Technical Assistance Report

Project Number: 42039
Policy and Advisory Technical Assistance (PATA)
December 2012

Socialist Republic of Viet Nam: Electricity Transmission Pricing Review in the Context of Power Sector Restructuring

Asian Development Bank

CURRENCY EQUIVALENTS

(as of 5 November 2012)

Currency unit	–	dong (D)
D1.00	=	$0.0000480
$1.00	=	D20,832.47

ABBREVIATIONS

ADB	–	Asian Development Bank
ERAV	–	Electricity Regulatory Authority of Viet Nam
EVN	–	Viet Nam Electricity
kWh	–	kilowatt-hour
NPT	–	National Power Transmission Corporation
PDMP	–	Power Development Master Plan
TA	–	technical assistance

TECHNICAL ASSISTANCE CLASSIFICATION

Type	–	Policy and advisory technical assistance (PATA)
Targeting classification	–	General intervention
Sector (subsector)	–	Energy (energy sector development)
Themes (subthemes)	–	Economic growth (widening access to markets and economic opportunities), capacity development (institutional development)
Location (impact)	–	Rural (low), urban (low), national (high), regional (medium)

NOTE

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

Vice-President	S. Groff, Operations 2
Director General	K. Senga, Southeast Asia Department (SERD)
Director	A. Jude, Energy Division, SERD
Team leader	D. Schmidt, Energy Specialist, SERD
Team members	T.M. Au, Senior Project Officer (Energy), SERD
	T. Kadono, Energy Specialist, SERD
	M.T. Nieto, Associate Project Analyst, SERD
	P. Rhee, Counsel, Office of the General Counsel

I. INTRODUCTION

1. The Government of Viet Nam requested the Asian Development Bank (ADB) to provide support in developing and implementing a more cost-reflective pricing regime for electricity transmission, an essential element in accommodating grid reliability and access to wholesale competition by 2017 in Viet Nam. The proposed technical assistance (TA) was developed and prepared in close communication and coordination with the Electricity Regulatory Authority of Viet Nam (ERAV). An understanding on the impact, outcome, outputs, implementation arrangements, costs and financing, and terms of reference for the TA was reached on 13 July 2012. The design and monitoring framework is in Appendix1.[1]

II. ISSUES

2. Since enacting the Electricity Law in 2005, Viet Nam has demonstrated a strong commitment to creating a competitive power market and broadening ownership in the sector. The key objectives of unbundling Viet Nam's power sector are (i) improving efficiency through competition, (ii) minimizing costs to consumers, and (iii) increasing financing and managerial resources from outside the state-operated system to meet the sector's investment requirements. A road map approved in 2006 describes the reform process spanning about 20 years and to be implemented in three phases: (i) creating competition in generation activities by allowing power plants to sell electricity to a single buyer (2009–2014), (ii) introducing a competitive wholesale market for bulk sale to distribution companies (2015–2022), (iii) establishing a competitive retail market (from 2023).

3. As of 2012, the key organizations in Viet Nam's power sector are the Directorate General of Energy and ERAV, both under the Ministry of Industry and Trade, and Viet Nam Electricity (EVN). The Directorate General of Energy guides the development of the power sector and is responsible for overall energy planning and policy. ERAV is the regulatory agency, responsible for establishing the power market, power planning, tariff regulation, and licensing. EVN, the country's national power utility, is a vertically integrated holding company responsible for the whole chain of electricity production, transmission, and distribution.

4. Restructuring of the electricity sector began when EVN was established as a holding company in 2006. The National Load Dispatch Center and the Electric Power Trading Company, the country's single buyer, were set up under EVN. The National Power Transmission Corporation (NPT) was established in 2008 as a company wholly owned by EVN. NPT is responsible for investment in, and the management and operation of, 500-kilovolt and 220-kilovolt transmission lines and associated substations. NPT consists of three power project management boards that implement investment projects undertaken by NPT. The northern, central, southern, Ha Noi, and Ho Chi Minh power corporations, established in 2010 and currently wholly owned by EVN, are responsible for the distribution network. In June 2012, decisions[2] were issued to group EVN-owned power generators and to establish three power generation companies wholly owned by EVN. The generation companies will be mainly responsible for undertaking investments in, and managing the operation of, assigned electricity-generating projects. In addition, several state-owned enterprises are involved in independent power generation projects, notably the oil and gas company PetroVietNam and the mining company Vinacomin, and the role of independent power producers is increasing rapidly. During 2011–2020, 46% of new power-generating capacity is planned as coming from foreign and

[1] The TA first appeared in the business opportunities section of ADB's website on 28 November 2012.
[2] Decisions nos. 3023/QD-BCT, 3024/QD-BCT, 3025/QD-BCT.

domestic private sector entities. Equitization of EVN's power generation and distribution companies is in process. However, the government specified that the national transmission network, and large hydro and nuclear power generation projects that are of high importance for socioeconomic and national security needs, will not be privatized.

5. Implementing the reforms cannot be done through unbundling alone. It will require formulating and implementing new regulations and updating existing ones that reform pricing and other mechanisms to allow for developing efficient, financially viable, and operationally sustainable and reliable power market infrastructure.

6. In 2010, Circular 14 Specifying the Methodology for Transmission Pricing was issued, which implements the processes and procedures for development, issuance, and regulation of wheeling charges. In January 2012, Circular 14 was amended mainly to align the review and application time frame of the transmission charge with NPT's fiscal year from 1 January to 31 December (previously the application time frame was from 1 March to 28 February). The current transmission pricing methodology follows the principle of marginal cost pricing under the constraint of a revenue or rate-of-return approach. The methodology does not reflect (i) time and geographical differences, (ii) connection costs, (iii) capacity charges, and (iv) treatment of network congestions. Currently, the transmission tariff is charged 100% to distributors and no charge applies to generators. Furthermore, effective implementation of the regulation is limited as ERAV lacks the required data and data management systems to effectively determine the various components comprising the transmission tariff. Hence, current transmission tariffs do not accurately reflect the cost of supply, which undermines the financial sustainability of the power transmission company, NPT.

7. Although affordability and public welfare must be considered at Viet Nam's stage of development, the government recognizes that changes in power market prices are inevitable to strengthen the financial capacity of power sector entities and allow these entities to implement the large investment requirements (investment needs for Viet Nam's transmission network upgrade and expansion are estimated at $8 billion for 2011–2020). Transmission charges were increased by 14.3% in March 2011 to D77.5 per kilowatt-hour (kWh) and by 7.5% in December 2011 to D83.3/kWh. Furthermore, in line with Viet Nam's reform process to gradually establish a competitive power generation and wholesale market, the current transmission tariff structure needs to be reviewed and made more consistent with the country's power sector developments by ensuring non-discriminatory access to and use of the transmission networks.

8. Recognizing the need to overcome constraints in the power sector, the government approved on 27 July 2011 the national Power Development Master Plan (PDMP) VII. With the PDMP VII, the government laid out a detailed road map and reform framework that emphasizes, among other aspects, strengthening the financial capacity and operational performance of the country's power sector entities. Furthermore, through the undertakings under ADB's Power Transmission Investment Program, a multitranche financing facility, the government agreed to set and implement transmission charges so that NPT can progressively achieve the financial performance objectives of a (i) debt-service coverage ratio of 1.5; (ii) self-financing ratio of 25%; and (iii) debt–equity ratio of 75:25 by 2015, and maintain them thereafter.

9. The TA is strategically aligned with the government's road map and reform framework laid out in the PDMP VII. There, the government specified to gradually increase electricity tariffs

by at least 5% per year from $0.06/kWh in 2010 to $0.08/kWh in 2015. Electricity tariff increases should facilitate the implementation of a more cost-reflective transmission tariff.[3]

10. ADB's country partnership strategy, 2012–2015[4] supports the government's aim to achieve continuous (i) inclusive economic growth, (ii) environmentally sustainable growth, and (iii) regional integration. Coupled with sustained growth in electricity demand, it will require ADB's continuous engagement and long-term commitment in the energy sector with both loans and TA. As Viet Nam is close to 100% electrified and the private sector is increasingly involved in power generation, ADB's Southeast Asia Department will continue to focus its assistance on transmission, one of its areas of strength as identified in the energy sector Assessment, Strategy, and Roadmap for Viet Nam.

11. ADB's Power Transmission Investment Program provides NPT with critical financing support in expanding and upgrading the country's transmission network in line with the objectives and time frame of the PDMP VII.[5] As part of ongoing TA on Increasing the Efficiency of NPT through Targeted Capacity Building, ADB also supports NPT in calculating capital, operational, and other financial expenditures for submission to ERAV in setting and approving transmission prices.[6] By providing assistance in developing and implementing a cost-reflective transmission pricing regime, the TA will effectively complement ADB's infrastructure financing support.[7]

12. Development partner coordination has in the past provided the government and ERAV with opportunities to synergize interventions and capitalize on best practices. The World Bank has over the past 5 years supported ERAV in developing the regulatory framework for electricity retail tariffs and electricity licensing. The World Bank will continue providing support focusing primarily on establishing the regulatory environment for effective demand-side management. With this TA, ADB thus continues to complement existing and ongoing support of development partners in establishing an effective energy-regulating framework in Viet Nam.

III. THE TECHNICAL ASSISTANCE

A. Impact and Outcome

13. The TA will contribute to the efficient operation of a competitive power generation and wholesale electricity market in Viet Nam. The outcome is a cost-reflective, transparent transmission pricing regime.

B. Methodology and Key Activities

14. The TA entails (i) a detailed study of electricity transmission pricing arrangements; (ii) recommendations for improving the current transmission pricing methodology, standards, and procedures in accordance with the establishment of a competitive power generation and

[3] The gradual increase in electricity tariffs is specified as an indicator in ADB's energy sector results framework, 2012–2015 for Viet Nam.
[4] ADB. 2012. *Country Partnership Strategy: Viet Nam, 2012–2015*. Manila.
[5] ADB. 2011. *Report and Recommendation of the President to the Board of Directors: Proposed Multitranche Financing Facility to the Socialist Republic of Viet Nam for the Power Transmission Investment Program.* Manila.
[6] ADB. 2010. *Technical Assistance to the Socialist Republic of Viet Nam for Increasing the Efficiency of the National Power Transmission Corporation through Targeted Capacity Building.* Manila.
[7] The TA is included in ADB. 2012. *Country Partnership Strategy: Viet Nam, 2012–2015*. Manila; and ADB. 2012. *Country Operations Business Plan: Viet Nam, 2012–2015*. Manila.

wholesale market; and (iii) support in determining pricing components for effective implementation of transmission pricing.

15. A set of practical and implementable proposals for transmission pricing arrangements, as well as support in effectively determining various transmission pricing components is to be developed with the objective that electricity transmission charges will (i) be more cost-reflective; (ii) promote socioeconomic growth; (iii) provide fairness to all users of the network and be related to the utilization of the network; (iv) support efficient use of electricity, operation of and investment in the network, so that costs are minimized in the long run; and (v) be transparent.

16. The TA is divided into three outputs:

(i) **Review and assessment of electricity transmission pricing arrangements.** It will involve a comprehensive review of Viet Nam's current transmission pricing methodology, available data, tools, and procedures in determining the various transmission tariff components, the arrangements for transmission pricing reviews, and adjustment mechanisms.
(ii) **Solutions to improve transmission pricing arrangements.** This will entail comparisons with transmission pricing regimes, procedures, and assessment mechanisms in up to five international jurisdictions and recommendations on suitable ways to improve Viet Nam's transmission pricing methodology, procedures, and assessment mechanisms, also in the context of increased regional power trade.
(iii) **Determination of pricing components for effective implementation of transmission pricing.** It will involve comprehensive support in gathering required data; developing standards; updating and, if required, developing data management systems and models, procedures, and mechanisms to set and implement transmission pricing in a transparent manner. It will also include on-the-job training to ERAV staff in sustainably setting, reviewing, and adjusting transmission prices.

C. Cost and Financing

17. The TA is estimated to cost $1,000,000, of which $800,000 will be financed on a grant basis by ADB's Technical Assistance Special Fund (TASF-IV). The government will provide counterpart support in the form of counterpart staff, office space, and other in-kind contributions. The cost estimates and financing plan are in Appendix 2.

D. Implementation Arrangements

18. Implementation of the TA is expected to begin on 1 August 2013 for completion by 31 December 2014 and closing of the TA by 30 June 2015. ERAV will be the executing agency and the Tariffs and Fees Department under ERAV will be the implementing agency. Within ADB, the Energy Division of the Southeast Asia Department will manage the TA. Disbursements under this TA will be in accordance with ADB's *Technical Assistance Disbursement Handbook* (2010, as amended from time to time).

19. A consulting firm will be engaged to provide about 29 person-months of consulting services (21 person-months of international and 8 person-months of national consultants). The consulting team will consist of a transmission tariff policy advisor and team leader (international, 8 person-months), a transmission tariff specialist (international, 8 person-months), a financial

specialist (international, 2 person-months), and two energy specialists (international, 3 person-months; national, 8 person-months). ADB will engage the consultants in accordance with its Guidelines on the Use of Consultants (2010, as amended from time to time). Given the nature and complexity of the assignment, ADB will adopt the quality- and cost-based selection method using a quality–cost ratio of 90:10 and a simplified technical proposal. The outline terms of reference for consultants are in Appendix 3.

20. Progress and findings to achieve the outputs will be reflected in the inception, midterm, and draft and final reports, as well as biweekly progress reports. Consultants will have to undertake the review and assessment of the transmission pricing arrangements within 3 months of starting the assignment and submit their findings as an inception report. The findings will be presented and discussed with stakeholders in a workshop to be organized by the consultants and ERAV. Specification of solutions for improving transmission pricing would need to be completed within 7 months and recommendations will need to be submitted in the form of a midterm report. The consultants and ERAV will organize a stakeholder workshop to discuss and agree on solutions. An agreement will be supported through a memorandum of understanding. The determination of transmission pricing components would need to be completed within 15 months of starting the assignment. All activities and outputs achieved need to be documented and will be part of the draft and final reports. In addition, consultants will be required to submit biweekly progress reports to ERAV and ADB.

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 $800,000 on a grant basis to the Government of Viet Nam for Electricity Transmission Pricing Review in the Context of Power Sector Restructuring, and hereby reports this action to the Board.

DESIGN AND MONITORING FRAMEWORK

Design Summary	Performance Targets and Indicators with Baselines	Data Sources and Reporting Mechanisms	Assumptions and Risks
Impact Efficient operation of a competitive power generation and wholesale electricity market in Viet Nam	Institutional framework established to accommodate transmission grid reliability and access for wholesale competition by 2017	Policies and regulations for implementing key elements of a wholesale power market provided by DGE and ERAV	**Assumption** Continuous commitment by government, through PDMP VII and facility undertakings under the Power Transmission Investment Program, to restructure power sector into a competitive power market
Outcome Implemented cost-reflective, transparent transmission pricing regime	Transmission prices incorporate transparently calculated capacity, connection, and usage charges, as well as profit allowance by 2015	Reports on transmission tariff setting and payments submitted by ERAV to ADB	**Assumption** Continuous commitment by government and power sector stakeholders to implement cost-reflective transmission pricing
Outputs 1. Review and assessment of transmission pricing arrangements	Reviewed transmission pricing arrangements by November 2013	Inception report and workshop prepared by consultants	**Assumptions** Effective work cooperation between the Ministry of Industry and Trade, ERAV staff, and consultants
2. Solutions to improve transmission pricing arrangements	Agreement on implementable improvements by March 2014	Signed memorandum of understanding between DGE, ERAV, and ADB	Effective sourcing of appropriate data from power sector stakeholders
3. Determination of pricing components for effective implementation of transmission pricing	Developed and implemented calculation mechanisms for standards and transmission charge components by November 2014	Completed data models to calculate transmission tariffs	Effective on-the-job training for ERAV staff
	Updated manuals and procedures by November 2014	Completed manuals and procedures	

Activities with Milestones	**Inputs**
1. Review and assessment of transmission pricing arrangements 1.1 Review current methodology used for setting transmission charges (September 2013–November 2013) 1.2 Review data sources, data models, information systems used for calculating, reviewing, and	**ADB** **Technical Assistance Special Fund (TASF-IV): $800,000** **Item** — **Amount** ($'000) Remuneration and per diem for international consultants (21 person-months) — 684.00

Activities with Milestones	Inputs	
adjusting standards and transmission tariff components (September 2013–November 2013) 1.3 Review procedures for setting, reviewing, and adjusting standards and transmission tariff components (September 2013–November 2013) **2. Solutions to improve transmission pricing arrangements** 2.1 Examine international experiences with transmission pricing regimes (December 2013–March 2014) 2.2 Recommend improvements to data sources, models, procedures, methodology, structure, and calculation mechanisms (December 2013–March 2014) 2.3 Agree with stakeholders on recommendations and subsequent support in strengthening capacity to set, review, and adjust transmission tariffs (December 2013–March 2014) **3. Determination of pricing components for effective implementation of transmission pricing** 3.1 Gather relevant data for calculating standards and transmission charge components (April 2014–November 2014) 3.2 Update and develop new models for calculating standards and transmission charge components (April 2014–November 2014) 3.3 Update and develop new procedures and mechanisms for calculating standards and transmission charge components (April 2014–November 2014) 3.4 Provide on-the-job training to ERAV staff (April 2014–November 2014)	Remuneration and per diem for national consultants (8 person-months):	20.00
	International and local travel	36.00
	Reports and communication	10.00
	Seminars, workshops, and training	10.00
	Miscellaneous administration and support costs	10.00
	Contingencies	30.00
	The government will provide counterpart support in the form of counterpart staff, office space, and other in-kind contributions.	

ADB = Asian Development Bank, DGE = Directorate General of Energy, ERAV = Electricity Regulatory Authority of Viet Nam, PDMP = Power Development Master Plan.
Source: Asian Development Bank.

COST ESTIMATES AND FINANCING PLAN
($'000)

Item	Amount
Asian Development Bank[a]	
1. Consultants	
a. Remuneration and per diem	
i. International consultants	684.00
ii. National consultants	20.00
b. International and local travel	36.00
c. Reports and communications	10.00
2. Training, seminars, and conferences	10.00
3. Miscellaneous administration and support costs[b]	10.00
4. Contingencies	30.00
Total	**800.00**

Note: The technical assistance (TA) is estimated to cost $1,000,000, of which contributions from the Asian Development Bank (ADB) are presented in the table above. The government will provide counterpart support in the form of counterpart staff, office, and other in-kind contributions. The value of government contribution is estimated to account for 20% of the total TA cost.

[a] Financed by ADB's Technical Assistance Special Fund (TASF-IV).

[b] Includes translation costs of $5,000.

Source: Asian Development Bank estimates.

OUTLINE TERMS OF REFERENCE FOR CONSULTANTS

1. A consulting firm will be engaged to provide about 29 person-months of consulting services (21 person-months international and 8 person-months national). Given the complexity and importance of the assignment, the quality- and cost-based selection method will be adopted, using a quality–cost ratio of 90:10 and a simplified technical proposal.

2. The following specialists will be required:
   (i) transmission tariff policy advisor and team leader (international, 8 person-months);
   (ii) transmission tariff specialist (international, 8 person-months);
   (iii) financial specialist in energy (international, 2 person-months);
   (iv) energy specialist (international, 3 person-months); and
   (v) energy specialist (national, 8 person-months).

3. A set of practical and implementable proposals for electricity transmission pricing, as well as support in effectively determining various transmission pricing components, is to be developed with the objective that electricity transmission charges will (i) be more cost-reflective; (ii) promote socioeconomic growth; (iii) provide fairness to all users of the network and reflect the utilization of the network; (iv) support efficient use of electricity, operation of and investment in the network, so that costs are minimized in the long run; and (v) be transparent.

4. In undertaking the analysis and developing proposals, recommendations and tools, the related aspects outlined in this section should be considered. Consultants will also be responsible for organizing workshops as described in the implementation arrangements. The electricity transmission pricing review will generate three outputs:

A. Review and Assessment of Electricity Transmission Pricing Arrangements

5. This entails a comprehensive review of the electricity transmission pricing arrangements in place, including an examination of:
   (i) the methodology used for setting transmission charges—(a) applicability of transmission pricing methodology, (b) cost-reflectivity of transmission pricing methodology and its impact on the financial viability of the power transmission company, (c) effectiveness of applying transmission pricing methodology and the reasons for it, (d) appropriateness of review period and adjustment mechanism, and (e) possible deficiencies in applying transmission pricing methodology;
   (ii) the current data sources, data models, and information systems used for setting, reviewing, and adjusting standards and transmission tariff components in accordance with the transmission pricing methodology—(a) existence, adequacy, consistency, and completeness of data for determining transmission charge components; (b) existence, adequacy, consistency, and completeness in calculating standards and indexes for determining transmission charge components; (c) existence, adequacy, consistency, and completeness of data models and data structure for calculating standards and transmission charge components; (d) applicability and accuracy in calculating standards and determining transmission charge components; and (e) possible deficiencies in the above aspects;
   (iii) current procedures for setting transmission charges—(a) applicability of the methodology for setting, reviewing, and adjusting transmission charges; (b) applicability of procedures used for setting, reviewing, and adjusting

transmission charges; (c) staff capacity in determining, reviewing, and adjusting the components of the transmission tariff; (d) availability of staff manuals, their applicability, adequacy and user friendliness for setting, reviewing, and adjusting transmission charges; and (e) possible deficiencies in procedures and their use.

B. Solutions to Improve Transmission Pricing Arrangements

6. The identification of appropriate data sources, models, procedures, transmission charge methodology and structure, and calculation mechanisms for standards and transmission tariff components to improve the current transmission pricing arrangements in Viet Nam will include comparisons of experiences in up to five international jurisdictions and the potential to adopt similar approaches for Viet Nam. This should take into account the country's energy market structure, such as pricing granularity, market design, connection costs, shared network costs, time of use, and geographical signals. Proposed solutions should factor in:

(i) applicability of transmission charges to different network users;
(ii) impact on the different network users of incorporating additional transmission pricing components in the transmission tariff structure;
(iii) cost reflectivity of the transmission pricing methodology;
(iv) expected level of transmission charges;
(v) financial viability of the power transmission company;
(vi) suitability for enhancing regional (cross-border) power trade;
(vii) merits, adequacy, and timing of introducing time-of-use and geographical signals, capacity charges, connection charges, and treatment of network congestions;
(viii) accessibility to data, information sources, and models including information technology system, data, model, and procedural, human resource requirements, and associated costs;
(ix) short-, medium- and long-term financial and economic costs and benefits for implementing a change in transmission pricing arrangements, including impact on electricity retail tariff;
(x) timing for any changes to the transmission pricing structure, including the transition process for amendments, and accounting for the government's commitment;
(xi) adequate time frame and index mechanism for transmission, pricing adjustments, and the criteria to be used in conducting regular reviews; and
(xii) any other related issues, as appropriate.

C. Determination of Pricing Components for Effective Implementation of Transmission Pricing

7. This output entails:

(i) gathering required data, as well as updating and, if required, developing new models, procedures, and mechanisms for calculating standards and transmission charge tariff components following the agreements reached under outputs A and B, including (a) determination of the standard profit allowance and assessment of weighted average cost of capital, (b) determination of the capacity charge component, (c) determination of the connection charge component, (d) determination of unit costs for transmission revenue requirements, and (e) determination of any other standards and transmission charge components as identified under outputs A and B;

(ii) revising and developing staff manuals and guidelines for setting, reviewing, and adjusting transmission price components; and

(iii) providing on the job-training to staff of the Electricity Regulatory Authority of Vietnam responsible for setting, reviewing, and adjusting transmission price components.