



# Technical Assistance Report

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Project Number: 48328-001  
Capacity Development Technical Assistance (CDTA)  
December 2014

## Socialist Republic of Viet Nam: Establishing the Wholesale Electricity Market

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Asian Development Bank

## CURRENCY EQUIVALENTS

(as of 5 December 2014)

Currency unit	–	dong (D)
D1.00	=	\$0.000047
\$1.00	=	D21,345

## ABBREVIATIONS

ADB	–	Asian Development Bank
ERAV	–	Electricity Regulatory Authority of Vietnam
EVN	–	Vietnam Electricity
NLDC	–	National Load Dispatch Center
SMO	–	system and market operator
TA	–	technical assistance
VCGM	–	Viet Nam competitive generation market
VWEM	–	Viet Nam wholesale electricity market

## NOTE

In this report, "\$" refers to US dollars.

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## CAPACITY DEVELOPMENT TECHNICAL ASSISTANCE AT A GLANCE

<b>1. Basic Data</b>		<b>Project Number: 48328-001</b>	
<b>Project Name</b>	Establishing the Wholesale Electricity Market	<b>Department /Division</b>	SERD/SEEN
<b>Country Borrower</b>	Viet Nam, Socialist Republic of -	<b>Executing Agency</b>	Electricity Regulatory Authority of Vietnam
<b>2. Sector</b>		<b>ADB Financing (\$ million)</b>	
✓ Energy	Energy sector development and institutional reform		0.75
		<b>Total</b>	<b>0.75</b>
<b>3. Strategic Agenda</b>		<b>Climate Change Information</b>	
Inclusive economic growth (IEG)	Pillar 1: Economic opportunities, including jobs, created and expanded	Climate Change impact on the Project	Low
<b>4. Drivers of Change</b>		<b>Gender Equity and Mainstreaming</b>	
Governance and capacity development (GCD)	Institutional development Organizational development	No gender elements (NGE)	✓
Partnerships (PAR)	Bilateral institutions (not client government) Implementation International finance institutions (IFI)		
Private sector development (PSD)	Conducive policy and institutional environment Promotion of private sector investment		
<b>5. Poverty Targeting</b>		<b>Location Impact</b>	
Project directly targets poverty	No	Nation-wide	High
<b>6. TA Category:</b>	B		
<b>7. Safeguard Categorization</b>	Not Applicable		
<b>8. Financing</b>			
<b>Modality and Sources</b>		<b>Amount (\$ million)</b>	
<b>ADB</b>		<b>0.75</b>	
Sovereign Capacity development technical assistance: Technical Assistance Special Fund		0.75	
<b>Cofinancing</b>		<b>0.00</b>	
None		0.00	
<b>Counterpart</b>		<b>0.03</b>	
Government		0.03	
<b>Total</b>		<b>0.78</b>	
<b>9. Effective Development Cooperation</b>			
Use of country procurement systems			No
Use of country public financial management systems			No



## I. INTRODUCTION

1. In 2005, the Government of Viet Nam began an effort to introduce an electricity market to ensure the sustainability of the power sector. The Electricity Regulatory Authority of Vietnam (ERAV) under the Ministry of Industry and Trade has been tasked with implementing power sector reform and is preparing for the wholesale electricity market, which is expected to be launched on a pilot basis in 2015. The ERAV requested the support of development partners to help with the reform process, and particularly requested the Asian Development Bank (ADB) to support building the capacities of the key market players that will play critical roles in the wholesale electricity market, including the five regional distribution companies (known as power corporations) and the National Load Dispatch Center (NLDC).

2. Energy is one of ADB's priority sectors of engagement in Viet Nam. The country partnership strategy for Viet Nam, 2012–2015 indicates that energy sector operations will focus on reform and market development to meet electricity demand with reliable, environmentally sustainable supply.<sup>1</sup> The government's request is consistent with ADB's priorities and, based on the government's demonstrated commitment to reform, ADB will provide assistance through this capacity development technical assistance (TA). The TA was designed through detailed discussions with the Ministry of Industry and Trade and ERAV by ADB team members stationed in the Viet Nam Resident Mission, and through extensive development partner coordination. The government and ERAV concur with the TA's impact, outcome, outputs, implementation arrangements, cost, financing arrangements, and terms of reference. The design and monitoring framework is in Appendix 1.<sup>2</sup>

## II. ISSUES

3. The power sector in Viet Nam is characterized by (i) the dominance of state-owned energy enterprises, with Viet Nam Electricity (EVN) being the major national power utility; (ii) an average electricity retail tariff of D1,500 per kilowatt-hour, which is lower than the long-run marginal cost estimated to be in the range of D1,700–D1,900 per kilowatt-hour; (iii) vast investment needs to satisfy anticipated electricity demand growth of more than 10% per annum for the next decade; and (iv) the weak financial position of EVN. The government does not directly subsidize EVN but supports it indirectly, e.g., through provision of fuel at submarket prices and low-interest loans. To ensure the sustainability of the sector, the government enacted the Electricity Law in 2005 and embarked on power sector reform starting with the establishment of the ERAV as the regulator. In 2006, a road map to establish the electricity market was approved, which stipulates the market's gradual development in three phases: (i) establishment of the Viet Nam competitive generation market (VCGM) from 2012; (ii) pilot test of the Viet Nam wholesale electricity market (VWEM) from 2015, with full implementation from 2019; and (iii) establishment of a competitive retail market from 2021 (Supplementary Appendix A).<sup>3</sup> The objectives of the reform include

- (i) developing a competitive electricity market in a phased and sustainable manner,
- (ii) attracting new investors to the power sector,
- (iii) reducing the state's investment and subsidies in the power sector,

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<sup>1</sup> ADB. 2012. *Country Partnership Strategy: Viet Nam, 2012–2015*. Manila.

<sup>2</sup> The TA first appeared in the business opportunities section of ADB's website on 17 November 2014.

<sup>3</sup> Government of Viet Nam. 2006. *Prime Minister Decision 26/2006/QD-TTg on Approving the Road Map and Conditions for Formation and Development of Different Levels of the Electricity Market in Viet Nam*. Ha Noi; Government of Viet Nam. 2013. *Prime Minister Decision 63/2013/QD-TTg on Road Map, Conditions and Power Sector Organization Structure for Vietnam Power Market Stages Formation and Development*. Ha Noi.

- (iv) improving the efficiency of the power sector and ensuring a stable and reliable supply of electricity, and
- (v) reducing the pressure of increasing electricity tariff.<sup>4</sup>

4. The government has demonstrated a strong commitment to implement the reform by restructuring EVN from a vertically integrated utility into a holding company, establishing the Electric Power Trading Company as the single buyer and NLDC, both of which are currently 100% owned by EVN. Subsequently, the transmission function was unbundled as the National Power Transmission Corporation in 2008, and five power corporations were established in 2010 (Supplementary Appendix B).<sup>5</sup>

5. Phase 1 of the road map (establishment of the VCGM) was launched in July 2012 with the unbundling of EVN's generation function into three power generation corporations.<sup>6</sup> Currently, 102 power plants participate in the VCGM, which is designed as a mandatory cost-based pool market with day-ahead bidding.<sup>7</sup> Monitoring and assessment of the VCGM have concluded that it has been operating largely according to the market rules.<sup>8</sup> However, several shortcomings have also been identified, which should be addressed as the government transitions to the second phase of the road map (the VWEM).

6. Based on the conceptual design of the VWEM prepared with the assistance of the World Bank in 2012, Agence Française de Développement has recently mobilized consultants to develop the detailed design of the VWEM. Further assistance is expected from the United States Department of State and the World Bank to monitor and improve the VCGM and to establish the market rules and the legal and regulatory frameworks of the VWEM.

7. Despite these efforts to develop the VWEM, little attention has been paid to helping the market players effectively participate in the proposed VWEM. In particular, the new roles of the power corporations and the NLDC will change, and their functions will be critical for the effective implementation of the VWEM. The power corporations currently purchase electricity from EVN at assigned transfer prices called bulk supply tariffs before selling the electricity to end users at nationally regulated retail tariffs that are assessed to be below the cost of supply. In the VWEM, the power corporations will initially purchase up to 5% of their electricity on the spot market, while the remainder will be purchased at bulk supply tariffs. The volume purchased at bulk supply tariffs will gradually be reduced to zero, and the power corporations will only either purchase electricity on the spot market or in competition with other wholesalers through power purchase agreements that they will conclude with the power plants. A new fund is expected to be established under VWEM to protect the power corporations from shocks related to market price spikes, since they are not able to pass on any price increase to customers until phase 3 of the roadmap (establishment of a competitive retail market). Under the VWEM, the power corporations will also become network service providers, and to ensure open and nondiscriminatory access to the distribution network by all network users, their distribution and retail functions need to be separated.

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<sup>4</sup> This is the language used in Prime Minister Decision 26/2006/QĐ-TTg (footnote 3). Introducing market principles may result in tariff increases, because the current regulated retail tariff level is assessed to be lower than the long-run marginal cost of supply. Such adjustments may be necessary to attain the other objectives of the reform.

<sup>5</sup> The five power corporations are Hanoi Power Corporation, Ho Chi Minh City Power Corporation, Northern Power Corporation, Central Power Corporation, and Southern Power Corporation.

<sup>6</sup> Pilot VCGM started in July 2011.

<sup>7</sup> A day-ahead market is a forward market in which prices are calculated for the next operating day.

<sup>8</sup> World Bank. 2012. *Assessment of Full Vietnam Competitive Generation Market Outcomes*. Ha Noi.



8. The NLDC will be transformed into the system and market operator (SMO). On top of the system operation function, it will need to further manage the market under the VWEM, including operating the sales and purchase of electricity, facilitating market settlements, and reconciling energy accounts and monetary accounts. Furthermore, based on the assessment made by the World Bank, the NLDC needs to build its capacity in load forecast, day-ahead and hour-ahead scheduling, and calculation of water value for the hydropower plants, which is the basis of the bid price of the hydropower plants (footnote 8). The reliability and transparency of the SMO is critical to boost confidence to attract new investors into the market.

9. The TA focuses on building the capacity of key market participants as well as that of other market participants, including power generation corporations, the National Power Transmission Corporation, the Electric Power Trading Company, and new market entrants such as renewable energy developers and potential wholesalers. Since one of the main objectives of the reform is to attract private investment to the power sector and gradually reduce the state's involvement, new entrants should understand the mechanism and build the necessary confidence to participate in the VWEM.

10. ADB was instrumental in launching the reform through the provision of six TA projects during 1995–2009 that contributed to the promulgation of the Electricity Law.<sup>9</sup> ADB is also implementing the Electricity Transmission Pricing Review in the Context of Power Sector Restructuring in Viet Nam, which reviews the transmission wheeling charges payable to the National Power Transmission Corporation.<sup>10</sup> The government's strong commitment to introducing the electricity market and improving the performance of the sector has been confirmed through such engagements, and ADB recognizes the imminent need to support the ERAV in the process.

11. Past experiences show that development partner coordination is critical to effectively support sector reform and to spur agreement on the direction of the reform. This TA was formulated in close coordination with Agence Française de Développement, the United States Department of State, and the World Bank. ADB has also dispatched two resident advisors under the Capacity Building of Renewable Energy Development Project to support the ERAV in making informed decisions on the design and implementation of the VWEM, and to coordinate the activities of the development partners.<sup>11</sup>

### III. THE CAPACITY DEVELOPMENT TECHNICAL ASSISTANCE

#### A. Impact and Outcome

12. The impact will be that national electricity growth rates are met sustainably through deregulation. The outcome will be that a competitive wholesale electricity market is fully established.

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<sup>9</sup> ADB. 1995. *Technical Assistance to the Socialist Republic of Viet Nam for the Improvement of Financial Management of Power Companies*. Manila (TA 2345); Attached to ADB. 1995. *Report and Recommendation of the President to the Board of Directors on a Proposed Loan to the Socialist Republic of Viet Nam for the Power Distribution Rehabilitation Project*. Manila (Loan 1358); ADB. 1997. *Technical Assistance to the Socialist Republic of Viet Nam for Improvement of the Power Sector Regulatory Framework*. Manila (TA 2888); ADB. 1997. *Technical Assistance to the Socialist Republic of Viet Nam for Commercialization of Power Companies*. Manila (TA 2897); ADB. 2001. *Technical Assistance to the Socialist Republic of Viet Nam for Road Map for Power Sector Reform*. Manila (TA 3763); ADB. 2006. *Technical Assistance to the Socialist Republic of Viet Nam for the Power Market Design*. Manila (TA 4768).

<sup>10</sup> ADB. 2012. *Technical Assistance to the Socialist Republic of Viet Nam for Electricity Transmission Pricing Review in the Context of Power Sector Restructuring*. Manila (TA 8302-VIE).

<sup>11</sup> ADB. 2009. *Technical Assistance to the Socialist Republic of Viet Nam for Capacity Building of Renewable Energy Development*. Manila (TA 7262-VIE).

## **B. Methodology and Key Activities**

13. The TA will have two outputs: (i) increased capacity and knowledge of relevant power agencies to operationalize effective wholesale electricity market mechanisms, and (ii) power corporations and the SMO effectively participate in the VWEM.

14. Key activities associated with output 1 are

- (i) a basic training workshop on generic wholesale electricity market mechanisms targeting all VWEM participants,
- (ii) a basic training workshop on the proposed detailed design of the VWEM to all its participants once the detailed design is drafted, and
- (iii) exchange of information and experience with the governments of Indonesia and the Philippines where ADB expects to provide TA to support power sector reforms.

15. Key activities associated with output 2 are as follows:

- (i) An advanced training workshop to strengthen the understanding of power corporations and the NLDC on the functions of distribution companies and SMOs in a generic wholesale electricity market.
- (ii) An overseas study tour to an ADB member with a functioning wholesale electricity market (e.g., the Philippines, Singapore). Participants will be from power corporations, the NLDC, and the ERAV, and they will be expected to present findings and recommendations at a subsequent workshop.
- (iii) An advanced training workshop on the proposed detailed design of the VWEM for the power corporations and NLDC on how their roles and functions will change under the VWEM.
- (iv) An assessment of the detailed design of the VWEM, and the provision of recommendations for the power corporations and NLDC on modifications to their charters, objectives, business registrations, legal status, functions, business models, financing, budgeting, staffing, information and communication technology hardware and software requirements, retrenchment, training requirements, etc. In particular, the information and communication technology requirements include the following:
  - (a) For NLDC, purchasing of a software license and arranging software training for dispatch scheduling and calculation of water value needed to set bid prices of hydropower plants in the electricity market.
  - (b) For the power corporations, upgrade requirements for supervisory control and data acquisition systems, energy management systems, demand management systems, metering systems, and software and tools for managing operation of distribution networks.
- (v) Preparation of action plans and cost estimates to implement the recommended solutions.
- (vi) Monitoring and assistance to support the power corporations and NLDC implement the recommended actions.

## **C. Cost and Financing**

16. The TA is estimated to cost \$780,000, of which \$750,000 will be financed on a grant basis by ADB's Technical Assistance Special Fund (TASF-V). The government will provide counterpart support in the form of counterpart staff, office space, office supplies, secretarial assistance, access to relevant information and data, and other in-kind contributions. The

proceeds of the TA will be disbursed in accordance with ADB's *Technical Assistance Disbursement Handbook* (2010, as amended from time to time).

#### **D. Implementation Arrangements**

17. The TA will be implemented from 1 January 2015 to 31 December 2017. The executing agency is the ERAV, which will handle policy, legal, and regulatory issues. The implementing agencies are (i) the five power corporations (footnote 5); and (ii) the NLDC, which will be transformed into the SMO. A steering committee comprising power sector stakeholders is being established by the Ministry of Industry and Trade and ERAV to decide on policy matters and, with the support of the resident advisors dispatched by ADB, coordinate the development partners' activities.

18. To implement the TA activities, a team of consultants (a consulting firm) will be recruited. The consultants will be engaged by ADB in accordance with ADB's Guidelines on the Use of Consultants (2013, as amended from time to time) using a quality- and cost-based selection method with a 90:10 ratio on the basis of a simplified technical proposal. It is estimated that 20.0 person-months of international consulting services and 4.0 person-months of national consulting services are required. The consultants will include (i) an electricity market expert and team leader (international, 5.5 person-months); (ii) a utility management expert (international, 5.0 person-months); (iii) a system and market operations expert (international, 3.5 person-months); (iv) a corporate financial management expert (international, 3.0 person-months); (v) an information and communication expert (international, 3.0 person-months); and (vi) a power sector expert (national; 4.0 person-months).

19. In addition, a power sector research assistant (national, 2.0 person-months) will be recruited through individual consultant selection to conduct additional research necessary by ADB to ensure that the recommendations made by the consulting firm are suitable for Viet Nam's power sector.<sup>12</sup>

20. Good practices and lessons learned will be disseminated through the uploading of consultants' reports and the TA completion report on the ADB website. They will also be shared with stakeholders in Indonesia and the Philippines, where ADB is expected to support power sector reforms.

#### **IV. THE PRESIDENT'S DECISION**

21. The President, acting under the authority delegated by the Board, has approved the provision of technical assistance not exceeding the equivalent of \$750,000 on a grant basis to the Government of Viet Nam for Establishing the Wholesale Electricity Market, and hereby reports this action to the Board.

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<sup>12</sup> To reduce administrative burden and to improve the economy and efficiency and value for money, all consulting services under the TA will be engaged on output-based (lump-sum) contracts.

## DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
<p><b>Impact</b></p> <p>National electricity growth rates are met sustainably through deregulation</p>	<p>By 2020: Electricity supply increases to 329.4 terawatt-hours<sup>a</sup> (2013 baseline: 127.7 terawatt-hours)<sup>b</sup></p> <p>By 2021: Retail tariff is determined based on market principles (2014 baseline: retail tariff is regulated at levels below cost of supply)</p>	<p>Prime Minister's decision on tariff structure</p> <p>Annual market reports prepared by the SMO</p> <p>EVN annual reports</p>	<p><b>Assumption</b></p> <p>Development partners support the preparation of the competitive retail market</p> <p><b>Risk</b></p> <p>Retail tariff adjustment is met with strong public resistance</p>
<p><b>Outcome</b></p> <p>A competitive wholesale electricity market is fully established</p>	<p>By 2017: New wholesalers are registered (2014 baseline: no wholesalers)</p> <p>By 2017: Bulk supply tariff for the power corporations is abolished (2014 baseline: power corporations purchase all electricity based on regulated bulk supply tariff)</p>	<p>Prime Minister's decisions on power sector structure and tariff structure</p> <p>Annual market reports prepared by the SMO</p> <p>EVN annual reports</p>	<p><b>Assumption</b></p> <p>The government remains committed to introduce market-based principles into the power sector as stipulated by Prime Minister Decisions No: 26/2006/QD-TTg and No. 63/2013/QD-TTg</p> <p><b>Risk</b></p> <p>Market design and rules are not conducive to attracting new wholesalers</p>
<p><b>Outputs</b></p> <p>1. Increased capacity and knowledge of relevant power agencies to operationalize effective wholesale electricity market mechanisms</p>	<p>By 2017: Existing power purchase agreements of the power plants (excluding build-operate-transfer types) are transferred to the power corporations (2014 baseline: power purchase agreements are concluded between power plants and the Electric Power Trading Company)</p> <p>By 2017: Wheeling charges are paid directly by the power corporations to the National Power Transmission Corporation (2014 baseline: wheeling charges are allocated to the National Power Transmission Corporation by EVN)</p>	<p>TA consultant reports</p> <p>Annual market reports prepared by the SMO</p> <p>EVN annual reports</p>	<p><b>Assumption</b></p> <p>Development partners provide timely support to develop the wholesale electricity market design, market rules, and legal and regulatory frameworks</p> <p><b>Risk</b></p> <p>The recommendations made by the TA and by other development partners are not ratified in a timely manner</p>
<p>2. Power corporations and the SMO effectively participate in the VWEM</p>	<p>By 2017: Recommendations for power corporations to adapt to the VWEM and for NLDC to transition into the SMO are adopted</p>		<p><b>Risk</b></p> <p>Legislative actions to change the mandate of the NLDC to transition into the SMO are delayed</p>

<b>Activities with Milestones</b>	<b>Inputs</b>
<p><b>1. Increased capacity and knowledge of relevant power agencies to operationalize effective wholesale electricity market mechanisms</b></p> <p>1.1 Mobilize consultants (February 2015)</p> <p>1.2 Prepare materials for wholesale electricity market mechanisms (basic course) (March 2015)</p> <p>1.3 Conduct workshop on wholesale electricity market mechanisms (basic course) for potential market participants (April 2015)</p> <p>1.4 Prepare materials for wholesale electricity market mechanisms (advanced course) and research on wholesale markets in the region (May 2015)</p> <p>1.5 Conduct workshop on wholesale electricity market mechanisms (advanced course) for potential market participants (June 2015)</p> <p><b>2. Power corporations and the SMO effectively participate in the VWEM</b></p> <p>2.1 Review draft VWEM detailed design (July 2015)</p> <p>2.2 Conduct overseas study tour to ADB member (participants will be from the ERAV, power corporations, and the NLDC [SMO]) (July 2015)</p> <p>2.3 Participants to prepare report on study tour (August 2015)</p> <p>2.4 Conduct workshop to disseminate the VWEM design, market rules, and legal and regulatory framework to potential market participants (August 2015)</p> <p>2.5 Conduct detailed workshop to explain and discuss implications of VWEM design, market rules, and legal and regulatory framework to the power corporations and SMO (August 2015)</p> <p>2.6 Provide feedback to the ERAV and its consultants preparing the VWEM detailed design, market rules, and legal and regulatory framework (September 2015)</p> <p>2.7 Assess current structure of the power sector and the current setup of the power corporations and NLDC (September 2015)</p> <p>2.8 Provide draft recommendations on modifications to power corporations and NLDC to effectively operate in the VWEM (October 2015)</p> <p>2.9 Conduct detailed workshops to explain and discuss the draft recommendations to the power corporations and NLDC (November 2015)</p> <p>2.10 Finalize recommendations for the power corporations and NLDC (December 2015)</p> <p>2.11 Support implementation of the recommendations (December 2017)</p> <p>2.12 Closing of technical assistance (March 2018)</p>	<p><b>ADB: \$750,000</b></p> <p>Note: The government will provide counterpart support in the form of: counterpart staff, office, office supplies, data and information, and other in-kind contributions.</p>

ADB = Asian Development Bank, ERAV = Electricity Regulatory Authority of Vietnam, EVN = Vietnam Electricity, NLDC = National Load Dispatch Center, SMO = system and market operator, TA = technical assistance, VWEM = Viet Nam Wholesale Electricity Market.

<sup>a</sup> Government of Viet Nam. 2011. *Prime Minister Decision 1208/QD-TTg on Approval of National Power Development Plan between 2010 and 2020, with Orientation towards 2030*. Ha Noi.

<sup>b</sup> Government of Viet Nam, Vietnam Electricity. 2014. *Annual Report 2012–2013*. Ha Noi.

Source: Asian Development Bank.

**COST ESTIMATES AND FINANCING PLAN**

(\$'000)

Item	Amount
<b>Asian Development Bank<sup>a</sup></b>	
1. Consultants	
a. Remuneration and per diem	
i. International consultants	483.0
ii. National consultants	34.0
b. International and local travel	82.0
c. Reports and communications <sup>b</sup>	8.0
2. Equipment <sup>c</sup>	60.0
3. Training, seminars, and conferences	
a. Workshops <sup>d</sup>	33.0
b. Overseas study tour <sup>d</sup>	28.0
4. Miscellaneous administration and support costs <sup>e</sup>	1.0
5. Contingencies	21.0
<b>Total</b>	<b>750.0</b>

Note: The technical assistance (TA) is estimated to cost \$780,000, of which contributions from the Asian Development Bank are presented in the table above. The government will provide counterpart support in the form of counterpart staff, office space, office supplies, secretarial assistance, access to relevant information and data, and other in-kind contributions. The value of government contribution is estimated to account for 4% of the total TA cost.

<sup>a</sup> Financed by the Asian Development Bank's Technical Assistance Special Fund (TASF-V).

<sup>b</sup> Includes translation and interpretation.

<sup>c</sup> Includes purchase of software licenses and recurrent annual license fees during the TA estimated at \$60,000. The licenses will be procured in accordance with the Asian Development Bank's *Procurement Guidelines* (2013, as amended from time to time) through the shopping method. The equipment purchased under the TA will be handed over to the executing agency upon completion of the TA activities.

<sup>d</sup> Includes travel by Asian Development Bank team members, as resource persons, to workshops and overseas study tour organized under the TA. The item also includes representation cost, estimated at \$1,000, for the five workshops to be conducted under the TA.

<sup>e</sup> Includes administrative costs such as consumable office supplies.

Source: Asian Development Bank estimates.

## **OUTLINE TERMS OF REFERENCE FOR CONSULTANTS**

### **A. Introduction**

1. The Electricity Regulatory Authority of Viet Nam (ERAV) is in the process of preparing a detailed design of the Viet Nam wholesale electricity market (VWEM), which will be implemented as follows:

(i) **Pilot stage (2015–2019).** During 2015–2017, power corporations will participate directly in the electricity market, and during 2017–2019, competitiveness will be increased by eligible large consumers and new wholesalers entering the market.

(ii) **Full implementation stage (2019–2021).** This stage will see increasing competitiveness and full implementation of electricity market mechanisms.

2. The ERAV is expected to receive assistance from Agence Française de Développement for the preparation of the detailed design. The ERAV has requested the Asian Development Bank (ADB) for technical assistance (TA) to provide support to prepare potential market participants for effective participation in the VWEM.

### **B. Scope of Work**

3. The TA will focus its support on the five distribution companies (known as power corporations) and the National Load Dispatching Center (NLDC), which will become the system and market operator (SMO) under the VWEM. The TA will also provide support to other market participants, including the three generation corporations, the National Power Transmission Corporation, the Electric Power Trading Company (as the single buyer), and other market entrants such as renewable energy investors and potential wholesalers. The TA consultants will build the capacity of the market participants and provide recommendations, particularly, to the power corporations and NLDC. The TA consultants shall also be available to provide support during the implementation of the recommendations. It is expected that the TA consultants are already familiar with the current structure of the power sector in Viet Nam.

### **C. Terms of Reference for Consulting Firm**

4. **Electricity market expert and team leader** (international, 5.5 person-months intermittent). The expert should preferably have at least a master's degree in electrical engineering, energy economics, finance, business administration, and/or an equivalent field. He or she should have at least 15 years of relevant experience including direct engagement in designing and/or operating a wholesale electricity market, have experience working in the Viet Nam power sector, and be fluent in English. The expert's tasks include the following:

- (i) lead the preparation of training materials to be used at the workshops on generic wholesale electricity market mechanisms, including the introduction of various international experiences and best practices;
- (ii) lead the preparation and facilitation of the workshops and study tour, together with the power sector expert, and with the support of the ERAV;
- (iii) lead the preparation of the overseas study tour based on assessments of wholesale electricity markets in several ADB members (and accompany the study tour if deemed necessary by ADB);

- (iv) lead the assessment on the current power market in Viet Nam and the setup of the power corporations and NLDC;
- (v) lead the review of the VWEM's design, market rules, and legal and regulatory framework (including the design in its draft form), and provide recommendations to the ERAV and the market participants through workshops;
- (vi) coordinate the preparation of recommendations, including action plans and cost estimates, on new functions and critical requirements of the power corporations and the SMO for the VWEM; and
- (vii) as the team leader, be responsible for communication with the ERAV, the power sector stakeholders, and ADB; preparation and implementation of workshops; preparation of reports; and the quality of implementation of the TA activities and outputs.

5. **Utility management expert** (international, 5.0 person-months intermittent). The expert should preferably have at least a master's degree in electrical engineering, energy economics, finance, business administration, and/or an equivalent field. He or she should have at least 15 years of relevant experience including experience in advising, managing, and/or working in a power utility (preferably in a distribution company) in a wholesale market environment; have experience working in the Viet Nam power sector; and be fluent in English. The expert's tasks include the following:

- (i) prepare training materials to be used at the workshops on generic wholesale electricity market mechanisms, with particular attention paid to the functions and responsibilities of distribution companies and wholesalers, including the introduction of various international experiences and best practices;
- (ii) provide inputs to the preparation of the overseas study tour based on assessments of wholesale electricity markets in several ADB members (and accompany the study tour if deemed necessary by ADB);
- (iii) lead the assessment on the current status of the five power corporations—identify areas of improvement and provide recommendations, and provide inputs to the workshops;
- (iv) lead the review of the VWEM's design, market rules, and legal and regulatory framework (including the design in its draft form) as they relate to the power corporations, and provide inputs to the workshops;
- (v) lead the preparation of recommendations, including action plans and cost estimates, on new functions and critical requirements of the power corporations for the VWEM; and
- (vi) provide inputs to the reports.

6. **System and market operations expert** (international, 3.5 person-months intermittent). The expert should preferably have at least a master's degree in electrical engineering, energy economics, finance, business administration, and/or an equivalent field. He or she should have at least 15 years of relevant experience including experience in advising, managing, and/or working in an SMO (or its equivalent) in a wholesale market environment; have experience working in the Viet Nam power sector; and be fluent in English. The expert's tasks include the following:

- (i) prepare training materials to be used at the workshops on generic wholesale electricity market mechanisms, with particular attention paid to the functions and



- responsibilities of the SMO, including the introduction of various international experiences and best practices;
- (ii) provide inputs to the preparation of the overseas study tour based on assessments of wholesale electricity markets in several ADB members (and accompany the study tour if deemed necessary by ADB);
  - (iii) lead the assessment on the current status of the NLDC—identify areas of improvement and provide recommendations, and provide inputs to the workshops;
  - (iv) lead the assessment of software needed (including the software currently being used) for NLDC to improve calculation of water value and dispatch scheduling of electricity; arrange purchase of software (and/or license), which shall be procured in accordance with ADB's Procurement Guidelines (2013, as amended from time to time); and arrange training provided by the software company;
  - (v) lead the review of the VWEM's design, market rules, and legal and regulatory framework (including the design in its draft form) as they relate to the SMO, and provide inputs to the workshops;
  - (vi) lead the preparation of recommendations, including action plans and cost estimates, on new functions and critical requirements of the SMO for the VWEM; and
  - (vii) provide inputs to the reports.

**7. Corporate financial management expert** (international, 3.0 person-months intermittent). The expert should preferably have at least a master's degree in finance or business administration and/or have a professional accounting qualification (chartered accountant, certified public accountant, or similar). He or she should have at least 15 years of relevant experience including experience in advising, managing, and/or working in a power utility or equivalent, preferably in a wholesale market environment; have experience working in the Viet Nam power sector; and be fluent in English. The expert's tasks, which are guided in accordance with ADB's Financial Management and Analysis of Projects (2005), include the following:

- (i) prepare training materials to lecture at the workshops on generic wholesale electricity market mechanisms, with particular attention to the financial implications to the power corporations and SMO, drawing on various international experiences and best practices;
- (ii) provide inputs to the preparation of the overseas study tour from the financing and financial management perspectives;
- (iii) review the financial results of the five power corporations and NLDC for 2011, 2012, and 2013 based on financial statements prepared in accordance with International Financial Reporting Standards and audited following international standards on auditing; the review should be based on recent available reviews undertaken by ADB and other donors, and should be used to provide inputs to the workshops;
- (iv) review the financial projections of the five power corporations and NLDC;
- (v) review the VWEM's design, market rules, and legal and regulatory framework (including the design in its draft form) from the financing, financial projection, and financial management perspectives, and provide inputs to the workshops;
- (vi) prepare recommendations, including action plans and cost estimates, on new functions and critical requirements of the power corporations and SMO for the

VWEM in terms of financing, financial projections, and financial management;  
and

- (vii) provide inputs to the reports.

8. **Information and communication technology expert** (international, 3.0 person-months intermittent). The expert should preferably have at least a master's degree in information and communication technology (ICT), electrical engineering, and/or an equivalent field. He or she should have at least 15 years of relevant experience including experience in advising, managing, and/or working in a power utility or equivalent, preferably in a wholesale market environment; and be fluent in English. The expert's tasks include the following:

- (i) prepare training materials to be used at the workshops on generic wholesale electricity market mechanisms, with particular attention to transactions made between the market players and the ICT infrastructure (hardware and software) required, including the introduction of various international experiences and best practices;
- (ii) provide inputs to the preparation of the overseas study tour based on assessments on ICT of wholesale electricity markets in several ADB members;
- (iii) lead the assessment on the current status of ICT infrastructure of the power corporations and NLDC—identify areas of improvement and provide recommendations, and provide inputs to the workshops;
- (iv) lead the review of the VWEM's design and market rules as they relate to the ICT infrastructure of the power corporations and SMO, and provide inputs to the workshops;
- (v) lead the preparation of recommendations, including action plans and cost estimates, on new functions and critical requirements of the power corporations and the SMO for the VWEM as they relate to ICT infrastructure; and
- (vi) provide inputs to the reports.

9. **Power sector expert** (national, 4.0 person-months intermittent). The expert should preferably have at least a bachelor's degree in electrical engineering, energy economics, finance, business administration, and/or equivalent field. He or she should have at least 10 years of relevant experience in the power sector of Viet Nam; have experience working with multilateral and/or bilateral development agencies; and be fluent in English. The expert's tasks include the following:

- (i) provide general advice to the international experts on the status of the power sector in Viet Nam, and provide inputs to the assessment on the current status of the power sector;
- (ii) support the international experts in obtaining and translating relevant documents and information;
- (iii) lead the preparation and facilitation of the workshops and study tour with the support of the ERAV;
- (iv) together with the team leader, liaise closely with the ERAV, power corporations, the SMO, and other market players, and ensure that the latest information is being made available to the consultant team; and
- (v) provide inputs to the reports.

10. **Reporting requirements.** The consultant team will prepare the following reports and training materials:

- (i) inception report confirming the TA project's scope, implementation schedule, milestones, staffing, etc.;
- (ii) training materials for the workshops on generic wholesale electricity market mechanisms;
- (iii) summary report on the implementation of the workshops on generic wholesale electricity market mechanisms including feedback from the participants;
- (iv) report on the study tour including feedback from the participants;
- (v) report and training materials on (a) the current status of the power corporations and the NLDC; (b) a review of the VWEM's design, market rules, and legal and regulatory framework (including the design in its draft form); and (c) areas of improvement and recommendations on new functions and critical requirements for the power corporations and SMO;
- (vi) draft final report and final report including all of the above; and
- (vii) bimonthly progress reports describing activities of the past 2 months and planned activities for the next 6 months.

#### **D. Terms of Reference for Individual Consultant**

11. **Power sector research assistant** (national, 2.0 person-months intermittent). The research assistant should preferably have at least a master's degree in electrical engineering, energy economics, finance, and/or an equivalent field. He or she should have at least 10 years of relevant experience in the power sector of Viet Nam; possess superior analytical skills demonstrated through past assignments (preferably with bilateral or multilateral development institutions); and be fluent in English. The expert's tasks include the following.

- (i) collect information on (a) the current situation of the power market, including the implementation of the ongoing Viet Nam competitive generation market; (b) activities of build–operate–transfer and independent power producer developers; (c) progress in the development of renewable energy resources; (d) development needs and status of the transmission and distribution investments; (e) tariff structure; etc.
- (ii) analyze data and information to derive at recommendations to support ADB staff in reviewing the deliverables of the consulting firm recruited under the TA; and
- (iii) assess the impact of the sector reform on the power sector and advise ADB staff on areas of potential ADB engagement, including a program loan to provide budgetary support required for restructuring the sector.

12. **Reporting requirements.** The research assistant will be required to produce short papers on various topics about which he or she is asked to research.