procedures and required content of the report are described in the Decree No.29/2011/ND-CP. Decree No.29 lays down that transmission and/or substation projects of 110 kV or more require an EIA. Five projects have 220 kV, fifty-one projects have 110 kV and twenty-two projects have less than 110 kV. Therefore, fifty-seven projects require an EIA. The projects which do not need an EIA or have an approved EIA are given three points, the projects that require an EIA but this is under preparation are given two points, and the projects that require an EIA but this has not started preparation are given one point (see Table 3-13).

Table 3-13 Evaluation points for Impact Assessment

EIA	Point
EIA not required/Approved	3
Under preparation/yet to be approved	2
EIA required but not started yet	1

Impact on the natural environment is evaluated by impact on forests and impact on protected areas. Based on the information reported by PCs, the projects which affect forest of more than 100ha are ruled to be excluded, 0.5 points are given for less than 100 ha and over 50 ha, 1 point is given for less than 50 ha, and 1.5 points are given for 0 ha affected forest projects (see Table 3-14). Even if no impact is reported by the PCs, the evaluation points are reviewed based on the satellite image and distribution maps of the protected species. On the other hand, impact on protected areas is evaluated by the impact on national and international protected area. Special-use forests and Protection forests are used as National Protected Area among forest areas defined by Forest Protection and Development Law No.29/2004/QH11 (see Table 3-15). Wetland under the Ramsar Convention, UNESCO's Biosphere reserves, and World Heritage Sites are used as International Protected Areas. 1.5 points are given to projects

outside of protected areas, 1 point is given to projects which partly cover protected areas, 0.5 points are given to projects which greatly cover protected areas (see Table3-16).

Table 3-14 Evaluation points for Impact on forest

Deforestation (ha)	Point
0 ha	1.5
Under 50 ha	1
50 - 100 ha	0.5
Over 100 ha	Exclude

Table 3-15 Forest categories in Vietnam

Category	Forest Type
Special-use forests	National parks Nature preservation zones Scenery protection
Protection Forest	Forest for research and experiment Headwater protective forest land Wind-protective and sand-protective forest Wave-breaking or sea-encroaching forest Environment protective forest
Production forests	Production forest land

Table 3-16 Evaluation points for Impact on protected areas

Protected Area	Point
No passage through protected area and endangered species	1.5
Limited impacts on protected area or endangered species	1
Considerable impacts on protected area or endangered species	0.5

Impact on Social Environment is evaluated by number of resettlements and land acquisition area. 0.5 points evaluation points are given for more than 50 and less than 200, 1 point is given for more than 1 and less than 50, 1.5 points are given for 0 persons, and projects in which resettled people is more than 200 are ruled to be excluded (see Table 3-17). For land acquisition, 1.5 points are given for 0 ha, 1 point for less than 50 ha, 0.5 points for over 50 ha and 0 points for unknown land acquisition area (see Table 3-18).

Table 3-17 Evaluation points for Resettlement

Resettlement (person)	Point
0	1.5
1-50	1.0

50-200	0.5
Over 200	Exclude

Table 3-18 Evaluation points for land acquisition

Land Acquisition	Point
0 ha	1.5
Under 50 ha	1.0
Over 50 ha	0.5
unknown	0.5

3.3.12. Benefits to Japanese Manufacturers (Transmission, Substation, Distribution Facilities)

To evaluate the benefits to Japanese manufacturers, two points are endowed in the case that Japanese manufacturers have technical superiority over overseas manufacturers and one point is endowed in the case that Japanese manufacturers do not have technical superiority, where international bidding is held. The delivery of products is directly linked to the benefit to Japanese manufacturers. Therefore, the evaluation is weighted with the factor of two. (See Table 3-19).

Table 3-19 Possibility of Delivery of Products by Japanese Manufacturers

Existence of equipment with advanced technologies in which Japanese manufacturers have advantages over competitors	Point
Exist	2
Absent	1

As candidates for products with the superiority of Japanese manufacturers, the below are chosen.

■ Transmission Equipment

The metropolitan areas such as Hanoi City and Ho Chi Minh City have witnessed significant advancement of urbanization accompanied by rapid economic growth. In these areas, it is quite difficult to acquire land and right-of-ways for new development and/or reinforcement of transmission lines. Some of the PCs, such as HPC and HCMCPC, have applied a special conductor, GZTACSR (Gap type super thermal-resistant aluminum alloy conductor steel reinforced), which was developed by Japanese manufacturers, for some transmission sections which pass through densely populated areas, aiming at enhancement of the transmission capacity as well as reduction of the conductor sag, thus avoiding re-erection of steel towers/poles. Application of GZTACSR can resolve the problem inherent in ACSR, the sag of which is likely to increase caused by conductor temperature rise led by the increase in the load factor of the transmission line due to the growth of power demand in urban areas.

■ Substation Equipment

GIS (gas-insulated switchgear): Toshiba Corporation, Hitachi, Ltd., Mitsubishi Electric Corporation

In the case of building a substation in an urban area, it is difficult to secure land. Thus, it is necessary for substations to be constructed in smaller sites as much as possible. In this case, if they adopt GIS (gas-insulated switchgear), SF6 gas-insulated, they can design the substation more compactly than when adopting AIS (Air Insulated Switchgear). Japanese manufacturers have the skill to turn out GIS. We obtained information from a PC in which they adopted GIS at their existing substations.

■ Distribution Equipment

There are no related products.

3.3.13. Relevance of Concurrent Implementation of Sub-Projects

In order to maximize the effectiveness of SP implementation, in the case that the other SP has to be implemented simultaneously, those SPs are given two points respectively. If an SP is implemented independently without losing its expected effectiveness, such SP is given 1 point. The weighting factor is 1.

Table 3-20 Relevance of concurrent Implementation of Sub-Projects

Existence of sub-project(s) that has (have) influence on the effect of the sub-project in question	Point
Exist	2
Absent	1

3.4. Evaluation Results (Technical, Economic, Benefit to Japanese Firms)

Indicated in Tables 3-21 through 3-37 are the distribution of points of all of SPs by PCs.

3.4.1. Peak Load Status

In Table 3-21, the ratio of peak load against rated capacity is indicated. There are 10 SPs of peak load ratios falling into the range of 100-120% and 30 SPs of peak load ratios less than 100% with no SPs of peak load status exceeding 120%. There are 35 SPs evaluated as N/A, since the content of the description in the FS Summary Report does not fit the format offered.

Table 3-21 Peak Load Rate

Load Factor Peak Load Status	Point	NPC	HPC	CPC	HCMC PC	SPC	Total
>120%	6						
Between 100% and 120%	4		6	3		1	10
<100%	2		7	4	1	18	30
N/A	0	35					35
Grand Total		35	13	7	1	19	75

3.4.2. Loss Rate

In Table 3-22, the annual average load operation rate is indicated as a result of evaluating loss rates. There are 3 SPs with loss rates exceeding 90%, 9 SPs with loss falling into the range of 70 to 80% and 3 SPs with loss rate less than 60%. 35 SPs are evaluated as N/A, since the format of the description is different from the one directed, which is the same as Table 3-21.

Table 3-22 Loss Rate

Average Load Factor	Point	NPC	HPC	CPC	HCMC PC	SPC	Total
>90%	8		2			1	3
Between 80% and 90%	6		1		1	7	9
Between 70% and 80%	4		4	1		11	16
<60%	2		3				3
N/A	0	35	3	6			44
Grand Total		35	13	7	1	19	75

3.4.3. Power Quality

In Table 3-23, the evaluation result of compliance with the regulation on voltage is depicted. 49 SPs do not comply with the regulation while 29 of them comply with it.

Table 3-23 Power Quality

Reference to the regulated permissible Voltage Range	Point	NPC	HPC	CPC	HCMC PC	SPC	Total
Not complied	2	32				17	49
Complied	1	3	13	7	1	2	26
Grand Total		35	13	7	1	19	75

3.4.4. Consistency with Higher Planning

In Table 3-24, the evaluation result of consistency with higher planning is shown. For 1 SP, the operation rate of higher systems is less than 60%. 13 SPs are falling into the range of 60 to

70% operation rate of higher systems and 42 SPs are falling into the range of operation rate 70 to 80 of higher systems. For 7 SPs, the operation rate of higher systems is more than 90%.

Table 3-24 Consistency with Higher Planning

	Point	NPC	HPC	CPC	HCMC PC	SPC	Total
<60%	5					1	1
Between 60% and 70%	4		6			6	12
Between 70% and 80%	3		5	5		3	13
Between 80% and 90%	2	35	1	2		4	42
>90%	1		1		1	5	7
Grand Total		35	13	7	1	19	75

3.4.5. Important Connections

Indicated in Table 3-25 is the evaluation result of important connections. For all of the 75 SPs, connection is made for important customers.

Table 3-25 Important Connections

Existence of important connections	Point	NPC	HPC	CPC	HCMC PC	SPC	Total
Exist	2	35	13	7	1	19	75
Absent	1						
Grand Total		35	13	7	1	19	75

3.4.6. Connection of RE sources

In Table 3-26, the evaluation result on the possible connections of RE sources is indicated. For all 75 SPs, there are no possible connections of RE sources (excluding hydropower stations).

Table 3-26 Connection of RE sources

Existence of interconnected large-scaled RE development plan	Point	NPC	HPC	CPC	HCMC PC	SPC	Total
Exist	2						
Absent	1	35	13	7	1	19	75
Grand Total		35	13	7	1	19	75

3.4.7. Economic Evaluations of SPs

In Table 3-27, the result of economic evaluation for SPs is indicated. For 26 SPs, FIRR exceeds 30%. 18 SPs have FIRR in the range of 20 to 30%. For 19 SPs, FIRR is less than 20%. 12 SPs without evidence on the timing of submission are evaluated as N/A.

Table 3-27 Economic Evaluation

Sub-Projects FIRR	Point	NPC	HPC	CPC	HCMC PC	SPC	Total
>30%	6	9	13	1		3	26
Between 20% and 30%	4	13				5	18
<20%	2	1		6	1	11	19
N/A	0	12					12
Grand Total		35	13	7	1	19	75

3.4.8. Benefit to Local Japanese Firms

Table 3-28 indicates the evaluation result of benefit to Japanese firms. For 66 SPs, firms that benefit are more than 10 or summed contracted capacities are more than 500kW. For 5 SPs, the number of firms that benefit are between 5 and 10 or summed contracted capacities are in the range of 250 to 500 kW. For 5 SPs, firms that benefit are less than 5 or summed contracted capacities are less than 250kW. A list of Japanese firms connected with substations where SPs take place is shown in Attachment 3.

Table 3-28 Benefit to Japanese Firms

Number (#) or Contracted Capacity (kW) of Japanese tenants connected with proposed lines & substations	Point	NPC	HPC	CPC	HCMC	SPC	Total
More than 10 units or 500kW	6	35	11	4		16	66
Between 5/250kW and 10/500kW	4		1	1	1	2	5
Less than 5 units or 250kW	2		1	2		1	4
Grand Total		35	13	7	1	19	75

3.4.9. Maturity of FS

Table 3-29 indicates the evaluation result of FS maturity of SPs. FSs have been approved for 7 PCs. Draft FS reports have been completed for 36 SPs. Pre-FSs have been undertaken for 30 SPs. 2 SPs do not accompany any FS documents.

Table 3-29 Maturity of FS

Progress of Feasibility Study including design, cost estimate and land acquisition of Japanese tenants connected with proposed lines & substations	Point	NPC	HPC	CPC	HCMC	SPC	Total
FS Approved	6	3	1		1	2	7
FS Draft Completed	4		12	7		17	36
Pre-FS only	2	30					30
N/A	0	2					2
Grand Total		35	13	7	1	19	75

3.4.10. Maturity of Project Summary Report

Table 3-30 indicates the evaluation results of the maturity of the Project Summary Report for each of the SPs. For 7 SPs, all three defined items are well described. For 56 SPs, two of the three items are covered. 10 SPs are accompanied with 1 item. For 2 SPs, there is no description on any of those three key items in the Project Summary Report.

Table 3-30 Maturity of Project FS Summary Report

Elaboration of contents for easy understanding of the following items: 1) Scope and investment amount 2) Necessity of sub-project 3) Effect of sub-project (Comparison of situation before and after project)	Point	NPC	HPC	CPC	HCMC PC	SPC	Total
3 items are well described	3		4	2		1	7
2 out of 3 items are well described	2	34	8	5		9	56
1 out of 3 items is well described	1				1	9	10
None of 3 items is well described	0	1	1				2
Grand Total		35	13	7	1	19	75

3.4.11. Benefits to Japanese Makers

Table 3-31 indicates the evaluation result of benefits to Japanese manufacturers. For 7 SPs, there is a possibility of installation of Japanese equipment. For 68 SPs, Japanese manufacturers may participate in international competitive bidding. In interviews with PCs, it was confirmed that GIS (gas-insulated switchgear) is the only item that PCs expect to adopt Japanese products for, for SPs with a substation component.

Table 3-31 Benefit to Japanese Makers

Existence of equipment with advanced technologies in which Japanese manufacturers have advantages over competitors	Point	NPC	HPC	CPC	HCMC PC	SPC	Total
Exist	4	5	2				7
Absent	2	30	11	7	1	19	68
Grand Total		35	13	7	1	19	75

3.4.12. Relevance of concurrent Implementation of Sub-Projects

Table 3-32 indicates the evaluation result of the relevance of concurrent implementation of SPs. 2 SPs have relevance to be implemented together, while the other 73 SPs were determined as independent.

Table 3-32 Relevance of concurrent Implementation of Sub-Projects

Existence of sub-project(s) that has (have) influence on the effect of the sub-project in question	Point	NPC	HPC	CPC	HCMC	SPC	Total
Exist	2					2	2
Absent	1	35	13	7	1	17	73
Grand Total		35	13	7	1	19	75

3.4.13. Progress of EIA

The progress of the EIAs is confirmed based on the EIA certificate and reporting from the PCs. Among the 75 candidate projects, 13 projects of Hanoi PC, 24 projects of NPC, 1 project of HMC, and 15 projects of SPC, a total of 53 projects, require an EIA. One project is confirmed to have an approved EIA, 14 projects are under preparation, and 38 projects have not started the EIA study yet. Regarding the evaluation points, three points are 23 projects, two points are 14 projects, and one point are 38 projects (see Table 3-33). Details of the results of social and environmental evaluations of SPs are summarized in Attachment 7.

Table 3-33 Status of EIA approval

EIA	Point	Hanoi	NPC	CPC	HCMC	SPC	Total
EIA not required/ Approved	3	1	11	7		4	23
Under preparation/ yet to be approved	2	12				2	14
EIA required but not started yet	1		24		1	13	38
Grand Total		13	35	7	1	19	75

3.4.14. Impact on Natural Environment

Impact on natural environment is evaluated by impact on forests and impact on protected areas. The affected forest areas are confirmed by the area reported by PCs and reevaluated by the forest information from satellite images and distribution information of IUCN red list species. The impacts on protected areas are checked by overlaying project location maps and protected area maps. There is no project which affects forest of more than 100 ha. Three projects affect forest of less than 5ha and seventy-two projects affect forest of 0 ha (see Table3-34). On the other hand, there are thirteen projects which go through protected areas (see Table3-35).

Table 3-34 Affected forest area

Deforestation (ha)	Point	NPC	HPC	CPC	HCMC	SPC	Total
0	1.5	32	13	7	1	19	72
1	1	1					1
2.5	1	1					1
4.5	1	1					1
Grand Total		35	13	7	1	19	75

Table 3-35 Impact on Protected areas

Protected Area	Point	NPC	HPC	CPC	HCMC PC	SPC	Total
No passage through protected area and endangered species	1.5	28	13	3	1	17	62
Limited impacts on protected area or endangered species	1	4		4		2	10
Considerable impacts on protected area or endangered species		3					3
Grand Total		35	13	7	1	19	75

3.4.15. Impact on Social Environment

Impact on social environment is evaluated by the number of resettlements and area of land acquisition. The Exhibits for the evaluations are obtained by interview with the PCs. There is no project which requires resettlement of over 200 people. 11 projects require one to fifty persons and 64 projects have no resettlement (see Table 3-44). On the other hand, 11 projects require no land acquisition, 44 projects require less than 2 ha, 8 projects require more than 2 ha and less than 6 ha and 1 project of CPC requires 22.8 ha (see Table 3-45). The number of resettled people is calculated with an assumption of 5 people in one household.

Table 3-36 Number of people resettled

Resettlement (persons)	Point	NPC	HPC	CPC	HCMC PC	SPC	Total
0	1.5	24	13	7	1	19	64
5	1	1					1
15	1	1					1
20	1	4					4
25	1	2					2
30	1	3					3
Grand Total		35	13	7	1	19	75

Table 3-37 Land acquisition

Land Acquisition	Point	NPC	HPC	CPC	HCMC PC	SPC	Total
0 ha	1.5	5	6				11
<2 ha	1	18	6	3	1	16	44
2 - 4 ha	1	1	1	2		3	7
4 - 6 ha	1			1			1
22.8 ha	1			1			1
Unknown	0	11					11
Grand Total		35	13	7	1	19	75

3.5. Ranking of Sub-Projects and Funds

3.5.1. Ranking of Sub-Projects

Table 3-38 shows the ranking of all the SPs proposed by the 5 PCs. The 75 proposed SPs were evaluated from the viewpoints of technology, economy, social environment, and benefits to Japanese companies based on the evaluation criteria, then ranked by the total score. The SPs in the green colored rows are to be included if the yen loan amount is up to JPY 15,000 million. The aggregate of the SPs in both green and yellow colored rows are to be included if the amount is up to JPY 20,000 million. The aggregate of the SPs in green, yellow, and red rows are to be included if the yen loan amount is up to JPY 25,000 million.

Table 3-38 List of SPs

順位	ポイント	PC名	プロジェクト名	累計 (百万円)	順位	ポイント	PC名	プロジェクト名	累計 (百万円)	順位	ポイント	PC名	プロジェクト名	累計 (百万円)
1	52.5	HPC	New building for the 110kV line, circuit 2 from the 110kV Dong Anh substation to 220/110kV Van Tri substation and reinstating feeder 112 at 110kV Dong Anh substation	480	25	37.5	SPC	Tan Bien - Chau Thanh (Dop stream) 110kV line	11,339	48	31.5	CPC	Upgrading and expansion of distribution power network in Thua Thien Hue Province	22,334
2	49.5	HPC	Rehabilitating 110kV overhead line Hadong - Son Tay (173E1.4 to 172E1.7)	2,061	27	35.5	SPC	Improve and develop medium & low voltage grid for rural areas of Long An province	11,766	48	31.5	CPC	Upgrading and expansion of distribution power network in Gia Lai	23,007
3	46	HPC	Upgrading and rehabilitating 110kV Yen Phu - E1.8 substation into the GIS substation	3,144	27	35.5	SPC	Improve and develop medium & low voltage grid for rural areas of Bac Lieu province	11,864	53	31	NPC	Installation of T2 transformer at 110kV S/s, Hung Yen city	23,164
4	45.5	SPC	Ben Luc Industrial zone 110kV substation and tee-off	3,332	27	35.5	SPC	Improve and develop medium & low voltage grid for rural areas of Hau Giang province	12,027	53	31	NPC	Upgrading the capacity of T1 Phó Cao transformer	23,281
4	45.5	SPC	Sa Dec 220kV substation and tee-off	4,095	27	35.5	SPC	Cai Mep port 110kV substation and connection line	12,327	53	31	NPC	Installation of T2 transformer at 110kV Ninh Binh	23,418
6	44.5	HPC	Rehabilitating and upgrading the capacity of the 110kV line, 175.176 Chem - Yen Phu, section from 220kV Chem substation to the outgoing pole of the 220/110kV Chem - Tav Ho line	4,259	27	35.5	HCMCPC	110kV Hoc Mon 2 substation and connection line	12,679	53	31	NPC	110kV Tam Dao substation and T/L	23,832
6	44.5	SPC	Can Duoc 220kV substation and tee-off	5,461	32	34.5	CPC	Upgrading and expansion of distribution power network in Son Tra District - Danang city	13,197	57	30.5	NPC	110kV Que Vo 3 substation and branch	24,124
8	43.5	HPC	New building for the 110kV line to supply power for 110kV Mai Lam substation	5,639	33	33.5	SPC	An Xuyen - Vinh Thuan 110kV line	13,548	57	30.5	CPC	Upgrading and expansion of distribution power network in Kon Tum	24,881
8	43.5	HPC	110kV line to supply power to Mo Lao substation	5,725	33	33.5	CPC	Upgrading and expansion of distribution power network in Hoa Vang and Cam Le Districts - Danang city	14,202	59	30	NPC	110kV Tan Quang substation and T/L	25,428
10	42.5	SPC	T5 110kV substation and tee-off (Hoa Phu - T5)	5,926	33	33.5	CPC	Upgrading and expansion of distribution power network in Dak Lak	14,849	59	30	NPC	110kV Hoa Mac substation and T/L	25,798
11	42	HPC	Supplementing transformer T3 - 63 MVA at the 110kV E1.11 Thanh Cong substation	6,036	36	32.5	NPC	Improving the transmission capacity of 110kV Vinh Yen - Phuc Yen T/L	15,298	59	30	NPC	110kV Phuc Son substation and T/L	26,101
12	40.5	SPC	Luong Son - Hoa Thang - Mui Ne 110kV line	6,347	36	32.5	NPC	110kV Quang Chau substation and branch	15,618	62	29	NPC	Installation of T2 transformer at 110kV Ninh Phúc industrial zone substation	26,240
12	40.5	SPC	Minh Hung Industrial zone 110kV substation and tee-off	6,502	36	32.5	NPC	110kV T/L of Thai Binh - Thai Thuy Thermo-Electric Factory	16,204	62	29	NPC	T2 Tam Diep Industrial Park	26,381
12	40.5	SPC	Dong Hoa 110kV substation and tee-off	6,704	36	32.5	NPC	110kV T/L of Thai Binh - Tien Hai Thermo-Electric Factory	16,790	64	28	NPC	110kV Yen Mo substation and T/L	26,787
15	39.5	SPC	Giao Long 110kV substation and Ben Tre - Giao Long 110kV line	6,948	36	32.5	NPC	110kV Lau Kiem substation and T/L	17,262	65	25.5	NPC	Upgrade and rehabilitation the medium voltage distribution networks in Thai Nguyen province	27,076
15	39.5	HPC	110kV Tu liem substation and 110kV branch	7,884	36	32.5	CPC	Upgrading and expansion of distribution power network in Phu Yen	17,909	65	25.5	NPC	Upgrade and rehabilitation the medium voltage distribution networks in Hai Duong	27,568
17	39	HPC	Upgrading capacity for 110kV Linh Dam substation	7,989	42	32	NPC	110kV Kim Bang substation and T/L	18,225	65	25.5	NPC	Upgrade and rehabilitation the medium voltage distribution networks in Hume Yen	29,278
18	38.5	SPC	VSP2-MR1 110kV substation and tee-off	8,360	42	32	NPC	110kV Nam Son - Hap Linh substation and branch	18,631	65	25.5	NPC	Upgrade and rehabilitation the medium voltage distribution networks in Bac Ninh	30,253
18	38.5	HPC	110kV Minh Khai substation and the branch	9,492	42	32	NPC	110kV Cam Thuy substation and T/L	19,103	65	25.5	NPC	Upgrade and rehabilitation the medium voltage distribution networks in Nghe An province	31,881
18	38.5	SPC	Hung Dinh 110kV substation and tee-off	9,693	42	32	NPC	110kV Tinh Gia 2 Substation and T/L	19,671	65	25.5	NPC	Upgrade and rehabilitation the medium voltage distribution networks in Thai Binh	32,499
21	38	HPC	Upgrading capacity for 110kV Cau Dien substation	9,825	42	32	NPC	110kV Tay Thanh Pho Substation and T/L	20,145	65	25.5	NPC	Upgrade and rehabilitation the medium voltage distribution networks in Ninh Binh	33,058
21	38	HPC	Upgrading capacity for 110kV Quang Minh substation	10,059	42	32	NPC	110kV Quán Trữ substation and branch	20,566	65	25.5	NPC	Upgrade and rehabilitation the medium voltage distribution networks in Ha Nam province	33,917
21	38	SPC	Thang Hai 110kV substation and tee-off	10,265	48	31.5	SPC	Improve and develop medium & low voltage grid for rural areas of Soc Trang province	20,901	73	24.5	NPC	Upgrade and rehabilitation the medium voltage distribution networks in Quang Ninh province	34,421
21	38	HPC	Building for 110kV substation side at 220kV Son Tây Substation	10,734	48	31.5	NPC	Construction of the second circuit of 110kV Tien Trung-Lai Khe double circuit T/L	21,001	73	24.5	NPC	Upgrade and rehabilitation the medium voltage distribution networks in Thanh Hoa	36,631
25	37.5	SPC	T1 110kV substation and tee-off (Bau Beo - T1)	10,982	48	31.5	NPC	Construction of the second circuit of 110kV T/L to 110kV Nghia An - Hai Duong	21,112	75	23.5	NPC	Upgrade and rehabilitation the medium voltage distribution networks in Vinh Phuc	37,801

The composition of the selected SPs by voltage class for each PC are shown by the upper limit amount of the yen loan in Exhibit 3-1 to Exhibit 3-3. Summarized in Annex 7 are a list of evaluation criteria and scores.

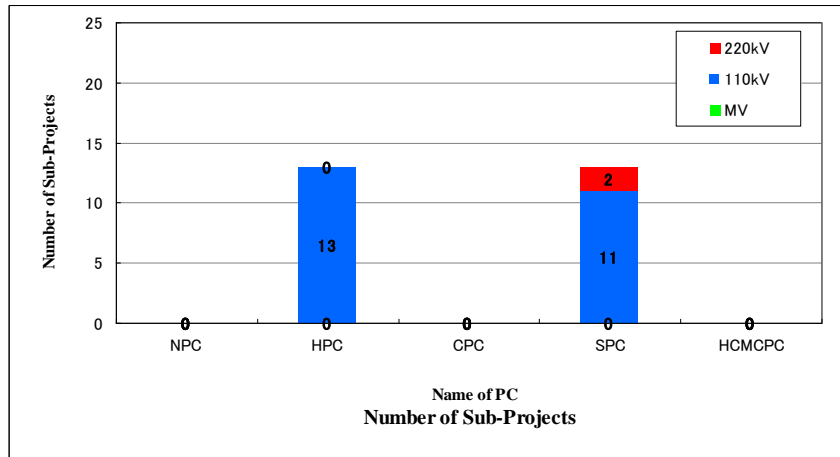


Exhibit 3-1 Selected SPs by PC (Yen Loan Limit Amount 15,000 million Case)

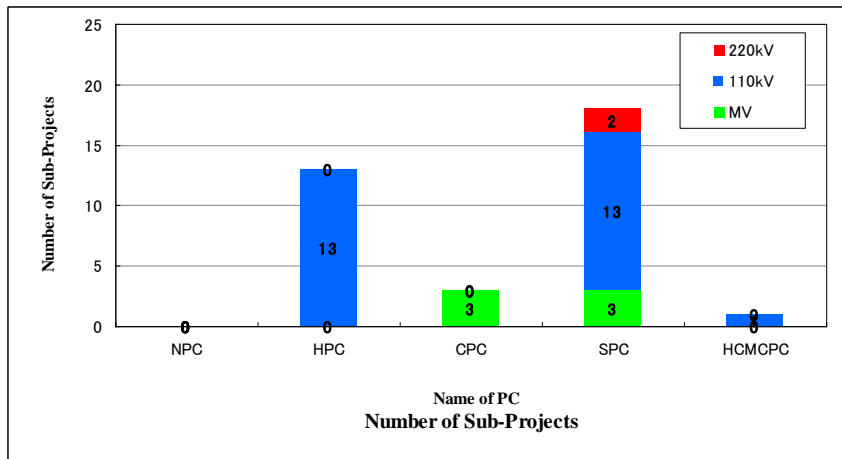


Exhibit 3-2 Selected SPs by PC (Yen Loan Limit Amount 20,000 million Case)

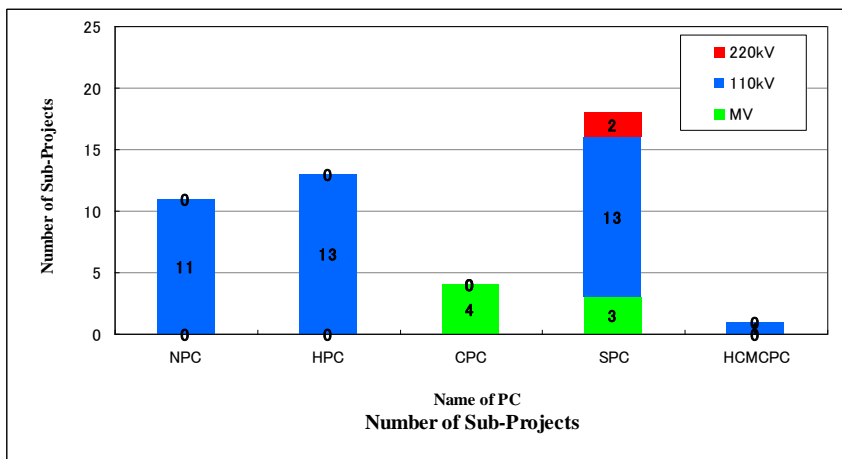


Exhibit 3-3 Selected SPs by PC (Yen Loan Limit Amount 25,000 million Case)

3.5.2. Project Cost and Funds

3.5.2.1. Project Cost

The total cost of the project by 3 yen loan cases (up to JPY 15,000 million, JPY 20,000 million, and JPY 25,000 million) are as follows:

■ JPY 15,000 million Case

The total cost is JPY 16,981 million, where, the Foreign Currency portion accounts for JPY 5,836 million, while the Local Currency portion accounts for VND 2,285,073 million. The eligible amount for the yen loan accounts for JPY 13,543 million of the total project cost. The rest of the JPY 3,438 million will be financed by each PC's own funds.

■ JPY 20,000 million Case

The total cost is JPY 22,350 million, where, the Foreign Currency portion accounts for JPY 6,721 million, while the Local Currency portion accounts for VND 3,204,505 million. The eligible amount for the yen loan accounts for JPY 17,810 million of the total project cost. The rest of the JPY 4,540 million will be financed by each PC's own funds.

■ JPY 25,000 million Case

The total cost is JPY 31,257 million, where, the Foreign Currency portion accounts for JPY 8,392 million, while the Local Currency portion accounts for VND 4,687,898 million. The eligible amount for the yen loan accounts for JPY 24,795 million of the total project cost. The rest of the JPY 6,462 million will be financed by each PC's own funds.

The total project cost estimation results for each of the 3 cases are shown in Table 3-39 to Table 3-41.

For the 3 yen loan cases, the total project costs by PC are shown in Exhibit 3-4, 3-6, and 3-8, and the yen loan allocation amounts by PC are shown in Exhibit 3-5, 3-7, and 3-9.

Table 3-39 Total Project Cost Estimation (Yen Loan Limit Amount 15,000 million Case)

Annual Fund Requirement

Base Year for Cost Estimation:	Jun, 2014		
Exchange Rates	VND = Yen	0.00488	
Price Escalation:	FC:	2.0%	LC:
Physical Contingency	5%		
Physical Contingency for Consultant	5%		

Item	Total		
	FC	LC	Total
A. ELIGIBLE PORTION			
I) Procurement / Construction	5,405	1,585,632	13,139
NPC	0	0	0
HPC	2,709	816,110	6,689
CPC	0	0	0
HCMCPC	0	0	0
SPC	2,163	509,864	4,650
Base cost for JICA financing	4,872	1,325,973	11,339
Price escalation	277	184,153	1,175
Physical contingency	257	75,506	626
Total (I)	5,405	1,585,632	13,139
B. NON ELIGIBLE PORTION			
a Procurement / Construction	0	0	0
NPC	0	0	0
HPC	0	0	0
CPC	0	0	0
HCMCPC	0	0	0
SPC	0	0	0
Base cost for JICA financing	0	0	0
Price escalation	0	0	0
Physical contingency	0	0	0
b Land Acquisition	0	125,946	614
Base cost	0	111,934	546
Price escalation	0	8,015	39
Physical contingency	0	5,997	29
c Consulting services	0	112,925	551
Base cost	0	95,755	467
Price escalation	0	11,793	58
Physical contingency	0	5,377	26
d Administration cost	0	140,993	688
e VAT	0	269,390	1,314
f Import Tax	0	33,248	162
g Consulting services TAX	0	16,939	83
Total (a+b+c+d+e+f)	0	699,441	3,411
TOTAL (A+B)	5,405	2,285,073	16,551
C. Interest during Construction			
Interest during Construction(Const.)	404	0	404
Interest during Construction (Const.)	403	0	403
Interest during Construction (Consul.)	0	0	0
D. Front-end fee			
Front-end fee	27	0	27
GRAND TOTAL (A+B+C+D)	5,836	2,285,073	16,981
E. JICA finance portion incl. IDC (A + C)	5,809	1,585,632	13,543
		portion of JICA Loan	79.75%

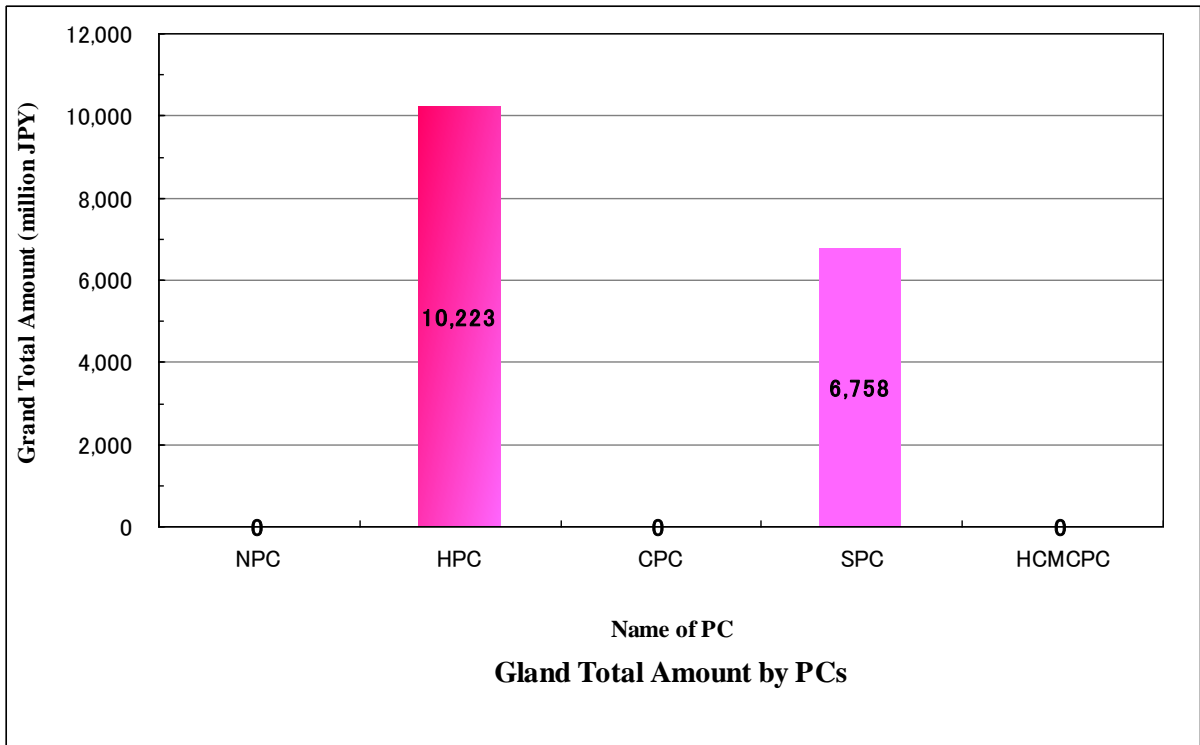


Exhibit 3-4 Total Project Cost by PC (Yen Loan Limit Amount 15,000 million Case)

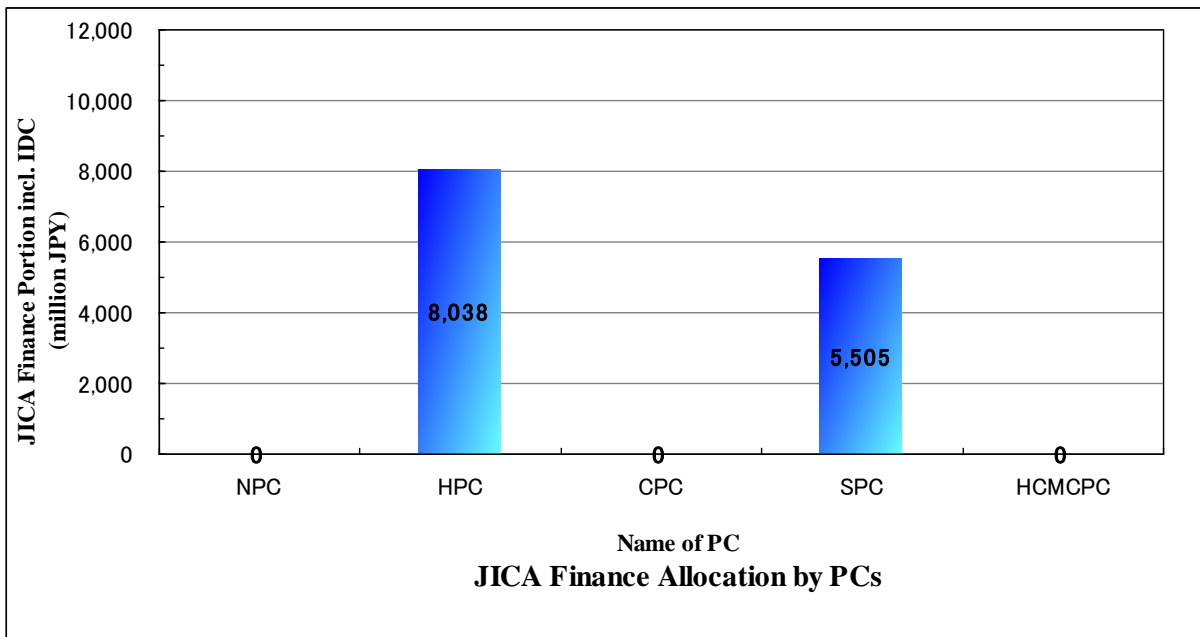


Exhibit 3-5 Yen Loan Allocation Amount by PC (Yen Loan Limit Amount 15,000 million Case)

Table 3-40 Total Project Cost Estimation (Yen Loan Limit Amount 20,000 million Case)

Annual Fund Requirement

Base Year for Cost Estimation:	Jun, 2014		
Exchange Rates	VND = Yen	0.00488	
Price Escalation:	FC:	2.0%	LC:
Physical Contingency	5%		
Physical Contingency for Consultant	5%		

Item	Total		
	FC	LC	Total
A. ELIGIBLE PORTION			
I) Procurement / Construction	6,136	2,280,993	17,261
NPC	0	0	0
HPC	2,709	816,110	6,689
CPC	177	336,498	1,819
HCMCPC	230	31,468	383
SPC	2,419	732,126	5,990
Base cost for JICA financing	5,535	1,916,201	14,881
Price escalation	309	256,173	1,558
Physical contingency	292	108,619	822
Total (I)	6,136	2,280,993	17,261
B. NON ELIGIBLE PORTION			
a Procurement / Construction	0	0	0
NPC	0	0	0
HPC	0	0	0
CPC	0	0	0
HCMCPC	0	0	0
SPC	0	0	0
Base cost for JICA financing	0	0	0
Price escalation	0	0	0
Physical contingency	0	0	0
b Land Acquisition	0	153,112	747
Base cost	0	136,077	664
Price escalation	0	9,744	48
Physical contingency	0	7,291	36
c Consulting services	0	168,833	823
Base cost	0	143,163	698
Price escalation	0	17,631	86
Physical contingency	0	8,040	39
d Administration cost	0	184,605	900
e VAT	0	353,898	1,726
f Import Tax	0	37,740	184
g Consulting services TAX	0	25,325	124
Total (a+b+c+d+e+f)	0	923,512	4,504
TOTAL (A+B)	6,136	3,204,505	21,765
C. Interest during Construction			
Interest during Construction(Const.)	549	0	549
Interest during Construction (Consul.)	0	0	0
D. Front-end fee			
	36	0	36
GRAND TOTAL (A+B+C+D)	6,721	3,204,505	22,350
E. JICA finance portion incl. IDC (A + C)			
	6,685	2,280,993	17,810
		portion of JICA Loan	79.69%

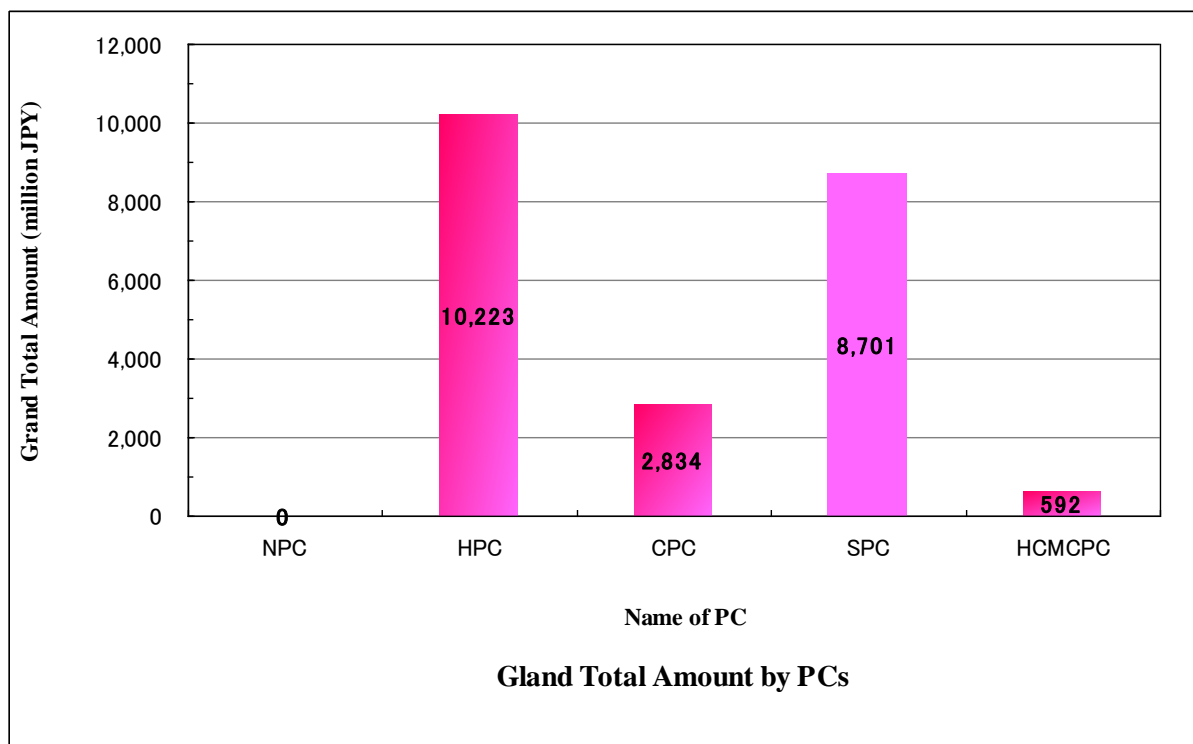


Exhibit 3-6 Total Project Cost by PC (Yen Loan Limit Amount 20,000 million Case)

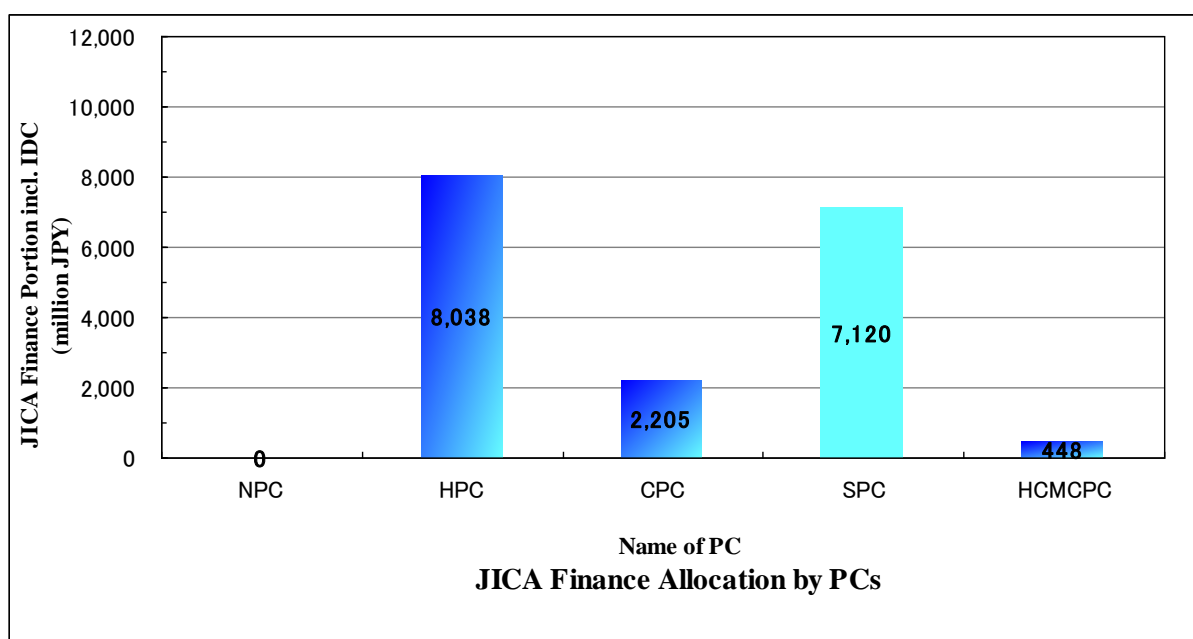


Exhibit 3-7 Yen Loan Allocation Amount by PC (Yen Loan Limit Amount 20,000 million Case)

Table 3-41 Total Project Cost Estimation (Yen Loan Limit Amount 25,000 million Case)

Annual Fund Requirement

Base Year for Cost Estimation:	Jun, 2014		
Exchange Rates	VND = Yen	0.00488	
Price Escalation:	FC:	2.0%	LC:
Physical Contingency	5%		
Physical Contingency for Consultant	5%		

Item	Total		
	FC	LC	Total
A. ELIGIBLE PORTION			
I) Procurement / Construction	7,557	3,373,164	24,009
NPC	1,264	798,805	5,160
HPC	2,709	816,110	6,689
CPC	201	464,333	2,466
HCMCPC	230	31,468	383
SPC	2,419	732,126	5,990
Base cost for JICA financing	6,822	2,842,842	20,688
Price escalation	374	369,695	2,178
Physical contingency	360	160,627	1,143
Total (I)	7,557	3,373,164	24,009
B. NON ELIGIBLE PORTION			
a Procurement / Construction	0	0	0
NPC	0	0	0
HPC	0	0	0
CPC	0	0	0
HCMCPC	0	0	0
SPC	0	0	0
Base cost for JICA financing	0	0	0
Price escalation	0	0	0
Physical contingency	0	0	0
b Land Acquisition	0	207,905	1,014
Base cost	0	184,774	901
Price escalation	0	13,231	65
Physical contingency	0	9,900	48
c Consulting services	0	270,943	1,321
Base cost	0	229,747	1,121
Price escalation	0	28,294	138
Physical contingency	0	12,902	63
d Administration cost	0	256,519	1,251
e VAT	0	492,247	2,401
f Import Tax	0	46,479	227
g Consulting services TAX	0	40,641	198
Total (a+b+c+d+e+f)	0	1,314,735	6,412
TOTAL (A+B)	7,557	4,687,898	30,421
C. Interest during Construction	786	0	786
Interest during Construction(Const.)	785	0	785
Interest during Construction (Consul.)	0	0	0
D. Front-end fee	50	0	50
GRAND TOTAL (A+B+C+D)	8,392	4,687,898	31,257
E. JICA finance portion incl. IDC (A + C)	8,342	3,373,164	24,795
		portion of JICA Loan	79.33%

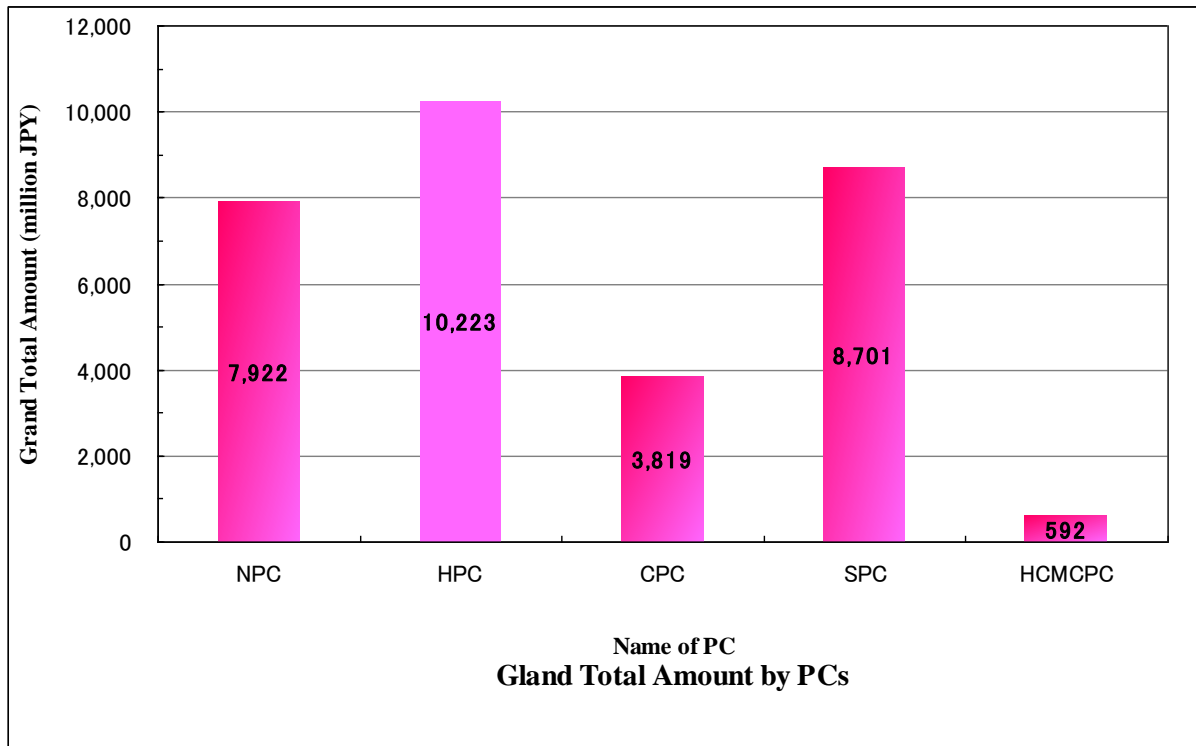


Exhibit 3-8 Total Project Cost by PC (Yen Loan Limit Amount 25,000 million Case)

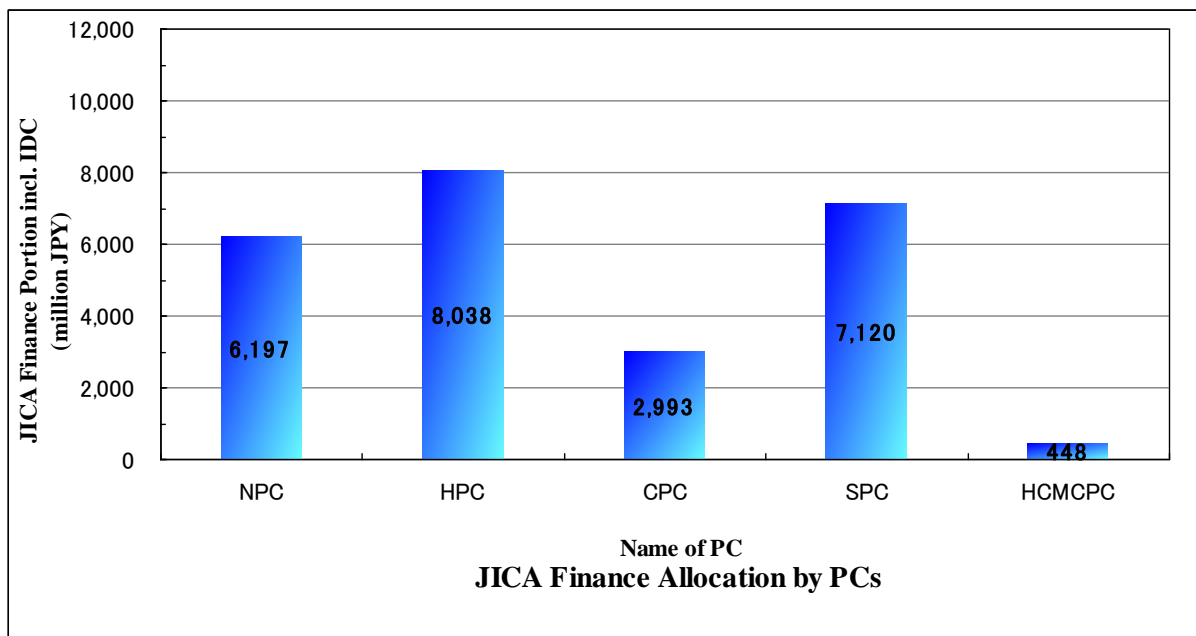


Exhibit 3-9 Yen Loan Allocation Amount by PC (Yen Loan Limit Amount 25,000 million Case)

3.5.2.2. Financial Plan

The financial plans for this project for the 3 yen loan cases (JPY 15,000 million, JPY 20,000 million, and JPY 25,000 million) are summarized in Table 3-42 to Table 3-44.

Table 3-42 Financial Plan (15,000 million JPY Case) (Unit: JPY million)

Year	Total Project Cost	JICA Loan
2015	2,535	1,762
2016	3,821	2,879
2017	5,529	4,635
2018	5,096	4,267
Total	16,981	13,543

Table 3-43 Financial Plan (20,000 million JPY Case) (Unit: JPY million)

Year	Total Project Cost	JICA Loan
2015	3,591	2,548
2016	5,357	4,084
2017	7,352	6,150
2018	6,050	5,029
Total	22,350	17,810

Table 3-44 Financial Plan (25,000 million JPY Case) (Unit: JPY million)

Year	Total Project Cost	JICA Loan
2015	4,701	3,264
2016	8,658	6,699
2017	10,675	8,909
2018	7,222	5,923
Total	31,257	24,795

3.5.2.3. Project Benefits

Expected financial and economic benefits in the form of FIRR and EIRR from the implementation of the Project are calculated as is shown in the following Table 3-28.

Table 3-45 Financial and Economic Benefit Calculation Results

Case	Financial Benefits (FIRR)	Economic Benefits (EIRR)
JICA Loan JPY 15 billion	12.12%	20.28%
JICA Loan JPY 20 billion	11.14%	19.40%
JICA Loan JPY 25 billion	13.82%	24.81%

Consultants hired by PC have calculated financial benefits (FIRR) as well as economic benefits (EIRR) for SPs in FS summary reports using many different methodologies; hence, it is extremely difficult to recalculate Project-wide FIRR and EIRR according to the size of the JICA ODA Loan in an aggregated manner. Therefore, the Study Team proposes a simple methodology to summarize financial and economic benefits for SPs selected according to the Loan amount. Whereas the financial cost is based on the project costs demonstrated in

previous sections, the economic cost is obtained as the deduction of tax items, price contingency and interest during construction. Based on data on reduced transmission and distribution losses after the implementation of each SP has been submitted by PCs, aggregated reduced loss amount according to the size of the JICA loan amount is multiplied by unit profit price, VND 744/kWh (average retail tariff minus average wholesale tariff, BST), to obtain financial benefits for PCs and by unit willingness-to-pay (WTP) price, VND 2,112/kWh, which is calculated with the use of software, WB has ensured that PCs obtain economic benefits for the entire economy. Then, FIRR and EIRR are calculated. The benefit calculation period is 20 years, following the one applied in local feasibility assessment.

3.6. SP Project Sheets with GIS Location Maps

The Study Team formulated an SP Project Sheet for each of the 75 SPs submitted by PCs with a project outline. Items appearing on the SP Project Sheet are as follows:

- The name of the SP (number, name, etc.)
- Implementation purpose and outline (purpose, scope, outline, etc.)
- Economy of the SP (FS status, FIRR, etc.)
- Environmental and social considerations (EIA status, resettlement, land acquisition, etc.)

Symbols reflecting facilities to be constructed/upgraded in the SP are plotted onto a GIS map. Symbols by voltage level and by type of facilities are expressed in the legend in Table 3-45.

Table 3-46 Legend for SP location mapping

Type	Color		Size	Expression
Transmission line	500kV	Blue		New: Solid line Upgrade: dotted line
	220kV	Red		
	110kV	Green		
Distribution line	22、35kV	Black		New: Solid line Upgrade: dotted line
Substation	500kV	Blue	Big	New:◎ Upgrade:○
	220kV	Red	Middle	
	110kV	Green	Small	

A sample SP summary sheet is attached in Exhibit 3-10. All the 75 SP Summary Sheets are provided in Attachment 5.


No	HAN_B07	Name	110kV Minh Khai substation and the branch						
Purpose	overloading, poor power quality, supply to new industrial zone								
Scope	new 110kV substation with 110kV 2x63MVA transformers, 5 110kV bays, 23 24kV cubicles and 110kV branch, 0.8 km long								
Province	Hai Bà Trưng		FS Approval		2014		FIRR	30.99	
Total Investment (VND billion)	277		Total Investment (JPY million)		1,353		Peak Load Status	93%	
Number of Japanese Tenants	9		Contracted Capacity of Japanese Tenant(kW)		1,288		Average Load Factor	67%	
Transmission Line	Voltage	110		Start	220kV Mai dong Sub		End	110kV Minh khai Sub	
	Circuit	2		Length (km)		2.0		Conductor	Cu1200
	New	Yes		Upgrade	No		Replace	No	Connect	Yes
Sub Station	Voltage	110/22							
	New	Yes		Upgrade	No		Replace	No	Connect	Yes
									
(c) OpenStreetMap and contributors, Creative Commons-Share Alike License (CC-BY-SA)									
EIA report	Under preparation/ yet to be approved				Number of Resettlement		0		
Protected area	-				Land acquisition (sqm)		15,933		

Exhibit 3-10 Sample Project Summary Sheet

In addition, a project overview map showing SP locations by JICA loan size for each of the PCs was produced. A sample overview map for all SPC submissions is attached in Exhibit 3-11 (other overview maps are provided in Attachment 6,7,8,9).

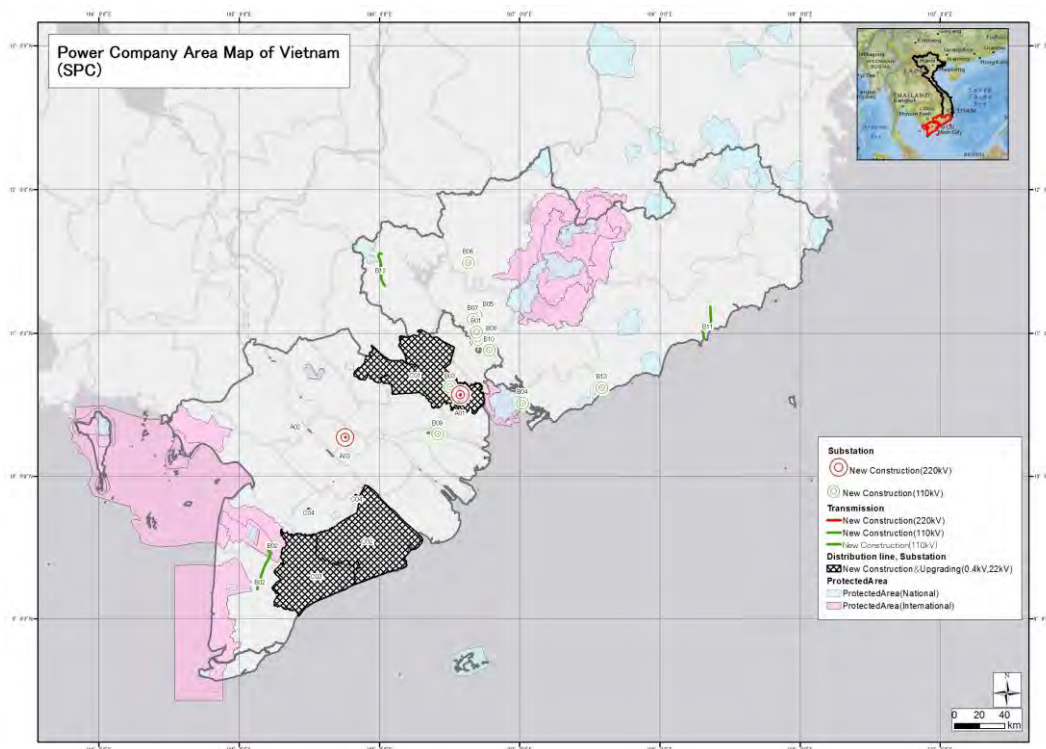


Exhibit 3-11 Project Overview Map (SPC)

3.7. Implementation Schedules

Implementation schedules for each PC of SPs by voltage class are depicted in the following Tables 3-12 to 3-16. The schedules summarize duration and timing of feasibility study, detailed design, bid preparation, bidding, procurement, and construction after the signing of LA. Implementation periods are four years, within which all selected SPs are completed.

Implementation Schedule (NPC)	year 2												year 3												year 4											
	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
Signing of Loan Agreement																																				
F/S																																				
D/D																																				
M Budding Plan																																				
V Bidding Document																																				
L Bidding Evaluation																																				
Contract Negotiation																																				
Procurement																																				
Construction																																				
F/S																																				
D/D																																				
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1 Bidding Document																																				
0 Bidding Evaluation																																				
k Bidding Evaluation																																				
Contract Negotiation																																				
Procurement																																				
Construction																																				

Exhibit 3-12 NPC SP Implementation Schedule

Implementation Schedule (HPC)		year 1												year 2												year 3												year 4											
		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
Signing of Loan Agreement																																																	
F/S																																																	
D/D																																																	
Bidding Plan																																																	
Bidding Document																																																	
Bidding Evaluation																																																	
Contract Negotiation																																																	
Procurement																																																	
Construction																																																	

Exhibit 3-13 HPCSP Implementation Schedule

Implementation Schedule		year 1												year 2												year 3												year 4											
		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
Signing Loan Agreement																																																	
Approval of FS																																																	
Preparation and approval of Detail Engineering Design Document																																																	
Bidding Plan																																																	
Procurement																																																	
Bidding Evaluation																																																	
Contract negotiation and signing																																																	
Construction																																																	

Exhibit 3-14 CPC SP Implementation Schedule

Implementation Schedule (HCMC)		year 1												year 2												year 3												year 4											
		4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
Signing of Loan Agreement																																																	
F/S																																																	
D/D																																																	
Bidding Plan																																																	
Bidding Document																																																	
Bidding Evaluation																																																	
Contract Negotiation																																																	
Procurement																																																	
Construction																																																	

Exhibit 3-15 HCMCSP Implementation Schedule

Implementation Schedule (SPC)			2014												2015												2016												
Signing of Loan Agreement			4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	
M V L	F/S																																						
	D/D																																						
	Bidding Plan																																						
	Bidding Document																																						
	Bidding Evaluation																																						
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	Bidding Plan																																						
	Bidding Document																																						
	Bidding Evaluation																																						
	Contract Negotiation																																						
	Procurement																																						
	Construction																																						

Exhibit 3-16 SPC SP Implementation Schedule

3.8. Possibility for installment of Japanese Material

3.8.1. Equipment for Transmission Facilities

Commonly used equipment, which has been utilized for similar projects implemented in the past, will be procured for steel towers and poles, insulators, conductors, and ground wires of the 14 Transmission SPs. According to the interview with PCs, onshore procurement of all the primary equipment but polymer insulators was available.

- Tower: About 10 Vietnamese steel tower manufacturers
- Conductor:
 - LS-VINA Cable (Vietnamese conductor manufacturer which supplies commonly used conductors such as ACSR)
 - CADIVI (Vietnamese conductor/cable manufacturer which supplies underground cables)
- Ground wire: THINH PHAT (Vietnamese conductor manufacturer which can solely supply OPGW)
- Insulator:

- MacLean Power China (Joint Stock Company of MacLean Power Systems, USA which supplies polymer insulators)
- Isoelectric (Italian manufacturer which supplies polymer insulators)

The metropolitan areas such as Hanoi City and Ho Chi Minh City have witnessed significant advancement of urbanization accompanied by rapid economic growth. In these areas, it is quite difficult to acquire land and right-of-ways for new development and/or reinforcement of transmission lines. Some of the PCs such as HPC and HCMCPC have applied a special conductor, GZTACSR (Gap type super thermal-resistant aluminum alloy conductor steel reinforced), which was developed by Japanese manufacturers, for some transmission sections which pass through densely populated areas aiming at enhancement of the transmission capacity as well as reduction of the conductor sag, thus avoiding re-erection of steel towers/poles. Application of GZTACSR can resolve the problem inherent in ACSR, the sag of which is likely to increase caused by conductor temperature rise led by the increase in the load factor of the transmission line due to the growth of power demand in urban areas.

However, there are no such transmission sections in which GZTACSR is adopted for the candidate transmission SPs submitted by HPC and HCMCPC. The other PCs have not planned to use GZTACSR for their transmission SPs either, since the condition of securing the right-of-ways for reinforcement and/or development of new interconnection transmission lines between newly installed substations and the existing transmission grid is not much severer than that in the two big cities.

For those reasons, virtually no opportunities for Japanese manufacturers to be in a favorable position over foreign competitors are expected in the ICB process for equipment procurement of the SPs.

3.8.2. Equipment for Substation Facilities

A total of 37 sub-projects relate to a newly constructed substation or expanding of substation capacity, for which there is a possibility of the adoption of the GIS (gas-insulated switchgear) that Japanese manufacturers produce. For the GIS in which SF₆ gas is sealed inside a sealed vessel, the main insulation of the grounding part and the charging part is sustained by the SF₆ gas.

GIS are adopted at indoor substations or underground substations, and after interviewing each PC this time, they have no plan to adopt underground substations. The reasons for not adopting underground substations in the SPs this time are that land acquisition of substation construction site is possible and the drainage of the planned construction site is foreseeable. Generally, since the installation cost of an underground substation is expensive compared to a substation on the ground, if land acquisition is very difficult, one will apply that method.

When comparing a GIS substation with an AIS (Air insulated switchgear) substation of the same capacity, construction costs are high, but since a compact design and compact facility

are possible, in substation design in urban areas, where the securing of land is difficult, it is very effective equipment. In this Project, adoption of GIS is planned in total of 7 SPs by HPC and NPC, these two PCs having jurisdiction in big cities and their surroundings.

As for the GIS technology, from the fact that in recent years, overseas manufacturers (South Korea and China etc.) have been closing in on the technical capabilities of the Japanese manufacturers, the superiority of Japanese manufacturers has fallen. And compared with East Asian manufacturers' GIS, there are no advantages in terms of price for Japanese GIS. Therefore, in the bidding, the possibility of applying Japanese manufacturers' GIS is reduced in this situation.

From the above, in terms of the substation SPs in these Projects, it is considered that there is no opportunity for Japanese manufacturers to participate in an advantageous position in the international competitive bidding and qualification in procurement at the time of each PC.

3.8.3. Equipment for Distribution Facilities

Commonly used equipment, which has been utilized for similar projects implemented in the past, will be procured for concrete poles, electric wires, transformers, Load Brake Switch (LBS), and Disconnecter Switch (DS) and Recloser ground wires of the 22 Distribution SPs. According to the interview with PCs, domestic procurement of all the primary equipment but Recloser was available. The Vietnamese manufacturing companies cannot manufacture the Recloser, and make the procurement through international manufacturers from Australia, USA and Korea, etc. At the present, Japanese manufacturers producing Reclosers of the 22kV class/35kV class do not exist. As for the equipment for distribution facilities, it was explained that the procurement is handled by international bidding.

From the above, in terms of the distribution SPs in these Projects, it is considered that there is no opportunity for Japanese manufacturers to participate in an advantageous position in the international competitive bidding and qualification in procurement at the time of each PC.

3.9. Information about Environmental and Social Considerations

3.9.1. Environmental and Social laws in Vietnam

The main laws for Environmental and Social considerations are Law on Environmental Protection No.52/2005/QH11, which stipulates Environmental protection and Environmental Impact Assessment, Forest Protection and Development Law No.29/2004/QH11, which provides for forest protection, and the Land Law ratified by the National Assembly of Socialist Republic of Vietnam on 26/11/2003, which mentions land acquisition and compensation.

3.9.1.1. Environmental Impact Assessment

Procedures and requirements of Environmental Impact Assessment (EIA) are described in Decree No.29/2011/ND-CP. New construction of transmission lines and substations of 110kV and more is required to submit an EIA report. The procedures are stipulated in Circular No.05-2008-TTP-BTNMT. EIA reports are reviewed once at the draft EIA report. Article 15 of Circular No.29/2011/ND-CP mentions the public hearing and Article 11 of Circular No.05-2008-TTP-BTNMT stipulates the disclosure of the EIA report. Vietnamese rules of EIA are different from JICA's guidelines. For example, timing of review is once and the review in scoping stage is lacked. Public hearing is once, not two times. EIA report is not fully disclosed but only summary part is open to the public. Public hearings are conducted by the people's committee of the affected commune by document and directly affected people will be invited if the people's committee decides this as a requirement. The affected group and organizations can attend the meeting if invited. A draft summary of the EIA report will be sent to the people's committee and opened to the public at the office of the people's committee. Not all the documents of the EIA report will be sent to the people's committee. Therefore, the directly affected people do not have the chance to see the whole EIA document and participation in the public hearing is not assured. The list of laws and regulations related to environmental protection is shown in Attachment 10-1.

3.9.1.2. Land acquisition and resettlement

According to the Decree No.181/2004/ND-CP dated 29/10/2004 on Implementation of the Land Law, land acquisition will start from preparation of Resettlement Action Plan (RAP) based on the site survey by project owners, Approval of the RAP by the local people's committee, Establishment of the compensation committee, and beginning of the compensation. Evaluation of the compensation cost is done by the compensation committee and affected people can negotiate the cost. Even if final agreement between the compensation committee and affected people is not reached, resettlement procedures will be carried out based on the RAP. No format for the RAP is stipulated. The list of laws and regulations related to environmental protection is shown in Attachment 10-2.

3.9.1.3. Forest Type and Development approval

According to Forest Protection and Development Law No.29/2004/QH11, Forests in Vietnam are categorized into three areas, which are Special-use forest, Protection forest, and Production forest (see table 3-15). Developments of 50 ha and more in the Special-use forest or Head water protection forest of Protection forest, Developments of 500 ha and more in other Protection forests, and Developments of 1,000 ha and more in the production forests require approval by the National Assembly (Resolution No.49/2010/QH12). Only the names and areas of all the Special-use forests are confirmed in this study (see Attachment 11-1). 98 locations out of the 164 Special-use forests are identified as National Parks and Nature

reserves (see Attachment 11-2). The others' names, areas, and locations have not been obtained.

3.9.1.4. Protected Species

Protected species which are listed in the IUCN red list (Vietnam), CITES (Vietnam), and Vietnam Red Data Book total 606 species in Plantae, 383 species in Animalia (see Table 3-47 and Table 3-48). According to the IUCN's distribution map of mammals, 286 species (including LC: Least concern etc.) are recorded in Vietnam (see Attachment 12). These protected species distribution information was referred during the evaluation of impacts SPs on forests.

Table 3-47 Number of Protected Plants in Vietnam

	IUCN ¹				Cites				Vietnam RDB		Grand Total
	CR	EN	VU	NT	I	I/II	II	III	1B	2B	
Plantae	36	47	87	0	13		408	1	15	51	606
	170				422				66		

Source: IUCN, CITES, Decree No. 32/2006/ND-CP OF MARCH 30, 2006

Table 3-48 Number of Protected Animals in Vietnam

	IUCN				Cites				Vietnam RDB		Total
	CR	EN	VU	NT	I	I/II	II	III	1B	2B	
Mammalia		4	2	1	33	1	30	12	46	26	98
Aves	3	8	12	19	15		93	1	13	30	161
Reptilia	5	8	8	1	10	1	36	4	2	20	60
Amphibia		4	13	15						1	32
Insecta	1	1	4	2			4			12	21
Malacostraca			1								1
Actinopterygii					3		7				10
Total	9	25	40	38	61	2	170	17	61	89	383
	112				250				150		

Source: IUCN, CITES, Decree No. 32/2006/ND-CP OF MARCH 30, 2006

CR: Critically Endangered, EN: Endangered, VU: Vulnerable, NT: Near Threatened

3.9.2. Category classification of JICA's guidelines

All the sub-projects are classified based on the JICA's guidelines. The collected information for all sub-projects are Approval status of EIA document, Impact on forest, Resettlement, Land acquisition, and Impact on forest. These information are summarized on Appendix 13 Environmental and Social evaluation sheet. The project which has got EIA approval is one out of 75 sub-projects. 12 sub-projects are located in the protected area. 11

sub-projects require resettlement. Ethnic minorities are confirmed at the one sub-project. All of the sub-projects seems to be categorized in B, because none of them require large resettlements more than 200 people and serious forest impact more than 100 ha.

Chapter 4 Progress in Electricity Market Liberalization

4.1. Streamlining of the Power Sector Reform (Liberalization) Road Map

4.1.1. Formulation of the Roadmap

In Vietnam, since the promulgation of Electricity Law in 2005, the Government has maintained a policy to introduce competition in the power market (Electricity Market Liberalization Policy). Two key drivers for the liberalization are to promote new market entrants to the fast-growing power sector by improving transparency in the sector and break the state monopoly through the power sector giant, EVN, which was considered one of the hindrances for the sector development at the time. In 2005, Electricity Regulatory Authority of Vietnam (ERAV) was established under the then Ministry of Industry (current Ministry of Industry and Trade, MOIT), assuming responsibility in power sector restructuring, tariff approval, regulatory development, market monitoring and the like. In 2006, the Prime Minister's decision on conditions and power sector organization structure for Vietnam power market stages formation and development, the Road Map (No.26/2006/QD-TTg). In 2011, the Government kicked off pilot operation of the Vietnam Competitive Generation Market (VCGM), and in 2012 put the VCGM into its full operation. The Road Map was issued as a Prime Minister's decision in November 2013 (No.63/2013/QD-TTg), which revised an original Road Map approved by the PM in 2006.

In this revised Road Map, recognizing delay in introduction of Vietnam Competitive Generation Market (VCGM) as the 1st Phase of the market liberalization, keeps the scheduled starting year of 2015 of the 2nd Phase, namely competitive wholesale market, as was scheduled in the original 2006 Road map. The introduction schedule of the 3rd Phase, competitive retail market, originally planned in 2022, is now rescheduled in one year in advance in 2021, showing strong commitment of the Vietnamese Government to electricity market liberalization. The following exhibit illustrates the implementation schedule of the revised Road Map for the power market reform in Vietnam.

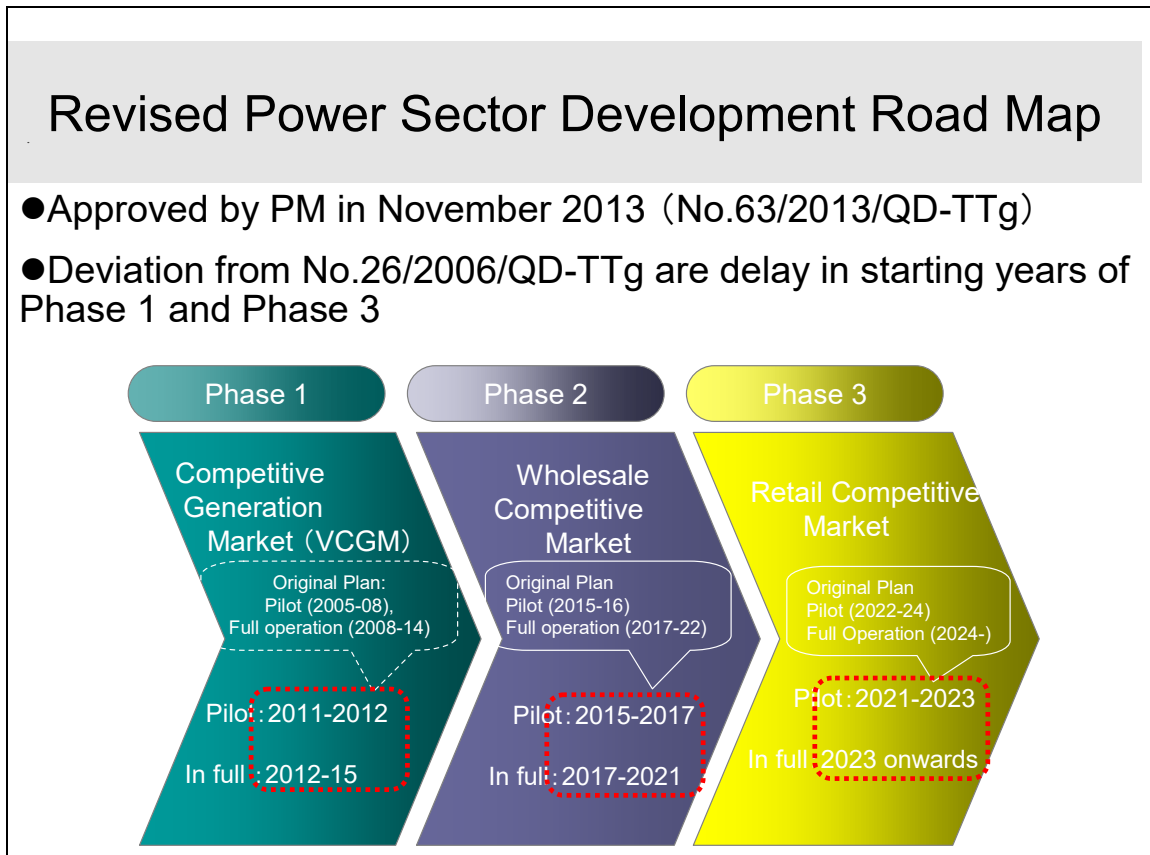


Exhibit 4.1: Implementation Schedule of the Revised Road Map

4.1.2. Status of Road Map Implementation

4.1.2.1. Status of Road Map Implementation and its Operation

The Government of Vietnam has committed to development of the Vietnam Competitive Generation market (VCGM) in line with the original Road Map since 2006. The reason why the introduction of pilot-VCGM operation, where there were no cash transactions, was delayed from the originally scheduled 2008 up to 2011 was the failure to meet pre-set preconditions such as electricity tariff increase at least for generation cost recovery and de-bottlenecking of power systems. However, since the introduction of pilot-VCGM in 2011, the Government has steadily accumulated power market operational experience, kicking off the full VCGM operation in 2012 four years after the original schedule. VCGM is a mandatory cost-base pool market with day-ahead bidding in which the EVN EPTC (Electric Power Trading Company) plays a role as single buyer (SB). Currently a total of 102 power plants with a total installed capacity of 26,901MW participate in VCGM, of which 48 power plants with a total installed capacity of 11,947, mostly small- and medium-sized run-of-river hydropower plants and multi-purposed hydropower plants, where it is difficult to adjust the generation output according to the market requirements, are indirect participants, which has no bidding obligation and no obligation for generation output control. Revenues form

generated energies from indirect participants are calculated based on a special tariff based on water value afterwards. Looking at the performance of VCGM in 2003, between July and November during the water-abundant rainy season, the monthly average spot-market prices of the electricity were dropped by 11% to 34% in comparison with ones during the dry season. This shows that VCGM functions properly. ERAV considers that participating power plants become more conscious on generation cost reduction than before, seeking optimization and efficiency in operation and maintenance of power generation facilities. ERAV recognizes that VCGM can be further improved by driving more indirect participants to be direct participants, building up market-oriented mechanism for purchasing the ancillary services such as reserves and frequency adjustment and developing the market supporting infrastructure such as SCADA/EMS.

4.1.2.2. Activities towards wholesale competition

ERAV undertakes preparatory activities in order to introduce a pilot wholesale competitive market in 2015. ERAV hired an individual expert with use of World Bank funding to prepare a draft conceptual design of the competitive wholesale market at the end of year 2013. Based on the draft, MOIT and ERAV jointly prepared a proposal for the final concept design and have negotiated over no-objection from the Prime Minister's office for the Minister's approval. As a result, the MOIT decision on the concept design of the wholesale competitive market was issued on 22 August 2014 (No.6463/QD-BCT). The Study Team received explanatory notes in English on the outline of the proposal with a tentative action plan from ERAV. The Team reviewed and evaluated the readiness of the Vietnamese side for the upcoming wholesale competition based on the explanatory notes. As of the end of July 2014, it was confirmed that the final proposal with no-objection from the PM's office was still awaiting the MOI Minister's final approval.

4.1.2.3. Start-up Plan of VWEM

Based on the ERAV notes, the Study Team streamlined the wholesale competitive market introduction plans. The formal English name of the wholesale market has been decided as the Vietnam Wholesale Electricity Market (VWEM) as is specified in the MOIT approval on conceptual design. The draft implementation timetable of VWEM is illustrated in the following exhibit. In the revised Road Map, wholesale competitive market will start its pilot operation in 2015 and full operation in 2017, two years after the start of the pilot operation. However, according to the current ERAV's plan, although pilot operation period is extended to four years, ERAV would like to operate the second half of the pilot VWEM, Phase 2 during 2017 and 2019, as almost full market operation. Then after 2019, by increasing the spot market transaction volume up to 40% of the total consumption, the full VCGM market operation will be introduced.

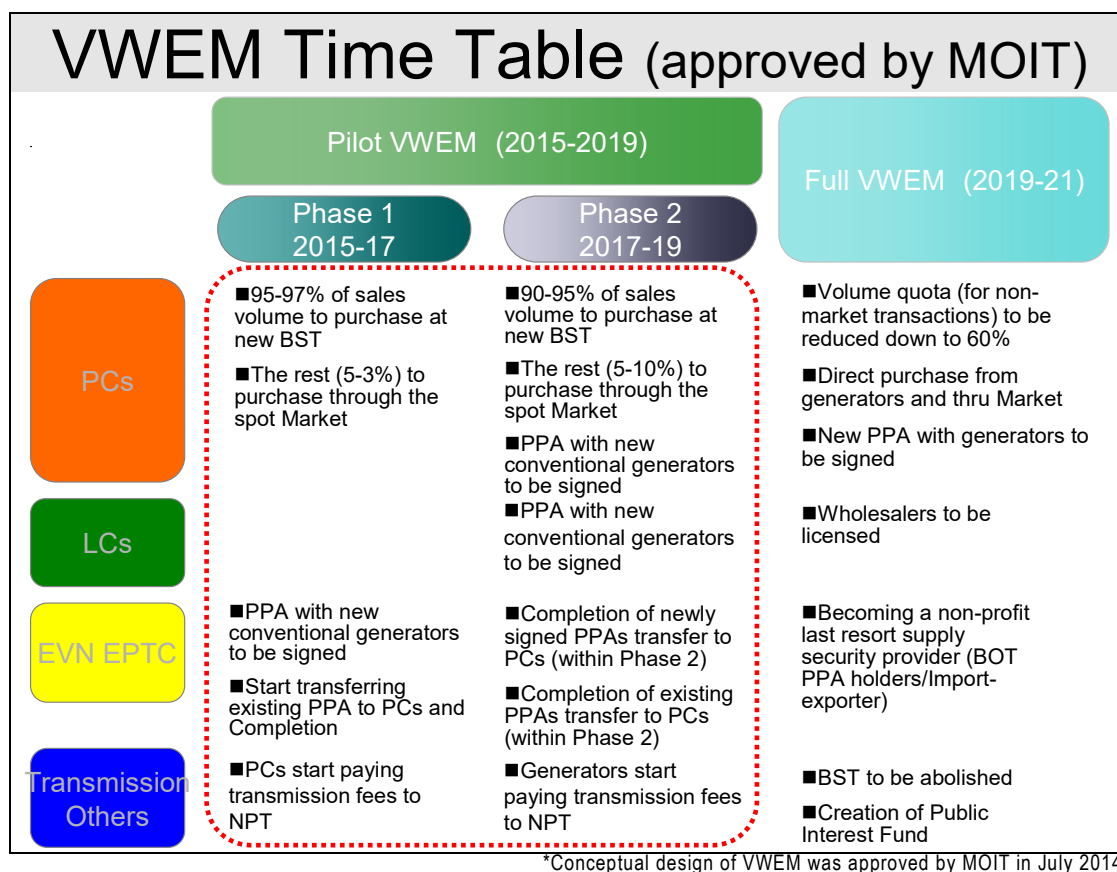


Exhibit 4-2: VWEM Timetable

Based on the current ERAV plan, the VWEM consists of two periods. The first period is the Pilot VWEM, and the second period is the Full VWEM. The first period to be implemented from 2015 to 2019 is further divided into two Phases, namely the first Phase between 2015 and 2017 and the second Phase between 2017 and 2019. As was described in a previous section, in the revised Road Map, the pilot operation period is scheduled from 2015 and 2017. Some may consider that the timetable in the Road Map has been slightly revised. However, according to ERAV, the only difference between Phase 2 of Pilot VWEM and the originally planned full competitive wholesale market is licensing for wholesalers. ERAV considers that full VWEM operation will virtually start at Phase 2 of Pilot VWEM. Therefore, ERAV maintains that there is no deviation from the Road Map.

4.1.2.4. Description on VWEM

In Phase 1 of the Pilot VWEM, PCs will start market procurement of electricity. Currently, except for power purchase from small-scale power generation, PCs procure almost all electricity required for retail sales from EVN EPTC at the Bulk Sales Tariff (BST), which varies from one PC to another. After Pilot VWEM Step 1, the electricity volume that a PC purchases from EPTC will be restricted to between 95% and 97% of the PC's electricity sales. Thus, the rest (between 3% and 5% of the total sales) has to be procured through the spot market. In addition, the new BST applied for electricity purchase from EPTC will not contain

any transmission service charge element. PCs will pay transmission charges to the National Power Transmission Company (NPT) separately. EPTC will start transferring PPAs, which EPTC maintains as SB, to five PCs. During the pilot VWEM Phase 1, EPTC continually enter into PPA terms with new power generators.

In Phase 2 of the Pilot VWEM, eligible large customers (LCs) enter into the market and partial retail market liberalization will practically start. LCs are allowed to purchase electricity either from the spot market or directly from generators. In addition, wholesale quota on PCs' purchase from EPTC is contracted from a range between 95% and 97% in Step 1 to one between 90% and 95%, hence increasing market transaction volume. LCs and PCs can now freely enter into PPA terms with generators. PPAs that EPTC has newly signed in the Phase 1 of the pilot also start being transferred to PCs and the transfer of all PPAs to PCs is completed during the Phase 2. As for transmission charges, whereas PCs pay fees to NPT in Phase 1, both PCs and generators start paying fees to NPT after amending the transmission fees structure to give disincentives to long-way transmission from remote generators and to promote fair cost-sharing of network reinforcement with remote generators in line with interim recommendations made through on-going ADB TA on transmission pricing review. Eligibility criteria for LCs' market participation will be discussed from now on. ERAV comes up with an idea to set an eligibility threshold based on annual electricity consumption volume in terms of MWh. The major differences between pilot Phase 1 and Phase 2 are expressed in the following table.

Table 4.1: Differences between pilot VWEM Steps

Items	Pilot Phase 1	Pilot Phase 2
Wholesales Quota	95%-97%	90%-95%
PPA holders	EPTC	EPTC or 5 PCs after the completion of PPA transfer
Transmission fees paid by	PCs	PCs and generators

Further, within the year 2019, full operation of the VWEM starts. Before the start of the Full VWEM operation, transfer of PPAs that EPTC has held (except for ones for power import/export and BOT) to PCs will be completed. As of this moment, EPTC's function as SB will be over. EPTC is expected to become a non-profit organization as a last-resort services provider in the market, being a mere administrator of power import/export and BOT PPAs. In addition, ERAV will start licensing a wholesaler as an aggregator of LCs. Public Interest Fund (PIF) will be created as a proxy of BST in order to cross-subsidize between PCs/regions and to adjust bargaining power among them. Details on who will establish and operate the PIF and how to operate it will be discussed in ERAV in the later stage. Funding of PIF is likely to be part of wholesale electricity paid by some PCs as crosssubsidy.

Taking into account the aforementioned transactions relations among players, VWEM configurations as well as a transition image from VCGM to VWEM are illustrated in the

following exhibit. The Study Team presented the exhibit to ERAV, which confirmed that the image was somewhat relevant to ERAV’s understanding. Details will be decided through the detailed designing process of VWEM.

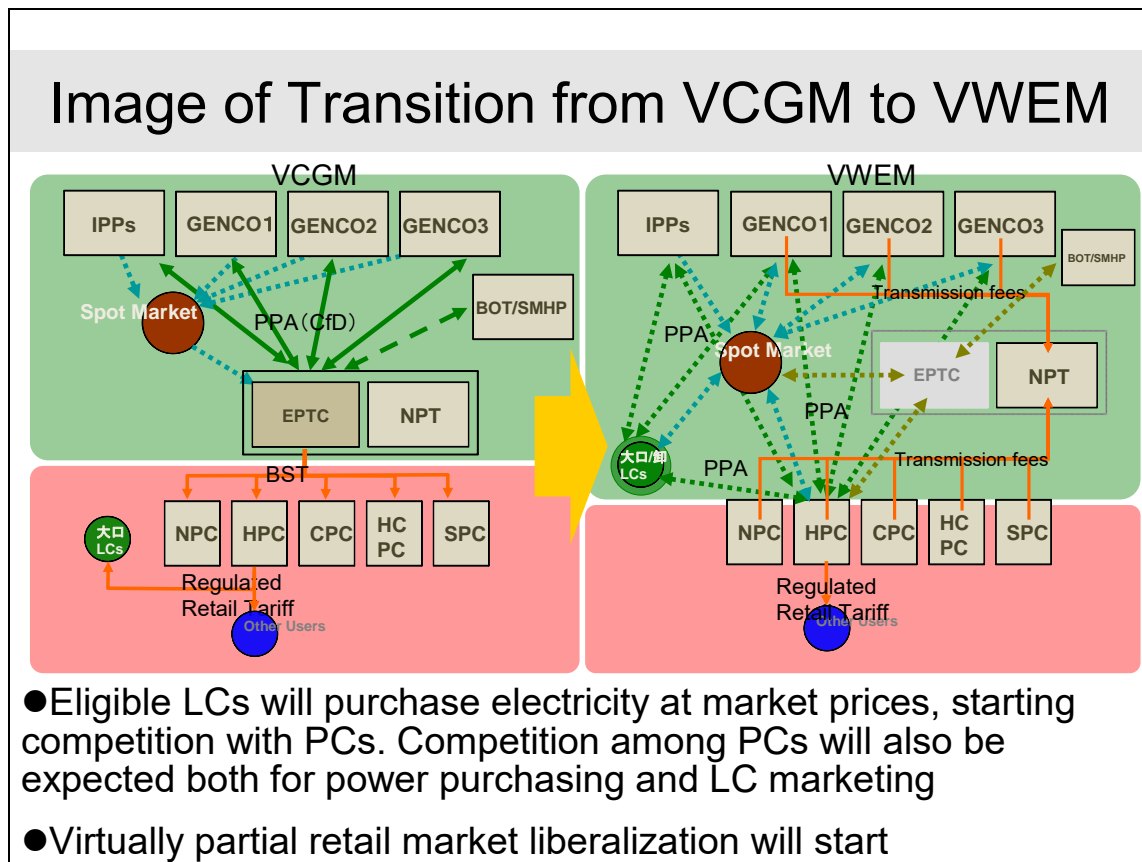


Exhibit 4-3: VWEM Market Configuration Image

4.1.3. Evaluation of Road Map Implementation

On 22 August 2014, VWEM conceptual design was approved by MOIT (6463/QD-BCT, see Attachment 18). However, ERAV has not started any specific detailed design activities. Detailed design needs starting as soon as possible. Although French donor funded Technical Assistance to ERAV on VWEM detailed design is planned, this TA has not yet been started with its consultant selection is underway as of July 2014. If the implementation of the TA experiences further delays, pilot VWEM introduction within 2015, which is considered the first milestone for the revised Road Map, might be difficult to achieve.

The Study Team also evaluated EVN’s readiness for VWEM transition through discussions with EVN’s power market department. The Power Market Department (PMD) is the section to manage and control EVN EPTC that undertakes power trading in VCGM. After the transition to VWEM, multiple buyers consisting of PCs and eligible PCs and multiple sellers, mainly GENCOs, will participate in the market, leaving all MO activities from bidding, transaction

settlement, market dispatching, metering, verification and execution more and more complicated. As for IT systems as market supporting infrastructure to administer these multilayered activities, ERAV is responsible for developing system requirements and EVN will make an IT system relevant to the IT system requirements available. According to EVN, without getting the system requirements developed, EVN cannot take any advance action for system development. Even before external experts start working on basic and detail designs of VWEM IT systems, ERAV personnel in charge of market design and market monitoring, EVN personnel in charge of power trading and ERAV/EVN IT personnel altogether sit and confer on problems and issues arising out of current IT systems as VCGM market-supporting infrastructure and get ready for upcoming specification setting for VWEM commenced in parallel with VWEM detailed design,

In VWEM, there is a transition from the SB model to the multiple buyer model. Power trading entity changes from EVN EPTC to five PCs. Through discussions with EVN, concern arose that there is an egregious lack of understanding at five PCs. A lack of sense of ownership at PCs is highly problematic. As soon as VWEM starts, PCs will be put under competitive environment in wholesale electricity purchase and gaining in customer base at the first time. Therefore, PCs will become key market players in VWEM. VWEM's success largely relies on PCs. However, PCs originally lack sense of profit making and are not accustomed with competition. PCs have to stabilize and empower their profit base through strengthening a wide variety of their capacity required under competitive business environment.

Next moving to future issues around the Road Map implementation, for GENCOs, electricity sales to a PC with a low level of facilities reliability and lengthy system down (outage) time are considered high-risk transactions with large potential opportunity losses. Therefore, it is likely that GENCOs ask the PC for premium on top of a normal wholesale price applicable for other technically sound PCs. A number of network bottlenecks due to overloading may hinder free movement of electricity between sellers and buyers, reducing the effect of market liberalization. As transmission and distribution service fees are not exposed to competition, effects of liberalization is not realized fully. Thus, in putting the proper facility investment planning practices in place in the competitive market environment, PCs are expected to resolve overloads as planning bottlenecks with a certain level of power quality being maintained, avoiding overinvestment.

In addition, reduction in operational bottlenecks such as emergency outage due to recovery from a fault as well as lengthy planned outage for construction and maintenance work will be one of key issues for smooth operation of the competitive wholesale market. Therefore, PCs have also to strengthen its capacity of power network operation for shortening of fault recovery time and minimization of planned outage.

By proactively surveying and researching customers' energy usage, PCs can propose effective demand-side management (DSM) menus such as energy saving and load leveling measures for users as energy service providers. PCs will be chosen by customers even under

the competitive market environment if they make attractive offers based on such proactive marketing activities. If PCs are well equipped with this marketing capacity with extensive load research, PCs can strengthen its financial base and improve the overall load factor for all users, which allow PCs to exercise greater bargaining power in direct negotiations with generators and in competitive price setting in the spot market.

For the above reasons, EVN believes that it is important to make all PCs understand that they become real profit-making entities through a series of capacity strengthening measures.

Both ERAV and EVN have concerns on the emergence of new network bottlenecks and the worsening of existing bottlenecks due to unexpected commercial power flow in VWEM. In the face of VWEM, it is more important for EVN PCs to identify weak points at 110kV levels or below and propose measures to strengthen the regional power transmission and distribution network from now on.

Finally, as for considerations for investment disincentives to the regional power distribution network, it has been one of the Government's prioritized issues in rural development. Therefore, regardless of the progress in power sector liberalization, the objectives of rural electrification will remain important for the time being.

4.2. Streamlining of Action Planning toward VWEM Introduction

4.2.1. Precondition set on VWEM introduction in the PM Decision

Policy objectives for VWEM introduction are described in the PM decision on the Road Map issued in November 2013 (No.63/2013/QD-TTg) as follows:

- As for legal framework:
 - Power sector restructuring plan approved by Prime Minister;
 - Market detailed design approved by MOIT;
 - MOIT promulgates or amends and supplements the following regulations:
 - Regulations on conditions for market participants; market operating rules
 - Regulations on electricity regulatory regimes; grid codes; distributions codes; electric energy metering; regulations on power pricing applicable to a competitive wholesale market;
 - Regulations on determination of transmission, distribution prices and system dispatching operation and trading operation charges;
 - Other regulations necessary and applicable to a market operation.
- As for power market infrastructure systems:

- Completing full SCADA/EMS, remote metering systems for connecting all independent accounting distributors and large customers, meeting the market standards and requirements;
- Equipping IT system for serving market operation and management meeting the market standards and requirements;
- As for market participants' capacity: The market participants should have been equipped with competent and well-trained human resources and the necessary infrastructure meeting market standards and requirements.

Before the introduction of VWEM, the Government will approve a sector restructuring plan including divestiture of three GENCOs. In addition, MOIT will approve the detailed design of VWEM itself beforehand. Based on the detailed design, MOIT/ERAV will formulate related laws, regulations and rules.

In addition, ERAV will set requirements for IT systems as VWEM supporting infrastructure such as metering, network data analysis, network controlling, and market operation/transactions and make investments on them together with other market participants, taking into account detailed design and market rules for VWEM.

Further more, ERAV needs to explain new market arrangements to all market participants in detail and strengthen capacity of participants according to each participant's specific requirements under VWEM such as market rules, bidding procedures/strategy, IT system usage and the like.

4.2.2. Legal and regulatory framework development for VWEM

Through discussions with the relevant personnel in the Vietnamese power sector, the Study Team confirmed that the legal and regulatory framework for VWEM had not even been prepared yet. Such legal and regulatory requirements will be identified in the course of detailed design of VWEM and following preparatory activities.

A number of laws, regulations and rules were issued by the PM's Office, MOIT and ERAV during VCGM development. It is anticipated that in introducing VWEM, ERAV and MOIT will make the same amount of legal and regulatory efforts as it did for VCGM. The following tables show lists of regulatory and legal documents related to VCGM issued by the Government.

Chapter 4 Progress in Electricity Market Liberalization

Table 4-2: Legal and Regulatory Documents for VCGM Development Issued by MOIT/PM

No.	Type	Issued	Date	Name
26/2006/QĐ-TTg	Decision	PM	26-Jan-06	APPROVING THE ROADMAP AND CONDITIONS FOR FORMATION AND DEVELOPMENT OF DIFFERENT LEVELS OF THE ELECTRICITY MARKET IN VIETNAM
6540/QĐ-BCT	Decision	MoIT	12-Dec-08	REGULATIONS ON PILOT COMPETITIVE GENERATION MARKET
27/2009/TT-BCT	Circular	MoIT	25-Sep-09	REGULATIONS ON ELECTRICITY MEASUREMENT IN COMPETITIVE GENERATION MARKET
6713/QĐ-BCT	Decision	MoIT	31-Dec-09	APPROVING DESIGN OF VIETNAM COMPETITIVE GENERATION MARKET
09/2010/TT-BCT	Circular	MoIT	3-Mar-10	REGULATIONS ON DEVELOPMENT, APPROVAL AND SUPERVISION OF OPERATION OF NATIONAL POWER NETWORK
12/2010/TT-BCT	Circular	MoIT	15-Apr-10	REGULATIONS ON POWER TRANSMISSION NETWORK
13/2010/TT-BCT	Circular	MoIT	15-Apr-10	REGULATIONS ON PROCEDURES AND METHOD FOR CALCULATION OF NETWORK AND MARKET OPERATION COST
14/2010/TT-BCT	Circular	MoIT	15-Apr-10	PROCEDURES AND METHOD FOR CALCULATION OF POWER TRANSMISSION COST
32/2010/TT-BCT	Circular	MoIT	30-Jul-10	REGULATION ON POWER DISTRIBUTIONS NETWORK
40/2010/TT-BCT	Circular	MoIT	13-Dec-10	REGULATIONS ON RESOLUTION OF DISPUTES IN POWER MARKET
41/2010/TT-BCT	Circular	MoIT	14-Dec-10	METHOD FOR CALCULATION OF GENERATION PRICE, PROCEDURES OF DEVELOPMENT FRAMEWORK GENERATION PRICES AND APPROVAL OF POWER PURCHASE AGREEMENT
6941/QĐ-BCT	Decision	MoIT	30-Dec-10	APPROVAL OF DESIGN OF IT INFRASTRUCTURE FOR OPERATION AND SUPERVISION OF VIETNAM COMPETITIVE GENERATION MARKET
24/2011/QĐ-TTg	Decision	PM	15-Apr-11	ADJUSTMENT OF ELECTRICITY TARIFF UNDER MARKET MECHANISM
37/QĐ-TTg	Decision	PM	29-Jun-11	MECHANISM FOR SUPPORTING WIND POWER PROJECT
1208/QĐ-TTg	Decision	PM	21-Jul-11	APPROVAL OF POWER DEVELOPMENT PLAN No. 7
31/2011/TT-BCT	Circular	MoIT	19-Aug-11	REGULATIONS ON ADJUSTMENT OF ELECTRICITY TARIFF UNDER MARKET MECHANISM
18/2012/TT-BCT	Circular	MoIT	29-Jun-12	REGULATION ON THE SUPERVISION OF COMPETITIVE GENERATION MARKET
32/2012/TT-BCT	Circular	MoIT	12-Nov-12	REGULATION ON WIND PROJECTS DEVELOPMENT AND PPA WIND POWER CONTRACT
03/2013/TT-BCT	Circular	MoIT	8-Feb-13	REGULATIONS ON OPERATION OF COMPETITIVE GENERATION MARKET
63/2013/QĐ-TTg	Decision	PM	8-Nov-13	APPROVING THE ROADMAP AND CONDITIONS FOR FORMATION AND DEVELOPMENT OF DIFFERENT LEVELS OF THE ELECTRICITY MARKET IN VIETNAM
43/2013/TT-BCT	Circular	MoIT	30-Dec-13	REGULATION ON DEVELOPMENT, APPRAISAL AND APPROVAL OF POWER DEVELOPMENT PLAN
28/2014/QĐ-TTg	Decision	PM	7-Apr-14	STRUCTURE OF RETAIL ELECTRICITY TARIFF
15/2014/TT-BCT	Circular	MoIT	28-May-14	SELLING AND PURCHASING OF REACTIVE POWER
16/2014/TT-BCT	Circular	MoIT	29-May-14	REGULATIONS ON IMPLEMENTATION OF ELECTRICITY TARIFF
4887/QĐ-BCT	Decision	MoIT	30-May-14	REGULATIONS ON ELECTRICITY TARIFF

Table 4-3: Regulatory Documents for VCGM Development Issued by ERAV

No.	Type	Issued	Date	Name
33-36/QD-DTDL	Decision	ERAV	26-Apr-11	TECHNICAL PROCEDURES RELATED TO ELECTRICITY MEASUREMENTS
40/QD-DTDL	Decision	ERAV	16-May-11	PROCEDURES FOR CALCULATION OF CEILING OFFER PRICES FOR THERMO POWER UNITS
53-55/QD-DTDL	Decision	ERAV	20-May-11	PROCEDURES ON INFORMATION EXCHANGE, SIMULATION OF POWER MARKET
17/QD-DTDL	Decision	ERAV	30-Mar-12	REGULATIONS ON MARKET OPERATION IN WEEK, MONTH AND YEAR AHEAD
18/QD-DTDL	Decision	ERAV	30-Mar-12	PROCEDURES ON CALCULATION OF WATER COST
19/QD-DTDL	Decision	ERAV	30-Mar-12	PROCEDURES ON SELECTION OF BEST NEW POWER PLANTS AND CALCULATION OF MARKET POWER PRICE
20/QD-DTDL	Decision	ERAV	30-Mar-12	PROCEDURES FOR CLASSIFICATION OF THERMAL UNITS AND CALCULATION OF CEILING OFFER PRICES FOR THERMO POWER UNITS
21/QD-DTDL	Decision	ERAV	30-Mar-12	PROCEDURES ON MARKET SIMULATION
22/QD-DTDL	Decision	ERAV	30-Mar-12	PROCEDURES ON DATA PUBLICATION
52/QD-DTDL	Decision	ERAV	25-Dec-12	LIST OF POWER PLANTS PARTICIPATING IN VCGM IN 2013
76/QD-DTDL	Decision	ERAV	27-Dec-13	LIST OF POWER PLANTS PARTICIPATING IN VCGM IN 2014
77/QD-DTDL	Decision	ERAV	30-Dec-13	REGULATIONS ON MARKET OPERATION IN WEEK, MONTH AND YEAR AHEAD
79/QD-DTDL	Decision	ERAV	30-Dec-13	PROCEDURES ON SELECTION OF BEST NEW POWER PLANTS AND CALCULATION OF MARKET POWER PRICE
81/QD-DTDL	Decision	ERAV	30-Dec-13	PROCEDURES ON CALCULATION OF WATER COST
82/QD-DTDL	Decision	ERAV	30-Dec-13	PROCEDURES FOR CLASSIFICATION OF THERMAL UNITS AND CALCULATION OF CEILING OFFER PRICES FOR THERMO POWER UNITS
84/QD-DTDL	Decision	ERAV	30-Dec-13	PROCEDURES ON OPERATION OF IT SYSTEM FOR MANAGEMENT OF POWER MARKET AND PUBLICATION OF MARKET DATA
85/QD-DTDL	Decision	ERAV	30-Dec-13	PROCEDURES ON CROSS CHECK OF PAYMENT DATA BETWEEN MARKET OPERATOR, GENERATION UNITS AND SINGLE BUYER
86/QD-DTDL	Decision	ERAV	30-Dec-13	PROCEDURES FOR REGISTRATION OF MARKET PARTICIPANTS
83/QD-DTDL	Decision	ERAV	30-Dec-13	PROCEDURES OF GENERATION MOBILIZATION PLANNING, REAL TIME OPERATION AND PAYMENT IN MARKET
24/QD-DTDL	Decision	ERAV	22-Apr-14	OPTIMAL PROCEDURES FOR MOBILIZATION OF GAS POWER PLAN IN A DAY AHEAD PLANNING

Towards the transition to VWEM, ERAV has listed up all required activities itself and prepared a tentative action plan (see Attachment 16). With experience through VCGM development, all foreseeable tasks were listed and they completed the list with the help of a WB-funded individual expert. The Study Team undertook grouping and mapping of tasks/activities in the tentative action plan in the following exhibit. The Team had discussions with ERAV personnel over the task mapping and confirmed that it was in line with the understanding of ERAV's personnel in charge.

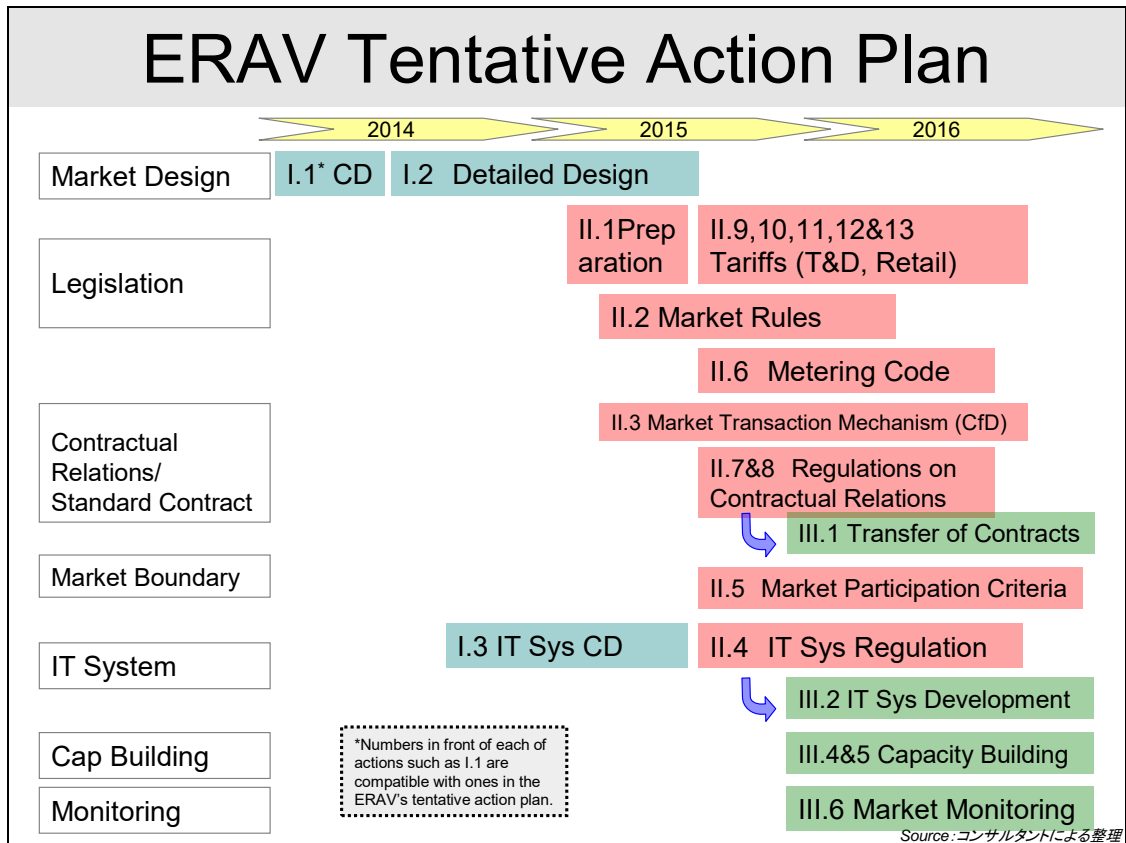


Exhibit 4-4: Mapping of ERAV Action Plan for VWEM Introduction

ERAV's action plan tasks/activities are generally classified into several categories like regulatory framework, legislation, contractual relations/standard contract, market boundary, IT system, and capacity development. All tasks/activities are located according to those categories and time frame in the mapping.

In detailed market design, details on market elements such as market arrangement, market structure, requirements for market participants, spot market configuration, tariffs will be formulated. Following the Government's approval on the detailed design of VWEM, legal and regulatory documents on specific arrangements for each of the market elements, operations rules, fees and tariffs including transmission and distribution services, cost sharing schemes will be produced by ERAV.

In addition, legal relationship among market participants will be streamlined and effective contract templates will be formulated, taking into account transparency for promotion of market entry as well as fairness among market participants. At the same time, to define the size of partial market liberalization, requirements for eligible LCs such as cut-off threshold contracted capacity and annual energy consumption will be strategically set.

Moreover, ERAV should undertake designing of IT systems on metering, market transaction, and ex-post examination as market supporting infrastructure in consultation with market participants who make investment on such infrastructure in order to secure operational

transparency and smooth market operation. Finally, ERAV will be responsible for regulatory capacity development for ERAV, market operational capacity development for participants and formulation of market monitoring.

ERAV admits that it cannot draw and analyze international practices for its own to bone up with activities in a tentative VWEM action plan due to the lack of experience and expertise in ERAV. Therefore, ERAV has to heavily depend on external technical assistances from development donors like the World Bank.

For EVN as a key industry player, the Study Team developed a similar action plan, presented it to EVN's power market department, had discussions over the required activities and agreed upon general requirements for VWEM. EVN's activities are generally classified into a few categories such as power sector restructuring (sale of GENCOs, restructuring of PCs such as separation between distribution network and retail divisions, and partial divestiture of PCs), PPA transfer in transition from SB to multiple buyers, and capacity development for EVN itself and subsidiary PCs. According to the conceptual design approved by MOIT, within 2015, EVN is required to submit proposals on IT infrastructure investment for VWEM, accounting and organizational separation between distribution network service and retail service, and capacity development programs for MOIT approval and start working on those issues after the approval of the proposals.

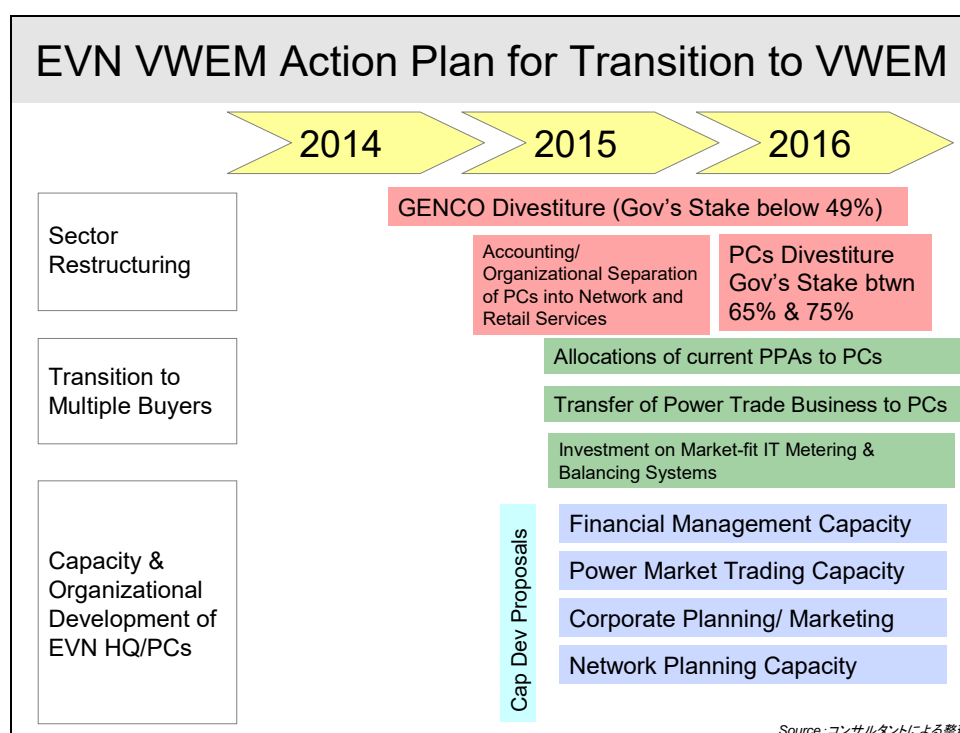


Exhibit 4-5: Mapping of EVN Action Plan for VWEM

4.3. Donors' assistance with power sector liberalization

The Study Team collected information on assistance policy of key development donors in the area of power market liberalization through interviewing and archival researches.

4.3.1. World Bank (WB)

The World Bank is the most proactive donor in power sector assistance in Vietnam. Through various investment and technical assistance (TA) projects WB assists the Government of Vietnam with key reform agenda such as power sector restructuring, power market liberalization, tariff reform and strengthening of the demand-side management (DSM) directly and indirectly.

Three Vietnam Power Sector Reform Development Policy Operations (VPSR DPO 1-3 from 2011 to 2014) is one of the most significant operations in terms of sector reform assistance. In the form of program loan, disbursement of the whole loan amount is made at once directly to a national budgetary base as soon as WB confirms with fulfillment of pre-set several policy conditions, namely Prior Actions (PAs), which is critical to achieving the policy objectives. PAs for the first DPO (DPO1, USD 312 million, Board-approved in April 2010) were seven items including the Government's approval on power sector reform vision and policy, and formulation of a fundamental legal framework (creation of a regulatory body). PAs for DPO2 (USD 200 million, Board-approved in March 2012) were formulation of legal framework and basic operation rules for VCGM, start-up of pilot VCGM operation, and improvement of transparency in electricity tariffs, restructuring of GENCOs, improvement of load research and short-term demand forecasting, and designing of time-of-use tariff (Details in APs for DPO1 and DPO2 are shown in Attachment 17).

DPO3 with total financing amount of USD 200 million was approved by the WB board on 30 June 2014 after WB had acknowledged the fulfillment of the following six PAs. (DPO3)

Table 4-4 : PDO3 Prior Actions

<p>Prior Action 1: The commercial operation of the Vietnam Competitive Generation Market has been fully implemented.</p> <p>Prior Action 2: All Gencos have started commercial operations and registered as market participants in VCGM.</p> <p>Prior Action 3: The Borrower, through its Prime Minister, has issued Decision Number 63/2013/QD-TTg dated November 8, 2013 to set forth the roadmap and operational principles for a power wholesale competitive market through the separation of Gencos and the System and Market Operator into independent companies that are not cross-owned with other market participants.</p> <p>Prior Action 4: The Borrower, through Ministry of Industry and Trade, has issued Circular Number 12/2014/TT-BCT dated March 31, 2014 setting forth the methodologies for the establishment of annual retail electricity tariffs.</p> <p>Prior Action 5: The Borrower, through MoIT, has issued Decision Number 2600/QD-BCT dated March 27, 2014 to authorize a power distribution company to carry out a pilot demand-response program.</p> <p>Prior Action 6: At least one power company has begun to pilot a demand-response program.</p>
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The following table summarizes WB TAs related to the power sector reform in Vietnam in recent years. Since 2000 there have been 80 TA projects including on-going assignments (see Attachment 18). The majority (63 TAs) are related to power sector reform. This expresses WB's huge presence in sector assistance.

WB will continually assist the Government's power sector reform initiative in Vietnam, launching the second consulting scoping mission in summer 2014. During the first scoping mission in spring 2014, WB reportedly received a high-level request for technical assistance for VWEM introduction. It is expected that WB structures a comprehensive TA package as it did with VCGM assistance.

Table 4.5 : WB Power Sector Reform TA List

No.	Title	Status	Year	Budget (USD '000)
1	Technical Assistance For Evn's Phase 2 Dsm Program	Completed	2004	601
2	Advisory Assistance & Dev. Of Implementation Program For Power Sector Equitization In Vn	Completed	2005	499
3	Restructuring Power Transmission Business Of Electricity Of Vietnam	Completed	2005	140
4	Consultant Service For Supervision Of Fmis/mmis Implementation	Completed	2005	808
5	Fs, Budgetary Cost Estimates & Conceptual Design Of Mms For Nldc	Completed	2005	110
6	Economic, Financial Analysis & Financing Support For Grid Connected Renewables Projects	Completed	2005	70
7	Consultant Services Package Development Of Avoided Cost Calculation Methodology For Renewable Energy Small Power Producers	Completed	2006	150
8	Standard Ppa & Dispute Settlement & Enforcement Procedure Regulation For Single Buyer Model Market	Completed	2007	0
9	Transmission Charges Methodology Development	Completed	2007	108
10	Development Of Grid Code For Generation Competitive Market	Completed	2007	102
11	Erav - Consultant Service Package - Development Of Metering Code For Generation Competitive Market	Completed	2007	92
12	Erav: Dev.of Detailed Subsidy & Fund Mechanism Prep.	Completed	2007	80
13	Erav: Development Of Tariff Setting Methodology & Subsidy Principle Development	Completed	2007	95
14	Consultancy Package Of Preparation Of Non-negotiable Standardized Power Purchase Agreement For Renewable Energy Small Power Producers	Completed	2007	146
15	Evaluation Of Commercial Energy Efficiency Pilot Program (ceep)	Completed	2008	237
16	Erav: Dev. Of Communication Strategy, Public & Customer Relation Function	Completed	2008	96
17	Development Of Distribution Code For Vietnam Power Competitive Market	Completed	2008	98
18	Prep. Of Market Rules For Generation Competitive Power Market	Completed	2008	354
19	Distribution Companies Tariff Calculation	Completed	2008	676
20	Erav - Package Generation Price Benchmarking	Completed	2009	56

Chapter 4 Progress in Electricity Market Liberalization

21	Erav - Advisor For Implementation Of Annual Market Adjustment Mechanism To Electricity Tariffs	Completed	2009	59
22	Moit - Package: Preparation Of Load Research Procedure And Regulation	Completed	2009	112
23	Erav: Development Of The System & Market Operator For Competitive Generation Power Market	Completed	2009	120
24	Adviser To MOIT For Economic, Financial And Regulatory Aspects Of Renewable Energy Small Power Producer (respp)	Completed	2009	97
25	Package 1: Int'l Consultant For Review Of Avoided Cost Tariff Mechanism	Completed	2010	78
26	Erav - Package 2 - Assessment Of The Avoided Cost Tariff Impact On The Retail Tariff	Completed	2010	86
27	Support Erav In Development Of Market Operation Procedures For Vcgm	Completed	2010	109
28	Support Erav In Review Of It System Design For Vcgm And Development Of Erav Monitoring It System	Completed	2010	110
29	Overall Review Of Tariff Regulation	Completed	2010	99
30	Nldc Component: Developing Ancillary Services Procedures For Vcgm	Completed	2011	92
31	Erav - Package Ta To Support Erav In Monitoring Operations Of Pilot And Full Vcgm	Completed	2011	433
32	Nldc Component: Design A Training Program For The System And Market Operator In Vietnam	Completed	2011	57
33	Erav - Ta Package For Support Erav In Implementation Of Load Research Regulation	Completed	2011	152
34	Ta Package To Support Erav In Implementation Of Technical Codes (grid Code And Distribution Code)	Completed	2011	362
35	Erav - Ta Package: Review And Finalize Regulations And Detailed Procedure For Distribution Charges Calculation	Completed	2011	120
36	Nldc Component: Package 3 - Int'l Consultant For Training Program On System And Market Operator In S Korea	Completed	2012	50
37	Erav: Organization Of Training Courses On Electricity Pricing	Completed	2012	70
38	Nldc Component: Package 2 - Int'l Consultant For Training On System And Market Operator In New Zealand And Vietnam	Completed	2012	70
39	Erav Ta Component - Package Basic And Advanced Training Courses On Power Market	Completed	2012	56
40	Nldc Component: Package 4 - Int'l Consultant For Training Program On Water Value Calculation And Hydro Power Plant	Completed	2012	53
41	Nldc Component: Package 1 - Int'l Consultant For Training On System And Market Operator In Singapore And Vietnam	Completed	2012	71
42	Erav: Consulting Service For Review Of Retail Tariff Structure And Subsidized Tariff	Completed	2012	134
43	Erav: Review Of Taxation Regime For Erav's Ta Component	Completed	2012	8
44	Erav - Package: Tariff Resident Advisor	Completed	2012	99
45	Erav: Support Erav In Development And Implementation Of Smart Grid Program In Vietnam	Completed	2012	142
46	Erav - Development Of The Conceptual Design For The Wholesale Electricity Competitive Market In Vietnam	Completed	2012	184
47	Erav: Development And Implementation Of Demand Side Response Regulation	Completed	2012	143
48	Nldc Component: Market Management System Technical Requirements Development For Vcgm	Completed	2012	74
49	Erav - Overall Review Of Tariff Regulation Extension Package (amendment)	Completed	2012	156

Chapter 4 Progress in Electricity Market Liberalization

50	Pilot demand response programs	On-going	2014	500
51	Tariff advisor	On-going	2014	350
52	Enhance load research activities and monitoring changes in demand consumption	On-going	2015	300
53	Enhancing technical codes efficiency, incorporating smart grids and integration of renewable energy generation	On-going	2015	500
54	Surveys and disseminations of demand response and energy efficiency	On-going	2015	250
55	Improving the efficiency of time of use (TOU) tariffs	On-going	2015	350
56	Informing large customers and workshops on electricity tariffs	On-going	2015	250
57	Final demand response programs for PCs	On-going	2015	250
58	Implementing smart grid program	On-going	2015	300
59	Improving efficiency of the retail electricity tariff structure	On-going	2015	500
60	Harmonizing electricity tariffs with implementation of demand response programs	On-going	2015	250
61	Enhancing efficiency and performance of PCs	On-going	2015	500
62	TA on improving EVN's financial performance	Pipeline		
63	TA on and advising the GoV on a divestiture strategy for the Gencos	Pipeline		

Table 4.5 : WB Power Sector Reform TA List

4.3.2. Asian Development Bank (ADB)

In parallel with finance on power transmission and distribution projects, ADB has also been involved in power market liberalization assistance. Specifically ADB has intermittently provided the Vietnamese power sector with TA-funded assistance such as “Road Map for Power Sector Reform (2001/ TA34343-01),” “Market Design TA (2006/ TA34352-012),” “Capacity Building of the National Power Transmission Corporation in a Competitive Power Market Environment (2008/ TA42497-012),” and “Electricity Transmission Pricing Review in the Context of Power Sector Restructuring (on-going/ TA42039-012).” (See Attachment 19). Including TAs related to power transmission and distribution network development as a precondition for the market liberalization, ADB has delivered 63 TAs in recent years (see the following table).

Table 4-6: List of ADB's Sector Reform TAs

TA No.	Title	Status	Year	Budget (USD '000)	Consultant
1 34343-012	Roadmap for Power Sector Reform	Completed	2001	500	PA Consultant
2 34352-012	Power Market Design TA	Completed	2006	500	KEMA
3 41077-012	Supporting Implementation of the National Energy Efficiency Program	Completed	2007		
4 44004-012	Increasing the Efficiency of the National Power Transmission Corporation through Targeted Capacity Building	Completed	2010	600	
5 42497-012	Capacity Building of the National Power Transmission Corporation in a Competitive Power Market Environment	Completed	2008	225	
6 42039-032	Electricity Transmission Pricing Review in the Context of Power Sector Restructuring	On-going	2012	800	

Through discussions with an ADB sector officer, ADB confirmed that it would be greatly interested in power sector reform assistance. Depending on WB TA scoping, ADB may dispatch TA-funded individual expert(s) as a resident consultant to assist ERAC with general day-to-day operation such as VWEM-related legislation. ADB is also looking to opportunities to assist EVN PCs with management/market strategy setting under wholesale competition.

4.3.3. L'Agence Française de Développement (AFD)

AFD started power sector financing in 2000. AFD finances a large variety of investment projects such as Rural Electrification (2000), UHV Transmission (co-financing with ADB, 2005), Huoi Quang Hydropower Plant (500MW, 2010), and UHV Transmission (500kV Pleiku-Cau Bong, co-financing with ADB, 2012). AFD backs up tariff increase, one of the power sector reform key items, with the use of a disbursement condition in the Huoi Quang HPP Loan Agreement on executions of biannual electricity increase.

In parallel with those financing projects, AFD started providing technical assistance to ERAV, which had just been established in 2005. Between 2006 and 2012, assistance components were ERAV's staff training and a resident advisor. The AFD resident advisor to ERAV undertook general day-to-day advisory activities including review of ERAV's terms of reference for regulatory development for VCGM introduction, assistance with strategic decision-making, assistance with gaining understanding on outputs from other TAs, and day-to-day operational advice. Based on such close relations with ERAV, AFD was formally asked by ERAV to structure TA on detailed design (DD) of VWEM with the use of TA funds. Even after DD assistance, AFD is willing to continually assist the Government's power sector

reform initiatives.

4.3.4. Other Donors

Apart from key development donors, other developed countries, through their own development vehicles, based on country/sector policies, give the Vietnamese power sector financial and technical assistance. In addition, the United Nations Development Programme (UNDP) actively assists MOIT with reduction of fuel subsidies that hinder efficient use of energy. With regard to power sector reform assistance, following the aforementioned major three donors, USTDA assists power sector liberalization through TA on development of wind grid code and updates of existing transmission grid code.

4.3.5. Donor assistance track records and direction of future assistance

Footprints of key donors’ assistance together with expected future assistance were placed on the aforementioned action plan maps of ERAV and EVN respectively (see the following exhibits).

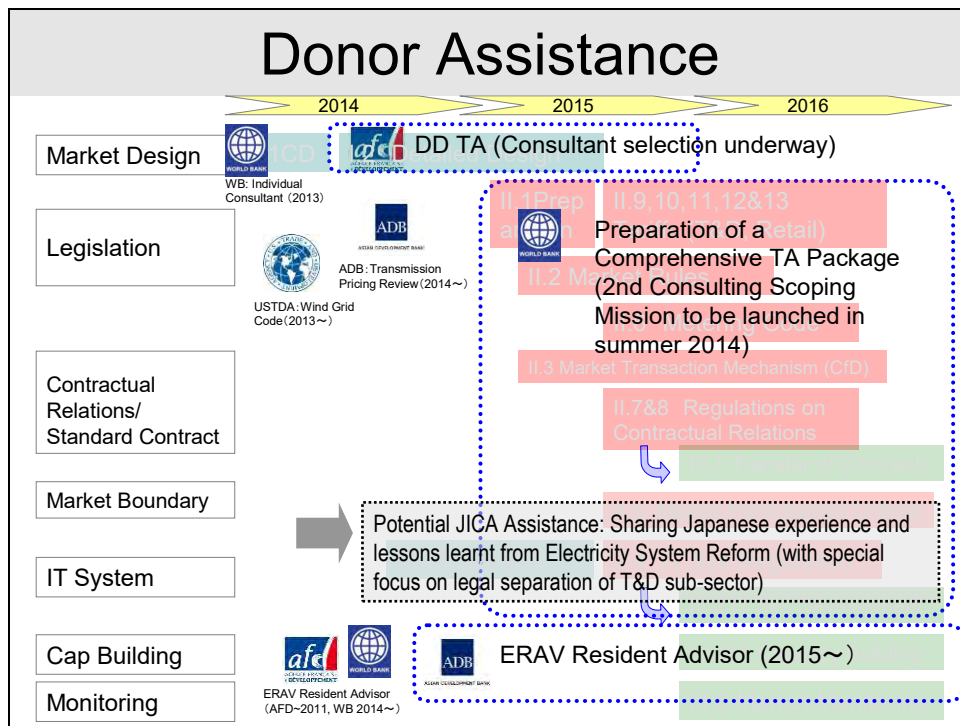


Exhibit 4-6: ERAV Action Plan and Donor Assistance

As mentioned in previous sections, key donors have actively assisted the Vietnamese Government’s power sector reform initiatives. In introduction of VWEM, AFD has already committed itself to TA on DD assistance. ADB has also decided to dispatch a long-term

resident advisor to ERAV. WB is expected to offer a comprehensive TA package as big as the one for VCGM during 2007 and 2012.

Under the circumstances, the Study Team discussed with sector officers in key donors the possibility of JICA's direct involvement in VWEM introductory assistance. Waiting for WB's proposal on a TA package like other donors and taking into account the importance of donor coordination, key donors suggested that there is very limited room currently for JICA's activity in the area of power sector reform assistance which is quite new to JICA.

However, it was confirmed that ERAV is interested in sharing knowledge and experience of Japanese Electricity System Reform. During the Study Team's visit in Hanoi, a two-hour information session for ERAV staff on the contents of Electricity System Reform was held by the Team. In particular, ERAV was really motivated to share real-time information on the legal separation of transmission and distribution divisions out of General Electric Power Companies, separation of distribution and retail services, establishment of the Organization for Cross-regional Coordination of Transmission Operators (OCCTO), and perfect retail competition as practical references to VWEM introduction. If the Japanese side is ready, it is possible to structure a training program for ERAV for such information sharing on Japanese sector reform experience.

Next, track records of key donors' assistance together with expected future assistance were placed on the aforementioned action plan maps of ERAV and EVN respectively (see the following exhibits). As is explicitly described in the revised Road Map, EVN has to undertake sector restructuring including divestiture of GENCOs in line with power sector reform requirements. In transition from the SB to multiple-buyers, EVN will face transfer of PPAs as well as power trade operation from EPTC to five PCs. At the same time, EVN needs to strengthen financial, managerial, and technical capacity of PCs and EVN itself in order to adapt the new market environment.

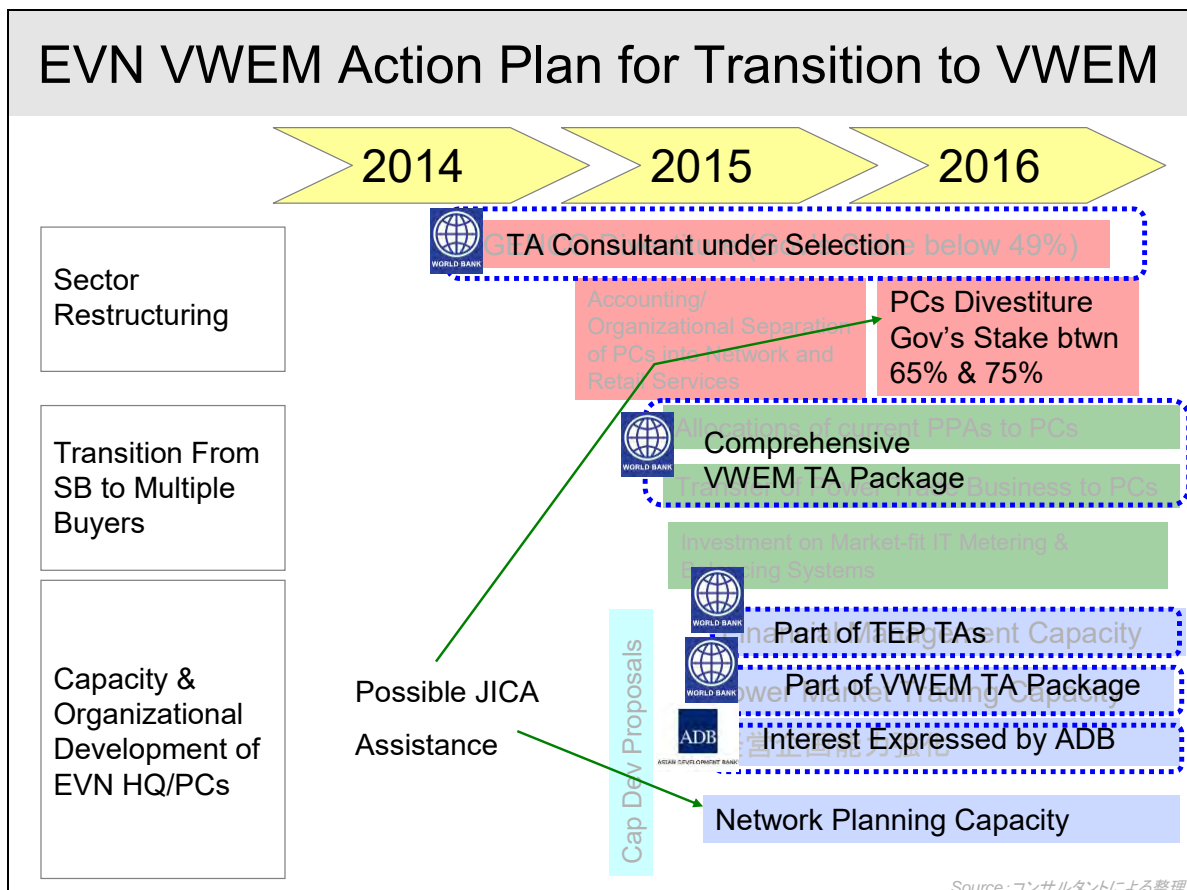


Exhibit 4-7: EVN Action Plan and Donor Assistance

With regard to EVN assistance, WB outweighs other donors as well. Currently, selection of consultants for divestiture strategy for GENGOs is underway, expecting TA to be initiated in the latter half of 2014. Assistance to EPTC on transferring existing PPAs to PCs may possibly be covered by the WB TA Package.

Regarding strengthening of various key capacity areas of PCs, WB envisages the preparation of capacity development TAs on selected issues in parallel with a couple of loan projects, Distribution Efficiency Project (DEP) and Transmission Distribution Efficiency Project (TEP). Financial management capacity development of both PCs and EVN will be targeted. ADB also expresses its interest for TA opportunity to build PCs' capacity of strategy setting, corporate planning and retail marketing.

Therefore, there are two issues where there is no specific interest on the assistance of key donors and where JICA's knowledge assistance is possible: namely, "capacity development on network planning and operation of PCs" and "assistance with PCs restructuring such as partial divestiture and accounting/organizational separation between distribution network and retail services." When the Study Team asked EVN if it is interested in JICA's assistance in these two issues, EVN expressed its strong interest in technical assistance to strengthen

network planning and the operational capacity of PCs in order to avoid overinvestment, to concentrate investment on the really necessary points in the network and, hence, to debottleneck the regional power network in a highly economic/efficient manner. With regard to partial divestiture of PCs, because the PM decision on classification of SOEs (37/2014/QD-TTg) was issued just recently (on 18 June 2014) and partial divestiture is scheduled for after 2016, EVN did not recognize immediate necessity and urgency of the assistance.

Chapter 5 Issues towards Market Liberalization and Identification of Possible Technical Assistance Menus

Towards the acceleration of electricity market liberalization, the Study Team maintains that, in addition to physical investment on transmission and distribution network development with the JICA loan financing, it is meaningful to structure and implement technical and knowledge assistance programs on capacity development on policy implementation, facility development planning optimization for halting the increase of network service fees. The Study Team streamline issues that the Vietnamese power sector faces towards the envisaged market liberalization and come up with assistance direction to overcome such issues.

5.1. Streamlining of Policy Issues and Proposal on a Possible Assistance Menu

5.1.1. Background of a Proposal

ERAV undertakes preparatory activities to introduce pilot wholesale electricity market (VWEM) in 2015, as the second phase of the electricity market reform, following successful commissioning of the Vietnam Competitive Generation Market (VCGM) in 2012. Responding to the MOIT's approval (process underway) of Conceptual Design of VWEM, detailed design (DD) of VWEM is in progress with the assistance of AFD. In addition, related activities such as legal and regulator framework setting, contractual relationship among key players in the new market setting, standard contract preparation, definition of market participants, and market supporting IT system requirements setting are also underway.

In Japan, following the cabinet decision on the Policy on Electricity System Reform in April 2013, a power market liberalization program including the establishment of the Organization for Cross-regional Coordination of Transmission Operators (OCCTO), perfect retail competition, and sector unbundling, has been carried out.

Comparing market liberalization policies between Vietnam and Japan, there are several key features such as staged approach for market liberalization and sector restructuring/unbundling in common. Although Japanese market liberalization precedes the Vietnamese one, ERAV, which is interested in the tendencies of Japanese Electricity Reform in Japan, cannot actually obtain the latest content or ascertain pressing issues in a timely manner due to unavailability of English-translated real-time information on the Reform from the Government of Japan.

Under the circumstances, the Study Team proposes a training program for ERAV personnel on the content of the Japanese Electricity System Reform, issues arising out of its implementation and lessons learned from Japanese experience.

5.1.2. Issues

- No confidence in methodology for staged transition from wholesale liberalization to perfect retail liberalization
- No idea on how to carve out transmission and distribution divisions from existing power companies (separation of network and retail services)
- Would like to know day-to-day activities on inter-regional network operation under competitive market environment
- Would like to gain understanding on marketing strategy of new market entrants and incumbents under competitive market environment

5.1.3. Assistance Contents and Methodology

■ Contents

- Drawing upon lessons learned from the Electricity System Reform in Japan
- Drawing upon implications to the market liberalization in Vietnam

■ Methodology

- Seminar on focused, timely topics on Japanese experience in Electricity System Reform with special focus on response of power utilities and new market entrants
 1. Establishment and operation of OCCTO
 2. Legal separation of power network divisions in a power utility company
 3. Perfect retail competition
- Study tours to learn day-to-day operations in the liberalized market and lessons from the Japanese reform
 1. Dialogue with Japanese regulatory authority
 2. Visit to OCCTO
 3. Visit to Japan Electric Power Exchange (JEPX)
 4. Site visits to key power facilities related to market liberalization (frequency converter stations, wind power plant, pumped-storage hydropower plant, load dispatch center, etc.)
 5. Discussions with power utilities and market entrants
- Lessons learned from Japanese experience and implications for Vietnamese market liberalization

5.2. Streamlining of Technical Issues and Proposal on a Possible Assistance Menu

5.2.1. Background of a Proposal

With the build-up of sufficient power generating capacity, PCs under the control of EVN (EVN/PCs hereinafter) are now focusing on meeting the fast growing power demand as well as raising the reliability of the power supply. However, apparently, the expertise/know-how

for optimal planning/investment and management/maintenance of assets has not been well established. By improving this, this may lead to inefficient investment in terms of improvement of SAIFI/SAIDI, and capacity of power delivering. The expected returns or effects from the investment are fully realized, leading to halting the increase of transmission and distribution service fees under the market liberalization.

Taking into account these situations, the Study Team proposes that a Technical Assistance Program on the capacity building for planning, and operation & maintenance to cope with overloading and low reliability, based on the cumulative expertise and experience in Japan will be effective.

5.2.2. Facts Found

- Demand forecast is made based on the extrapolation of past trends of each area or forecast made in the Master plan.
- The methodology for deciding system configuration in an organized manner has not been fixed yet, even though interconnecting switches are installed for distribution lines in urban areas.
- Fault location is done by visual inspection, which causes prolonged outages.
- Two of the main causes of outages are faults and construction/maintenance of power facilities. More outages are caused by construction/maintenance of power facilities.
- The operation targets of power facilities are set at 60% and 80% for average load and peak load respectively. This is relatively high compared to targets set by Japanese utilities.
- Furthermore, some of the PCs seem not to have operation targets.

5.2.3. Issues

- Overload cannot be resolved for T&D facilities whose power growth rates surpasses the aerial average by a substantial margin.
- The operation targets may be set lower than needed, since the real capacity of facilities has not been properly ascertained.
 - ⇒ Inflated investment without optimal allocation of investment
- Optimal configuration of distribution systems by area and population density is not realized.
- Hardware and expertise for fault location is not in place.
 - ⇒ Remaining low power supply reliability

5.2.4. TA contents (proposals for planning/operational methodological improvement)

- Establishment of unified standard for necessary reliability level
 - Introduction of demand forecasting methodology for each of the distribution lines
 - Introduction of methodology of planning for optimal allocation of investment
 - Evaluation of performance of grids and identification of weak points on grids
 - Introduction of asset management for the evaluation of performance of facilities
-
- Optimal allocation of investment**
- Higher reliability**

5.2.5. Methodology

- Introduction of more detailed demand forecasting methodology executed for each of the distribution lines
- Introduction of methodology of planning for optimal allocation of investment
- Introduction of methodologies for the evaluation of performance of grids and the identification of weak points on grids
- Introduction of asset management for the evaluation of performance of facilities based on current status and past records
- Introduction of fault locating skills including the adoption of fault locating equipment
- Implementation of pilot project for optimal planning and reduced SAIFI/SAIDI at selected EVN/PC with best practice to be deployed to other EVN/PC
- Organizing counter-part training programs in Japan to have trainees study good practice, aiming to promote EVN/PC in-house activities

Chapter 6 Conclusion and Proposal on the Methodology for Ex-post Evaluation on JICA Loan Project

The propose of the Technical Assistance was to rank the SPs proposed for JICA loan project (Sector Loan) to prioritize and select SPs needed for the effective building up of power infrastructure in Vietnam. Furthermore, the menus of assistance were considered for the proposal in view of the possible technical assistance facing Vietnamese power sector in terms of policy making and infrastructure build-up.

As for the ex-post evaluation of the project, the selection of indices were made for gauging the effectiveness of the project with the purpose of the project implementation in mind.

6.1. Big Picture and Adequacy of the Project Planning

For the said project, the evaluation is made for 75 of SPs considered by EVN with the basic planning completed by executive agencies (PCs), for which use of JICA loan is planned. As the purposes of implementation of projects, posed was mitigating the overloading, raising power supply reliability, reducing technical loss and alleviating social impacts in terms of safety and landscape. It is confirmed that the proposed SPs fit the purpose mentioned above, which also proved the adequacy of entire project.

The hearing was made with regards to the system of each PC for procurement, construction and O&M after the construction as well as implementation schedule. As a result, it was confirmed the management system is well-established with job allocation of each of the department of PCs defined and some of works which can be covered by each of PC effectively outsourced. In judging the capability of O&M, the experiences for the past implementation of the similar project were taken into consideration.

6.2. Setting Criteria and Ranking based on the Criteria

In order to raise the effectiveness of investments, it was critical to rank 75 of SPs to select SPs with priority. To this end, objective criteria were prepared through the discussion with relevant parties, with which the SPs proposed from each of PCs are to be evaluated on the unique gauge. As for some of criteria with importance such as mitigation of overloading and loss, economical evaluation of SPs, maturity of FS and benefits to Japanese firms criteria were weighted.

The selection of criteria and weight for criteria was indicated to Vietnamese side in advance for their approval as well as JICA so as to optimize the criteria in taking local conditions into consideration.

SPs proposed by each PCs were evaluated and ranked based on the said criteria in terms of technical aspects, economical effectiveness, social and environmental impacts and benefits to Japanese firms. The evaluation was made according with the ceilings of JICA loan amount of

15 billion JPY, 20 billion JPY and 25 billion JPY. If the 15 billion JPY is taken as a ceiling, only SPs from HPC and SPC were selected. With loan amount raised to 25 billion JPY, SPs were almost equally selected from 4 PCs except HCMPC, which proposed less SPs than others.

Furthermore, the distributions of points of all of 75 SPs were indicated so as to observe how the entire project fit the each of criteria. For some of criteria such as connection of RE sources, important connections, it turned out that same points were endowed to all of SPs. It is concluded that the evaluation from multiple aspects are important, since it is difficult to foresee the evaluation results in advance.

6.3. Movement of Power Market Liberalization and Possibility on Technical Assistance for its Smooth Implementation

Through the hearing to organizations facilitating power market liberalization and each of PCs, contents and progress of Roadmap were grasped together with the action plan to realize the Roadmap. The activities of foreign aid agencies were also surveyed to be arranged for reference. Based on this information, proposal was made on the possible area of technical assistance by the Japanese aid agency. To be specific, it is promising to assist the capacity building of policy makers working on power market liberalization as well as system operators working on planning and O&M, which is to lower the wheeling tariff.

6.4. Operation and Effectiveness Indices

Regarding the calculation of effectiveness after the implementation of the Project, based on discussions made with the relevant personnel in EVN, the following set of indices and measurement methods are proposed. In the selection of indices, it is considered that the selected indices can measure values that power distribution companies must bear. In addition, indices have to be easily measurable.

Specifically, the Study Team agreed with EVN on the selection of the following indices to measure the effectiveness of the Project before and after the implementation.

■ Improvement of load factors

Indices

- Peak load value gauged by the percentage to rated current
- Average load value gauged by the percentage to rated current

Comparison

The percentage values are to be collected for 3 years after the completion of each of project. Comparison is made between percentage value before implementation and percentage values after implementation.

■ Improvement of power supply reliability

Index

- SAIDI/SAIFI for selected provincial PCs

Comparison

SAIFI/SAIDI is to be collected for 3 years after the completion of each of project. Comparison is made between SAIFI/SAIDI values before implementation and SAIFI/SAIDI values after implementation.

■ Reduction of power loss

Index

- Technical loss of the following:
 - 110kV system for each of PCs
 - MV and LV system for each of CPC and SPC, where the selected sub-projects are to be implemented

Comparison



Percentage values of technical loss are to be collected for 3 years after the completion of each project. Comparison is made between technical loss values before implementation and technical loss values after implementation

Attachments

- Attachment 1 : Outline of Key Materials and Equipment
 - Attachment 2 : The Definition of Facility Operation Rate
 - Attachment 3 : A list of Japanese firms connected with sub-stations where SPs take place
 - Attachment 4 : SP Evaluation and Ranking
 - Attachment 5 : SP Summary Sheet (75 SPs)
 - Attachment 6 : Project Overview Map for all 75 SPs submitted (NPC/HPC/CPC/SPC/HCMCPC)
 - Attachment 7 : Project Overview Maps for JICA loan JPY 15 billion case (Same Above)
 - Attachment 8 : Project Overview Maps for JICA loan JPY 20 billion case (Same Above)
 - Attachment 9 : Project Overview Maps for JICA loan JPY 25 billion case (Same Above)
 - Attachment10 : The list of laws and regulations related to environmental protection
 - Attachment11 : References of Forest Category and Types / References of Development in Forest Area
 - Attachment12 : The IUCN's distribution map of mammals
 - Attachment13 : Evaluation Sheet of Environmental and Social Considerations
 - Attachment14 : Environmental and Social consideration checklist (Transmission/Distribution line and Substation)
 - Attachment15 : MOIT Approval (VWEM Conceptual Design) [In Vietnamese]
 - Attachment16 : ERAV Action Plan
 - Attachment17 : Prior Actions for DPO1 and DPO2
 - Attachment18 : World Bank TA List
 - Attachment19 : ADB TA List
-




Attachment1 : Outline of Key Materials and Equipment




Attachment1 : Outline of Key Materials and Equipment




Name of Equipment	Picture	Note
Steel tower for 220kV and 110kV (with cable head) Transmission Line		Underground Cable for connection with 220/110/22/15kV Hiep Binh Phuoc Substation (indoor substation) Lower circuit: 220kV Upper circuit: 110kV (HCMCPC)
Steel Tower for 110kV Transmission Line		110kV Bao Loc – Dambri Line (SPC: Existing)



Steel Pole for 110kV Transmission Line		
220/110kV Transformer		<p>220/110kV Hiep Binh Phuoc Substation (HCMCPC: Existing) Capacity : 250MVA Manufacturer : Crompton Greaves Ltd. (India)</p>
110/22kV Transformer		<p>110/22kV Tan Son Nhat Substation (HCMCPC: Existing) Capacity : 63MVA Manufacturer : EEMP (Vietnam)</p>

<p>220kV GIS</p>		<p>220/110kV Hiep Binh Phuoc Substation (HCMCPC: Existing) Manufacturer : HYOSUNG Corporation (Korea)</p>
<p>110kV Gas Insulated Switchgear (GIS)</p>		<p>110/22kV Tan Son Nhat Substation (HCMCPC) Manufacturer : HYOSUNG Corporation (Korea)</p>
<p>110kV Vacuum Circuit Breaker (VCB)</p>		<p>110/22kV Yen Phu Substation (HPC: Existing) Manufacturer : ABB(China)</p>

<p>22kV VCB</p>		<p>110/22kV Hiep Binh Phuoc Substation (HCMCPC: Existing) Manufacturer : TGE</p>
<p>110kV Current Transformer (CT)</p>		<p>110/22kV Ben Luc Substation (SPC: Existing) Manufacturer : RITZ(USA)</p>
<p>Surge Arrester</p>		<p>110/22kV Ben Luc Substation (SPC: Existing)</p>

SCADA Monitor		220/110/22/15kV Hiep Binh Phuoc Substation (HCMCPC: Existing)
Disconnecter (DS)		
Recloser		Radio Control Type Recloser

Load Break Switch (LBS) and Underground Cable Terminal		
Fuse Cutout (FCO)		
Fuse Cut Out (FCO)		FCO for 22kV

<p>MV/0.4kV 3-phase Transformer</p>		<p>CPC Area</p>
<p>MV/0.4kV 3- phase Transformer (3 sets of single-phase Transformer)</p>		<p>Picture taken in HCMCPC area (Same Type used in SPC Area)</p>

Attachment2 : The Definition of Facility Operation Rate

Attachment 2 : The Definition of Facility Operation Rate

Data of Facility operation rate of each PC is written below;

Items	NPC		HPC		CPC		SPC		HCMC PC		
Definition of Peak Load Status (%)	= Peak load / rated load × 100										
Definition of Average Load Factor (%)	= Average of the monthly peak load of past 12 months / rated load × 100										
Operation target for Peak Load Status	Transmission lines	80%	80% (8.3% of the operation time)		- *2		80%	60%			
	S/S	80%			- *2		80%	70%			
	MV lines	90%			80%		80%-85%	50%			
Operation target for Average Load Factor	Transmission lines	60%	60% (80% of the operation time)		- *2		60%	50%			
	S/S	60%			- *2		60%	60%			
	MV lines	70%			60% *3		60%	40%			
The higher operation target and corresponding peak loading time for peak Loading Status..	Transmission lines	- % *1	-min. *1	120%	120 min.	- % *2	-min. *2	100%	120min.	110%	30min.
	S/S	- % *1	-min. *1	120%	120 min.	130%*4	20 min.*4	100%	120min.	120%	30min.
						145%*4	80 min.*4				
						160%*4	45 min.*4				
						175%*4	20 min.*4				
MV lines	- % *1	-min. *1	120%	120 min.	- %	- min.	100%	120min.	100%	120min.	

* 1 : NPC don't have these targets

*2: N/A This time CPC don't have Transmission SPs & Substation SPs

*3: Of which: $= (\sum_{i=1}^n (Ki\%))/n$

- Ki%: Load factor of distribution substation i

- n: Total number of distribution substation in each province

*4: Of which:

- Ki%: Load factor of distribution substation i

- n: Total number of distribution substation in each province

Attachment3 :

A list of Japanese firms connected with sub-stations where SPs take place

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
1	NPC	Vinh Phuc	Toyota Motor VN Co.,ltd	5,256.0	35	NPC-B-2, NPC-C-9
2	NPC	Vinh Phuc	Toyota Motor VN Co.,ltd	26,640.0	35	NPC-B-2, NPC-C-9
3	NPC	Vinh Phuc	Toyota Boshoku VN Co.,ltd	3,549.6	22	NPC-B-2, NPC-C-9
4	NPC	Vinh Phuc	Kohsei Multipack VN Co.,ltd	3,369.6	35	NPC-B-2, NPC-C-9
5	NPC	Vinh Phuc	Prec VN Co.,ltd	453.6	35	NPC-B-2, NPC-C-9
6	NPC	Vinh Phuc	Sun Steel VN Co.,ltd	2,160.0	35	NPC-B-2, NPC-C-9
7	NPC	Vinh Phuc	Ohashi TekkoVN Co.,ltd	612.0	35	NPC-B-2, NPC-C-9
8	NPC	Vinh Phuc	Think VN Co.,ltd	230.4	35	NPC-B-2, NPC-C-9
9	NPC	Vinh Phuc	Tanaka Vn Co.,ltd	288.0	35	NPC-B-2, NPC-C-9
10	NPC	Vinh Phuc	Toyota Hiroshima VP Co.,ltd	576.0	22	NPC-B-2, NPC-C-9
11	NPC	Bac Ninh	Sumo Japan	637.5	35	NPC-B-3, NPC-C-4
12	NPC	Bac Ninh	Manufacturing Viet Nam Co.,ltd	1,250.0	22	NPC-B-3, NPC-C-4
13	NPC	Bac Ninh	TABUCHIELECTRIC Co.,ltd	1,630.0	22	NPC-B-3, NPC-C-4
14	NPC	Bac Ninh	Rare Earth Viet Nam Joint Stock Company	5,130.0	35	NPC-B-3, NPC-C-4
15	NPC	Bac Ninh	SUMO Viet Nam Co.,ltd (Hap Linh Industrial Complex)	750.0	35	NPC-B-3, NPC-C-4
16	NPC	Thanh Hoa	SAKURA; YOTSUBA DRESS; NOMURA	4,500.0	22	NPC-B-9, NPC-C-1
17	NPC	Thanh Hoa	SAKURA; YOTSUBA DRESS; NOMURA	6,850.0	22	NPC-B-9, NPC-C-1
18	NPC	Thanh Hoa	SAKURA; YOTSUBA DRESS; NOMURA	7,500.0	22	NPC-B-9, NPC-C-1
19	NPC	Thanh Hoa	SAKURA; YOTSUBA DRESS; NOMURA	4,600.0	22	NPC-B-9, NPC-C-1
20	NPC	Thanh Hoa	SAKURA; YOTSUBA DRESS; NOMURA	4,120.0	22	NPC-B-9, NPC-C-1
21	NPC	Thanh Hoa	SAKURA; YOTSUBA DRESS; NOMURA	12,000.0	22	NPC-B-9, NPC-C-1
22	NPC	Thanh Hoa	SAKURA; YOTSUBA DRESS; NOMURA	8,500.0	22	NPC-B-9, NPC-C-1
23	NPC	Thanh Hoa	Nghi Son Oil refinery Co.,ltd	6,700.0	22	NPC-B-8, NPC-C-1
24	NPC	Thanh Hoa	Nghi Son Oil refinery Co.,ltd	5,620.0	22	NPC-B-8, NPC-C-1
25	NPC	Thanh Hoa	Nghi Son Oil refinery Co.,ltd	500.0	22	NPC-B-8, NPC-C-1
26	NPC	Thanh Hoa	Nghi Son Oil refinery Co.,ltd	4,600.0	22	NPC-B-8, NPC-C-1
27	NPC	Thanh Hoa	JAPAN-MARINE-UNITED-CORPORATION	5,420.0	22	NPC-B-9, NPC-C-1

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
28	NPC	Thanh Hoa	Công ty cơ khí XL CN tàu thủy	4,350.0	22	NPC-B-9, NPC-C-1
29	NPC	Thanh Hoa	SAKURA; YOTSUBA DRESS; NOMURA	6,500.0	22	NPC-B-9, NPC-C-1
30	NPC	Thanh Hoa	Shoes ANNURA Co., Ltd.	5,600.0	35	NPC-B-9, NPC-C-1
31	NPC	Thanh Hoa	Export Enterprise Viet Trang	7,500.0	35	NPC-B-10, NPC-C-1
32	NPC	Thanh Hoa	VAUDE Co.,ltd	5,600.0	22	NPC-B-10, NPC-C-1
33	NPC	Thanh Hoa	SAKURA Co.,ltd, Nghi Son Oil refinery Co.,ltd	6,500.0	22	NPC-B-8, NPC-C-1
34	NPC	Thanh Hoa	SAKURA, NOMURA, TNHH YOTSUBA DRESS Co.,ltd	8,600.0	22	NPC-B-9, NPC-C-1
35	NPC	Thanh Hoa	Cty Maruberni co...ltd: koken co..ltd: N.ITEIJINSHOJ CO..LTD	7,900.0	22	NPC-B-10, NPC-C-1
36	NPC	Thai Binh	JOHOKU Hai Phong Co.,ltd	210.0	35	NPC-B-6, NPC-C-3
37	NPC	Thai Binh	KIMONOE JAPAN Co.,ltd	25.0	10	NPC-B-7, NPC-C-3
38	NPC	Thai Binh	YAZAKI Hai Phong Co.,ltd	1,200.0	35	NPC-B-6, NPC-C-3
39	NPC	Thai Binh	Branch Japanese company in Thai Binh province	2.0	10	NPC-B-7, NPC-C-3
40	NPC	Bac Giang	Cty Yokoi Mould Co.,ltd	5,000.0	22	NPC-B-5
41	NPC	Bac Giang	DOVAN Co.,ltd	3,200.0	22	NPC-B-5
42	NPC	Bac Giang	TOKAI TRIM Co.,ltd	2,500.0	22	NPC-B-5
43	NPC	Bac Giang	Yoshimura Kogyo Co.,ltd	2,500.0	22	NPC-B-5
44	NPC	Bac Giang	SURTECKARIYA Co.,ltd	1,500.0	22	NPC-B-5
45	NPC	Bac Giang	EXT RENGINEER Co.,ltd	5,000.0	22	NPC-B-5
46	NPC	Hai Phong	OST Co.,ltd	1,500.0	35	NPC-B-16
47	NPC	Hai Phong	Bridgestose Viet Nam Co.,ltd	2,500.0	35	NPC-B-16
48	NPC	Hai Phong	NOMURA Co.,ltd	800.0	6	NPC-B-16
49	NPC	Hai Phong	Viet-Nhat Glass Co.,ltd	850.0	6	NPC-B-22
50	NPC	Hai Phong	YAZAKI Co.,ltd	250.0	6	NPC-B-16
51	HPC	Hoan Kiem district	Bệnh viện T doanh Quốc tế TNHH EUKARIA Việt nam	5.0	0.4	HAN-B-1, HAN-B-5
52	HPC	Hoan Kiem district	Chi nhánh ngân hàng Mizuho Corporate Bank	10.0	22	HAN-B-1, HAN-B-5

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
53	HPC	Hoan Kiem district	Công ty TNHH Accord Biz	15.0	22	HAN-B-1, HAN-B-5
54	HPC	Hoan Kiem district	Công ty TNHH Morisada Việt Nam	15.0	22	HAN-B-1, HAN-B-5
55	HPC	Hoan Kiem district	Công ty TNHH Kinden Việt Nam	3.0	0.4	HAN-B-1, HAN-B-5
56	HPC	Hoan Kiem district	Công ty TNHH All in One Solution Việt Nam	10.0	0.4	HAN-B-1, HAN-B-5
57	HPC	Hoan Kiem district	Công ty TNHH giải pháp NEC Việt Nam	15.0	22	HAN-B-1, HAN-B-5
58	HPC	Hoan Kiem district	CÔNG TY TNHH PHẦN MỀM ESTELLE VIỆT NAM	1.0	0.4	HAN-B-1, HAN-B-5
59	HPC	Hoan Kiem district	Công ty LD Reality Design	1.0	0.4	HAN-B-1, HAN-B-5
60	HPC	Hoan Kiem district	Công ty TNHH Mặt trời Sông Hồng	15.0	22	HAN-B-1, HAN-B-5
61	HPC	Hoan Kiem district	Công ty TNHH NARAI	5.0	0.1	HAN-B-1, HAN-B-5
62	HPC	Hoan Kiem district	Công ty TNHH Shiki	1.0	0.4	HAN-B-1, HAN-B-5
63	HPC	Hoan Kiem district	Công ty TNHH Sumitomo Corporation Việt nam	8.0	22	HAN-B-1, HAN-B-5
64	HPC	Hoan Kiem district	Công ty TNHH Nasage Việt nam	6.0	0.4	HAN-B-1, HAN-B-5
65	HPC	Hoan Kiem district	Công ty TNHH Toyota Tsusho Việt Nam	15.0	22	HAN-B-1, HAN-B-5
66	HPC	Hoan Kiem district	Công ty TNHH Honda Trading Việt nam	15.0	22	HAN-B-1, HAN-B-5
67	HPC	Hoan Kiem district	Công ty TNHH Molitec Steel (việt Nam)	15.0	22	HAN-B-1, HAN-B-5
68	HPC	Hoan Kiem district	Công ty TNHH Truyền thông Dentsu	10.0	22	HAN-B-1, HAN-B-5
69	HPC	Hoan Kiem district	Chi nhánh Công ty TNHH Sojitz Việt nam	15.0	22	HAN-B-1, HAN-B-5
70	HPC	Hoan Kiem district	Chi nhánh Công ty liên doanh Du lịch H.I.S. Sông Hàn VN	6.0	22	HAN-B-1, HAN-B-5
71	HPC	Hoan Kiem district	Công ty TNHH Nec Việt Nam	15.0	22	HAN-B-1, HAN-B-5
72	HPC	Hoan Kiem district	Công ty TNHH phát triển phần mềm MPG Operations Việt Nam	5.0	0.4	HAN-B-1, HAN-B-5

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
73	HPC	Hoan Kiem district	Công ty TNHH Nakano Corporation - VP Đại diện Hà Nội	6.0	22	HAN-B-1, HAN-B-5
74	HPC	Hai Bà Trưng district	Cty LD TNHH Hai Ha - Kotobuki	734.0	22	HAN-B-7, HAN-B-12
75	HPC	Hai Bà Trưng district	Công ty TNHH Yamaha Motor Việt Nam	21.0	22	HAN-B-7, HAN-B-12
76	HPC	Hai Bà Trưng district	CÔNG TY CỔ PHẦN TẬP ĐOÀN P&T	2.0	22	HAN-B-7, HAN-B-12
77	HPC	Hai Bà Trưng district	Công ty TNHH Sakura	0.0	22	HAN-B-7, HAN-B-12
78	HPC	Hai Bà Trưng district	Công ty TNHH Intertable Corporation	10.0	22	HAN-B-7, HAN-B-12
79	HPC	Hai Bà Trưng district	Công ty TNHH Coatech J Hà Nội	5.0	22	HAN-B-7, HAN-B-12
80	HPC	Hai Bà Trưng district	Công ty TNHH KEIHAN Việt Nam	3.0	22	HAN-B-5
81	HPC	Hai Bà Trưng district	Công ty TNHH Toshiba Machine (Việt Nam)	6.0	22	HAN-B-5
82	HPC	Hai Bà Trưng district	Công ty TNHH Eikoh Việt Nam	5.0	0.4	HAN-B-5
83	HPC	Đống Đa district	Công ty TNHH Công nghệ cao và thiết bị y tế Shimadzu Việt Nam	25.5	10	HAN-B-12
84	HPC	Đống Đa district	Phòng khám gia đình Hà Nội	20.0	0.4	HAN-B-12
85	HPC	Đống Đa district	Công ty TNHH Kiểm toán HSK Việt Nam	15.0	10	HAN-B-12
86	HPC	Đống Đa district	CÔNG TY TNHH WASEDA CONSULTING	25.0	0.4	HAN-B-12
87	HPC	Đống Đa district	Công ty TNHH Tokyo Consluting	10.0	0.4	HAN-B-12
88	HPC	Đống Đa district	CTLD Toyota TC Hà Nội.	8.0	22	HAN-B-12
89	HPC	Đống Đa district	Cty TNHH vận tải hỗn hợp Việt-Nhật số 1	230.0	22	HAN-B-12
90	HPC	Đống Đa district	CÔNG TY TNHH "K" LINE (VIỆT NAM)	20.0	0.4	HAN-B-12
91	HPC	Đống Đa district	Công ty TNHH Vận tải quốc tế Hankyu-Hanshin Việt Nam	20.0	0.4	HAN-B-12
92	HPC	Đống Đa district	Công ty TNHH Xây dựng Asahiya Việt Nam	20.0	0.4	HAN-B-12
93	HPC	Đống Đa district	Công ty Cổ phần Just Imformation Technology	15.0	0.4	HAN-B-12
94	HPC	Đống Đa district	Cty TNHH Vijasgate	20.0	0.4	HAN-B-12

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
95	HPC	Đông Đa district	Công ty TNHH Grape City	30.0	0.4	HAN-B-12
96	HPC	Đông Đa district	Công ty TNHH hệ thống Image Partner Việt Nam	15.0	0.4	HAN-B-12
97	HPC	Đông Đa district	CÔNG TY TNHH TECHNICA VIỆT NAM	45.0	0.4	HAN-B-12
98	HPC	Đông Đa district	Công ty TNHH Tact system Việt Nam	45.0	0.4	HAN-B-12
99	HPC	Đông Đa district	Công ty TNHH Siêu thị PCSC (Việt Nam)	320.0	10	HAN-B-12
100	HPC	Đông Đa district	Cty TNHH Fujiya Việt nam (đăng ký lại giấy chứng nhận đầu tư số 011023000088 ngày 10/10/2005)	15.0	0.4	HAN-B-12
101	HPC	Đông Đa district	CÔNG TY TNHH NR GREENLINES LOGISTICS	40.0	0.4	HAN-B-12
102	HPC	Đông Đa district	Công ty TNHH Taikisha Việt nam	9.0	0.4	HAN-B-12
103	HPC	Đông Đa district	Công ty TNHH M.APRI	N/A	0.4	HAN-B-12
104	HPC	Đông Đa district	Công ty TNHH MTV Takasago Việt Nam	N/A	0.4	HAN-B-12
105	HPC	Đông Đa district	Công ty TNHH Sepia	N/A	0.4	HAN-B-12
106	HPC	Đông Đa district	Công ty TNHH Itsuwa Việt Nam	N/A	0.4	HAN-B-12
107	HPC	Đông Đa district	Công ty TNHH Terada Việt Nam	N/A	0.4	HAN-B-12
108	HPC	Đông Đa district	Công ty TNHH Vina World Link	230.0	22	HAN-B-12
109	HPC	Đông Đa district	Cty TNHH V-MEX	20.0	22	HAN-B-12
110	HPC	Đông Đa district	Công ty TNHH Minami Design Việt Nam	45.0	0.4	HAN-B-12
111	HPC	Đông Đa district	Công ty CP Global Data Service	15.0	22	HAN-B-12
112	HPC	Từ Liêm district	Công ty TNHH 1 thành viên Ihara Manufacturing Việt Nam	N/A	N/A	HAN-B-1, HAN-B-6, HAN-B-10
113	HPC	Từ Liêm district	Công ty TNHH ADO	N/A	N/A	HAN-B-1, HAN-B-6, HAN-B-10
114	HPC	Từ Liêm district	CÔNG TY TRÁCH NHIỆM HỮU HẠN NIKKEN INTERNATIONAL ASIA	N/A	N/A	HAN-B-1, HAN-B-6, HAN-B-10
115	HPC	Từ Liêm district	Công ty TNHH Hoetsu Việt Nam	N/A	N/A	HAN-B-1, HAN-B-6, HAN-B-10
116	HPC	Từ Liêm district	Công ty TNHH Cơ khí chính xác Seikico	N/A	N/A	HAN-B-1, HAN-B-6, HAN-B-10

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
117	HPC	Từ Liêm district	Công ty TNHH Thiết bị hoá chất Nakagawa Việt Nam	N/A	N/A	HAN-B-1, HAN-B-6, HAN-B-10
118	HPC	Từ Liêm district	Cty TNHH các hệ thống viễn thông VNPT-NEC	3.0	0.4	HAN-B-1, HAN-B-6, HAN-B-10
119	HPC	Từ Liêm district	Công ty TNHH TRAVIET JAPAN	0.0	N/A	HAN-B-1, HAN-B-6, HAN-B-10
120	HPC	Từ Liêm district	Công ty TNHH Kokusai Keiso Việt Nam	1.0	0.4	HAN-B-1, HAN-B-6, HAN-B-10
121	HPC	Từ Liêm district	Công ty TNHH Kamogawa Việt Nam	2.0	0.4	HAN-B-1, HAN-B-6, HAN-B-10
122	HPC	Từ Liêm district	Công ty TNHH Riising Sun Việt Nam	0.0	N/A	HAN-B-1, HAN-B-6, HAN-B-10
123	HPC	Từ Liêm district	Chi nhánh Công ty TNHH Sagawa Express Việt Nam	1.0	0.4	HAN-B-1, HAN-B-6, HAN-B-10
124	HPC	Từ Liêm district	Công ty TNHH Bumyang Vina Eng	0.0	N/A	HAN-B-1, HAN-B-6, HAN-B-10
125	HPC	Từ Liêm district	Công ty TNHH Compass Systems Việt Nam	0.0	N/A	HAN-B-1, HAN-B-6, HAN-B-10
126	HPC	Từ Liêm district	Công ty TNHH Sreng	0.0	N/A	HAN-B-1, HAN-B-6, HAN-B-10
127	HPC	Từ Liêm district	Công ty TNHH Hitachi Plant Technologies (Việt Nam)	0.0	N/A	HAN-B-1, HAN-B-6, HAN-B-10
128	HPC	Từ Liêm district	Công ty TNHH VS MARINE	0.0	N/A	HAN-B-1, HAN-B-6, HAN-B-10
129	HPC	Từ Liêm district	Công ty TNHH Kỹ thuật và xây dựng Seolim	0.0	N/A	HAN-B-1, HAN-B-6, HAN-B-10
130	HPC	Thanh Trì district	Công ty TNHH Canyon Châu Á	504.0	0.4	HAN-B-9
131	HPC	Đông Anh district	Công ty TNHH Hoa Anh Đào (tên cũ là Trung tâm đào tạo tiếng Nhật thế kỷ 21 TOPA-HOANG Lê)	20.0	22	HAN-B-2, HAN-B-4
132	HPC	Đông Anh district	Công ty TNHH DK Vina Motor	40.4	22	HAN-B-2, HAN-B-4
133	HPC	Đông Anh district	Cty TNHH Bemac Panels Manufacturi	200.0	22	HAN-B-2, HAN-B-4
134	HPC	Đông Anh district	Cty TNHH TOA VN	250.0	22	HAN-B-2, HAN-B-4
135	HPC	Đông Anh district	Cty TNHH IKEUCHI VN	200.0	22	HAN-B-2, HAN-B-4
136	HPC	Đông Anh district	Cty TNHH EIWO RUBBER MFG	200.2	22	HAN-B-2, HAN-B-4
137	HPC	Đông Anh district	Cty TNHH EIWO RUBBER MFG	150.0	22	HAN-B-2, HAN-B-4

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
138	HPC	Đông Anh district	Cty TNHH HTTT&PP Toshiba VN	60.0	22	HAN-B-2, HAN-B-4
139	HPC	Đông Anh district	Cty TNHH Ryonan Electric VN	700.0	22	HAN-B-2, HAN-B-4
140	HPC	Đông Anh district	Cty TNHH VINACAD	110.0	22	HAN-B-2, HAN-B-4
141	HPC	Đông Anh district	Cty TNHH VL Băng keo Nitto Denko VN	55.3	22	HAN-B-2, HAN-B-4
142	HPC	Đông Anh district	Cty TNHH SEED VN	170.0	22	HAN-B-2, HAN-B-4
143	HPC	Đông Anh district	Cty TNHH KYOEI DIETECH VN	100.0	22	HAN-B-2, HAN-B-4
144	HPC	Đông Anh district	Cty TNHH Sanko Soken VN	80.0	22	HAN-B-2, HAN-B-4
145	HPC	Đông Anh district	Cty TNHH DAIWA PLASTICS Thăng Long	140.0	22	HAN-B-2, HAN-B-4
146	HPC	Đông Anh district	Cty TNHH Nippon Kouatsu Electric VN	200.0	22	HAN-B-2, HAN-B-4
147	HPC	Đông Anh district	Cty TNHH JTEC HN	300.0	22	HAN-B-2, HAN-B-4
148	HPC	Đông Anh district	Cty TNHH Goshu Kohsan VN	90.0	22	HAN-B-2, HAN-B-4
149	HPC	Đông Anh district	Cty TNHH KCN Thăng Long	70.0	22	HAN-B-2, HAN-B-4
150	HPC	Đông Anh district	Cty TNHH KCN Thăng Long	200.0	22	HAN-B-2, HAN-B-4
151	HPC	Đông Anh district	Cty Khu Công nghiệp Thăng Long	40.0	22	HAN-B-2, HAN-B-4
152	HPC	Đông Anh district	Cty TNHH VOLEX VN	270.0	22	HAN-B-2, HAN-B-4
153	HPC	Đông Anh district	Cty TNHH OHARA PLASTICS VN	275.5	22	HAN-B-2, HAN-B-4
154	HPC	Đông Anh district	Cty KCN Thăng Long	350.0	22	HAN-B-2, HAN-B-4
155	HPC	Đông Anh district	Cty TNHH SD Việt Nam	470.0	22	HAN-B-2, HAN-B-4
156	HPC	Đông Anh district	Cty TNHH FUJIPLA ENGINEERING VN	230.0	22	HAN-B-2, HAN-B-4
157	HPC	Đông Anh district	Cty TNHH VN IRITANI	129.8	22	HAN-B-2, HAN-B-4
158	HPC	Đông Anh district	Cty TNHH VN IRITANI	75.0	22	HAN-B-2, HAN-B-4
159	HPC	Đông Anh district	Cty TNHH VN IRITANI	39.6	22	HAN-B-2, HAN-B-4
160	HPC	Đông Anh district	Cty TNHH VN IRITANI	335.0	22	HAN-B-2, HAN-B-4
161	HPC	Đông Anh district	Cty TNHH VN IRITANI	380.0	22	HAN-B-2, HAN-B-4
162	HPC	Đông Anh district	Cty TNHH Kane Package VN	30.5	22	HAN-B-2, HAN-B-4
163	HPC	Đông Anh district	Cty TNHH AIKAWA VN	210.0	22	HAN-B-2, HAN-B-4
164	HPC	Đông Anh district	Cty TNHH TAKARA TOOL & DIE HN	320.0	22	HAN-B-2, HAN-B-4
165	HPC	Đông Anh district	Cty TNHH DENSO VN	5,500.0	22	HAN-B-2, HAN-B-4

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
166	HPC	Đông Anh district	Cty TNHH PARKER PROCESSING VN	750.0	22	HAN-B-2, HAN-B-4
167	HPC	Đông Anh district	Cty TNHH PARKER PROCESSING VN	2,200.0	22	HAN-B-2, HAN-B-4
168	HPC	Đông Anh district	Cty TNHH Bút chì MITSUBISHI VN	180.0	22	HAN-B-2, HAN-B-4
169	HPC	Đông Anh district	Cty TNHH Bút chì MITSUBISHI VN	700.0	22	HAN-B-2, HAN-B-4
170	HPC	Đông Anh district	Cty TNHH Bút chì MITSUBISHI VN	240.0	22	HAN-B-2, HAN-B-4
171	HPC	Đông Anh district	Cty CP Santomas VN	1,150.0	22	HAN-B-2, HAN-B-4
172	HPC	Đông Anh district	Cty CP Santomas VN	700.0	22	HAN-B-2, HAN-B-4
173	HPC	Đông Anh district	Cty TNHH CANON VN	9,000.0	22	HAN-B-2, HAN-B-4
174	HPC	Đông Anh district	Cty TNHH CANON VN	5,000.0	22	HAN-B-2, HAN-B-4
175	HPC	Đông Anh district	Cty TNHH linh kiện điện tử SEI	5,800.0	22	HAN-B-2, HAN-B-4
176	HPC	Đông Anh district	Cty TNHH linh kiện điện tử SEI	2,100.0	22	HAN-B-2, HAN-B-4
177	HPC	Đông Anh district	Cty TNHH SUMITOMO HEAVY INDUSTRIES VN	844.5	22	HAN-B-2, HAN-B-4
178	HPC	Đông Anh district	Cty TNHH SUMITOMO HEAVY INDUSTRIES VN (SHI)	3,115.0	22	HAN-B-2, HAN-B-4
179	HPC	Đông Anh district	Cty TNHH SUMITOMO HEAVY INDUSTRIES VN	1,050.0	22	HAN-B-2, HAN-B-4
180	HPC	Đông Anh district	Cty TNHH SUMITOMO NACCO MH VN	700.0	22	HAN-B-2, HAN-B-4
181	HPC	Đông Anh district	Cty TNHH Tokyo Micro VN	170.0	22	HAN-B-2, HAN-B-4
182	HPC	Đông Anh district	Cty TNHH MATSUO INDUSTRIES VN	1,900.0	22	HAN-B-2, HAN-B-4
183	HPC	Đông Anh district	Cty TNHH MATSUO INDUSTRIES VN	1,300.0	22	HAN-B-2, HAN-B-4
184	HPC	Đông Anh district	Cty TNHH MATSUO INDUSTRIES VN	150.0	22	HAN-B-2, HAN-B-4
185	HPC	Đông Anh district	Cty TNHH HAL VN	2,405.5	22	HAN-B-2, HAN-B-4
186	HPC	Đông Anh district	Cty TNHH HAL VN	2,700.0	22	HAN-B-2, HAN-B-4
187	HPC	Đông Anh district	Cty TNHH HAL VN	2,900.0	22	HAN-B-2, HAN-B-4
188	HPC	Đông Anh district	Cty TNHH HAL VN	2,200.0	22	HAN-B-2, HAN-B-4
189	HPC	Đông Anh district	Cty TNHH HAL VN	879.5	22	HAN-B-2, HAN-B-4
190	HPC	Đông Anh district	Cty TNHH DAIWA PLASTICS Thăng Long	3,650.0	22	HAN-B-2, HAN-B-4
191	HPC	Đông Anh district	Cty TNHH Hoya Glass Disk VN	16,500.0	22	HAN-B-2, HAN-B-4

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
192	HPC	Đông Anh district	Cty TNHH Hoya Glass Disk VN	16,500.0	22	HAN-B-2, HAN-B-4
193	HPC	Đông Anh district	Cty TNHH SX Phụ tùng Yamaha Motor VN	7,000.0	22	HAN-B-2, HAN-B-4
194	HPC	Đông Anh district	Cty TNHH DENSO VN (không dung)	0.0	22	HAN-B-2, HAN-B-4
195	HPC	Đông Anh district	Cty TNHH DENSO VN	1,700.0	22	HAN-B-2, HAN-B-4
196	HPC	Đông Anh district	Cty TNHH TOTO VN	1,400.0	22	HAN-B-2, HAN-B-4
197	HPC	Đông Anh district	Cty TNHH TOTO VN	7,000.0	22	HAN-B-2, HAN-B-4
198	HPC	Đông Anh district	Cty TNHH Panasonic VN	6,960.0	22	HAN-B-2, HAN-B-4
199	HPC	Đông Anh district	Cty TNHH Panasonic VN	4,000.0	22	HAN-B-2, HAN-B-4
200	HPC	Đông Anh district	Cty TNHH Panasonic VN	2,500.0	22	HAN-B-2, HAN-B-4
201	HPC	Đông Anh district	Cty TNHH FUJIKIN 3 VN	1,500.0	22	HAN-B-2, HAN-B-4
202	HPC	Đông Anh district	Cty TNHH KAI VN	800.0	22	HAN-B-2, HAN-B-4
203	HPC	Đông Anh district	Cty TNHH KAI VN	1,680.0	22	HAN-B-2, HAN-B-4
204	HPC	Đông Anh district	Cty TNHH NISSEI ELECTRIC HN	3,700.0	22	HAN-B-2, HAN-B-4
205	HPC	Đông Anh district	Cty TNHH FCC VN	1,300.0	22	HAN-B-2, HAN-B-4
206	HPC	Đông Anh district	Cty TNHH FCC VN	2,300.0	22	HAN-B-2, HAN-B-4
207	HPC	Đông Anh district	Cty TNHH Tokyo Byokane VN	700.5	22	HAN-B-2, HAN-B-4
208	HPC	Đông Anh district	Cty TNHH Nagatsu VN	230.0	22	HAN-B-2, HAN-B-4
209	HPC	Đông Anh district	Cty TNHH Công nghiệp KYB VN	2,005.0	22	HAN-B-2, HAN-B-4
210	HPC	Đông Anh district	Cty TNHH SATO VN	500.0	22	HAN-B-2, HAN-B-4
211	HPC	Đông Anh district	Cty TNHH Phụ tùng Xe máy-Ô tô Showa VN	8,000.0	22	HAN-B-2, HAN-B-4
212	HPC	Đông Anh district	Cty TNHH Phụ tùng Xe máy-Ô tô Showa VN	670.5	22	HAN-B-2, HAN-B-4
213	HPC	Đông Anh district	Cty TNHH KCN Thăng Long	1,800.0	22	HAN-B-2, HAN-B-4
214	HPC	Đông Anh district	Cty TNHH KCN Thăng Long	1,800.0	22	HAN-B-2, HAN-B-4
215	HPC	Đông Anh district	Cty TNHH Enkei VN	3,200.0	22	HAN-B-2, HAN-B-4
216	HPC	Đông Anh district	Cty TNHH Molex VN	1,000.0	22	HAN-B-2, HAN-B-4
217	HPC	Đông Anh district	Cty TNHH Panasonic Home Appliances VN	1,600.0	22	HAN-B-2, HAN-B-4
218	HPC	Đông Anh district	Cty TNHH ASAHI INTECC HN	4,500.0	22	HAN-B-2, HAN-B-4
219	HPC	Đông Anh district	Cty TNHH Sun call Technology VN	1,500.0	22	HAN-B-2, HAN-B-4

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
220	HPC	Đông Anh district	Cty TNHH ENPLAS VN	1,000.0	22	HAN-B-2, HAN-B-4
221	HPC	Đông Anh district	Cty TNHH ENPLAS VN	1,000.0	22	HAN-B-2, HAN-B-4
222	HPC	Đông Anh district	Cty TNHH SWCC SHOWA VN	2,000.0	22	HAN-B-2, HAN-B-4
223	HPC	Đông Anh district	Cty TNHH HOEV	1,200.0	22	HAN-B-2, HAN-B-4
224	HPC	Đông Anh district	Cty TNHH ATSUMITEC VN	1,200.0	22	HAN-B-2, HAN-B-4
225	HPC	Đông Anh district	Cty TNHH OHARA PLASTICS VN	900.0	22	HAN-B-2, HAN-B-4
226	HPC	Đông Anh district	Cty TNHH Hà Nội Steel Center	650.0	22	HAN-B-2, HAN-B-4
227	HPC	Đông Anh district	Cty TNHH KCN Thăng Long	60.0	22	HAN-B-2, HAN-B-4
228	HPC	Đông Anh district	Cty TNHH KCN Thăng Long	130.0	22	HAN-B-2, HAN-B-4
229	HPC	Đông Anh district	Cty TNHH KCN Thăng Long	900.0	22	HAN-B-2, HAN-B-4
230	HPC	Đông Anh district	Cty TNHH Chiyoda Integre VN	700.0	22	HAN-B-2, HAN-B-4
231	HPC	Đông Anh district	Cty TNHH KEIN HINH-MURAMOTO VN	500.0	22	HAN-B-2, HAN-B-4
232	HPC	Đông Anh district	Cty TNHH SAKURAI	60.0	22	HAN-B-2, HAN-B-4
233	HPC	Đông Anh district	Cty TNHH SAKURAI	630.0	22	HAN-B-2, HAN-B-4
234	HPC	Đông Anh district	Cty TNHH TOHO VN	630.0	22	HAN-B-2, HAN-B-4
235	HPC	Đông Anh district	Cty TOKYO MICRO VN	630.0	22	HAN-B-2, HAN-B-4
236	HPC	Đông Anh district	Cty TNHH YASUFUKU VN	500.0	22	HAN-B-2, HAN-B-4
237	HPC	Đông Anh district	Cty TNHH Alpha Industries VN	400.0	22	HAN-B-2, HAN-B-4
238	HPC	Đông Anh district	Cty TNHH OGINO VN	3,900.0	22	HAN-B-2, HAN-B-4
239	HPC	Đông Anh district	Cty TNHH MHI Aerospace VN	800.0	22	HAN-B-2, HAN-B-4
240	HPC	Đông Anh district	Cty CP DV Số liệu Toàn Cầu	2,000.0	22	HAN-B-2, HAN-B-4
241	HPC	Sóc Sơn	Công ty TNHH NCI (Việt Nam)	1,100.0	20-22/0.4	HAN-B-11
242	HPC	Sóc Sơn	Công ty TNHH sản phẩm thép Việt Nam (VSP)	400.0	20-22/0.4	HAN-B-11
243	HPC	Sóc Sơn	Công ty TNHH Kyoei Việt Nam	600.0	20-22/0.4	HAN-B-11
244	HPC	Sóc Sơn	Công ty TNHH kỹ thuật Yamazaki Việt Nam	400.0	20-22/0.4	HAN-B-11
245	HPC	Sóc Sơn	Công ty TNHH Fujico Việt Nam	800.0	20-22/0.4	HAN-B-11

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
246	HPC	Sóc Sơn	Công ty TNHH Rhythm Precision Việt Nam	875.0	20-22/0.4	HAN-B-11
247	HPC	Sóc Sơn	Công ty TNHH Toyota Giken Việt Nam	680.0	20-22/0.4	HAN-B-11
248	HPC	Sóc Sơn	Công ty TNHH Honest Việt Nam	140.0	20-22/0.4	HAN-B-11
249	HPC	Sóc Sơn	Chi nhánh Công ty CP thép đặc biệt Pro-Vision	320.0	20-22/0.4	HAN-B-11
250	HPC	Sóc Sơn	Công ty TNHH Việt Nam Nippon Seiki	550.0	20-22/0.4	HAN-B-11
251	HPC	Sóc Sơn	Công ty TNHH Iki Cast Việt Nam	250.0	20-22/0.4	HAN-B-11
252	HPC	Sóc Sơn	Công ty TNHH Credit Up Việt Nam	900.0	20-22/0.4	HAN-B-11
253	HPC	Sóc Sơn	Công ty TNHH Kishiro	950.0	20-22/0.21	HAN-B-11
254	HPC	Sóc Sơn	Công ty TNHH Japan Seidai (Fukuko)	1,540.0	20-22/0.4	HAN-B-11
255	HPC	Sóc Sơn	Endo stales Steel Việt Nam	300.0	20-22/0.4	HAN-B-11
256	HPC	Sóc Sơn	Công ty TNHH Roki Việt Nam	840.0	22/0.4	HAN-B-11
257	HPC	Sóc Sơn	Công ty TNHH Rhythm Kyoshin Hà Nội	240.0	22/0.4	HAN-B-11
258	HPC	Sóc Sơn	Công ty TNHH Nippo Mechatronics Việt Nam	1,120.0	20-22/0.4	HAN-B-11
259	HPC	Sóc Sơn	Công ty TNHH CN Broad Bright Sakura Việt Nam	460.0	20-22/0.4	HAN-B-11
260	HPC	Sóc Sơn	Công ty TNHH Asahi Denso Việt Nam	120.0	22/0.4	HAN-B-11
261	HPC	Sóc Sơn	Công ty TNHH Goko Spring Việt Nam	200.0	20-22/0.4	HAN-B-11
262	HPC	Sóc Sơn	Công ty TNHH Sakura Hong Minh Việt Nam	1,300.0	20-22/0.4	HAN-B-11
263	HPC	Sóc Sơn	Công ty TNHH Nippon Konpo Việt Nam	100.0	20-22/0.4	HAN-B-11
264	HPC	Sóc Sơn	Công ty TNHH Việt Nam Leakless	200.0	20-22/0.4	HAN-B-11
265	HPC	Sóc Sơn	Công ty TNHH Yamaha Motor Việt Nam	2,000.0	20-22/0.4	HAN-B-11
266	HPC	Sóc Sơn	Công ty TNHH Hamagasu Việt Nam	170.0	20-22/0.4	HAN-B-11
267	HPC	Sóc Sơn	Công ty TNHH Tamron Optical Việt Nam	4,100.0	22/0.4	HAN-B-11
268	HPC	Tây Hồ district	Công ty TNHH trường mầm non tư thục quốc tế Sakura	320.0	0	HAN-B-1, HAN-B-5
269	HPC	Tây Hồ district	Cty TNHH Làng hoa Thụy Khuê	500.0	22/0.4	HAN-B-1, HAN-B-5
270	HPC	Thanh Xuân district	Công ty đá quý Việt Nhật	50.0	22	HAN-B-8, HAN-B-9
271	HPC	Thanh Xuân district	Công ty TNHH Toyota Thanh Xuân	200.0	22	HAN-B-8, HAN-B-9

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
272	HPC	Thanh Xuân district	Công ty Liên Doanh Jana	124.0	10	HAN-B-8, HAN-B-9
273	HPC	Cầu Giấy district	Công ty TNHH Trung tâm Nagai Việt Nam	15.0	22/0.4	HAN-B-6, HAN-B-10
274	HPC	Cầu Giấy district	Công ty TNHH tư vấn Seietsu	10.0	22/0.4	HAN-B-6, HAN-B-10
275	HPC	Cầu Giấy district	Công ty TNHH Ammet Việt Nam	50.0	22/0.4	HAN-B-6, HAN-B-10
276	HPC	Cầu Giấy district	Công ty TNHH Một thành viên Jellyfish Việt Nam	5.0	22/0.4	HAN-B-6, HAN-B-10
277	HPC	Cầu Giấy district	Công ty TNHH HR-LINK Vietnam		22/0.4	HAN-B-6, HAN-B-10
278	HPC	Cầu Giấy district	Công ty TNHH Proaim Việt Nam	630.0	22/0.4	HAN-B-6, HAN-B-10
279	HPC	Cầu Giấy district	Cty TNHH Nissan techno Việt nam	660.0	22/0.4	HAN-B-6, HAN-B-10
280	HPC	Cầu Giấy district	Công ty TNHH NYK LOGISTICS VIỆT NAM	5.0	10/0.4	HAN-B-6, HAN-B-10
281	HPC	Cầu Giấy district	Công ty quản lý và Đầu tư Logitem Việt Nam	1,000.0	22/0.4	HAN-B-6, HAN-B-10
282	HPC	Cầu Giấy district	Công ty TNHH XD Tone - Viet nam		22/0.4	HAN-B-6, HAN-B-10
283	HPC	Cầu Giấy district	CTLD TNHH Vinaconex Taisei	N/A	N/A	HAN-B-6, HAN-B-10
284	HPC	Cầu Giấy district	Công ty TNHH Fuji Engineering Việt Nam	5.0	22/0.4	HAN-B-6, HAN-B-10
285	HPC	Cầu Giấy district	Công ty TNHH Coccinelle Kafuka	5.0	22/0.4	HAN-B-6, HAN-B-10
286	HPC	Cầu Giấy district	Công ty phần mềm Luvina	10.0	22/0.4	HAN-B-6, HAN-B-10
287	HPC	Cầu Giấy district	CTY USOL VIỆT NAM	630.0	22/0.4	HAN-B-6, HAN-B-10
288	HPC	Cầu Giấy district	Công ty TNHH DSI Việt Nam	630.0	22/0.4	HAN-B-6, HAN-B-10
289	HPC	Cầu Giấy district	Công ty TNHH Solpac Việt Nam	15.0	22/0.4	HAN-B-6, HAN-B-10
290	HPC	Cầu Giấy district	Công ty TNHH truyền thông Sprite	5.0	22/0.4	HAN-B-6, HAN-B-10
291	HPC	Cầu Giấy district	Công ty TNHH J-GAD	630.0	22/0.4	HAN-B-6, HAN-B-10
292	HPC	Cầu Giấy district	Công ty TNHH Shoei Việt Nam	630.0	22/0.4	HAN-B-6, HAN-B-10
293	HPC	Cầu Giấy district	Cty TNHH Mobile Mapping VN	630.0	22/0.4	HAN-B-6, HAN-B-10
294	HPC	Cầu Giấy district	Công ty TNHH Tema Việt Nam	130.0	N/A	HAN-B-6, HAN-B-10
295	HPC	Cầu Giấy district	Công ty TNHH D Hearts Việt Nam	130.0	22/0.4	HAN-B-6, HAN-B-10
296	HPC	Cầu Giấy district	Công ty cổ phần quốc tế Telehouse Việt Nam	150.0	22/0.4	HAN-B-6, HAN-B-10
297	HPC	Cầu Giấy district	Công ty TNHH Nissho Electronics Việt Nam	630.0	22/0.4	HAN-B-6, HAN-B-10
298	HPC	Cầu Giấy district	Công ty TNHH OS Việt Nam	5.0	22/0.4	HAN-B-6, HAN-B-10

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
299	HPC	Cầu Giấy district	Công ty TNHH Oriental Việt nam	15.0	22/0.4	HAN-B-6, HAN-B-10
300	HPC	Cầu Giấy district	Công ty TNHH Dịch vụ Golf Hà Nội	50.0	22/0.4	HAN-B-6, HAN-B-10
301	HPC	Cầu Giấy district	Công ty TNHH EPOCH Việt nam	15.0	22/0.4	HAN-B-6, HAN-B-10
302	HPC	Cầu Giấy district	Công ty TNHH Kanetoyo	5.0	10/0.4	HAN-B-6, HAN-B-10
303	HPC	Cầu Giấy district	Công ty TNHH kỹ thuật số Fujisho Việt Nam	15.0	22/0.4	HAN-B-6, HAN-B-10
304	HPC	Cầu Giấy district	Công ty TNHH Osco International	560.0	22/0.4	HAN-B-6, HAN-B-10
305	HPC	Cầu Giấy district	Công ty TNHH Asahi Sangyo VN	5.0	22/0.4	HAN-B-6, HAN-B-10
306	HPC	Cầu Giấy district	Công ty TNHH Nakagawa Special Steel Việt Nam	560.0	22/0.4	HAN-B-6, HAN-B-10
307	HPC	Cầu Giấy district	Công ty TNHH Nichias Việt Nam	5.0	22/0.4	HAN-B-6, HAN-B-10
308	HPC	Cầu Giấy district	Công ty TNHH Hamabo Việt Nam	15.0	22/0.4	HAN-B-6, HAN-B-10
309	HPC	Cầu Giấy district	Công ty TNHH Niigata Machine Techno (Việt Nam)	560.0	22/0.4	HAN-B-6, HAN-B-10
310	HPC	Cầu Giấy district	Dự án Takubo Việt Nam	5.0	22/0.4	HAN-B-6, HAN-B-10
311	HPC	Cầu Giấy district	Công ty TNHH Việt Nam Healthcare Connexion	5.0	22/0.4	HAN-B-6, HAN-B-10
312	HPC	Cầu Giấy district	Công ty Cổ phần Taemi Vina	15.0	22/0.4	HAN-B-6, HAN-B-10
313	HPC	Cầu Giấy district	Công ty TNHH quản lý và đầu tư Logitem Việt Nam	N/A	N/A	HAN-B-6, HAN-B-10
314	HPC	Cầu Giấy district	Công ty TNHH Vina-Sanwa	15.0	22/0.4	HAN-B-6, HAN-B-10
315	HPC	Hoàng mai district	Công ty Front Line Việt Nam((CTY tư vấn XD và quản lý)	50.0	22/0.4	HAN-B-7, HAN-B-9
316	HPC	Hoàng mai district	Công ty LD HINO MOTORS Việt nam	256.0	35/0.4	HAN-B-7, HAN-B-9
317	HPC	Hoàng mai district	CTLD Toyota Giải phóng	210.0	35/0.4	HAN-B-7, HAN-B-9
318	HPC	Long Biên district	Công ty Phụ tùng xe máy ô tô Goshi - Thăng Long	7,583.0	35/22	HAN-B-4
319	HPC	Long Biên district	Làng Văn hoá công nghệ Việt Nam - Lưu Cầu	208.0	35	HAN-B-4
320	HPC	Long Biên district	Công ty TNHH Tsukuba - Việt Nam	958.0	22	HAN-B-4
321	HPC	Long Biên district	Công ty TNHH Hệ Thống Dây - Sumi Hanel	2,086.0	22	HAN-B-4

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
322	HPC	Long Biên district	Công ty TNHH Pentax Việt Nam	2,121.0	22	HAN-B-4
323	HPC	Long Biên district	Công ty kim loại Orion - Hà Nội	184.0	22	HAN-B-4
324	HPC	Long Biên district	Công ty TNHH katolec việt nam	1,800.0	22/0.4	HAN-B-11
325	HPC	Long Biên district	Công ty TNHH Hokuyo Precision Việt Nam	302.4	22/0.4	HAN-B-11
326	HPC	Long Biên district	Công ty TNHH Nippon Paint Việt Nam (Hà Nội)	607.5	22/0.4	HAN-B-11
327	HPC	Long Biên district	Công ty TNHH Inoac việt nam	2,250.0	22/0.4	HAN-B-11
328	HPC	Long Biên district	Công ty TNHH Terumo Việt Nam	3,330.0	22/0.4	HAN-B-11
329	HPC	Long Biên district	Công ty TNHH Yamagata việt nam	337.5	22/0.4	HAN-B-11
330	HPC	Long Biên district	Công ty TNHH Công nghệ Muto HN	4,003.2	22/0.4	HAN-B-11
331	HPC	Long Biên district	Công ty TNHH Nidec Sankyo VN (HN)	2,520.0	22/0.4	HAN-B-11
332	HPC	Long Biên district	Công ty TNHH Nihon Etching Việt Nam	108.0	22/0.4	HAN-B-11
333	HPC	Long Biên district	Công ty TNHH điện tử Asti Hà Nội	1,350.0	22/0.4	HAN-B-11
334	HPC	Long Biên district	Doanh nghiệp Chế xuất Nitori Việt Nam	7,512.8	22/0.4	HAN-B-11
335	HPC	Long Biên district	Công ty TNHH Logitem VN	67.5	22/0.4	HAN-B-11
336	HPC	Long Biên district	Công ty Cổ phần V-Trac Việt Nam	675.0	22/0.4	HAN-B-11
337	HPC	Chương Mỹ	Công ty TNHH Toyo Electic Control Việt Nam	100.0	35/0.4	HAN-B-3, HAN-B-8
338	HPC	Chương Mỹ	Công Ty TNHH Nissan Techno Việt Nam	140.0	22/0.4	HAN-B-3, HAN-B-13
339	HPC	Chương Mỹ	Cty TNHH Điện tử NOBLE Việt Nam	500.0	22/0.4	HAN-B-3, HAN-B-13
340	HPC	Chương Mỹ	Công ty TNHH VinaTaiyo Spring	500.0	22/0.4	HAN-B-3, HAN-B-13
341	HPC	Chương Mỹ	Công ty TNHH Tajima Steel Việt Nam	15.0	22/0.4	HAN-B-3, HAN-B-13
342	HPC	Chương Mỹ	Công ty TNHH Điện tử Meiko Việt Nam	31,621.4	22/0.4	HAN-B-3, HAN-B-13
343	HPC	Chương Mỹ	Công ty TNHH Điện tử Meiko Việt Nam	241.4	22/0.4	HAN-B-3, HAN-B-13
344	HPC	Chương Mỹ	Công ty TNHH Điện tử Meiko Việt Nam	62.3	22/0.4	HAN-B-3, HAN-B-13
345	HPC	Chương Mỹ	Công ty TNHH Điện tử Meiko Việt Nam	28.6	22/0.4	HAN-B-3, HAN-B-13
346	HPC	Hoài Đức district	Công ty TNHH các hệ thống viễn thông VNPT- FUJITSU	52.9	35/0.4	HAN-B13
347	HPC	Hoài Đức district	Công ty TNHH NaKaTo	35.3	35/0.4	HAN-B13

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
348	HPC	Hoài Đức district	Công ty TNHH Yano Ken Consulting	6.5	0.4	HAN-B-13
349	CPC	Danang city	VijaChip (Japan) Co.Ltd	960.0	22/0.4	CPC-C-2
350	CPC	Danang city	DaNafood (Japan) Co.Ltd	2,100.0	22/0.4	CPC-C-2
351	CPC	Danang city	P & I (Japan Resort)	240.0	22/0.4	CPC-C-2
352	CPC	Danang city	Foster Electric (Japan) Co.Ltd	2,870.0	22/0.4	CPC-C-3
353	CPC	Danang city	Fujikura Automotive (Japan) Co.Ltd	1,120.0	22/0.4	CPC-C-3
354	CPC	Danang city	Tokai (Japan) Co.Ltd	1,200.0	22/0.4	CPC-C-3
355	CPC	Danang city	Sasaki Danimex Vietnam (Japan) Co.Ltd	735.0	22/0.4	CPC-C-3
356	CPC	Danang city	Apple film (Japan) Co.Ltd	70.0	22/0.4	CPC-C-3
357	CPC	Phu Yen	YASAKA - Huong Sen Hotel	136.0	22/0.4	CPC-C-4
358	CPC	Phu Yen	Ngoc Trai Sai Gon Co., Ltd	212.0	22/0.4	CPC-C-4
359	HCM C	Ho Chi Minh City	SAWANO VIET NAM ONE MEMBER LTD. COMPANY	33.1	6	HCM-B-1
360	HCM C	Ho Chi Minh City	ACCURATE ELECTRONIC OKUTOMI - NGUYEN J.V. LTD. COMPANY	100.0	6	HCM-B-1
361	SPC	Long An	Công ty TNHH IBERO	245.0	22	SPC-A-1, SPC-B-3
362	SPC	Long An	Công ty TNHH TAKAZOMO	145.0	22	SPC-A-1, SPC-B-3
363	SPC	Long An	Khu nhà xưởng Cty CP Long Hậu	4,276.0	22	SPC-A-1
364	SPC	Long An	Khu nhà xưởng Cty CP Long Hậu 2		22	SPC-A-1
365	SPC	Long An	Khu nhà xưởng Cty CP Long Hậu Khu B		22	SPC-A-1
366	SPC	Long An	Khu nhà xưởng Cty CP Long Hậu 3		22	SPC-A-1
367	SPC	Long An	Công ty TNHH SIMONE VN	2,488.0	22	SPC-A-1, SPC-B-3
368	SPC	Long An	Công ty TNHH TAZMO	7,844.0	22	SPC-A-1, SPC-B-3
369	SPC	Long An	Công ty TNHH Chubu Rika	514.0	22	SPC-A-1, SPC-B-3
370	SPC	Long An	Công ty TNHH OHNOSENKO	417.0	22	SPC-A-1, SPC-B-3
371	SPC	Long An	Công ty TNHH KAISE	181.0	22	SPC-A-1, SPC-B-3
372	SPC	Long An	Công ty CP KIZUNA 1	3,974.0	22	SPC-A-1, SPC-B-3
373	SPC	Long An	Công ty CP KIZUNA 2		22	SPC-A-1, SPC-B-3

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
374	SPC	Long An	Công ty TNHH Vina Eco Board	4,246.0	22	SPC-A-1,SPC-B-3
375	SPC	Long An	Công ty TNHH Thức Ăn Chân Nuôi Kyodo Sojitz	1,238.0	22	SPC-A-1,SPC-B-3
376	SPC	Long An	Công ty TNHH MTV BenKan Việt Nam	500.0	22	SPC-A-1,SPC-B-3
377	SPC	Long An	Công ty TNHH MTV Đồ Gỗ Fukui Việt Nam	291.0	22	SPC-A-1,SPC-B-3
378	SPC	Long An	Công ty TNHH Koei Kiko	42.0	22	SPC-A-1,SPC-B-3
379	SPC	Long An	Công ty TNHH MTV SAN - EI	21.0	22	SPC-A-1,SPC-B-3
380	SPC	Long An	Công ty TNHH USHIWAKA MG Việt Nam	24.0	22	SPC-A-1,SPC-B-3
381	SPC	Long An	CÔNG TY TRÁCH NHIỆM HỮU HẠN DAIYA ALUMI VIỆT NAM	267.2	22	SPC-C-1
382	SPC	Long An	CÔNG TY TRÁCH NHIỆM HỮU HẠN H.B.F WARP	154.5	22	SPC-C-1
383	SPC	Long An	CÔNG TY TRÁCH NHIỆM HỮU HẠN DAIKURE VIETNAM	107.2	22	SPC-C-1
384	SPC	Long An	CÔNG TY TRÁCH NHIỆM HỮU HẠN BÁCH SỰ CAO VIỆT NAM	92.5	22	SPC-C-1
385	SPC	Long An	CÔNG TY TRÁCH NHIỆM HỮU HẠN SAPPORO VIỆT NAM	1,236.2	22	SPC-C-1
386	SPC	Long An	CÔNG TY TRÁCH NHIỆM HỮU HẠN PERUBCO NITTO KAKO	218.1	22	SPC-C-1
387	SPC	Long An	CÔNG TY CỔ PHẦN CHẾ BIẾN THỰC PHẨM THỦY SẢN KAIYO	694.6	22	SPC-C-1
388	SPC	Long An	CÔNG TY TRÁCH NHIỆM HỮU HẠN TANGO CANDY-CHI NHÁNH LONG AN	196.6	22	SPC-C-1
389	SPC	Long An	Công ty Yashuda	225.0	22	SPC-C-1
390	SPC	An Giang	Công ty TNHH Anggimex-KiToKu	1,440.0	22	SPC-A-2
391	SPC	Can Tho city	Cty TNHH Quốc Tế Tri Việt	400.0	22	SPC-A-2
392	SPC	Vinh Long	Công ty Cổ phần ACECOOK (Chi nhánh tại Việt Nam)	4,000.0	22	SPC-A-3
393	SPC	Binh Duong	Chi nhánh 2- Công ty CP BĐS Việt - Nhật tại Bình Dương	3,000.0	22	SPC-B-10
394	SPC	Binh Duong	Công ty TNHH NL & KTMT FUJIKASUI	250.0	22	SPC-B-10

No.	Name of PC	Province/ District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
395	SPC	Binh Duong	Công ty TNHH YaZaKi EDS Việt Nam	1,500.0	22	SPC-B-10
396	SPC	Binh Duong	Công Ty TNHH Điện Tử ASTI	800.0	22	SPC-B-10
397	SPC	Binh Duong	Công ty Gốm Sứ Sài Gòn Nhật Bản	45.0	22	SPC-B-10
398	SPC	Binh Duong	Công ty TNHH Việt Nam Success	720.0	22	SPC-B-10
399	SPC	Binh Duong	Công ty TNHH A & M Việt Nam	720.0	22	SPC-B-10
400	SPC	Binh Duong	Công ty TNHH RINNAI Việt Nam	750.0	22	SPC-B-10
401	SPC	Binh Duong	Công ty TNHH chế biến trái cây YASAKA	650.0	22	SPC-B-8
402	SPC	Binh Duong	Công ty TNHH AEON Việt Nam	9,000.0	22	SPC-B-8
403	SPC	Binh Duong	Chi nhánh Công ty CP BĐS Việt - Nhật tại Bình Dương	2,500.0	22	SPC-B-8
404	SPC	Binh Duong	Công ty TNHH CERUBO	3,060.0	22	SPC-B-8
405	SPC	Binh Duong	Công ty TNHH Japan New Furniture -VN	1,250.0	22	SPC-B-1
406	SPC	Binh Duong	Công ty TNHH Prosh Saigon	1,000.0	22	SPC-B-1
407	SPC	Binh Duong	Công ty TNHH Kazu	560.0	22	SPC-B-1
408	SPC	Binh Duong	Công ty TNHH Công Nghiệp Plus Việt Nam	560.0	22	SPC-B-1
409	SPC	Binh Duong	Công ty TNHH TPR Việt Nam	9,400.0	22	SPC-B-1
410	SPC	Binh Duong	Công ty TNHH Tokyo Rope Việt Nam	2,500.0	22	SPC-B-1
411	SPC	Binh Duong	Công ty TNHH Maruha Chemical Việt Nam	900.0	22	SPC-B-1
412	SPC	Binh Duong	Công ty TNHH TPR Việt Nam	4,500.0	22	SPC-B-1
413	SPC	Binh Duong	Công ty TNHH Thép Đặc Biệt Yamaichi Việt Nam	1,250.0	22	SPC-B-7
414	SPC	Binh Duong	Công ty TNHH Key Plastics Việt Nam	1,430.0	22	SPC-B-7
415	SPC	Binh Duong	Công ty TNHH Điện Tử Foster (Việt Nam)	3,600.0	22	SPC-B-7
416	SPC	Binh Duong	Công ty TNHH DDK Việt Nam	630.0	22	SPC-B-7
417	SPC	Binh Duong	Công ty TNHH Saigon Stec	5,200.0	22	SPC-B-7
418	SPC	Binh Duong	Công ty TNHH VN Seibi Semiconductor	1,000.0	22	SPC-B-7
419	SPC	Binh Duong	Công ty TNHH Sài Gòn Stec	9,400.0	22	SPC-B-7
420	SPC	Binh Duong	Công ty TNHH Điện Tử Foster (Việt Nam)	4,000.0	22	SPC-B-7
421	SPC	Binh Duong	Công ty TNHH ISHO Việt Nam	250.0	22	SPC-B-7

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
422	SPC	Binh Duong	Công ty TNHH Japan Việt Nam Forging	800.0	22	SPC-B-7
423	SPC	Binh Duong	Công ty TNHH Shinwa Việt Nam	250.0	22	SPC-B-7
424	SPC	Binh Duong	Công ty TNHH Maruzen Foods Việt Nam	1,000.0	22	SPC-B-7
425	SPC	Binh Duong	Công ty TNHH Chuubu Kougyou Việt Nam	560.0	22	SPC-B-7
426	SPC	Binh Duong	Công ty TNHH Toin Việt Nam	1,500.0	22	SPC-B-7
427	SPC	Binh Duong	Công ty Cổ Phần Quản Lý Xây Dựng Nhật Bản	400.0	22	SPC-B-7
428	SPC	Binh Duong	Công ty TNHH Noa Việt Nam	320.0	22	SPC-B-7
429	SPC	Binh Duong	Công ty TNHH Aiphone Communications VN	800.0	22	SPC-B-7
430	SPC	Binh Duong	Công ty TNHH Yuwa Việt Nam	2,630.0	22	SPC-B-7
431	SPC	Binh Duong	Công ty TNHH DDK Việt Nam	2,500.0	22	SPC-B-7
432	SPC	Binh Duong	Công ty TNHH Takashima Việt Nam	810.0	22	SPC-B-7
433	SPC	Binh Duong	CN Công ty TNHH KỸ NGHỆ GỖ HOA NÉT - VSIP II	1,600.0	22	SPC-B-7
434	SPC	Binh Duong	Công ty TNHH Yazaki Eds	750.0	22	SPC-B-7
435	SPC	Binh Duong	Công ty TNHH VINEX	400.0	22	SPC-B-7
436	SPC	Binh Duong	Công Ty TNHH Dệt KonDo Việt Nam	7,500.0	22	SPC-B-7
437	SPC	Binh Duong	Công ty TNHH Nihon Canpack (Việt Nam)	2,500.0	22	SPC-B-5
438	SPC	Binh Duong	Công ty TNHH Sơn Akzo Nobel Việt Nam	1,600.0	22	SPC-B-5
439	SPC	Binh Duong	Công ty TNHH Isseiki Furniture Việt Nam	1,000.0	22	SPC-B-5
440	SPC	Binh Duong	Công ty TNHH Hayabusa Việt Nam	1,000.0	22	SPC-B-5
441	SPC	Binh Duong	Công ty TNHH S & J Hosiery Việt Nam	560.0	22	SPC-B-5
442	SPC	Binh Duong	Công ty TNHH United Mechanical	1,660.0	22	SPC-B-5
443	SPC	Binh Duong	Công ty TNHH Sung Shin Vina	2,210.0	22	SPC-B-5
444	SPC	Binh Duong	Công ty TNHH V - Eikou	800.0	22	SPC-B-5
445	SPC	Binh Duong	Công ty TNHH Metran Vitec	1,000.0	22	SPC-B-5
446	SPC	Binh Duong	Công ty TNHH Kawasaki Heat Metal Việt Nam	2,500.0	22	SPC-B-5
447	SPC	Binh Duong	Công ty TNHH Yuasa Glove Việt Nam	400.0	22	SPC-B-5

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
448	SPC	Binh Duong	Công ty TNHH Varivas Việt Nam	160.0	22	SPC-B-5
449	SPC	Binh Duong	Công ty TNHH Iwai Plant Tech VN	112.0	22	SPC-B-5
450	SPC	Binh Duong	Công Ty TNHH Temco Việt Nam	320.0	22	SPC-B-5
451	SPC	Binh Duong	Công ty TNHH Matsumura Electronics Industry Việt Nam	630.0	22	SPC-B-5
452	SPC	Binh Duong	Công ty TNHH Daigaku Việt Nam	800.0	22	SPC-B-5
453	SPC	Binh Duong	Công ty TNHH M.I.T.Furniture (Việt Nam)	560.0	22	SPC-B-5
454	SPC	Binh Duong	Công ty TNHH Taisei Bijutsu Printing VN	500.0	22	SPC-B-5
455	SPC	Binh Duong	Công ty TNHH Công Nghiệp Koei Toda	560.0	22	SPC-B-5
456	SPC	Binh Duong	CN Công ty TNHH KD Lốp Xe Bridgestone VN tại BD	250.0	22	SPC-B-5
457	SPC	Binh Duong	Công ty TNHH Yamabiko	250.0	22	SPC-B-5
458	SPC	Binh Duong	Công ty TNHH Takayoshi Việt Nam	250.0	22	SPC-B-5
459	SPC	Binh Duong	Công ty TNHH GGM Việt Nam	500.0	22	SPC-B-5
460	SPC	Binh Duong	Công ty TNHH Nawa Precision Việt Nam	500.0	22	SPC-B-5
461	SPC	Binh Duong	Công ty Hàng Gia Dung TOSHIBA -Việt Nam	560.0	22	SPC-B-5
462	SPC	Binh Duong	Công ty TNHH Nanten	650.0	22	SPC-B-5
463	SPC	Binh Duong	Công ty TNHH Thực Phẩm Ridong Việt Nam	250.0	22	SPC-B-5
464	SPC	Binh Duong	Công ty TNHH Fuji Denso Việt Nam	2,000.0	22	SPC-B-5
465	SPC	Binh Duong	Công ty TNHH SX - TM - DV Sa Pai	630.0	22	SPC-B-5
466	SPC	Binh Duong	Công Ty TNHH Shinei Việt Nam	1,380.0	22	SPC-B-5
467	SPC	Binh Duong	Công ty TNHH Olympia Lighting Việt Nam	160.0	22	SPC-B-5
468	SPC	Binh Duong	Công Ty TNHH RECO ASIA	560.0	22	SPC-B-5
469	SPC	Binh Duong	Công ty Ajinomoto Việt Nam	75.0	22	SPC-B-5
470	SPC	Binh Duong	Công ty TNHH Osco Việt Nam	1,000.0	22	SPC-B-5
471	SPC	Binh Duong	Công ty Cổ Phần NH Engineering	560.0	22	SPC-B-5
472	SPC	Binh Duong	Công ty TNHH NCL Việt Nam	560.0	22	SPC-B-5
473	SPC	Binh Duong	Công ty TNHH Asahi Chemicals Việt Nam	560.0	22	SPC-B-5

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
474	SPC	Binh Duong	Công ty TNHH Sato-Sangyo Việt Nam	2,630.0	22	SPC-B-5
475	SPC	Binh Duong	Công ty TNHH Công Nghiệp Koei Toda	3,130.0	22	SPC-B-5
476	SPC	Binh Duong	Công ty TNHH Meiwa Việt Nam	1,120.0	22	SPC-B-5
477	SPC	Binh Duong	Công ty TNHH Uchihashi Việt Nam	960.0	22	SPC-B-5
478	SPC	Binh Duong	Công ty TNHH Koyo Sangyo Việt Nam	630.0	22	SPC-B-5
479	SPC	Binh Duong	Công ty TNHH IWK Việt Nam	400.0	22	SPC-B-5
480	SPC	Binh Duong	Công ty TNHH Fuji Seal Việt Nam	1,600.0	22	SPC-B-5
481	SPC	Binh Duong	Công ty TNHH Hoya Lens Việt Nam	6,000.0	22	SPC-B-5
482	SPC	Binh Duong	Công ty TNHH Techno Excel Việt Nam	1,810.0	22	SPC-B-5
483	SPC	Binh Duong	Công ty TNHH Kewpie Việt Nam	800.0	22	SPC-B-5
484	SPC	Binh Duong	Công ty TNHH Takigawa Việt Nam	3,000.0	22	SPC-B-5
485	SPC	Binh Duong	Công ty TNHH Thực Phẩm Nissin Việt Nam	2,630.0	22	SPC-B-5
486	SPC	Ba Ria - Vung Tau	Dự án Công ty TNHH Ống Thép Nippon Steel Việt Nam	4,000.0	22	SPC-B-4
487	SPC	Ba Ria - Vung Tau	Công ty TNHH Trung tâm Thép Vina	1,000.0	22	SPC-B-4
488	SPC	Ba Ria - Vung Tau	Công ty TNHH cảng Quốc tế Tân cảng Cái Mép	19,500.0	22	SPC-B-4
489	SPC	Ba Ria - Vung Tau	Công ty TNHH Cảng Quốc tế Thị Vải	500.0	22	SPC-B-4
490	SPC	Binh Thuan	Sản xuất các sản phẩm từ giấy /Cty TNHH Nakagawa MFG Việt Nam	1,000.0	22	SPC-B-11
491	SPC	Binh Thuan	Khu nuôi trồng rong nho/Công ty LD Hải Nam -RyuKyu	160.0	0,4	SPC-B-11
492	SPC	Binh Thuan	Khu du lịch Yasaka Phan Thiết/Công ty TNHH YASAKA Phan Thiết	250.0	0,4	SPC-B-13
493	SPC	Binh Phuoc	Công ty TNHH Asathio Chemical Việt Nam	8.0	22	SPC-B-6
494	SPC	Ben Tre	Cty TNHH 1TV Furukawa Automotive Systems VN II	2,000.0	22	SPC-B-9
495	SPC	Ben Tre	Cty TNHH 1TV Furukawa Automotive Systems VN I	2,000.0	22	SPC-B-9
496	SPC	Ben Tre	Cty TNHH MTV Nidec Tosok Precision Việt Nam	4,850.0	22	SPC-B-9

No.	Name of PC	Province/District	Name of Japanese firms	Contracted capacity [kW]	Supply voltage [kV]	SP No.
497	SPC	Ben Tre	Chi nhánh Công ty TNHH Nam An Suntop-Xưởng Sản Xuất Tại Bến Tre	400.0	22	SPC-B-9
498	SPC	Tay Ninh	Công ty TNHH Mitsuei (Việt Nam)	820.0	22	SPC-B-12
499	SPC	Tay Ninh	Công ty TNHH Katagiri Industry (Việt Nam)	800.0	22	SPC-B-12
500	SPC	Tay Ninh	Công ty TNHH Ichihiro VN	3,560.0	22	SPC-B-12
501	SPC	Tay Ninh	Công ty TNHH Kiyokawa	250.0	22	SPC-B-12
502	SPC	Tay Ninh	Văn phòng đại diện Công ty Ajinomoto Việt Nam	10.0	22	SPC-B-12
503	SPC	Hau Giang	Công ty TNHH HONKAWAVINA	250.0	22	SPC-C-4
504	SPC	Hau Giang	Công ty Cổ phần Thủy sản Minh Phú Hậu Giang (Tập đoàn MITSUI & CO Nhật Bản sở hữu 30,77% vốn đầu tư)	16,200.0	22	SPC-C-4
505	SPC	Bac Lieu	Công ty TNHH Thủy sản NIGICO	3,312.0	22	SPC-C-3

Attachment 4 : SP Evaluation and Ranking

Attachment 4: SP Evaluation and Ranking

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environmen t		Social Consideratio ns		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
HAN-B-2	New building for the 110kV line, circuit 2 from the 110kV Dong Anh substation to 220/110kV Van Tri substation and reinstating feeder 112 at 110kV Dong Anh substation.	Dong Anh	4	8	1	4	2	1	6	6	6	3	3	1.5	1.5	1.5	1	2	1	52.5	1

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
HAN-B-3	Rehabilitating 110kV overhead line Hadong - Son Tay (173E1.4 to 172E1.7)	Hà Đông, Son Tây	4	8	1	4	2	1	6	6	4	3	2	1.5	1.5	1.5	1	2	1	49.5	2
HAN-B-5	Upgrading and rehabilitati ng 110kV Yen Phu - E1.8 substation into the GIS substation	Tây Hồ	4	4	1	3	2	1	6	6	4	2	2	1.5	1.5	1.5	1.5	4	1	46.0	3
SPC-B-3	Ben Luc Industrial zone 110kV substation and tee-off	Long An	4	8	2	2	2	1	6	6	4	1	1	1.5	1.5	1.5	1	2	1	45.5	4

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
SPC-A-3	Sa Dec 220kV substation and tee-off	Dong Thap	2	6	1	4	2	1	4	6	6	3	2	1.5	1.5	1.5	1	2	1	45.5	4

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
HAN-B-1	Rehabilitating and upgrading the capacity of the 110kV line, 175,176 Chem - Yen Phu, section from 220kV Chem substation to the outgoing pole of the 220/110kV Chem - Tay Ho line	Tay Ho, Tu Liem	4	6	1	4	2	1	6	6	4	0	2	1.5	1.5	1.5	1	2	1	44.5	6

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
SPC-A-1	Can Duoc 220kV substation and tee-off	Long An	2	6	2	3	2	1	4	6	6	2	2	1.5	1.5	1.5	1	2	1	44.5	6
HAN-B-4	New building for the 110kv line to supply power for 110kV Mai Lam substation	Gia Lâm	2	4	1	4	2	1	6	6	4	3	2	1.5	1.5	1.5	1	2	1	43.5	8
HAN-B-8	110kV line to supply power to Mo Lao substation	Hà Đông	4	4	1	4	2	1	6	4	4	3	2	1.5	1.5	1.5	1	2	1	43.5	8
SPC-B-7	T5 110kV substation and tee-off (Hoa Phu - T5)	Binh Duong	2	4	2	4	2	1	6	6	4	1	1	1.5	1.5	1.5	1	2	2	42.5	10

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
HAN-B-13	Supplementing transformer T3 - 63 MVA at the 110kV E1.11 Thanh Cong substation	Đông Đa	2	2	1	3	2	1	6	6	4	2	2	1.5	1.5	1.5	1.5	4	1	42.0	11
SPC-B-11	Luong Son - Hoa Thang - Mui Ne 110kV line	Binh Thuan	2	6	2	5	2	1	2	6	4	1	1	1.5	1.5	1.5	1	2	1	40.5	12
SPC-B-6	Minh Hung Industrial zone 110kV substation and tee-off	Binh Phuoc	2	4	2	3	2	1	6	6	4	1	1	1.5	1.5	1.5	1	2	1	40.5	12
SPC-B-10	Dong Hoa 110kV substation and tee-off	Binh Duong	2	6	2	2	2	1	4	6	4	2	1	1.5	1.5	1.5	1	2	1	40.5	12

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
SPC-B-9	Giao Long 110kV substation and Ben Tre - Giao Long 110kV line	Ben Tre	2	6	2	4	2	1	2	6	4	1	1	1.5	1.5	1.5	1	2	1	39.5	15
HAN-B-6	110kV Tu liem substation and 110kV branch	Từ Liêm	2	2	1	3	2	1	6	6	4	2	2	1.5	1.5	1.5	1	2	1	39.5	15
HAN-B-9	Upgrading capacity for 110kV Linh Dam substation	Linh Đ à m	2	0	1	4	2	1	6	6	4	2	2	1.5	1.5	1.5	1.5	2	1	39.0	17
SPC-B-5	VSIP 2-MR1 110kV substation and tee-off	Binh Duong	2	4	2	4	2	1	2	6	4	1	1	1.5	1.5	1.5	1	2	2	38.5	18

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
HAN-B-7	110kV Minh Khai substation and the branch	Hai Bà Trung	2	2	1	2	2	1	6	6	4	2	2	1.5	1.5	1.5	1	2	1	38.5	18
SPC-B-8	Hung Dinh 110kV substation and tee-off		2	6	1	1	2	1	4	6	4	2	1	1.5	1.5	1.5	1	2	1	38.5	18
HAN-B-10	Upgrading capacity for 110kV Cau Dien substation	Cầu Điện	2	0	1	3	2	1	6	6	4	2	2	1.5	1.5	1.5	1.5	2	1	38.0	21
HAN-B-11	Upgrading capacity for 110kV Quang Minh substation	Đông Anh	2	0	1	3	2	1	6	6	4	2	2	1.5	1.5	1.5	1.5	2	1	38.0	21

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
SPC-B-13	Thang Hai 110kV substation and tee-off	Binh Thuan	2	6	2	2	2	1	4	4	4	2	1	1	1.5	1.5	1	2	1	38.0	21
HAN-B-15	Building for 110kV substation side at 220kV Sơn Tây Substation	Sơn Tây	4	4	1	1	2	1	6	2	4	2	2	1.5	1.5	1.5	1.5	2	1	38.0	21
SPC-B-1	T1 110kV substation and tee-off (Bau Beo - T1)	Binh Duong	2	4	2	4	2	1	2	6	4	1	1	1.5	1.5	1.5	1	2	1	37.5	25
SPC-B-12	Tan Bien - Chau Thanh (Dop stream) 110kV line	Tay Ninh	2	4	2	4	2	1	2	6	4	1	1	1.5	1.5	1.5	1	2	1	37.5	25

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
SPC-C-1	Improve and develop medium & low voltage grid for rural areas of Long An province	Long An	2	4	2	1	2	1	2	6	4	2	1	1.5	1.5	1.5	1	2	1	35.5	27
SPC-C-3	Improve and develop medium & low voltage grid for rural areas of Bac Lieu province	Bac Lieu	2	4	2	1	2	1	2	6	4	2	1	1.5	1.5	1.5	1	2	1	35.5	27

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
SPC-C-4	Improve and develop medium & low voltage grid for rural areas of Hau Giang province	Hau Giang	2	4	2	1	2	1	2	6	4	2	1	1.5	1.5	1.5	1	2	1	35.5	27
SPC-B-4	Cai Mep port 110kV substation and connection line	Long An	2	4	2	2	2	1	2	6	4	2	1	1	1	1.5	1	2	1	35.5	27
HCM-B-1	110kV Hoc Mon 2 substation and connection line	Hoc Mon District	2	6	1	1	2	1	2	4	6	1	1	1.5	1.5	1.5	1	2	1	35.5	27

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
CPC-C-2	Upgrading and expansion of distribution power network in Son Tra District - Danang city	Da Nang City	4	0	1	3	2	1	2	6	4	2	1	1.5	1.5	1.5	1	2	1	34.5	32
SPC-B-2	An Xuyen - Vinh Thuan 110kV line	Kien Giang - Ca Mau	2	4	2	3	2	1	2	4	4	1	1	1	1	1.5	1	2	1	33.5	33

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
CPC-C-3	Upgrading and expansion of distribution power network in Hoa Vang and Cam Le Districts - Danang city	Da Nang City	4	0	1	2	2	1	2	6	4	2	1	1.5	1.5	1.5	1	2	1	33.5	33
CPC-C-7	Upgrading and expansion of distribution power network in Dak lak	Dak Lak	4	0	1	3	2	1	2	4	4	3	1	1.5	1.5	1.5	1	2	1	33.5	33

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
NPC-B-2	Improving the transmission capacity of 110kV Vinh Yen - Phuc Yen T/L	Vinh Phuc	0	0	2	2	2	1	6	6	2	2	1	1.5	1.5	1.5	1	2	1	32.5	36
NPC-B-5	110kV Quang Chau substation and branch	Bac Giang	0	0	2	2	2	1	6	6	2	2	1	1.5	1.5	1.5	1	2	1	32.5	36
NPC-B-6	110kV T/L of Thai Binh - Thai Thuy Thermo-Electric Factory	Thai Binh	0	0	2	2	2	1	4	6	6	2	1	0.5	0.5	1.5	1	2	1	32.5	36

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
NPC-B-7	110kV T/L of Thái Bình - Tiền Hải Thermo- Electric Factory	Thái Bình	0	0	2	2	2	1	4	6	6	2	1	0.5	0.5	1.5	1	2	1	32.5	36
NPC-B-22	110kV Luu Kiem substation and T/L	Hai Phong	0	0	2	2	2	1	4	6	2	2	1	1.5	1.5	1.5	1	4	1	32.5	36
CPC-C-4	Upgrading and expansion of distributio n power network in Phu Yen	Phu Yen	2	0	1	3	2	1	2	6	4	3	1	1	1	1.5	1	2	1	32.5	36
NPC-B-14	110kV Kim Bang substation and T/L	Hà Nam	0	0	2	2	2	1	6	6	2	2	1	1.5	1.5	1	1	2	1	32.0	42

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
NPC-B-3	110kV Nam Son - Hap Linh substation and branch	Bắc Ninh	0	0	2	2	2	1	6	6	2	2	1	1.5	1.5	1	1	2	1	32.0	42
NPC-B-10	110kV Cam Thuy substation and T/L	Thanh Hóa	0	0	2	2	2	1	4	6	2	2	1	1.5	1.5	1	1	4	1	32.0	42
NPC-B-8	110kV Tinh Gia 2 Substation and T/L	Thanh Hóa	0	0	2	2	2	1	4	6	2	2	1	1.5	1.5	1	1	4	1	32.0	42
NPC-B-9	110kV Tay Thanh Pho Substation and T/L	Thanh Hóa	0	0	2	2	2	1	4	6	2	2	1	1.5	1.5	1	1	4	1	32.0	42
NPC-B-16	110kV Quán Trữ substation and branch	Hải Phòng	0	0	1	2	2	1	6	6	2	2	1	1	1	1	1	4	1	32.0	42

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
SPC-C-2	Improve and develop medium & low voltage grid for rural areas of Soc Trang province	Soc Trang	2	4	2	1	2	1	2	2	4	2	1	1.5	1.5	1.5	1	2	1	31.5	48
NPC-B-18	Construction of the second circuit of 110kV Tien Trung-Lai Khe double circuit T/L	Hai Duong	0	0	1	2	2	1	6	6	2	2	1	1.5	1.5	1.5	1	2	1	31.5	48

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
NPC-B-17	Construction of the second circuit of 110kV T/L to 110kV Nghĩa An- Hải Dương substation	Hải Dương	0	0	1	2	2	1	6	6	2	2	1	1.5	1.5	1.5	1	2	1	31.5	48
CPC-C-1	Upgrading and expansion of distribution power network in Thua Thien Hue Province	Thua Thien Hue	2	0	1	3	2	1	2	6	4	2	1	1	1	1.5	1	2	1	31.5	48
CPC-C-5	Upgrading and expansion of distribution power network in Gia Lai	Gia lai	2	0	1	3	2	1	6	2	4	2	1	1	1	1.5	1	2	1	31.5	48

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
NPC-B-12	Installation of T2 transformer at 110kV S/s, Hung Yen city	Hung Yên	0	0	2	2	2	1	4	6	2	2	1	1.5	1.5	1.5	1.5	2	1	31.0	53
NPC-B-13	Upgrading the capacity of T1 Phó Cao transformer *title name is Dffer.	Hung Yên	0	0	2	2	2	1	4	6	2	2	1	1.5	1.5	1.5	1.5	2	1	31.0	53
NPC-B-19	Installation of T2 transformer at 110kV Ninh Binh substation	Ninh Bình	0	0	2	2	2	1	6	6	0	2	1	1.5	1.5	1.5	1.5	2	1	31.0	53

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
NPC-B-1	110kV Tam Đ ao substation and T/L	Vĩ nh Phúc	0	0	2	2	2	1	6	6	2	2	1	1	1	1	1	2	1	31.0	53
NPC-B-4	110kV Que Vo 3 substation and branch	Bắc Ninh	0	0	2	2	2	1	0	6	6	2	1	1.5	1.5	1.5	1	2	1	30.5	57
CPC-C-6	Upgrading and expansion of distributio n power network in Kon Tum	Kon Tum	2	4	1	2	2	1	2	2	4	2	1	1	1	1.5	1	2	1	30.5	57
NPC-B-11	110kV Tan Quang substation and T/L	Hưng Yên	0	0	2	2	2	1	4	6	2	2	1	1.5	1.5	1	1	2	1	30.0	59

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
NPC-B-15	110kV Hoa Mac substation and T/L	Hà Nam	0	0	2	2	2	1	4	6	2	2	1	1.5	1.5	1	1	2	1	30.0	59
NPC-B-23	110kV Phuc Son substation and T/L	Ninh Binh	0	0	2	2	2	1	4	6	2	2	1	1.5	1.5	1	1	2	1	30.0	59
NPC-B-20	Installatio n of T2 transformer at 110kV Ninh Phúc industrial zone substation	Ninh Binh	0	0	2	2	2	1	4	6	0	2	1	1.5	1.5	1.5	1.5	2	1	29.0	62
NPC-B-24	T2 Tam Diep Industrial Park	Ninh Binh	0	0	2	2	2	1	2	6	2	2	1	1.5	1.5	1.5	1.5	2	1	29.0	62

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
NPC-B-21	110kV Yen Mo substation and T/L	Ninh Binh	0	0	2	2	2	1	4	6	2	0	1	1.5	1.5	1	1	2	1	28.0	64
NPC-C-7	Upgrade and rehabitation the medium voltage distribution networks in Thai Nguyen province	Thai Nguyen	0	0	2	2	2	1	0	6	2	2	1	1.5	1.5	1.5	0	2	1	25.5	65

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
NPC-C-5	Upgrade and rehabilitation in the medium voltage distribution networks in Hai Duong province	Hai Duong	0	0	2	2	2	1	0	6	2	2	1	1.5	1.5	1.5	0	2	1	25.5	65
NPC-C-2	Upgrade and rehabilitation in the medium voltage distribution networks in Hung Yen province	Hung Yen	0	0	2	2	2	1	0	6	2	2	1	1.5	1.5	1.5	0	2	1	25.5	65


No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
NPC-C-4	Upgrade and rehabilitation in the medium voltage distribution networks in Bac Ninh province	Bac Ninh	0	0	2	2	2	1	0	6	2	2	1	1.5	1.5	1.5	0	2	1	25.5	65
NPC-C-10	Upgrade and rehabilitation in the medium voltage distribution networks in Nghe An province	Nghe An	0	0	2	2	2	1	0	6	2	2	1	1.5	1.5	1.5	0	2	1	25.5	65


No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
NPC-C-3	Upgrade and rehabilitation in the medium voltage distribution networks in Thai Binh province	Thai Binh	0	0	2	2	2	1	0	6	2	2	1	1.5	1.5	1.5	0	2	1	25.5	65
NPC-C-6	Upgrade and rehabilitation in the medium voltage distribution networks in Ninh Binh province	Ninh Binh	0	0	2	2	2	1	0	6	2	2	1	1.5	1.5	1.5	0	2	1	25.5	65


No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
NPC-C-8	Upgrade and rehabilitation in the medium voltage distribution networks in Ha Nam province	Ha Nam	0	0	2	2	2	1	0	6	2	2	1	1.5	1.5	1.5	0	2	1	25.5	65
NPC-C-11	Upgrade and rehabilitation in the medium voltage distribution networks in Quang Ninh province	Quang Ninh	0	0	2	2	2	1	0	6	2	2	1	1	1	1.5	0	2	1	24.5	73

No	Project information		Item to be Evaluated																		
	Name of Project	Project Site	• Load Factor • Peak Load Status	Loss Rates (Average Load Factor)	Power Quality	Consistency with higher planning	Important connections with special considerations	Renewable Energy Integration	Project Economy FIRR	Benefits to Japanese Tenants	Maturity of Project Preparation	Maturity of Project Summary Report	Maturity of Socio-environmental Impact Analysis	Impact on natural environment		Social Considerations		Opportunities for Japanese Manufacturers	Relevance of concurrent Implementation of Sub- Project	Score	Final Rank
														Impact on Forest	Impact on protected area	Number of household to be resettled	Area of land to be acquired (m2)				
NPC-C-1	Upgrade and rehabilitation in the medium voltage distribution networks in Thanh Hoa province	Thanh Hoa	0	0	2	2	2	1	0	6	2	2	1	1	1	1.5	0	2	1	24.5	73
NPC-C-9	Upgrade and rehabilitation in the medium voltage distribution networks in Vinh Phuc province	Vinh Phuc	0	0	2	2	2	1	0	6	2	2	1	0.5	0.5	1.5	0	2	1	23.5	75


Attachment 5 : SP Summary Sheet (75 SPs)
(NPC/HPC/CPC/SPC/HCMCPC)


No	NPC_B01	Name	110kV Tam Dao substation and T/L				
Purpose	Meet the demand on power supply for the load, Improve the power quality, the reliability and convenience in the management and operation						
Scope	Construction of 5,0 km double circuit AC185 T/L and 2x 40MVA-110/35/22kV Sub. (Phase 1, installation of 01 Transformer); Construction of 3,4 km 35kV T/L and 8,5 km 22kV T/L						
Province	Vĩnh Phúc	FS Approval	Pre-FS only	FIRR	31.60%		
Total Investment (VND billion)	106	Total Investment (JPY million)	517	Peak Load Status	98% *No evidence		
Number of Japanese Tenants	7	Contracted Capacity of Japanese Tenant(kW)	4,867	Average Load Factor	76% *No evidence		
Transmission Line	Voltage	110	Start	110kV line supply Tam Duong 110kV substation		End	Tam Dao 110kV substation
	Circuit	2	Length (km)		5.0	Conductor	ACSR 185
	New	Yes	Upgrade	No	Replace	No	Connect	Yes
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	No	Replace	No	Connect
MV	New	3.4 km 35kV T/L and 8.5 km 22kV T/L					
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		20 people		
Protected area	Tam Dao National Park			Land acquisition (sqm)		11,867	


No	NPC_B02	Name	Improving the transmission capacity of 110kV Vinh Yen - Phuc Yen T/L				
Purpose	Meet the demand on power supply, Improve the general power quality, Improve the reliability and convenience in the management and operation						
Scope	Rehabilitation and Improvement of the transmission capacity for 23km 110kV T/L from conductor AC 185 to AC 300						
Province	Vinh Phuc	FS Approval	Pre-FS only	FIRR	32.20%		
Total Investment (VND billion)	115	Total Investment (JPY million)	561	Peak Load Status	102% *No evidence		
Number of Japanese Tenants	10	Contracted Capacity of Japanese Tenant(kw)	42,559	Average Load Factor	78% *No evidence		
Transmission Line	Voltage	110	Start	Vinh Yen 220kV substation		End	Phuc Yen 110kV substation
	Circuit	1	Length (km)		23.0	Conductor	ACSR 300
	New	No	Upgrade	Yes	Replace	No	Connect
Sub Station	Voltage	0					
	New	0	Upgrade	0	Replace	0	Connect
MV	New						
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		0		
Protected area			Land acquisition (sqm)		13,800		


No	NPC_B03		Name		110kV Nam Son - Hap Linh substation and branch			
Purpose	New establish of substation							
Scope	- Construction of 4,0 km branch of 110kV double circuit line. - Construction of 2x63MVA-110/35/22kV Sub. (at first, installation of 01 Transformer) -Construction of 4,7 km 35kV T/L and 9,5 km 22kV T/L							
Province	Bắc Ninh		FS Approval		Pre. FS		FIRR	54.70%
Total Investment (VND billion)	104.152066		Total Investment (JPY million)		508		Peak Load Status	91% *No evidence
Number of Japanese Tenants	5		Contracted Capacity of Japanese Tenant(kw)		9,398		Average Load Factor	70% *No evidence
Transmission Line	Voltage	110	Start	tower 41 - 110kV line : 178E276 -178E11 and 177E276-177E11.		End	Poctic 110kV – Nam Sơn Hap Linh 110kV transformer station	
	Circuit	2	Length (km)		4.0		Conductor	ACSR300
	New	Yes	Upgrade	No	Replace	No	Connect	Yes
Sub Station	Voltage	110/22						
	New	Yes	Upgrade	No	Replace	No	Connect	Yes
MV	New	4.7 km 35kV T/L and 9.5 km 22kV T/L						
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EIA report	Under preparation/ yet to be approved				Number of Resettlement		30 People	
Protected area					Land acquisition (sqm)		12,033	

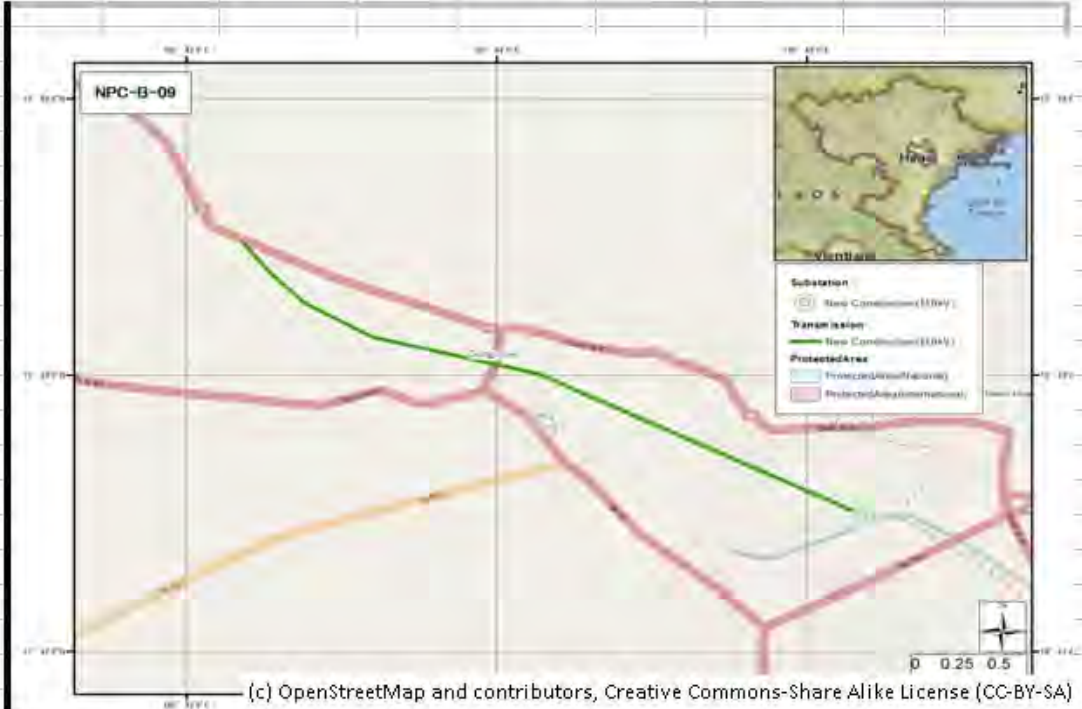
No	NPC_B04	Name	110kV Que Vo 3 substation and branch				
Purpose	Expansion						
Scope	Construction of 1,919 km 110kV double circuit line; Construction of 2 x 63MVA-110/35/22kV (Phase 1, installation of 01 Transformer);						
Province	Bắc Ninh	FS Approval	FS approval	FIRR	29.80%		
Total Investment (VND billion)	74.990089	Total Investment (JPY million)	366	Peak Load Status	93% *No evidence		
Number of Japanese Tenants	10	Contracted Capacity of Japanese Tenant(kW)	64,150	Average Load Factor	72% *No evidence		
Transmission Line	Voltage	-	Start	-	End	-	
	Circuit	-	Length (km)		-	Conductor	-
	New	-	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	0					
	New	0	Upgrade	0	Replace	0	Connect
MV	New	-					
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		0		
Protected area	-			Land acquisition (sqm)	11,400		

No	NPC_B05	Name	110kV Quang Chau substation and branch				
Purpose	ensure the capacity of power supply Station, reliability of power supply, creating the favorable investment environment for enterprises						
Scope	Construction of 1km 110kV double circuit line; 01 S/s 1x40MVA-110/22kV (at first, installation of 01 Transformer); Construction of 7,9 km 22kV T/L and 4,2 km 35kV T/L						
Province	Bắc Giang	FS Approval	Pre FS	FIRR	30.70%		
Total Investment (VND billion)	82.1940184	Total Investment (JPY million)	401	Peak Load Status	89% *No evidence		
Number of Japanese Tenants	6	Contracted Capacity of Japanese Tenant(kW)	19,700	Average Load Factor	69% *No evidence		
Transmission Line	Voltage	110	Start	Bac Giang – Quang Chau double circuit wireline		End	Poctic 110kV – Quang Chau 110kV transformer station
	Circuit	2	Length (km)		1.0	Conductor	ACSR185
	New	Yes	Upgrade	No	Replace	No	Connect	Yes
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	No	Replace	No	Connect
MV	New	7.9 km 22kV T/L and 4.2 km 35kV T/L					
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EIA report	Under preparation/ yet to be approved			Number of Resettlement		0	
Protected area				Land acquisition (sqm)		8,133	


No	NPC_B06	Name	110kV T/L of Thái Bình -Thái Thủy Thermo-Electric Factory				
Purpose	Satisfy power demand, Improve power quality, the reliability and the flexibility of the power system operation - Transmit the power to Thai Binh power plant after this plant going into operation.						
Scope	11,376 km 110kV double circuit line AC 300, there is one part of fourth-circuit: 1,978 km; the third-circuit: 1,668 km, the second: 7,927 km						
Province	Thái Bình	FS Approval	FS approval	FIRR	20% to 30%		
Total Investment (VND billion)	150.02859	Total Investment (JPY million)	732	Peak Load Status	78% *No evidence		
Number of Japanese Tenants	2	Contracted Capacity of Japanese Tenant(kW)	1,410	Average Load Factor	60% *No evidence		
Transmission Line	Voltage	110	Start	Thái Bình Power plant	End	110kV Thái Thủy Substation	
	Circuit	2	Length (km)		15.0	Conductor	ACSR300/39
	New	Yes	Upgrade	No	Replace	No	Connect
Sub Station	Voltage	0					
	New	0	Upgrade	0	Replace	0	Connect
MV	New	-					
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EIA report	Under preparation/ yet to be approved			Number of Resettlement		0	
Protected area	Red River Delta (UNESCO-MAB Biosphere Reserve)			Land acquisition (sqm)		9,000	

No	NPC_B07	Name	110kV T/L of Thái Bình -Tiền Hải Thermo-Electric Factory						
Purpose	Rehabilitation and expansion								
Scope	17km 110kV double circuit line AC 300, Rehabilitation of feeder of 110kV Tiền Hải Sub.								
Province	Thái Bình	FS Approval	FS approval	FIRR	29.60%				
Total Investment (VND billion)	150.099118	Total Investment (JPY million)	732	Peak Load Status	82% *No evidence				
Number of Japanese Tenants	2	Contracted Capacity of Japanese Tenant(kW)	27	Average Load Factor	63% *No evidence				
Transmission Line	Voltage	110	Start	Pooctic 110kV – Thai Thuy 220kV transformer station		End	Pooctic 110kV – Tien Hai 110kV transformer station.		
	Circuit	2	Length (km)		17.1	Conductor	ACSR and AACSR300		
	New	Yes	Upgrade	No	Replace	No	Connect	Yes	
Sub Station	Voltage	110/22							
	New	Yes	Upgrade	Yes	Replace	No	Connect	No	
MV	New								
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		0				
Protected area	Red River Delta (UNESCO-MAB Biosphere Reserve)			Land acquisition (sqm)		10,200			

No	NPC_B08	Name	110kV Tinh Gia 2 Substation and T/L					
Purpose	to meet the growing demand of load, reduce losses							
Scope	-Construction of 11km 110kV double circuit line, conductor AC240; -Sub. 2x40MVA (at first, installation of 01 Transformer); -Construction of 19,5 km 22kV line and 14,5 km 35kV line							
Province	Thanh Hóa	FS Approval	Pre-FS only	FIRR	26.80%			
Total Investment (VND billion)	145,5	Total Investment (JPY million)	710	Peak Load Status	80% *No evidence			
Number of Japanese Tenants	5	Contracted Capacity of Japanese Tenant(kw)	23,920	Average Load Factor	62% *No evidence			
Transmission Line	Voltage	110	Start	110kV Tinh Gia substation		End	110kV Tinh Gia 2 substation	
	Circuit	2	Length (km)		11.0	Conductor	ACSR240	
	New	No	Upgrade	No	Replace	No	Connect	Yes
Sub Station	Voltage	110/22						
	New	Yes	Upgrade	No	Replace	No	Connect	No
MV	New	19.5 km 22kV line and 14.5 km 35kV line						
 <p>PJ area and line length are not identified.</p> <p>(c) OpenStreetMap and contributors, Creative Commons-Share Alike License (CC-BY-SA)</p>								
EIA report	Under preparation/ yet to be approved			Number of Resettlement	20 People			
Protected area	-			Land acquisition (sqm)	22,833			


No	NPC_B09	Name	110kV Tay Thanh Pho Substation and T/L				
Purpose	meet the development speed, reduce loss						
Scope	-Construction of 4km 110kV double circuit line, conductor AC240; - Sub. 2x40MVA (at first, installation of 01 Transformer); -Construction of 29,5 km 22kV line and 8,5 km 35kV line						
Province	Thanh Hóa	FS Approval	Pre-FS only	FIRR	28.00%		
Total Investment (VND billion)	121.5	Total Investment (JPY million)	593	Peak Load Status	88% *No evidence		
Number of Japanese Tenants	11	Contracted Capacity of Japanese Tenant(kW)	73,120	Average Load Factor	68% *No evidence		
Transmission Line	Voltage	110	Start	220kV Thanh Hoa substation		End	110kV Tay Thanh Pho substation
	Circuit	2	Length (km)		4.0	Conductor	ACSR240
	New	No	Upgrade	No	Replace	No	Connect	Yes
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	No	Replace	No	Connect
MV	New	29.5 km 22kV line and 8.5 km 35kV line					
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EIA report	Under preparation/ yet to be approved			Number of Resettlement	5 household		
Protected area				Land acquisition (sqm)	19,967		


No	NPC_B10	Name	110kV Cam Thuy substation and T/L						
Purpose	meet the development speed, reduce loss								
Scope	Construction of 8km 110kV double circuit line, conductor AC240; Sub. 2x40MVA (at first, installation of 01 Transformer); Construction of 5,5 km 22kV line and 6,5 km 35kV line								
Province	Thanh Hóa		FS Approval		Pre-FS only		FIRR	28.60%	
Total Investment (VND billion)	121		Total Investment (JPY million)		590		Peak Load Status	79% *No evidence	
Number of Japanese Tenants	3		Contracted Capacity of Japanese Tenant(kW)		21,000		Average Load Factor	61% *No evidence	
Transmission Line	Voltage	110		Start	110kV Line(Bim Son substation-Ba Thuoc 2 hydropower)		End	110kV Cam Thuy substation	
	Circuit	2		Length (km)		8.0		Conductor	ACSR240
	New	No		Upgrade	No		Replace	No	
Sub Station	Voltage	110/22							
	New	Yes		Upgrade	No		Replace	No	
MV	New		5.5 km 22kV line and 6.5 km 35kV line						
<p style="text-align: center;">PJ area and line length are not identified.</p> <p style="text-align: center;">(c) OpenStreetMap and contributors, Creative Commons-Share Alike License (CC-BY-SA)</p>									
EIA report	Under preparation/ yet to be approved				Number of Resettlement		0		
Protected area					Land acquisition (sqm)		13,700		

No	NPC_B11	Name	110kV Tan Quang substation and T/L				
Purpose	To meet the load demand, To improve power quality, convenience and flexibility in operation management						
Scope	- To be the foundation for development and planning, improvement of the existing power - Construction of 5 km 110kV double circuit line, conductor ACSR 300; - Sub. 2x63MVA (at first, installation of 01 Transformer) Construction of 6,7 km 35kV line and 12,5 km 22kV line						
Province	Hưng Yên	FS Approval	Pre-FS only	FIRR	26.40%		
Total Investment (VND billion)	140	Total Investment (JPY million)	683	Peak Load Status	89% *No evidence		
Number of Japanese Tenants	9	Contracted Capacity of Japanese Tenant(kW)	16,100	Average Load Factor	69% *No evidence		
Transmission Line	Voltage	110	Start	Khoai Chau - Van Giang 110kV Transmission Line	End	Tan Quang 110kV substation	
	Circuit	2	Length (km)		5.0	Conductor	ACSR 300
	New	Yes	Upgrade	No	Replace	No	Connect	Yes
Sub Station	Voltage	110/35/22					
	New	Yes	Upgrade	No	Replace	No	Connect
MV	New	6.7 km 35kV line and 12.5 km 22kV line					
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		15 People		
Protected area			Land acquisition (sqm)		14,300		


No	NPC_B12	Name	Installation of T2 transformer at 110kV S/s, Hung Yen city					
Purpose	To meet the load demand, To improve power quality, convenience and flexibility in operation management To be the foundation for development and planning, improvement of the existing power							
Scope	Installation of Transformer T2 40MVA-110/35/22kV							
Province	Hưng Yên		FS Approval		Pre-FS only		FIRR	23.90%
Total Investment (VND billion)	40		Total Investment (JPY million)		195		Peak Load Status	100% *No evidence
Number of Japanese Tenants	8		Contracted Capacity of Japanese Tenant(kw)		18,250		Average Load Factor	77% *No evidence
Transmission Line	Voltage	-	Start	-	End	-		
	Circuit	-	Length (km)		-	Conductor	-	
	New	-	Upgrade	-	Replace	-	Connect	-
Sub Station	Voltage	110/35/22						
	New	Yes	Upgrade	No	Replace	No	Connect	No
MV	New							
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EIA report	Under preparation/ yet to be approved			Number of Resettlement		0		
Protected area	-			Land acquisition (sqm)		-		


No	NPC_B13	Name	Upgrading the capacity of T1 Phố Cao transformer *title name is Dffer.					
Purpose	To meet the load demand, To improve power quality, convenience and flexibility in operation management, improvement of the existing power grid system							
Scope	Installation of Transformer T1 from Installation of Transformer 25MVA to 40MVA-110/35/22kV							
Province	Hưng Yên		FS Approval	Pre-FS only		FIRR	25.80%	
Total Investment (VND billion)	30	Total Investment (JPY million)	146	Peak Load Status		105% *No evidence		
Number of Japanese Tenants	1	Contracted Capacity of Japanese Tenant(kW)	16,800	Average Load Factor		79% *No evidence		
Transmission Line	Voltage	-	Start	-		End	-	
	Circuit	-	Length (km)		-	Conductor	-	
	New	-	Upgrade	-	Replace	-	Connect	
Sub Station	Voltage	110/35/22						
	New	No	Upgrade	Yes	Replace	No	Connect	
MV	New	-						
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EIA report	Under preparation/ yet to be approved			Number of Resettlement		0		
Protected area	-			Land acquisition (sqm)		-		


No	NPC_B14	Name	110kV Kim Bang substation and T/L				
Purpose	To meet the load demand, To improve power quality, convenience and flexibility in operation management, improvement of the existing power grid system						
Scope	- Construction of 2,5 km line 110kV double circuit line, conductor AC240; - Sub. 2x63 MVA (at first, installation of 01 Transformer) - Construction of 4,8 km 35kV line and 8,8 km 22kV line						
Province	Hà Nam	FS Approval	Pre-FS only	FIRR	31.10%		
Total Investment (VND billion)	81	Total Investment (JPY million)	395	Peak Load Status	90% *No evidence		
Number of Japanese Tenants	2	Contracted Capacity of Japanese Tenant(kW)	660	Average Load Factor	70% *No evidence		
Transmission Line	Voltage	110	Start	Ly Nhan - Dong Van 110kV Transmission Line	End	Kim Bang 110kV sustation	
	Circuit	2	Length (km)		2.5	Conductor	ACSR 240
	New	Yes	Upgrade	No	Replace	No	Connect	Yes
Sub Station	Voltage	110/35/22					
	New	Yes	Upgrade	No	Replace	No	Connect
MV	New	4.8 km 35kV line and 8.8 km 22kV line					
							
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		30 People		
Protected area			Land acquisition (sqm)		10,933		


No	NPC_B15	Name	110kV Hoa Mac substation and T/L				
Purpose	To meet the load demand, To improve power quality, convenience and flexibility in operation management, improvement of the existing power grid system						
Scope	- Construction of 2,5 km 110kV double circuit line, conductor AC 240; - Sub. 2x25MVA (GB1 lắp 1 transformer); - - Construction of 5,5 km 35kV line and 7,9 km 22kV line						
Province	Hà Nam	FS Approval	Pre-FS only	FIRR	20.70%		
Total Investment (VND billion)	95	Total Investment (JPY million)	464	Peak Load Status	81% *No evidence		
Number of Japanese Tenants	3	Contracted Capacity of Japanese Tenant(kW)	15,500	Average Load Factor	63% *No evidence		
Transmission Line	Voltage	110	Start	Phu Ly - Van Dinh 110kV Transmission Line		End	Hoa Mac 110kV sustation
	Circuit	2	Length (km)		2.5	Conductor	ACSR 240
	New	Yes	Upgrade	No	Replace	No	Connect	Yes
Sub Station	Voltage	110/35/22					
	New	Yes	Upgrade	No	Replace	No	Connect
MV	New	5.5 km 35kV line and 7.9 km 22kV line					
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		30 People		
Protected area			Land acquisition (sqm)		10,867		


No	NPC_B16	Name	110kV Quán Trữ substation and branch				
Purpose	meet the load demand, reduce the loss						
Scope	- Construction of 2.5 km 110kV double circuit line, conductor AC240; - Sub. 2 x 63 MVA (trước mắt installation of 01 transformer); - Construction of 3.2 km 35kV line and 13.6 km 22kV line						
Province	Hải Phòng	FS Approval	Pre-FS only	FIRR	32.00%		
Total Investment (VND billion)	108	Total Investment (JPY million)	527	Peak Load Status	69% *No evidence		
Number of Japanese Tenants	4	Contracted Capacity of Japanese Tenant(kW)	5,050	Average Load Factor	53% *No evidence		
Transmission Line	Voltage	110	Start	110kV Line Dong Hoa - Kien An - Do Son.		End	110kV Quan Tru substation
	Circuit	2	Length (km)		2.5	Conductor	ACSR240
	New	No	Upgrade	No	Replace	No	Connect	Yes
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	No	Replace	No	Connect
MV	New	3.2 km 35kV line and 13.6 km 22kV					
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EIA report	Under preparation/ yet to be approved			Number of Resettlement		5	
Protected area	Do Son (Cultural and Historical Site)			Land acquisition (sqm)		12,000	

No	NPC_B17	Name	Construction of the second circuit of 110kV T/L to 110kV Nghĩa An-Hải Dương substation					
Purpose	Satisfy the increased power demand, Improve the power quality, Improve the reliability and the flexibility of the power system operation.							
Scope	Construction of 110kV second circuit with the length of 12 km + 02 110kV feeders							
Province	Hải Dương	FS Approval	Pre-FS only	FIRR	38.20%			
Total Investment (VND billion)	28.5	Total Investment (JPY million)	139	Peak Load Status	73% *No evidence			
Number of Japanese Tenants	24	Contracted Capacity of Japanese Tenant(kW)	35,530	Average Load Factor	56% *No evidence			
Transmission Line	Voltage	110	Start	The pole number 68 of 110kV Dong Nien - Pho Cao		End	110kV Nghĩa An substation	
	Circuit	1	Length (km)		12.0	Conductor	ACSR240/32	
	New	No	Upgrade	Yes	Replace	No	Connect	No
Sub Station	Voltage	110/22						
	New	0	Upgrade	Yes	Replace	0	Connect	Yes
MV	New							
								
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EIA report	Under preparation/ yet to be approved			Number of Resettlement		0		
Protected area				Land acquisition (sqm)		7,200		


No	NPC_B18	Name	Construction of the second circuit of 110kV Tien Trung-Lai Khe double circuit T/L					
Purpose	Satisfy the increased power demand, Improve the power quality, Improve the reliability and the flexibility of the power system operation - Promote the social economic development of Nam Sach district in particular and Hai Duong							
Scope	Construction of 110kV second circuit with the length of 6.4km + 02 110kV feeders outgoing from 110kV Lai Khê Sub.							
Province	Hải Dương	FS Approval	Pre-FS only	FIRR	42.30%			
Total Investment (VND billion)	25.5	Total Investment (JPY million)	124	Peak Load Status	87% *No evidence			
Number of Japanese Tenants	26	Contracted Capacity of Japanese Tenant(kw)	64,640	Average Load Factor	67% *No evidence			
Transmission Line	Voltage	110	Start	110kV Tien Trung substation		End	110kV Lai Khe substation	
	Circuit	1	Length (km)		6,4	Conductor	ACSR240/32	
	New	No	Upgrade	Yes	Replace	No	Connect	No
Sub Station	Voltage	110/22						
	New	0	Upgrade	Yes	Replace	0	Connect	Yes
MV	New							
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EIA report	Under preparation/ yet to be approved			Number of Resettlement		0		
Protected area				Land acquisition (sqm)		3,840		

No	NPC_B19	Name	Installation of T2 transformer at 110kV Ninh Binh substation					
Purpose	Satisfy the increased power demand, Improve the power quality, Improve the reliability							
Scope	Installation of Transformer T2 40MVA-110/35/22kV							
Province	Ninh Binh	FS Approval	0	FIRR	0.00%			
Total Investment (VND billion)	35.2225551	Total Investment (JPY million)	172	Peak Load Status	97% *No evidence			
Number of Japanese Tenants	1	Contracted Capacity of Japanese Tenant(kW)	140,000	Average Load Factor	75% *No evidence			
Transmission Line	Voltage	110	Start	Ninh Binh 110kV Transformer Station		End	Ninh Binh 110kV Transformer Station	
	Circuit	-	Length (km)		-	Conductor	--	
	New	-	Upgrade	-	Replace	-	Connect	-
Sub Station	Voltage	110/22						
	New	Yes	Upgrade	No	Replace	No	Connect	No
MV	New	-						
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EIA report	Under preparation/ yet to be approved			Number of Resettlement		0		
Protected area	-			Land acquisition (sqm)		-		


No	NPC_B20	Name	Installation of T2 transformer at 110kV Ninh Phúc industrial zone substation				
Purpose	ensure the capacity of power supply for loads						
Scope	Installation of Transformer T2 40MVA-110/35/22kV						
Province	Ninh Binh	FS Approval	0		FIRR	0.00%	
Total Investment (VND billion)	35.4001551	Total Investment (JPY million)	173		Peak Load Status	89% *No evidence	
Number of Japanese Tenants	1	Contracted Capacity of Japanese Tenant(kw)	150		Average Load Factor	69% *No evidence	
Transmission Line	Voltage	110	Start	Ninh Binh 110kV Transformer Station		End	Ninh Binh 110kV Transformer Station
	Circuit	-	Length (km)		-	Conductor	--
	New	-	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	No	Replace	No	Connect
MV	New	-					
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		0		
Protected area	-		Land acquisition (sqm)		-		


No	NPC_B21	Name	110kV Yen Mo substation and T/L					
Purpose	assure the power supply capacity for loads							
Scope	- Construction of 8,6 km 110kV double circuit line, conductor AC185; - Sub. 2x25MVA (at first, installation of 01 Transformer); - Construction of g 6,5 km 35kV line and 7,6 km 22kV line							
Province	Ninh Binh		FS Approval		Pre-FS only		FIRR	25.50%
Total Investment (VND billion)	104.10328		Total Investment (JPY million)		508		Peak Load Status	68% *No evidence
Number of Japanese Tenants	1		Contracted Capacity of Japanese Tenant(kw)		7,300		Average Load Factor	53% *No evidence
Transmission Line	Voltage	110	Start	Ninh Binh – Kim Son 178-E23.1 wireline		End	Poctic 110kV – Yen Mo 110kV transformer station.	
	Circuit	2	Length (km)		8.6	Conductor	ACSR185	
	New	Yes	Upgrade	No	Replace	Yes	Connect	Yen Mo 110kV Transformer
Sub Station	Voltage	110/22						
	New	Yes	Upgrade	No	Replace	No	Connect	No
MV	New	6.5 km 35kV line and 7.6 km 22kV line						
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EIA report	Under preparation/ yet to be approved			Number of Resettlement		20 people		
Protected area				Land acquisition (sqm)		14,760		

No	NPC_B22	Name	110kV Luu Kiem substation and T/L				
Purpose	meet the development speed and reduce the loss						
Scope	- Construction of 8,5 km 110kV double circuit line, conductor AC240; - Sub. 2x40MVA (at first, installation of 01 Transformer);						
Province	Hai Phong		FS Approval	Pre-FS only	FIRR	28.60%	
Total Investment (VND billion)	121	Total Investment (JPY million)	590	Peak Load Status	72% *No evidence		
Number of Japanese Tenants	3	Contracted Capacity of Japanese Tenant(kw)	5,650	Average Load Factor	56% *No evidence		
Transmission Line	Voltage	110	Start	220kV Thuy Nguyen substation		End	110kV Luu Kiem substation
	Circuit	2	Length (km)		8.5	Conductor	ACSR240
	New	No	Upgrade	No	Replace	No	Connect	Yes
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	No	Replace	No	Connect	No
MV	New						
<p>PJ area and line length are not identified.</p> <p>(c) OpenStreetMap and contributors, Creative Commons-Share Alike License (CC-BY-SA)</p>							
EIA report	Under preparation/ yet to be approved			Number of Resettlement	0		
Protected area				Land acquisition (sqm)	16,700		


No	NPC_B23	Name	110kV Phuc Son substation and T/L					
Purpose	meet the development speed, reduce the loss							
Scope	- Construction of 2,5 km 110kV double circuit line, conductor AC185; - Sub. 2x25MVA (at first, installation of 01 Transformer);							
Province	Ninh Binh		FS Approval		Pre-FS only	FIRR	25.50%	
Total Investment (VND billion)	77.732691		Total Investment (JPY million)		379	Peak Load Status	66% *No evidence	
Number of Japanese Tenants	1		Contracted Capacity of Japanese Tenant(kW)		150	Average Load Factor	51% *No evidence	
Transmission Line	Voltage	110	Start	Ninh Binh – Kim Son 178-E23.1 wireline		End	Poocitic 110kV – Yen Mo 110kV transformer station.	
	Circuit	2	Length (km)		2.5	Conductor	ACSR185	
	New	Yes	Upgrade	No	Replace	No	Connect Yen Mo 110kV Transformer	
Sub Station	Voltage	110/22						
	New	Yes	Upgrade	No	Replace	No	Connect No	
MV	New							
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EIA report	Under preparation/ yet to be approved			Number of Resettlement		20 people		
Protected area				Land acquisition (sqm)		6,400		


No	NPC_B24	Name	T2 Tam Diep Industrial Park					
Purpose	ensure the capacity of power supply for loads							
Scope	Installation of Transformer T2 40MVA-110/35/22kV							
Province	Ninh Binh		FS Approval	Pre-FS only		FIRR	19,7%	
Total Investment (VND billion)	35.400155	Total Investment (JPY million)	173	Peak Load Status	87% *No evidence			
Number of Japanese Tenants	1	Contracted Capacity of Japanese Tenant(kW)	7,300	Average Load Factor	67% *No evidence			
Transmission Line	Voltage	110	Start	Tam Diep 110kV Transformer Station		End	Tam Diep 110kV Transformer Station	
	Circuit	-	Length (km)		-	Conductor	--	
	New	-	Upgrade	-	Replace	-	Connect	Tam Diep 110kV Transformer Station
Sub Station	Voltage	110/22						
	New	Yes	Upgrade	No	Replace	No	Connect	No
MV	New	-						
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EIA report	Under preparation/ yet to be approved			Number of Resettlement		0		
Protected area	-			Land acquisition (sqm)		-		


No	NPC_C01	Name	Thanh Hoa			
Purpose	<p>- To reduce the overload of the grid, improve the safety of power supply and reduce power losses, improve the power quality in the grid.</p> <p>- To upgrade and rehabilitation the distribution grid which have been newly handed over in order to enhance the capacity of the distribution grid, meeting the demand of subload development and ensure the electricity quality supplied to customers.</p> <p>- To support District Electricity in overcoming overload and grid congestion in electricity distribution system in rural regions to ensure the quality, reduce power losses and improve the reliability and safety of power supply.</p>					
Scope	Construction of 39,24 km line, rehabilitation of 283,579 km line and 175Subs.					
Province	Thanh Hoa	FS Approval	Pre-FS only	FIRR	13.90%	
Total Investment (VND billion)	566	Total Investment (JPY million)	2,763	Peak Load Status	103% *No evidence	
Number of Japanese Tenants	20	Contracted Capacity of Japanese Tenant(kW)	123,460	Average Load Factor	72% *No evidence	
Distribution line	District	NATHanh Hoa City, Tinh Gia, Quang Xuong, Bim Son town, Nong Cong, Sam Son town, Nga Son, Dong Son , Cam Thuy				
	MV Feeder connected 110/MV Substation	Nui 1, Thanh Hoa, Thieu Yen, Nong Cong, Tinh Gia, Sam Son, Ha Trung substations		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	No
Rehabilitation		Yes	Rehabilitation		No	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area	Red River Delta (UNESCO-MAB Biosphere Reserve)		Land acquisition (sqm)		unknown	


No	NPC_C02	Name	Hưng Yên			
Purpose	<p>- To reduce the overload of the grid, improve the safety of power supply and reduce power losses, improve the power quality in the grid.</p> <p>- To upgrade and rehabilitation the distribution grid which have been newly handed over in order to enhance the capacity of the distribution grid, meeting the demand of subload development and ensure the electricity quality supplied to customers.</p> <p>- To support District Electricity in overcoming overload and grid congestion in electricity distribution system in rural regions to ensure the quality, reduce power losses and improve the reliability and safety of power supply.</p>					
Scope	Construction of 66 km line, rehabilitation of 190,06 km line and 183 Subs					
Province	Hưng Yên	FS Approval	Pre-FS only	FIRR	21.30%	
Total Investment (VND billion)	438	Total Investment (JPY million)	2,139	Peak Load Status	111% *No evidence	
Number of Japanese Tenants	18	Contracted Capacity of Japanese Tenant(kW)	53,130	Average Load Factor	77% *No evidence	
Distribution line	District	Hung Yen City, Kim Dong, Tien Lu, Phu Cu, An Thi, Khoai Chau, Van Lam, Yen My, My Hao				
	MV Feeder connected 110/MV Substation	Lac Dao, Giai Pham, Yen My, Khoai Chau, Kim Dong, Hung Yen, Pho Cao	Transformer (MV/LV) construction/Rehabilitation	Yes		
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	No
Rehabilitation		Yes	Rehabilitation		No	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area			Land acquisition (sqm)	unknown		

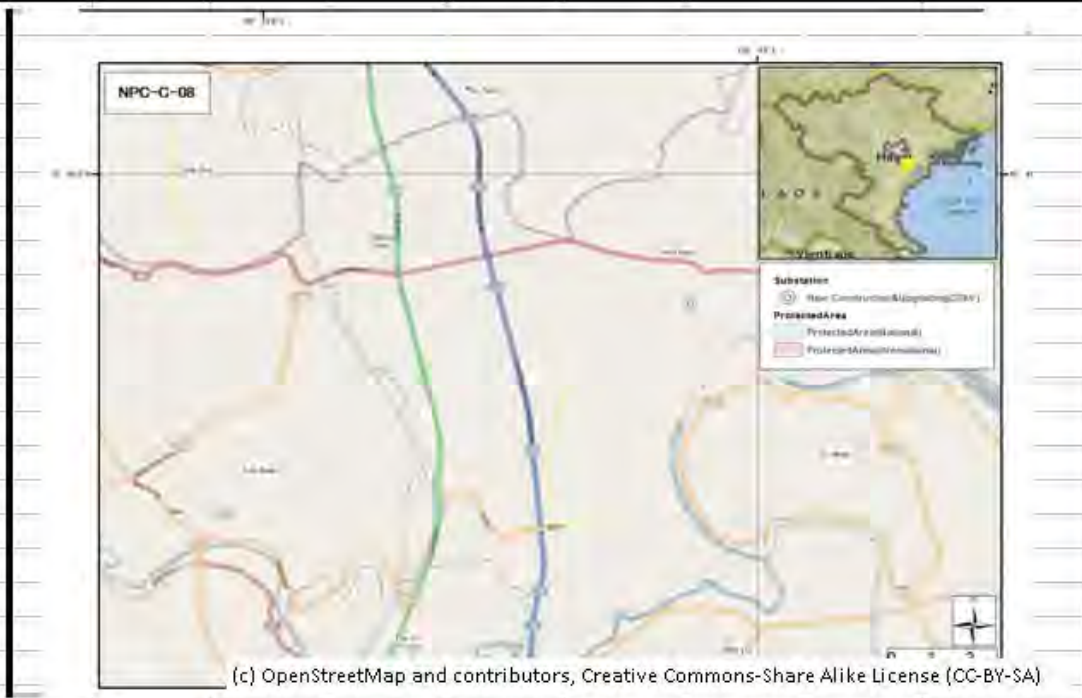
No	NPC_C03	Name	Thai Binh			
Purpose	<p>- To reduce the overload of the grid, improve the safety of power supply and reduce power losses, improve the power quality in the grid.</p> <p>- To upgrade and rehabilitation the distribution grid which have been newly handed over in order to enhance the capacity of the distribution grid, meeting the demand of subload development and ensure the electricity quality supplied to customers.</p> <p>- To support District Electricity in overcoming overload and grid congestion in electricity distribution system in rural regions to ensure the quality, reduce power losses and improve the reliability and safety of power supply.</p>					
Scope	Rehabilitation of 126,164 km line and 172 Subs					
Province	Thai Binh	FS Approval	Pre-FS only	FIRR	20.80%	
Total Investment (VND billion)	158	Total Investment (JPY million)	773	Peak Load Status	98% *No evidence	
Number of Japanese Tenants	4	Contracted Capacity of Japanese Tenant(kW)	1,437	Average Load Factor	68% *No evidence	
Distribution line	District	Thai Binh City, Vu Thu, Quynh Phu				
	MV Feeder connected 110/MV Substation	Thai Binh, Long Boi, Vu Thu, Hung Ha, Kien Xuong, Thai Thuy		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	No	LV (0.4kV) line	New	No
Rehabilitation		Yes	Rehabilitation		No	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area			Land acquisition (sqm)	unknown		


No	NPC_C04	Name	Bac Ninh			
Purpose	<p>- To reduce the overload of the grid, improve the safety of power supply and reduce power losses, improve the power quality in the grid.</p> <p>- To upgrade and rehabilitation the distribution grid which have been newly handed over in order to enhance the capacity of the distribution grid, meeting the demand of subload development and ensure the electricity quality supplied to customers.</p> <p>- To support District Electricity in overcoming overload and grid congestion in electricity distribution system in rural regions to ensure the quality, reduce power losses and improve the reliability and safety of power supply.</p>					
Scope	Construction of 29,47 km line, rehabilitation of 38,6 km line and 33 Subs					
Province	Bac Ninh	FS Approval	Pre-FS only	FIRR	21.60%	
Total Investment (VND billion)	250	Total Investment (JPY million)	1,219	Peak Load Status	109% *No evidence	
Number of Japanese Tenants	34	Contracted Capacity of Japanese Tenant(kW)	113,393	Average Load Factor	76% *No evidence	
Distribution line	District	Bac Ninh, Tien Du, Yen Phong, Que Vo, Thuan Thanh, Tu Son town				
	MV Feeder connected 110/MV Substation	Vo Cuong, Khac Niem, Tien Son, Thuan Thanh		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	No
Rehabilitation		Yes	Rehabilitation		No	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area	-		Land acquisition (sqm)	unknown		


No	NPC_C05	Name	Hai Duong			
Purpose	<p>- To reduce the overload of the grid, improve the safety of power supply and reduce power losses, improve the power quality in the grid.</p> <p>- To upgrade and rehabilitation the distribution grid which have been newly handed over in order to enhance the capacity of the distribution grid, meeting the demand of subload development and ensure the electricity quality supplied to customers.</p> <p>- To support District Electricity in overcoming overload and grid congestion in electricity distribution system in rural regions to ensure the quality, reduce power losses and improve the reliability and safety of power supply.</p>					
Scope	Construction of 55,9 km line, rehabilitation of 30,8 km line and 24 Subs					
Province	Hai Duong	FS Approval	Pre-FS only	FIRR	20.90%	
Total Investment (VND billion)	126	Total Investment (JPY million)	615	Peak Load Status	90% *No evidence	
Number of Japanese Tenants	51	Contracted Capacity of Japanese Tenant(kW)	102,170	Average Load Factor	63% *No evidence	
Distribution line	District	Song Cong, Pho Yen, Phu Binh				
	MV Feeder connected 110/MV Substation	Phuc Dien, Hai Duong, Dai An, Thanh Mien, Nghia An		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	No
Rehabilitation		Yes	Rehabilitation		No	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area			Land acquisition (sqm)	unknown		


No	NPC_C06	Name	Ninh Binh			
Purpose	<p>- To reduce the overload of the grid, improve the safety of power supply and reduce power losses, improve the power quality in the grid.</p> <p>- To upgrade and rehabilitation the distribution grid which have been newly handed over in order to enhance the capacity of the distribution grid, meeting the demand of subload development and ensure the electricity quality supplied to customers.</p> <p>- To support District Electricity in overcoming overload and grid congestion in electricity distribution system in rural regions to ensure the quality, reduce power losses and improve the reliability and safety of power supply.</p>					
Scope	Construction of 16,26 km line, rehabilitation of 94,69 km line and 167 Subs					
Province	Ninh Binh	FS Approval	Pre-FS only	FIRR	14.50%	
Total Investment (VND billion)	143	Total Investment (JPY million)	698	Peak Load Status	89% *No evidence	
Number of Japanese Tenants	3	Contracted Capacity of Japanese Tenant(kW)	147,450	Average Load Factor	62% *No evidence	
Distribution line	District	Yen Khanh district, Tam Diep town, Gia Vien district, Ninh Binh City				
	MV Feeder connected 110/MV Substation	Ninh Binh, Khanh Phu, KCN Tam Diep		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	No
Rehabilitation		Yes	Rehabilitation		No	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area			Land acquisition (sqm)	unknown		


No	NPC_C07	Name	Thai Nguyen			
Purpose	<p>- To reduce the overload of the grid, improve the safety of power supply and reduce power losses, improve the power quality in the grid.</p> <p>- To upgrade and rehabilitation the distribution grid which have been newly handed over in order to enhance the capacity of the distribution grid, meeting the demand of subload development and ensure the electricity quality supplied to customers.</p> <p>- To support District Electricity in overcoming overload and grid congestion in electricity distribution system in rural regions to ensure the quality, reduce power losses and improve the reliability and safety of power supply.</p>					
Scope	Construction of 5,212 km line, rehabilitation of 60,266 km line and 96 Subs					
Province	Thai Nguyen	FS Approval	Pre-FS only	FIRR	21.90%	
Total Investment (VND billion)	74	Total Investment (JPY million)	361	Peak Load Status	101% *No evidence	
Number of Japanese Tenants	5	Contracted Capacity of Japanese Tenant(kW)	1,018,500	Average Load Factor	70% *No evidence	
Distribution line	District	Song Cong, Pho Yen, Phu Binh				
	MV Feeder connected 110/MV Substation	Go Dam		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	No
Rehabilitation		Yes	Rehabilitation		No	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area	-		Land acquisition (sqm)	unknown		

No	NPC_C08	Name	Ha Nam			
Purpose	<p>- To reduce the overload of the grid, improve the safety of power supply and reduce power losses, improve the power quality in the grid.</p> <p>- To upgrade and rehabilitation the distribution grid which have been newly handed over in order to enhance the capacity of the distribution grid, meeting the demand of subload development and ensure the electricity quality supplied to customers.</p> <p>- To support District Electricity in overcoming overload and grid congestion in electricity distribution system in rural regions to ensure the quality, reduce power losses and improve the reliability and safety of power supply.</p>					
Scope	Construction of 23,5 km line, rehabilitation of 88,7 km line and 133 Subs					
Province	Ha Nam	FS Approval	Pre-FS only	FIRR	20.40%	
Total Investment (VND billion)	220	Total Investment (JPY million)	1,075	Peak Load Status	99% *No evidence	
Number of Japanese Tenants	5	Contracted Capacity of Japanese Tenant(kW)	16,160	Average Load Factor	69% *No evidence	
Distribution line	District	Kim Bang, Hoa Mac				
	MV Feeder connected 110/MV Substation	Phu Ly, Dong Van		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	No
		Rehabilitation	Yes		Rehabilitation	No
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area			Land acquisition (sqm)	unknown		


No	NPC_CD9	Name	Vinh Phuc			
Purpose	<p>- To reduce the overload of the grid, improve the safety of power supply and reduce power losses, improve the power quality in the grid.</p> <p>- To upgrade and rehabilitation the distribution grid which have been newly handed over in order to enhance the capacity of the distribution grid, meeting the demand of subload development and ensure the electricity quality supplied to customers.</p> <p>- To support District Electricity in overcoming overload and grid congestion in electricity distribution system in rural regions to ensure the quality, reduce power losses and improve the reliability and safety of power supply.</p>					
Scope	Construction of 39,4 km line, rehabilitation of 246 km line and 246 Subs					
Province	Vinh Phuc	FS Approval	Pre-FS only	FIRR	20.40%	
Total Investment (VND billion)	300	Total Investment (JPY million)	1,464	Peak Load Status	105% *No evidence	
Number of Japanese Tenants	17	Contracted Capacity of Japanese Tenant(kW)	48,002	Average Load Factor	73% *No evidence	
Distribution line	District	Yen Lac, Tam Duong, Tam Dao, Lap Thanh, Song Lo				
	MV Feeder connected 110/MV Substation	Vinh Yen, Lap Thanh, Phuc Yen		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4KV) line	New	No
Rehabilitation		Yes	Rehabilitation		No	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area	Tam Dao National Park		Land acquisition (sqm)	unknown		

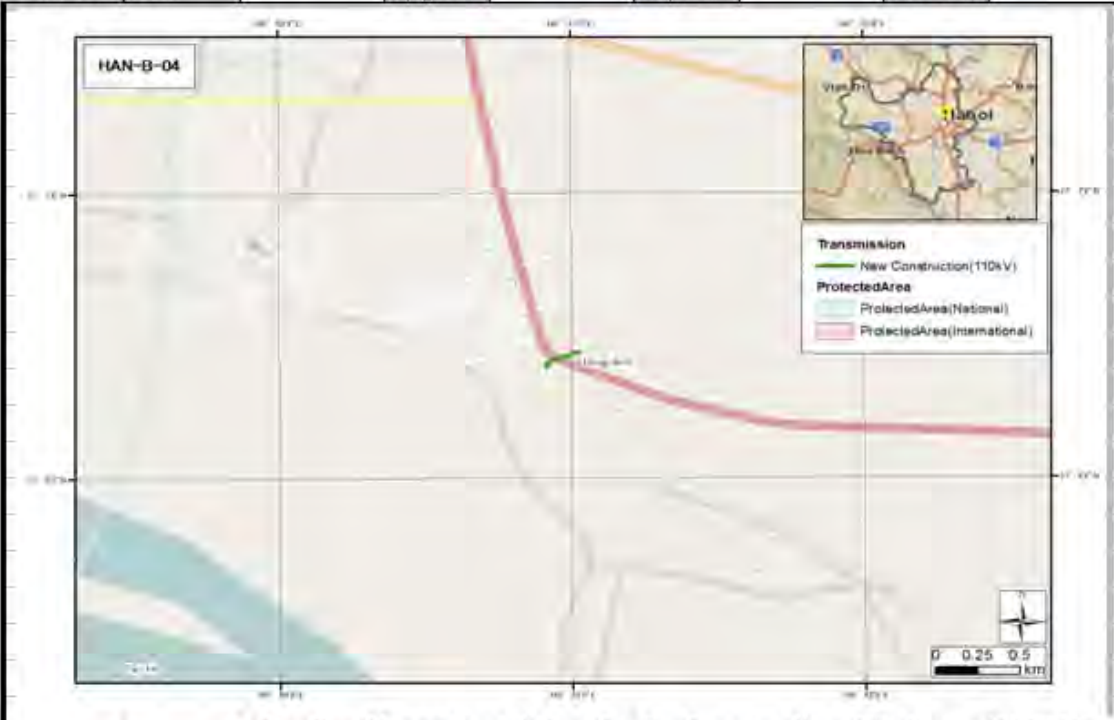
No	NPC_C10	Name	Nghe An			
Purpose	<p>- To reduce the overload of the grid, improve the safety of power supply and reduce power losses, improve the power quality in the grid.</p> <p>- To upgrade and rehabilitation the distribution grid which have been newly handed over in order To enhance the capacity of the distribution grid, meeting the demand of subload development and ensure the electricity quality supplied To customers.</p> <p>- To support District electricity in overcoming overload and grid congestion in electricity distribution system in rural regions To ensure the quality, reduce power losses and improve the reliability and safety of power supply.</p>					
Scope	Construction of 47,3 km line, rehabilitation of 345,479 km line and 310 Subs					
Province	Nghe An	FS Approval	Pre-FS only	FIRR	16.70%	
Total Investment (VND billion)	417	Total Investment (JPY million)	2,036	Peak Load Status	97% *No evidence	
Number of Japanese Tenants	10	Contracted Capacity of Japanese Tenant(kW)	65,650	Average Load Factor	67% *No evidence	
Distribution line	District	Quyhn Luu, Hoang Mai, Do Luong, Cua Lo				
	MV Feeder connected 110/MV Substation	Quyhn Luu, Hoang Mai, Do Luong, Cua Lo		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	No
Rehabilitation		Yes	Rehabilitation		No	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area			Land acquisition (sqm)	unknown		


No	NPC_C11	Name	Quang Ninh			
Purpose	<p>- To reduce the overload of the grid, improve the safety of power supply and reduce power losses, improve the power quality in the grid.</p> <p>- To upgrade and rehabilitation the distribution grid which have been newly handed over in order to enhance the capacity of the distribution grid, meeting the demand of subload development and ensure the electricity quality supplied to customers.</p> <p>- To support District Electricity in overcoming overload and grid congestion in electricity distribution system in rural regions to ensure the quality, reduce power losses and improve the reliability and safety of power supply.</p>					
Scope	Construction of 31,9 km line, rehabilitation of 30,2 km line and 21 Subs					
Province	Quang Ninh	FS Approval	Pre-FS only	FIRR	20.10%	
Total Investment (VND billion)	126	Total Investment (JPY million)	613	Peak Load Status	92% *No evidence	
Number of Japanese Tenants	4	Contracted Capacity of Japanese Tenant(kW)	29,400	Average Load Factor	64% *No evidence	
Distribution line	District	Ha Long, Quang Yen				
	MV Feeder connected 110/MV Substation	Cai Lan, Cai Dam		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	No
Rehabilitation		Yes	Rehabilitation		No	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area	Bai Chay (Cultural and Historical Site)		Land acquisition (sqm)		unknown	


No	HAN_B01	Name	Rehabilitating and upgrading the capacity of the 110kV line, 175,176 Chem - Yen Phu, section from 220kV Chem substation to the outgoing pole of the 220/110kV Chem - Tay Ho line				
Purpose	overloading, poor power quality, supply to new industrial zone						
Scope	to replace the AC185 with AC400 for the 110kV Chèm - Yên Phú line, section from 220kV Chem substation to pole no. 19, length: 3.8 km						
Province	Tay Ho, Tu Liem	FS Approval	2014	FIRR	31.98		
Total Investment (VND billion)	45	Total Investment (JPY million)	222	Peak Load Status	108%		
Number of Japanese Tenants	43	Contracted Capacity of Japanese Tenant(kw)	1,039	Average Load Factor	89%		
Transmission Line	Voltage	110	Start	220kV Chem Sub	End	Tower No. 19	
	Circuit	2	Length (km)		4.0	Conductor	ACSR400
	New	No	Upgrade	Yes	Replace	No	Connect
Sub Station	Voltage	-					
	New	-	Upgrade	-	Replace	-	Connect
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		0		
Protected area			Land acquisition (sqm)		2,648		


No	HAN_B02	Name	New building for the 110kV line, circuit 2 from the 110kV Dong Anh substation to 220/110kV Van Tri substation and reinstating feeder 112 at 110kV Dong Anh substation.				
Purpose	overloading, poor power quality, supply to new industrial zone						
Scope	to replace the 110kV line and the existing single circuit poles with the double circuit poles with total number of positions: 30 and the length: 5 km from from Dong Anh 110kV substation to 220kV Van Tri substation						
Province	Dong Anh	FS Approval	2014	FIRR	33.38		
Total Investment (VND billion)	173	Total Investment (JPY million)	845	Peak Load Status	104%		
Number of Japanese Tenants	110	Contracted Capacity of Japanese Tenant(kw)	185,912	Average Load Factor	96%		
Transmission Line	Voltage	110	Start	110kV Dong anh Sub	End	220kV Van tri Sub	
	Circuit	2	Length (km)		11.0	Conductor	ACSR400
	New	No	Upgrade	Yes	Replace	No	Connect
Sub Station	Voltage	-					
	New	-	Upgrade	-	Replace	-	Connect
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EIA report	EIA not required/ Approved		Number of Resettlement		0		
Protected area			Land acquisition (sqm)		2,561		


No	HAN_B03	Name	Rehabilitating 110kV overhead line Hadong - Son Tay (173E1.4 to 172E1.7)				
Purpose	overloading, poor power quality, supply to new industrial zone						
Scope	to replace AC150 with AC400 for the 110kV line from 220kV Ha Dong substation to 110kV Son Tay substation, length: 40km						
Province	Hà Đông, Sơn Tây	FS Approval	2014	FIRR	31.38		
Total Investment (VND billion)	437	Total Investment (JPY million)	2,130	Peak Load Status	112%		
Number of Japanese Tenants	9	Contracted Capacity of Japanese Tenant(kw)	33,209	Average Load Factor	96%		
Transmission Line	Voltage	110	Start	110kV Ha dong Sub	End	110kV Son tay Sub	
	Circuit	2	Length (km)		38.0	Conductor	ACSR400
	New	No	Upgrade	Yes	Replace	No	Connect
Sub Station	Voltage	110/22					
	New	-	Upgrade	-	Replace	-	Connect
							
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		0		
Protected area			Land acquisition (sqm)		20,497		


No	HAN_B04	Name	New building for the 110kv line to supply power for 110kv Mai Lam substation					
Purpose	overloading, poor power quality, supply to new industrial zone							
Scope	building 110kv line to supply power for Mai Lam substation, length: 0.5km							
Province	Gia Lâm		FS Approval	2014	FIRR	30.51		
Total Investment (VND billion)	47	Total Investment (JPY million)	231	Peak Load Status	86%			
Number of Japanese Tenants	116	Contracted Capacity of Japanese Tenant(kw)	199,052	Average Load Factor	72%			
Transmission Line	Voltage	110	Start	Tower No. 22 of No. 180 line Dong anh - Long Bien		End	110kv Mai lam Sub	
	Circuit	2	Length (km)		0.5	Conductor	ACSR400	
	New	Yes	Upgrade	No	Replace	No	Connect	Yes
Sub Station	Voltage	-						
	New	-	Upgrade	-	Replace	-	Connect	-
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EIA report	Under preparation/ yet to be approved			Number of Resettlement		0		
Protected area				Land acquisition (sqm)		1,291		


No	HAN_B05	Name	Upgrading and rehabilitating 110kV Yen Phu - E1.8 substation into the GIS substation			
Purpose	overloading, poor power quality, supply to new industrial zone					
Scope	additionally install 63 MVA transformer, 9 GIS 110kV modules and 30 24kV cubicles					
Province	Tây HỒ	FS Approval	2014	FIRR	30.09	
Total Investment (VND billion)	291	Total Investment (JPY million)	1,420	Peak Load Status	105%	
Number of Japanese Tenants	28	Contracted Capacity of Japanese Tenant(kW)	1,046	Average Load Factor	71%	
Transmission Line	Voltage	-	Start	-	End	-
	Circuit	-	Length (km)	-	Conductor	-
	New	-	Upgrade	-	Replace	-
Sub Station	Voltage	110/22				
	New	No	Upgrade	Yes	Replace	No
				Connect	Yes	
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		0	
Protected area			Land acquisition (sqm)		-	

No	HAN_B06	Name	110kV Tu liem substation and 110kV branch					
Purpose	overloading, poor power quality, supply to new industrial zone							
Scope	new 110kV substation with 110kV 2x63MVA transformers, 5 110kV bays, 28 24 kV cubicles and 110kV branch, 0.8 km long							
Province	Từ Liêm	FS Approval	2014		FIRR	34.71		
Total Investment (VND billion)	236	Total Investment (JPY million)	1,152	Peak Load Status	96%			
Number of Japanese Tenants	60	Contracted Capacity of Japanese Tenant(kw)	8,462	Average Load Factor	61%			
Transmission Line	Voltage	110	Start	Tower No. 25 of No. 176 line Chem - Giam		End	110kV Tu liem Sub	
	Circuit	2	Length (km)		0.8	Conductor	ACSR400	
	New	Yes	Upgrade	No	Replace	No	Connect	Yes
Sub Station	Voltage	110/22						
	New	Yes	Upgrade	No	Replace	No	Connect	Yes
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EIA report	Under preparation/ yet to be approved			Number of Resettlement		0		
Protected area				Land acquisition (sqm)		16,325		

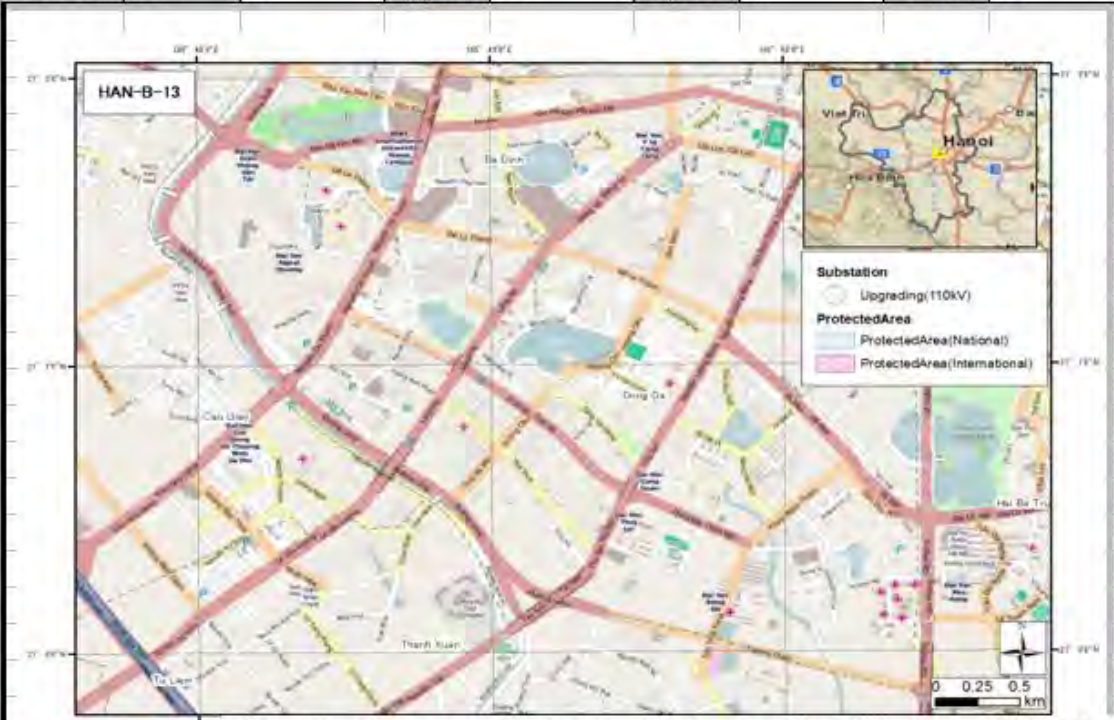
No	HAN_B07	Name	110kV Minh Khai substation and the branch					
Purpose	overloading, poor power quality, supply to new industrial zone							
Scope	new 110kV substation with 110kV 2x63MVA transformers, 5 110kV bays, 23 24kV cubicles and 110kV branch, 0.8 km long							
Province	Hai Bà Trưng		FS Approval	2014		FIRR	30.99	
Total Investment (VND billion)	277		Total Investment (JPY million)	1,353		Peak Load Status	93%	
Number of Japanese Tenants	9		Contracted Capacity of Japanese Tenant(kV)	1,288		Average Load Factor	67%	
Transmission Line	Voltage	110	Start	220kV Mai dong Sub		End	110kV Minh khai Sub	
	Circuit	2	Length (km)		2.0	Conductor	Cu1200	
	New	Yes	Upgrade	No	Replace	No	Connect	Yes
Sub Station	Voltage	110/22						
	New	Yes	Upgrade	No	Replace	No	Connect	Yes
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EIA report	Under preparation/ yet to be approved			Number of Resettlement		0		
Protected area				Land acquisition (sqm)		15,933		


No	HAN_B08	Name	110kV line to supply power to Mo Lao substation							
Purpose	overloading, poor power quality, supply to new industrial zone									
Scope	building 110kV line, 4 km long to supply power for MoLao substation									
Province	Hà Đông		FS Approval	2014		FIRR	31.95			
Total Investment (VND billion)	21		Total Investment (JPY million)	101		Peak Load Status	107%			
Number of Japanese Tenants	4		Contracted Capacity of Japanese Tenant(kW)	474		Average Load Factor	73%			
Transmission Line	Voltage	110		Start	Tower No. 4 of No, 172 line Ha dong - Chem		End	110kV Mo lao Sub		
	Circuit	2		Length (km)		4.0		Conductor	ACSR400	
	New	Yes		Upgrade	No		Replace	No		
Sub Station	Voltage	-		Upgrade	-		Replace	-		
	New	-		Upgrade	-		Replace	-		
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EIA report	Under preparation/ yet to be approved			Number of Resettlement			0			
Protected area				Land acquisition (sqm)			288			


No	HAN_B09	Name	Upgrading capacity for 110kV Linh Dam substation				
Purpose	overloading, poor power quality, supply to new industrial zone						
Scope	additionally install 63MVA transformer						
Province	Linh Đâm	FS Approval	2014	FIRR	32.99		
Total Investment (VND billion)	27	Total Investment (JPY million)	132	Peak Load Status	70%		
Number of Japanese Tenants	7	Contracted Capacity of Japanese Tenant(kW)	1,394	Average Load Factor	51%		
Transmission Line	Voltage	-	Start	-	End	-	
	Circuit	-	Length (km)	-	Conductor	-	
	New	-	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	110/22					
	New	No	Upgrade	Yes	Replace	No	Connect
							
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		0		
Protected area			Land acquisition (sqm)		-		

No	HAN_B10	Name	Upgrading capacity for 110kV Cau Dien substation				
Purpose	overloading, poor power quality, supply to new industrial zone						
Scope	additionally install 63MVA transformer						
Province	Cầu Diễn	FS Approval	2014	FIRR	31.74		
Total Investment (VND billion)	34	Total Investment (JPY million)	166	Peak Load Status	86%		
Number of Japanese Tenants	60	Contracted Capacity of Japanese Tenant(kw)	8,462	Average Load Factor	48%		
Transmission Line	Voltage	-	Start	-	End	-	
	Circuit	-	Length (km)		-	Conductor	-
	New	-	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	110/22					
	New	No	Upgrade	Yes	Replace	No	Connect
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		0		
Protected area			Land acquisition (sqm)		-		


No	HAN_B11	Name	Upgrading capacity for 110kV Quang Minh substation				
Purpose	overloading, poor power quality, supply to new industrial zone						
Scope	additionally install 63MVA transformer and 01 110kV bay, 4 35 kV cubicles and 14 24kV cubicles						
Province	Đông Anh	FS Approval	2014	FIRR	30.03		
Total Investment (VND billion)	60	Total Investment (JPY million)	293	Peak Load Status	65%		
Number of Japanese Tenants	40	Contracted Capacity of Japanese Tenant(kw)	45,519	Average Load Factor	38%		
Transmission Line	Voltage	-	Start	-	End	-	
	Circuit	-	Length (km)		-	Conductor	-
	New	-	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	110/22					
	New	No	Upgrade	Yes	Replace	No	Connect
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		0		
Protected area			Land acquisition (sqm)		-		


No	HAN_B13	Name	Supplementing transformer T3 - 63 MVA at the 110kV E1.11 Thanh Cong substation				
Purpose	overloading, poor power quality, supply to new industrial zone						
Scope	additionally install 63MVA transformer						
Province	Đông Đa	FS Approval	2014	FIRR	40.46		
Total Investment (VND billion)	28	Total Investment (JPY million)	138	Peak Load Status	90%		
Number of Japanese Tenants	35	Contracted Capacity of Japanese Tenant(kW)	2,029	Average Load Factor	62%		
Transmission Line	Voltage	-	Start	-	End	-	
	Circuit	-	Length (km)		-	Conductor	-
	New	-	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	110/22					
	New	No	Upgrade	Yes	Replace	No	Connect
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		0		
Protected area			Land acquisition (sqm)		-		

No	HAN_B15	Name	Building for 110kV substation side at 220kV Sơn Tây Substation				
Purpose	overloading, poor power quality, supply to new industrial zone						
Scope	building 110kV substation inside the area of the existing 220kV Sơn Tây substation including 02 63MVA transformers, 02 110kV bays, 14 35kV cubicles and 40 24kV cubicles						
Province	Sơn Tây	FS Approval	2015	FIRR	37.32		
Total Investment (VND billion)	120	Total Investment (JPY million)	583	Peak Load Status	104%		
Number of Japanese Tenants	11	Contracted Capacity of Japanese Tenant(kw)	33,162	Average Load Factor	76%		
Transmission Line	Voltage	-	Start	-	End	-	
	Circuit	-	Length (km)		-	Conductor	-
	New	-	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	110/22					
	New	No	Upgrade	Yes	Replace	No	Connect
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		0		
Protected area			Land acquisition (sqm)		-		


No	CPC_C01	Name	Upgrading and expansion of distribution power network in Thua Thien Hue Province			
Purpose	Reduce power loss, voltage loss; improvement of reliability in supplying power; improvement of load capacity for MV, LV line					
Scope	Expansion and rehabilitation of 211.895km MV line, 53.869 km LV line and newly construction of 07 substation with total capacity of 1300KVA					
Province	Thua Thien Hue	FS Approval	FS Draft Completed	FIRR	9.75%	
Total Investment (VND billion)	359	Total Investment (JPY million)	1,750	Peak Load Status	99%	
Number of Japanese Tenants	8	Contracted Capacity of Japanese Tenant(kW)	6,137	Average Load Factor	30%	
Distribution line	District	Phu Loc, Huong Thuy, A Luoi, Hue city, Huong Tra, Phong Dien, Quang Dien, Phu Vang				
	MV Feeder connected 110/MV Substation	Hue 1, Lang Co, An Hoa, Phong Dien, Phu Bai		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	Yes
Rehabilitation		Yes	Rehabilitation		Yes	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area	Tam Giang-Cau Hai National Park Hai Van-Hon Son Tra Marine Protected Area		Land acquisition (sqm)		13,491	


No	CPC_C02	Name	Upgrading and expansion of distribution power network in Son Tra District - Danang city			
Purpose	Reduce power loss, voltage loss; improvement of reliability in supplying power; improvement of load capacity for MV, LV line					
Scope	Expansion and rehabilitation of 38.96 km MV line, 40.50k m LV line and newly construction of 06 substation with total capacity of 1,430KVA					
Province	Da Nang City	FS Approval	FS Draft Completed	FIRR	17.98%	
Total Investment (VND billion)	142	Total Investment (JPY million)	693	Peak Load Status	86%	
Number of Japanese Tenants	3	Contracted Capacity of Japanese Tenant(kW)	3,300	Average Load Factor	56%	
Distribution line	District	Son Tra, Ngu Hanh Son				
	MV Feeder connected 110/MV Substation	An Don, Bac My An		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	Yes
Rehabilitation		Yes	Rehabilitation		Yes	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area			Land acquisition (sqm)		37,816	

No	CPC_C03	Name	Upgrading and expansion of distribution power network in Hoa Vang and Cam Le Districts - Danang city			
Purpose	Reduce power loss, voltage loss; improvement of reliability in supplying power; improvement of load capacity for MV, LV line					
Scope	Expansion and rehabilitation of 156.12 km MV line, 16.23 km LV line and newly construction of 17 substation with total capacity of 3,190KVA					
Province	Da Nang City	FS Approval	FS Draft Completed	FIRR	17.15%	
Total Investment (VND billion)	187	Total Investment (JPY million)	912	Peak Load Status	99%	
Number of Japanese Tenants	5	Contracted Capacity of Japanese Tenant(kW)	5,995	Average Load Factor	59%	
Distribution line	District	Cam Le, Hoa Vang				
	MV Feeder connected 110/MV Substation	Cau Do		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	Yes
		Rehabilitation	Yes		Rehabilitation	Yes
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area	-		Land acquisition (sqm)	228,300		


No	CPC_C04	Name	Upgrading and expansion of distribution power network in Phu Yen			
Purpose	To solve the problem that some MV lines, who operated for a long time without improvement, are now extremely downgrading. On the other hand, load demand in the subproject area are now increasing day by day, causing overload, power loss on distribution network. The subproject when done will improve reliability in power supply in the area.					
Scope	Construction of 189.518 km MV line; 37 substations with total capacity of 9,105kVA; Construction of 62.438km LV line					
Province	Phu Yen	FS Approval	FS Draft Completed	FIRR	22.40%	
Total Investment (VND billion)	155	Total Investment (JPY million)	756	Peak Load Status	156%	
Number of Japanese Tenants	3	Contracted Capacity of Japanese Tenant(kW)	560	Average Load Factor	54%	
Distribution line	District	Tuy Hoa city, Tay Hoa, Tuy An, Dong Xuan, Song Cau, Dong Hoa, Song Hinh, Son Hoa, Phu Hoa				
	MV Feeder connected 110/MV Substation	Hoa Hiep, 110kV E23, 110kV E22, Tuy An, Dong Xuan, Song Cau, Son Hoa, Song Hinh A20		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	Yes
Rehabilitation		Yes	Rehabilitation		Yes	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area	Krong Trai Nature Reserve		Land acquisition (sqm)		16,324	

No	CPC_C05	Name	Upgrading and expansion of distribution power network in Gia Lai			
Purpose	Aim to eliminate poverty, , motivate spiritual and physical life of ethnic minority, contribute to the general development of local resident in Highland area. In addition, after the project complete, it will support local PC to solve some problem, such as overload status, meet the requirement of day-by-day increasing of load, improvement of reliability in power supply					
Scope	Newly construction and rehabilitation of 64.436 km MV line, 326.629km LV line and 92 distribution substation with total capacity of 12,970 kVA					
Province	Gia lai	FS Approval	FS Draft Completed	FIRR	24.58%	
Total Investment (VND billion)	228	Total Investment (JPY million)	1,115	Peak Load Status	144%	
Number of Japanese Tenants	0	Contracted Capacity of Japanese Tenant(kW)	-	Average Load Factor	52%	
Distribution line	District	Chu Pah, Mang Yang, Kongchro, Phu Thien, A Yun Pa, Krong Pa, Ia Grai, An Khe, Duc Co, Plei Ku City, Chu Prong, Dak Doa, Chu se, Chu Puh				
	MV Feeder connected 110/MV Substation	110kV F16, 110kV E41, 110kV E42, 110kV E43, 110kV E44, 110kV E50, Chu Prong	Transformer (MV/LV) construction/Rehabilitation	Yes		
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	Yes
Rehabilitation		Yes	Rehabilitation		Yes	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area	Bac Plei Ku Nature Reserve		Land acquisition (sqm)		51,292	

No	CPC_C06	Name	Upgrading and expansion of distribution power network in Kon Tum			
Purpose	Aim to rehabilitate and improve distribution network received from Local Electricity Cooperative, reduce power loss, voltage loss and power outage. Contribute to the general economic development of Kon Tum province					
Scope	Newly construction and rehabilitation of 157.235 km MV line, 142.911 km LV line and 146 distribution substation with total capacity of 15,012 kVA					
Province	Kon Tum	FS Approval	FS Draft Completed	FIRR	11.45%	
Total Investment (VND billion)	251	Total Investment (JPY million)	1,223	Peak Load Status	224%	
Number of Japanese Tenants	0	Contracted Capacity of Japanese Tenant(kW)	-	Average Load Factor	70%	
Distribution line	District	Dak Ha, Dak To, Ngoc Hoi, Kon Plong, Dak Giei, Kon Ray, Sa Thay, Kon Tum City				
	MV Feeder connected 110/MV Substation	110kV E45, 110kV E46, Kon Plong		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	Yes
Rehabilitation		Yes	Rehabilitation		Yes	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area	Chu Mom Ray National Park and ASEAN Heritage Park		Land acquisition (sqm)		37,738	

No	CPC_C07	Name	Upgrading and expansion of distribution power network in Dak Lak			
Purpose	Reduce overload status of 22kV feeder line, overload of distribution substation; Improvement the quality of power supply, contribute to clear electricity cooperative in local area					
Scope	Expansion and rehabilitation of 170.86km MV line, 274,26 km LV line and construction/rehabilitation of 75 substations with total capacity of 9,855KVA					
Province	Dak Lak	FS Approval	FS Draft Completed	FIRR	7.36%	
Total Investment (VND billion)	184	Total Investment (JPY million)	896	Peak Load Status	98%	
Number of Japanese Tenants	2	Contracted Capacity of Japanese Tenant(kW)	250	Average Load Factor	49%	
Distribution line	District	Buon Ma Thuot City, Buon Ho Town, Krong Bong, Ea Kar, Krong Nang, Buon Don, Cu M'Gar, Krong Pak, Ea H'Leo, Cu Kuin, Ea Sup, Krong Ana				
	MV Feeder connected 110/MV Substation	110kV E47, 110kV E48, 110kV E49, Buon Don, CMG, EHL, KNA, KRP		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	Yes
Rehabilitation		Yes	Rehabilitation		Yes	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area			Land acquisition (sqm)		4,660	


No	SPC_A01	Name	Can Duoc 220kV substation and tee-off				
Purpose	<ul style="list-style-type: none"> - To meet the rapidly load growth in area, include: Long An province, Ho Chi Minh City - To reduce length of existing 110kV T/Ls - To improve the electricity reliability. 						
Scope	Construction of : <ul style="list-style-type: none"> - Four 220kV outgoing feeders (Phase 1, installation of 0.331 km double circuit 2xACSR 795MCM 220kV T/L for 2 outgoing feeders); - 2 transformers 250MVA-220/110kV and 2 transformers 63MVA-110/22kV (Phase 1, installation of one 250MVA-220/110kV transformer and one 40MVA-110/22kV transformer); - Four 110kV outgoing feeders (8154m length) 						
Province	Long An	FS Approval	FS Approved	FIRR	20.12%		
Total Investment (VND billion)	375	Total Investment (JPY million)	1,828	Peak Load Status	96%		
Number of Japanese Tenants	16	Contracted Capacity of Japanese Tenant(kW)	22,170	Average Load Factor	80%		
Transmission Line	Voltage	220	Start	New tower G2' and G3'	End	Can Duoc SS	
	Circuit	2	Length (km)		0.3	Conductor	ACSR795 MCM
	New	Yes	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	220/110					
	New	Yes	Upgrade	-	Replace	-	Connect
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		0		
Protected area	0		Land acquisition (sqm)		27,673		

No	SPC_A03	Name	Sa Dec 220kV substation and tee-off				
Purpose	<ul style="list-style-type: none"> - To meet the rapidly load growth in Dong Thap province (585.2 MVA in 2015 and 1082.7MVA in 2020). - To improve the electricity reliability in Dong Thap and Vinh Long province, especially in load zone 3 (Sa Dec town, Chau Thanh, Lai Vung, Lap Vo district) - Supply power to Vinh Long province when the Vinh Long 2 220kV substation have problem 						
Scope	Construction of : <ul style="list-style-type: none"> - Four 220kV outgoing feeders (Phase 1, installation of 0.199 km double circuit 2xACSR 795MCM 220kV T/L for 2 outgoing feeders); - 2 transformers 250MVA-220/110kV and 2 transformers 63MVA-110/22kV (Phase 1, installation of one 250MVA-220/110kV transformer); - Four 110kV outgoing feeders (965m length) 						
Province	Dong Thap	FS Approval	FS Approved	FIRR	22.30%		
Total Investment (VND billion)	219	Total Investment (JPY million)	1,068	Peak Load Status	92%		
Number of Japanese Tenants	1	Contracted Capacity of Japanese Tenant(kW)	4,000	Average Load Factor	82%		
Transmission Line	Voltage	220	Start	New tower No. 324A	End	Sa Dec IZ SS	
	Circuit	2	Length (km)		0.2	Conductor	ACSR795 MCM
	New	Yes	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	220/110					
	New	Yes	Upgrade	-	Replace	-	Connect
							
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EIA report	Under preparation/ yet to be approved		Number of Resettlement		0		
Protected area	0		Land acquisition (sqm)		25,997		

No	SPC_B01	Name	T1 110kV substation and tee-off (Bau Beo - T1)				
Purpose	- To resolve overloading of existing three 110kV substation (loading 85-97%): Bàu Bèo T2, Gò Đậu, Bình Hòa - To reduce length of existing 22kV feeders						
Scope	Construction of 2.865 km double circuit ACSR/MZ-400/51 T/L and 2x 63MVA-110/22kV Sub. (Phase 1, installation of 01 Transformer)						
Province	Binh Duong	FS Approval	FS Draft Completed	FIRR	13.78%		
Total Investment (VND billion)	77	Total Investment (JPY million)	376	Peak Load Status	87%		
Number of Japanese Tenants	11	Contracted Capacity of Japanese Tenant(kW)	22,470	Average Load Factor	75%		
Transmission Line	Voltage	110	Start	Tower No. 12	End	T1 SS	
	Circuit	2	Length (km)		2.9	Conductor	ACSR400
	New	Yes	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	-	Replace	-	Connect
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EIA report	EIA required but not started yet		Number of Resettlement		0		
Protected area	0		Land acquisition (sqm)		3,000		

No	SPC_B02	Name	An Xuyen - Vinh Thuan 110kV line				
Purpose	<p>- Increase power supply reliability for the region An Bien, An Minh, Vinh Thuan, U Minh Thuong District, Kien Giang province and Tran Van Thoi, An Xuyen district, Ca Mau province.</p> <p>- Increase power supply for operation by transmission power between the 220/110kV Rach Gia 2 substation and 220/110kV Ca Mau 2 substation through the 110kV Rach Gia 2 – Minh Phong – An Bien – Vinh Thuan – An Xuyen – Rach Gia 2 transmission line.</p>						
Scope	Construction of 41.223 km single circuit ACKP 240/32 T/L, to connect An Xuyen substation (Ca Mau) to Vinh Thuan substation (Kien Giang)						
Province	Kien Giang - Ca Mau	FS Approval	FS Draft Completed	FIRR	15.13%		
Total Investment (VND billion)	116	Total Investment (JPY million)	564	Peak Load Status	87%		
Number of Japanese Tenants	1	Contracted Capacity of Japanese Tenant(kW)	476	Average Load Factor	70%		
Transmission Line	Voltage	110	Start	An Xuyen SS	End	Vinh Thuan SS	
	Circuit	1	Length (km)	41.2	Conductor	ACSR240	
	New	Yes	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	0					
	New	-	Upgrade	-	Replace	-	Connect
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EIA report	EIA required but not started yet		Number of Resettlement		0		
Protected area	Kien Giang UNESCO-MAB Biosphere Reserve		Land acquisition (sqm)		2,912		

No	SPC_B03	Name	Ben Luc Industrial zone 110kV substation and tee-off				
Purpose	<ul style="list-style-type: none"> - To meet the rapidly load growth in Ben Luc district up to 2015 and after 2015 - To reduce length of existing 22kV feeders - To improve the electricity reliability in Ben Luc district. 						
Scope	Construction of : <ul style="list-style-type: none"> - Two 110kV outgoing feeders; - 2 transformers 110/22kV (Phase 1, installation of one 63MVA-110/22kV transformer); - Six 22kV outgoing feeders (6 outgoing cubicles) 						
Province	Long An	FS Approval	FS Draft Completed	FIRR	31.10%		
Total Investment (VND billion)	54	Total Investment (JPY million)	264	Peak Load Status	102%		
Number of Japanese Tenants	16	Contracted Capacity of Japanese Tenant(kW)	22,170	Average Load Factor	90%		
Transmission Line	Voltage	110	Start	Tower No. 71	End	Ben Luc IZ \$\$	
	Circuit	1	Length (km)		0.1	Conductor	ACSR240
	New	Yes	Upgrade	-	Replace	-	Connect	Yes
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	-	Replace	-	Connect	Yes
<p>(c) OpenStreetMap and contributors, Creative Commons-Share Alike License (CC-BY-SA)</p>							
EIA report	EIA required but not started yet		Number of Resettlement		0		
Protected area	0		Land acquisition (sqm)		2,912		

No	SPC_B04	Name	Cai Mep port 110kV substation and connection line				
Purpose	<ul style="list-style-type: none"> - To meet the rapidly load growth in project's area up to 2015 and after 2015 - To reduce length of existing 22kV feeders - To improve the electricity reliability. - Supply power to Cai Mep port and Industrial Zone in the area 						
Scope	Construction of : <ul style="list-style-type: none"> - 4.028 km double circuit ACKP 400/51 T/L - Two 110kV outgoing feeders; - 2 transformers 110/22kV (Phase 1, installation of one 63MVA-110/22kV transformer); - Six 22kV outgoing feeders (6 outgoing cubicles) 						
Province	Long An	FS Approval	FS Draft Completed	FIRR	18.08%		
Total Investment (VND billion)	89	Total Investment (JPY million)	433	Peak Load Status	89%		
Number of Japanese Tenants	6	Contracted Capacity of Japanese Tenant(kW)	46,950	Average Load Factor	75%		
Transmission Line	Voltage	110	Start	Tower No. 18	End	Cai Mep SS	
	Circuit	2	Length (km)		4.0	Conductor	ACSR400
	New	Yes	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	-	Replace	-	Connect
							
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EIA report	EIA required but not started yet		Number of Resettlement		0		
Protected area	Can Gio Mangrove UNESCO-MAB Biosphere Reserve		Land acquisition (sqm)		7,234		

No	SPC_B05	Name	VSIP 2-MR1 110kV substation and tee-off				
Purpose	<ul style="list-style-type: none"> - Existing 110kV-2x63 MVA Hoa Phu substation and 110kV-2x63MVA Bau Beo substation will lead to overload in the first quarter. Thus, 110kV VSIP II MR1 goes to operate loss overload for 110kV substation area. (342.6 MW in 2015). - To reduce length of existing 22kV feeders - To improve the electricity reliability in project's area. 						
Scope	Construction of : <ul style="list-style-type: none"> - 6.98 km double circuit ACKP 400/51 T/L - Two 110kV outgoing feeders; - 2 transformers 110/22kV (Phase 1, installation of one 63MVA-110/22kV transformer); - Six 22kV outgoing feeders (6 outgoing cubicles) 						
Province	Binh Duong	FS Approval	FS Draft Completed	FIRR	15.10%		
Total Investment (VND billion)	103	Total Investment (JPY million)	501	Peak Load Status	87%		
Number of Japanese Tenants	50	Contracted Capacity of Japanese Tenant(kW)	54,207	Average Load Factor	75%		
Transmission Line	Voltage	110	Start	Tower No. 14	End	VSIP SS	
	Circuit	2	Length (km)		7.0	Conductor	ACSR400
	New	Yes	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	-	Replace	-	Connect
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EIA report	EIA required but not started yet		Number of Resettlement		0		
Protected area	0		Land acquisition (sqm)		2,967		

No	SPC_B06	Name	Minh Hung Industrial zone 110kV substation and tee-off				
Purpose	<ul style="list-style-type: none"> - To meet the rapidly load growth in Chon Thanh district up to 2015 and after 2015 (33.6 MW in 2015 and 61.9 MW in 2020). - To reduce length of existing 22kV feeders - To improve the electricity reliability in project's area. 						
Scope	Construction of : <ul style="list-style-type: none"> - Two 110kV outgoing feeders; - 2 transformers 110/22kV (Phase 1, installation of one 40MVA-110/22kV transformer); - Four 22kV outgoing feeders (4 outgoing cubicles) 						
Province	Binh Phuoc	FS Approval	FS Draft Completed	FIRR	37.07%		
Total Investment (VND billion)	46	Total Investment (JPY million)	223	Peak Load Status	83%		
Number of Japanese Tenants	3	Contracted Capacity of Japanese Tenant(kW)	578	Average Load Factor	75%		
Transmission Line	Voltage	110	Start	Existing T/L	End	Minh Hung SS	
	Circuit	2	Length (km)		0.0	Conductor	ACSR185
	New	Yes	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	-	Replace	-	Connect
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EIA report	EIA required but not started yet		Number of Resettlement		0		
Protected area	0		Land acquisition (sqm)		4,659		

No	SPC_B07	Name	T5 110kV substation and tee-off (Hoa Phu - T5)				
Purpose	0						
Scope	Construction of : - Two 110kV outgoing feeders; - 2 transformers 110/22kV (Phase 1, installation of one 63MVA-110/22kV transformer); - Five 22kV outgoing feeders (5 outgoing cubicles)						
Province	Binh Duong	FS Approval	FS Draft Completed	FIRR	37.4%		
Total Investment (VND billion)	59	Total Investment (JPY million)	288	Peak Load Status	87%		
Number of Japanese Tenants	24	Contracted Capacity of Japanese Tenant(kW)	48,580	Average Load Factor	75%		
Transmission Line	Voltage	110	Start	Existing T/L	End	T5 SS	
	Circuit	2	Length (km)		0.1	Conductor	ACSR400
	New	Yes	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	-	Replace	-	Connect
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EIA report	EIA required but not started yet		Number of Resettlement		0		
Protected area	0		Land acquisition (sqm)		3,520		


No	SPC_B08	Name	HƯng Dinh 110kV substation and tee-off				
Purpose	<ul style="list-style-type: none"> - To meet the rapidly load growth in project's area up to 2015 and after 2015 - To reduce length of existing 22kV feeders - To improve the electricity reliability. - Supply power to many residentials and Industrial Zone in the area 						
Scope	Construction of : <ul style="list-style-type: none"> - Two 110kV outgoing feeders; - 2 transformers 110/22kV (Phase 1, installation of one 40MVA-110/22kV transformer); - Six 22kV outgoing feeders (6 outgoing cubicles) 						
Province	0	FS Approval	FS Draft Completed	FIRR	27.68%		
Total Investment (VND billion)	60	Total Investment (JPY million)	295	Peak Load Status	94%		
Number of Japanese Tenants	4	Contracted Capacity of Japanese Tenant(kW)	15,210	Average Load Factor	85%		
Transmission Line	Voltage	110	Start	Existing T/L	End	Hung DinhSS	
	Circuit	2	Length (km)		0.0	Conductor	ACSR240
	New	Yes	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	-	Replace	-	Connect
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EIA report	EIA required but not started yet		Number of Resettlement		0		
Protected area	0		Land acquisition (sqm)		3,098		

No	SPC_B09	Name	Giao Long 110kV substation and Ben Tre - Giao Long 110kV line				
Purpose	<ul style="list-style-type: none"> - To meet the rapidly load growth in Chau Thanh district up to 2015 and after 2015 (58.5 MW in 2015 and 98.6 MW in 2020). - To reduce length of existing 22kV feeders - To improve the electricity reliability in project's area. - Supply power to Industrial Zone in the area 						
Scope	Construction of : <ul style="list-style-type: none"> - 9.5 km single circuit ACSR 240/32 T/L - Two 110kV outgoing feeders (In the 1st phase, there is just one transformer bay); - 2 transformers 110/22kV (Phase 1, installation of one 40MVA-110/22kV transformer); - Five 22kV outgoing feeders (5 outgoing cubicles) 						
Province	Ben Tre	FS Approval	FS Draft Completed	FIRR	19.92%		
Total Investment (VND billion)	82	Total Investment (JPY million)	399	Peak Load Status	96%		
Number of Japanese Tenants	4	Contracted Capacity of Japanese Tenant(kW)	9,250	Average Load Factor	85%		
Transmission Line	Voltage	110	Start	Existing T/L	End	Giao Long SS	
	Circuit	1	Length (km)		9.5	Conductor	ACSR240
	New	Yes	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	-	Replace	-	Connect
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EIA report	EIA required but not started yet		Number of Resettlement		0		
Protected area	0		Land acquisition (sqm)		4,130		


No	SPC_B10	Name	Dong Hoa 110kV substation and tee-off				
Purpose	<ul style="list-style-type: none"> - To meet the rapidly load growth in project's area up to 2015 and after 2015 - To reduce length of existing 22kV feeders - To improve the electricity reliability. - Supply power to many residentials, students in the area 						
Scope	Construction of : <ul style="list-style-type: none"> - Two 110kV outgoing feeders; - 2 transformers 110/22kV (Phase 1, installation of one 40MVA-110/22kV transformer); - Six 22kV outgoing feeders (6 outgoing cubicles) 						
Province	Binh Duong	FS Approval	FS Draft Completed	FIRR	27.97%		
Total Investment (VND billion)	60	Total Investment (JPY million)	292	Peak Load Status	95%		
Number of Japanese Tenants	12	Contracted Capacity of Japanese Tenant(kW)	9,345	Average Load Factor	85%		
Transmission Line	Voltage	110	Start	Existing T/L	End	Dong Hoa SS	
	Circuit	2	Length (km)		0.0	Conductor	ACSR240
	New	Yes	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	-	Replace	-	Connect
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EIA report	EIA required but not started yet		Number of Resettlement		0		
Protected area	0		Land acquisition (sqm)		3,088		

No	SPC_B11	Name	Luong Son - Hoa Thang - Mui Ne 110kV line				
Purpose	- To increase reliability of power supply for the regions of Bac Binh district, Phan Thiet city, Binh Thuan province by mutual transferring power between the 220/110kV substations of Phan Thiet 2, Dai Ninh Hydropower and Phan Ri 2 through the 110kV Dai Ninh – Phan Ri – Luong Son – Mui Ne – Phan Thiet 2 T/Ls.						
Scope	Construction of 28.663 km single circuit ACKP 240/32 T/L, to connect Luong Son, Hoa Thang and Mui Ne substation						
Province	Binh Thuan	FS Approval	FS Draft Completed	FIRR	13.01%		
Total Investment (VND billion)	96	Total Investment (JPY million)	468	Peak Load Status	95%		
Number of Japanese Tenants	3	Contracted Capacity of Japanese Tenant(kW)	7,075	Average Load Factor	85%		
Transmission Line	Voltage	110	Start	Luong Son SS	End	Mui Ne SS	
	Circuit	1	Length (km)		28.7	Conductor	ACSR240
	New	Yes	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	0					
	New	-	Upgrade	-	Replace	-	Connect
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EIA report	EIA required but not started yet		Number of Resettlement		0		
Protected area	0		Land acquisition (sqm)		3,361		


No	SPC_B12	Name	Tan Bien - Chau Thanh (Dop stream) 110kV line				
Purpose	<ul style="list-style-type: none"> - Increase power supply reliability for Project area. - Increase power supply for operation by transmission power between the 110kV feeder of 220/110kV Tay Ninh 2 substation through the 110kV Tay Ninh 2 – Bourbon – Tan Hung – Tan Bien – Suoi Dop (Chau Thanh) – Tay Ninh 2 T/L - To make a circle between the existing substation 						
Scope	Construction of 28.82 km single circuit ACKP 240/32 T/L, to connect Tan Bien and Chau Thanh substation						
Province	Tay Ninh	FS Approval	FS Draft Completed	FIRR	18.40%		
Total Investment (VND billion)	106	Total Investment (JPY million)	519	Peak Load Status	89%		
Number of Japanese Tenants	5	Contracted Capacity of Japanese Tenant(kW)	5,440	Average Load Factor	76%		
Transmission Line	Voltage	110	Start	Tan Bien SS	End	Chau Thanh SS	
	Circuit	1	Length (km)		28.8	Conductor	ACSR240
	New	Yes	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	0					
	New	-	Upgrade	-	Replace	-	Connect
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EIA report	EIA required but not started yet		Number of Resettlement		0		
Protected area	0		Land acquisition (sqm)		6,547		


No	SPC_B13	Name	Thang Hai 110kV substation and tee-off				
Purpose	<ul style="list-style-type: none"> - To meet the rapidly load growth in project's area up to 2015 and after 2015. - To reduce length of existing 22kV feeders - To improve the electricity reliability. - Supply power to many residential and Industrial Zone in the area 						
Scope	Construction of : <ul style="list-style-type: none"> - 1.7 km double circuit 2xACSR 185/29 T/L - Two 110kV outgoing feeders; - 2 transformers 110/22kV (Phase 1, installation of one 40MVA-110/22kV transformer); - Four 22kV outgoing feeders (4 outgoing cubicles) 						
Province	Binh Thuan	FS Approval	FS Draft Completed	FIRR	27.93%		
Total Investment (VND billion)	60	Total Investment (JPY million)	292	Peak Load Status	90%		
Number of Japanese Tenants	1	Contracted Capacity of Japanese Tenant(kW)	250	Average Load Factor	80%		
Transmission Line	Voltage	110	Start	Existing T/L	End	Thang Hai SS	
	Circuit	2	Length (km)		1.7	Conductor	ACSR185
	New	Yes	Upgrade	-	Replace	-	Connect
Sub Station	Voltage	110/22					
	New	Yes	Upgrade	-	Replace	-	Connect
							
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EIA report	EIA required but not started yet		Number of Resettlement		0		
Protected area	Binh Chau Phuoc Buu Nature Reserve		Land acquisition (sqm)		3,029		

No	SPC_C01	Name	Improve and develop medium & low voltage grid for rural areas of Long An province			
Purpose	<ul style="list-style-type: none"> - Reduce power losses on the rural power networks. - Handle basically the shortcomings of the rural networks, such as: safety, quality stability, aesthetic views and reduction of losses. - Improve voltage quality and meet load demands, contributing to the boosting of production, living and socioeconomic development in the rural areas 					
Scope	Construction of : - MV length: 77.443km;					
Province	Long An	FS Approval	FS Draft Completed	FIRR	-2.20%	
Total Investment (VND billion)	124	Total Investment (JPY million)	607	Peak Load Status	87%	
Number of Japanese Tenants	8	Contracted Capacity of Japanese Tenant(kW)	2,967	Average Load Factor	75%	
Distribution line	District	Tan Hung, Thanh Hoa, Can Giuoc, Tan Tru, Duc Hoa, Chau Thanh, Thu Thua, Ben Luc, Tan Thanh, Moc Hoa, Vinh Hung, Vinh Hung, Can Duoc, Duc Hue, Tan An Town				
	MV Feeder connected 110/MV Substation	Moc Hoa, Thanh Hoa, Long Hau, Tan An, Duc Hue, Duc Lap, Duc Hoa, Tan An, Ben Luc, Can Duoc, Rach Chanh, Long An	Transformer (MV/LV) construction/Rehabilitation	Yes		
	MV (35/22kV) line	New	Yes	LV (0.4kV) line	New	No
Rehabilitation		Yes	Rehabilitation		No	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area	-		Land acquisition (sqm)		3,344	

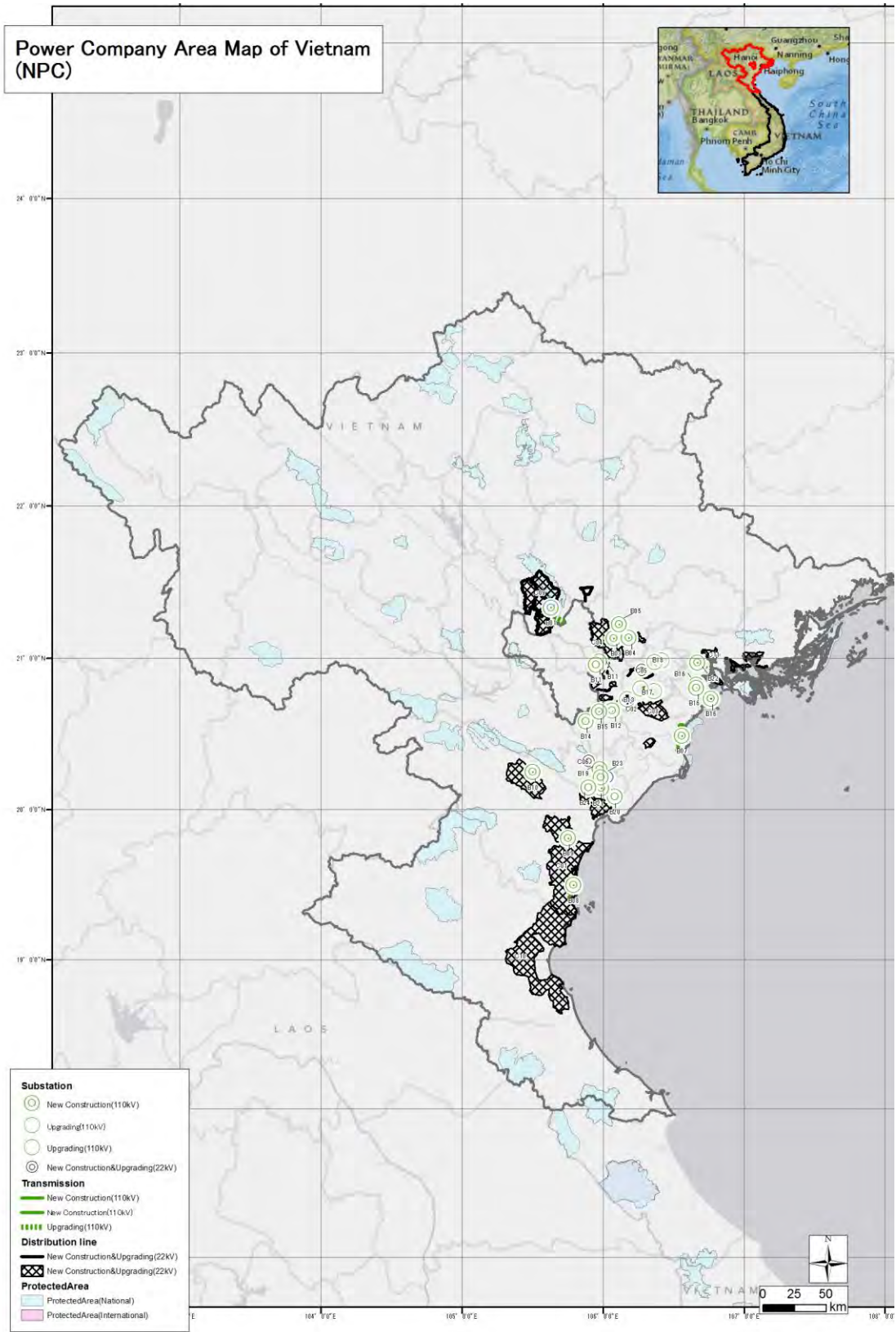
No	SPC_C02	Name	Improve and develop medium & low voltage grid for rural areas of Soc Trang province			
Purpose	<ul style="list-style-type: none"> - Reduce power losses on the rural power networks. - Handle basically the shortcomings of the rural networks, such as: safety, quality stability, aesthetic views and reduction of losses. - Improve voltage quality and meet load demands, contributing to the boosting of production, living and socioeconomic development in the rural areas 					
Scope	Construction of : - MV length: 57.5km;					
Province	Soc Trang	FS Approval	FS Draft Completed	FIRR	5.60%	
Total Investment (VND billion)	98	Total Investment (JPY million)	480	Peak Load Status	85%	
Number of Japanese Tenants	0	Contracted Capacity of Japanese Tenant(kW)	-	Average Load Factor	75%	
Distribution line	District	Chau Thanh, Ke Sach, My Tu, Thanh Tri, Long Phu, Cu Lao Dung, Tran De, Vinh Chau, My Xuyen				
	MV Feeder connected 110/MV Substation	Soc Trang, Dai Ngai, My Tu, Tran De		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22kV) line	New	Yes	LV (0.4kV) line	New	Yes
Rehabilitation		Yes	Rehabilitation		Yes	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area	-		Land acquisition (sqm)		21,916	

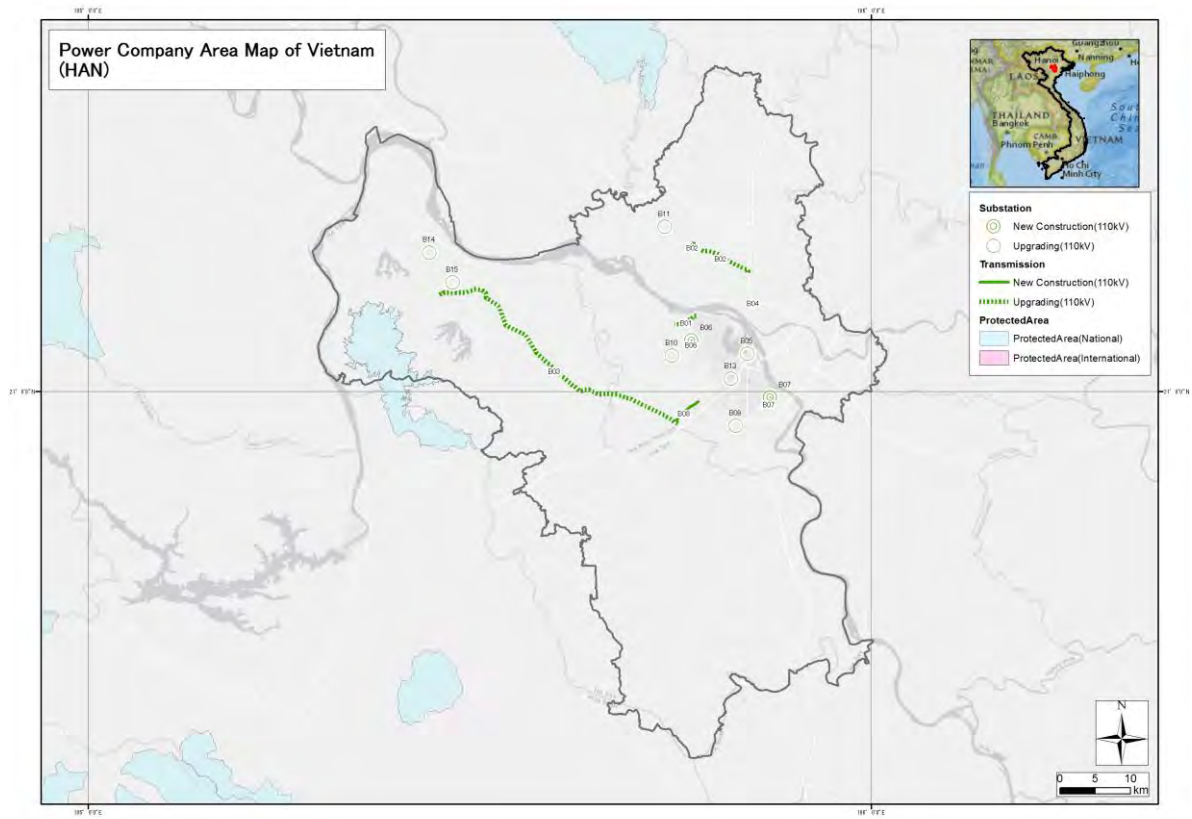
No	SPC_C03	Name	Improve and develop medium & low voltage grid for rural areas of Bac Lieu province			
Purpose	<ul style="list-style-type: none"> - Reduce power losses on the rural power networks. - Handle basically the shortcomings of the rural networks, such as: safety, quality stability, aesthetic views and reduction of losses. - Improve voltage quality and meet load demands, contributing to the boosting of production, living and socioeconomic development in the rural areas 					
Scope	Construction of : - MV length: 51.449 km;					
Province	Bac Lieu	FS Approval	FS Draft Completed	FIRR	4.50%	
Total Investment (VND billion)	36	Total Investment (JPY million)	177	Peak Load Status	85%	
Number of Japanese Tenants	1	Contracted Capacity of Japanese Tenant(kW)	3,312	Average Load Factor	73%	
Distribution line	District	Phuoc Long, Gia Rai, Dong Hai, Vinh Loi, Hoa Binh, Hong Dan, Bac Lieu City				
	MV Feeder connected 110/MV Substation	Hong Dan, Gia Rai, Bac Lieu		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	No
Rehabilitation		Yes	Rehabilitation		Yes	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area			Land acquisition (sqm)		594	

No	SPC_C04	Name	Improve and develop medium & low voltage grid for rural areas of Hau Giang province			
Purpose	<ul style="list-style-type: none"> - Reduce power losses on the rural power networks. - Handle basically the shortcomings of the rural networks, such as: safety, quality stability, aesthetic views and reduction of losses. - Improve voltage quality and meet load demands, contributing to the boosting of production, living and socioeconomic development in the rural areas 					
Scope	Construction of : - MV length: 24.34 km;					
Province	Hau Giang	FS Approval	FS Draft Completed	FIRR	4.90%	
Total Investment (VND billion)	48	Total Investment (JPY million)	237	Peak Load Status	85%	
Number of Japanese Tenants	2	Contracted Capacity of Japanese Tenant(kW)	16,450	Average Load Factor	75%	
Distribution line	District	Phung Hiep, Nga Bay Town, Vi Thuy, Long My, Vi Thanh Town				
	MV Feeder connected 110/MV Substation	Phung Hiep, Vi Thanh, Long My, Chau Thanh		Transformer (MV/LV) construction/Rehabilitation	Yes	
	MV (35/22KV) line	New	Yes	LV (0.4kV) line	New	Yes
Rehabilitation		No	Rehabilitation		No	
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EIA report	EIA not required/ Approved		Number of Resettlement		0	
Protected area			Land acquisition (sqm)		4,134	

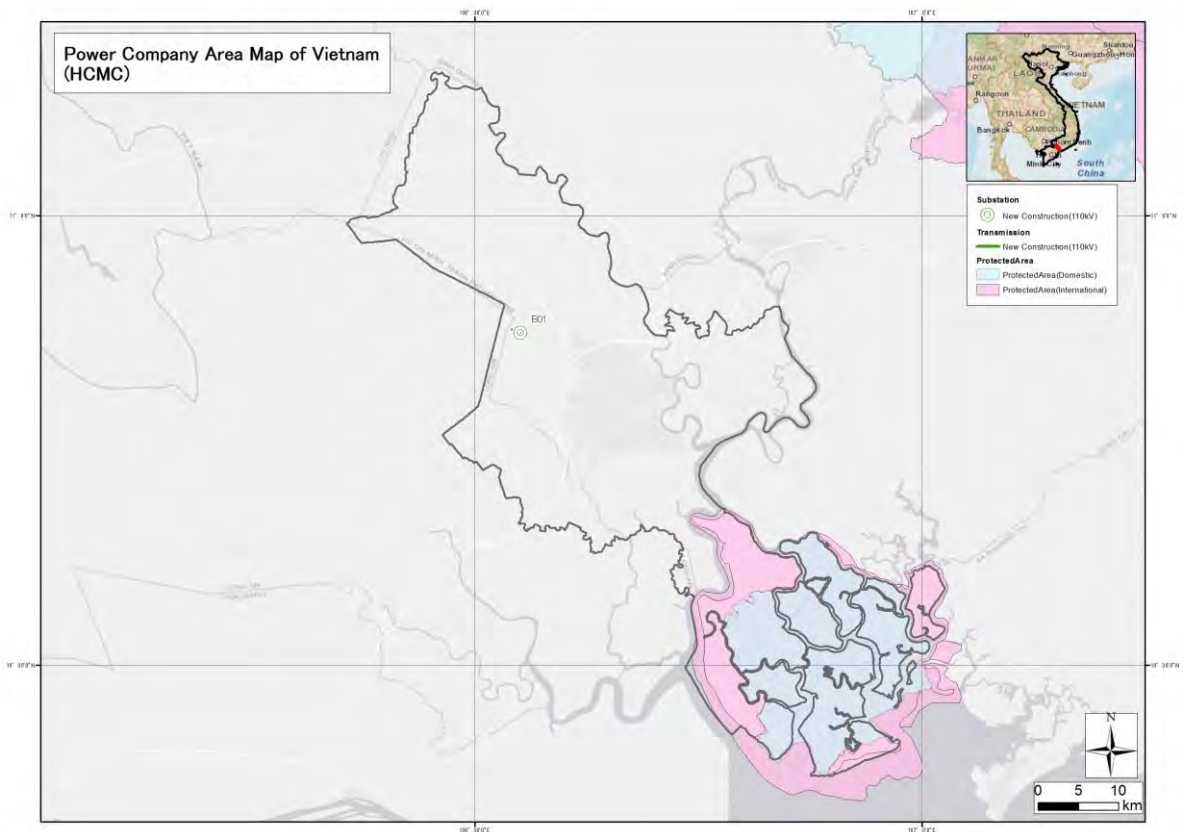
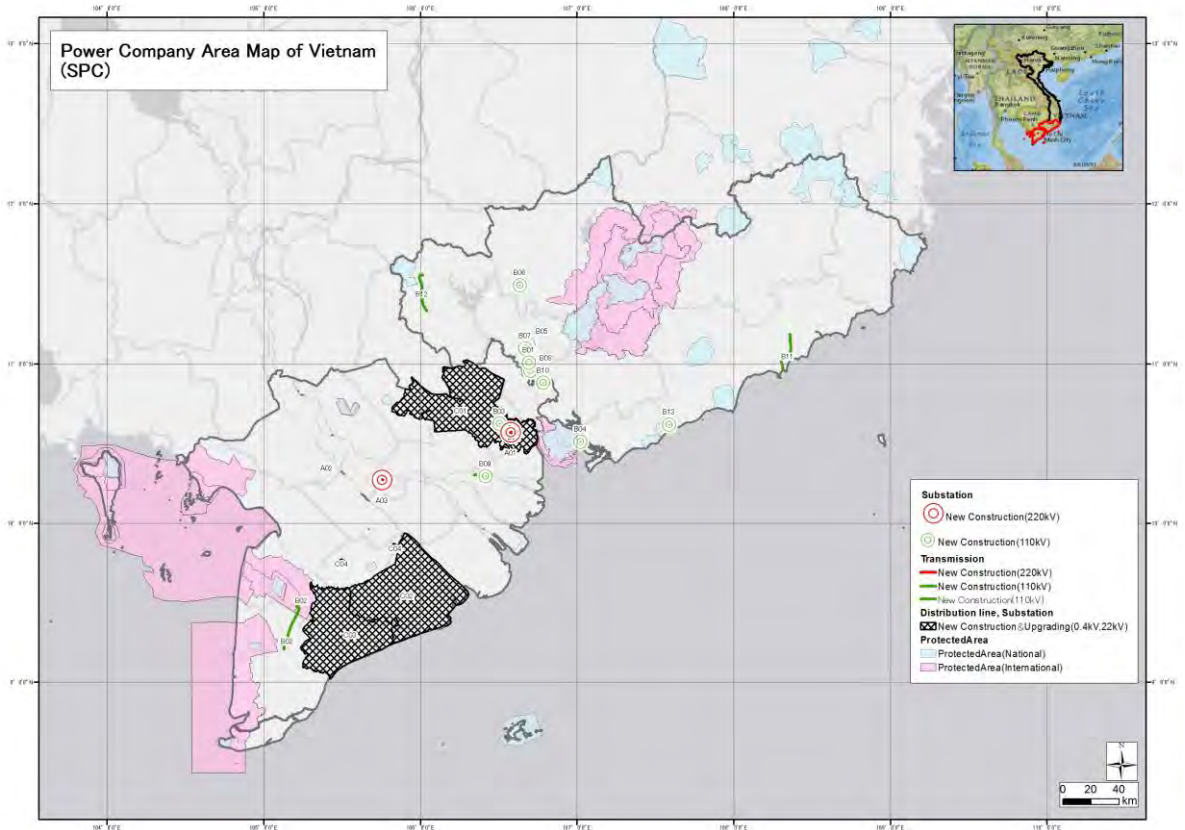
No	HCM_B01	Name	110kV Hoc Mon 2 substation and connection line					
Purpose	- Respond to load growth in Hoc Mon district. Ensure the reliability of electricity supply in this area. Decrease the power losses on power system - Supply power for Japanese companies in Xuan Thoi Son industrial cluster							
Scope	Construction of 1x 63MVA-110/15kV							
Province	Hoc Mon District	FS Approval	FS Approved		FIRR	10.12%		
Total Investment (VND billion)	115	Total Investment (JPY million)	561		Peak Load Status	78%		
Number of Japanese Tenants	2	Contracted Capacity of Japanese Tenant(kW)	133		Average Load Factor	85%		
Transmission Line	Voltage	110	Start	110kV Hoc Mon 2 Substation		End	New tower of 220kV, 110kV Binh Tân - Cầu Bông transmission line	
	Circuit	2	Length (km)		0.5	Conductor	XLPE1200	
	New	Yes	Upgrade	No	Replace	No	Connect	Yes
Sub Station	Voltage	110/22						
	New	Yes	Upgrade	No	Replace	No	Connect	Yes
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EIA report	EIA required but not started yet			Number of Resettlement		0		
Protected area					Land acquisition (sqm)		6,000	

Attachment 6 : Project Overview Map for all 75 SPs submitted
(NPC/HPC/CPC/SPC/HCMCPC)

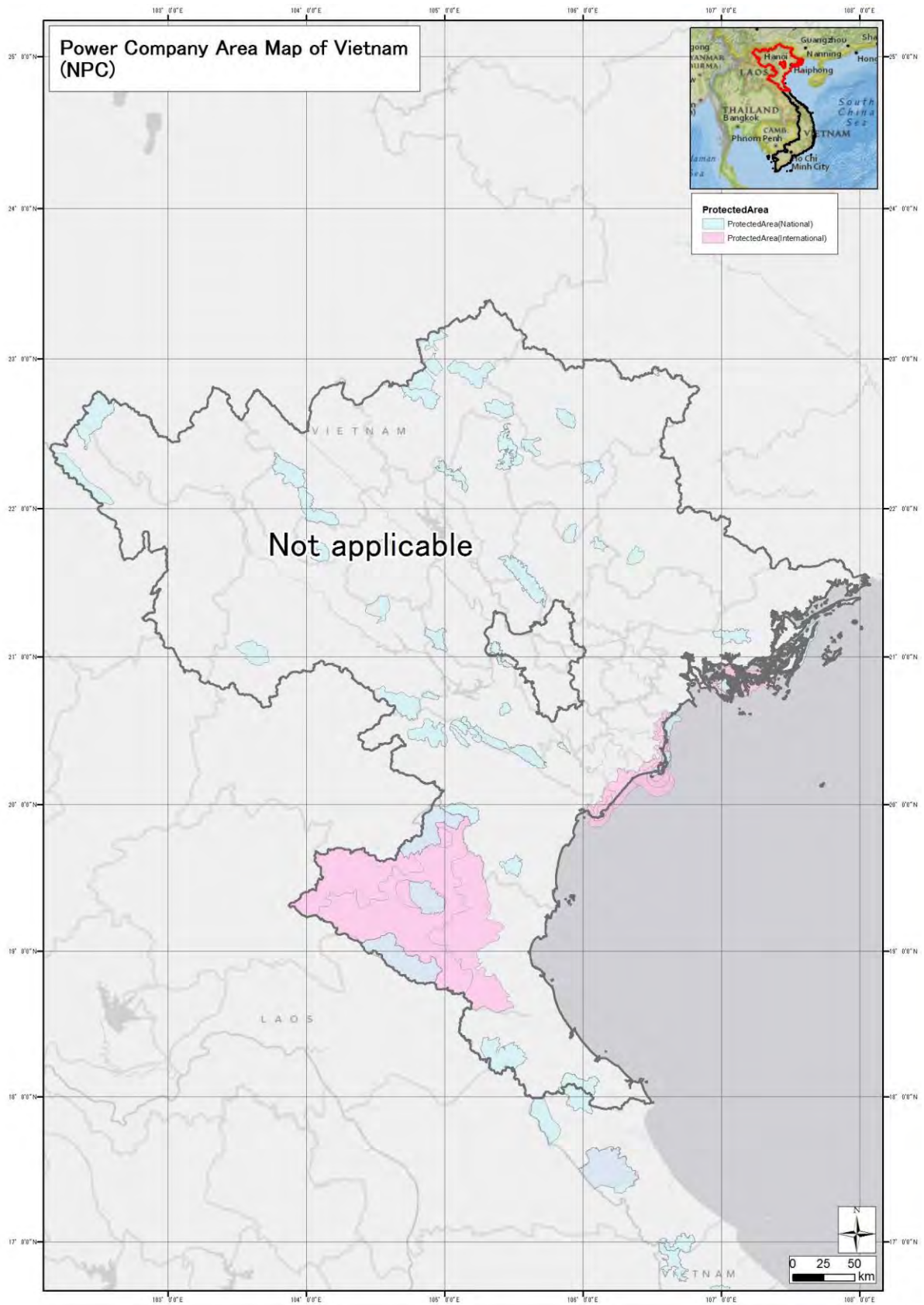


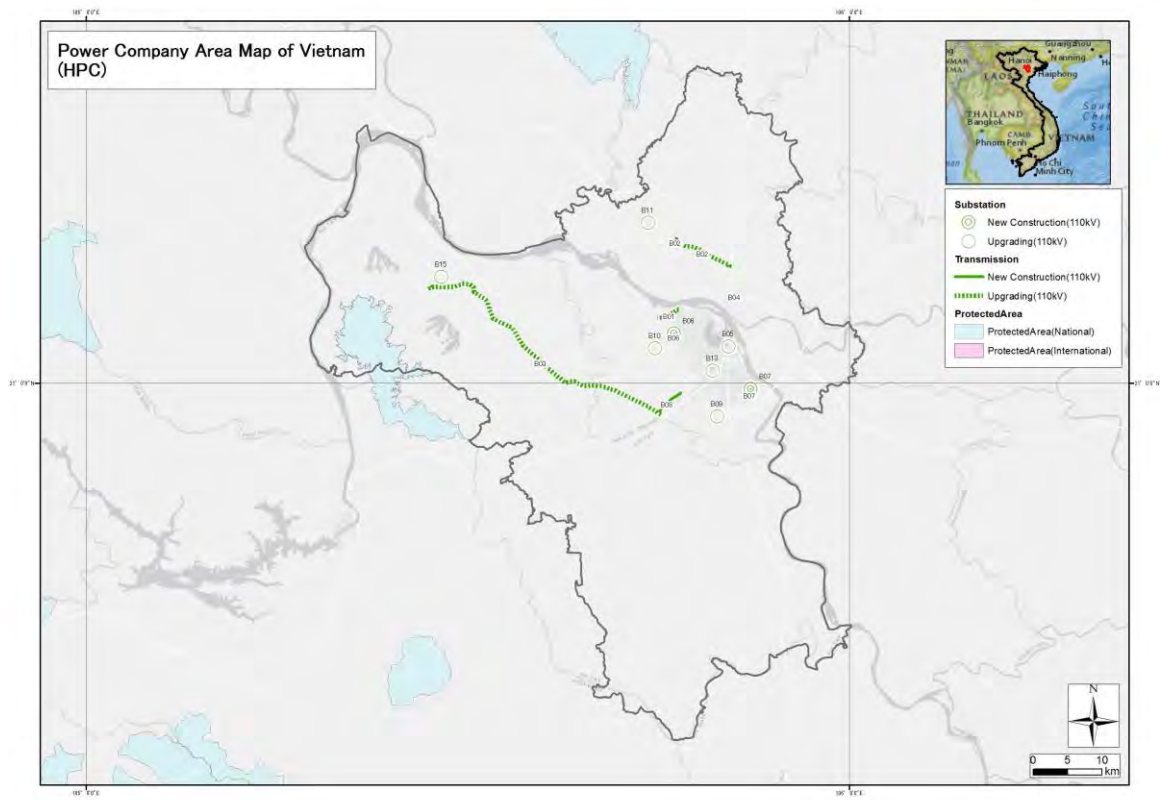


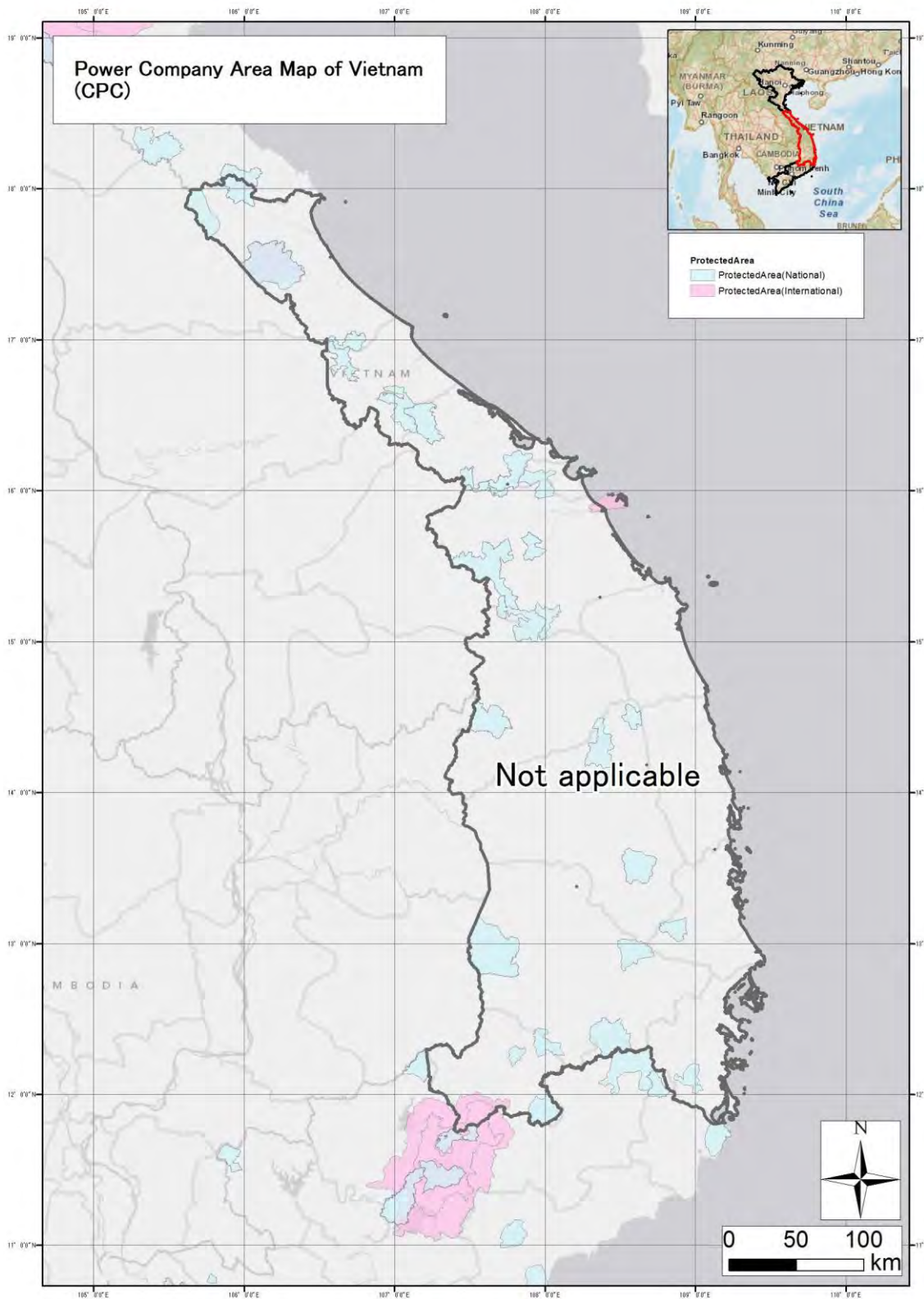


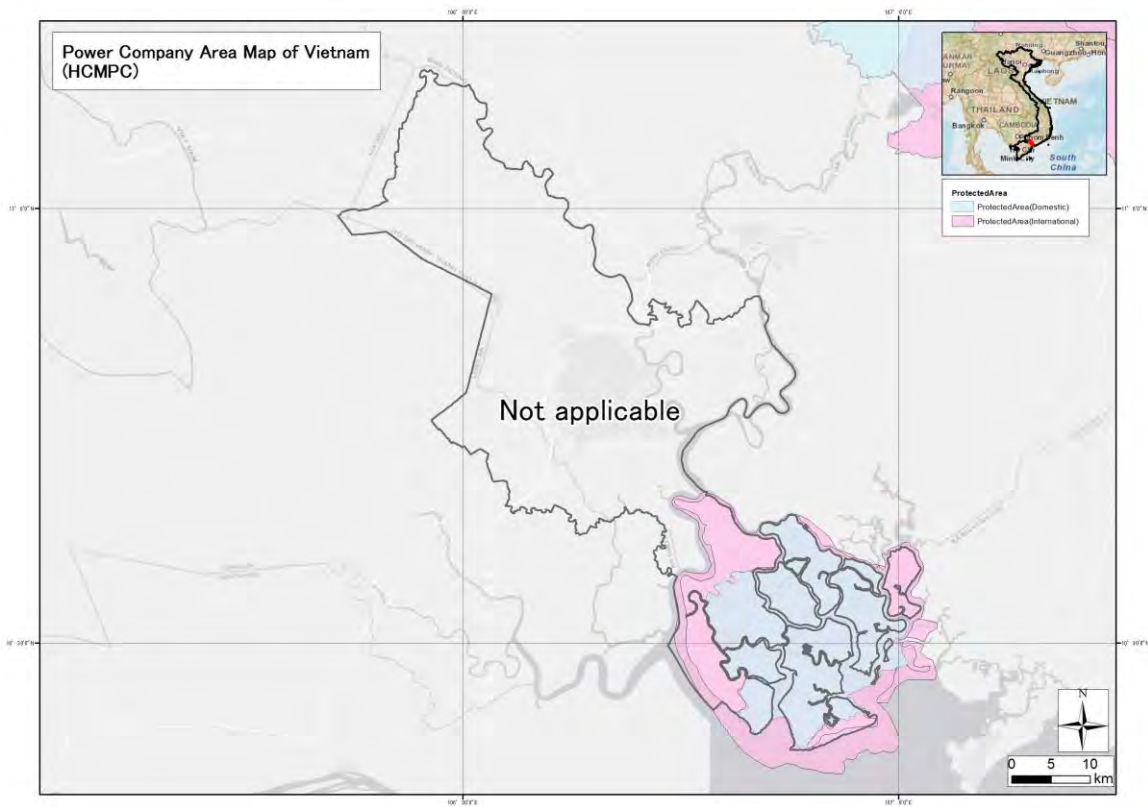
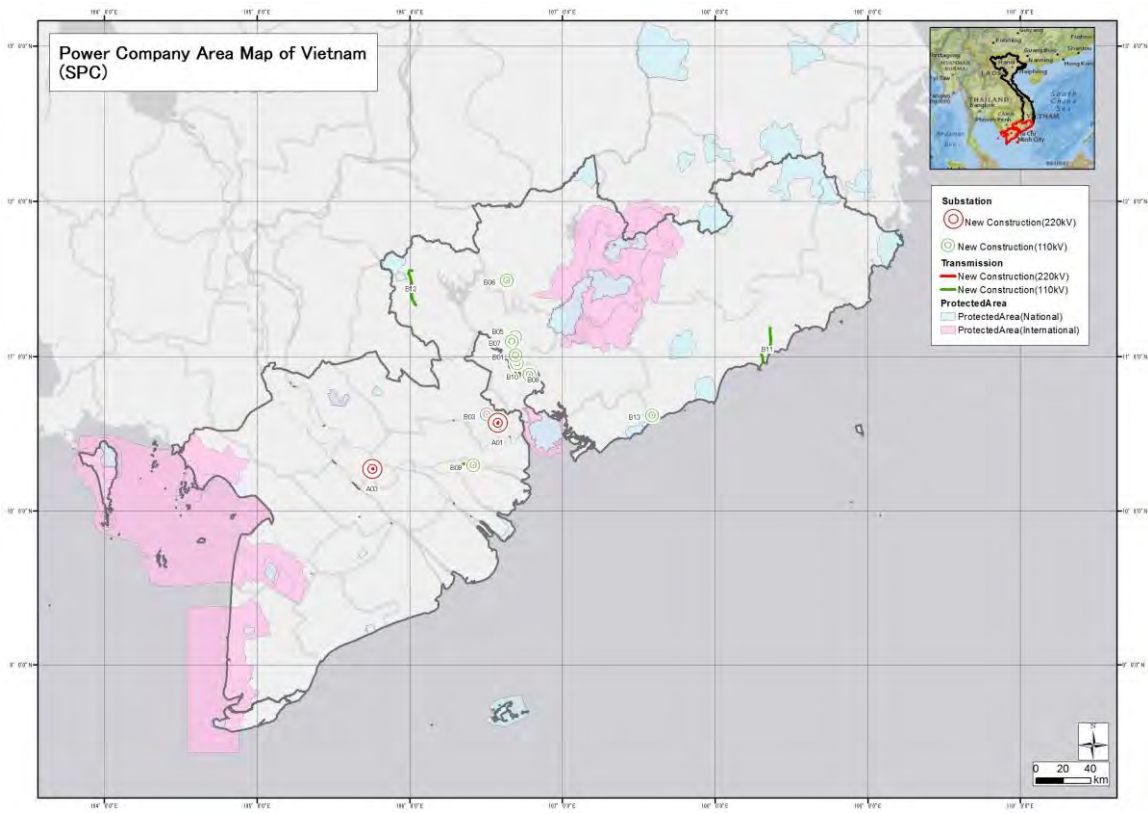


Attachment 7 : Project Overview Maps for JICA loan JPY 15 billion case
(NPC/HPC/CPC/SPC/HCMCPC)

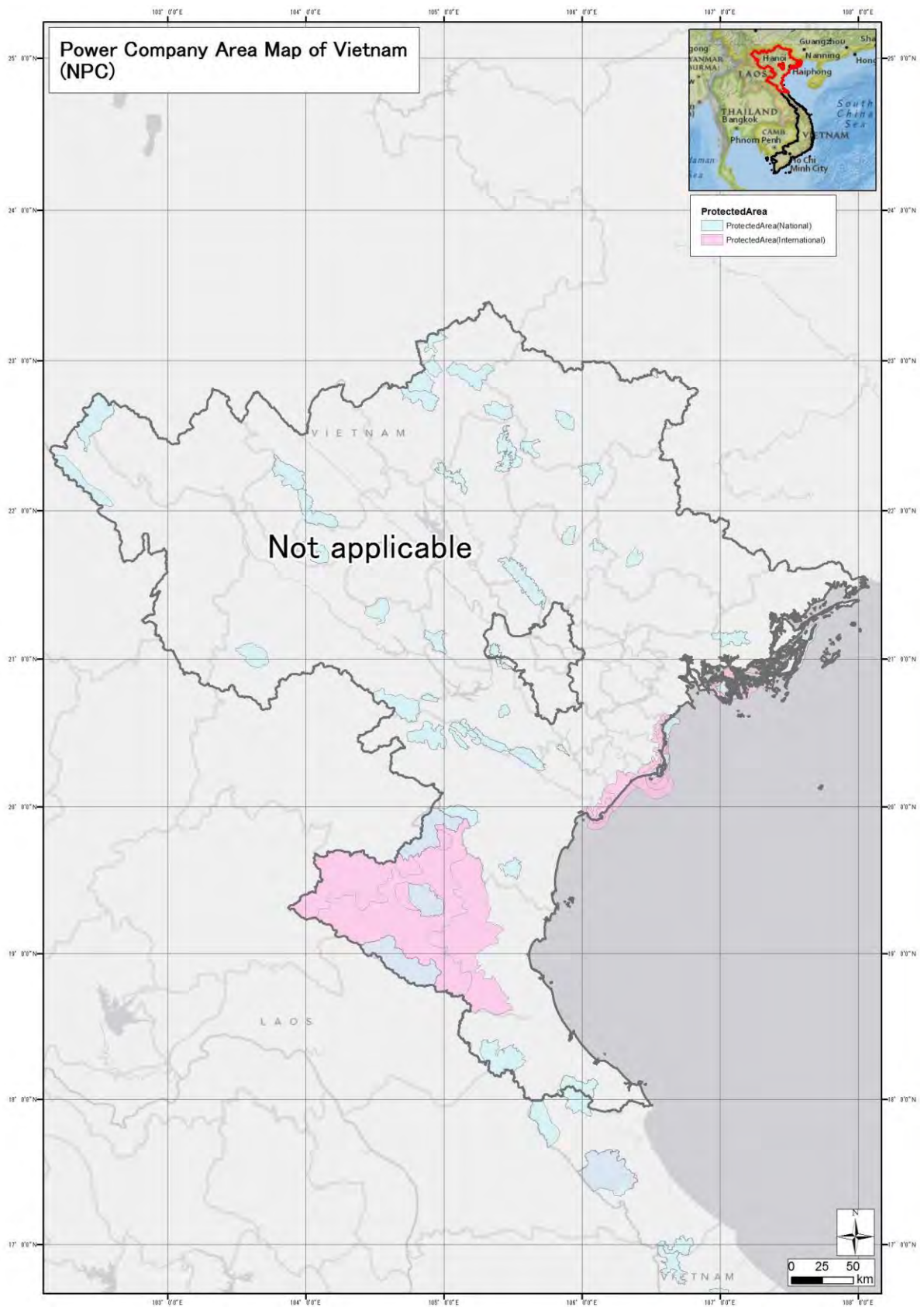


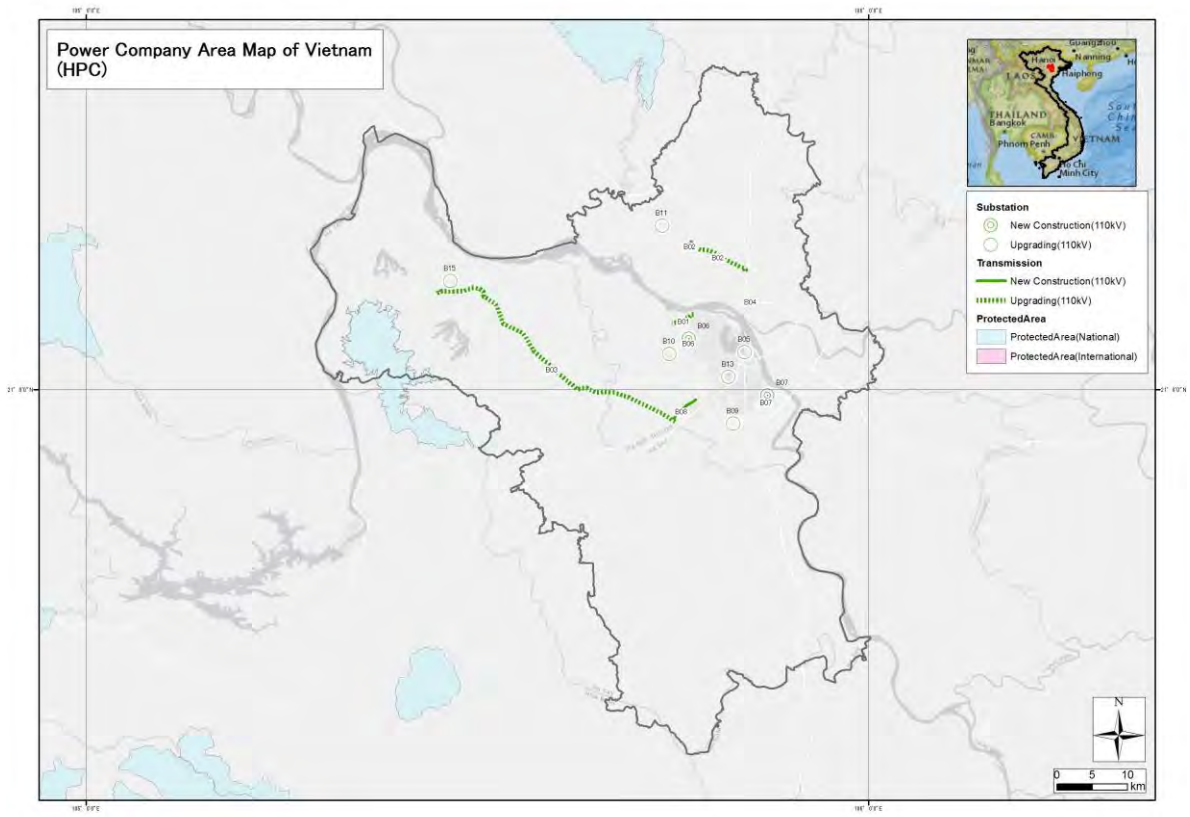


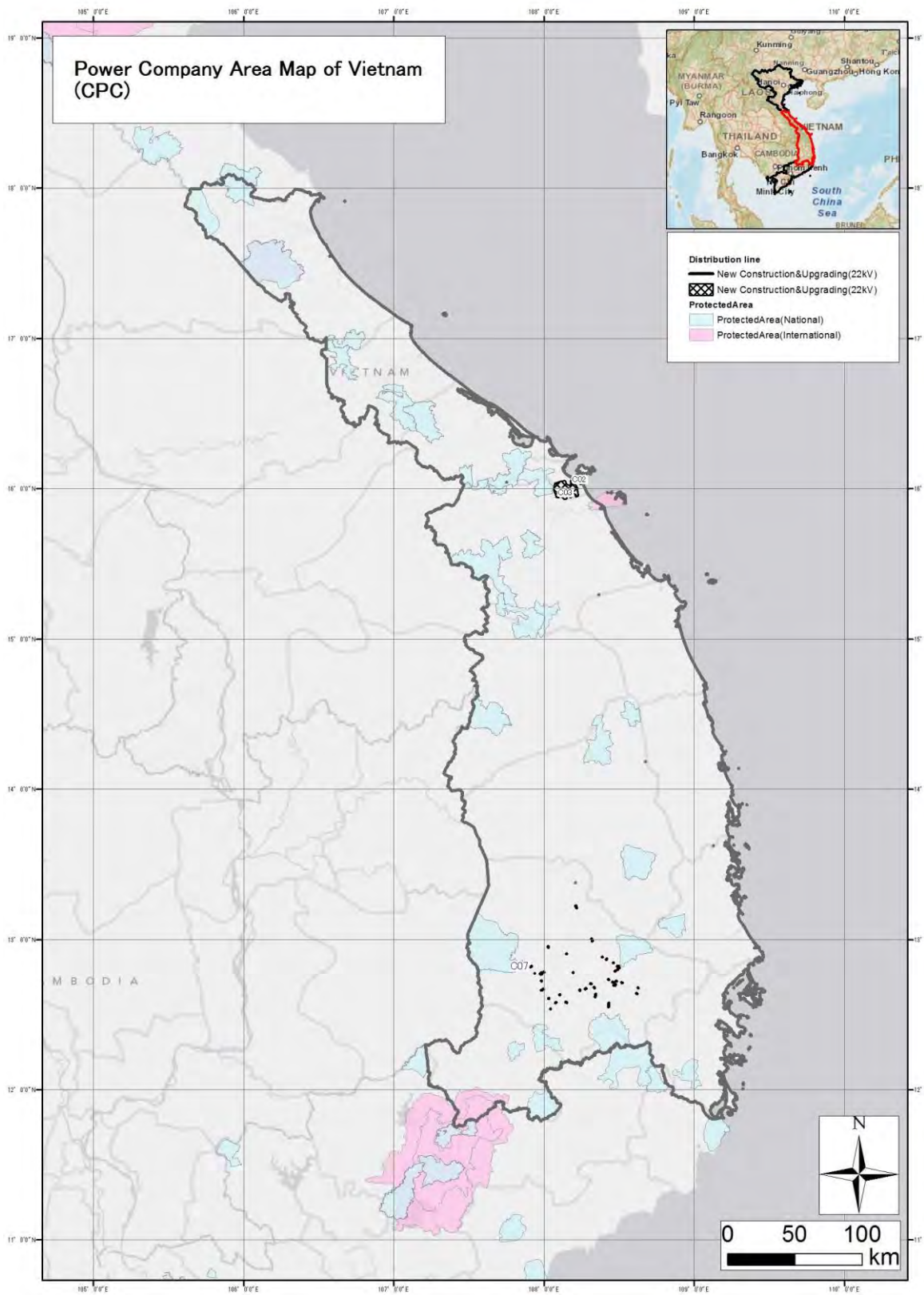


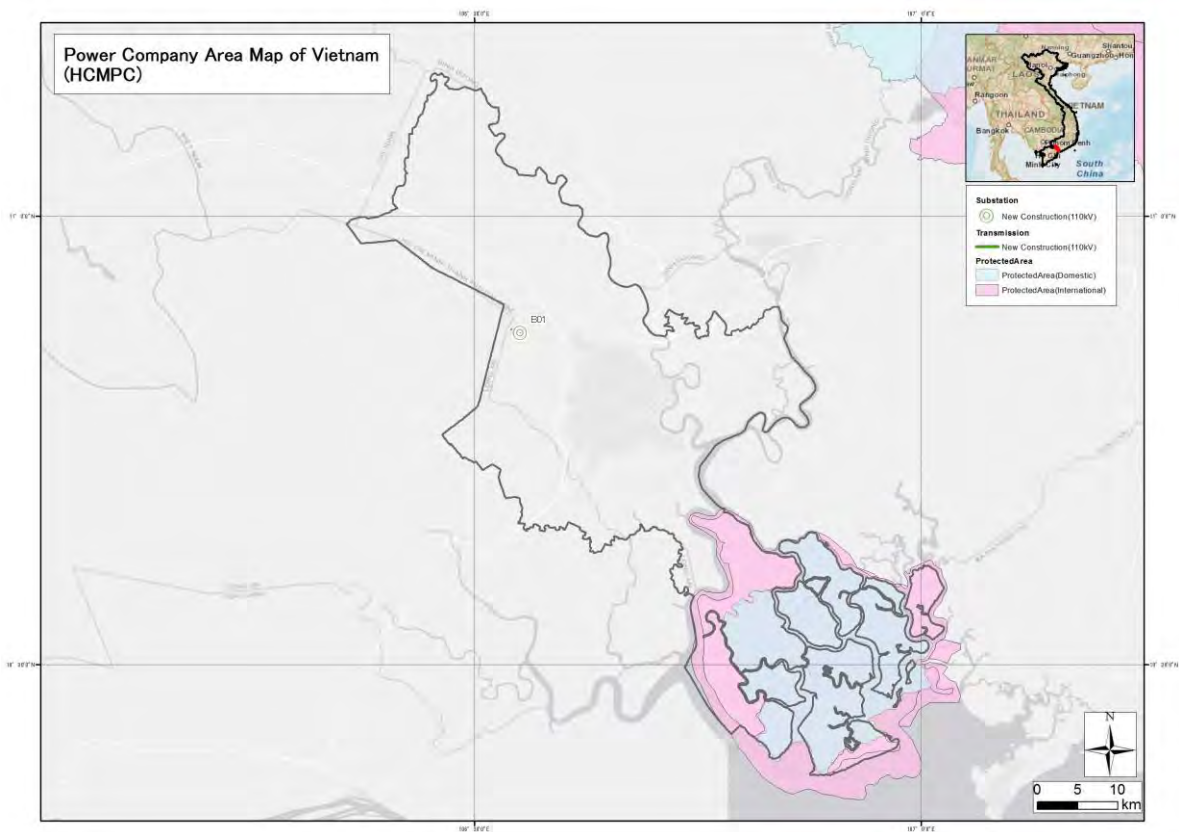
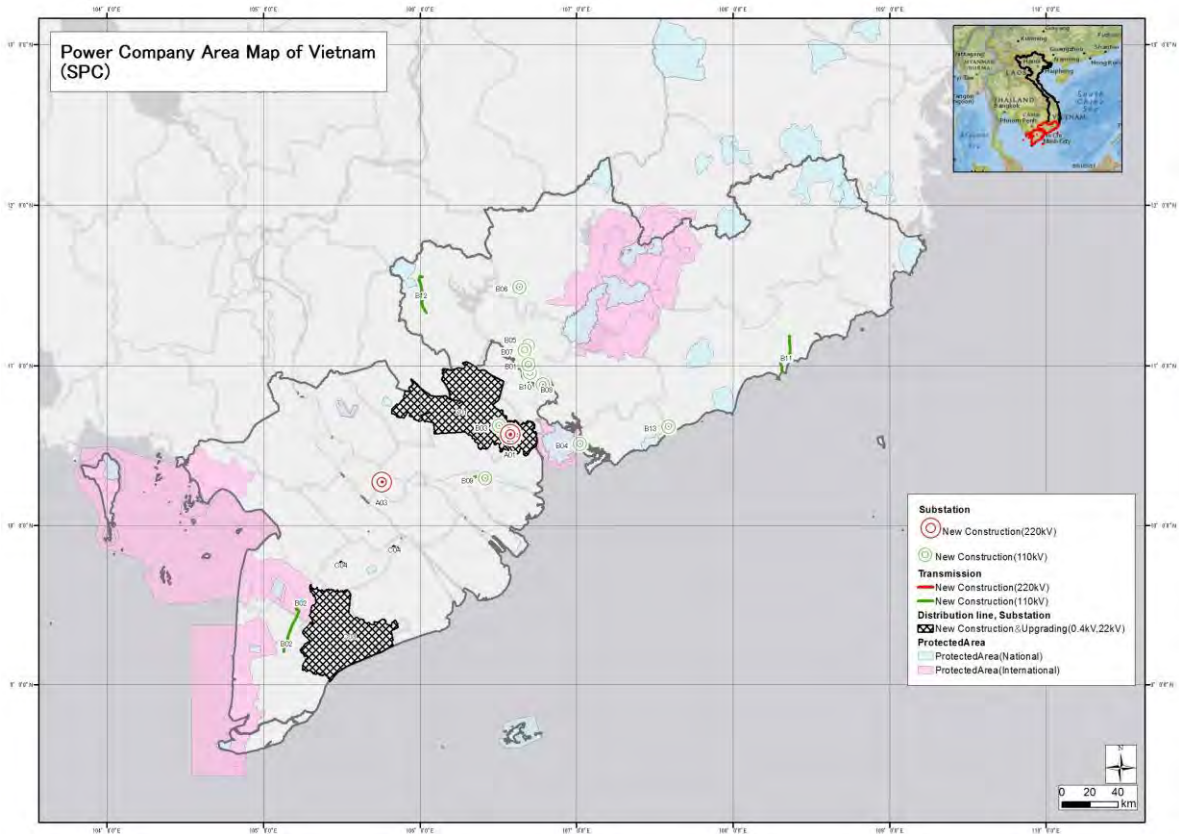


Attachment 8 : Project Overview Maps for JICA loan JPY 20 billion case
(NPC/HPC/CPC/SPC/HCMCPC)

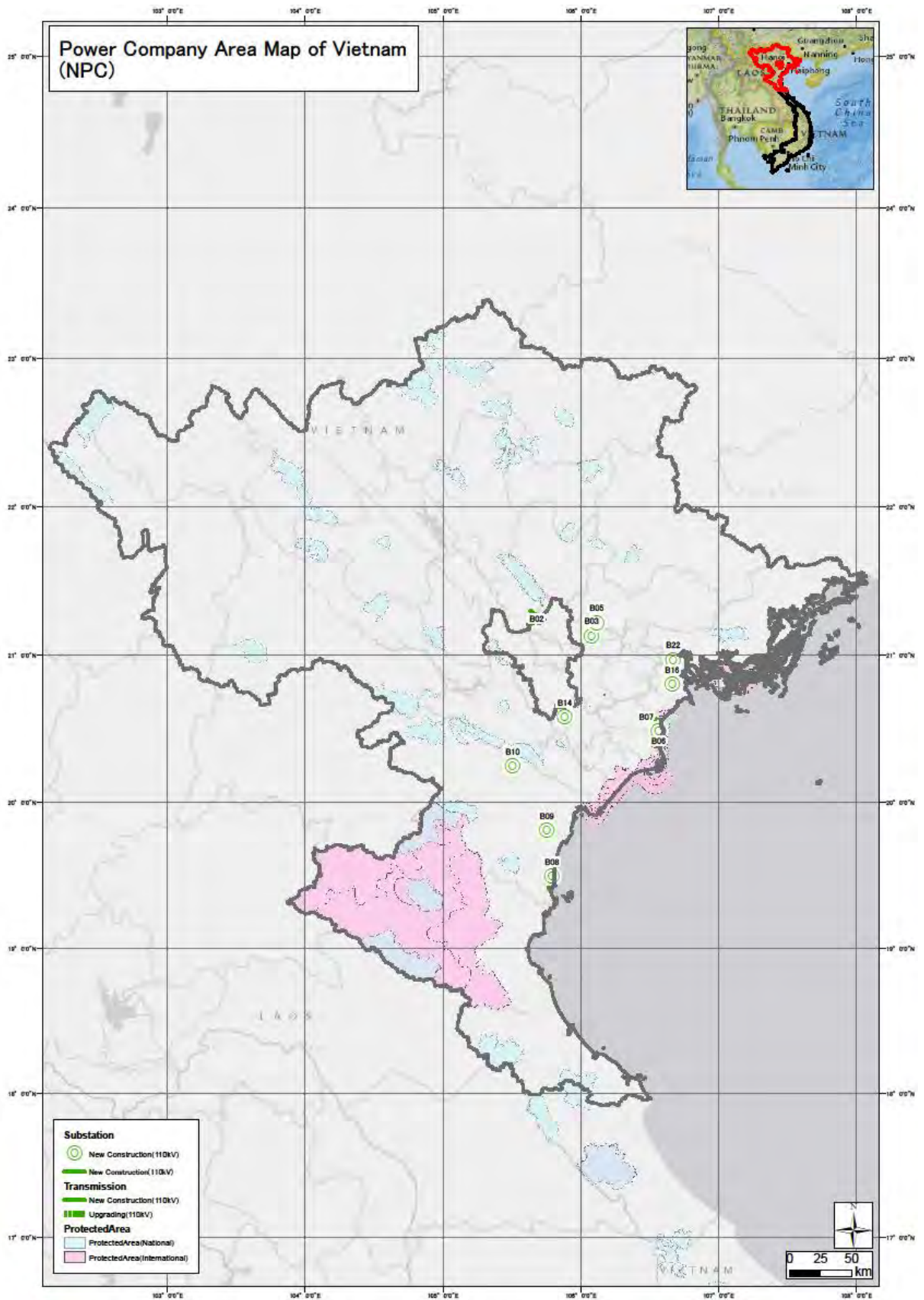


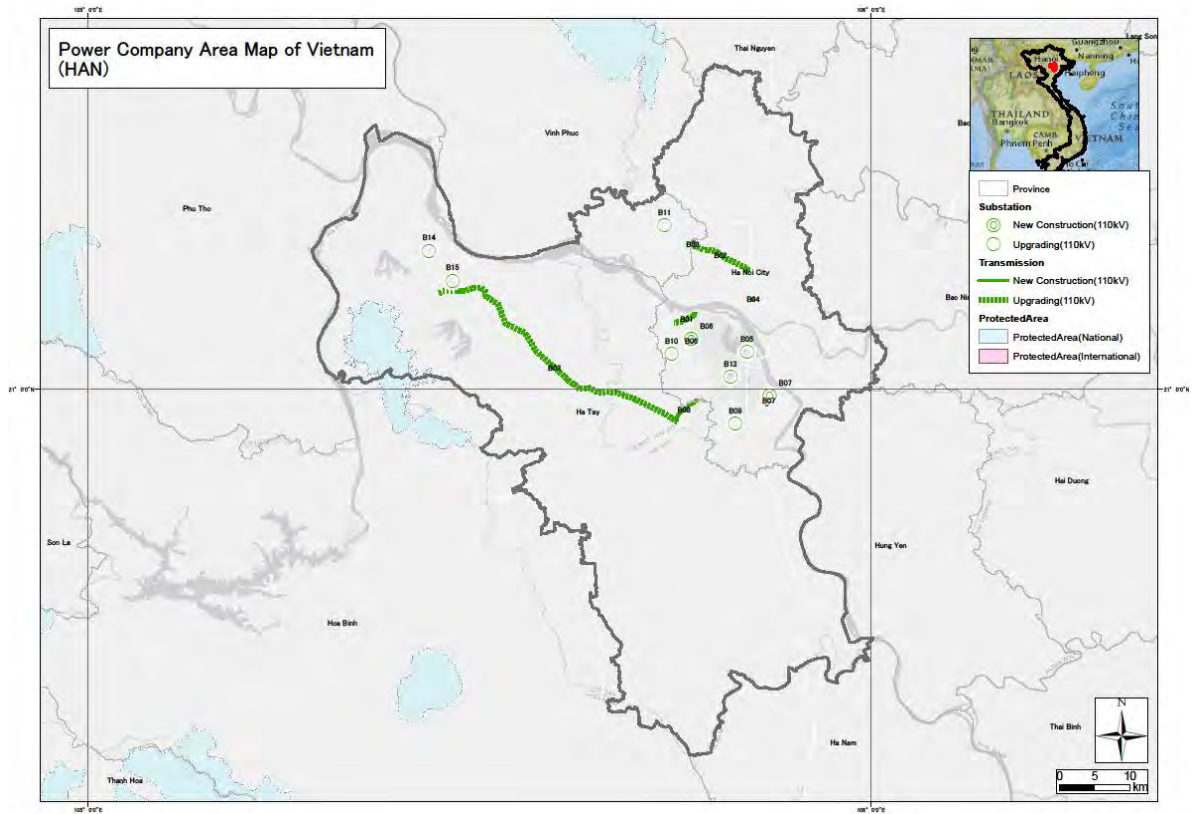


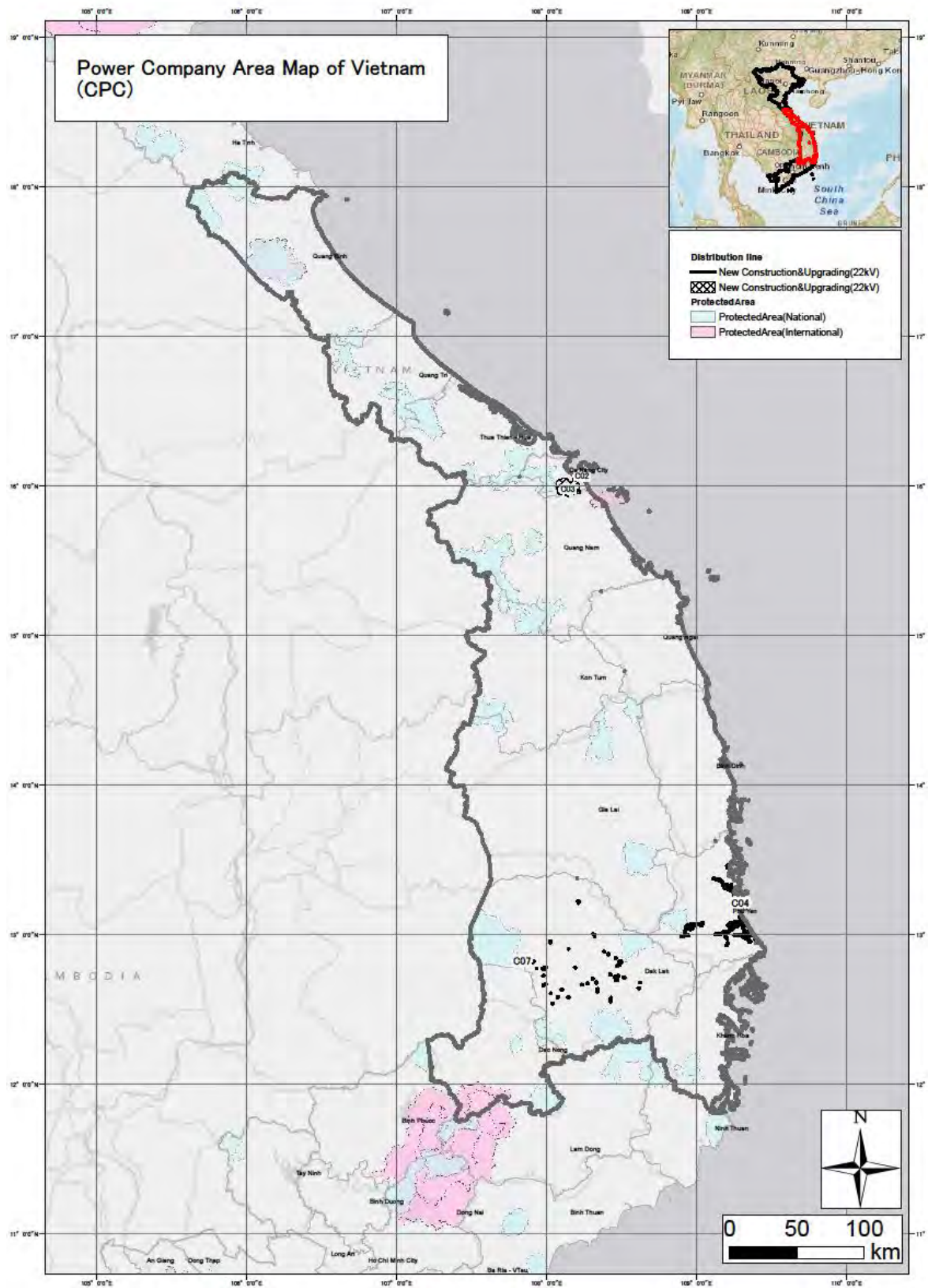


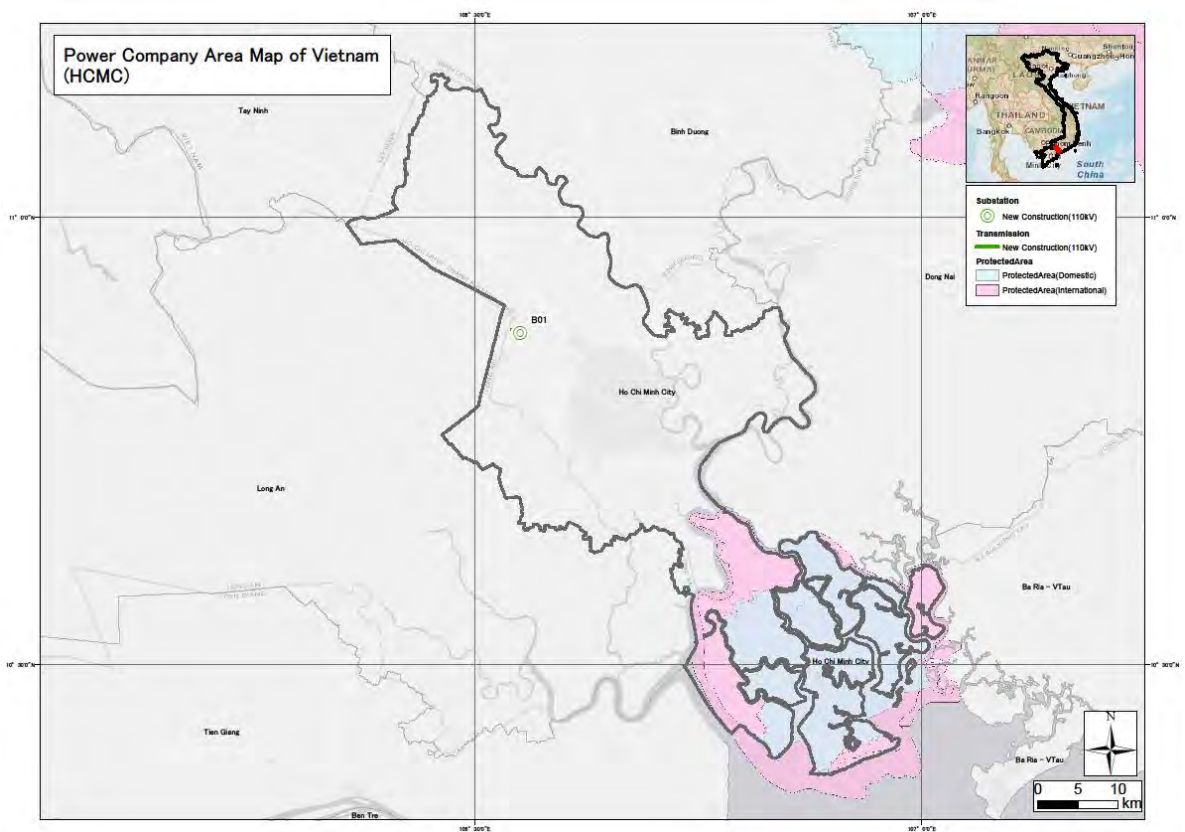
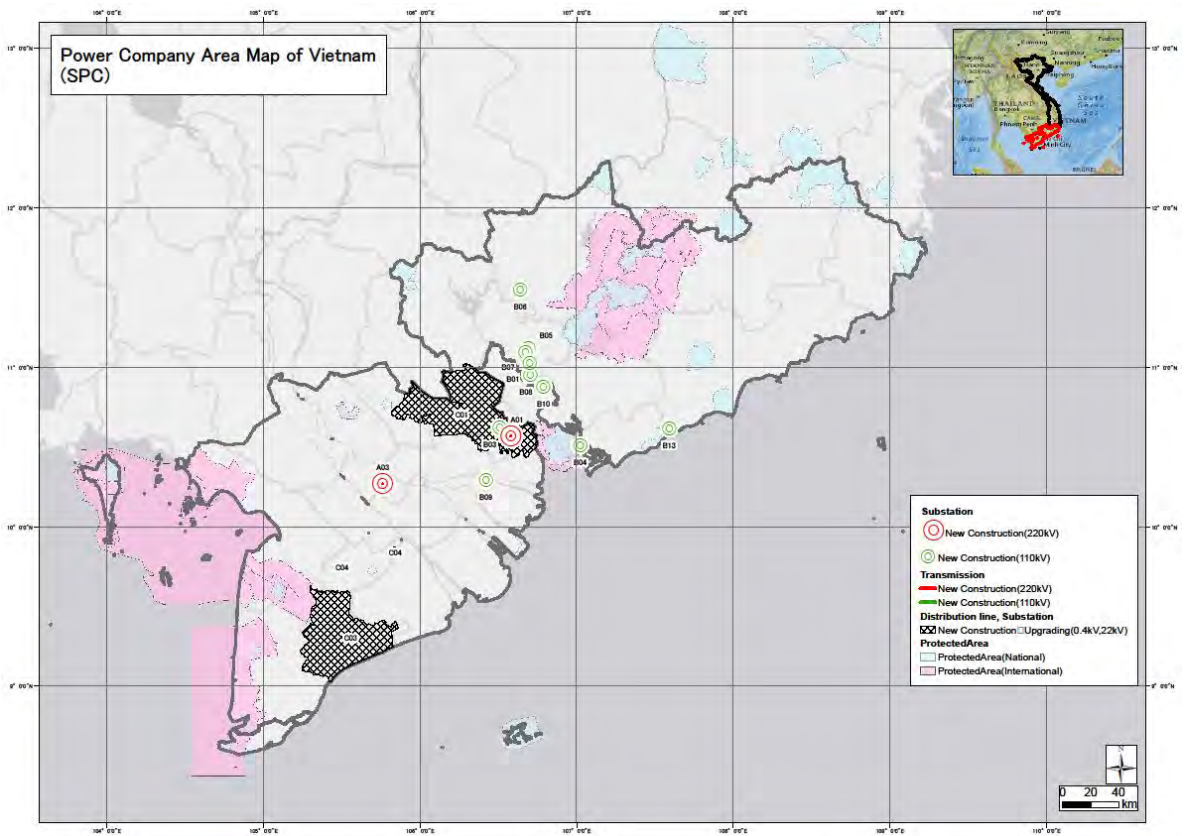


Attachment 9 : Project Overview Maps for JICA loan JPY 25 billion case
(NPC/HPC/CPC/SPC/HCMCPC)









Attachment10 :
The list of laws and regulations related to environmental protection

Attachment10-1 : The list of laws and regulations related to environmental protection

- Law on Environmental Protection No.52/2005/QH11 approved by the National Assembly of Socialist Republic of Vietnam dated 29/11/2005 and having effect from 01/07/2006
- Decree No.80/2006/ND-CP dated 09/8/2006 by the Government on guiding the implementation of some articles in Law on Environmental Protection
- Decree No.140/2006/ND-CP dated 22/11/2006 by the Government on Regulation for the Environmental Protection in the formulation, appraisal, approval and Implementation of Development Strategies, Plannings, Plans, Programs and Projects
- Resolution No.49/2010 The 12th National Assembly dated 06/19/2010 About the important project will be submitted to the National Assembly for National investment decisions
- Decree No.21/2008/ND-CP by the Government dated 28/2/2008 on “amendment and supplementation of several clauses of Decree No.80/2006/ND-CP dated 09/08/2006 on “guiding the implementation of some articles in Environment Protection Law”
- Decree No.29/2011/ND-CP dated 18/04/2011 by the Government on guiding strategy environment assessment, environment impact assessment and protection commitment
- Circular No. 26/2011/TT-BTNMT dated on 18/7/2011 by the Ministry of Natural Resources and Environment for Detailed regulation on some articles of Decree No. 29/2011/NĐ-CP on 18/4/2011 by the Government for strategy environment assessment, environment impact assessment, and environment protection commitment which has taken effect on 2/9/2011 (replace for Circular No. 05/2008/TT-BTNMT)
- Decree No.117/2009/NĐ-CP dated 31/12/2009 the fine of law violations in the field of environmental protection
- Current Environmental Standards (TCVNs) and National Technical Regulations (QCVNs)

Attachment10-2 : The list of laws and regulations related to environmental protection

- 2003 Land Law ratified by the National Assembly of Socialist Republic of Vietnam on 26/11/2003, which came into effect as from 01/07/2004
- Decree No.197/2004/ND-CP dated 03/12/2004 by the Government of Vietnam on compensation, support and resettlement upon land repossession by the Government
- Decree No.181/2004/ND-CP dated 29/10/ 2004 on Implementation of the Land Law
- Decree No.188/2004/ND-CP dated 16/11/2004 on methods to determine land prices and assorted land price brackets
- Decree No.198/2004/ND-CP dated 03 /12/ 2004 on Fee for land use
- Decree No.17/2006/ND-CP of 27/01/2006 by the Government on revising some contents in the Decrees guiding the implementation of Land Law
- Decree No.84/2007/ND9-CP by the Government of 25/05/2007 on the additional regulations on issuance of land use right certificate, land repossession, exercising the land use right, the procedures of compensation, support and resettlement upon land repossession by the Government and adjustment of land claims
- Circular No.06/2007/TT-BTNMT dated 15/06/2007 by the Ministry of Natural Resources and Environment guiding the implementation of some contents in the Decree No. 84/2007/ND-CP of 25/05/2007 issued by the Government
- Decree No. 69/2009/ND-CP dated 13/08/2009 of the Government's additional regulations on land use planning, land prices, land acquisition, compensation, assistance and resettlement
- Decision No. 34/QĐ-TTg of the Prime-Minister dated 8/8/2010 on issue of Regulation on compensation, assistance and resettlement for irrigation and hydropower projects.
- Decision No. 07/2011/QĐ-UBND dated 30/01/2011 by People's Committee of Lam Dong province of unit price building villas, houses, greenhouses and unit price of components integrated to determine the value of property on the Lam Dong Province
- Decision No. 36/2012/QĐ-UBND dated 20/8/2010 by People's Committee of Lam Dong province of regulations on compensation, support and resettlement upon land acquisition by the Government on the Lam Dong Province

- Decision No. 09/2013/QĐ-UBND dated 20/02/2013 by People's Committee of Lam Dong province of 2013 land price regulations on the Don duong District - Lam Dong Province
- Decision No. 03/2013/QĐ-UBND dated 18/01/2013 by People's Committee of Lam Dong province of issued compensation unit price for crops upon land acquisition by the Government on the Lam Dong Province
- Decision No. 48/2012/QĐ-UBND dated 20/12/2012 by People's Committee of Lam Dong province of 2013 land price regulations on Da Lat City
- Circular No.14/2009/TT-BTNMT dated 01/10/2009 by the Ministry of Natural Resources and Environment for detailed regulation on Compensation, Support and Resettlement; and the order and procedures of land acquisition, land allocation, land lease

Attachment 11 :
References of Forest Category and Types / References of Development in Forest Area

Attachment11-1 : List of the Special-use forests

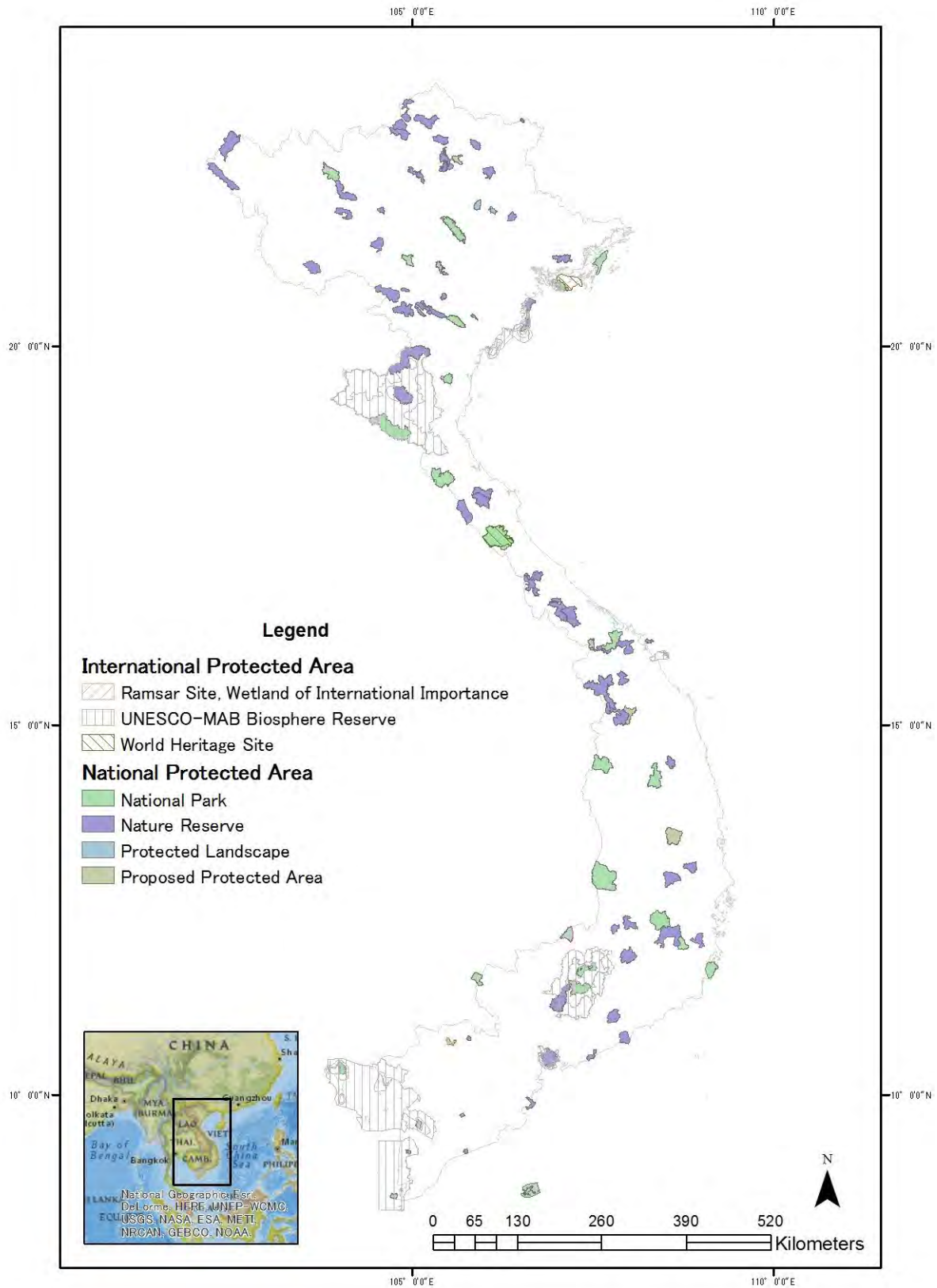
No.	Name	Location	Area (ha)	Breakdown		
				Forest Land	Bare Land	Sea
I. National Park			1077236.13	932370.76	77855.37	67010.00
1	Ba Bê	Bắc Kạn	9022.00	8555.80	466.20	
2	Ba Vì	Hà Tây	6486.40	5165.77	1320.63	
		Hoà Bình	4263.30	1072.40	3190.90	
3	Bạch Mã	Thừa Thiên Huế	34380.00	29050.80	5329.20	
		Quảng Nam	3107.00	3107.00	0.00	
4	Bái Tử Long	Quảng Ninh	15600.00	5233.00	709.00	9658.00
5	Bến En	Thanh Hoá	12033.00	11401.50	631.50	
6	Bidoup-Núi Bà	Lâm Đồng	55968.00	50713.00	5255.00	
7	Bù Gia Mập	Bình Phước	25926.00	25695.00	231.00	
8	Cát Bà	Hải Phòng	15331.60	8168.30	1763.30	5400.00
9	Cát Tiên	Đồng Nai	39627.00	34288.30	5338.70	
		Lâm Đồng	27530.00	24130.00	3400.00	
		Bình Phước	4300.00	3837.00	463.00	
10	Chư Mom Rây	Kon Tum	56434.20	54316.90	2117.30	
11	Chư Yang Sin	Đắk Lắk	59316.10	59316.10	0.00	
12	Côn Đảo	Bà Rịa Vũng Tàu	19991.00	4854.00	1137.00	14000.00
13	Cúc Phương	Ninh Bình	11350.00	11343.80	6.20	
		Thanh Hoá	4981.60	4857.81	123.79	
		Hoà Bình	6074.30	6074.30	0.00	
14	Hoàng Liên	Lào Cai	21000.10	19413.60	1586.50	
		Lai Châu	7500.00	5906.00	1594.00	
15	Kon Ka Kinh	Gia Lai	39955.00	37102.00	2853.00	
16	Lò Gò Sa Mát	Tây Ninh	18345.00	15484.00	2861.00	
17	Mũi Cà Mau	Cà Mau	41089.00	8749.00	5740.00	26600.00
18	Núi Chúa	Ninh Thuận	29865.00	17223.00	5290.00	7352.00
19	Phong Nha Kẻ Bàng	Quảng Bình	125362.00	125156.00	206.00	
20	Phú Quốc	Kiên Giang	29135.90	27849.10	1286.80	
21	Phước Bình	Ninh Thuận	19814.00	15545.40	4268.60	
22	Pù Mát	Nghệ An	93524.70	91952.90	1571.80	
23	Tam Đảo	Vĩnh Phúc	14679.03	11321.88	3357.15	
		Thái Nguyên	8757.60	8757.60	0.00	
		Tuyên Quang	6078.40	5105.40	973.00	
24	Tràm Chim	Đồng Tháp	7313.00	2893.00	4420.00	
25	U Minh Hạ	Cà Mau	7926.00	7321.00	605.00	
26	U Minh Thượng	Kiên Giang	8038.00	7111.70	926.30	
27	Vũ Quang	Hà Tĩnh	52882.00	51571.00	1311.00	
28	Xuân Sơn	Phú Thọ	15048.00	9398.00	5650.00	
29	Xuân Thủy	Nam Định	7100.00	1650.00	1450.00	4000.00
30	Yok Đôn	Đắk Lắk	109196.00	108885.50	310.50	
		Đắk Nông	2905.90	2793.90	112.00	

No.	Name	Location	Area (ha)	Breakdown		
				Forest Land	Bare Land	Sea
II. Nature Reserve			1099736.11	938602.69	161133.42	
II a	Nature Reserve		1060958.87	910334.90	150623.97	
1	Bà Nà- Núi Chúa	Đà Nẵng	30206.30	29136.30	1070.00	
2	An Toàn	Bình Định	22545.00	16943.00	5602.00	
3	Áp Canh Điền	Bạc Liêu	363.00	66.60	296.40	
4	Bắc Hương Hóa	Quảng Trị	25200.00	22138.00	3062.00	
5	Bắc Mê	Hà Giang	9042.50	8298.90	743.60	
6	Bán đảo Sơn Trà	Đà Nẵng	3871.00	3778.00	93.00	
7	Bát Đại Sơn	Hà Giang	4531.20	4263.10	268.10	
8	Bà Nà - Núi Chúa	Quảng Nam	2753.00	2609.00	144.00	
9	Bình Châu Phước Bửu	Bà Rịa-Vùng Tàu	10905.00	7912.00	2993.00	
10	Cham Chu	Tuyên Quang	15902.10	15593.50	308.60	
11	Copia	Sơn La	11995.90	6655.20	5340.70	
12	Đakrông	Quảng Trị	37640.00	32289.00	5351.00	
13	Đồng Sơn - Kỳ Thượng	Quảng Ninh	14851.00	12259.00	2592.00	
14	Du Già	Hà Giang	11540.10	10737.50	802.60	
15	Ea Sô	Đắk Lắk	24017.00	21065.60	2951.40	
16	Hang Kia - Pà Cò	Hoà Bình	5257.77	4882.75	375.02	
17	Hòn Bà	Khánh Hòa	19164.48	16160.95	3003.53	
18	Hòn Chông	Kiên Giang	964.70	868.40	96.30	
19	Hữu Liên	Lạng Sơn	8293.00	8129.00	164.00	
20	Kon Cha Răng	Gia Lai	15446.00	15386.90	59.10	
21	Kẻ Gỗ	Hà Tĩnh	21759.00	19780.00	1979.00	
22	Kim Hỷ	Bắc Kạn	14772.00	13913.70	858.30	
23	Krông Trai	Phú Yên	13392.00	12648.00	744.00	
24	Láng Sen	Long An	5030.00	3381.00	1649.00	
25	Mường Nhé	Điện Biên	44940.30	26881.90	18058.40	
26	Mường Tè	Lai Châu	33775.00	22412.00	11363.00	
27	Nà Hâu	Yên Bái	16399.90	12705.20	3694.70	
28	Na Hang	Tuyên Quang	22401.50	21277.70	1123.80	
29	Nam Ca	Đắk Lắk	21912.30	21912.30	0.00	
30	Nam Nung	Đắk Nông	10912.00	10618.80	293.20	
31	Ngọc Sơn - Ngõ Luông	Hoà Bình	15890.63	12928.00	2962.63	
32	Ngọc Linh	Kon Tum	38109.40	34294.60	3814.80	
33	Ngọc Linh	Quảng Nam	17576.00	13916.00	3660.00	
34	Núi Ông	Bình Thuận	24017.00	23131.00	886.00	
35	Núi Pia Oắc	Cao Bằng	10261.00	7732.00	2529.00	
36	Phong Điền	Thừa Thiên Huế	30262.80	30262.80	0.00	
37	Phong Quang	Hà Giang	7910.90	7271.40	639.50	
38	Phu Canh	Hoà Bình	5647.00	4077.90	1569.10	
39	Pù Hoạt	Nghệ An	35723.00	32508.80	3214.20	
40	Pù Hu	Thanh Hoá	23028.20	19983.20	3045.00	
41	Pù Huống	Nghệ An	40127.70	31668.90	8458.80	

No.	Name	Location	Area (ha)	Breakdown		
				Forest Land	Bare Land	Sea
42	Pù Luông	Thanh Hoá	16902.30	16722.10	180.20	
43	Sông Thanh	Quảng Nam	79694.00	61752.00	17942.00	
44	Sốp Cộp	Sơn La	17369.00	13654.10	3714.90	
45	Tà Đùng	Đắk Nông	17915.20	13406.30	4508.90	
46	Tà Xùa	Sơn La	13412.20	12257.20	1155.00	
47	Tà Kôu	Bình Thuận	8468.00	6721.00	1747.00	
48	Tây Côn Lĩnh	Hà Giang	14489.30	14018.60	470.70	
49	Tây Yên Tử	Bắc Giang	13022.70	12308.80	713.90	
50	Thần Sa - P.Hoàng	Thái Nguyên	18858.90	17833.60	1025.30	
51	Thanh Phú	Bến Tre	2584.00	1914.00	670.00	
52	Thượng Tiển	Hoà Bình	5872.99	5284.80	588.19	
53	Tiền Hải	Thái Bình	3245.00	2259.00	986.00	
54	Văn Bàn	Lào Cai	25173.00	24574.00	599.00	
55	Vân Long	Ninh Bình	1973.50	1860.50	113.00	
56	Vĩnh Cửu	Đồng Nai	53850.30	48188.10	5662.20	
57	Xuân Nha	Sơn La	16316.80	14643.90	1672.90	
58	Xuân Liên	Thanh Hoá	23475.00	20459.00	3016.00	
II	Special Conservation Area		38777.24	28267.79	10509.45	
b						
1	Chê Tạo	Yên Bái	20293.20	10779.80	9513.40	
2	Đắk Uy	Kon Tum	659.50	491.00	168.50	
3	Ea Ral	Đắk Lắk	49.00	49.00	0.00	
4	Hương Nguyên	Thừa Thiên Huế	10310.50	10310.50	0.00	
5	Khau Ca	Hà Giang	2010.40	1875.00	135.40	
6	Lung Ngọc Hoàng	Hậu Giang	790.64	599.19	191.45	
7	Nam Xuân Lạc	Bắc Kạn	1788.00	1788.00	0.00	
8	Khu Bảo tồn loài sinh cảnh Thông nước	Đắk Lắk	100.00	15.30	84.70	
9	Trùng Khánh	Cao Bằng	2261.00	2135.00	126.00	
10	Sân Chim đăm Dơi	Cà Mau	130.00	123.00	7.00	
11	Vườn Chim Bạc Liêu	Bạc Liêu	385.00	102.00	283.00	
III.	Landscape Protection Area		78129.39	60554.52	17574.87	
1	ATK Định Hoá	Thái Nguyên	8728.00	6779.30	1948.70	
2	Bản Dốc	Cao Bằng	566.00	494.00	72.00	
3	Căn cứ Đồng Rùm	Tây Ninh	32.00	32.00	0.00	
4	Căn cứ Châu Thành	Tây Ninh	147.00	138.00	9.00	
5	Chàng Riệp	Tây Ninh	9122.00	8088.00	1034.00	
6	Chùa Thầy	Hà Tây	37.13	37.13	0.00	
7	Côn Sơn Kiếp Bạc	Hải Dương	1216.90	1216.90	0.00	
8	Cù Lao Chàm	Quảng Nam	1490.00	596.00	894.00	
9	Đá Bàn	Tuyên Quang	119.60	119.60	0.00	

No.	Name	Location	Area (ha)	Breakdown		
				Forest Land	Bare Land	Sea
3	Vườn Thực Vật Củ Chi	TP. Hồ Chí Minh	39.49	38.63	0.86	
4	Trung tâm nghiên cứu thực nghiệm Cầu Hai	Phú Thọ	700.80	700.80	0.00	
5	TTNC ứng dụng kỹ thuật rừng ngập mặn Minh Hải	Cà Mau	281.00	245.00	36.00	
6	Khu thực nghiệm nghiên cứu TP. Hạ Long	Quảng Ninh	64.00	64.00	0.00	
7	Khu rừng thực nghiệm Đại học LN Hà Tây	Hà Tây	73.00	73.00	0.00	
8	Trạm Thực nghiệm lâm nghiệp Cam Ly	Đà Lạt	348.00	300.00	48.00	
9	Trạm Thực nghiệm lâm nghiệp Lang Hanh	Đà Lạt	105.00	105.00	0.00	
10	Đak Plao	Đắk Nông	3280.00	3200.00	80.00	
11	Đá Chông, Cẩm quỳ, Ba Vì	Hà Tây	215.10	215.10	0.00	
12	Trung tâm KHSX Lâm nghiệp Tây Bắc	Sơn La	152.00	142.00	10.00	
13	Trường Trung cấp LN	Pleiku	723.60	386.90	336.70	
14	Trung tâm LN nhiệt đới Pleiku-Gia Lai	Pleiku	1611.80	1546.70	65.10	
15	Trung tâm ứng dụng KHKT Lâm nghiệp	Hòa Bình	150.00	150.00	0.00	
16	TT ứng dụng KHKT Lâm nghiệp Bắc Trung Bộ	Quảng Trị	879.20	879.20	0.00	
17	TT ứng dụng KHSX LN Đông Nam Bộ	Đồng Nai	326.42	302.90	23.52	
18	TT ứng dụng KHSX LN Bình Dương	Bình Dương	1.10	1.10	0.00	
19	Trung tâm nghiên cứu Lâm Đặc Sản	Quảng Ninh	227.52	200.00	27.52	
20	TT ứng dụng KHSX LN Đông Bắc Bộ	Quảng Ninh	909.80	850.00	59.80	

Attachment11-2 : Map of Protected Forests

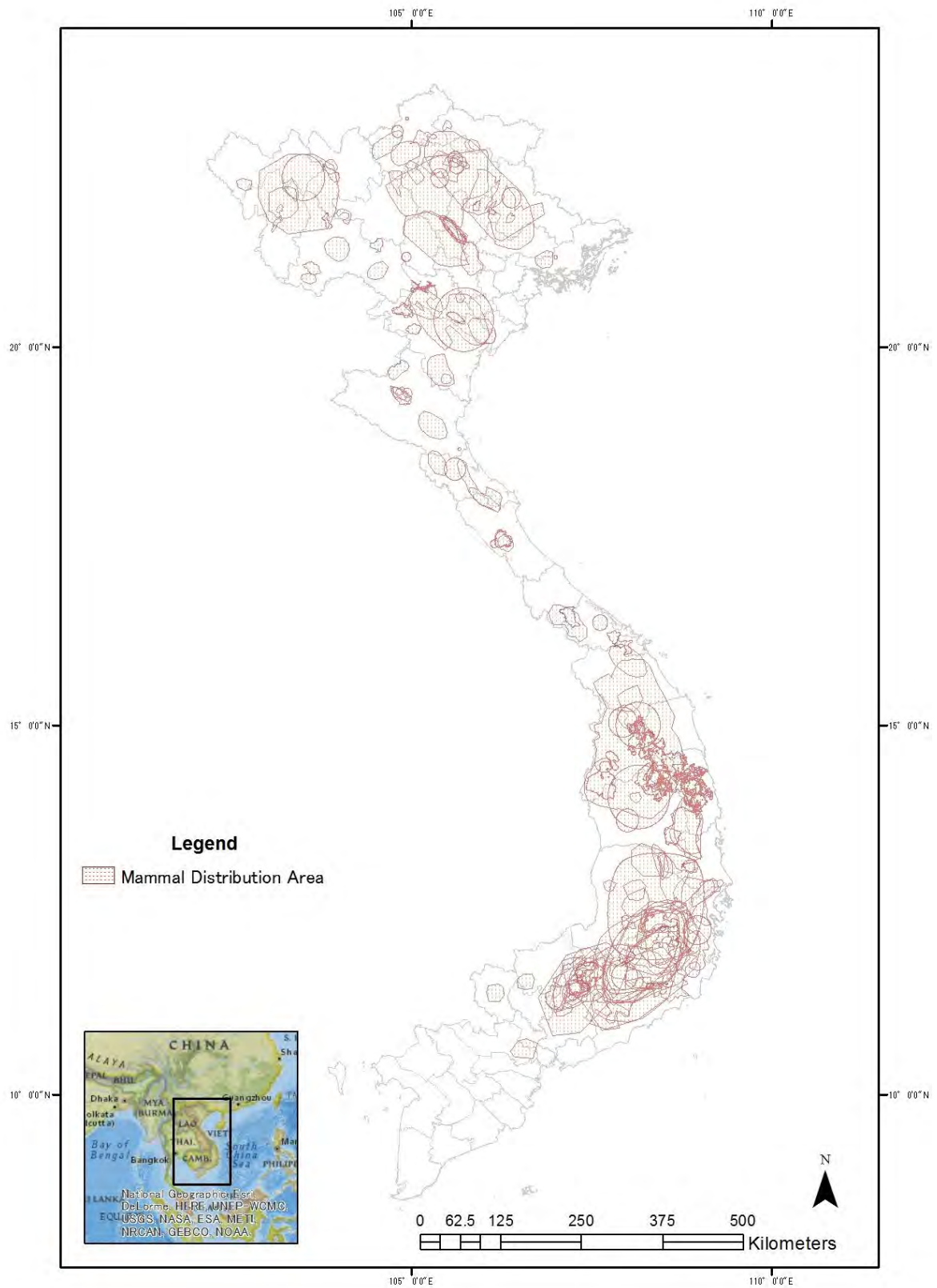


Attachment11-3 : The list of laws related to Forest Protection in Vietnam

- Forest Protection and Development Law No.29/2004/QH11, approved by the National Assembly of Socialist Republic of Vietnam dated 03/12/2004 and having effect from 01/04/2005
- Decree No. 23/2006/QĐ-CP dated 03/03/2006 by the Government on implementation of law on forest protection and development
- Decree 09/2006/NĐ-CP dated 16/01/2006 by the Government on regulations of fire prevention and fire-fighting of forest
- Biodiversity Law No.20/2008/QH12 approved by the National Assembly of Socialist Republic of Vietnam dated 13/11/2008
- Decree No.65/2010/NĐ-CP dated 11/06/2010 by the Government on Detailing and guiding the implementation of biodiversity-law having effect from 30/07/2010
- Decree No.32/2006/NĐ-CP dated 30/03/2006 by the Government on management of endangered, endangered animal rare
- Decision No 61/2005/BNN dated 12/10/2005 on Classification of Protective Forest
- Decision No 62/2005/BNN dated 12/10/2005 on Classification of Special Use Forest

Attachment12 :
The IUCN's Distribution Map of Mammals

Attachment12 : The IUCN's Distribution Map of Mammals (Data on the border)



Attachment 13 : Evaluation Sheet of Environmental and Social Considerations

No	Project Name	Province	Env. Approval	EIA Status		Deforestation		Protected Area		Resettlement		Land Acquisition		Archeological site	Indigenous People	Note	Total
				EIA	Point	Area (ha)	Point	Impact	Point	People	Point	Area (sqm)	Point				
HAN-B01	Rehabilitating and upgrading the capacity of the 110kV line, 175,176 Chem - Yen Phu, section from 220kV Chem substation to the outgoing pole of the 220/110kV Chem - Tay Ho line	Tay Ho, Tu Liam	Completing	Under preparation/ yet to be approved	2	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	2,648	1	Absent	Absent		7.5
HAN-B02	New building for the 110kV line, circuit 2 from the 110kV Dong Anh substation to 220/110kV Van Tri substation and reinstating feeder 112 at 110kV Dong Anh substation.	Dong Anh	Signed and approved	EIA not required/ Approved	3	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	2,561	1	Absent	Absent		8.5
HAN-B03	Rehabilitating 110kV overhead line Hadong - Son Tay (173E1.4 to 172E1.7)	Hà Đông, Sơn Tây	Completing	Under preparation/ yet to be approved	2	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	20,497	1	Absent	Absent		7.5
HAN-B04	New building for the 110kV line to supply power for 110kV Mai Lam substation	Gia Lâm	Completing	Under preparation/ yet to be approved	2	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	1,291	1	Absent	Absent		7.5
HAN-B05	Upgrading and rehabilitating 110kV Yen Phu - E1.8 substation into the GIS substation	Tây Hồ	Completing	Under preparation/ yet to be approved	2	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	0	1.5	Absent	Absent		8
HAN-B06	110kV Tu liem substation and 110kV branch	Từ Liêm	Completing	Under preparation/ yet to be approved	2	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	16,325	1	Absent	Absent		7.5
HAN-B07	110kV Minh Khai substation and the branch	Hai Bà Trưng	Completing	Under preparation/ yet to be approved	2	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	15,933	1	Absent	Absent		7.5
HAN-B08	110kV line to supply power to Mò Lao substation	Hà Đông	Completing	Under preparation/ yet to be approved	2	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	288	1	Absent	Absent		7.5

No	Project Name	Province	Env. Approval	EIA Status		Deforestation		Protected Area		Resettlement		Land Acquisition		Archeological site	Indigenous People	Note	Total
				EIA	Point	Area (ha)	Point	Impact	Point	People	Point	Area (sqm)	Point				
HAN-B09	Upgrading capacity for 110kV Linh Dam substation	Linh Đam	Completing	Under preparation/ yet to be approved	2	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	0	1.5	Absent	Absent		8
HAN-B10	Upgrading capacity for 110kV Cau Dien substation	Cau Dien	Completing	Under preparation/ yet to be approved	2	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	0	1.5	Absent	Absent		8
HAN-B11	Upgrading capacity for 110kV Quang Minh substation	Đông Anh	Completing	Under preparation/ yet to be approved	2	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	0	1.5	Absent	Absent		8
HAN-B13	Supplementing transformer T3 - 63 MVA at the 110kV E1.11 Thanh Cong substation	Đông Đa	Completing	Under preparation/ yet to be approved	2	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	0	1.5	Absent	Absent		8
HAN-B15	Building for 110kV substation side at 220kV Sơn Tây Substation	Sơn Tây	Completing	Under preparation/ yet to be approved	2	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	0	1.5	Absent	Absent		8
NPC-B01	110kV Tam Dao substation and TL	Vĩnh Phúc	Dec. 2014	EIA required but not started yet	1	2.5	1	Limited impacts on protected area or endangered species	1	20	1	11,867	1	Absent	Absent	Tam Dao National Park	5
NPC-B02	Improving the transmission capacity of 110kV Vinh Yen - Phu Yen TL	Vĩnh Phúc	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	13,800	1	Absent	Absent		6.5
NPC-B03	110kV Nam Son - Hap Linh substation and branch	Bắc Ninh	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	30	1	12,033	1	Absent	Absent		6
NPC-B04	110kV Que Wo 3 substation and branch	Bắc Ninh	Sep. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	11,400	1	Absent	Absent		6.5
NPC-B05	110kV Quang Chau substation and branch	Bắc Giang	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area	1.5	0	1.5	8,133	1	Absent	Absent		6.5

No	Project Name	Province	Env. Approval	EIA Status		Deforestation		Protected Area		Resettlement		Land Acquisition		Archeological site	Indigenous People	Note	Total
				EIA	Point	Area (ha)	Point	Impact	Point	People	Point	Area (sqm)	Point				
									and endangered species								
NPC-B06	110kV TL of Thái Bình - Thái Thụy Thermo-Electric Factory	Thái Bình	Sep. 2014	EIA required but not started yet	1	0	0.5	Considerable impacts on protected area or endangered species	0.5	0	1.5	9,000	1	Absent	Absent	Red River Delta (UNESCO-MAB Biosphere Reserve)	4.5
NPC-B07	110kV TL of Thái Bình - Tiền Hải Thermo-Electric Factory	Thái Bình	Sep. 2014	EIA required but not started yet	1	0	0.5	Considerable impacts on protected area or endangered species	0.5	0	1.5	10,200	1	Absent	Absent	Red River Delta (UNESCO-MAB Biosphere Reserve)	4.5
NPC-B08	110kV Tĩnh Gia 2 Substation and TL	Thanh Hóa	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	20	1	22,833	1	Absent	Absent		6
NPC-B09	110kV Tây Thanh Pho Substation and TL	Thanh Hóa	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	25	1	19,967	1	Absent	Absent		6
NPC-B10	110kV Cam Thụy substation and TL	Thanh Hóa	Dec. 2014	EIA required but not started yet	1	4.5	1.0	No passage through protected area and endangered species	1.5	0	1.5	13,700	1	Absent	Absent		6
NPC-B11	110kV Tân Quang substation and TL	Hung Yên	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	15	1	14,300	1	Absent	Absent		6
NPC-B12	Installation of T2 transformer at 110kV S/s, Hung Yên city	Hung Yên	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	0	1.5	Absent	Absent		7
NPC-B13	Upgrading the capacity of T1 Phó Cao transformer	Hung Yên	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	0	1.5	Absent	Absent		7
NPC-B14	110kV Kim Bang substation and TL	Hà Nam	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered	1.5	30	1	10,933	1	Absent	Absent		6

No	Project Name	Province	Env. Approval	EIA Status		Deforestation		Protected Area		Resettlement		Land Acquisition		Archeological site	Indigenous People	Note	Total
				EIA	Point	Area (ha)	Point	Impact	Point	People	Point	Area (sqm)	Point				
									species								
NPC-B15	110kV Hoa Mac substation and TL	Hà Nam	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	30	1	10,867	1	Absent	Absent		6
NPC-B16	110kV Quán Trữ substation and branch	Hải Phòng	Dec. 2014	EIA required but not started yet	1	0	1	No passage through protected area and endangered species	1.5	5	1	12,000	1	Absent	Absent		5
NPC-B17	Construction of the second circuit of 110kV TL to 110kV Nghĩa An- Hải Dương substation	Hải Dương	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	7,200	1	Absent	Absent		6.5
NPC-B18	Construction of the second circuit of 110kV Tien Trung- Lai Khe double circuit TL	Hải Dương	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	3,840	1	Absent	Absent		6.5
NPC-B19	Installation of T2 transformer at 110kV Ninh Binh substation	Ninh Binh	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	0	1.5	Absent	Absent		7
NPC-B20	Installation of T2 transformer at 110kV Ninh Phúc industrial zone substation	Ninh Binh	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	0	1.5	Absent	Absent		7
NPC-B21	110kV Yen Mo substation and TL	Ninh Binh	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	20	1	14,760	1	Absent	Absent		6
NPC-B22	110kV Luu Kiem substation and TL	Hải Phòng	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	16,700	1	Absent	Absent		6.5
NPC-B23	110kV Phuc Son substation and TL	Ninh Binh	Dec. 2014	EIA required but not started yet	1	1	1.5	No passage through protected area and endangered species	1.5	20	1	6,400	1	Absent	Absent		6

No	Project Name	Province	Env. Approval	EIA Status		Deforestation		Protected Area		Resettlement		Land Acquisition		Archeological site	Indigenous People	Note	Total
				EIA	Point	Area (ha)	Point	Impact	Point	People	Point	Area (sqm)	Point				
NPC-B24	T2 Tam Diep Industrial Park	Ninh Binh	Dec. 2014	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	0	1.5	Absent	Absent		7
NPC-C01	Thanh Hoa	Thanh Hoa	not required	EIA not required/ Approved	3	0	1	Limited impacts on protected area or endangered species	1	0	1.5	unknown	0	Absent	Absent	Red River Delta (UNESCO MAB Biosphere Reserve)	6.5
NPC-C02	Hung Yen	Hung Yen	not required	EIA not required/ Approved	3	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	unknown	0	Absent	Absent		7.5
NPC-C03	Thai Binh	Thai Binh	not required	EIA not required/ Approved	3	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	unknown	0	Absent	Absent		7.5
NPC-C04	Bac Ninh	Bac Ninh	not required	EIA not required/ Approved	3	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	unknown	0	Absent	Absent		7.5
NPC-C05	Hai Duong	Hai Duong	not required	EIA not required/ Approved	3	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	unknown	0	Absent	Absent		7.5
NPC-C06	Ninh Binh	Ninh Binh	not required	EIA not required/ Approved	3	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	unknown	0	Absent	Absent		7.5
NPC-C07	Thai Nguyen	Thai Nguyen	not required	EIA not required/ Approved	3	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	unknown	0	Absent	Absent		7.5
NPC-C08	Ha Nam	Ha Nam	not required	EIA not required/ Approved	3	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	unknown	0	Absent	Absent		7.5
NPC-C09	Vinh Phuc	Vinh Phuc	not required	EIA not required/ Approved	3	0	0.5	Considerable impacts on	0.5	0	1.5	unknown	0	Absent	Absent	Tam Dao National Park	5.5

No	Project Name	Province	Env. Approval	EIA Status		Deforestation		Protected Area		Resettlement		Land Acquisition		Archeological site	Indigenous People	Note	Total
				EIA	Point	Area (ha)	Point	Impact	Point	People	Point	Area (sqm)	Point				
				Approved				protected area or endangered species									
NPC-C10	Nghe An	Nghe An	not required	EIA required/ Approved	not 3	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	unknown	0	Absent	Absent		7.5
NPC-C11	Quang Ninh	Quang Ninh	not required	EIA required/ Approved	not 3	0	1	Limited impacts on protected area or endangered species	1	0	1.5	unknown	0	Absent	Absent	Bai Chay (Cultural and Historical Site)	6.5
CPC-C01	Upgrading and expansion of distribution power network in Thua Thien Hue Province	Thua Thien Hue	not required	EIA required/ Approved	not 3	0	1	Limited impacts on protected area or endangered species	1	0	1.5	13,491	1	Absent	Absent	"Tam Giang-Cau Hai National Park Hai Van-Hon Tra Marine Protected Area"	7.5
CPC-C02	Upgrading and expansion of distribution power network in Son Tra District - Danang city	Da Nang City	not required	EIA required/ Approved	not 3	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	37,816	1	Absent	Absent		8.5
CPC-C03	Upgrading and expansion of distribution power network in Hoa Vang and Cam Le Districts - Danang city	Da Nang City	not required	EIA required/ Approved	not 3	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	228,300	1	Absent	Absent		8.5
CPC-C04	Upgrading and expansion of distribution power network in Phu Yen	Phu Yen	not required	EIA required/ Approved	not 3	0	1	Limited impacts on protected area or endangered species	1	0	1.5	16,324	1	Absent	Absent	Krong Trai Nature Reserve	7.5
CPC-C05	Upgrading and expansion of distribution power network in Gia Lai	Gia Lai	not required	EIA required/ Approved	not 3	0	1	Limited impacts on protected area or endangered species	1	0	1.5	51,292	1	Absent	Absent	Bac Plei Ku Nature Reserve	7.5
CPC-C06	Upgrading and expansion of distribution power network in Kon Tum	Kon Tum	not required	EIA required/ Approved	not 3	0	1	Limited impacts on protected area or endangered species	1	0	1.5	37,738	1	Absent	Absent	Chu Mom Ray National Park and ASEAN Heritage Park	7.5
CPC-C07	Upgrading and expansion of distribution power network	Dak Lak	not required	EIA required/	not 3	0	1.5	No passage through	1.5	0	1.5	4,660	1	Absent	Exist		8.5

No	Project Name	Province	Env. Approval	EIA Status		Deforestation		Protected Area		Resettlement		Land Acquisition		Archeological site	Indigenous People	Note	Total
				EIA	Point	Area (ha)	Point	Impact	Point	People	Point	Area (sqm)	Point				
	in Daklak			Approved					protected area and endangered species								
HCM-B-1	110kV Hoc Mon 2 substation and connection line	Hoc Mon District	2014/10	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	6,000	1	Absent	Absent		6.5
SFC-A01	Can Duoc 220kV substation and tee-off	Long An	2014/8	Under preparation/ yet to be approved	2	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	27,673	1	Absent	Absent		7.5
SFC-A03	Sa Dec 220kV substation and tee-off	Dong Thap	2014/8	Under preparation/ yet to be approved	2	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	25,997	1	Absent	Absent		7.5
SFC-B01	T1 110kV substation and tee-off (Bau Beo - T1)	Binh Duong	2014/8	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	3,000	1	Absent	Absent		6.5
SFC-B02	An Xuyen - Vinh Thuan 110kV line	Kien Giang Ca Mau	2014/8	EIA required but not started yet	1	0	1	Limited impacts on protected area or endangered species	1	0	1.5	2,912	1	Absent	Absent	Kien Giang UNESCO MAB Biosphere Reserve	5.5
SFC-B03	Ben Luc Industrial zone 110kV substation and tee-off	Long An	2014/8	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	2,912	1	Absent	Absent		6.5
SFC-B04	Cai Mep port 110kV substation and connection line	Long An	2014/8	EIA required but not started yet	1	0	1	Limited impacts on protected area or endangered species	1	0	1.5	7,234	1	Absent	Absent	Can Gio Mangrove UNESCO MAB Biosphere Reserve	5.5
SFC-B05	VSIP 2-MR1 110kV substation and tee-off	Binh Duong	2014/8	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	2,967	1	Absent	Absent		6.5
SFC-B06	Minh Hung Industrial zone 110kV substation and tee-off	Binh Phuoc	2014/8	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered	1.5	0	1.5	4,659	1	Absent	Absent		6.5

No	Project Name	Province	Env. Approval	EIA Status		Deforestation		Protected Area		Resettlement		Land Acquisition		Archeological site	Indigenous People	Note	Total
				EIA	Point	Area (ha)	Point	Impact	Point	People	Point	Area (sqm)	Point				
									species								
SPC-B07	T5 110kV substation and tee-off (Hoa Phu - T5)	Binh Duong	2014/8	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	3,520	1	Absent	Absent		6.5
SPC-B08	Hung Dinh 110kV substation and tee-off		2014/8	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	3,098	1	Absent	Absent		6.5
SPC-B09	Giao Long 110kV substation and Ben Tre - Giao Long 110kV line	Ben Tre	2014/8	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	4,130	1	Absent	Absent		6.5
SPC-B10	Dong Hoa 110kV substation and tee-off	Binh Duong	2014/8	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	3,088	1	Absent	Absent		6.5
SPC-B11	Luong Son - Hoa Thang - Mui Ne 110kV line	Binh Thuan	2014/8	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	3,361	1	Absent	Absent		6.5
SPC-B12	Tan Bien - Chau Thanh (Dop stream) 110kV line	Tay Ninh	2014/8	EIA required but not started yet	1	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	6,547	1	Absent	Absent		6.5
SPC-B13	Thang Hai 110kV substation and tee-off	Binh Thuan	2014/8	EIA required but not started yet	1	0	1	No passage through protected area and endangered species	1.5	0	1.5	3,029	1	Absent	Absent	Binh Chau Phuoc Buu Nature Reserve	6.0
SPC-C01	Improve and develop medium & low voltage grid for rural areas of Long An province	Long An	not required	EIA not required/ Approved	3	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	3,344	1	Absent	Absent		8.5
SPC-C02	Improve and develop medium & low voltage grid for rural areas of Soc Trang province	Soc Trang	not required	EIA not required/ Approved	3	0	1.5	No passage through protected area and endangered species	1.5	0	1.5	21,916	1	Absent	Absent		8.5

Attachment 14: Environmental and Social consideration checklist
(Transmission/Distribution line and Substation)

Attachment 14 : Environmental and Social consideration checklist (Transmission/Distribution line and Substation)

Category	Environmental Item	Main Check Items	Yes: Y No: N	Confirmation of Environmental Considerations (Reasons, Mitigation Measures)
1 Permits and Explanation	(1) EIA and Environmental Permits	(a) Have EIA reports been already prepared in official process? (b) Have EIA reports been approved by authorities of the host country's government? (c) Have EIA reports been unconditionally approved? If conditions are imposed on the approval of EIA reports, are the conditions satisfied? (d) In addition to the above approvals, have other required environmental permits been obtained from the appropriate regulatory authorities of the host country's government?	(a)N (b)N (c)Y (d)N	(a)The project the EIA report is prepared is only one, HAN-E02. 55 sub-projects out of 75 sub-projects required EIA. Among them 38 projects are not started EIA studies. Nine projects (HAN-E01, HAN-E03, HAN-E04, HAN-E06, HAN-E08, HAN-E09, HAN-E10, HAN-E11, and HAN-E13) has prepared IEE. But all of the description is too general and lack detail or specifics. (b)One EIA report has been approved by authorities of the Vietnamese government. (c)Some conditions are imposed. The conditions are requesting to follow the national pollution standard and restrictions of air, noise, vibration, and water quality. They are considered to be satisfied if the project owners follow the standards. (d)Compensation agreements of land and properties should be taken by local government but any sub-projects have got the agreements yet.
	(2) Explanation to the Local Stakeholders	(a) Have contents of the project and the potential impacts been adequately explained to the local stakeholders based on appropriate procedures, including information disclosure? Is understanding obtained from the local stakeholders? (b) Have the comment from the stakeholders (such as local resident) been reflected to the project design?	(a)N (b)N	(a)No stakeholder meetings are held. They will be held during procedures of negotiation of compensation. (b)No comment from the affected people is referred for project planning. There is no chance for the people to address about the plan, because the plan is approved before meeting with stakeholders.
	(3) Examination of Alternatives	(a) Have alternative plans of the project been examined with social and environmental considerations?	(a)Y	(a)Transmission line route was changed to avoid the impact on protected landscape area in HAN-E02. The other locations of transmission lines and substations are also carefully selected to avoid impact on houses.
2 Pollution Control	(1) Water Quality	(a) Is there any possibility that soil runoff from the bare lands resulting from earthmoving activities, such as cutting and filling will cause water quality degradation in downstream water area? If the water quality degradation is anticipated, are adequate measures considered?	(a)N	(a)The ten projects which has EIAMEE has mitigations for water quality. Similar mitigation will be planned for the other projects which required EIA.
3 Natural Environment	(1) Protected Areas	(a) Is the project site located in protected areas designated by the country's laws or international treaties and conventions? Is there a possibility that the project will affect the protected areas?	(a)Y	(a)15 sub-projects (NPC-C09, NPC-E06, NPC-E07, NPC-C01, NPC-C11, CPC-C01, CPC-C04, CPC-C05, CPC-C06, NPC-E01, NPC-E16, SPC-E02, SPC-E04) out of 75 sub-projects are located in the protected area. Especially three sub-projects, NPC-C09, NPC-E06, and NPC-E07, might affect protected areas because they cover a lot on protected area.
	(2) Ecosystem	(a) Does the project site encompass primeval forests, tropical rain forests, ecologically valuable habitats (e.g., coral reefs, mangroves, or tidal flats)? (b) Does the project site encompass the protected habitats of endangered species designated by the country's laws or international treaties and convention? (c) If significant ecological impacts are anticipated, are adequate protection measures taken to reduce the impacts on the ecosystem? (d) Are adequate measures taken to prevent disruption of migration routes and habitat fragmentation of wildlife and livestock? (e) Is there any possibility that the project will cause the negative impacts, such as destruction of forest, poaching, desertification, reduction in wetland areas, and disturbance of ecosystem due to introduction of exotic (non-native invasive) species and pests? Are adequate measures for preventing such impacts considered? (f) In cases where the project site is located in undeveloped areas, is there any possibility that the new development will result in extensive loss of natural environments?	(a)Y (b)Y (c)N (d)N (e)Y (f)Y	(a)12 sub-projects go through the ecologically valuable habitats. (b)5 sub-projects (NPC-E06, NPC-E07, NPC-C01, SPC-E02, SPC-E04) go through the UNESCO-MAB Biosphere Reserves and 6 sub-projects (NPC-C09, CPC-C01, CPC-C04, CPC-C05, CPC-C06, NPC-E01) go through National Park. (c)Significant ecological impacts are not anticipated, because the sizes of the sub-projects are not so big. Any protection measures are not taken. (d)TMI route of HAN-E02 was changed to avoid fragmentation of the green area. There is not mitigation measures are taken to avoid fragmentation. (e)There is no risk that the project will cause poaching. The possibility of reduction in wetland and exotic species are worried at SPC-E04. There is no mitigation measures are planned but some mitigations might be examined at EIA. (f)Some distribution sub-projects such as NPC-C09, NPC-C01, NPC-C11, CPC-C01, CPC-C04, CPC-C05, CPC-C06 might accelerate the development around the distribution lines and indirect impact might affect the protected area, even if the direct impacts are not so serious.
	(3) Topography and Geology	(a) Is there any soft ground on the route of power transmission and distribution lines that may cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides, where needed? (b) Is there any possibility that civil works, such as cutting and filling will cause slope failures or landslides? Are adequate measures considered to prevent slope failures or landslides? (c) Is there a possibility that soil runoff will result from cut and fill areas, waste soil disposal sites, and borrow sites? Are adequate measures taken to prevent soil runoff?	(a)Y (b)Y (c)Y	(a)The impacts on soil erosion are mentioned for 10 sub-projects which has done EIAMEE. Most of the sub-projects are located in flat area. Then the risk of land slide and slope failures is not so high. Some sub-projects of NPC and CPC covers steep area. But it is a bit difficult to evaluate the risk by collected information. (b)Massive earth fill and cut earth will not be happen by most of the sub-projects because of they are located on flat land. Some projects are located at steep area but the land slide and slope failure risk is not evaluated because of insufficient information. (c)Most of the sub-projects are located in the flat area. Then soil runoff will not be serious anxiety. Some sub-projects might locate in the steep areas, but some mitigation measures will be examined in the next stage.

	(1) Resettlement	<p>(a) Is involuntary resettlement caused by project implementation? If involuntary resettlement is caused, are efforts made to minimize the impacts caused by the resettlement?</p> <p>(b) Is adequate explanation on compensation and resettlement assistance given to affected people prior to resettlement?</p> <p>(c) Is the resettlement plan, including compensation with full replacement costs, restoration of livelihoods and living standards developed based on socioeconomic studies on resettlement?</p> <p>(d) Are the compensations going to be paid prior to the resettlement?</p> <p>(e) Are the compensation policies prepared in document?</p> <p>(f) Does the resettlement plan pay particular attention to vulnerable groups or people, including women, children, the elderly, people below the poverty line, ethnic minorities, and indigenous peoples?</p> <p>(g) Are agreements with the affected people obtained prior to resettlement?</p> <p>(h) Is the organizational framework established to properly implement resettlement? Are the capacity and budget secured to implement the plan?</p> <p>(i) Are any plans developed to monitor the impacts of resettlement?</p> <p>(j) Is the grievance redress mechanism established?</p>	<p>(a)Y (b)Y (c)Y (d)Y (e)Y (f)Y (g)Y (h)Y (i)Y (j)Y</p> <p>(a)Involuntary resettlement of 20 to 30 persons per project will be caused by some sub projects (NPC-E01, NPC-E03, NPC-E08, NPC-E09, NPC-E10, NPC-E11, NPC-E14, NPC-E15, NPC-E21, NPC-E25). All the other sub-projects made effort to minimize the impact. Then layouts are carefully designed to avoid residential area. (b)Explanation on compensation and resettlement assistance has not been given so far. But it will be implemented after budget allocation following the Vietnamese Law and Decree (2003). (c)The resettlement plans based on the socioeconomic studies have not been prepared yet. Resettlement Action Plans are prepared for 12 projects (HAN-E01, HAN-E02, HAN-E03, HAN-E04, HAN-E06, HAN-E08, HAN-E09, HAN-E10, HAN-E11, HAN-E13, CPC-C04, CPC-C07). Resettlement plans for all sub-projects will be prepared after budget allocation. (d)According to the Vietnamese law the compensation should be paid prior to the resettlement. (e)Compensation policies are described in the confirmed RAP. The policies will be mentioned in the RAPs prepared later. (f)Vulnerable groups, including women, children, the elderly, and people below poverty line are mentioned in the Compensation Policy and Institutional Arrangement in the submitted RAP for 12 projects. But it is not clear existence of vulnerable groups in the affected people and specific mitigation measures are lacked. Specific mitigation measures will be examined after detail survey for compensation. (g)Agreements with the affected people have not been obtained yet. The affected people will be explained at the detail compensation study and agreement will be got following the formal procedures. (h)Although organizational frameworks are established in the confirmed RAP of 12 sub projects, they are so similar and not specific. But considering the many resettlement experience of EVN, the capacity and budget will be secured. (i)Some projects which are prepared RAP have monitoring plan and budget. But monitoring plan has not been confirmed for the other projects. (j)Some projects which have RAP are established grievance redress mechanism. But the other projects have not been prepared yet.</p>
A-187	(2) Living and Livelihood	<p>(a) Is there a possibility that the project will adversely affect the living conditions of inhabitants? Are adequate measures considered to reduce the impacts, if necessary?</p> <p>(b) Is there a possibility that diseases, including infectious diseases, such as HIV will be brought due to immigration of workers associated with the project? Are adequate considerations given to public health, if necessary?</p> <p>(c) Is there any possibility that installation of structures, such as power line towers will cause a radio interference? If any significant radio interference is anticipated, are adequate measures considered?</p> <p>(d) Are the compensations for transmission wires given in accordance with the domestic law?</p>	<p>(a)Y (b)N (c)Y (d)Y</p> <p>(a)Resettlement will happen for 10 sub-projects and land acquisitions or land use restriction less than 30 ha will be caused by 56 sub-projects. Land acquisition will happen at newly construction of Substations and tower area (10m x 10m for 220 kV suspension tower and 7m x 7m for 110kV suspension tower). Land use restriction means cutting trees over 4m high and buildings more than 4m will not be allowed in the Run of Way of transmission line (22m under 220kV and 15m under 110kV). (b)The constructions are tentative work and relatively small scale. Then the risk of infectious diseases is not so high. EIA/IEE have mentioned the consideration of public health. (c)The risk of radio interference by transmission line and substation is concerned. The mitigation measures for radio interference are mentioned in the EIA/IEE. The similar mitigations will be planned for the other projects. (d)The land compensation in ROW is calculated as a 80% of the land price and buildings and agricultural products are also calculated based on the Vietnamese law. The same measures will be taken for the other projects.</p>
	(3) Heritage	<p>(a) Is there a possibility that the project will damage the local archeological, historical, cultural, and religious heritage? Are adequate measures considered to protect these sites in accordance with the country's laws?</p>	<p>(a)N</p> <p>(a)There is no sub-projects which affect local archeological, historical, cultural, or religious heritage based on the hearing survey.</p>
	(4) Landscape	<p>(a) Is there a possibility that the project will adversely affect the local landscape? Are necessary measures taken?</p>	<p>(a)Y</p> <p>(a)NPC-C11 and NPC-E16 might affect the landscape, because it go through the Cultural and Historical Site. But the extent of the impact is unknown because of lack of EIA study.</p>
	(5) Ethnic Minorities and Indigenous Peoples	<p>(a) Are considerations given to reduce impacts on the culture and lifestyle of ethnic minorities and indigenous peoples?</p> <p>(b) Are all of the rights of ethnic minorities and indigenous peoples in relation to land and resources respected?</p>	<p>(a)Y (b)Y</p> <p>(a)According to the hearing survey, ethnic minorities are confirmed at CPC-C07. Ethnic Minorities Development Plan has already prepared for the project. (b)The rights of ethnic minorities and indigenous peoples will be respected if the Ethnic Minorities Development Plan is really implemented.</p>
	(6) Working Conditions	<p>(a) Is the project proponent not violating any laws and ordinances associated with the working conditions of the country which the project proponent should observe in the project?</p> <p>(b) Are tangible safety considerations in place for individuals involved in the project, such as the installation of safety equipment which prevents industrial accidents, and management of hazardous materials?</p> <p>(c) Are intangible measures being planned and implemented for individuals involved in the project, such as the establishment of a safety and health program, and safety training (including traffic safety and public health) for workers etc.?</p> <p>(d) Are appropriate measures taken to ensure that security guards involved in the project not to violate safety of other individuals involved, or local residents?</p>	<p>(a)Y (b)Y (c)Y (d)Y</p> <p>(a)EIA/IEEs of the 10 sub-projects have a part of work safety conditions based on the law. Similar part will be included in the EIA/IEE of the other 47 sub-projects. (b)Tangible safety considerations to avoid occupational injuries are mentioned in the EIA/IEE for 10 projects. If they are implemented, the safety will be secured. (c)Safety programs are mentioned in the EIA/IEEs of 10 sub-projects. If they are implemented as planned, safety education will be done. (d)Monitoring is mentioned in the EIA/IEE of 10 sub-projects. If they are implemented as planned, violence safety of other individuals involved or local residents by security guards will be treated properly.</p>
	5 Others	(1) Impacts during Construction	<p>(a) Are adequate measures considered to reduce impacts during construction (e.g., noise, vibrations, turbid water, dust, exhaust gases, and wastes)?</p> <p>(b) If construction activities adversely affect the natural environment (ecosystem), are adequate measures considered to reduce impacts?</p>	(a)Y (b)N (c)N (a)Mitigation measures for dust, exhaust gases, noise, waste, and water quality are mentioned in the EIA/IEE for 10 sub-projects. Similar measures will be included for the other sub-projects. (b)The impact on natural environment will not be serious, because most of the sub-projects located on agricultural land except some projects which pass through the protected area.

		(c) If construction activities adversely affect the social environment, are adequate measures considered to reduce impacts?		(c) Social impact will not be serious, because the affected area is not so large and farming and building less than 4m is allowed under the transmission lines.
	(2) Monitoring	(a) Does the proponent develop and implement monitoring program for the environmental items that are considered to have potential impacts? (b) What are the items, methods and frequencies of the monitoring program? (c) Does the proponent establish an adequate monitoring framework (organization, personnel, equipment, and a adequate budget to sustain the monitoring framework)? (d) Are any regulatory requirements pertaining to the monitoring report system identified, such as the format and frequency of reports from the proponent to the regulatory authorities?	(a) Y (b) Y (c) Y (d) Y	(a) Monitoring is planned for 10 sub projects which have EIA/EE. The other 47 sub projects which requires EIA are considered to be prepared similar monitoring plan. (b) The monitoring items, methods, frequencies seem to be adequate. The other 47 sub projects are considered to be prepared similar one. (c) Monitoring cost is not clear for 10 projects which have EIA/EE, even if they have monitoring frameworks. It is recommended to be more specific one before implementation. (d) Submissions of monitoring reports are planned for 10 sub projects which has EIA/EE. The frequency is two times a year during construction and once a year during operation.
6 Note	Reference to Checklist of Other Sectors	(a) Where necessary, pertinent items described in the Road checklist should also be checked (e.g., projects including installation of electric transmission lines and/or electric distribution facilities).	(a)	(a)
	Note on Using Environmental Checklist	(a) If necessary, the impacts to transboundary or global issues should be confirmed, (e.g., the project includes factors that may cause problems, such as transboundary waste treatment, acid rain, destruction of the ozone layer, or global warming).	(a)	(a)

1) Regarding the term "Country's Standard" mentioned in the above table, in the event that environmental standards in the country where the project is located diverge significantly from international standards, appropriate environmental considerations are required to be made.

In cases where local environmental regulations are yet to be established in some areas, considerations should be made based on comparison with appropriate standards of other countries (including Japan's experience).

2) Environmental checklist provides general environmental items to be checked. It may be necessary to add or delete an item taking into account the characteristics of the project and the particular circumstances of the country and locality in which it is located.

Attachment15 : MOIT Approval (VWEM Conceptual Design) [In Vietnamese]

BỘ CÔNG THƯƠNG**CỘNG HOÀ XÃ HỘI CHỦ NGHĨA VIỆT NAM**

Số: 6463/QĐ-BCT

Độc lập - Tự do - Hạnh phúc*Hà Nội, ngày 22 tháng 7 năm 2014***QUYẾT ĐỊNH****Phê duyệt Thiết kế tổng thể Thị trường bán buôn điện
cạnh tranh Việt Nam****BỘ TRƯỞNG BỘ CÔNG THƯƠNG**

Căn cứ Luật Điện lực ngày 03 tháng 12 năm 2004 và Luật sửa đổi bổ sung một số điều của Luật Điện lực ngày 20 tháng 11 năm 2012;

Căn cứ Nghị định số 95/2012/NĐ-CP ngày 12 tháng 11 năm 2012 của Chính phủ quy định chức năng, nhiệm vụ, quyền hạn và cơ cấu tổ chức của Bộ Công Thương;

Căn cứ Quyết định số 63/2013/QĐ-TTg ngày 08 tháng 11 năm 2013 của Thủ tướng Chính phủ quy định về lộ trình, các điều kiện hình thành và cơ cấu ngành điện để hình thành và phát triển các cấp độ thị trường điện lực tại Việt Nam;

Theo đề nghị của Cục trưởng Cục Điều tiết điện lực,

QUYẾT ĐỊNH:

Điều 1. Phê duyệt Thiết kế tổng thể Thị trường bán buôn điện cạnh tranh Việt Nam với các nội dung sau đây:

1. Tên gọi

- a) Tên tiếng Việt: Thị trường bán buôn điện cạnh tranh Việt Nam;
- b) Tên tiếng Anh: Vietnam Wholesale Electricity Market;
- c) Tên viết tắt: VWEM.

2. Đơn vị tham gia Thị trường bán buôn điện cạnh tranh

- a) Bên bán điện
 - Đơn vị phát điện sở hữu các nhà máy điện có công suất đặt lớn hơn 30 MW.
- b) Bên mua điện
 - Tổng công ty Điện lực miền Bắc, Tổng công ty Điện lực miền Trung, Tổng công ty Điện lực miền Nam, Tổng công ty Điện lực Thành phố Hà Nội,

Tổng công ty Điện lực Thành phố Hồ Chí Minh (sau đây viết là các Tổng công ty Điện lực);

- Đơn vị bán buôn điện;
- Khách hàng sử dụng điện lớn đủ điều kiện.

c) Công ty Mua bán điện: là đơn vị mua buôn điện đặc biệt, ký hợp đồng với các đơn vị phát điện theo quy định;

d) Đơn vị cung cấp dịch vụ phục vụ hoạt động của Thị trường bán buôn điện cạnh tranh: là đơn vị cung cấp dịch vụ cho các thành viên tham gia giao dịch trong Thị trường bán buôn điện cạnh tranh trên nguyên tắc đảm bảo tính công bằng, minh bạch và không phân biệt đối xử; độc lập với Bên mua điện và Bên bán điện, bao gồm:

- Đơn vị vận hành hệ thống điện và thị trường điện: hiện nay là Trung tâm Điều độ hệ thống điện Quốc gia;

- Đơn vị cung cấp dịch vụ truyền tải điện: hiện nay là Tổng công ty Truyền tải điện Quốc gia;

- Đơn vị cung cấp dịch vụ phân phối điện: là đơn vị có giấy phép hoạt động điện lực trong lĩnh vực phân phối điện, bao gồm các Tổng công ty điện lực và các đơn vị điện lực có giấy phép hoạt động điện lực trong lĩnh vực phân phối điện;

- Đơn vị thu thập và quản lý số liệu đo đếm điện năng: là đơn vị có chức năng thu thập, quản lý và cung cấp số liệu đo đếm điện năng phục vụ công tác thanh toán trong Thị trường bán buôn điện cạnh tranh.

3. Cơ chế hoạt động của Thị trường bán buôn điện cạnh tranh

Thị trường bán buôn điện cạnh tranh Việt Nam là thị trường toàn phần, điều độ tập trung. Mua bán điện trong thị trường điện thực hiện thông qua thị trường giao ngay và hợp đồng mua bán điện. Các cơ chế vận hành Thị trường bán buôn điện cạnh tranh cụ thể như sau:

a) Cơ chế vận hành của thị trường điện giao ngay

- Đơn vị phát điện chào bán toàn bộ công suất khả dụng lên thị trường giao ngay với giá chào nằm trong dải từ giá sàn đến giá trần;

- Lịch huy động các tổ máy được Đơn vị vận hành hệ thống điện và thị trường điện lập theo nguyên tắc tối thiểu hóa chi phí mua điện cho từng chu kỳ giao dịch căn cứ trên bản chào giá của các tổ máy, dự báo phụ tải hệ thống điện có xét đến các ràng buộc vận hành hệ thống điện;

- Giá thị trường giao ngay được Đơn vị vận hành hệ thống điện và thị trường điện xác định sau ngày vận hành cho từng chu kỳ giao dịch căn cứ trên phụ tải thực tế của hệ thống điện, các bản chào giá và công suất sẵn sàng thực tế của các tổ máy.

b) Cơ chế hợp đồng mua bán điện song phương

Bên bán điện và Bên mua điện trên Thị trường bán buôn điện cạnh tranh có quyền tự do lựa chọn đối tác để thoả thuận ký hợp đồng mua bán điện song phương theo quy định của Bộ Công Thương.

c) Cơ chế cung cấp dịch vụ phụ trợ

- Số lượng dịch vụ phụ trợ cần thiết hàng năm do Đơn vị vận hành hệ thống điện và thị trường điện xác định để đảm bảo an ninh hệ thống điện. Giá các dịch vụ phụ trợ được xác định trên nguyên tắc đảm bảo cho nhà máy điện cung cấp dịch vụ thu hồi đủ chi phí;

- Dịch vụ phụ trợ trong Thị trường bán buôn điện cạnh tranh do đơn vị phát điện cung cấp được huy động và thanh toán theo các quy định của Thị trường bán buôn điện cạnh tranh.

d) Cơ chế thanh toán

- Thanh toán trên thị trường giao ngay: Đơn vị vận hành hệ thống điện và thị trường điện có trách nhiệm tính toán và công bố các khoản thanh toán trong thị trường điện giao ngay cho từng chu kỳ giao dịch và cho toàn bộ chu kỳ thanh toán;

- Thanh toán theo hợp đồng mua bán điện song phương: Bên mua điện thanh toán trực tiếp cho Bên bán điện theo các quy định trong hợp đồng căn cứ trên sản lượng điện hợp đồng, giá hợp đồng và giá thị trường giao ngay theo quy định của Thị trường bán buôn điện cạnh tranh;

- Thanh toán chi phí sử dụng dịch vụ: Đơn vị thành viên tham gia giao dịch trong Thị trường bán buôn điện cạnh tranh có trách nhiệm thanh toán các khoản chi phí sử dụng các dịch vụ truyền tải điện, phân phối điện, vận hành hệ thống điện, vận hành thị trường điện và các dịch vụ khác cho các đơn vị cung cấp dịch vụ theo quy định.

đ) Cơ chế huy động và thanh toán cho đơn vị phát điện gián tiếp giao dịch trong Thị trường điện bán buôn cạnh tranh (các nhà máy điện BOT, các nhà máy điện vận hành theo yêu cầu đặc biệt của Chính phủ, nguồn nhập khẩu điện)

- Huy động nguồn điện theo nguyên tắc tối thiểu hoá chi phí mua điện toàn hệ thống, đồng thời đảm bảo tuân thủ các cam kết hợp đồng và các ràng buộc đặc thù của nguồn điện;

- Thực hiện thanh toán cho các sản lượng điện này theo các quy định trong hợp đồng mua bán điện đã ký kết.

Điều 2. Các giai đoạn thực hiện Thị trường bán buôn điện cạnh tranh

1. Thị trường bán buôn điện cạnh tranh giai đoạn thí điểm được thực hiện theo hai giai đoạn:

a) Giai đoạn I (dự kiến từ năm 2015 đến năm 2017)

- Các Tổng công ty Điện lực thực hiện mua không quá 5% sản lượng điện thực tế theo giá thị trường, phần còn lại theo giá bán điện của Tập đoàn Điện lực Việt Nam bán cho các Tổng công ty Điện lực. Khách hàng sử dụng điện tiếp tục mua điện từ Tổng công ty Điện lực theo biểu giá bán lẻ điện thông nhất toàn quốc;

- Công ty Mua bán điện tiếp tục ký kết hợp đồng mua bán điện với các Đơn vị phát điện mới;

- Cơ chế chào giá, huy động các tổ máy trong giai đoạn I thực hiện tương tự như Thị trường phát điện cạnh tranh.

b) Giai đoạn II (dự kiến từ năm 2017 đến năm 2019)

- Nâng tỷ lệ mua buôn điện qua Thị trường điện bán buôn điện cạnh tranh của Tổng công ty Điện lực để tăng tính cạnh tranh;

- Khách hàng sử dụng điện lớn và Đơn vị bán buôn điện đáp ứng đủ điều kiện do Bộ Công Thương quy định được phép tham gia Thị trường bán buôn điện cạnh tranh và thực hiện ký kết hợp đồng, mua bán, thanh toán theo quy định vận hành Thị trường bán buôn điện cạnh tranh;

- Thực hiện thí điểm tại một số Tổng công ty Điện lực hoặc Công ty Điện lực cơ chế khách hàng sử dụng điện lớn được mua điện với các Tổng công ty Điện lực hoặc Công ty Điện lực khác theo biểu giá trong khung giá do cơ quan nhà nước có thẩm quyền quy định;

- Đơn vị sử dụng lưới điện truyền tải, lưới điện phân phối có trách nhiệm thanh toán chi phí sử dụng lưới điện theo quy định;

- Đơn vị thành viên tham gia giao dịch trong thị trường điện có trách nhiệm thanh toán chi phí sử dụng dịch vụ đo đếm điện năng, chi phí dịch vụ vận hành hệ thống điện và điều hành thị trường điện theo quy định.

2. Thị trường bán buôn điện cạnh tranh giai đoạn hoàn chỉnh (dự kiến từ năm 2019 đến năm 2021)

- Cho phép các khách hàng sử dụng điện lớn và Đơn vị bán buôn điện đủ điều kiện được tham gia Thị trường bán buôn điện cạnh tranh theo quy định.

Điều 3. Tổ chức thực hiện Thị trường bán buôn điện cạnh tranh giai đoạn thí điểm

1. Giao Cục Điều tiết điện lực

a) Chủ trì xây dựng thiết kế chi tiết Thị trường bán buôn điện cạnh tranh trình Bộ trưởng Bộ Công Thương phê duyệt trong năm 2015;

b) Chủ trì xây dựng thông tư quy định vận hành Thị trường bán buôn điện cạnh tranh và các văn bản quy phạm pháp luật liên quan trình Bộ trưởng Bộ Công Thương ban hành đáp ứng yêu cầu, tiến độ vận hành Thị trường bán buôn điện cạnh tranh quy định tại Điều 2 Quyết định này;

c) Chủ trì, phối hợp với các đơn vị trong Bộ Công Thương xây dựng đề án tái cơ cấu ngành điện phục vụ thị trường bán buôn điện cạnh tranh;

d) Chủ trì, phối hợp với Tập đoàn Điện lực Việt Nam tổ chức đào tạo nâng cao năng lực cho các đơn vị tham gia Thị trường bán buôn điện cạnh tranh;

đ) Hướng dẫn, chỉ đạo và đôn đốc các đơn vị tham gia Thị trường bán buôn điện cạnh tranh chuẩn bị các điều kiện cần thiết để vận hành thị trường bán buôn điện, đáp ứng yêu cầu, tiến độ vận hành Thị trường bán buôn điện cạnh tranh quy định tại Điều 2 Quyết định này.

2. Giao Tập đoàn Điện lực Việt Nam

a) Xây dựng đề án đào tạo nâng cao năng lực cho các đơn vị tham gia Thị trường bán buôn điện cạnh tranh trình Bộ Công Thương phê duyệt trong Quý I năm 2015 và chuẩn bị nguồn kinh phí để triển khai thực hiện;

b) Xây dựng đề án phát triển cơ sở hạ tầng công nghệ thông tin phục vụ vận hành và giám sát hoạt động của Thị trường bán buôn điện cạnh tranh trình Bộ Công Thương phê duyệt các nội dung phục vụ giai đoạn I của Thị trường bán buôn điện cạnh tranh thí điểm trong Quý II năm 2015; các nội dung phục vụ Thị trường bán buôn điện cạnh tranh các giai đoạn còn lại trong Quý IV năm 2015;

c) Lập phương án và trình Bộ Công Thương phương án tách bạch về tổ chức và tách bạch hạch toán chi phí của các bộ phận phân phối điện và bán lẻ điện của các Tổng công ty Điện lực trong Quý I năm 2015;

d) Đầu tư, nâng cấp các cơ sở hạ tầng kỹ thuật cần thiết đáp ứng theo yêu cầu vận hành Thị trường bán buôn điện cạnh tranh cho Đơn vị vận hành hệ thống điện và thị trường điện, Công ty Mua bán điện, Đơn vị thu thập và quản lý số liệu đo đếm điện năng và cho giám sát hoạt động thị trường điện của Cục Điều tiết điện lực;

đ) Phối hợp với Cục Điều tiết điện lực, hỗ trợ kinh phí, các nguồn lực cần thiết khác để triển khai xây dựng và thực hiện các nhiệm vụ quy định tại Khoản 1 Điều này.

3. Giao các Đơn vị phát điện, các Tổng công ty Điện lực, Tổng công ty Truyền tải điện Quốc gia, Đơn vị bán buôn điện và các khách hàng sử dụng điện lớn tham gia Thị trường bán buôn điện cạnh tranh:

a) Đầu tư, nâng cấp các trang thiết bị cần thiết phục vụ việc tham gia Thị trường bán buôn điện cạnh tranh theo thiết kế đã được duyệt trong phạm vi quản lý của đơn vị, đảm bảo tương thích với hệ thống cơ sở hạ tầng công nghệ thông tin cho Thị trường bán buôn điện cạnh tranh đã được duyệt;

b) Tham gia các chương trình đào tạo và bố trí nguồn kinh phí cho việc đào tạo nâng cao năng lực cho các đơn vị thành viên đáp ứng yêu cầu tham gia Thị trường bán buôn điện cạnh tranh theo đúng tiến độ.

Điều 4. Quyết định này có hiệu lực kể từ ngày ký.

Điều 5. Cục trưởng Cục Điều tiết điện lực, Chánh văn phòng Bộ, Chánh thanh tra Bộ, các Vụ trưởng, Tổng Cục trưởng, Cục trưởng có liên quan thuộc Bộ, Tổng giám đốc Tập đoàn Điện lực Việt Nam, các đơn vị điện lực và các tổ chức, cá nhân có liên quan chịu trách nhiệm thi hành Quyết định này./.

Nơi nhận:

- Thủ tướng CP (để b/c);
- PTTg Hoàng Trung Hải (để b/c);
- Bộ trưởng (để b/c);
- Thứ trưởng Cao Quốc Hưng;
- Như Điều 5;
- Lưu: VT, ĐTĐL.

**KT. BỘ TRƯỞNG
THỨ TRƯỞNG**



Lê Dương Quang
Lê Dương Quang

Attachment 16 : ERAV Action Plan

Attachment 16 : ERAV Action Plan

No.	Activities	Period	Implementa tion
I	Development of detail design of wholesale electricity market (2014 -2015)		
I.1	Finalization and issuance of the conceptual design of the WCM	03 months	ERAV
I.2	Development of detail design of wholesale electricity market	15 months	ERAV
I.3	Development of the conceptual design of the IT system for WCM operation	09 months	ERAV
II	Development of legal framework for the WCM (2015-2016)		
II.1	Reviewing and preparing the list of legal documents required by the WCM	04 months	ERAV
II.2	Developing the WCM operation rules	13 months	ERAV
II.3	Developing the mechanism of CfD contract in the WCM	12 months	ERAV
II.4	Developing regulations of IT system for the WCM	12 months	ERAV
II.5	Setting technical - economic criteria for the WCM's participants	12 months	ERAV
II.6	Developing the WCM metering code for the WCM	12 months	ERAV
II.7	Developing regulations of contracting relationship between EPTC and indirect trading generators (SMHP, import...)	12 months	ERAV
II.8	Developing regulations of contracting relationship between EPTC and power companies (wholesaler)	12 months	ERAV
II.9	Developing regulation of providing transmission service in the WCM	12 months	ERAV
II.10	Developing regulation of providing distribution services in the WCM	12 months	ERAV
II.11	Revising regulations of retail tariff methodology and cost pass-through mechanism for the WCM	12 months	ERAV
II.12	Developing the cross-subsidy arrangement among power companies	12 months	ERAV
II.13	Developing other regulation (market monitoring, ancillary services, integration of renewable sources, dispute settlement, etc...)	12 months	ERAV

No.	Activities	Period	Implementa
III	Other preparations (2015 – 2016)	12 months	ERAV
III.1	Developing methodology and action plan for transfer the existing CfD contract (held by Single Buyer) in the VCGM to the WCM	12 months	ERAV
III.2	Developing IT system for the WCM operation	12 months	Market Participant s
III.3	Capacity building for the System Market Operator	18 months	ERAV
III.4	Capacity building for the SEPTC, power company		Market Participant s
III.5	Basic and advance training on the WCM for the market participants	18 months	ERAV
III.6	Assessing the readiness for the WCM, monitoring the WCM operation	12 months	ERAV

Attachment 17 : Prior Actions for DPO1 and DPO2

Attachment 17 : Prior Actions for DPO1 and DPO2

DPO1 (USD 312 million, Board Approved on April 6, 2010)
Prior Action 1: VCGM Establishing of design principles for the implementation of the VCGM (MoIT Decision 6713/QD-BCT of December 31, 2009)
Prior Action 2: Establishing metering systems standards and procedures for generation plants participating in the VCGM. (MoIT Circular 27/2009/TT-BCT of September 25, 2009)
Prior Action 3: Establishing a sector structure to allow for the introduction of the VCGM. (OoG Notice No. 232/TBVPCP of July 31, 2009)
Prior Action 4: (a): increasing the average tariff in 2009 to VND 948/kWh, and (b): implementing transparent annual tariff-setting from 2010-12 based on cost recovery principles, including the unbundling of the average retail tariff into power supply cost components and the delegation of tariff changes of less than five percent to the MoIT. (PM Decision 21/2009/QD-TTg of February 12, 2009).
Prior Action 5: Restructuring the residential block tariff system to establish the principle of the subsidy to the consumer as a percentage of production cost and extend the subsidy mechanism and residential tariff structure to local distribution utilities. (PM Decision No. 21/2009/QD-TTg of February 12, 2009).
Prior Action 6: Establishing energy efficiency standards for consumer goods accounting for large quantities of electricity. (Done, MoST Decision 2740/QD-BKHCHN, December 9, 2008 and Decision 632/QDBKHCHN, April 20, 2009).
Prior Action 7: Introducing time-of-use tariffs for industrial zones and commercial, industrial, and irrigation consumer categories. (Done, MoIT Circular 05/2009/TT-BCT, February 26, 2009).

DPO2 (USD 200 million, Board Approved on March 22, 2012)
Prior Action 1: Establishing market rules for the VCGM, instructing EVN to draft market procedures, and delegating authority for ERAV to review and approve market procedures. Done (MoIT Circular, 18/2010/TT-BCT of May 10, 2010)
Prior Action 2: Establishing methodologies and procedures to determine and approve standard contracts and pricing for generation, except for BOT and Strategic Multi Purpose Hydro (SMHP) Done (MoIT Circular 41/2010/TTBCT of December 14, 2010)
Prior Action 3: Establishing methodology for cost recovery revenue requirement of SMHPs. Done (MoIT Circular 46/2011/TTBCT of December 30, 2011)
Prior Action 4: Deciding to create Generation Companies (Gencos) with portfolio of EVN power plants, excluding SMHP, to later become independent successor companies with no cross ownership with transmission or Single Buyer (SB). Done (OoG Notice No. 77/TB-VPCP of April 5, 2011) (MoIT Letter 350/TTr-BCT of November 15, 2011) (PM Letter 138 /TTgĐMDN of February 3, 2012)
Prior Action 5: Establishing market based mechanism to adjust average electricity tariff, including annual update and adjustments during the year to reflect changes in generation costs. Done. (PM Decision 24/2011/QD-TTg, April 15, 2011) (MoIT Circular 31/2011/TTBCT of August 19, 2011)
Prior Action 6: Establishing methodologies to determine and approve transmission revenue requirement for NPT, and transmission charges. Done. (MoIT Circular, 14/2010/TTBCT of April 15, 2010) (MoIT Circular 03/2012/TT-BCT of January 19, 2012, amending and complementing Circular 14)
Prior Action 7: Establishing load research regulations for PCs. (Done, MoIT Circular 33/2011/TTBCT of September 6, 2011)

Attachment 18 : World Bank TA List

No.	Title	Status	Year	Budget (USD '000)	Consultant's Name
1	Y TA on improving EVN's financial performance	Pipeline			
2	Y TA on and advising the GoV on a divestiture strategy for the Genco's	Pipeline			
3	Y Enhance load research activities and monitoring changes in demand consumption	On-going	2015	300	
4	Y Enhancing technical codes efficiency, incorporating smart grids and integration of renewable energy generation	On-going	2015	500	
5	Y Surveys and disseminations of demand response and energy efficiency	On-going	2015	250	
6	Y Improving the efficiency of time of use (TOU) tariffs	On-going	2015	350	
7	Y Informing large customers and workshops on electricity tariffs	On-going	2015	250	
8	Y Final demand response programs for PCs	On-going	2015	250	
9	Y Implementing smart grid program	On-going	2015	300	
10	Y Improving efficiency of the retail electricity tariff structure	On-going	2015	500	
11	Y Harmonizing electricity tariffs with implementation of demand response programs	On-going	2015	250	
12	Y Enhancing efficiency and performance of PCs	On-going	2015	500	
13	Monitoring and Evaluation of project and GHG reduction	On-going	2015	300	
14	Y Pilot demand response programs	On-going	2014	500	DIAMOND ENERGY SERVICES PTE LTD
15	Y Tariff advisor	On-going	2014	350	
16	Y Nldc Component: Package 3 - Int'l Consultant For Training Program On System And Market Operator In Skorea	Completed	2012	50	Ind
17	Y Erav: Organization Of Training Courses On Electricity Pricing	Completed	2012	70	Ind
18	Y Nldc Component: Package 2 - Int'l Consultant For Training On System And Market Operator In New Zealand And Vietnam	Completed	2012	70	Ind
19	Y Erav Ta Component - Package Basic And Advanced Training Courses On Power Market	Completed	2012	56	Ind
20	Y Nldc Component: Package 4 - Int'l Consultant For Training Program On Water Value Calculation And Hydro Power Plant	Completed	2012	53	Ind
21	Y Nldc Component: Package 1 - Int'l Consultant For Training On System And Market Operator In Singapore And Vietnam	Completed	2012	71	Ind
22	Y Erav: Consulting Service For Review Of Retail Tariff Structure And Subsidized Tariff	Completed	2012	134	Ind
23	Y Erav: Review Of Taxation Regime For Erav's Ta Component	Completed	2012	8	Ind
24	Y Erav - Package: Tariff Resident Advisor	Completed	2012	99	Ind
25	Y Erav: Support Erav In Development And Implementation Of Smart Grid Program In Vietnam	Completed	2012	142	Ind
26	Y Erav - Development Of The Conceptual Design For The Wholesale Electricity Competitive Market In Vietnam	Completed	2012	184	EASTER BAY CONSULTANTS LTD.
27	Y Erav: Development And Implementation Of Demand Side Response Regulation	Completed	2012	143	FUTURA CONSULTING
28	Y Nldc Component: Market Management System Technical Requirements Development For Vcgm	Completed	2012	74	Ind
29	Y Erav - Overall Review Of Tariff Regulation Extension Package (amendment)	Completed	2012	156	Ind
30	Y Nldc Component: Developing Ancillary Services Procedures For Vcgm	Completed	2011	92	Ind
31	Y Erav - Package Ta To Support Erav In Monitoring Operations Of Pilot And Full Vcgm	Completed	2011	433	INTELLIGENT ENERGY SYSTEMS
32	Y Nldc Component: Design A Training Program For The System And Market Operator In Vietnam	Completed	2011	57	Ind
33	Y Erav - Ta Package For Support Erav In Implementation Of Load Research Regulation	Completed	2011	152	Ind
34	Y Ta Package To Support Erav In Implementation Of Technical Codes (grid Code And Distribution Code)	Completed	2011	362	INDRA
35	Y Erav - Ta Package: Review And Finalize Regulations And Detailed Procedure For Distribution Charges Calculation	Completed	2011	120	Ind
36	Preparation Of Dam Safety Plans For Sung Wui Shp And Guidelines For Preparation Of Dam Safety Plans	Completed	2010	125	DAMWATCH SERVICE LTD.
37	Y Package 1: Int'l Consultant For Review Of Avoided Cost Tariff Mechanism	Completed	2010	78	Ind
38	Moit Wind Atlas Update For Vietnam	Completed	2010	270	AWS TRUEWIND
39	Y Moit Preparation Of Environment Guidelines For Small Hydroelectric Projects In Vietnam	Completed	2010	58	BOFFA MISKELL

No.	Title	Status	Year	Budget (USD '000)	Consultant's Name
40	Y Erav - Package 2 - Assessment Of The Avoided Cost Tariff Impact On The Retail Tariff	Completed	2010	86	Ind
41	Y Support Erav In Development Of Market Operation Procedures For Vcgm	Completed	2010	109	Ind
42	Y Support Erav In Review Of It System Design For Vcgm And Development Of Erav Monitoring It System	Completed	2010	110	Ind
43	Y Overall Review Of Tariff Regulation	Completed	2010	99	Ind
44	Y Erav - Package Generation Price Benchmarking	Completed	2009	56	Ind
45	Y Erav - Advisor For Implementation Of Annual Market Adjustment Mechanims To Electricity Tariffs	Completed	2009	59	Ind
46	Y Moit - Package: Preparation Of Load Research Procedure And Regulation	Completed	2009	112	Ind
47	Y Erav: Development Of The System & Market Operator For Competitive Generation Power Market	Completed	2009	120	Ind
48	Y Adviser To MOIT For Economic, Financial And Regulatory Aspects Of Renewable Energy Small Power Producer (respp)	Completed	2009	97	Ind
49	Y Evaluation Of Commercial Energy Efficiency Pilot Program (ceep)	Completed	2008	237	BURGEAP
50	Carbon Finance For Renewable Energy Strategy & Master Plan	Completed	2008	58	Ind
51	Y Erav: Dev. Of Communication Strategy, Public & Customer Relation Function	Completed	2008	96	Ind
52	Y Development Of Distribution Code For Vietnam Power Competitive Market	Completed	2008	98	Ind
53	Y Prep. Of Market Rules For Generation Competitive Power Market	Completed	2008	354	PARSONS BRINCKERHOFF PTE LTD
54	Y Distribution Companies Tariff Calculation	Completed	2008	676	SOLUZIONEA
55	Y Standard Ppa & Dispute Settlement & Enforcement Procedure Regulation For Single Buyer Model Market	Completed	2007	0	DUANE MORRIS LLP
56	Y Transmission Charges Methodology Development	Completed	2007	108	Ind
57	Y Development Of Grid Code For Generation Competitive Market	Completed	2007	102	Ind
58	Y Erav - Consultant Service Package - Development Of Metering Code For Generation Competitive Market	Completed	2007	92	Ind
59	Y Erav: Dev. of Detailed Subsidy & Fund Mechanism Prep.	Completed	2007	80	Ind
60	Y Erav: Development Of Tariff Setting Methodology & Subsidy Principle Development	Completed	2007	95	Ind
61	Wind Resource Assessment At Selected Sites	Completed	2007	560	GPCO INC./AUS
62	International Banking & Finance Consultant	Completed	2007	141	Ind
63	Consultant Service For Assistance To MOI For Preparation Of A Renewable Energy Small Power Producer Program	Completed	2007	172	Ind
64	Y Consultancy Package Of Preparation Of Non-negotiable Standardized Power Purchase Agreement For Renewable Energy Small Power Producers	Completed	2007	146	Ind
65	Y Consultant Services Package Development Of Avoided Cost Calculation Methodolog For Renewable Energy Small Power Producers	Completed	2006	150	Ind
66	Y Advisory Assistance & Dev. Of Implementation Program For Power Sector Equitization In Vn	Completed	2005	499	KPMG LIMITED
67	Y Restructuring Power Transmission Business Of Electricity Of Vietnam	Completed	2005	140	ECONOMIC CONSULTING ASSOCIATES CH
68	Y Consultant Service For Supervision Of Fmis/mmis Implementation	Completed	2005	808	P.A CONSULTING, NEW ZEALAND
69	Y Fs, Budgetary Cost Estimates & Conceptual Design Of Mms For Nlde	Completed	2005	110	Ind
70	Preparation Of Fs, Design, Bidding Docs For Four Small-scale Hydro Proj And Rehab Plan On On-job Training & O&m Business Plans	Completed	2005	153	ENTEC AG
71	Preparation Of Feasibility Study For Wind Power On Phu Quoc Island	Completed	2005	350	LAHMEYER INTERNATIONAL GMBH
72	Y Economic, Financial Analysis & Financing Support For Grid Connected Renewables Projects	Completed	2005	70	Ind
73	Y Technical Assistance For Eun's Phase 2 Dsm Program	Completed	2004	601	DANSK ENERGI MANAGEMENT A/S
74	Screening, Risk Assessment, & Economic & Financial Analysis Of Small Hydro Projects In Vn	Completed	2004	82	Ind
75	Renewable Energy Small Power Producer Program Planning & Preparation	Completed	2004	80	Ind
76	International Consul. Service For Wind Measurement On Phu Quoc Island, Kien Giang	Completed	2003	51	DECON DEUTSCHE ENERGIE-CONSULT
77	Design Of Remote Area Renewable Electricity Fund	Completed	2001	95	MR. WOLFGANG MOSTERT

No.	Title	Status	Year	Budget (USD '000)	Consultant's Name
78	Community Support Program & Feasibility Study For Rare Fund	Completed	2001	105	MERITEC
79	Y Improving Management System	Completed	2000	219	ELECTRICITY SUPPLY BOARD INT'L (ESBI)
80	Y Power System Analysis & Optimization	Completed	2000	0	BCEOM-FRENCH ENGINEERING

Attachment 19 : ADB TA List

	TA No.	Title	Status	Year (approved)	Budget (USD '000)	Consultant's Name
1	Y 46391-002	Ha Noi and Ho Chi Minh City Power Grid Development Sector Project	On-going	41770	700	
2	46237-001	Developing the Market Readiness Proposal for a Domestic Carbon Market	On-going	41354		
3	Y 42039-032	Electricity Transmission Pricing Review in the Context of Power Sector Restructuring	On-going	41254	800	
4	45108-001	Implementation and Monitoring of Song Bung 4 Hydropower Project Resettlement and Ethnic Minority Development Plan	Completed	40908	725	
5	41436-012	Energy Efficiency in the Industry Project	Completed	40879	800	
6	Y 43100-012	Support for the National Target Program on Climate Change with a Focus on Energy and Transport	On-going	40574		
7	Y 42039-012	Power Transmission Investment Program (MFF)	On-going	40515	1500	
8	Y 44004-012	Increasing the Efficiency of the National Power Transmission Corporation through Targeted Capacity Building	Completed	40494	600	
9	Y 42497-012	Capacity Building of the National Power Transmission Corporation in a Competitive Power Market Environment	Completed	39804	225	
10	Y 41077-012	Supporting Implementation of the National Energy Efficiency Program	Completed	39428		
11	41120-012	Vinh Tan 3 Thermal Power Generation Project	Completed	39419		
12	40208-012	Capacity Building on Environmental Management to Power Sector	Completed	39335		
13	41008-012	Preparing the Support for the Public-Private Development of the O Mon Gas Pipeline Project	Completed	39160	975	
14	40081-012	Support for Public-Private Development of the O Mon Thermal Power Complex Project	Completed	38989	2700	
15	Y 34352-012	Power Market Design TA	Completed	38777	500	KEMA
16	39536-012	Capacity Building in Strategic Environmental Assessment of Hydropower Sector	Completed	38695		
17	39537-012	Environmental Management Plan Improvement and Implementation and Downstream Impacts Management for Son La Hydro Power Project	Completed	38688		
18	39595-012	Mong Duong Thermal Power Generation Project	Completed	38687		
19	39387-012	Strengthening Institutional Capacity of Local Stakeholders for Implementation of Son La Livelihood and Resettlement Plan	Completed	38670		
20	39379-012	Developing Benefit Sharing Mechanisms for People Adversely Affected by Power Generation Projects	Completed	38670		
21	36352-012	Phase II of PPTA: Song Bung 4 Hydropower Project	Completed	38566	975	
22	36352-022	Phase I of the PPPTA: Song Bung 4 Hydropower Project	Completed	38334		
23	38196-012	Northern Power Transmission Expansion Project	Completed	38331	500	
24	32273-012	Northern Power Transmission Project	Completed	37608	700	
25	Y 34343-012	Roadmap for Power Sector Reform	Completed	37201	500	