ADB

Concept Paper

Project Number: 49175
July 2016

Proposed Loan
Viet Nam: Distribution Grid Development Sector Project for Viet Nam Power Corporations

Asian Development Bank

CURRENCY EQUIVALENTS
(as of 1 July 2016)

Currency unit	–	dong (D)
D1.00	=	$0.000045
$1.00	=	D22,304

ABBREVIATIONS

ADB	–	Asian Development Bank
EVN	–	Vietnam Electricity
GDP	–	gross domestic product
GW	–	gigawatt
kV	–	kilovolt
kWh	–	kilowatt-hour
PC	–	power corporation
PDP	–	Power Development Plan
PPTA	–	project preparatory technical assistance
TWh	–	terawatt-hour

NOTE

(i) In this report, "$" refers to US dollars

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PROJECT AT A GLANCE

1. Basic Data — **Project Number:** 49175-003

Project Name	Distribution Grid Development Sector Project for Viet Nam Power Corporations	**Department /Division**	SERD/SEEN
Country	Viet Nam, Socialist Republic of		
Borrower	Viet Nam, Socialist Republic of	**Executing Agency**	Central Power Corporation (Power Company 3), Hanoi Power Corporation, Northern Power Corporation (Power Company 1), Southern Power Corporation (Power Company 2)

2. Sector

	Subsector(s)	ADB Financing ($ million)
✓ **Energy**	Electricity transmission and distribution	335.00
	Total	**335.00**

3. Strategic Agenda

	Subcomponents
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded

Climate Change Information

Climate Change impact on the Project	Low

4. Drivers of Change

	Components
Governance and capacity development (GCD)	Institutional development Organizational development Public financial governance
Knowledge solutions (KNS)	Application and use of new knowledge solutions in key operational areas Knowledge sharing activities Pilot-testing innovation and learning
Partnerships (PAR)	Official cofinancing Regional organizations

Gender Equity and Mainstreaming

No gender elements (NGE)	✓

5. Poverty Targeting

Project directly targets poverty	No

Location Impact

Nation-wide	High

6. Risk Categorization: Complex

7. Safeguard Categorization **Environment:** B **Involuntary Resettlement:** B **Indigenous Peoples:** C

8. Financing

Modality and Sources	Amount ($ million)
ADB	**335.00**
Sovereign Sector loan: Ordinary capital resources	335.00
Cofinancing	**25.00**
ASEAN Infrastructure Fund - Loan	25.00
Counterpart	**90.00**
Government	90.00
Total	**450.00**

9. Effective Development Cooperation

Use of country procurement systems	No
Use of country public financial management systems	No

Source: Asian Development Bank

I. THE PROJECT

A. Rationale

1. The proposed Distribution Grid Development Sector Project for Viet Nam Power Corporations will support the Socialist Republic of Viet Nam in the implementation of its seventh Power Development Plan 2011–2020 (PDP VII)[1] to provide adequate and reliable power supply to sustain economic growth, and expand employment and income-generating opportunities articulated in the socioeconomic development strategy of Viet Nam. The project will assist part of the government's investment program in strengthening the power distribution system, managed by the five distribution power corporations (PCs) of state-owned Vietnam Electricity (EVN). It will support: (i) upgrading and development of 220 kilovolt (kV), 110 kV, and medium voltage (6 kV to 35 kV) power networks including associated substations in the urban and industrial areas across the country; and (ii) capacity strengthening of the PCs.[2]

2. Viet Nam's economy has grown steadily (gross domestic product [GDP] annual growth rate averaged 6.5% from 2005 to 2015) with a GDP of $191.5 billion in 2015. During 2005–2015, GDP per capita increased from $699 to $2,109. Population living below national poverty line was 13.5% in 2014. During 2005–2014 (i) national electricity consumption grew from 45.6 terawatt-hours (TWh) to 128.4 TWh (12.2% annual growth); (ii) per capita electricity consumption grew from 549 kilowatt-hours (kWh) to 1,415 kWh; (iii) peak demand grew from 9.5 gigawatts (GW) to 22.2 GW; and (iv) total installed generation capacity increased from 11.6 GW to 34.1 GW showing a 300% growth in power demand and generation capacity over the period.

3. The PDP VII indicates similar rate of growth in the demand in next 15 years and power consumption is projected to reach 500 TWh by 2030, and to meet the increasing demand, installed generation capacity to be increased gradually to 130 GW by 2030 which is a fourfold increase from current level. The investments in the past focused more on generation and high voltage transmission network expansion, and distribution sector was relatively neglected. Therefore, to evacuate and distribute the sizeable new generation, continued investments in distribution sector are required. In addition, upgrading and rehabilitation of aging and overloaded distribution networks is also a priority. While technical and nontechnical losses of the power system are quite low (transmission losses 2.5% and distribution losses 6.1% in 2014), the reliability of supply is very poor in Viet Nam mainly due to weak distribution grid and consumers suffer from frequent outages. Capacity of the PCs is at a satisfactory level in project implementation, operation, and maintenance but there are institutional gaps in system planning and design, and advanced technologies.[3]

4. The PDP VII has identified $40 billion investments (generation—$30 billion, and grid development—$10 billion) for 2016–2020 and $148 billion (generation—$120 billion, and grid development—$28 billion) for 2020–2030. The government also has plans to establish fully competitive electricity wholesale market by 2021 and retail market by 2024.

5. One of the key problems in the power sector is the poor financial autonomy due to low electricity tariffs which are not adequate for cost recovery (revenue collection is efficient, energy meters are connected to almost all the customers). Recognizing this issue, the reform towards a

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[1] Government of Viet Nam. 2016. Prime Ministers decision No: 428/QD-TTg, Approval of the *Revised National Power Development Plan 2011–2020, with the Vision to 2030.* Ha Noi.

[2] The project is included in ADB. 2015. *Country Operations Business Plan: Viet Nam, 2016–2018.* Manila. Project preparatory technical assistance (PPTA) will be provided (Appendix 3). Project design advance is not required.

[3] The summary Energy Sector Assessment, Strategy, and Road Map for Viet Nam is in Supplementary Appendix.

cost-reflective electricity tariff was directed in the Electricity Law passed in 2004, and detailed tariff reform was initiated in 2009 to allow EVN to reflect the change in supply costs. Following above directions, retail electricity prices have been gradually increased and the current average retail tariff is D1,622/kWh ($0.072/kWh at $1=D22,300). However, it is assessed that more than 8% annual tariff increase is required in the next five years (2016–2020) to restore EVN's financial sustainability.[4] Besides the tariff reform, a competitive electricity market development was initiated in 2006 which is progressing well.[5] This is also contributing to improve financial viability of the power sector by providing cost-based price signals and attracting private sector. The Asian Development Bank (ADB) has been instrumental in this reform process through the provision of nine technical assistances, which led to the promulgation of the Electricity Law in 2004; the roadmap for the development of a competitive power market in 2006; the launching of a competitive generation market in 2012; and ongoing development of wholesale electricity market development and transmission pricing regulation. Furthermore, a joint ADB, KfW, and the World Bank policy-based lending program from 2017 to 2020 will support in implementation of key policy actions across four key policy areas: (i) development of a competitive wholesale electricity market; (ii) restructuring of the power sector by equitizing EVN's Generation Companies and developing an independent system and market operator; (iii) electricity tariff reforms to improve efficiency of retail tariff structure and to establish performance-based regulations for power transmission and distribution; and (iv) improving the quality of supply and demand-side response. The reform process is deemed appropriate to improve the financial viability of the power sector.[6] The proposed project supports the fourth policy area contributing to achieve the goals of competitive electricity market by 2024.

6. Since 1994, ADB has provided $2.5 billion to Viet Nam's energy sector development.[7] ADB expects to support the government's broader program adopting a programmatic approach to enhance sustainability of its interventions and $1 billion financing has been programmed in the ADB country operations business plan 2016–2018.[8] The program is aligned with the priorities of ADB's Country Partnership Strategy (CPS) 2012–2015 and the energy sector assessment, strategy, and road map for Viet Nam, and firmly anchored with PDP VII. It includes support in: power sector reforms and institutional strengthening for sustainability of the sector; grid development using advanced technologies including the project to ensure adequate grid capacity and quality of supply; and increased access to energy for inclusive growth.[9] Distribution grid development is also a precursor that enables further extension of the networks to provide access to remaining population hence the project complements Viet Nam's goal of achieving universal energy access by 2020 and United Nations Sustainable Development Goal 7, "access to affordable, reliable, sustainable, and modern energy for all." It also targets further reduction of distribution network losses and maintaining the losses at an optimal level aligned with the Viet Nam's Intended Nationally Determined Contributions.

7. ADB supported three distribution grid strengthening projects in the past and there are two ongoing sector projects to rehabilitate and expand the distribution system across the country. The project is continuation of development of the distribution system and will cover distribution networks in urban and industrial centers. Thus, ADB has a track record of the PCs and their overall implementation capacity is deemed satisfactory. The PCs also have experience in the

[4] The World Bank. 2016. *A Financial Recovery Plan for Vietnam Electricity (EVN)*. Washington D.C.
[5] Prime Minister Decision 26/2006/QD-TTg dated 26 January 2006; later amended through Prime Minister Decision 63/2013/QD-TTg dated 8 November 2013.
[6] The financial management assessment of each PC will be conducted during the course of PPTA.
[7] ADB completed projects and technical assistances, ADB's sector experience in Supplementary Appendix.
[8] ADB. 2015. *Country Operations Business Plan: Viet Nam, 2016–2018*. Manila.
[9] The next ADB's CPS 2016-2020 for Viet Nam is under preparation which will include the strategy on renewable energy and energy efficiency programs.

implementation of projects funded by other development partners, namely the World Bank, KfW, the French Development Agency, and Japan International Cooperation Agency. The project will build on ADB's extensive and continuous engagement in power sector development and targets to add value focusing on: (i) the technological optimization and modernization of power distribution infrastructure focusing on government's smart grid road map and international good practices; and (ii) the strengthening of operational capacity of PCs focusing on the priority areas and lessons from completed and ongoing projects. The project will take a holistic approach using sector lending modality identifying priority projects in accordance with the respective PCs' 5-year investment plans 2016–2020 and in-depth coordination with other ongoing and planned power sector programs by the government and the other development partners. The sector loan modality is deemed appropriate over multitranche financing facility due to smaller project amount[10] and involvement of four executing agencies.

B. Impacts, Outcome, and Outputs

8. The impact will be increased economic activities, jobs, and income in Viet Nam from improved power supply by 2030. The outcome will be power supply with adequate capacity, increased reliability and quality, and improved efficiency. The outputs are: (i) 220 kV and 110 kV distribution networks upgraded and expanded, (ii) medium voltage distribution networks of different voltage levels ranging from 6 kV to 35 kV upgraded and expanded,[11] and (iii) capacity of the power corporations in distribution network planning, advanced technologies, project design, and project management strengthened.[12]

C. Investment and Financing Plans

9. Total estimated project cost is $450 million. The tentative financing plan is in Table 1.[13]

Table 1: Tentative Financing Plan

Source	**Amount** ($ million)	**Share of Total** (%)
Asian Development Bank (ordinary capital resources)	335.0	74.4
ASEAN Infrastructure Fund	25.0	5.6
Government of Viet Nam	90.0	20.0
Total	**450.0**	**100.0**

ASEAN= Association of Southeast Asian Nations
Source: Asian Development Bank estimates.

D. Indicative Implementation Arrangements

10. The executing and implementing agencies will be four PCs out of five PCs of EVN: (i) Northern Power Corporation, (ii) Central Power Corporation, (iii) Southern Power Corporation, and (iv) Hanoi Power Corporation. The other PC, Ho Chi Minh City Power Corporation has already identified financing resources.[14] Project management units will be established within the respective PCs. The project envisages turnkey contracts and all goods and works will be procured in accordance with ADB's Procurement Guidelines (2015, as amended from time to time). International and national consultants will be engaged through a consulting firm following the Guidelines on the Use of Consultants (2013, as amended from time to time). Advance

[10] Currently Viet Nam's public investment law limits the total amount of a public investment project to D10 trillion (about $450 million equivalent) that can be approved by the prime minister. Anything over D10 trillion requires National Assembly approval. Therefore, Vietnam Electricity wishes to implement small projects below D10 trillion.
[11] The voltage levels from 6 kV to 35 kV will be standardized to 22 kV in urban areas and 35 kV in rural areas.
[12] The design and monitoring framework is in Appendix 1, and the problem tree is in Appendix 2.
[13] The detailed investment plan and share of funds among four PCs will be determined during the PPTA.
[14] The five power corporations are responsible for the distribution systems in Central, North, and South regions of Viet Nam and Ha Noi and Ho Chi Minh cities.

contracting will be used to improve project readiness. The government on-lending arrangements and funds flow will be examined under the project preparatory technical assistance (PPTA).

II. DUE DILIGENCE REQUIRED

11. Key due diligence include: (i) **Technical—**technologies to be used, soundness of PCs' 5-year investment plans, standards, specifications, and smart grid road map; (ii) **Economic and financial—**the economic and financial viability of the project and financial assessment separately for EVN and each PC; (iii) **Governance—**capacities of PCs on financial management, procurement, anticorruption, integrity, and other institutional aspects and mechanisms; (iv) **Procurement—**PCs capacity any training required, risks, county procurement system, project procurement plan, bidding documents, and sample forms; (v) **Poverty and social—**poverty and social dimension aspects; (vi) **Safeguards—**verification of the tentative safeguard categorizations, environment (B), involuntary resettlement (B), and indigenous peoples (C); (vii) ongoing and proposed support by other development partners in the distribution subsector including capacity building; and (viii) PCs' capacity in system planning, advanced technologies, project design and management, and operation and maintenance.

III. PROCESSING PLAN

A. Risk Categorization

12. The proposed project is classified as complex because the loan amount exceeds $200 million.

B. Resource Requirements

13. A total of 18 person-months of staff resources will be required comprising a team leader having expertise in power sector (8 months); finance specialist (2 months); energy economist (2 months); environmental specialist (2 months); social, resettlement, and indigenous people specialist (2 months); and operations assistant (2 months). A PPTA financed by the Technical Assistance Special Fund-V will help in due diligence and designing the project (Appendix 3).

C. Processing Schedule

14. The processing schedule is in Table 2.

Table 2: Proposed Processing Schedule

Milestones	Expected Completion Date
Project preparatory technical assistance inception	Sep 2016
Loan fact-finding mission	May 2017
Management Review Meeting	Jun 2017
Project preparatory technical assistance completion	Dec 2017
Loan negotiations	Q2 2018
Board consideration	Q2 2018
Loan effectiveness	Q4 2018

Source: Asian Development Bank staff estimates.

IV. KEY ISSUES

15. The project builds on the long experience of ADB's engagement in Viet Nam's energy sector and major issues are not identified. Support from other ADB departments will be sought to ensure the compliance with ADB policies and procedures.

DESIGN AND MONITORING FRAMEWORK

Impacts the Project is aligned with: Economic activities, jobs, and income increased (National Power Development Plan 2011–2020 with Outlook to 2030)*			
Results Chain	**Performance Indicators with Targets and Baselines**	**Data Sources and Reporting Mechanisms**	**Risks**
Outcome Power supply with adequate capacity, increased reliability and quality, and improved efficiency	By 2024 a. Per capita consumption of power more than 3,000 kWh (2014 baseline 1,415 kWh) b. SAIDI reduced to less than xx minutes per customer per year for each of the PCs: CPC, HANOIPC, HCMCPC, NPC, and SPC, and maintained or decreased thereafter (2014 baseline: minutes per customer per year—CPC=3,276 HANOIPC=2,027, HCMCPC=1,300, NPC=4,212, and SPC=2,630) c. Distribution Network losses reduced to less than xx% for each of the PCs: CPC, HANOIPC, HCMCPC, NPC, and SPC (2015 baseline: CPC=xx%, HANOIPC=xx%, HCMCPC=xx%, NPC=xx%, and SPC=xx%)	a–c. Annual reports of EVN, PCs, and MOIT	Investments in power system development are delayed by power sector entities
Outputs 1. 220kV and 110 kV electricity networks upgraded and expanded	By 2023 1a. xx km 220 kV and xx km 110 kV existing electricity networks upgraded (2015 baseline: total xx km 220 kV and xx km 110 kV need upgrading) 1b. xx km 220 kV and xx km 110 kV new distribution lines developed (2015 baseline: xx km 220 kV and xx km 110kV) 1c. xx MVA capacity of existing 220 kV and 110 kV substations upgraded (2015 baseline: xx MVA 220 kV and xx MVA 110 kV need upgrading) 1d. xx MVA capacity of 220 kV and 110 kV new substations developed (2015 baseline: xx MVA 220 kV and xx MVA 110 kV total capacity)	1a–d. Annual reports of PCs 1a–d. Quarterly project progress reports 1a–d. Project completion report by PCs	Prices of goods, works, and services rise more than budgeted at project design
2. Medium voltage distribution networks of different voltage levels ranging from 6 kV to 35 kV upgraded and expanded	By 2023 2a. xx km 6 kV to 35 kV existing distribution lines upgraded to standard voltages of 22 kV and 35 kV (2015 baseline: xx km [length of each voltage level] needs upgrading) 2b. xx km of 35 kV and 22 kV new distribution lines developed (2015 baseline: xx km 35 kV and xx km 22 kV)	2a–b. Annual reports of PCs 2a–b. Quarterly project progress reports 2a–b. Project completion report by PCs	Prices of goods, works, and services rise more than budgeted at project design

3. Capacity of the power corporations in distribution network planning, advanced technologies, project design, and project management strengthened	By 2023 3a. A minimum of six staff (50% female staff) from each PC trained in distribution network planning, and trainers for training other staff. (2015 baseline: 0 staff trained on systematic distribution system planning) 3b. A minimum of six staff (50% female staff) from each PC trained in advanced technologies, project design and management, and trainers for training other staff (2015 baseline: 0 staff trained on advanced technologies)	3a–b. Capacity assessment and training programs 3a–b. Training evaluation certificates of the trained staff	Staff retention and staff movement within the PCs

Key Activities with Milestones

Output 1 and 2: 220 kV and 110 kV electricity networks, and medium voltage distribution networks of different voltage levels ranging from 6 kV to 35 kV upgraded and expanded using advanced technologies

1.1. Assess government's medium and long-term power distribution system development in coordination with PDP VII, 5-year investment plan, and propose most techno-economical and priority scope for the project (Q4 2016–Q1 2017) [G/CD]

1.2. Review existing distribution code and adopt distribution standards based on advanced technologies, good international practices, and governments smart grid roadmap (Q4 2016–Q1 2017) [G/CD]

1.3. Select few core subprojects and appraise to serve as models for subsequent subprojects (Q4 2016–Q1 2017) [G/CD]

1.4. Identify suitable threshold for appraisal of subprojects (in physical or financial terms), eligibility criteria, and selection procedure for subsequent subprojects (Q4 2016–Q1 2017)

1.5. Establish project implementation arrangements, PMU and PIU (Q1–Q2 2017)

1.6. Conduct financial and economic assessment (Q1–Q2 2017)

1.7. Environmental assessment and review framework, initial environmental examinations and environmental management plans for core subprojects (Q1–Q2 2017)

1.8. Assess the contribution of the project in achieving INDC's targets of mitigating GHG emissions (Q1–Q2 2017)

1.9. Resettlement and indigenous peoples framework, social and poverty impacts assessment, indigenous people plan, land acquisition and resettlement plans if any (Q4 2016–Q1 2017)

1.10. Advance preparation of bidding documents (Q3–Q4 2017)

1.11. Advance actions for recruitment of project implementation consultants (Q1–Q2 2018)

1.12. Bidding for first core subprojects award of contracts (Q1–Q2 2018), second batch (Q3–Q4 2018), third batch (Q1–Q2 2019), and last batch (Q3–Q4 2019)

1.13. Update and expand distribution grid adopting advanced technologies (Q3 2018–Q2 2023)

Output 3: Strengthened capacity of the power corporations in distribution network planning, advanced technologies, project design and project management

3.1 Assess capacity of four PCs in system planning, project design and project management, and prepare capacity development programs (Q4 2016–Q2 2017) [G/CD]

3.2 Deliver capacity development programs for minimum 12 staff (six staff for each of the two training programs) from each PC (total 48 staff) and evaluate training courses (Q3 2018–Q2 2022) [G/CD]

3.3 Assess suitable lending modalities for similar projects and recommend most efficient lending modality for subsequent projects in distribution sector (Q1-Q2 2017) [G/CD]

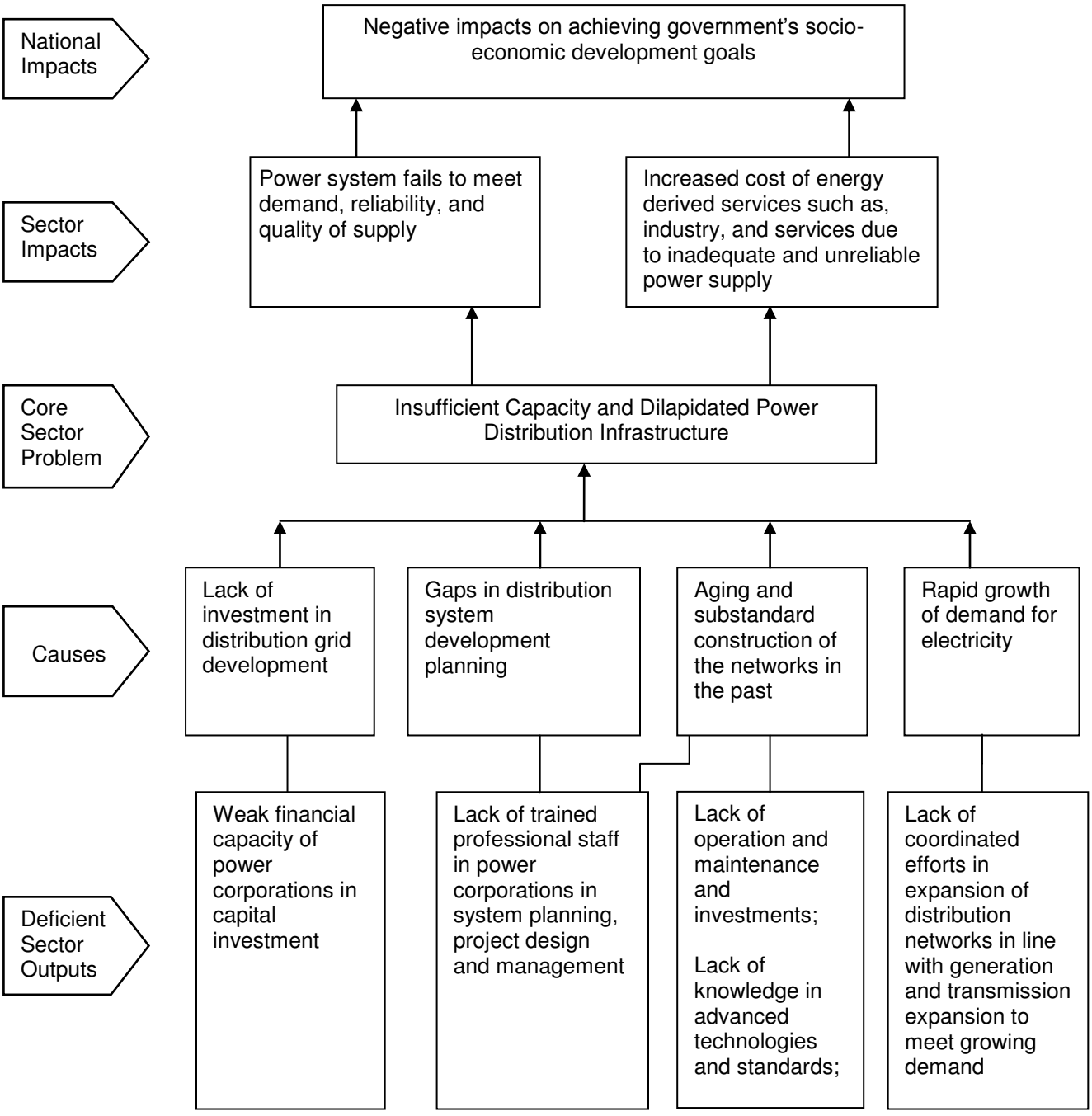
Project Management Activities Risk mitigation measures, monitoring and evaluation, submission of periodic reports, beneficiary and affected people surveys, and other activities identified during PPTA (Q3 2018–Q2 2023) Conduct needs assessment for specific skills and knowledge areas (Q4 2016–Q3 2017) [G/CD] Prepare learning modules as needed to fit participant needs (Q3–Q4 2017) [G/CD] Deliver and evaluate training courses for 75 staff (xx% female) in procurement, project management, safeguards, and financial management. (Q2–Q4 2018) [G/CD] [GE]
Inputs Asian Development Bank: $335,000,000 (loan) Government: $90,000,000 ASEAN Infrastructure Fund: $25,000,000 (loan)
Assumptions for partner financing Not applicable

ADB = Asian Development Bank, ASEAN = Association of Southeast Asian Nations, CPC = Central Power Corporation, EVN = Vietnam Electricity, G/CD = governance and capacity development, GE = gender equity, HANOIPC = Hanoi Power Corporation, HCMCPC = Ho Chi Minh City Power Cooperation, kV = kilovolt, kWh = kilowatt-hour, INDC = Intended Nationally Determined Contributions, MOIT = Ministry of Industry and Trade, MVA = megavolt-ampere, NPC = Northern Power Corporation, PC = Power Corporation, PDP VII = Seventh Power Development Plan, PIU = Project Implementation Unit, PMU = Project Management Unit, SAIDI = system average interruption duration index, SAIFI = system average interruption frequency index, SPC = Southern Power Corporation.

* Government of Viet Nam. 2016. Revised *National Power Development Plan 2011–2020 with Vision to 2030*. Ha Noi.

Source: Asian Development Bank.

PROBLEM TREE



PROJECT PREPARATORY TECHNICAL ASSISTANCE

A. Justification

1. The Government of the Socialist Republic of Viet Nam has requested a project preparatory technical assistance (PPTA) from the Asian Development Bank (ADB) to conduct assessments to prepare an investment project for development of power distribution system in Viet Nam. The investment project will follow sector project modality. Implementing agencies are four of the power corporations (PCs) of Vietnam Electricity (EVN): (i) Northern Power Corporation, (ii) Central Power Corporation, (iii) Southern Power Corporation, and (iv) Hanoi Power Corporation.

B. Major Outputs and Activities

2. Consultants shall provide services to assess all aspects of the project and provide sufficient data, information, and inputs to prepare project appraisal documents for loan approval by ADB and project documents required by the PCs for obtaining approval from EVN and the government. The major outputs and activities are in Table A3.1.

Table A3.1: Summary of Major Outputs and Activities

1. Assessment of government's power distribution system development plan in accordance with PDP VII, PCs' 5-year investment plan, and select feasible, priority scope for the project (Nov 2016)
2. Assessment of anticorruption, integrity, and other institutional aspects and mechanisms of PCs
3. Review Viet Nam existing distribution code and smart grid roadmap, and establish standards for the project based on advanced technologies and good international practices (Dec 2016)
4. Financial management assessment of the four PCs including the risk assessment (Dec 2016)
5. Governments on-lending mechanism / fund flow / fund allocation among the four PCs (Dec 2016)
6. Assess the aspects of the project that support private sector development (Apr 2017)
7. Procurement risk assessment, markets assessment, and state-owned enterprises participation (Dec 2016)
8. Project risks assessment and risk management plan (Mar 2017)
9. Establish well-defined performance indicators, baseline data, and targets for the project (Dec 2016)
10. Project feasibility studies and design of multiple subprojects (May 2017)
11. Project implementation arrangements, project management and implementation units (Apr 2017)
12. Project cost estimate, broken down by components, and subprojects (Apr 2017)
13. Project financial and economic evaluation including the assessment of cost recovery mechanisms, tariff policy and structure (Apr 2017)
14. Procurement plan for multiple subprojects, procurement packaging and master bidding documents (Apr 2017)
15. Project Implementation plan, reporting and monitoring mechanism (Apr 2017)
16. Environmental assessment and review framework (Dec 2016)
17. Initial environmental examinations and environmental management plans for core subprojects (Apr 2017)
18. Design project consultation and information disclosure plan (Apr 2017)
19. Resettlement and indigenous peoples framework (Dec 2016)
20. Social and poverty impacts assessment, indigenous people plan, land acquisition and resettlement plans if any, and also assess possible means to promote gender equality or empower women (Apr 2017)
21. Assess loss reduction benefits of the project and quantify greenhouse gas emission reductions (Apr 2017)
22. Draft project administration manual (Apr 2017)
23. Advance actions, and Bid documents for first core subprojects (Jun 2017)
24. Identify suitable threshold for appraisal of subprojects (in physical or financial terms), eligibility criteria, and selection procedure for subsequent subprojects (Jun 2017)
25. Assessment of capacity of four PCs in system planning, project design and project management (Apr 2017)
26. Prepare capacity development programs and a plan for staff retention (Jun 2017)
27. Administer workshops and training under the technical assistance (Q2 2017)
28. Assess suitable lending modalities for similar projects and recommend most efficient lending modality for subsequent projects (Jun 2017)

PC = Power Corporation, PDP VII = Seventh Power Development Plan 2011–2020.

C. Cost Estimate and Financing Plan

3. The TA is estimated to cost $1,100,000 equivalent, of which $1,000,000 will be financed on a grant basis by the ADB Technical Assistance Special Fund (TASF-V). The government will

provide counterpart support for the TA in the form of counterpart staff, office space, office supplies and internet access, and other in-kind contributions with an estimated value of 10% of the total cost of the TA. A detailed cost estimates and financing plan are presented in Table A3.2.

Table A3.2: Cost Estimates and Financing Plan

($'000)

Item	Total Cost
Asian Development Bank[a]	
1. Consultants	
a. Remuneration and per diem	
i. International consultants (24 person-months)	600.0
ii. National consultants (28 person-months)	120.0
b. International and local travel	100.0
c. Reports and communications	12.0
2. Equipment (computer, printer, etc.)[b]	10.0
3. Workshops, training, seminars, and conferences[c]	30.0
4. Surveys	16.0
5. Miscellaneous administration and support costs[d]	12.0
6. Contingencies	100.0
Total	**1,000.0**

[a] Financed by the Asian Development Bank's Technical Assistance Special Fund (TASF-V)

[b] Equipment: The equipment will be turned over to the power corporations upon completion of PPTA.

Type	Quantity	Cost
Printer (1 black and white, 1 color)	3	3,000
Photocopier/scanner	1	2,000
color plotter	1	5,000

[c] Workshops, training, seminars, and conferences

Purpose	Venue
Conference on investment plan in the transmission and distribution system	Ha Noi
Consultation workshop on the investment project	Ha Noi
Capacity building programs	to be confirmed

Note: It is not expected to have representation costs, such as alcoholic beverages in any of the events

[d] Costs for translation, printing, office supplies, communications, etc.

PPTA = Project Preparatory Technical Assistance, TASF = Technical Assistance Special Fund.
Note: The value of the in-kind government contribution is estimated at 9% of the total TA cost.
Source: Asian Development Bank estimates.

D. Consulting Services

4. A consulting firm will be engaged to provide a total of about 52 person-months of consulting services as in Table A3.3 following the quality- and cost-based selection (QCBS) method with a quality–cost ratio of 90:10, and using Full Technical Proposals. The consultants will report to ADB. The team leader will be the power distribution expert. All the national staff shall have a good command of English. The outline terms of reference for the PPTA consultants are described in paras. 5–14.

Table A3.3: Summary of Consulting Services Requirement

International Experts	Person-months	National Experts	Person-months
Team leader and power distribution expert	10	Distribution engineer	8
System planning specialist	2	Substation specialist	3
Smart grid specialist	2	Financial management specialist	4
Power system economist	2	Resettlement specialist	5
Financial management specialist	2	Environment specialist	4
Resettlement specialist	2	Procurement specialist	4
Environmental specialist	2		
Procurement specialist	2		
Total person-months	**24**	Total person-months	**28**

Source: Asian Development Bank estimates.

5. **Team Leader/Power Distribution Expert (international: 10 person-months)**. The expert should have a degree in electrical engineering, minimum 15 years of experience in a power distribution utility and advising utility management globally. The expert will assess the PCs capacity in: system planning; financial management, accounting, and internal control; project design and management; and monitoring and evaluation with the support of the team. The team leader is responsible for coordinating the team of experts and consolidating and delivering high quality of deliverables outlined Table A3.1.

6. **Deputy Team Leader/Power Distribution Engineer (national: 8 person-months).** The expert should have a degree in electrical engineering, utility experience, and minimum eight years of experience in power distribution sector. The expert will review the existing distribution code comparative to international standards and propose standards based on latest technologies; assess the measuring systems of reliability indices and the power system losses, and identify data collection process to monitor project performance indicators; and translate all relevant materials into English. The expert will work with the team leader to coordinate the team of experts and is responsible for consolidating and ensuring high quality of the deliverables.

7. **System Planning Specialist (international: 2 person-months)**. The expert should preferably have at least a master's degree in electrical engineering and minimum 8 years of experience in power system planning. The expert shall review the demand forecast, distribution system planning process, system planning capacity of PCs, and recommend the following: (i) gaps in the distribution system planning and actions to bridge the gaps, (ii) an action plan to establish sustainable planning function in each PC, (iii) training program, and (iv) key indicators to monitor implementation of above.

8. **Substation Expert (national: 3 person-months)**. The expert should have a degree in electrical engineering, with a minimum of 10 years extensive experience in design, construction, and operation and maintenance of substations. The expert shall conduct a condition assessment of the substations that require upgrading, review standards, and propose advanced technologies to adopt for the project.

9. **Smart Grid Expert (international: 2 person-months)**. The expert should preferably have at least a master's degree in electrical engineering or information and communication technology, with extensive experience in the advanced smart grid technologies. The expert will review the government smart grid roadmap and ongoing pilot activities. The expert's major outputs are smart grid options for adoption in the project and a preliminary design report.

10. **Financial Expert (international: 2 person-months, national 4 person-months).** The experts will have a chartered accountancy degree, MBA (Finance/Accounting), CPA or comparable qualification from a reputable institution, with at least 15 years of relevant financial experience and with extensive experience working directly on ADB/World Bank power sector projects in Asia. The expert will undertake the following tasks: (i) detailed project cost estimates and financing plans; (ii) financial analysis of the project, including the financial rate of internal return (FIRR), net present value, weighted average cost of capital; (iii) assess risks to the project's revenues and costs, and conduct sensitivity analyses on the FIRR against these variables; (iv) financial management assessment (FMA) of the four PCs including planning and budgetary control, financial and management accounting practices and procedures, internal control, and auditing; (v) design funds flow and disbursement mechanisms for the ensuing project, based on the results of the FMA; (vi) assessment of capacity to administer imprest fund/SOE procedures; and (vii) financial performance and projections of four PCs and EVN, and where appropriate recommend financial covenants.

11. **Power System Economist (international: 2 person-months).** The expert should preferably have a degree in finance, economics and/or business administration, and have minimum 8 years of experience in power system economic analysis, and experience with ADB

(or other Multilateral Development Bank) funded projects. The experts' tasks will include but are not limited to: (i) assess the economic benefits of the project, and (ii) conduct project economic analysis covering 10 key areas of economic analysis under the ADB Guidelines.

12. **Environmental Safeguards Experts (international: 2 person-months, national: 4 person-months).** The international expert should preferably have at least a master's degree in environmental science or similar, and have extensive experience in technical assistance of development agencies similar to ADB, particularly, in the power sector. The national expert should preferably have a degree in environmental science and should have minimum six years of experience in environmental impact assessment of similar projects. Under the guidance of ADB's safeguards specialist, the experts will undertake the following tasks including the preparation of relevant appendices and sections of the Report and Recommendation of the President, in accordance with the relevant guidelines and policies for environmental assessment and ADB Safeguards Policy Statement (2009): (i) prepare environmental assessment and review framework for the overall sector project, (ii) support the four PCs to conduct initial environmental examination of the core subprojects including environmental audit of facilities that will be rehabilitated, and (iii) prepare environmental management plans of the core subprojects.

13. **Social Safeguards Experts (international: 2 person-months, national: 5 person-months)**. The international expert should preferably have a master's degree in sociology, anthropology or similar, and have extensive experience preparing resettlement and other social development plans in accordance with ADB/World Bank/IFC guidelines. The national expert should preferably have a degree in sociology, anthropology or similar, and should be familiar with Viet Nam social safeguards policy. The experts together will: (i) collect adequate data and prepare resettlement and indigenous peoples plans and a resettlement framework, as required, conforming to ADB's Safeguards Policy Statement (2009); (ii) support the government initiate a participatory process for resettlement and indigenous peoples plans preparation; (iii) assess the capacity of the responsible institutions to prepare, update, and implement resettlement and indigenous peoples plans, and propose training programs; (iv) prepare involuntary resettlement and indigenous peoples categorization checklists; (v) conduct socioeconomic surveys; (vi) review the government policies and strategies for poverty reduction and gender development; (vii) conduct a public perception survey to identify public problems and development priorities; (viii) conduct a poverty and social analysis; (ix) prepare a poverty and social strategy; and (x) prepare a gender action plan and other social action plans, if required.

14. **Procurement Experts (international: 2 person-months, national: 4 person-months).** The specialists should preferably have 10 years' experience in procurement in power sector projects, and experience with ADB (or other Multilateral Development Bank) funded projects. The specialists' tasks will include but are not limited to: (i) undertake the project procurement risk assessment, including procurement capacity assessment of four PCs, and prepare risk assessment report; (ii) develop suitable contract packaging and assist the four PCs to prepare a procurement plan covering the whole implementation period of procurement activities for multiple subprojects in accordance with ADB Procurement Guidelines (2015, as amended from time to time); and (iii) prepare master bidding documents for each type of contract to be procured under the project including specifications.

E. Implementation Arrangements

15. The PPTA will be implemented during 1 September 2016–31 December 2017. ADB is the executing agency of the PPTA. The PCs will provide counterpart support in the form of counterpart staff, provision of office space, communication facilities for consultants, and other in-kind contributions. Disbursements under the PPTA will be done in accordance with the ADB's *Technical Assistance Disbursement Handbook* (March 2010, as amended from time to time). The proposed TA processing and implementation schedule is in Table A3.4.

Table A3.4: Technical Assistance Processing and Implementation Schedule

Major Milestones	Expected Completion Date
Contract negotiations	Aug 2016
Consultants fielding	1 Sep 2016
Inception report submission	Oct 2016
Support in fact finding mission	Apr 2017
Project start-up support including bidding documents	May-Dec 2017
Draft final report	May 2017
Submission final report	Dec 2017
Technical assistance closure	31 Dec 2017

Source: Asian Development Bank.

INITIAL POVERTY AND SOCIAL ANALYSIS

Country:	Socialist Republic of Viet Nam	Project Title:	Distribution Grid Development Sector Project for Viet Nam Power Corporations
Lending/Financing Modality:	Sector Modality	Department/ Division:	SERD/SEEN

I. POVERTY IMPACT AND SOCIAL DIMENSIONS

A. Links to the National Poverty Reduction Strategy and Country Partnership Strategy

Viet Nam's economy has grown steadily (gross domestic product [GDP] annual growth rate averaged 6.5% from 2005 to 2015) with a GDP of $191.5 billion in 2015. During 2005–2015, GDP per capita increased from $699 to $2,109. Population living below national poverty line was 13.5% in 2014. Economic growth naturally demands more electricity and other forms of end-use energies and above economic growth was accompanied by: (i) growth of national electricity consumption from 45.6 terawatt-hours (TWh) to 128.4 TWh (12.2% annual growth); and (ii) growth of per capita electricity consumption from 549 kilowatt-hours (kWh) to 1,415 kWh. The growth was also due to the dramatic increase in the household electrification rate from less than 50% in the early 1990s to 98% by 2014. Demand for electricity is expected to grow at a similar rate in the demand in next 15 years and power consumption is projected to reach 500 TWh by 2030.

The government is committed to develop the power system in a suitable manner as power supply is one vital prerequisite to sustaining economic growth, and expanding employment and income-generating opportunities contributing to poverty reduction. In the government's Socioeconomic Development Plan 2011–2015 (SEDP), the government recognizes the importance of expanding power sector infrastructure to meet growing demand and thus sustain socioeconomic growth through continuous industrialization and commercialization. The country partnership strategy 2012–2015 of the Asian Development Bank (ADB) supports SEDP. The Viet Nam Energy Sector Assessment, Strategy, and Road Map recognizes the strategic importance for ADB of continuing to support the power sector and strengthening the transmission and distribution grid to ensure a reliable and efficient power supply to all consumers. The project is also in line with ADB's Midterm Review of Strategy 2020: *Meeting the Challenges of a Transforming Asia and Pacific* (2014, Manila), which emphasizes the need for inclusive economic growth and infrastructure development in middle-income countries.

The distribution networks operated and maintained by power corporations of Viet Nam Electricity (EVN) presents several constraints in supplying adequate, safe, reliable and efficient power supply at present. Hence existing distribution networks need to be upgraded to address the constraints and same needs to be expanded to meet the future power demand. The project will upgrade and expand: (i) 220 kilovolt (kV) and 110 kV distribution networks; and (ii) medium voltage distribution networks of different voltage levels ranging from 35 kV to 6 kV. Project locations are countrywide urban and key industrial areas. The project will support provision of reliable and efficient power supply for industrialization, modernization, and economic development countrywide. Given the importance of reliable power supply to support the economy and reduce poverty, ADB's support to the project is essential to ensure sustainable economic growth.

B. Poverty Targeting

☒General Intervention ☐Individual or Household (TI-H) ☐Geographic (TI-G) ☐Non-Income MDGs (TI-M1, M2, etc.)

The project will provide more reliable and efficient electricity supply and it also foster the country's efforts in providing sustainable energy for all which is a key service necessary for sustainable economic growth and poverty alleviation.

C. Poverty and Social Analysis

1. **Key issues and potential beneficiaries.** Less than 1% of households in the peri-urban areas have per capita household incomes of less than D600,000 per month, but the cost of living has increased significantly since 2010 and most households are sensitive to increases in basic living expenditures. While these peri-urban areas offer a significant range of income-generating opportunities, the higher-value opportunities are generally contingent on a more reliable supply of electricity. The project does not involve tariff reform, but includes an assurance by the government to continue its social safety measures for the lower-income consumers. Urban and peri-urban consumers including industrial, agricultural, commercial, and domestic are all potential beneficiaries from the continuation of existing social safety related programs.

2. **Impact channels and expected systemic changes.** The project does not deal with the higher costs arising from the expansion of generation, transmission, and distribution capacities—which will necessitate gradual increases in electricity tariffs—most households do not consider tariffs to be the major issue. It is rather the unreliable supply of

power that worries them because it hampers household-based and income-generating activities. Poor and vulnerable groups will benefit from improved electricity supply because it will boost economic activity and in turn create more systematic and better income-generating opportunities for these groups, given that higher-value income generation hinges on the use of electricity.

3. **Focus of (and resource allocated in) the PPTA or due diligence.** Under the PPTA, in coordination with key development partners, Ministry of Industry and Trade, EVN and Power Corporations, assessments will be undertaken which will include (i) the viability of various projects under the sector loan; (ii) technical aspects including design, quality, quantity, and unit costs; (iii) financial and economic feasibility; (iv) environmental and social safeguards; (v) fund flow mechanisms, project reporting; (vi) procurement procedures; and (vii) other aspects which may be considered relevant and appropriate to the project.

II. GENDER AND DEVELOPMENT

1. **What are the key gender issues in the sector/subsector that are likely to be relevant to this project?** Women have capacity to meet their families' basic needs through income-earning activities while attending to other family needs. Reliable, sustainable, and affordable supply of electricity will significantly improve the productivity through lower production costs and increased revenue of home industries, businesses, and other enterprises run by women. Therefore, provision of reliable power supply can alleviate women's activities.

2. Does the proposed project have the potential to make a contribution to the promotion of gender equity and/or empowerment of women by providing women's access to and use of opportunities, services, resources, assets, and participation in decision making? ☐ Yes ☒ No

While provision of electricity is identified as a critical input for women's activities, the project aims at improvement of the distribution infrastructure for the electricity to be supplied to the population irrespective of gender and benefits will be generalized, allowing very little opportunity for gender design features. Therefore, it is not foreseen that the project will specifically promote gender equality or empowerment of women.

3. Could the proposed project have an adverse impact on women and/or girls or widen gender inequality?

☐ Yes ☒ No

Strengthening of the power distribution networks will impact positively on the population as a whole in a generalized manner, but will not have a direct gender impact nor widen gender inequality.

4. Indicate the intended gender mainstreaming category:

☐ GEN (gender equity) ☐ EGM (effective gender mainstreaming)
☐ SGE (some gender elements) ☒ NGE (no gender elements)

III. PARTICIPATION AND EMPOWERMENT

1. **Who are the main stakeholders of the project, including beneficiaries and negatively affected people? Identify how they will participate in the project design.** Main stakeholders are the national and local governments, EVN and four power corporations. Beneficiaries include all classes of electricity customers.

2. **How can the project contribute (in a systemic way) to engaging and empowering stakeholders and beneficiaries, particularly, the poor, vulnerable and excluded groups? What issues in the project design require participation of the poor and excluded?** The stakeholders will be consulted through meetings, interviews and surveys in order to increase awareness about the project and seek inputs to the project. Consultation with the poor, vulnerable and excluded groups will focus on issues associated with environment, involuntary resettlement, if any, and other social issues that may affect them.

3. What are the key, active, and relevant civil society organizations in the project area? What is the level of civil society organization participation in the project design?

☒ Information generation and sharing ☐ Consultation ☐ Collaboration ☐ Partnership

Because the social benefits of the project are primarily indirect, civil society organizations (CSOs) relevant to social impact and development will have a limited role in the project; if any such CSOs express interest in being involved, the project will make sure information flows are fully transparent and will seek their advice as appropriate.

4. Are there issues during project design for which participation of the poor and excluded is important? What are they and how shall they be addressed? ☐ Yes ☒ No

IV. SOCIAL SAFEGUARDS

A. Involuntary Resettlement Category ☐ A ☒ B ☐ C ☐ FI

1. Does the project have the potential to involve involuntary land acquisition resulting in physical and economic displacement? ☐ Yes ☒ No

The program does not foresee large scale involuntary resettlement or land acquisition because the upgrading of

distribution lines are already owned and managed by regional power companies and new extension of distribution lines will be installed normally along the roads. All affected persons will be consulted during the PPTA.

2. What action plan is required to address involuntary resettlement as part of the PPTA or due diligence process?

☒ Resettlement plan ☒ Resettlement framework ☐ Social impact matrix
☐ Environmental and social management system arrangement ☐ None

B. Indigenous Peoples Category ☐ A ☐ B ☒ C ☐ FI

1. Does the proposed project have the potential to directly or indirectly affect the dignity, human rights, livelihood systems, or culture of indigenous peoples? ☐ Yes ☒ No

2. Does it affect the territories or natural and cultural resources indigenous peoples own, use, occupy, or claim, as their ancestral domain? ☐ Yes ☒ No

3. Will the project require broad community support of affected indigenous communities? ☐ Yes ☒ No

4. What action plan is required to address risks to indigenous peoples as part of the PPTA or due diligence process?

☒ Indigenous peoples plan ☒ Indigenous peoples planning framework ☐ Social Impact matrix
☐ Environmental and social management system arrangement ☒ None

The impacts on indigenous peoples are not envisaged, however impacts will be evaluated in the PPTA to ensure that if indigenous peoples are impacted, they will be consulted, compensated, and able to seek grievance redress.

V. OTHER SOCIAL ISSUES AND RISKS

1. What other social issues and risks should be considered in the project design?

☒ Creating decent jobs and employment ☐ Adhering to core labor standards ☐ Labor retrenchment
☐ Spread of communicable diseases, including HIV/AIDS ☐ Increase in human trafficking ☒ Affordability
☐ Increase in unplanned migration ☐ Increase in vulnerability to natural disasters ☐ Creating political instability
☐ Creating internal social conflicts ☐ Others, please specify _____

2. How are these additional social issues and risks going to be addressed in the project design?

(a) Creating decent jobs and employment: The project will contribute to the national economy through and generating additional employment as a result of expanded supply and reliability of electricity supply. Factories will be able to operate with greater certainty, for more hours per day, thereby increasing productivity; (b) affordability: the project will support the government's medium term plan to provide universal access to electricity nationwide.

VI. PPTA OR DUE DILIGENCE RESOURCE REQUIREMENT

1. Do the terms of reference for the PPTA (or the due diligence) contain key information needed to be gathered to better analyze (i) poverty and social impact; (ii) gender impact; (iii) participation dimensions; (iv) social safeguards; and (v) other social risks. Are the relevant specialists identified?

☒ Yes ☐ No

2. What resources (e.g., consultants, survey budget, and workshop) are allocated for conducting poverty, social and/or gender analysis and participation plan during the PPTA or due diligence? Social safeguards experts (one international position of two person-months and national positions of five person-months) will be recruited under the PPTA.

Source: Asian Development Bank.

SECTOR ASSESSMENT, STRATEGY, AND ROAD MAP (SUMMARY): ENERGY

1. Sector Performance, Problems and Opportunities

1. Availability of adequate and reliable power supply is an essential prerequisite for maintaining Viet Nam's enviable record of socio-economic development. The government's seventh Power Development Plan 2011–2020 (PDP VII) with an outlook to 2030 defines objectives, strategies and the road map to develop power sector.[1]

2. The Ministry of Industry and Trade (MOIT) has policy and supervisory responsibilities for the energy sector, both as line ministry and as ministry with oversight of the state-owned energy enterprises. The state-owned Vietnam Electricity (EVN), the main power utility is organized as a holding company with a series of wholly owned subsidiaries: three power generation corporations (GENCOs), the National Power Transmission Corporation (NPT) which is responsible for power transmission, and the five regional power corporations (PCs)[2] responsible for power distribution. EVN owns the National Load Dispatch Center, Electric Power Trading Company, strategic power plants, and is majority shareholder of partially privatized power plants.

3. **Demand Growth**. Average annual electricity demand growth was 12.1% during 2005–2014 and electricity consumption increased from 45.6 terawatt-hours (TWh) to 128.4 TWh,[3] and peak demand grew from 9.5 gigawatts (GW) to 22.2 GW in the same period. Per capita electricity consumption increased from 156 kilowatt-hours (kWh) in 1995 to 983 kWh in 2010 and to 1,415 kWh in 2014. The total installed and operating generation capacity in Viet Nam was 11.6 GW in 2005 and 34.1 GW in 2014 showing an average 12.6% annual growth in generation additions.

4. **Demand Forecast.** Power demand is expected to grow at an average rate of 10.5% per year during 2016–2020, and 8.0% per annum during 2021–2030. Electricity consumption is projected to reach 234.6 TWh in 2020 and 506.0 TWh by 2030 representing a fourfold increase by 2030 compared to the consumption in 2014. The peak demand is estimated to reach 140 GW by 2030.

5. **Power Generation.** The total installed and operating generation capacity in Viet Nam was 34.1 GW in 2014. In the same year power generation mix by type of fuel source was 46.07% hydropower, 21.58% gas, 28.64% coal, 3.39% oil, and 0.32% renewable energy.

6. **Access to Electricity.** Viet Nam has made remarkable progress in expanding access to electricity, and the percentage of households without electricity fell from 50% in 1995 to 2% in 2014. Providing universal access to electricity is a top priority of the government.

7. **Electricity Tariff**. The financial autonomy of power sector entities remains affected by average below-market electricity tariffs although retail electricity prices have been gradually increasing and the average electricity retail tariff reached D1,622/kWh ($0.72/kWh at $1=D22,300). At present retail tariffs are being adjusted every six months based on the government directions. ADB and the World Bank advisory consultations have led the

[1] Government of Viet Nam. 2011. *National Power Development Plan 2011–2020, with outlook to 2030.* Ha Noi. This power development plan has been updated several times and the latest update is in April 2016.

[2] Central Power Corporation (EVNCPC), Hanoi Power Corporation (EVNHANOI), Ho Chi Minh City Power Corporation (EVNHCMC), Northern Power Corporation (EVNNPC), and Southern Power Corporation (EVNSPC).

[3] Government of Viet Nam, Viet Nam Electricity. 2014. *Annual Report*. Ha Noi.

government in deciding appropriate electricity tariffs to cover production, transmission, and distribution costs, and financial recovery of EVN and its subsidiaries. Satisfactory progress has been made and it is expected that electricity prices will be increased at an appropriate rate for all tariff categories to ensure cost reflective pricing.

8. **Sector Reforms and Market Development.** Viet Nam has demonstrated a strong commitment in power subsector reforms and a good progress has been made by establishing the Electricity Regulatory Authority of Vietnam under MOIT in 2005, NPT in December 2009, five PCs in February 2010, and three GENCOs in July 2012. It is expected to establish competitive power market in three phases: (i) generation market during 2014–2017, (ii) wholesale market during 2015 to 2021, and (iii) retail market during 2021 to 2024. A joint ADB, the World Bank, and KfW policy-based lending program (three subprograms) from 2017 to 2021 will support the government in the implementation of key policy actions which are deemed appropriate to improve the financial performance of EVN and its subsidiaries to a sustainable level by 2024.

9. **Private Sector Investment.** Currently, EVN and its joint stock companies own 61% of the installed capacity and the rest is owned by the domestic independent power producers and international private companies. Although the PDP VII slates many private sector investments in power generation, negotiations on the concessional agreement with the government and on the power purchase agreement with EVN are often prolonged. The introduction of an electricity market is hoped to attract more private sector investments in power generation.

10. **Environmental Management and Climate Change Mitigation.** The most recent government initiative, National Green Growth Strategy (GGS) identifies energy and transport sectors as priorities for reduction of greenhouse gas emissions (GHG) and sets out clear goals for: (i) reducing GHG emissions intensity and promoting the use of clean and renewable energy, (ii) moving towards greener production, and (iii) enhancing green lifestyle and sustainable consumption. The GGS commits to build a road map to phase out subsidies for fossil fuels, apply market instruments to assure principles of competitiveness, transparency and efficiency in the energy sector, and support renewable energy development. However the progress is slow in achieving the set targets.

11. The key development challenge of EVN and its holding companies is the rapid expansion of power infrastructure to cope with increasing power demand. Furthermore, during the period from 2014 to 2024, the power subsector also needs investments in the upgrading and rehabilitation of aging and overloaded transmission and distribution networks. In turn, the financial requirements needed are huge and beyond these agencies' financing capacity.

2. Government Sector Strategy

12. In accordance with PDP VII, the government has approved multiple power infrastructure development projects and laid out a detailed road map and reform framework for: (i) strengthening financial capacity, (ii) improving the operational performance of power subsector entities, (iii) enhancing human resource capacity, (iv) technological optimization and modernization of power infrastructure, and (v) enhancing energy efficiency in generation and consumption (supply-side and demand-side management). The PDP VII defines the objectives, strategies, and a road map to develop the power sector requiring sustained and multi-year efforts, and $91 billion investments (generation—$68 billion, transmission—$10.5 billion, distribution—$11 billion, and new electrification—$1.5 billion) from 2014 to 2025.

13. EVN will not be able to fully meet increased power demand by developing new generation plants by its own. The government is encouraging private sector investment, including national and international investors, to invest in power generation. Although private sector investors are gradually being attracted to power generation, the environment in the expansion of power transmission and distribution systems is not conducive for private sector investments. Hence, the NPT and power corporations remain solely responsible for meeting investment requirements either using own resources or borrowing from export credit agencies, multilateral banks, other bilateral development agencies, and commercial banks.

14. **Regional Power Trade.** Currently Viet Nam has some cross border power transmission connections with neighboring countries such as People's Republic of China (PRC), Lao People's Democratic Republic (Lao PDR), and Cambodia. Regional power trade will continue to play an important role and in the future, imports from PRC and Lao PDR, and export to Cambodia will be scaled up. Currently there are six proposed transmission line interconnections to be constructed in the future.

15. **Rural Electrification.** The Government's rural electrification program is targeting provision of electricity services to the remaining 2% of households that have no access to electricity by 2020. Most of the remaining areas for providing access to electricity are very far from existing networks and further expansions are not feasible unless the existing rural networks are augmented. The estimated investment requirement for rural electrification in the period 2016–2020 is around $1.5 billion.

16. **Renewable Energy Generation.** The PDP VII envisages increasing the share of renewables in the energy mix to 6.6% in 2020 and 10.2% in 2030. The bulk of this renewable capacity will come from small hydropower and wind power. In particular the total wind power capacity from the current negligible level will be increased to around 1,000 megawatts (MW) by 2020 and 6,200 MW by 2030; biomass power generation in sugar mills is estimated around 500 MW by 2020 and 2,000 MW by 2030.

17. **Energy Efficiency**. Viet Nam's energy intensity in terms of elasticity of electricity demand growth against GDP growth had been very high, which had been 1.74 over the period 2010–2014, reflecting a high consumption of electricity per output of GDP. The PDP VII calls for this ratio to be reduced to 1.53 by 2020. This requires drastic demand-side management and energy efficiency especially in the energy intensive industries such as steel mills and cement factories. In the power system, EVN has made good progress and achieved steady reduction of transmission and distribution losses from 12.2% in 2003 to 8.6% in 2014 and continue to reduce the losses by upgrading the networks.

3. ADB's Sector Experience and Support Program

18. The energy sector has been a priority sector in ADB's Viet Nam Country Program. Since 1994, ADB has provided 13 loans for a total $2.50 billion and 46 technical assistances for a total $32.90 million to the energy sector. ADB provided nine technical assistances for power sector reforms and market structuring which progressed well.[4] ADB's intervention has also contributed to connecting more people to modern forms of energy. ADB has also supported (i)

[4] Accomplishments include enactment of Electricity Law (2004), establishment of Electricity Regulatory Authority (2005), unbundling power transmission (2008), creation of five power corporations (2010) and three generation companies (2012).

energy efficiency, (ii) infrastructure development, (iii) access to electricity, (iv) renewable energy, and (v) institutional strengthening.

19. Based on the most recent ADB's Country Partnership Strategy Final Review for Viet Nam conducted in 2015, the energy sector assistance strategy and program is highly relevant, successful, effective, sustainable, and substantial in impact and contribution to development results and value addition. However, the assessment shows efficiency issues related to implementation delays and high transaction costs, in particular: (i) lengthy government administrative and approval procedures involving several ministries taking long interval between feasibility studies and loan approvals; (ii) delays in finalizing technical designs; (iii) delays in preparing and implementation of procurement, land acquisition, and social and environmental safeguards; and (iv) limited trained human resources to implement safeguard measures in an effective and timely manner.

20. ADB's energy sector strategy in Viet Nam from 2016 to 2020 will be to support (i) power subsector reform and competitive market development; (ii) infrastructure development (generation, transmission, and distribution); (iii) access to electricity; (iv) energy efficiency and renewable energy generation; (v) an enabling environment for cross-border power trading; and (vi) skills development. Current partnerships and close coordination with key development agencies supporting the energy sector in Viet Nam will be enhanced.

21. In supporting power subsector reforms, ADB will place particular focus on the evolution of a competent and independent regulatory body that enforces cost-recovery principles to ensure financial sustainability of the power subsector. A policy-based loan is being prepared to further support in power subsector reforms. ADB will continue to provide technical assistance to establish environmental management guidelines/mitigation measures, and measuring reporting and verification systems for mainstreaming climate change mitigation into energy sector infrastructure projects.

22. Participation of Greater Mekong Subregion (GMS) countries, including Viet Nam in GMS power trade program as well as in other ASEAN fora will continue to be supported by ADB. Particularly under the Regional Power Trade Coordination Committee umbrella, cross-border interconnections will be further pursued. The GMS countries are in the process of establishing the Regional Power Coordination Center.

23. ADB strategy 2020 Medium-Term Review action plan approved merger of Asian Development Fund and Ordinary Capital Resource enabling increased lending capacity to its developing member countries. Hence from 2017, ADB's lending volume for Viet Nam energy sector development is expected to be scaled up based on the county needs and absorption capacity. In the next phase of development support, ADB shall employ instruments that confer scale and flexibility. Therefore, ADB will follow a programmatic approach match with the government sector development program during 2016–2030.

24. ADB's Private Sector Operations Department and Office of Public–Private Partnership will seek the possibilities to promote public-private partnership opportunities in the energy sector. ADB will also draw on its financial instruments, including partial risk and other forms of guarantees, to help improve the availability and terms of financing for private-sector-led power generation projects.

ENERGY SECTOR RESULTS FRAMEWORK (2016–2020)

This results framework will be revised based on Viet Nam Country Partnership Strategy 2016–2020 final results framework.

Country Sector Outcomes		Country Sector Outputs		ADB Sector Operations	
Outcomes with ADB Contribution	**Outcome Indicators with Targets and Baselines**	**Outputs with ADB Contribution**	**Output Indicators with Incremental Targets**	**Planned and Ongoing ADB Interventions**	**Main Outputs Expected from ADB Interventions**
National electricity demand met in a reliable, efficient, and sustainable manner Financial viability of power subsector Access to energy for all	(i) Per capita consumption of power increased to 3,610 kWh by 2025 (2014 baseline: 1,415 kWh) (ii) Projected peak demand of 63.5 GW is met by 2025 (2014 baseline: 22.2 GW) (iii) Electrification rate increased to 100% by 2020 (2015 baseline: 98%) (iv) Fully operational competitive wholesale power market in 2017, retail market in 2024 (2014 baseline: generation of competitive market)	Transmission and distribution grid strengthened, operated, and managed efficiently Rural distribution networks rehabilitated and expanded to increase access to electricity Enhanced enabling environment for private sector investment into power subsector	Installed capacity increased by 23.6 GW Additional renewable generation: 3.2 GW by 2020 Minimum additional 23,000 MVA of 500/220 kV and 39,000 MVA of 220/110 kV substation capacities developed by 2020 (2014 baseline: 21,900 MVA of 500 kV and 30,726 MVA of 220 kV) Additional 3,000 km of 500 kV and 7,000 km of 220 kV transmission lines developed (2014 baseline: 6,755 km of 500 kV and 12,513 km of 220 kV) Additional 2% of the households in remote communes to be provided with access to electricity by 2020	**(i) Pipeline projects with estimated amounts** - Power Transmission Investment MFF Program: Tranche 4 ($330 million) - Electricity Distribution System Development Program 1 ($360 million, including AIF cofinancing) - Electricity Distribution System Development Program 2 ($350 million, including AIF cofinancing) - Development Policy Operations Support (policy-based loan: 1 $160 million) - Development Policy Operations Support (policy-based loan: $2—$200 million) - Rural Electrification loan 1 ($360 million, including cofinancing) - Rural Electrification loan 2 ($300 million, including cofinancing) - Power Transmission Grid Reinforcement Loan1 ($350 million) **(ii) Ongoing projects with approved amounts** - Mong Duong 1 Thermal Power MFF, Tranche 2 ($902 million) and cofinancing from Korea Eximbank ($510 million)	**(i) Pipeline projects** Over 600 km of transmission lines developed and 3,000 MVA of high-voltage substation capacities expanded[a] Over 3,000 km of medium-voltage networks rehabilitated and expanded along with associated substations of total capacity of more than 600 MVA[a] Over 6,000 km of low-voltage networks extended/rehabilitated providing electricity access to more than 150,000 rural households[a] Institutional arrangements of the power corporations involved in distribution network development, operation, and maintenance strengthened Viet Nam competitive wholesale power market developed **(ii) Ongoing projects** About 500 km of 500 kV, 100 km of 220 kV transmission lines expanded, and 600 MVA of 500/220 kV and 1,000 MVA of 220 kV substation transformer

				- Song Bung 4 Hydropower Project ($196 million) - Power Transmission Investment Program: MFF, Tranche 1 ($120.5 million), Tranche 2 ($110.9 million), and Tranche 3 ($200.0 million) - Renewable Energy Development and Network Expansion and Rehabilitation for Remote Communes Sector Project ($153 million) - Ha Noi and Ho Chi Minh City Power Grid Development Sector ($180 million)	capacity added About 1,150 MW of installed generation capacity added Over 2,250 km of medium-voltage network and 8,000 km of low-voltage network extended/rehabilitated, providing electricity access to about 128,000 households Grid connection provided to minimum 48,000 poor households About 35 MW small hydropower generation capacity added The NPT's operating efficiency in procurement, financial systems, and setting of transmission charges improved Capacity to design and implement climate change response measures improved

ADB = Asian Development Bank, AIF = ASEAN Infrastructure Fund, GW = gigawatt, km = kilometer, kV = kilovolt, kWh = kilowatt-hour, MFF = multitranche financing facility, MVA = megavolt-ampere, MW = megawatt, NPT = National Power Transmission Corporation.
[a] ADB staff estimates. Exact outputs will be known during the project feasibility studies.
Source: Asian Development Bank.

SECTOR PROBLEM ANALYSIS
Sector Problem Analysis