



Public Disclosure Authorized

Public Disclosure Authorized

Public Disclosure Authorized

VIETNAM

MAXIMIZING FINANCE FOR DEVELOPMENT IN THE ENERGY SECTOR

DECEMBER 2018



ACKNOWLEDGMENTS

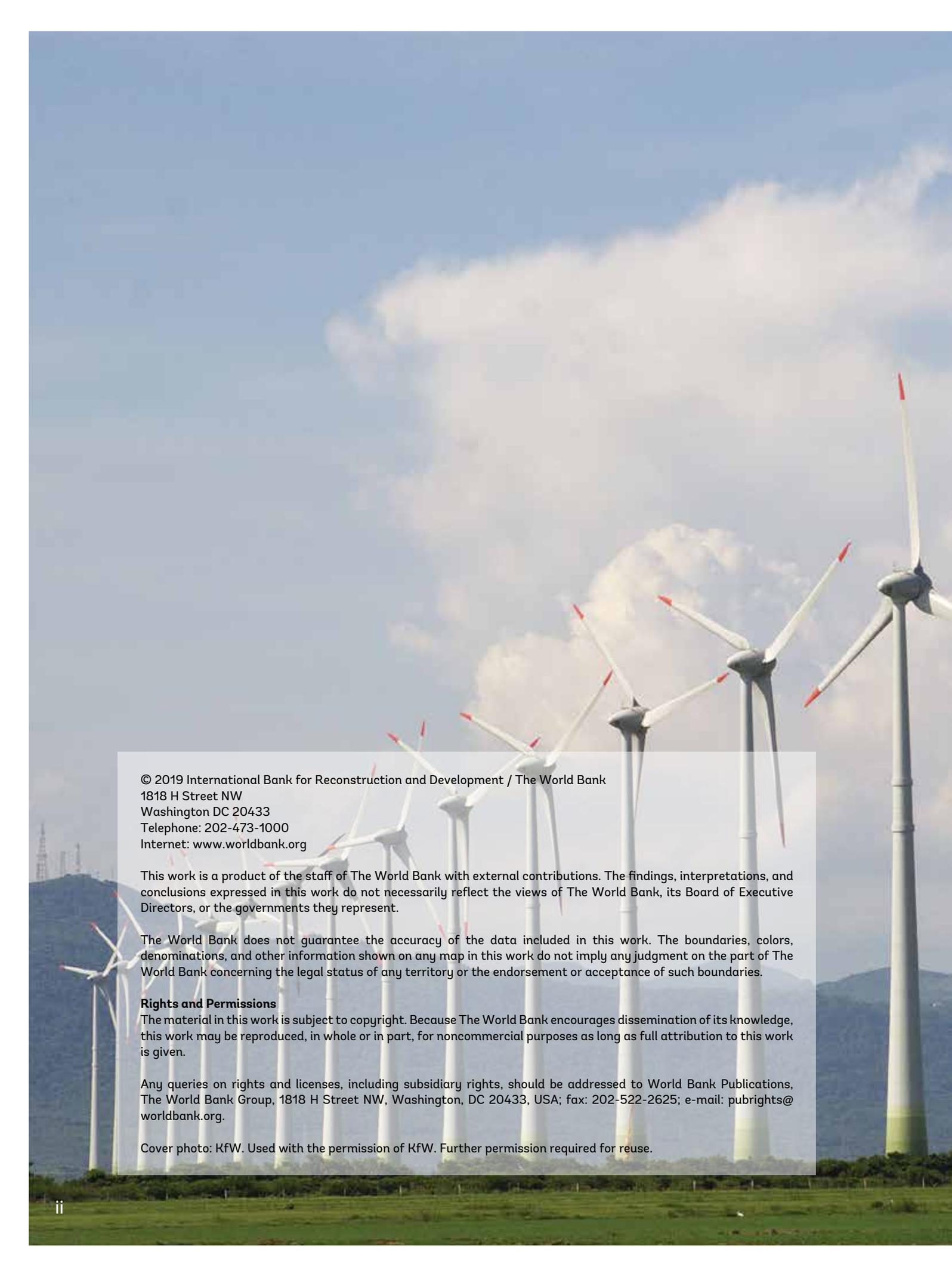
This report was prepared by a core team led by Franz Gerner (Lead Energy Specialist, Task Team Leader) and Mark Giblett (Senior Infrastructure Finance Specialist, Co-Task Team Leader). The team included Alwaleed Alatabani (Lead Financial Sector Specialist), Oliver Behrend (Principal Investment Officer, IFC), Sebastian Eckardt (Lead Country Economist), Vivien Foster (Lead Economist), and David Santley (Senior Petroleum Specialist).

Valuable inputs were provided by Pedro Antmann (Lead Energy Specialist), Ludovic Delplanque (Program Officer), Nathan Engle (Senior Climate Change Specialist), Hang Thi Thu Tran (Investment Officer, IFC), Tim Histed (Senior Business Development Officer, MIGA), Hoa Nguyen Thi Quynh (Financial Management Consultant), Towfiqua Hoque (Senior Infrastructure Finance Specialist), Hung Tan Tran (Senior Energy Specialist), Hung Tien Van (Senior Energy Specialist), Kai Kaiser (Senior Economist), Ketut Kusuma (Senior Financial Sector Specialist, IFC), Ky Hong Tran (Senior Energy Specialist), Alice Laidlaw (Principal Investment Officer, IFC), Mai Thi Phuong Tran (Senior Financial Management Specialist), Peter Meier (Energy Economist, Consultant), Aris Panou (Counsel), Alejandro Perez (Senior Investment Officer, IFC), Razvan Purcaru (Senior Infrastructure Finance Specialist), Madhu Raghunath (Program Leader), Thi Ba Chu (Energy Specialist), Alan Townsend (Senior Industry Specialist, IFC), and Hin Lung Yuen (Senior Infrastructure Finance Specialist).

The team would like to thank the government of Vietnam, development partners, and members of the private sector for their valuable written comments and contributions to drafting of the report, including: Ministry of Industry and Planning (MPI); Ministry of Finance (MOF); Ministry of Industry and Trade (MOIT); Electricity Vietnam (EVN); PetroVietnam (PVN); the Vietnam Business Forum (VBF); and the following international financial institutions and development partners: ADB, KfW, JICA, AFD, and REXIM.

Overall guidance on the report was provided by Ousmane Dione (Country Director, Vietnam), Ranjit Lamech (Director, Energy and Extractives), Julia Fraser (Practice Manager, Energy and Extractives), and Kyle Kelhofer (Senior Manager, IFC).

The report has benefited from the excellent comments of peer reviewers Martin Raiser (Country Director, Brazil), Ulrich Zachau (Country Director, Colombia and Venezuela) and Omar Chaudry (Head, Development Impacts and Strategy, IFC).



© 2019 International Bank for Reconstruction and Development / The World Bank
1818 H Street NW
Washington DC 20433
Telephone: 202-473-1000
Internet: www.worldbank.org

This work is a product of the staff of The World Bank with external contributions. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent.

The World Bank does not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Rights and Permissions

The material in this work is subject to copyright. Because The World Bank encourages dissemination of its knowledge, this work may be reproduced, in whole or in part, for noncommercial purposes as long as full attribution to this work is given.

Any queries on rights and licenses, including subsidiary rights, should be addressed to World Bank Publications, The World Bank Group, 1818 H Street NW, Washington, DC 20433, USA; fax: 202-522-2625; e-mail: pubrights@worldbank.org.

Cover photo: KfW. Used with the permission of KfW. Further permission required for reuse.

CONTENTS

▶	ACKNOWLEDGMENTS	i
▶	GRAPHS	iv
▶	TABLES	v
▶	ABBREVIATIONS	vi
▶	EXECUTIVE SUMMARY	1
REPORT		
▶	1. Why This Study Now?	8
▶	2. How Much Does Vietnam Need to Invest in Energy?	10
	2.1 Electricity Sector	14
	2.2 Gas Sector	16
▶	3. How Has Vietnam Financed the Energy Sector to Date?	18
	3.1 Electricity Sector	19
	3.2 Gas Sector	26
▶	4. What Constraints Impede the Raising of Additional Capital?	28
	4.1 Constraints Affecting PPPs/IPPs	29
	4.2 Constraints Affecting corporate finance by SOEs	33
	4.3 Constraints Affecting Debt and Local Capital Markets	35
▶	5. What Needs to Be Done to Unlock New Sources of Finance?	38
	5.1 Pillar 1: Develop a Major IPP/PPP Program to Build Investor Confidence	41
	5.2 Pillar 2: Prepare Electricity and Gas SOEs to Access Commercial Finance	44
	5.3 Pillar 3: Embark on a Program to Increase the Availability of Local-Currency Finance	49
ANNEXES		53
	1. Macroeconomic Profile	53
	2. Financial Sector Profile	60
	3. Electricity Sector Profile	74
	4. Natural Gas Sector Profile	88
	5. Public Private Partnerships Framework	101

GRAPHS

Graph 1	Historic and Forecast Trends in Electricity Demand (2000–2030)	14
Graph 2	Historic and Forecast Trends in Natural Gas Demand (2005–35)	16
Graph 3	13.1 GW (US\$11.3 billion) Private Sector Participation in Power Generation (1990–2017)	23
Graph 4	Planned Evolution of Market Structure for Power Generation	25
Graph 5	Estimated Foreign Exchange Convertibility Requirements (2017–30)	30
Graph 6	Benefits of Access to Cross-Border Financing	32
Graph 7	Interest Rates on Local Currency Deposits by Duration	36
Graph 1.1	Sluggish Investment Since the Global Financial Crisis	54
Graph 1.2	External Accounts and Total Reserves	54
Graph 1.3	Stable Exchange Rate	55
Graph 1.4	Sizeable Fiscal Imbalances	56
Graph 1.5	Fiscal Support to EVN (% of GDP)	58
Graph 2.1	Total Banking Sector Assets and Credit Growth	60
Graph 2.2	Vietnam’s Total Credit / Vietnam’s GDP	60
Graph 2.3	Banking Sector LDR and Liquidity	61
Graph 2.4	Average Interest Rate	62
Graph 2.5	Loans and Deposits of SOCBs	62
Graph 2.6	Loans and Deposits in JSCBs	63
Graph 2.7	Government Bonds	65
Graph 2.8	Market Size and Growth of the Insurance Sector (US\$ bn)	66
Graph 2.9	Deposits / Loans by Currency	68
Graph 2.10	Sources of Budget Financing for Infrastructure —Domestic versus Foreign	71
Graph 2.11	Energy Investments in Vietnam Compared to Other EAP Countries (last 10 years).....	73
Graph 3.1	Capacity by Fuel and Ownership	74
Graph 3.2	Installed Generation Capacity and Systemwide Reserve Margin (2000–16)	75
Graph 3.3	Improvement in Power System Performance	75
Graph 3.4	Electricity Sector Reform Roadmap	77
Graph 3.5	Annual Revenues and Collection Rates	79
Graph 3.6	Solvency and Liquidity	80
Graph 3.7	Profitability	81
Graph 3.8	Generation Investment Plan to 2030	83
Graph 4.1	Overview of Gas Fields	88
Graph 4.2	Gas Demand by Region (2006–2016)	89
Graph 4.3	Gas Demand Composition (2006–2016)	89
Graph 4.4	Annual Revenues (VND trillion)	94
Graph 4.5	Solvency and Liquidity	95
Graph 4.6	Profitability	95

TABLES

Table 1	Historic Investment Trends and Forecast Investment Needs for the Power Sector (US\$ billion)	15
Table 2	EVN Debt Financing Requirements (US\$ billion)	16
Table 3	Historic Investment Trends and Forecast Investment Needs for the Gas Sector (US\$ billion)	17
Table 4	Overview of Fiscal Support Instruments	20
Table 5	Capital Raised by EVN through Partial Generation Asset Sales (2010–2016)	21
Table 6	Total EVN Borrowing 2010–2016 (US\$ billion)	21
Table 7	Planned Energy Lending Volumes of 6 Major IFIs/DPs in Vietnam (US\$ million)	24
Table 8	Estimated Current Sources of Financing for the Energy Sector (US\$ billion)	35
Table 9	Unlocking Financial Resources for Energy Investments	40
Table 10	Pillar I Recommended Actions – Develop Major IPP/PPP Program	44
Table 11	Pillar II Recommended Actions – Prepare Energy Companies to Access Commercial Finance	48
Table 12	Pillar III Recommended Actions – Improve the Availability of Local Currency Finance	51
Table 2.1	Selected Banks and Their Involvement in Electricity Sector (2016)	63
Table 2.2	Size of Bond Market as Percentage of GDP	64
Table 2.3	Estimated Current Sources of Financing to the Energy Sector (US\$ billion)	68
Table 3.1	Key Parameters for Future Power Sector Structure	78
Table 3.2	Installed Generation Capacity under RPDP7 2015–2030 (GW) – Base Case	82
Table 3.3	Three Scenarios for Renewable Energy Additions under RPDP7 (GW) for Base Case Demand Forecast	82
Table 3.4	Historic Investment in Power Generation (US\$ billion)	82
Table 3.5	Historic Network Investment (US\$ billion)	83
Table 3.6	Forecast Investment in Transmission and Distribution by 2030 (US\$ billion)	84
Table 3.7	Current Feed in Tariffs (FITs)	84
Table 3.8	Average Retail Tariff Increases (2009–2017)	86
Table 4.1	Upstream Gas Production	88
Table 4.2	GMP Directives for Gas Market Development	91
Table 4.3	Current Governance Structure of Vietnam’s Petroleum, Gas, and Power Industry	94
Table 4.4	Key Gas Development Sources and Sequencing	97
Table 4.5	Historic Gas Pipeline Investments	97
Table 4.6	Midstream Gas Sector Investment Plan by Segment (US\$ million)	98
Table 4.7	Proposed LNG Import Terminals	98
Table 5.1	Existing Build Operate Transfer (BOT) Power Plants	105

ABBREVIATIONS

ADB	Asian Development Bank	FITs	Feed-in Tariffs
AFD	Agence Française de Développement	FOREX	Foreign Exchange
AiIB	Asia Infrastructure Investment Bank	FSRU	Floating Storage Regasification Unit
BCM	Billion Cubic Meters	GDP	Gross Domestic Product
BIDV	Bank for Investment and Development of Vietnam	GENCOs	Generation Companies
BLT	Build-Lease-Transfer	GGU	Government Guarantee Undertakings
BOO	Build-Own-Operate	GMP	Gas Master Plan
BoP	Banlance of Payment	GSA	Gas Supply Agreement
BOT	Build-Operate-Transfer	GW	Gigawatt
BST	Bulk Supply Tariff	HAGL	Hoang Anh Gia Lai
BT	Build-Transfer	HCMPC	Ho Chi Minh City Power Corporation
BTL	Build-Transfer-Lease	HPC	Hanoi Power Corporation
BTO	Build-Transfer-Operate	IBRD	International Bank for Reconstruction and Development
CAGR	Compounded Annual Growth Rate	IDA	International Development Association
CAPEX	Capital Expenditure	IFC	International Finance Corporation
CARs	Capital Adequacy Ratios	IFIs	International Financial Institutions
CCGT	Combined Cycle Gas Turbine	IFRS	International Financial Reporting Standards
CfDs	Contracts for Differences	IPO	Initial Public Offering
CNG	Compressed Natural Gas	IPPs	Independent Power Producers
CO ₂	Carbon Dioxide	JICA	Japan International Cooperation Agency
COP 21	21st Conference of the Parties to the UN Framework Convention on Climate Change	JSCBs	Joint Stock Commercial Banks
CPC	Central Power Corporation	JSCs	Joint Stock Companies
CTF	Clean Technology Fund	KEXIM	Korea Eximbank
CTG	Vietnam Commercial Bank for Industry and Trade	KfW	Kreditanstalt für Wiederaufbau
CVX	Ca Voi Xanh	LDR	Loan to Deposit Ratio
DPs	Development Partners	LDUs	Local Distribution Units
EAP	East Asia and Pacific	LLA	Land Lease Agreement
EPTC	Electricity Power Trading Company	LNG	Liquefied Natural Gas
ERAV	Electricity Regulatory Authority of Vietnam	LPG	Liquefied Petroleum Gas
EU	European Union	MFD	Maximizing Finance for Development
EVN	Electricity Vietnam		
FCCL	Fiscal Commitment and Contingent Liabilities		
FDI	Foreign Direct Investment		

MIGA	Multilateral Investment Guarantee Agency	PV	Photovoltaics
MMBTU	British Thermal Unit	PVPower	PetroVietnam Power Corporation
mmscm	Million Standard Cubic Meter	PVEP	PetroVietnam Exploration and Production Corporation
MOF	Ministry of Finance (Vietnam)	PVGas	PetroVietnam Gas Corporation
MOIT	Ministry of Industry and Trade (Vietnam)	PVN	Petro Vietnam
MOLISA	Ministry of Labour - Invalids and Social Affairs (Vietnam)	RPDP7	Revised Power Sector Development Plan 7
MOU	Memorandum of Understanding	SB	Single Buyer
MPI	Ministry of Planning and Investment (Vietnam)	SBV	State Bank of Vietnam
NDC	Nationally Determined Contributions	SHB	Saigon Hanoi Bank
NLDC	National Load Dispatch Center	SHP	Small Hydropower Project
NPC	Northern Power Corporation	SMO	System and Market Operator
NPLs	Non-performing Loans	SOEs	State-owned Enterprises
NPT	National Power Transmission Corporation	SPC	Southern Power Corporation
ODA	Official Development Assistance	TCT	Techcombank
O&M	Operation and Maintenance	TKV	Vietnam National Coal and Mineral Industries Holding Corporation Limited (Vinacomin)
PC	Power Corporation	VAMC	Vietnam Asset Management Company
PDP8	Power Sector Development Plan 8	VCB	Vietcombank
PPA	Power Purchase Agreement	VCGM	Vietnam Competitive Generation Market
PPI	Private Participation in Infrastructure	VDB	Vietnam Development Bank
PPP	Public Private Partnerships	VND	Vietnam Dong
PSC	Production Sharing Contract	VWEM	Vietnam Wholesale Electricity Market



Children at Resettlement Village
of Trung Son Hydropower Project

The background of the page features a photograph of several children, likely in a rural or ethnic region of Vietnam. They are wearing traditional, colorful clothing with intricate patterns. The children are looking towards the camera with neutral expressions. The overall tone is soft and humanistic, contrasting with the technical nature of the text.

Executive Summary

MAXIMIZING FINANCE FOR DEVELOPMENT IN VIETNAM'S ENERGY SECTOR

Vietnam has successfully developed the electricity and gas sectors that have contributed substantially to the economic development of Vietnam. To date, near-universal electrification has been achieved, and the industrial, commercial, and residential sectors benefit from increasingly reliable electricity and gas supply. By early 2018, 99.9 percent of the country's communes and 99 percent of its rural households were connected to the grid. Both EVN and PVN, the state-owned electricity and gas utilities, are operationally and technically strong.

Vietnam has a hydro-based power system, claiming 38 percent of installed capacity in 2017, followed by coal (34 percent) and natural gas (18 percent). Future investment requirements in generation are huge, and the country is expected to increase generation capacity from the current 42 GW to 100 GW by 2030. Because most domestic hydropower resources have already been developed, and to reduce the planned scale-up of coal-fired power generation, Vietnam has established renewables targets for solar and wind (18 GW by 2030).

Starting in 1995, PVN, jointly with international oil and gas companies, developed large-scale gas fields in offshore central and southern Vietnam. In 2017, total offshore gas production was about 10 bcm, mostly destined for gas-to-power. PVN is one of the most significant enterprises operating in the Vietnamese economy, accounting for about 20 percent of national GDP and contributing to 20–30 percent of state budget revenues.

To improve the efficiency of the gas and power sector, the government has embarked on introducing competition in those sectors. Electricity liberalization started in 2004 with the unbundling of EVN, the establishment of a regulator, and the introduction of a competitive generation market to ensure long-term sustainability of the power supply. The wholesale electricity market will be fully operational by 2021, allowing large eligible consumers to contract directly with power generators. The government is embarking on a similar liberalization process for gas, is currently preparing a relevant restructuring roadmap for PVN, and introducing a legal and regulatory framework for promoting LNG development, especially for gas-to-power.

Executive Summary

The purpose of this study is to explore ways of maximizing finance for development (MFD) for the electricity and gas sector in Vietnam. The report identifies financing needs and constraints for the electricity and natural gas sectors from 2018 through 2035 and outlines a roadmap for seizing these opportunities.

Vietnam has experienced double-digit growth in energy demand, calling for continued high levels of investment in the electricity and gas sectors.

- *Electricity.* In the electricity sector demand has grown at a compound annual growth rate of 13 percent since 2000 and is projected to continue to grow at 8 percent through 2030. The government estimates that generation capacity needs to increase from the current 42 GW to 60 GW by 2020 and to 100 GW by 2030. This would require the installation of 5 GW annually between 2018 and 2030, which poses huge technical, administrative, and financial challenges. High levels of historic investment at close to US\$8 billion annually will need to be further increased to about US\$8–12 billion annually frontloaded through 2030, with an increasing shift toward investments in renewable energy, thermal generation, and network infrastructure.
- *Natural gas.* Natural gas will play a critical role in satisfying future energy demand in the electricity and industrial sectors, and Vietnam's Gas Master Plan (GMP) shows gas demand growing from the current 10 bcm/year up to 30 bcm/year by 2035. However, even with the planned development of two new offshore gas fields, domestic gas production will fall short of projected demand, and LNG imports will comprise more than half of total gas supply by 2035. Cumulative investment needs for the period 2015–35 are estimated at around US\$20 billion, including upstream production facilities, pipelines, gas treatment facilities, and LNG infrastructure.

Vietnam's traditional financing model for energy infrastructure has relied mostly on public investment by state-owned enterprises (EVN and PVN), backed by government guarantees, with significant domestic and international private sector participation.

- *Electricity.* The bulk of power generation as well as all network infrastructure has been funded through the balance sheet of EVN. The Ministry of Finance (MOF) on-lends concessional, foreign currency-denominated resources from international financial institutions (IFIs) and development partners (DPs) to EVN at less than concessional rates. The MOF also guarantees EVN's direct borrowing from local and international commercial banks. About 30 percent of generation capacity (13 GW) has been developed by the domestic and international private sector under build-transfer-operate (BOT) arrangements, often accompanied by government support in the form of a government guarantee undertaking (GGU) and guarantees, mainly for large thermal power plants financed by international investors. Only private sector investments in small hydropower plants (about 3 GW) have generally been made without any government support.
- *Natural gas.* The national oil and gas company, PVN, has been primarily responsible for the development of the natural gas sector. In upstream exploration and production, it enters into production-sharing contracts (PSCs) with international oil companies. In the case of midstream gas pipelines, about half of all investments have been undertaken

under BOT contracts with international investors. The downstream gas sector has been financed and developed by PV Gas, a fully owned PVN subsidiary.

The changing macroeconomic and sectoral context mean that the traditional approach to financing electricity and gas investments is no longer sustainable.

- *Electricity.* Vietnam's public debt ceiling is approaching the statutory limit of 65 percent of GDP. This means that for some years to come there will be limited fiscal space available for either direct public borrowing or government guaranteed borrowing that counts toward the statutory limit. At the same time, Vietnam's middle-income status is reducing the availability of highly concessional financing. Moreover, the current power sector reform and liberalization process, the scaling up of renewables, and the planned equitization and divestiture of EVN's generation subsidiaries creates opportunities to explore new approaches to financing the energy sector. A major milestone has been the positive Fitch credit rating of EVN from June 6, 2018, at BB—Outlook Stable (equal to Vietnam's sovereign rating). That rating may now provide EVN access to international capital markets on a nonsovereign basis, as well as provide the private sector with more certainty on the financial viability of the utility when signing long-term power purchase agreements (PPAs).
- *Natural gas.* Development of Vietnam's next generation of gas fields will require large investments at a time when, due to lower oil prices, PVN is financially stretched. At the same time, the need for new investments in midstream gas infrastructure and the challenges being encountered in moving forward with LNG import projects are exposing weaknesses in Vietnam's existing gas market structure and pricing regime, under which PVN is the monopoly midstream player and gas prices are based on bilateral negotiations referencing low-cost fields developed prior to 2007. A comprehensive gas liberalization and PVN restructuring strategy is needed for the development of the domestic gas market. Limited domestic gas reserves and current attractive LNG prices require the exploration of the potential use of floating storage and regasification units (FSRUs) as a means of speeding up regasification terminal development and lowering financing requirements, increasing flexibility, and reducing risk associated with LNG to fill the supply and demand gap.

Given the limited fiscal headroom and the reduction in the amounts of highly concessional financing available moving forward, it will be important for Vietnam to start mobilizing other sources of financing for the electricity and gas sector.

- *Commercial financing.* Aside from public funding and concessional financing from IFIs and DPs, the main source of financing will be from the private sector, which will typically provide financing on nonconcessional, i.e., commercial terms. There are many commercial banks (both domestic and international) that are willing to lend to well-structured projects, and there are also currently trillions of dollars sitting with institutional investors (e.g., pension funds and insurance companies) that are beginning to look at emerging market infrastructure as a possible investment class because of the returns on these assets and because these infrastructure assets are typically long-term in nature, which matches their long-term insurance and pension liabilities.

Executive Summary

- *PPPs/IPPs.* There are many benefits that can be derived through Vietnam entering into a partnership with the private sector to deliver infrastructure, including: (i) access to private sector financing (thereby reducing the upfront funding burden on the state); (ii) technical skills; and (iii) efficiencies in terms of delivery (design, construction, and operation). Hence, the private sector can often design, build, and operate energy infrastructure at a lower overall cost and more efficiently than the public sector can, while also delivering the project on time and within budget.
- *Blended financing.* It will be important for Vietnam to leverage its limited fiscal resources to try and maximize financing from other sources. Sometimes, the optimum approach may be to blend concessional financing with commercial financing to help encourage commercial financing to come into the project and ensure it is feasible from a private sector's perspective.

Looking ahead, the following constraints will need to be addressed to unlock new sources of financing for the energy sector.

- *Constraints affecting PPPs/IPPs.*
 - o *Ambiguous and changing legal framework.* The government has recently replaced Decree No. 15/2015/ND-CP with Decree No. 63/2018/ND-CP. Under the previous Decree No. 15, no new PPP projects had been successfully procured because government agencies preferred to make use of the relevant investment law provisions to procure projects, as these were seen to be less stringent with respect to the preparation of feasibility studies and the application of competitive procurement procedures. Decree No. 63 only came into effect in June 2018, and while it does provide much needed clarification in some areas, it will be interesting to see whether this new Decree will act as a catalyst for the successful procurement of PPP projects.
 - o *Risk allocation.* Several projects from Vietnam's "second wave of independent power projects" from 2007/08 have yet to reach financial closure one decade later due to protracted negotiations over risk allocation, including suitable government supports. The PPAs issued for renewable energy (small hydro, solar PV, wind, biomass, and solid waste-to-energy)¹ are not considered bankable by international investors for project finance due to a risk allocation that is not in line with international best practice; this inhibits foreign expertise and potentially cheaper cross-border capital into the Vietnamese renewables sector. To scale up renewables deployment, there is a need for unified and well-defined risk allocation in project contracts, consistent with international best practices and adapted to Vietnamese requirements.
 - o *Government support.* Although the legal framework allows government support to be provided, there is currently no clear and transparent policy on the provision of such government support to electricity and gas projects and its fiscal implications (particularly in relation to contingent liabilities).

¹ Circular No. 32/2014/TT-BCT for small hydro; Circular No. 44/2015/TT-BCT for biomass; Circular No. 32/2015/TT-BCT for solid-waste-to-energy; Circular No. 32/2012/TT-BCT for wind; Circular No. 16/2017/TT-BCT for solar.

- o *Foreign exchange convertibility.* Despite Vietnam having removed controls on currency convertibility, foreign investors remain concerned about the long-term availability of foreign exchange and usually require government convertibility undertakings.
- o *Alignment of electricity and gas.* There is a need for tighter operational and contractual alignment of gas and electricity projects, given that the power sector consumes 80 percent of natural gas production. In particular, the bankability of gas purchase agreements critically hinges on the bankability of the related downstream power purchase agreements, necessitating closer coordination among both sectors moving forward.
- *Constraints affecting corporate finance by SOEs.* Both EVN and PVN are large state-owned enterprises that should, in principle, be able to raise their own corporate finance based on the strength of their balance sheet, without recourse to government guarantees. In the case of EVN, although the company is efficiently run, the government's constraints to raise tariffs from US\$0.076 per kilowatt-hour (covering operating costs and debt service only) to full cost-recovery levels of about US\$0.12 per kilowatt-hour (also covering capital expenditures) for social, macroeconomic, and political reasons has left the company financially weakened. The recently completed Fitch credit rating of EVN at BB—Outlook Stable—has created a positive momentum, allowing EVN more opportunities to access offshore financing on a nonsovereign basis. In the case of PVN, volatile oil prices and the company's extensive diversification beyond its core business has led to a weakening of its financial position; and the government now has plans to divest PVN subsidiaries, both in core and noncore businesses to raise financing, bring in private sector capital and expertise, and create a more efficient gas market.
- *Constraints affecting local capital markets.* Despite sizeable domestic savings of US\$60 billion annually, deficiencies in the local banking sector and capital markets limit the extent to which these resources can be channeled into energy projects, which require long-tenor and fixed-interest debt.
 - o *Domestic commercial banks.* These banks have outstanding loans of US\$250 billion but are heavily skewed toward short- and medium-term lending (up to 3 years maturity), reflecting the lack of long-term deposits and the flat yield curve by deposit duration. At the same time, there is a lack of technical capacity in the banking sector to evaluate new types of energy projects, such as renewables and LNG.
 - o *Stock exchange.* While there is a stock exchange in Vietnam, market liquidity is low and the market is dominated by state-controlled companies.
 - o *Bond market.* The corporate bond sector remains in its infancy, with total issuances under 1 percent of GDP and a shortage of suitable large corporates that could issue bonds.
 - o *Institutional investors.* Resources maintained by longer-term investors like public pension funds and insurance companies remain modest (US\$25 billion), and their investments are mostly confined to government bonds.

Executive Summary

Tapping new and larger sources of finance for much-needed energy infrastructure investment requires a major coordinated policy effort organized along three pillars, which will in turn help to achieve a gradual transformation of the electricity and gas sector.

Pillar I: Develop multiyear IPP/PPP programs to build investor confidence.

To achieve the kind of scale-up of IPPs/PPPs needed to deliver the next wave of energy investments, there will need to be a well-designed programmatic approach rolled out over the next few years, especially for power generation. While Vietnam has recently made progress in harmonizing and integrating the legal framework for PPPs, this still falls well short of what is needed to kick-start a major new program of PPPs/IPP on the scale needed to address the energy sector investment needs through 2030. There are still many critical elements missing from the enabling environment. Hence, the government should consider crafting a multiyear IPP program for power generation based on a substantial project pipeline, applying competitive bidding with a view to establishing a strong track record of speedily and competitively implemented IPP projects that will gradually reduce the need for government support as investor confidence increases. The development of IPP program should be jointly developed with Power Sector Development Plan 8 (PDP8) which will be approved by the government in 2020.

As an immediate priority, the government is designing a post feed-in tariff (FIT) competitive auction regime to attract private sector investment into solar PV development at scale and to achieve the government's 12 GW target by 2030. That solar auction regime will also review and adjust the current contractual and regulatory risk management framework (including PPAs) to bring in international expertise and investment at a competitive cost, tapping into domestic and offshore finance.

Pillar II: Prepare electricity and gas companies to access commercial finance.

Corporate financing will remain a central channel for funding investment into the sector, but this will increasingly need to be on the strength of the company's own balance sheet without state recourse. All government-owned energy companies should work toward improving their financial performance, bringing in private sector financing and expertise and obtaining credit ratings with the objective of gradually raising their own debt finance without state support. Rationalizing pricing policies and increasing transparency of tariff setting for both electricity and gas, as well as modernizing the associated regulatory and institutional frameworks, will be critical to achieving such creditworthiness. This should include the application of two-part (capacity and energy charges), time-of-use (TOU) retail tariffs for medium and large consumers to: (i) provide accurate price signals reflecting costs of efficient service delivery and their variation over time; and (ii) allow power companies to recover fixed costs of supply through fixed (capacity) charges and variable costs through variable (energy) charges. In addition,

the compensation for ancillary service provisions provided by EVN to maintain reliable operations, such as frequency control and spinning reserves, would further enhance the company's financial position. During the transition period, until this is achieved, targeted concessional financing will continue to be required to fund critical infrastructure investments that ensure sustainable, affordable and reliable energy supply in Vietnam.

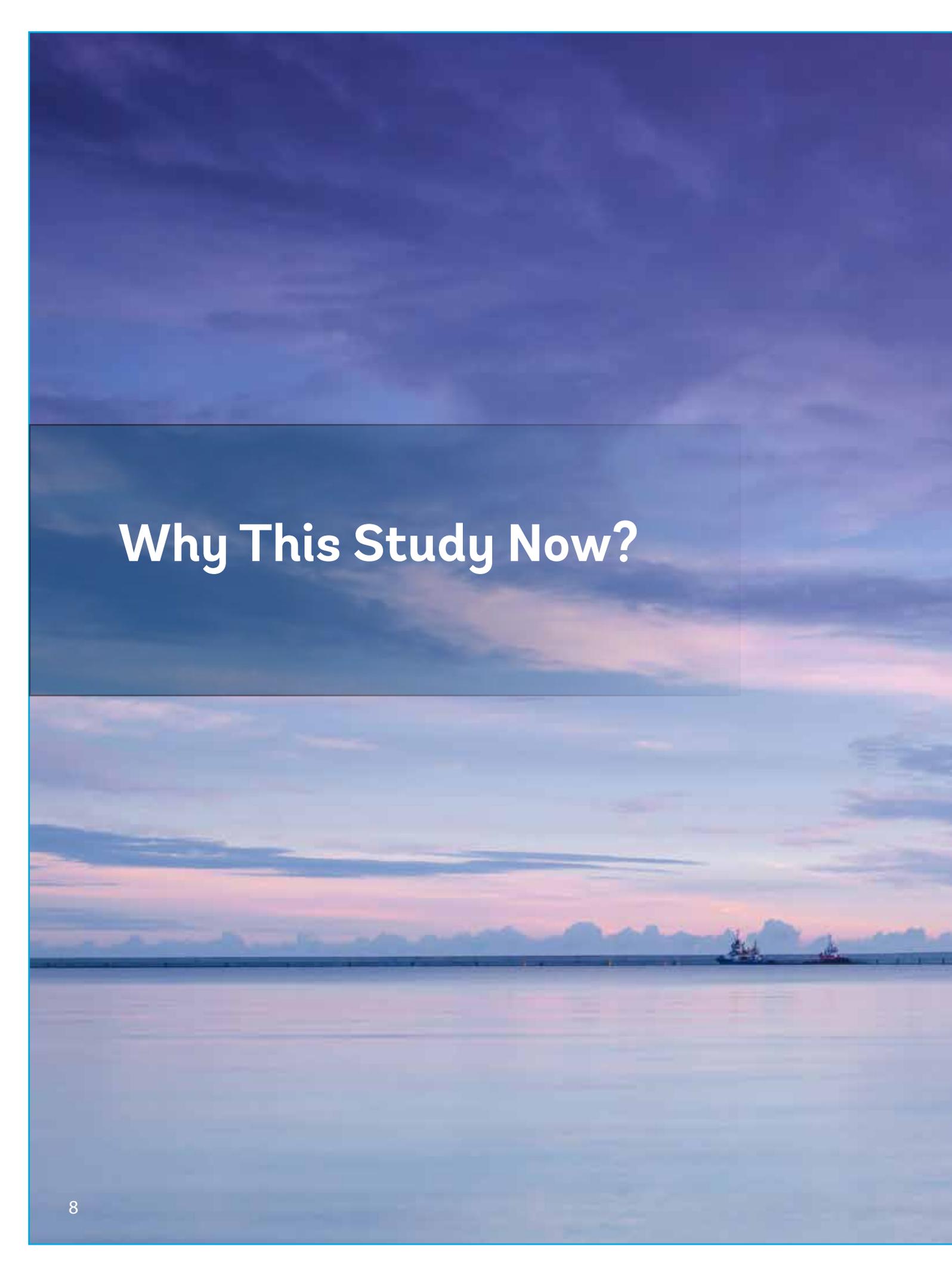
EVN has recently achieved a BB credit rating by Fitch. This is a major milestone for EVN, allowing it to get access to offshore finance on a nonsovereign basis. Based on its positive credit rating, ENV is planning its first international bond issuance. EVN is also planning credit ratings for its transmission and distribution companies (NPT, PCs). PVN is also in the process of getting a credit rating.

Pillar III: Improve the availability of local-currency financing.

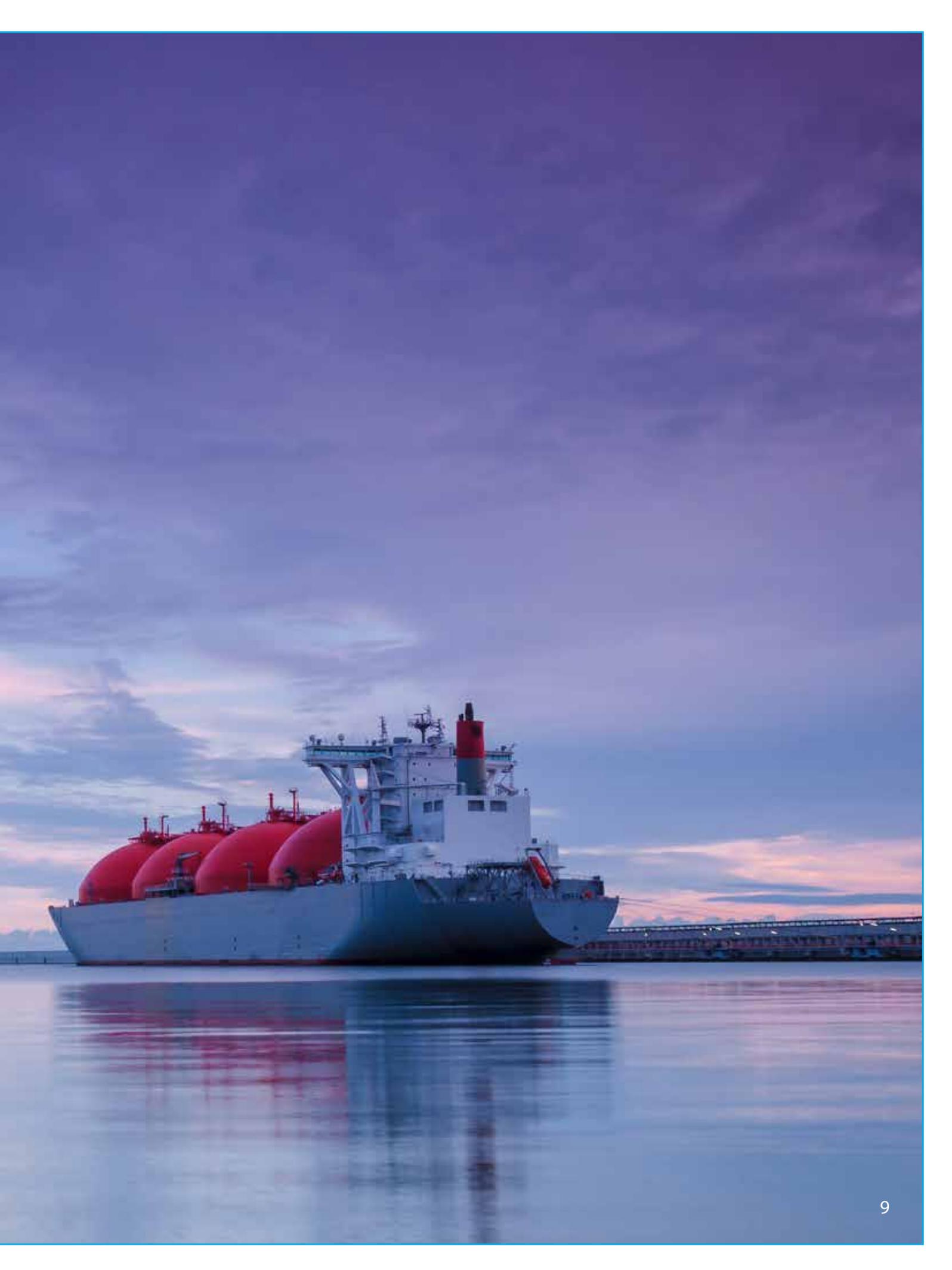
There is a pressing need to strengthen the domestic commercial banking sector while deepening and broadening domestic capital markets. Both project finance and corporate finance structures could benefit from a greater availability of longer-term, lower-cost local-currency financing through domestic capital markets. Local-currency financing is attractive in several ways and avoids risks associated with exchange rate variations and currency convertibility. Nevertheless, at present, these advantages are outweighed by high interest rates, short tenors, and constraints on the availability of capital in the banking sector. Addressing these will call for a concerted effort to deepen and broaden Vietnam's capital markets, particularly deepening the domestic corporate bond market as an alternative channel of finance. While the domestic financing market is being developed, it will be important for Vietnam to mobilize offshore financing in a sustainable manner while closely monitoring the fiscal commitments and contingent liabilities that may arise from such financing.

Improving banking sector soundness and capital market development are two priority areas for the government. Through various financial sector support programs it seeks to reduce the risks in the banking sector that inhibit long-term financial intermediation to the real sectors in the economy, including the energy sector, and to support the development of domestic capital markets to channel long-term financial resources toward long-term growth and development in Vietnam.



A wide-angle photograph of a sunset or sunrise over a large body of water. The sky is filled with soft, wispy clouds in shades of purple, blue, and pink. The water is calm and reflects the colors of the sky. In the distance, a low-lying landmass or city skyline is visible on the horizon. A semi-transparent dark blue rectangular box is overlaid on the upper portion of the image, containing the text 'Why This Study Now?'.

Why This Study Now?



1. Why This Study Now?

The electricity and gas sectors are among the largest and most strategic segments of the Vietnamese economy. Electricity sector reform and restructuring started in earnest in 2004 with the passing of the Electricity Law, aimed at ensuring the sustainable development of the sector to meet the fast-growing electricity demand. The overall and continuous guiding principles set by the government regarding power sector development are to: (i) ensure reliable, safe power system operation and security of supply; and (ii) minimize impacts on electricity tariffs (macroeconomic spillover effects and distributional impacts). Gas sector reform has been lagging the electricity sector and the government is currently developing a gas liberalization roadmap to stimulate gas and LNG development and to improve the overall sector performance. The government aims to publish the gas liberalization roadmap in 2019.

Vietnam's electricity sector has made tremendous strides in recent years, yet major challenges still lie ahead, calling for substantial new investments. Vietnam's electricity sector is among the most successful in the developing world. EVN is a technically and operationally strong company that has used concessional² financing effectively. In recent years, the electricity sector has made great progress in improving security of supply, near-universal electrification, high levels of operational efficiency, and an energy mix that is dominated by hydropower, followed by gas and coal. Vietnam has also implemented a competitive generation market and is seeking to establish a wholesale electricity market by 2021. However, sustaining these achievements (including dealing with limited domestic energy resources), keeping pace with demand from a rapidly growing economy, and meeting ambitious climate change targets under the Nationally Determined Contributions (NDC), requires large new investments, especially in renewables and natural gas. If those investments are not forthcoming, it will further increase Vietnam's reliance on (increasingly imported) coal to meet its energy needs, with substantial negative environmental, health, climate, and economic impacts. In this context, the development of PDP8 will be critical to balance the least cost power system planning objectives with the wider climate change targets the government has committed under the NDC.

Promoting the clean energy transition to achieving NDC targets: Vietnam has been extremely successful in exploring its domestic gas, coal, and hydropower reserves, and currently has a high share of renewables (i.e., hydropower) in its overall energy mix. However, domestic energy resources are limited, and Vietnam will increasingly rely on imported energy sources to meet its fast-growing domestic energy needs. Imported coal is planned to play a particularly important source of future power generation under the government's Revised Power System Development Plan 7. However, since Vietnam's climate change targets adopted at the 21st Conference of the Parties of the United Nations Framework Convention on Climate Change (COP21) in December 2015, the government has set solar and wind generation targets of 18 GW by 2030, aimed at reducing its future reliance on imported coal. In its Low Carbon Development Strategy for Vietnam in

2 There is no single definition of 'concessional finance'. This report distinguishes between the degree of concessionality, including highly concessional finance (similar to IDA terms or grants) and less concessional finance (similar to IBRD terms, EXIM banks, etc).

2016, the Bank further estimated that up to 12 GW of new coal-fired generation could be avoided through demand-side energy efficiency measures. Additional hydropower imports from Lao PDR could further reduce the need to install 5 GW of coal-fired generation by 2030. There is also huge potential for importing large volumes of renewables into Northern Vietnam from Southern China, which has a surplus of electricity generated from renewable energy. A recently conducted rooftop solar PV assessment for Danang and HCMC, demonstrated a rooftop solar potential for both cities of 1 GW and 6 GW, respectively. Implementing and scaling up Vietnam's solar (including rooftop solar PV), wind, energy efficiency, and power trading potential can substantially contribute to achieving the country's climate change targets and reducing its reliance on future coal-fired power generation.

Vietnam's past model for electricity and gas sector financing, which relied primarily on public investment, no longer seems viable; new approaches are therefore needed.

To date, Vietnam has been able to mobilize a substantial volume of public investment and concessional financing to build its energy sector. The use of highly concessional financing is coming under increasing pressure due to a combination of macroeconomic and fiscal constraints, as well as the fact that Vietnam is now transitioning to middle-income country status, which will reduce the volume of "highly" concessional funding that is available moving forward. There are still large volumes of less concessional financing available, especially provided by bilateral DPs, but it is insufficient to meet the growing financing needs, and they mostly require government counter-guarantees.

Given the above constraints, it will be important for Vietnam to mobilize financing from alternative sources.

Experience to date in Vietnam has shown that private sector investors and commercial lenders (domestic and international) are willing to support well-structured projects that are procured in a competitive and transparent manner. In addition to commercial banks, there are domestic and international institutional investors that have expressed an interest in energy projects in Vietnam.

Private sector participation in the energy sector through PPPs/IPPs can bring several benefits to Vietnam. These benefits include: (i) access to private sector financing (thereby reducing the upfront funding burden on the state); (ii) technical skills; and (iii) efficiencies in terms of energy infrastructure delivery (design, procurement, construction, and operation).

The purpose of this study is to identify how to maximize the capital available to Vietnam in the energy sector in order to efficiently meet future energy demand. This report identifies financing needs and constraints for the energy sector in the short to medium term and outlines a roadmap for overcoming these constraints and seizing opportunities to gradually achieve a transformation of the sector. It covers both electricity (power generation, transmission, and distribution) and gas (gas pipelines and LNG). The report forms part of the World Bank Group's Infrastructure Sector Assessment Program (INFRA-SAP). It is based on the principle of prioritizing private sector commercial sources of finance wherever possible; as long as these do not create unsustainable liabilities and provide value for money for the government of Vietnam. Where private sector commercial financing may not be feasible straightaway due to constraints in the enabling and regulatory environment or certain specific risks, the priority of the World Bank Group is to identify and address such constraints and to develop and offer options for risk mitigation to open up such capital flows. Where private sector financing is not viable despite regulatory reform and risk mitigation, or where certain sectors are not open to private sector participation and financing, public or blended finance may be needed.





How Much Does Vietnam Need to Invest in Energy?

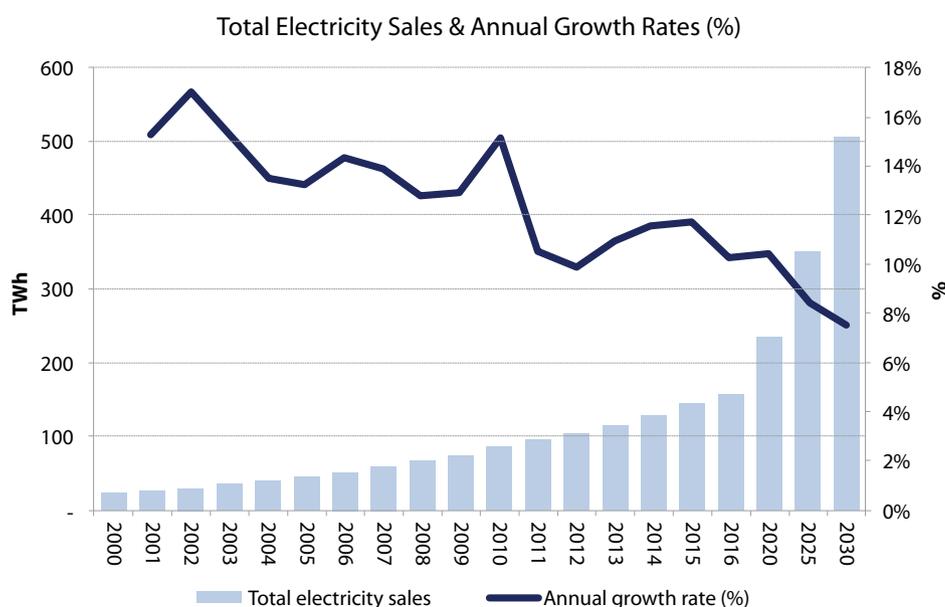


2. How Much Does Vietnam Need to Invest in Energy?

2.1 Electricity

Due to vibrant economic growth, electricity demand in Vietnam has been rising rapidly. A compound annual growth rate in demand of 13 percent since 2000 has resulted in a doubling of electricity consumption every six years. While the demand forecast through 2030 envisages a dampening of demand growth, expansion is expected to remain rapid at 8 percent per year, implying a doubling of electricity consumption every nine years.³

Graph 1: Historic and Forecast Trends in Electricity Demand (2000–30)



Source: EVN and MOIT.

Over the period 2011–15, the Vietnamese electricity sector has achieved investments of US\$7.8 billion per year on average. While this is a significant sum, it falls short of the annual investment amount that will be required for the period 2015–30. Over 80 percent of this investment has been concentrated in the power generation segment; and almost all of this has gone to large coal-fired, gas-fired, and hydropower projects. At the same time, electricity sector investments as a share of GDP will continue to decline, averaging 2.3–2.8 percent annually from 2016 to 2030 (table 1).

³ It is important to point out that the demand forecasts and investment estimates in this report are based mostly on data from the RPDP7 approved in April 2016. The government is currently preparing PDP8 to be finalized in 2020. The objective of this section is to provide a general overview of future investment requirements and the associated challenges.

To keep pace with demand, electricity sector investments will need to accelerate substantially, to around US\$8–12 billion annually for the period 2016–30. According to the government's PDP7, the total investment needed in the power sector for the forecasted period of 2016–30 are estimated at US\$152–185 billion. The estimated annual needs range from US\$8–12 billion; this is significantly higher than what has been achieved historically.

Moreover, a substantial shift toward cleaner sources of energy is envisaged. Under the RPDP7, while coal will continue to dominate future generation investments, there is also considerable diversification, with new renewable energy (wind and solar) forming the second largest investment category and natural gas also representing a significant share.

Table 1: Historic Investment Trends and Forecast Investment Needs for the Power Sector (US\$ billions)

	Average Annual Investment				Total Investment Financing Needs
	Historic Period	Forecast Period			
	2011–15	2016–20	2020–25	2025–30	2016–30
Generation	6.6	9.8–12.0	7.8–9.5	6.0–7.3	118–144
• Coal	3.6	7.2–8.8	3.9–4.7	3.9–4.7	75–92
• Gas (and oil)	0.4	1.2–1.4	0.8–1.0	0.0–0.1	10–12
• Large hydro	2.5	0.3–0.4	0.8–0.9	-	5–7
• Renewables	0.1	1.1–1.3	2.3–2.9	2.0–2.5	27–33
Network	1.2	1.7–2.1	2.4–2.9	2.6–3.2	34–41
• Transmission	0.5	0.8–1.0	1.3–1.5	1.3–1.6	17–21
• Distribution	0.7	0.9–1.1	1.1–1.4	1.3–1.6	17–21
Grand total	7.8	11.6–14.1	10.1–12.4	8.6–10.5	152–185
Total (% of GDP)	4.6	3.4–4.1	2.6–3.2	1.4–1.7	2.3–2.8

Source: World Bank calculations based on data from RPDP7, EVN, and MOIT. A range of future investment requirements was calculated based on low, medium, and high electricity demand forecasts in RPDP7.

This reflects Vietnam's commitments under the Nationally Determined Contributions to the Paris Climate Change Agreement to raise renewable energy capacity from the current level of 12 GW to up to 30 GW by 2030. Achieving the country's targets will also require large-scale gas developments of about 10 GW, demand-side energy savings of 12 GW, and increased hydropower imports from Laos of up to 5 GW by 2030. If those investments are not forthcoming, imported coal will play an even greater role than currently planned. Furthermore, the balance of future investment shifts slightly, from generation toward network infrastructure, which accounts for about a third of total investment requirements.

EVN will continue to play an important role and will be responsible for about 30 percent of total investment requirements until 2030, being fully responsible for all transmission and distribution investments via its subsidiaries National Power Transmission Corporation (NPT) and the five Power Corporations (PCs). During the period 2018–22, EVN debt financing requirements, which include new debt-to-finance capex as well as maturing debt-to-refinance existing debt, are US\$2.3–3.2 billion annually.

Table 2: EVN Debt Financing Requirements (US\$ billions)

	2018	2019	2020	2021	2022
Debt financing requirements	3.2	2.7	2.3	2.7	2.6

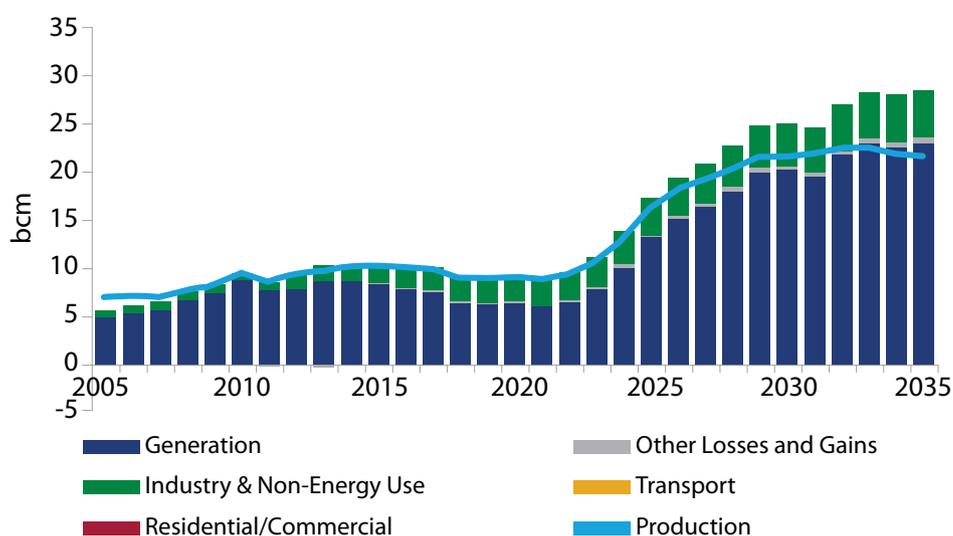
Source: EVN.

2.2 Natural Gas

Vietnam’s gas market has scaled-up rapidly during the 20 years since its inception, with a primary focus on supplying gas-fired power generation. Large-scale natural gas extraction began in 1995 following major discoveries and the development of fields in four off-shore basins: Nam Con Son and Cuu Long in the south, Malay Thu Chu in the southwest, and Song Hong in the north. Gas reserves are estimated at around 202 bcm. Annual output, which has been expanding rapidly at 5 percent annually over the past decade, reached 9.8 bcm in 2017. The power sector accounts for about 80 percent of demand for natural gas in Vietnam, with the remainder being evenly split between the fertilizer and industrial sectors. Gas use is almost entirely confined to the southeast of the country.

Vietnam’s Gas Master Plan (GMP) forecasts a doubling of demand for gas between 2020 and 2025, reaching about 20 bcm per year and leveling off thereafter. This surge in demand will be driven by plans to increase gas-fired generation capacity from around 9 GW in 2017 to 19 GW by 2030. There are also plans to further expand and diversify industrial uses of gas into petrochemical activities, including production of ammonia and extraction of ethane. Much of this demand will be met by new fields, although these will be increasingly costly to develop due to deeper water and more complex geology. Therefore, it will also be necessary to phase in LNG imports beginning in the early 2020s to complement dwindling domestic natural gas production.

Graph 2: Historic and Forecast Trends in Natural Gas Demand (2005–35)



Source: Wood Mackenzie.

If LNG prices remain comparatively low, a growing reliance on LNG could bring considerable advantages by reducing costs and emissions and increasing flexibility of supply.

Since 2014, a sustained global oversupply situation has created a buyer's market for LNG, and Asian prices have declined from US\$12–18/MMBtu in 2012–14 to US\$5–10/MMBtu in 2016–18. At current prices, LNG-fired CCGT power is becoming increasingly competitive with coal-fired power. In addition, LNG supply arrangements are becoming more and more flexible: an increasing share of LNG trade is now conducted under spot-market sales and short-term contracts, and LNG sellers are offering greater volume flexibility with much lower take-or-pay requirements. Floating storage and regasification unit (FSRU)-based LNG terminals provide importers with lower costs, quicker construction timelines, and greater financial flexibility than traditional land-based terminals. These factors create a window of opportunity for LNG buyers to lock-in attractive conditions. LNG-to-power will likely remain an attractive option even if the expected tightening in the global LNG market takes place post-2020.

The envisaged expansion of the gas market calls for a substantial scale-up in both upstream and midstream gas sector investment.

During the last 20 years, Vietnam has invested a total of almost US\$19 billion in upstream gas field development of the four main offshore basins, the development of two gas processing plants (at Dinh Co and Ba Ria with total capacity of 9 bcm), and midstream infrastructure to create three separate pipeline networks in different geographical regions (primarily concentrated in the south). According to the GMP, investments for the next 20 years will need to be significantly higher to deliver the planned expansion of the sector. Development of two new major gas fields at Ca Voi Xanh and Block B-O Mon, to supply a total additional supply of 14 bcm per year, will entail upstream investments of around US\$30 billion. In addition, the need for midstream infrastructure is estimated at US\$17–21 billion, including construction of major new gas pipelines (primarily associated with bringing the gas production from the two new mega-projects onshore), as well as the development of six LNG import terminals with investments of US\$7–9 billion.

Table 3: Historic Investment Trends and Forecast Investment Needs for the Gas Sector (US\$ billions)

	Historical Period Cumulative 2005–15	Forecast Period Cumulative 2015–35 ^a
Upstream	16.7	27–33^b
Ca Voi Xanh (Blue Whale) (9 bcm/year)		18–22
Block B-O Mon (5 bcm/year)		9–11
Midstream/downstream	1.9	17–21
Pipelines	1.9	6–8
Gas treatment plant	Not available	2–3
LNG terminals	0	7–9
Other	0	1–2
Grand Total	18.6	44–54

Source: MOIT, World Bank.

- A range of future investment requirements was calculated based on low, medium, and high electricity demand forecasts in the gas master plan.
- There is potentially significant double counting between upstream and associated mid- or downstream investments.



How Has Vietnam Financed Energy Sector Investments to Date?

3. How Has Vietnam Financed Energy Sector Investments to Date?

3.1 Electricity Sector

The electricity sector has relied primarily on state-guaranteed debt to finance the bulk of its investment program through the national utility EVN. During the period 2010–15, as much as 96 percent of EVN’s capital expenditures was financed by debt, leading to a total debt of US\$9 billion in 2016. Some US\$8.1 billion of this EVN debt is de facto backed by the MOF. The debt is almost equally split into two categories: US\$4.2 billion is on-lent to EVN by the MOF, which had borrowed it from a variety of IFIs; and US\$3.9 billion is direct loans to EVN from a variety of domestic and international commercial banks, backed by the MOF through direct debt guarantees. Both categories of borrowing count toward public debt.

EVN’s borrowing is primarily in foreign currencies, typically on nonconcessional terms, and often of short maturity. Only 30 percent of EVN loans were denominated in the local currency, leaving the company heavily exposed to foreign exchange risk for the remainder of its loan portfolio, which is denominated primarily in U.S. dollars and Japanese yen. Much of EVN’s borrowing is short term, yet the debt has been used to acquire long-term assets of up to 25 years, thus causing a mismatch between EVN’s assets and liabilities. The average interest rate on all loans in 2011 was about 9.6 percent, decreasing to about 6.1 percent in 2015 as older, more expensive loans were repaid and as market conditions for local and international borrowing slowly improved.

The bulk of EVN’s foreign currency loans are not provided at fully concessional financing terms, even when they originate with IFIs; this is because they are typically channeled through the government and a financial institution that bears credit risk, which on-lends them to EVN, adding an on-lending fee and foreign exchange premium. These on-lending modalities follow the Public Debt Management Law and other legislation regarding on-lending to the government’s foreign loans. The government’s borrowing terms and conditions passed through to EVN plus an on-lending fee of 0.25 percent is nevertheless concessional compared with those terms and conditions provided by domestic commercial finance to the power sector.

Table 4: Overview of Fiscal Support Instruments

Instrument	Legal and Regulatory Framework	Key Features	Recording	Subject to 65 Percent Debt Ceiling
On-lending of concessional finance to SOEs	<ul style="list-style-type: none"> - 2009 Public Debt Management Law - Decree 78 on on-lending 	<ul style="list-style-type: none"> - Repayment obligation fully passed on - Financial terms are 2/3 of commercial borrowing - +20/25 bps on-lending fee applies - +400 bps premium if MOF assumes FOREX risk 	Public debt	Yes
Government loan guarantees	<ul style="list-style-type: none"> - 2009 Public Debt Management Law - Decree 4/2017 on Government Guarantees 	<ul style="list-style-type: none"> - Maximum coverage level at 70 percent - <200 bps guarantee fees - Collateral and credit insurance required - Limited to eligible sectors (including energy) 	Publicly guaranteed debt	Yes
Other payment guarantees	<ul style="list-style-type: none"> - Decree No. 63/2018/ND-CP dated May 4, 2018 	<ul style="list-style-type: none"> - Covers minimum revenue guarantees, termination payments, convertibility risk - Limited to eligible sectors (including energy) 	Contingent liabilities that are not related to debt go unrecorded	No
Tax concessions (fiscal revenue forgone)	<ul style="list-style-type: none"> - Decree 04/2009 - Decision 87/2010 - Decision 37/2011 - Decree 75/2011 	All power generation projects	-	No

In the past EVN has also raised capital through the partial sale of strategic assets, such as large generation plants. Between 2010 to 2016, EVN has partially divested 1.9 GW of thermal and hydropower generation capacity, raising a total of US\$0.4 billion. In June 2017, the prime minister approved the restructuring plan of EVN’s subsidiaries in which six subsidiaries⁴ will be fully divested. An IPO was attempted for 16 percent of Genco 3 in February 2018, which was, however, unsuccessful due to its high valuation and high indebtedness.

⁴ Including Thu Duc Electrical and Mechanical JSC, Dong Anh Electrical Equipment Corp, Binh Thuan Wind Power JSC, EVNPECC3, and EVNPECC4, EVN has already divested 100 percent of EVN Finance JSC in 2017.

Table 5: Capital Raised by EVN through Partial Generation Asset Sales (2010–16)

	Installed Capacity (MW)	Capital Raised (US\$ billions)	EVN/Genco Ownership Share (%)
Thermal			
Pha Lai	1,040	0.192	51
Ninh Binh	100	0.009	55
Ba Ria	389	0.044	80
Hydropower			
Thac Mo	150	0.049	52
Thac Ba	120	0.016	30
Vinh Son Song Hinh	136	0.075	31
Total	1,935	0.384	

Source: EVN.

Over the period 2010–17, total borrowing of EVN was US\$25.5 billion. Total foreign commercial borrowing was US\$6.4 billion, domestic commercial borrowing US\$9 billion, and borrowing from IFIS AND DPS US\$10.1 billion.

Table 6: Total EVN Borrowing 2010–17 (US\$ billions)

	2010	2011	2012	2013	2014	2015	2016	2017	2010–17
Foreign commercial	0.6	0.2	0.6	1.0	1.5	1.4	0.6	0.5	6.4
Domestic commercial	1.2	0.7	0.8	1.5	1.8	1.2	1.0	0.8	9.0
IFIs and bilaterals	1.2	1.3	1.4	1.5	1.3	1.2	1.2	1.0	10.1
Total	3.0	2.2	2.8	4.0	4.6	3.7	2.8	2.3	25.5
EVN equity	0.3	0.3	0.3	0.7	0.7	0.5	0.9	1.2	4.9
EVN equity (%)	10.9	13.1	9.1	16.9	16.1	13.5	31.0	52	19.2

Source: EVN.

Domestic commercial and development banks provide local currency debt to projects in the electricity sector, typically on a corporate basis rather than a nonrecourse project finance basis. The single borrower limit of 15 percent of a bank's equity capital constrains lending for many of the banks. Moreover, lending is further constrained by sector concentration limits set by banks for prudential purposes. The current outstanding loans to the energy sector from the domestic banking system is around \$10 billion.⁵ Based on a sample of some of the major banks (VCB, CTG, BIDV, TCB, and SHB), an estimated 5 percent of total outstanding loans are channeled to the electricity sector.

Vietnamese Dong lending rates to prioritized sectors, including power, are currently set at 6–9 percent annually for short-term loans, and 8–10 percent annually for long-term loans. This compares with normal business lending rates of 7–10 percent annually for short-term loans and 9–12 percent annually for long-term loans. Given the narrow differential between short-term and long-term borrowing rates, there is little incentive for banks to lend long-term, which is an issue for investors, such as EVN, that are borrowing to invest in long-term assets.

⁵ As reported by 24 domestic banks, representing 61.4 percent of the banking sector assets.



The domestic private sector has been involved primarily in developing renewable energy generation projects. The government currently provides incentives for investment in renewable energy. For hydropower, these are based on the regionally differentiated avoided cost of thermal generation. For solar, they are based on relatively high feed-in tariffs (FITs) at US\$0.0935 per kilowatt-hour. The onshore and near shore FITs for wind was increased to US\$0.085 and US\$0.098 per kilowatt-hour in September 2018, aiming at attracting more investment. Both solar and wind FITs (as well as prices under recently approved imported coal-fired power plants) exceed the average cost of wholesale power purchase of US\$0.072 per kilowatt-hour. Renewable energy projects to date have been mainly developed by domestic investors (due to the terms and conditions—i.e., PPA—offered) and some of the large conglomerates, including the Bitexco Group, the HAGL group, the TTC group, and the Hung Loc Phat Corporation have invested in the sector. There have also been smaller, local, private investors who mobilized financing for projects of up to 30 MW. In addition to providing equity, these sponsors obtained debt finance mostly from domestic commercial banks on a corporate loan basis.

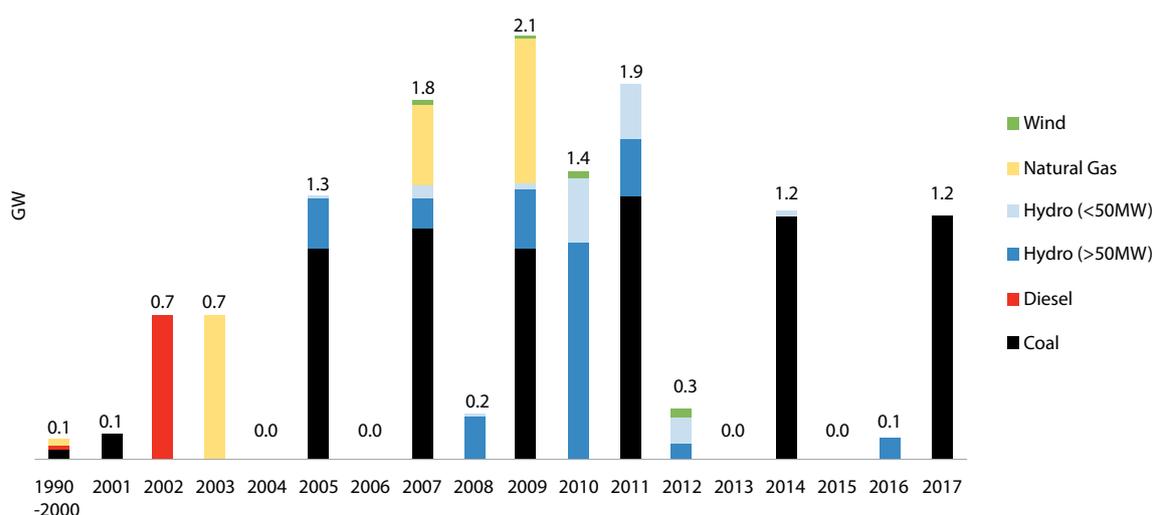
The international private sector has made a significant contribution to the financing of several large thermal generation plants. While Vietnam is currently enjoying substantial flows of FDI, with FDI in 2016 totaling around 8 percent of GDP (equivalent to around US\$16 billion per year), relatively little has been captured by the energy sector. A total of around US\$8 billion went to the power sector between 1990 and 2016, where the international private sector financed several large gas- and coal-fired power projects. International investor participation in renewable energy has been more limited due to concerns about the bankability of current contractual documentation. However, there have been a few hydropower projects that were financed by foreign debt (often benefitting from a government guarantee) and some foreign investors, have small equity investments in hydropower projects and the development of solar PV projects.

More recently, there has been a renewed surge in international private finance for energy projects in Vietnam. In 2017, FDI in power generation was around US\$8.4 billion (23 percent of total FDI in 2017), which is more than was raised in total during the last decade. There were three electricity mega projects financed by Japanese and Singapore FDI, including the US\$2.8 billion Nghi Son 2 thermal power plant, the US\$2.6 billion Van Phong 1 thermal power plant, and the US\$2.1 billion Nam Dinh 1 thermal power plant, all under the BOT model with government support. South Korea FDI is also financing the US\$1.3 billion Block B O Mon gas pipeline project. In the first half of 2018, there was also eight wind and solar project commitments by domestic and international investors totalling about US\$1.5 billion.

In the past, international private investments in coal and gas sector investments have required payment guarantees from the government of Vietnam. They benefit from a government guarantee and undertaking (GGU) to cover certain Vietnam risks, including nonperformance of SOEs in terms of offtake and supply, VND convertibility and inflation adjustment, and termination payment obligations. Unlike MOF guarantees of commercial bank loans borrowed by EVN, these nondebt-related contingent liabilities are not recorded as part of publicly guaranteed debt but have potentially significant fiscal implications that need to be carefully managed.

Overall, by 2017, about 9.8 GW of thermal generation plants (i.e., coal, gas, and diesel) have been financed by the international private sector and 3.4 GW of small and medium hydropower and other renewables (wind), mostly by the domestic private sector. In total, around US\$8.5 billion came from international investment in thermal and around US\$3 billion from domestic investment, primarily in small and medium hydro and wind generation development. As of 2017, generation capacity funded by both the domestic and international private sector represented 28 percent of the country's installed capacity of 39 GW. Notable privately financed power generation projects include the Phu My 2.2 gas fired BOT (2002), the Phu My 3 gas-fired BOT power plant (2003), the Mong Duong coal-fired BOT plant (2011), Vinh Tan coal-fired BOT plant (2014), and the Duyen Hai 2 Thermal Power Plant (2017). Together, these five projects represented over 60 percent of private capital flows to the power generation sector during this period. Most of these projects were done under the BOT model, based on majority foreign ownership, Vietnam government support, and access to long-term international commercial debt.

Graph 3: 13.1 GW (US\$11.3 billion) Private Sector Participation in Power Generation (1990–2017)



Source: World Bank PPI database. The database records investment commitments at financial close based on publicly available information.

Going forward, the historic model of relying mostly on public sector borrowing to develop electricity infrastructure is unsustainable. At a time when Vietnam is planning a substantial scale-up in electricity investments, the country's traditional modes of power sector finance will be severely constrained by two main factors.

First, Vietnam's fiscal situation has deteriorated in recent years, and the country is rapidly approaching its statutory public debt ceiling. By law, Vietnam's public debt cannot exceed 65 percent of GDP. Due to sizable fiscal deficits in recent years, public debt has risen steeply from 51.7 percent of GDP in 2010 to an estimated 61.4 percent of GDP in 2017. Public finances are projected to remain tight for some years to come, at least until the completion of the government's draft Medium Term Financial and Budgetary Plan (2016–20). Outstanding publicly guaranteed and on-lent debt to EVN already amounts to

4 percent of GDP, and the scope to expand this further over the coming years is limited given the public debt cap. In practice, this means that it will be difficult for EVN to rely on the government for extra capital or to borrow directly from commercial banks, DPs and IFIs supported by a MOF guarantee.

Second, due to its recent middle-income status, Vietnam has reduced access to highly concessional funds from IFIs and DPs. As a middle-income country, Vietnam has been in the process of “graduating” from the highly concessional finance windows of the IFIs and DPs. Overall, total concessional financing to Vietnam’s energy sector of the ADB, AfD, JICA, KfW, and IBRD have dropped substantially over last 2 years (table 7) from US\$ 2.5 billion to US\$ 620 million for the period 2017-2018.

Table 7: Planned Energy Lending Volumes of 5 Major IFIs/DPs in Vietnam (US\$ million)

Banks	Planned 2017	Actual 2017	Planned 2018	Actual 2018	Planned 2019	Total Planned*
ADB	153	0	220	142**	350	1,033
AfD	123	112**	110**	88**	110	343
JICA	0	0	429	0	429	429
KfW	375	177	484	0	150	1,054
IBRD	102	102	530	0	350	1,012
Total	753	391	1,773	230	1,389	3,781

Note: *Information provided by 5 IFIs/bilateral development partners in 2017

** Non-sovereign lending indicating no state guarantees provided by Government of Vietnam

Nevertheless, it is expected that Vietnam will continue to have access to significant financing at less concessional terms. There is continued strong support from bilateral development partners (especially from China, Japan, and Korea) to provide funding for the energy sector on less concessional terms but with government guarantee requirements. In addition, some IFIs are already able to provide funding on a nonsovereign basis (AIIB, ADB, AfD) or are considering doing so in the near future (KfW, JICA). For example, AfD is currently providing a €60 million nonsovereign loan for the extension of the 720 MW Yali hydropower project owned by EVN. However, much of nonsovereign lending will not be on the highly concessional terms that Vietnam has been used to, but rather closer to commercial terms. There is also a trend that additional concessional financing will be available for climate mitigation (e.g., Green Climate Fund—GCF) and therefore also energy investments in Vietnam. In addition, new providers of funds are entering the sector and some DPs have increased their grant funding (i.e., EU with €340 million for energy).

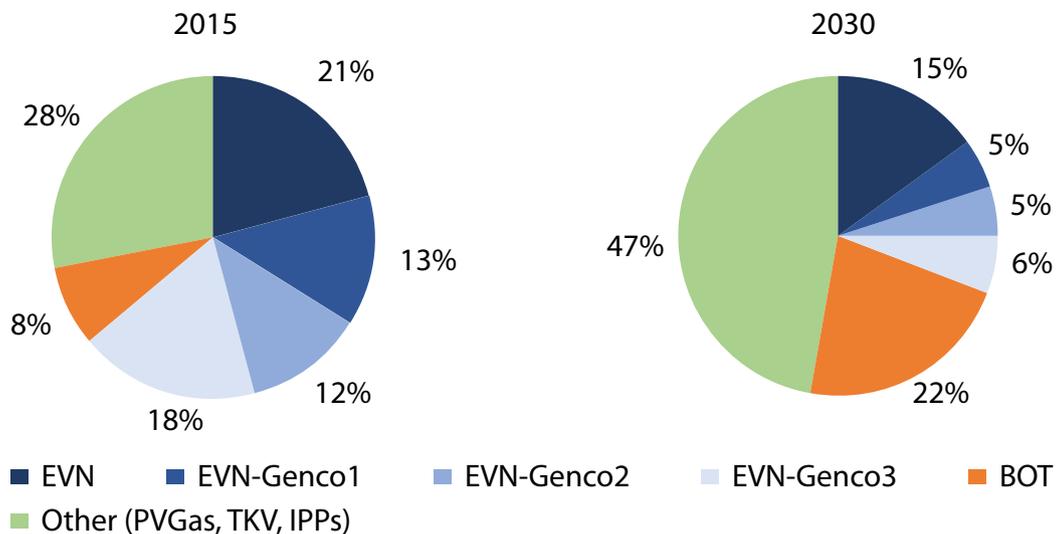
What is the consequence of this tightening of finance? For the short to medium term, public sector constraints will limit EVN’s ability to access highly and less concessional financing that require a sovereign guarantee as well as large volumes of financing from domestic commercial banks. While the recent EVN credit rating will enable the utility to access some commercial finance on a nonsovereign basis, it may be insufficient to cover the large investment requirement of the utility, especially for its fully owned subsidiaries (NPT and the five PCs) that have large network investment requirements and will require government support to raise ODA and/or blended finance. There should be a progressive

shift of responsibility for investment in the sector to the private sector in line with the government’s own objective set out in its power system development plan. However, this will require that the government puts in place a legal, regulatory, and institutional framework that attracts such investment and mitigates risks.

Planned equitization of EVN generating companies and further reliance on independent power producers will decrease EVN’s role in power generation investment going forward.

As of 2017, EVN and its three wholly owned subsidiary generation companies (Gencos) owned 64 percent of Vietnam’s installed generation capacity. However, there are plans to equitize the three Gencos through a stock market flotation of up to 51 percent ownership from 2018. It is not yet entirely clear whether there will be full uptake of the 51 percent ownership stake or the extent to which this will be purchased by private investors versus other state-owned enterprises. According to government policy, EVN would retain full ownership of only the multipurpose hydropower generation plants, with all other generation plants being developed either by the equitized generation companies or by independent power producers. By 2030, it is envisaged that all Gencos will be fully privatized with EVN only retaining ownership of strategic generation assets (such as the multipurpose hydropower plants). However, the failed IPO of Genco 3 in early 2018 has clearly indicated that it will be challenging to privatize those large and highly indebted generation plants that comprise both thermal and renewable generation assets. Foreign investors do not seem keen on investing in a large-cap power corporation like the Gencos, and it may be easier to sell shares of individual Genco power plants due to accessibility of information disclosure and fewer risks.

Graph 4: Planned Evolution of Market Structure for Power Generation



Source: EVN

Given the envisaged liberalization of the power generation sector and the enhanced role of the private sector, the main area for continuing public investment over the long-term will be transmission and distribution. The full or partial privatization of distribution will be considered by government as part of implementing full retail competition post 2021. Transmission, which is considered a strategic asset by the government, would remain entirely in the public sector with EVN. It is expected that these network segments of the electricity supply chain will require investments of around US\$2–3 billion annually from 2016 to 2030. Despite public sector ownership of the network in the near future, NPT and PCs are seeking access to commercial finance that would require strengthening their balance sheets by adopting cost-reflective transmission and distribution tariffs and transforming them into well-governed and independent companies within the EVN corporate structure. NPT is currently in the process of getting a credit rating and the 5 PCs should follow.

3.2 Gas Sector

PVN has made a significant contribution to funding the development of Vietnam’s gas sector through its own equity, based on minority partnerships with international oil companies. As an SOE, PVN also has access to funding from MOF and commercial banks. PVN is one of the most significant enterprises operating in the Vietnamese economy, contributing 25–30 percent of state budget revenues. PVN operates through various subsidiaries, including: (i) PVEP that is responsible for upstream oil and gas exploration, production activities, and management of production-sharing contracts; (ii) PV Gas, which manages the midstream and retail gas activities with monopoly rights to gas transportation and distribution; and (iii) PV Power that mainly manages gas-fired power generation projects. The overall PVN group has a turnover of some US\$13 billion per year. While, historically, the company has shown strong financial performance, profitability has been adversely affected by a combination of declining oil prices and extensive diversification into noncore businesses.

Vietnam’s existing gas basins have been developed largely by private investment from international oil companies in partnership with PVN. For the development of gas fields to date, PVN has partnered with international oil companies and has typically retained a minority stake of around 20 percent in the development of the fields.

Midstream infrastructure has been funded by a combination of PVN equity and private capital. PVN has made a large contribution to the financing of midstream infrastructure, largely from its own internal cash generation based on a low debt-to-equity ratio. Nam Con Son Gas Pipeline is the only project in the natural gas transmission and distribution segment to have received private sector investment back in 2002. Valued at US\$1 billion, this single mega-project represents about 50 percent of midstream gas infrastructure investment in Vietnam since the inception of the natural gas sector.

As with the electricity sector, the historic model of gas sector investment finance is no longer adequate to meet the challenges ahead. The second generation of gas sector investments will be significantly more challenging than the first for several reasons.

First, development of the next generation of gas fields will require larger investments against the backdrop of a global sector that still has not fully recovered from the decline in oil prices post 2014. Existing gas fields are depleting, and new supplies have been slow to come onstream. Moreover, new domestic fields will be more expensive to develop and operate than existing ones. Vietnam has found it difficult to attract investors into new

production-sharing contracts (PSCs) because of highly regulated domestic gas prices, high field development costs, and industry-wide capital constraints resulting from lower global oil prices and a Petroleum Law that needs revisions to meet today's requirements.

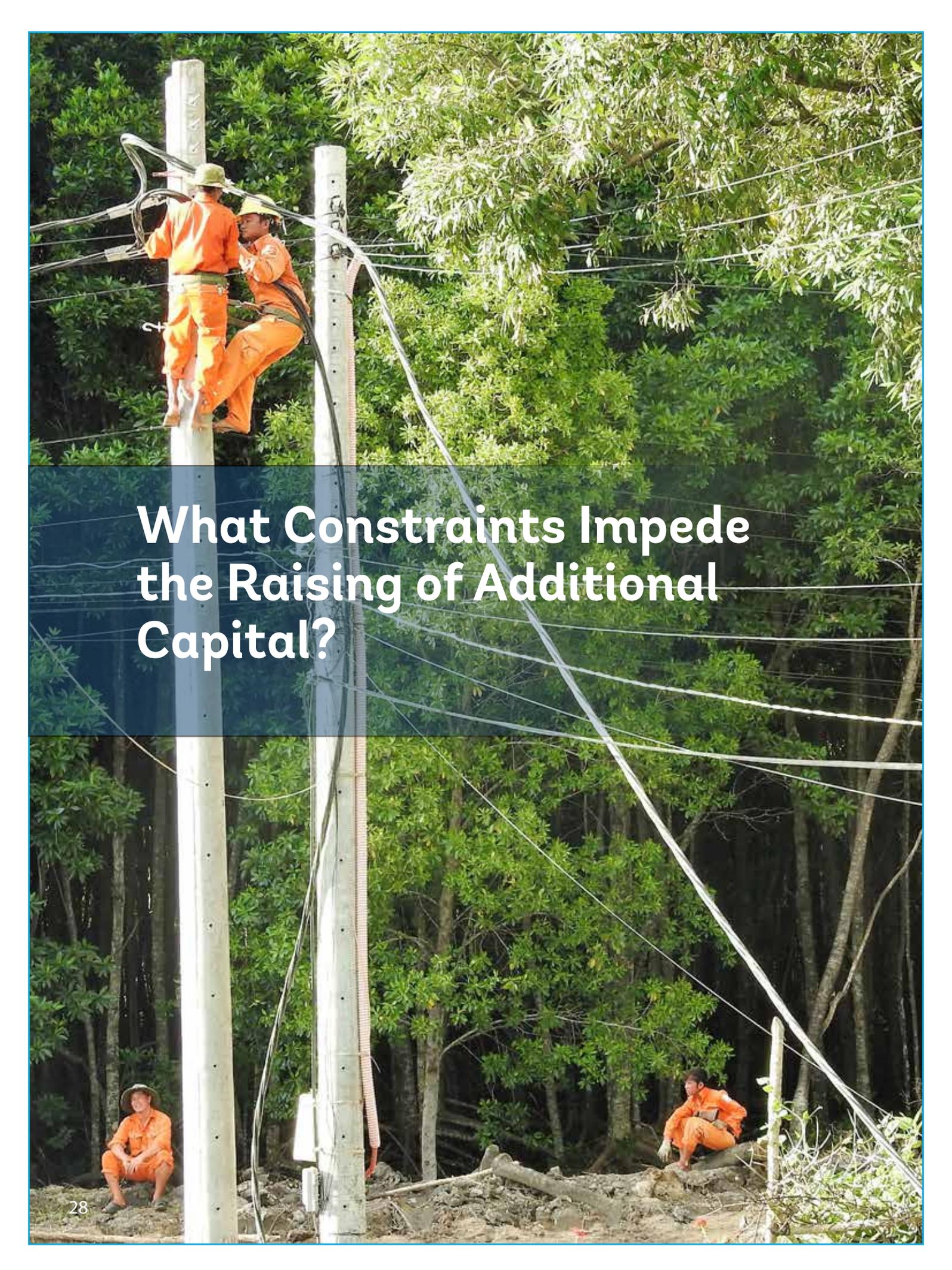
Second, PVN's financial standing has been stretched by diversification beyond its core business. PVN's activities have expanded well beyond those of the core business of gas and oil into numerous noncore areas such as equipment and materials supply, manufacturing, fertilizers, and shipbuilding. In the process, it has developed a complex corporate structure comprising 32 subsidiary companies. It has also stretched PVN's balance sheet, constraining the company's ability to fund the investment needed to boost domestic gas production.

Overall, financial indicators show that PVN still remains a profitable company, even though there has been a downward trend in revenue and after tax profits over the period 2014–16, before the recovery in 2017. The balance sheet is relatively robust with the value of noncurrent assets being less than long-term liabilities and equity, which means noncurrent assets are being fully financed by long-term resources. The concern of less-than-one debt service ratio during 2013–16 was addressed in 2017, when it increased to 1.16 times, which means that there is enough net operating income to cover annual debt payments. The deterioration of PVN's debt service capability in 2013–16 was caused by the fall of global oil prices from the peak of US\$90/barrel in 2014 to US\$40/barrel in 2016, which caused a steep 41 percent decline in revenues from US\$18.5 billion in 2013 to US\$10.5 billion in 2016 and an even more dramatic reduction of operating income from US\$2.9 billion to US\$1.1 billion. Oil prices are now back at around US\$66/barrel (average 2018), and the forecasted financial ratios of PVN for 2017 and 2018 are expected to significantly improve.

Third, the need to transition toward an imported LNG-based system will put significant pressure on the historic framework for gas pricing. Based on the current production outlook and government plans, Vietnam will need to start importing significant volumes of LNG within the next 5–10 years. The flexibility and low pricing now achievable from the LNG and FSRU markets could be highly beneficial to Vietnam, providing a valuable complement to the relatively inflexible and insufficient supply that is likely to come from the new fields. However, growing reliance on LNG will make Vietnam increasingly exposed to market prices, whereas current gas pricing practices in Vietnam are largely based on bilateral negotiations benchmarked against exceptionally low historic prices of domestic production that have low correlation with future production costs or the wider opportunity costs of natural gas.

In recognition of these challenges, the government has adopted a long-term vision of a liberalized gas sector, although major reforms are not scheduled to start until 2025. The government has published the *Plan for Development of the Vietnam Gas Industry by 2025 with Vision to 2035* based on modernized legislation for the sector. It envisages market liberalization preceded by divestiture of almost all PVN subsidiaries, reducing public shareholding to under 50 percent. Among the first companies to be equitized are PV Power and PetroVietnam Oil Corporation. In January 2018, PV Power conducted a successful IPO, auctioning a 16 percent share in the company. The government's future role in the sector would be confined to policy, regulation, and planning, with rational gas pricing policies being introduced. Nevertheless, the government's timetable for reform has been deferred to 2025, leaving doubts as to how the much-needed investments will be financed during the intervening years. This may require a greater part of the future investment requirements being met by the private sector, which in turn makes it more urgent to develop a robust and consistent investment framework.





What Constraints Impede the Raising of Additional Capital?

4. What Constraints Impede the Raising of Additional Capital?

The historic financing model for the energy sector is no longer tenable. It will be critical for Vietnam to address the constraints that are currently limiting access to other sources of potential finance. There are three sets of constraints, which can be grouped according to how they affect each of the three principal channels available for raising additional capital in Vietnam.

- Constraints preventing greater use of IPPs and PPPs that offer the prospect of capturing increased international capital under a project finance modality.
- Constraints preventing major energy sector SOEs from directly accessing international capital markets without government guarantees under a corporate finance modality.
- Constraints limiting greater availability of long-term local-currency finance in the domestic market, which could be a source of funding either for project or corporate finance.

4.1 Constraints Affecting PPPs/IPP

Vietnam has recently updated its enabling environment for public private partnerships.

The regulatory framework for private participation in infrastructure through PPPs has been improved and clarified with the introduction of Decree No. 63/2018/ND-CP on PPP investments. The new decree supersedes Decree No. 15/2015/ND-CP, which was introduced to help create a more unified and consistent legal framework for private investment in public infrastructure. Decree No. 15 was drafted to give state authorities, as well as private investors, more detailed guidelines to help facilitate project preparation and implementation. However, no PPP project has been procured under Decree 15 since it was introduced. One reason for this is that any project classified as a PPP must follow the processes and requirements set out in Decree No. 15/2015, which include, inter alia, preparation of feasibility studies as well as competitive tendering processes. Unfortunately, many authorities lack the technical capacity and financial resources needed to fulfill these requirements, and therefore choose to circumvent them by developing projects under other laws and regulations. This has been particularly true in the energy sector where investment licenses have been routinely given to domestic and international investors on a negotiated basis.

It is hoped that Decree No. 63 will support the greater use of PPPs in Vietnam moving forward, particularly as it allows more flexibility in terms of the types of PPP contracts that can be entered into as well as the sectors that can carry out PPPs. More importantly, Decree 63 clarifies the forms through which state investment capital can be used to support PPP projects and requires that all private sector initiated projects that need state investment capital be competitively tendered.

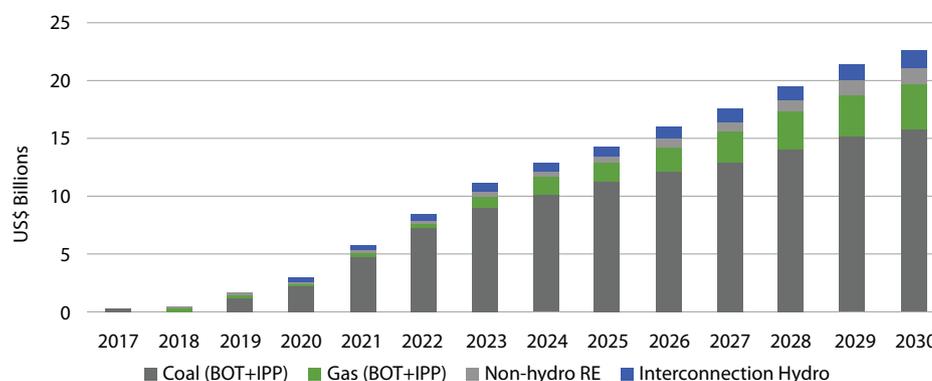
Differences in opinion between the government and investors regarding risk allocation for PPPs and IPPs have slowed or hindered the deployment of international capital, espe-

cially for renewables. Vietnam launched its second wave of power generation IPP projects in 2007/08. However, the first two projects did not reach financial closure until 2011 (Muong Dong) and 2014 (Vinh Tuan 4), while the remaining two are still under negotiation a decade later in 2017. One of the main reasons for the delay with these projects is the difficulty of the government and investors to reach agreement about risk allocation for certain key issues in the project contracts, including the convertibility of profits earned in local currency into foreign exchange (principally U.S. dollars) for the purpose of repatriation, and payment for U.S. dollar-denominated input commodities (coal, gas), as well as the extent of guarantees required from the government to cover various project risks, such as off-taker risk and early termination. Similar concerns about risk allocation under Vietnam’s current renewable energy program have meant that the PPAs are not regarded as bankable by international investors (especially in terms of termination, curtailment, and arbitration clauses) for project finance. However, several international investors from Singapore, Thailand, Philippines, and Canada have recently committed to finance wind and solar projects on a corporate basis.

Despite a liberal currency regime, foreign exchange convertibility has been a concern among investors. Overseas investors still have concerns about foreign exchange convertibility. International reserves have increased to US\$63 billion (2018), equal to about 3.5 months of imports, and projections suggest that the demand for foreign currency associated with BOT projects and associated tariff revenues to be covered in the energy sector could escalate dramatically through 2030, up to US\$23 billion/annually by 2030.

To mitigate this risk, the government has provided specific foreign currency convertibility guarantees for certain larger thermal generation projects. The current policy is to limit the extent of these guarantees, and a ceiling of 30 percent of the overall foreign exchange transaction has been established for projects in the past.⁶ In the absence of such government convertibility guarantees, there is limited availability of currency hedging instruments that would allow private investors to cover currency risks through the market.

Graph 5: Estimated Foreign Exchange Convertibility Requirements (2017–30)



Source: World Bank.

Assumptions: Planned thermal BOT/PPs (31 GW coal, 7 GW gas), nonhydro renewable energy projects, and power trade. Capacity factor of 80 percent for gas/coal; average tariff of 8 U.S. cents for coal/gas, 7 U.S. cents for hydro interconnection; and 90 percent FOREX convertibility.

6 PM Letter No.1604/TTg-KTN of 11/2011 indicates that the government shall provide a guarantee for conversion into U.S. dollars of 30 percent of BOT project turnover in VND after subtracting the expenses in VND, leaving some doubt as to the convertibility of the remaining 70 percent.

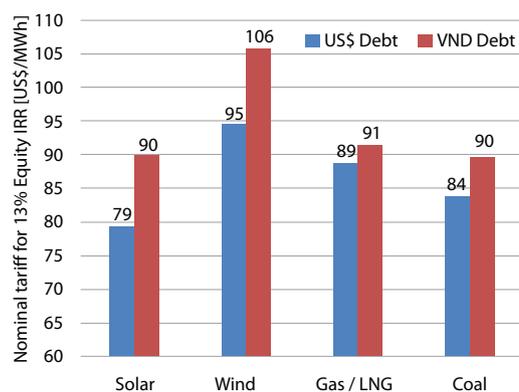
The absence of a standardized contractual framework acceptable to the government and private sector is a key hurdle for attracting large scale private sector capital, especially cross-border. Without a standardized, internationally bankable contract, issues are often negotiated on a project-by-project basis, which typically leads to protracted negotiations and terms that can vary significantly from one project to another. It also signals a lack of consistency to international investors. Some local and international developers with RE licences and relationships with local authorities still manage to raise financing and technical support through local and foreign banks. However, to scale up and raise sufficient finance to achieve RE targets, developing a bankable PPA that contains three essential elements to be improved in the current PPA is critical: sufficient payments from EVN upon termination of the PPA to ensure project lenders are made whole; adequate compensation to the project if it is curtailed by EVN; and arbitration of disputes under the PPA in a neutral, international jurisdiction. All three are already in place for Vietnam's BOT projects.

One of the complicating factors facing the government is the absence of a methodology for quantifying the contingent liabilities associated with different types of support, which would aid the government in making an objective assessment of the fiscal risk in providing project support and expedite the overall negotiation process. Despite the recent credit rating of EVN at BB (equal to Vietnam's sovereign rating), some international investors may not consider EVN as a fully standalone creditworthy entity, and its obligations under PPA therefore may continue to require some government support, which can represent a significant, but contingent (i.e., only due in the occurrence of certain events, most of which are within the control of EVN or the government) commitment from the government. Other examples of risk that investors typically want to address include termination clauses in PPA and BOT contracts that specify compensation to be paid to private investors in case of premature contract termination by the offtaker.

The lack of access for cross-border financing limits access to potentially cheaper sources of financing. Domestic capital market development is a long-term initiative, and in the interim, cross-border finance can support Vietnam's energy sector. Addressing the constraints that inhibit cross-border financing will be essential for diversifying sources of funding for energy-sector investments. Until the PPA issues can be resolved, however, it may be difficult for Vietnam to benefit from the advantages that international financing can provide for both the electricity and midstream gas sectors in terms of longer tenors and fixed-interest rates. This is especially important for renewables, which due to their greater capital intensity exhibit unit costs that are much more sensitive to the cost of capital than the conventional fossil fuel projects. The figure below demonstrates that under current market conditions, all generation technologies, but especially wind and solar projects, would benefit from accessing U.S. dollar denominated debt, reducing the potential tariffs.



Graph 6. Benefits of Access to Cross-Border Financing



Source: IFC.

PPPs for the gas sector face the additional challenge of needing to integrate commercial and financial arrangements with the main downstream off-takers in the electricity sector (especially EVN). Since power generation is the primary off-taker for gas, the bankability of PPPs for the gas sector depend critically on tighter commercial and operational integration of the gas and power sectors. The development of bankable PPP structures for upstream and midstream development of gas fields and gas infrastructure depend on the ability to sign a gas purchase agreement and LNG terminal use agreement with a credit-worthy off-taker. Since power generation accounts for about 80 percent of gas demand, the bankability of the gas purchase agreement is typically linked to the agreement of a bankable PPA in the power sector. This means that all the investment challenges in the power sector identified above feed directly into the gas sector. Going forward, it will therefore be critical to develop the power generation and upstream production activities under synchronized project plans with mutually consistent contractual terms regarding financing, payment security, and government support. Another central issue is to develop pricing mechanisms to ensure that evolving gas prices, which are often indexed to global markets, can be passed-through to power purchase tariffs and ultimately to electricity consumers.

Bringing PPPs into the LNG sector poses unique financing challenges of its own. Because of the size of the investment requirements in LNG infrastructure, similar to large thermal BOTs, the domestic bank and capital markets will have severe limitations on their ability to finance LNG projects. Indeed, Vietnam needs to develop LNG import capacity of over 20 million tons per year by the mid-2020s. In doing so, the country faces two major LNG technological options with widely varying financial implications. The most permanent solution is to develop onshore terminal facilities, with an estimated total cost of US\$8 billion and a minimum individual project cost of US\$1 billion. Although this could be partially financed through the balance sheets of PVN and EVN, the volumes of investment involved may be challenging. Alternatively, a PPP structure could be adopted with some contribution of public capital and associated credit enhancements. A less capital-intensive approach could be to begin with a FSRU facility, entailing an initial capital requirement in the order of US\$100 million for fixed infrastructure and a recurring lease payment for the FSRU itself. This would reduce the up-front financial burden associated with developing LNG, while at the same time allowing Vietnam to gain experience with the fuel. In the long-term, larger

onshore LNG terminals will be required, but this will be easier to finance once the economic and financial viability of LNG has been established.

4.2 Constraints Affecting Corporate Finance by SOEs

Companies of the size and stature of EVN and PVN could potentially raise their own capital (domestic and international) without government support. Around the world, large, well-managed utilities in emerging markets are increasingly able to raise their own capital directly from commercial banks or through issuing corporate bonds with diminishing need for recourse to guarantees or other support from the Ministry of Finance. However, their ability to do so is critically hinged on the creditworthiness of the companies as quantified by an adequate credit rating from a reputable rating agency. This, in turn, depends on the utility's ability to demonstrate sound financials through a combination of efficient performance, a stable but flexible tariff regime, and/or reliable budget support. EVN is planning to diversify its sources of financing and aims to raise long-term capital from commercial sources, including through domestic and international capital markets. As a first step, EVN received its first credit rating in June 2018. However, some form of credit enhancement from IFIs may still be requested by EVN to enhance the credit rating of bonds and thus lower their costs. In addition, key EVN subsidiaries in the power sector, such as the transmission company (NPT) and the distribution companies (PCs) are corporatized but do not have a credit rating and the financial strength to raise commercial finance from their own balance sheets to meet their large investment requirements. Hence, it is critical that the government provides support (guarantees) for those entities to raise financing until those companies are capable of raising their own funds.

Despite being a technically and operationally well-managed utility, EVN experienced weak and deteriorating financials in recent years. As a utility, EVN and its main subsidiaries (NPT, PCs) demonstrate good operational performance. For example, all five distribution subsidiaries report revenue collection ratios approaching 100 percent and distribution losses of 5 percent that align with international best practice. Nevertheless, EVN's overall financial performance in recent years has been deteriorating. Net income before interest and taxes turned negative in 2015 and were barely positive in 2016. Current assets remain significantly below current liabilities, denoting short-term liquidity constraints. Moreover, three out of EVN's nine subsidiaries quoted on the stock exchange have been incurring losses.

The fundamental reason for EVN's weak financial performance has been the failure to allow end-user electricity tariffs to keep pace with costs. Given EVN's high level of operational efficiency, it is the relatively low level of end-user power tariffs that are largely to blame for the company's weak financial performance. EVN's tariffs have been frozen since 2015, and only in November 2017 increased to an average rate of US\$0.076 per kilowatt-hour compared with the full cost of service, estimated at US\$0.12 per kilowatt-hour in 2017. To keep pace with planned investments, it is estimated that tariffs would need to continue to rise toward US\$0.14 per kilowatt hour by the early 2020s. Moreover, the present tariff is also below the price at which EVN is expected to purchase electricity from upcoming, new (renewable and thermal) generation. Furthermore, greater reliance on costlier commercial

finance and less reliance on sovereign financing through the MOF in the future is likely to increase the costs of electricity production, which will require tariffs to increase to prevent EVN's financial position from further deteriorating.

To raise its own investment finance without recourse to sovereign guarantees, EVN would need to improve its financial performance. A financial recovery plan jointly prepared by the World Bank and EVN in 2015 demonstrated that cost-reflective tariffs will be a critical component for EVN's financial sustainability moving forward, and proposed a tariff adjustment trajectory through to 2021. However, the political economy of electricity tariff increases is complicated in Vietnam; and there are social, economic, and political concerns around raising tariffs, particularly given public perceptions that EVN tariffs are adequate and the company is already "profitable" (which is the case in a typical financial year). EVN has embarked on a tariff communication campaign to better explain the need for higher tariffs to enable future capital investments in the sector. Other financial measures to bolster investors' confidence include enhanced transparency and improved corporate governance, such as financial accounting, as well as reporting and disclosure based on International financial reporting standards (i.e., IFRS).

In the case of PVN, the planned equitization of its subsidiaries will raise significant capital and open-up new possibilities for investment finance. The government plans to divest almost all PVN's subsidiaries by 2019 through an initial public offering (IPO) process of equitization. One of the main subsidiaries, PV Power, conducted a successful IP in early 2018. PV Power is the second largest power producer after EVN, owning and operating three gas-fired power plants, three hydropower plants and one coal-fired power plant, with a total capacity of 4.2 GW. MOIT proposes to allow PVN to hold a minimum 51 percent stake in PV Power until 2025 and then subsequently reduce its stake to below 50 percent thereafter. With PVN's annual revenues in the order of US\$13 billion, equitization proceeds are likely to be substantial and could provide significant cashflows for future investment. In addition, those equitized companies with private ownership may have the potential to access domestic or international capital markets, subject to financial viability. However, this would likely still involve some form of government support until the companies can be rated as creditworthy.

The equitization process has been far from straightforward. The equitization of SOEs in Vietnam through IPOs has so far underperformed, with many state-owned enterprises unable to attract enough domestic and international investors, including in the power sector (i.e., Genco 3). In addition, many Gencos have high debt equity ratios. A major challenge has been the determination of the asset value of the enterprises and associated land-use rights and land value. Foreign investors are also concerned about corporate governance, transparency, and quality of accounting among Vietnamese firms. Hence, the government recently issued relevant legislation (Decree 126/2017/ND-CP; Circular 41/2018/TT-BTC), providing greater transparency and protection to investors. It remains to be seen whether those changes will be sufficient to attract private investors into the three Gencos. However, there also have been successful IPOs in the energy sector, including Binh Son Refining and Petrochemical Company (BSR) and PetroVietnam Power Corporation (PV Power), selling a total of VND 17 trillion (US\$ 750 million equivalent) worth of shares.

4.3 Constraints Affecting Debt and Local Capital Markets

Vietnam enjoys high levels of domestic savings, but a shrinking share has been reaching the energy sector. Vietnam's domestic savings rate is relatively high at around 30 percent of GDP. This is the equivalent to around US\$60 billion in 2017 providing a sizeable potential inflow of resources to domestic debt and capital markets. The total outstanding financing stock in the domestic capital markets is estimated at US\$422 billion in 2017, of which only 3.3 percent was captured by the energy sector.

Commercial banks are by far the largest players in Vietnam's domestic debt market. The main channels for domestic financing are the commercial and some development banks, with a total outstanding loan portfolio of around US\$250 billion in 2017. Despite progress in recent years, the regulatory and supervisory framework is still weak, and financial infrastructure is deficient. There is a high degree of interconnectedness in the financial system between banks and the enterprise sector, and commercial banks' lending for term investments are constrained by their weak capital base and low capital adequacy ratios (CARs) due to asset quality and provisioning for nonperforming loans (NPLs). Moreover, securitization of balance sheet assets to manage exposure is not practiced due to the absence of relevant regulations. This constrains the banks' ability to effectively manage their lending portfolios and sectoral exposure.

Table 8: Estimated Current Sources of Financing for the Energy Sector (US\$ billions)

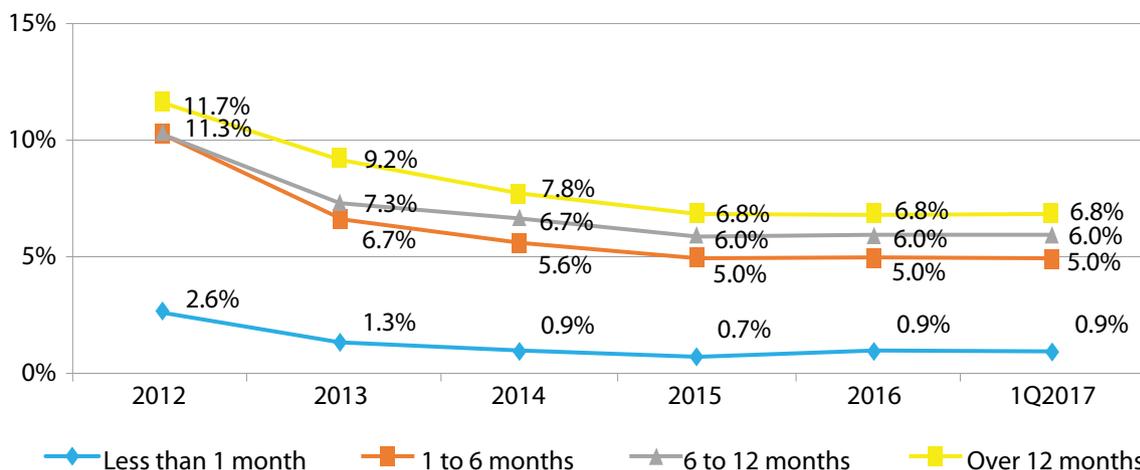
Source of Financing (US\$ billions)	Current Total (US\$bn)	Current to Energy (US\$bn)	Percentage to Energy (%)
Domestic commercial banks, total loans, 2016	242.3	10.0	4.1
Vietnam Development Bank, total loans, 2016	13.2	0.5	3.8
Government bonds (domestic market)	62.1	1.0	1.6
Corporate/provincial/municipal bonds	11.7	<0.1	0.3
Insurance companies	4.6	-	0.0
Pension funds	16	0.1	0.6
Stock market	72.5	2.2	3.0
Total	422.4	13.8	3.3

Source: World Bank.

Due to the structure of their deposits, commercial banks find it difficult to offer the longer-term finance needed by infrastructure projects. Vietnamese banks typically provide short-term loans as they lack longer-term sources of funding to finance medium (1–3 years) and long-term lending (more than 5 years). In fact, longer-term loans are themselves provided through short-term deposits based on a prudential ratio of 50 percent, creating an asset-liability mismatch and intermediation problem for banks. The lack of long-term deposits is mainly due to the flat yield curve by duration for deposits in the local market (see graph below), with only 80 basis points of interest rate differential between deposits longer and shorter than 12 months' duration. Short-term lending interest rates in

Vietnam are also high, currently ranging from 7.5–9.5 percent, although they are slightly lower for sectors (like energy) that are promoted by the government in the form of directed credit. The shortage of long-term lending reflects the short-term nature of deposits.

Graph 7: Interest Rates on Local Currency Deposits by Duration



Source: Stoxplus.

Limited access to long-term funding constrains the ability of commercial banks to contribute to energy-sector financing, as does their lack of sector know-how and exposure to single borrower limits. Despite commercial bank interest in financing renewable energy and LNG projects, they have generally not been able to provide a great deal of finance for several reasons. First, the short-term nature of their deposits makes it difficult for commercial banks to structure financial products that can match their short-term deposits with cash flows from such long-term projects. Second, local banks often lack the necessary in-house technical expertise to evaluate renewable energy and LNG projects, thereby increasing their perceived risks. Third, given the size of EVN in the domestic market and the fact that it frequently borrows from both private and state-owned banks, many banks are close to or have reached their single borrower lending limits, set at 15 percent of bank capital/equity. This limits the ability of EVN and PVN to borrow further amounts from banks to help finance their capital investment programs unless the banks can securitize a portion of their EVN and PVN loans. Finally, legacy NPLs in the banking sector need to be addressed through resolution or debt restructuring to provide the space for banks to lend more.⁷

⁷ The National Assembly has recently approved resolution 42 that addresses NPL resolution in the banking sector. This allows more flexibility in addressing NPLs in the banking sector.

Beyond the banking sector, local capital markets remain relatively underdeveloped compared with neighboring countries in southeast Asia. The stock market capitalization was 76 percent of GDP in 2017, but liquidity and trading is low. Although several state-owned enterprises are listed, in practice, the government retains a tight grip on management. The corporate bond market is in its infancy, with total issuances of just 1 percent of GDP, including some from EVN and PVN. The market is expanding, albeit slowly, due to a limited number of large companies able to place high-quality issues as well as limited demand from institutional investors. It is also hampered by cumbersome procedures for bond issuance, high transactions costs, the lack of transparency and information for investors, and the lack of a domestic credit rating agency capable of providing credit ratings to entities and financial structures. Most recent bond issues have been structured as quasi-loan transactions and channeled mainly through local banks in form of private placements. EVN plans to issue bonds by 2020 to finance its investment requirements.

The institutional investor market is currently very small, with most investments being channeled into government bonds but presenting a viable source of long-term investment. With regard to institutional investors with longer-term horizons, pension funds and insurance companies are relatively small but growing, managing portfolios of US\$20 billion and US\$5 billion, respectively. In both cases, their investment policies are heavily skewed toward government bonds. Nevertheless, they provide potential sources of financing for long-term investment given the structure of their liabilities, as they seek to diversify their investment portfolios and increase returns. However, this would require the issuance of high-quality corporate bonds, which ideally would be rated.



What Needs to Be Done to Unlock New Sources of Finance?

5. What Needs to Be Done to Unlock New Sources of Finance?

Tapping new and larger sources of finance for much-needed energy infrastructure in Vietnam calls for a major coordinated policy effort organized along three pillars. Vietnam finds itself with energy sector investment needs that are larger than ever before, at a time when its traditional financing models are becoming more constrained and less viable. While there are several avenues for expanding and diversifying sources of investment finance to the energy sector in Vietnam, each one of them faces significant implementation challenges. There is, consequently, a real need to make a paradigm shift that will substantially expand the availability of capital to the energy sector while reducing the burden on the state. To seize this opportunity, the government needs to organize a sustained and concerted policy effort to make progress on three parallel pillars (see table below):

Pillar I: Develop a major IPP/PPP program to build investor confidence;

Pillar II: Prepare electricity and gas companies to access commercial finance; and

Pillar III: Increase the availability of local-currency finance.

Each of these pillars is developed in further detail below.

Table 9: Unlocking Financial Resources for Energy Investments

Pillar I	Pillar II	Pillar III
<p>Develop a major IPP/PPP program to build investor confidence</p>	<p>Prepare electricity and gas companies to access commercial finance</p>	<p>Increase the availability of local-currency finance</p>
<p><i>(1) Develop transparent policy framework</i></p> <ul style="list-style-type: none"> • Risk allocation • Government support • Foreign exchange convertibility • Managing contingent liabilities • Procurement of IPPs/PPPs 	<p><i>(1) Optimize use of limited public finance and concessional finance</i></p> <ul style="list-style-type: none"> • Prioritize future concessional finance 	<p><i>(1) Increase availability of long-term domestic capital</i></p> <ul style="list-style-type: none"> • Mobilize long-term capital • Develop long-term financial products • Revise decree 90 (issuance of corporate bonds) to allow for more transparency/disclosure on broader issuances for energy companies to access the corporate debt market
<p><i>(2) Adopt programmatic approach to IPPs/PPPs</i></p> <ul style="list-style-type: none"> • Announce multiyear project pipeline 	<p><i>(2) Enhance credit worthiness of energy sector SOEs</i></p> <ul style="list-style-type: none"> • Refinance existing public debt • Limited access to commercial finance by energy SOEs • Move to fully cost-reflective electricity tariffs 	<p><i>(2) Ease constraints facing domestic commercial banks</i></p> <ul style="list-style-type: none"> • Address single borrower limits and de-risk investment in the energy sector • Improve banking capacity to appraise energy projects
	<p><i>(3) Update policy and regulatory framework for gas and LNG</i></p> <ul style="list-style-type: none"> • Develop gas/LNG pricing policy that reflect rising costs and develop integrated commercial framework for gas-to-power • Define modern planning and regulatory approach for LNG • Implement gas sector liberalization 	

5.1 Pillar I: Develop a Major IPP/PPP Program to Build Investor Confidence

To achieve the kind of scale-up of IPPs/PPPs needed to deliver the next wave of energy investments, there will need to be a well-designed programmatic approach, which can be rolled out over the next few years. While Vietnam has recently made progress in harmonizing and integrating the legal framework for PPPs, this still falls well short of what is needed to kick-start a major new program of PPPs/PPPs on the scale needed to address power generation investment needs through 2030. Whereas BoTs and IPPs to date have built 13 GW of generation capacity based on bilateral negotiations, those IPPs planned through 2030 will need to develop an additional 41 GW of capacity. There is a general consensus that building those large volumes of new generation based on negotiations will lead to a sub-optimal outcome for Vietnam, and competitive bidding must be applied.

The lack of know-how in key line ministries to prepare and competitively procure IPP/PPP projects has been partly responsible for the poor implementation of the new legal framework and the slow process in closing deals. If there is to be a successful IPP/PPP program in the future, it will be important to build capacity and consider establishing an efficient central PPP unit for the procurement of new power-generation capacity.

Moreover, to maximize investor interest, the government should consider crafting and launching a multiyear PPP/IPP program based on the substantial generation project pipeline, with a view to establishing a strong track record of successful IPP/PPP projects based on a competitive and transparent bidding process that will gradually reduce the need for government support over time. This can be rolled out with differentiated timeframes for different types of projects, starting with the post-FiT regime solar auction program MOIT is currently preparing. Such a PPP/IPP program for power generation should be developed closely with the upcoming PDP8.

(1) Develop clear and transparent policy frameworks

(a) Risk allocation. Bilateral customized negotiations of risk allocation (including convertibility, government credit support for the obligations of SOEs, the consequences of termination, arbitration, etc.) are an inefficient way to scale up investment. At the same time, the current “standard” risk allocation in the wind, solar, and hydro PPAs appears to be generally not acceptable to international investors and, as such, these projects will likely find it difficult to attract foreign capital. Therefore, there is a need for the government to adopt a well-grounded and consistent contractual framework for all IPP/PPP projects.

(b) Government support. Regarding government support for credit enhancements and the impact of such guarantees on the government’s balance sheet, the emphasis should be on trying to minimize the level of support needed to attract the desired level of investment from the private sector while at the same time recognizing that Vietnam is still in the process of establishing a robust track record for developing IPPs/PPPs.

Therefore, it may be necessary for the government to provide more generous levels of support in the initial phases of the program to encourage participation and build confidence among private investors and then gradually reduce the level of support and skew the risk allocation back to the private sector moving forward as the market becomes more confident in the program and the government's ability to meet its obligations.

Guarantee products available from some IFIs can also provide comfort for both international and domestic investors, whether in the form of a political risk guarantee, a partial credit guarantee, or first loss risk sharing facilities, and thus lower the cost of capital (and therefore the cost of power to Vietnam).

- (c) **Foreign exchange convertibility.** Foreign exchange convertibility is currently a contentious issue with many international investors, necessitating significant government guarantees. An immediate solution would be to encourage the use of convertibility and transferability insurance products available from some multilateral organizations, such as MIGA, albeit at a cost premium. A longer-term solution would be to develop a currency swap market so that Vietnamese currency risk can be hedged by foreign investors without the need of a guarantee. However, the derivatives market in Vietnam, including for FOREX hedging instruments, remains at a nascent stage. Available derivatives are limited to basic currency products, such as spot FOREX transactions, short-tenor interest rate swap transactions, and commodity swap transactions entered for hedging purposes between a Vietnamese bank or a Vietnamese branch of a foreign bank and a Vietnamese counterparty. A licensed Vietnamese bank or a Vietnamese branch of a foreign bank could also enter into cross-border derivative transactions (e.g., interest rate swap) with an offshore counterparty, depending on the transaction and counterparties involved and subject to SBV approval, which is granted on a case-by-case basis. The Decree 42/2015 extends the range of permissible derivatives to also include options and futures.
- (d) **Managing contingent liabilities.** At present, government-guaranteed debt counts fully toward the statutory public debt ceiling, whereas government contingent support to IPPs/PPPs (e.g., minimum revenue and payment guarantees) are not counted. Despite that, the government is cautious in giving contingent support due concerns that such support may still have uncertain fiscal consequences. It is therefore important to develop a clear and well-founded framework for valuing the fiscal risks associated with different types of government support, as well as a process for recording and monitoring them as part of the MOF's fiscal oversight. This would help to: (i) support decisions of what type of support are worth providing during contract negotiations, (ii) increase the transparency of such decisions, and (iii) alleviate concerns about fiscal prudence. The establishment of fiscal commitment and contingent liability (FCCL) thresholds (covering the contribution of the public party to PPP financing, including contingent liabilities) within PPP-related decrees might allow the government to more actively support the development of PPPs (and associated commercial financing) in the energy sector as it will have more confidence that the resulting contingent liabilities are being accurately accounted for and monitored.

(e) **Procurement of IPPs/PPPs.** It may be necessary to revise the legislation and regulatory framework with respect to IPPs/PPPs as the existing laws and regulations are not viewed by the various stakeholders as being “fit for purpose.” There are some discussions around drafting a new PPP law, which will replace the existing decrees and regulations governing PPPs in Vietnam. The passing of a new law could greatly improve the current legal and regulatory approach to PPPs and ensure consistency across all ministries and line agencies. Indeed, one of the constraints to procuring IPPs/PPPs is that, notwithstanding the current regulatory framework, which requires the use of competitive bidding for IPPs/PPPs, most transactions continue to be implemented on a direct negotiation basis. This creates the impression that the playing field is not level for private, and particularly foreign, investors. While there can be cases when direct negotiation may be justified, in most normal circumstances, an open, competitive, and transparent bidding process is likely to yield the best value-for-money for the government, encouraging an increasing number of private sector players to engage in the Vietnamese market. The lingering presence of IPP projects that have yet to reach financial closure after a decade of negotiations does not set a good precedent or encourage new investors to enter the Vietnamese market. At the same time, it would be important to adopt clear timebound procedures for how such IPP/PPP negotiations should be conducted in the future. Another bottleneck in the procurement process that needs to be addressed is the lack of consistency across provinces with respect to licensing and permitting procedures, as well as the multiplicity of licenses and permits required for a project.

(2) **Adopt a programmatic approach to IPPs/PPPs**

(a) **Announce multiyear project pipeline.** To signal to investors its serious commitment to IPP/PPP projects, the government should consider announcing an IPP/PPP program for power generation covering the next 2–3 years. This would involve identifying priority projects that are suitable for IPP/PPPs and for which preparation is at a sufficiently advanced stage, and publishing a timeline for their procurement based on a clear and standardized process, as described above. Such a program could also be publicized among international investors by means of a road show. A predictable large-scale program of this kind would give prospective investors an incentive to invest in entering the Vietnamese market. This would also allow the government to rapidly replicate and scale-up successful transactions as well as reduce development costs incurred by investors entering the market (including due diligence, documentation, legal work, etc.). The MOIT is currently developing PDP8. As part of developing the new plan, this would be a good opportunity to develop in parallel an IPP/PPP program for power generation.

Table 10: Pillar I Recommended Actions—Develop a Major IPP/PPP Program

Key Constraints (Responsible Party)	Near-term Actions (Within a Year)	Medium-term Actions (1–3 years)
(1) Lack of clear and transparent policy frameworks		
(a) Risk allocation between government and private sector (MOIT/MOF/SBV)	Develop improved risk allocation framework (starting with solar as part of the development of solar auction mechanism)	Develop improved risk allocation framework for all generation technologies
(b) Government support (MOIT/MOF)		Develop transparent framework for government support for power-generation technologies
(c) Foreign exchange convertibility (MOF/SBV)	Encourage the use of convertibility insurance products	Develop strategy for VND/US\$ currency swap market
(d) Identify, monitor and manage contingent liabilities (MOF/MPI)	Develop a comprehensive framework for managing contingent liabilities	
(e) Procurement of IPPs/PPPs (MOIT)	Develop a transparent and competitive bidding process for new generation	Apply competitive bidding for all new generation
(2) Lack of programmatic approach to PPPs		
(a) Announce multiyear project pipeline (MOIT)	Identify project pipeline as part of developing PDP8	Announce multiyear pipeline for IPP/PPP

5.2 Prepare Electricity and Gas Companies to Access Commercial Finance

Corporate finance will remain a key channel for funding investment into the sector, but this will increasingly need to be on the strength of the company’s own balance sheet without recourse to the state. All energy companies should work toward obtaining positive credit ratings with the objective of being able to raise their own debt finance without state support. Rationalizing pricing policies for both electricity and gas, as well as modernizing the associated regulatory and institutional frameworks, will be critical to achieving such creditworthiness. Measures are also needed to ensure that some space remains for funding critical public investments into sectors that are not open to the private sector, such as investments into power transmission and distribution, and that use of increasingly scarce finance from IFIs and DPs are carefully prioritized for these kinds of investments. Some specific actions for consideration in this regard are highlighted below.

(1) Optimize use of limited public finance and concessional finance

(a) Prioritize allocation of future concessional finance. With the volumes of highly concessional finance available to Vietnam and the energy sector is expected to decline in the future, it will be important to ensure that principles for the efficient allocation of

the limited concessional financing be applied to those subsectors and projects where it can have the greatest benefit. These principles should aim to allocate these resources to programs and projects that will accelerate the creation and growth of robust markets for newer and cleaner energy technologies and solutions, and in sector segments that are not currently structured to absorb private investment. In the former category, would be technologies such as variable renewable energy systems at utility-scale and energy efficiency upgrades, where for a variety of market, cost-competitiveness and information constraints, their uptake and delivery by the private sector is not near desired levels (e.g., battery storage).⁸ In the latter category, would-be segments of the natural monopoly distribution and transmission networks, which are held publicly (i.e., distribution networks by the five PCs and transmission network by NPT).

(2) *Enhance the creditworthiness of energy sector SOEs*

(a) *Refinance existing public debt.* In the electricity sector, a portion of current EVN debt is short-term with relatively high interest rates. As EVN's creditworthiness continues to improve, or by using multinational guarantee products, the company can refinance its expensive debt with more favorable terms and conditions. This will result in lower debt service payments (higher interest offset by lower principal amortization) by EVN through longer tenors of its refinanced loans. PVN and some PVN subsidiaries may face a similar debt situation where refinancing existing debt would benefit the utility. In this context, note that the government only guarantees long-term loans (with maturity of at least 10 years). Among the EVN loans with government guarantees, there are some loans entering the principal repayment period, so the remaining lending terms on these loans tend to be medium to short term.

(b) *Limited access to commercial finance by energy SOEs.* The equitization process already underway in the electricity and gas sectors is aimed at divesting a significant number of EVN and PVN subsidiaries. Some equitization efforts have been more successful (e.g., PV Power) than others (e.g., Genco 3). Delivering on the objectives of the equitization program will be challenging unless underlying concerns about the enabling commercial environment and financial viability of the companies are addressed. Once successful, these new companies, whether public or private, could potentially raise their own debt on domestic or international markets, but would need to be able to demonstrate creditworthiness and have this certified by a reputable rating agency.

⁸ More than 90 percent of renewable energy investment in 2016 was financed from private sources. Public investment typically constitutes a small share of total global renewable energy finance, 13 percent in 2013–16. However, the public sector accounts for a much larger share of renewable energy investment in developing countries, where barriers to investment are high and there is little track record of successful renewable energy projects. In 2013–16, public investment accounted for 49 percent of total renewable energy financing in Latin America/Caribbean, 41 percent in Sub-Saharan Africa, and 24 percent in South Asia. (Source: International Renewable Energy Agency and Climate Policy Initiative (IRENA & CPI) (2018). Global Landscape of Renewable Energy Finance, 2018, IRENA, Abu Dhabi.)

Therefore, as a matter of policy, it would be important for companies to be equitized as well as for those energy SOEs that remain in public ownership (e.g., NPT, PCs) to improve their financial standing and the corporate governance needed to obtain a credit rating and achieve an investment-grade rating in the shortest possible period to enable them to raise commercial financing in both the domestic and international markets without government backstopping.

(c) *Move toward fully cost-reflective electricity tariffs.* For companies operating in the electricity sector, creditworthiness hinges critically on establishing retail tariffs that adequately match the costs of service (opex, capex, debt service) plus a profit margin. The adoption of a multiyear tariff trajectory that places the sector on a path toward full cost recovery would be an important positive signal to potential investors. However, since there are sociopolitical concerns associated with raising electricity tariffs, it is important to ensure that any cost recovery trajectory for electricity tariffs is accompanied by suitable policies to mitigate macroeconomic, inflationary, and social impacts to protect lower-income households, as well as an effective public awareness campaign that explains the need to increase tariffs.

(3) *Update policy and regulatory framework for gas and LNG*

(a) *Develop gas/LNG pricing policy that reflect rising costs and develop integrated commercial framework for gas-to-power.* Current gas pricing policy does not reflect rising costs of new gas fields and LNG and lacks bankable integrated commercial framework for gas-to-power projects. Attracting private capital into gas-to-power projects will require development of a bankable power purchase agreement (PPA) that is fully aligned with the volume, pricing, payment terms, performance obligations, and other terms of the underlying pipeline transportation, terminal use, and gas/LNG supply agreements. The ability to raise investment finance for the gas sector depends critically on modernizing the regulatory framework for gas prices, which are currently benchmarked to exceptionally low historic development costs that no longer reflect current market conditions. It is also important to have clear pricing rules for updating gas prices under long-term contracts to reflect evolving global trends. As in the case of electricity, a transitional mechanism will need to be adopted to support the move from current pricing practices to a fully market-based approach. Since the bulk of Vietnam's gas production is consumed in power generation, any reforms will only be meaningful to the extent that these evolving prices can be passed through to electricity tariffs, which is where the costs will ultimately need to be recovered. It is relatively common for countries to adopt pricing formulas that allow fuel price changes to automatically feed through into electricity tariffs on a regular basis (such as monthly, quarterly, or bi-annually) without any need for regulatory intervention.

- (b) ***Deline modern planning and regulatory approach to LNG.*** The existing regulatory framework for the gas sector does not contemplate some of the specific issues associated with LNG. Introduction of LNG will expose Vietnam for the first time to global gas prices, so it is critically important to define the mechanism by which LNG prices are transmitted to the electricity market. In addition, there are significant gaps in areas, such as how LNG regassification tariffs would be determined, what would be the capacity and access rights of different market players, and the framework to govern any PPP arrangements for LNG development. The current Gas Master Plan is quite rigid and tends to favor SOE ownership and lock-in specific projects. These projects may not always be the most cost-effective and may expose EVN (as the ultimate off-taker) to substantial risk. A well-designed LNG contracting and procurement strategy would enable the electricity sector to realize the benefits of attractive pricing terms and volume flexibility that are available in the current LNG market. With respect to LNG terminals, Vietnam has not fully explored the possibility of using FSRU technology to lower cost, gain flexibility, and reduce financial commitments. There is also considerable scope for pursuing PPP arrangements for terminal development, potentially as an integrated package with gas-fired power generation. Given the lack of prior experience with LNG in Vietnam, there is a lack of technical know-how in the sector to inform key decisions regarding strategy formulation, commercial structuring, terminal site and technology selection, and LNG procurement. It would therefore be desirable for MOIT, EVN and PVN to retain experienced third-party legal and technical experts as in-house advisers to support all the key decision-making processes around LNG.
- (c) ***Implement gas sector liberalization.*** The implementation of the government's vision for the gas sector cannot be achieved under the current structure. It would require a comprehensive modernization of the institutional, legal, and regulatory framework that governs the sector. Hence, the implementation of the gas sector roadmap to liberalize gas supply is of critical importance. In this context, the unbundling of PVN to create a more transparent and accountable set of companies will be an important first step. Thereafter, the establishment of modern sector legislation and the creation of a regulatory entity will help to pave the way for market liberalization and the entry of new actors into the market. An important element is the establishment of clear contracting mechanisms to allow gas buyers and sellers to trade as well as third-party access to gas network.

Table 11: Pillar II Recommended Actions—Prepare Energy Companies to Access Commercial Finance

Constraints (Responsible Party)	Near-term Actions (Within a Year)	Medium-term Actions (1–3 years)
(1) Optimize use of limited public finance and concessional finance		
(a) Prioritize allocation of future concessional finance (MOF/MOIT/MPI)		Develop and apply principles to prioritize application of limited concessional resources
(2) Enhance the creditworthiness of energy sector SOEs		
(a) Refinance existing EVN and PVN debt (EVN, PVN, MOF)	Reduce sovereign exposure by refinancing existing SOE debt	Identify options for private sector financing of state-owned transmission and distribution networks
(b) Limited access to commercial finance of energy SOEs (EVN/PVN)	Finalize PVN and NPT credit rating and support EVN in the issuance of international green bonds	Prepare credit rating for 5 PCs and relevant VPN subsidiaries
(c) Electricity tariffs do not recover full costs of supply (MOIT)	Improve transparency of electricity tariff setting and regulatory decision-making processes	Adopt a multiyear cost recovery trajectory for electricity tariffs
(3) Update policy and regulatory framework for natural gas and LNG		
(a) Develop gas pricing policy that reflects rising costs of new gas fields, and LNG and develop integrated commercial framework for gas-to-power projects (MOIT)	Develop gas pricing policy and integrated gas-to-power commercial structure	Adopt efficient gas and LNG pricing policy
(b) Deline a modern planning and regulatory approach to LNG (MOIT)	Develop LNG strategy to capture benefits from cost reduction and supply flexibility available in current global market	Implement LNG strategy
(c) Implement gas sector liberalization (MOIT)	Approve gas roadmap and gas law defining regulated and competitive segments, and initiate restructuring of PVN	Introduce an open access regime for gas transportation, and implement market rules that allow flexibility in gas supply contracting and trading

5.3 Embark on a Program to Increase the Availability of Local-Currency Finance

There is a pressing need to strengthen the domestic commercial banking sector, while deepening and broadening domestic capital markets. Both project finance and corporate finance structures will benefit from greater availability of long-term fixed-interest local-currency finance through the domestic debt and capital markets. Local-currency financing is attractive as it avoids the additional risks associated with exchange rate variations and currency convertibility. Nevertheless, at present, these advantages are outweighed by high and variable interest rates, short tenors, and constraints on the availability of capital for long-term financing. Addressing these constraints calls for a concerted effort to deepen and broaden Vietnam's capital markets, particularly the domestic corporate bond market as a promising alternative channel for long-term finance. However, as it will take time for the domestic financial sector to develop to the level that will enable it to support much of Vietnam's future energy financing needs, it will be important to also mobilize financing from offshore investors and lenders, while ensuring that such financing is raised on a sustainable basis and that the contingent liabilities are appropriately monitored and managed. Some actions for considerations are highlighted below.

(1) Increase availability of long-term domestic capital

- (a) Mobilize long-term capital.** Underlying the scarcity of long-term lending in the domestic market is the shortage of long-term savings or other sources of long-term capital. There is a need to develop a strategy to mobilize such long-term savings, whether through wider use of pension funds and life insurance products or through providing incentives and financial products to existing savers to invest their funds in longer-term deposits, for instance through developing a steeper deposit duration yield curve or establishing specific investment funds dedicated toward infrastructure investments.
- (b) Develop long-term financial products.** The government has recently adopted the Bond Market Development Road Map 2017, with a vision through 2030. Progress on this agenda will be critical to provide channels for longer-term domestic corporate finance for the equitized subsidiaries of EVN and PVN and to support debt restructuring. Among the critical steps to be taken are: (i) development of short-term benchmark interest rates; (ii) measures to increase liquidity in the longer end of the government bond market; (iii) plugging regulatory gaps; (iv) provision of better-quality information on the credit rating of corporate bond issues; and (v) streamlining the corporate bond issuance process in the public market, while loosening issuer conditions (including years of establishment and profitability requirements) in the private placement market so that project companies and special purpose companies can issue bonds in this segment (e.g., green bonds) while at the same time restricting this private placement market to only qualified investors.⁹

⁹ These are the recommended amendments to decree 90 on corporate bond issuance.

- (c) **Revise decree 90.** Most corporate bond issuances are done through private placements, which do not require any substantial disclosure requirements. Decree 90 is currently being revised to improve disclosure standards to attract more institutional investors and allow for broader issuance for energy companies to access the corporate debt market.
- (2) **Ease constraints facing domestic commercial banks**

 - (a) **Address single borrower limits and de-risk investment in the energy sector.** Banks are currently limited by constraints on single borrower exposure, which can be problematic for large energy projects. This can be addressed through various risk-sharing facilities. Risk sharing facilities can promote investment in the energy sector by sharing the risks associated with lending to the energy sector and thereby reduce the banks' exposure to the associated risks. The establishment of syndication capabilities could also address this problem by enabling banks to sell down some of their exposure to other banks. An alternative method of recycling exposure is through the securitization of loan assets, which would require the development of domestic bond markets and the introduction of asset-back securities into the market. This would also contribute toward deepening the corporate bond market in Vietnam.
 - (b) **Improve banking capacity to appraise projects.** Many local banks are unfamiliar with energy projects, particularly with renewable energy and LNG technologies. This makes it difficult for them to assess credit risks and to price loans accordingly. However, if local banks are to play a greater role in energy finance in the future, it is important to undertake capacity building activities to provide them with the necessary know-how.

Table 12: Pillar III Recommended Actions – Increase the Availability of Local-Currency Finance

Constraints (Responsible Party)	Near-term Actions (Within a Year)	Medium-term Actions (1–3 years)
(1) Increase availability of long-term domestic capital		
(a) Mobilize long-term capital (MOF/SBV)	<ul style="list-style-type: none"> • Develop strategy for mobilizing long term domestic savings • Revise regulations on private placement of corporate bonds • Develop long term savings products (pension funds, life insurance) 	<ul style="list-style-type: none"> • Pilot SOE VND bond issue as ‘strategic paper’ without MOF guarantee • Develop SOE financing needs plan as a basis for a long-term financing strategy
(b) Develop long-term financial products (SBV/MOF)	<ul style="list-style-type: none"> • Develop strategy for long term fixed interest rates and hedging • Develop short-term benchmark interest rate to improve pricing of financial instruments 	<ul style="list-style-type: none"> • Implement debt/swap strategy • Introduce measures to increase liquidity of government bond market and streamline process of corporate bond issuance
(c) Revise decree 90 on the issuance of corporate bonds (MoF)	Revise decree 90 to allow for more transparency and for energy companies to access the corporate debt market	Issue model capital markets transaction in the energy sector, such as a green bond
(2) Ease constraints facing domestic commercial banks		
(a) Address single borrower limits and de-risk investment in the energy sector (MOF)	Develop strategy of banks to recycle assets and address asset quality of the banks’ balance sheets	<ul style="list-style-type: none"> • Explore securitization of assets to manage balance sheet exposure • Establish risk sharing facility to reduce exposure
(b) Improve banking capacity to appraise projects (SBV/ Commercial Banks)	Develop strategy to increase banking sector appraisal capacity	





Annex 1. Macroeconomic Profile

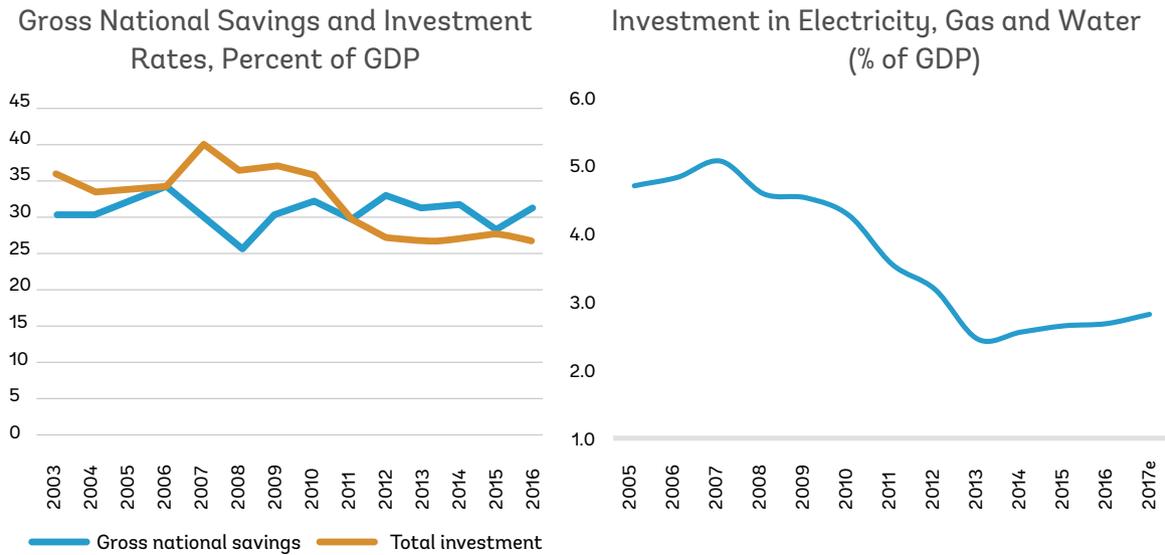
1.1 Macroeconomic Environment

1. Vietnam's overall macroeconomic environment remains favorable, with resilient growth and broad macroeconomic stability. Driven by export-oriented manufacturing and robust domestic demand, GDP growth has averaged 6 percent annually between 2010–16. This resilient growth has been accompanied by macroeconomic stability. After a period of high inflation and acute instability in 2011, inflationary pressures have subsided, with headline inflation remaining in single digits for the last five years. Vietnam's external position also remains in balance, underpinned by strong export growth, robust remittance inflows, and a capital account surplus. While foreign reserves remain relatively low, supported by strong inflows, the exchange rate has been relatively stable, while reserves continue to rise, reaching about US\$63 billion in the first half of 2018, more than twice the nominal level reported in December 2015 and equal to around 3.5 months of imports.
2. High domestic savings and large FDI inflows provide ample resources to finance investments, including for infrastructure. Indeed, Vietnam's domestic savings rate is relatively high at around 30 percent of GDP. This is the equivalent to around US\$60 billion in 2016 (at the current exchange rate¹⁰). In addition, Vietnam is also attracting significant foreign investment in the form of inflows of FDI, equaling 8 percent of GDP, or close to US\$16 billion in 2016. In contrast, portfolio capital inflows are marginal, reflecting the relatively limited presence of nonresident investors in Vietnam's capital markets.
3. However, overall investment growth has been sluggish in recent years despite large unmet infrastructure investment needs. Investment activity has slowed markedly since the 2008/09 global financial crisis. Indeed, over the past six years, the investment rate has averaged only about 26 percent of GDP (compared with 36 percent in the six years prior to the global financial crisis). While slowing investment growth is partly a correction from high pre-crisis investment rates, it also reflects the fact that there are a range of obstacles holding back investment, including fiscal constraints, lack of efficient financial intermediation, and shallow capital markets, which have constrained investment by the domestic private sector.

¹⁰ The applied exchange rate is 22,350 (average exchange rate for 2016).



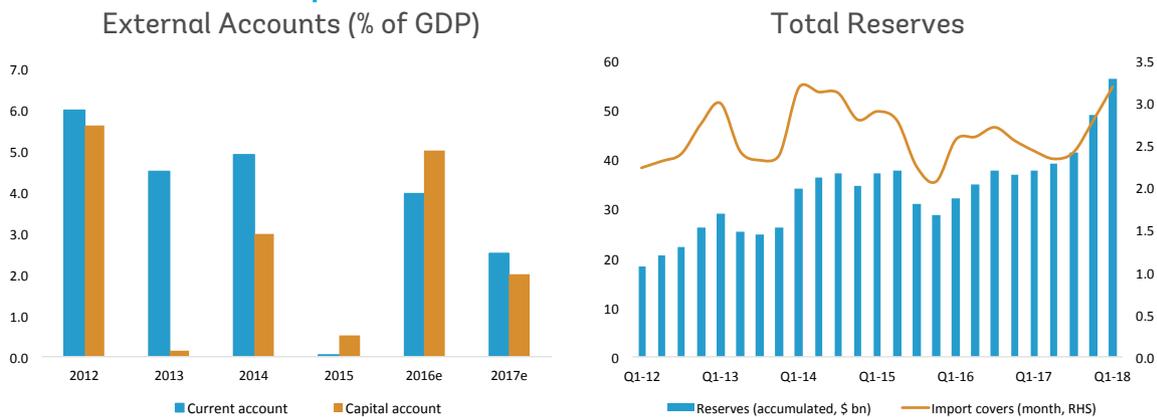
Graph 1.1. Sluggish Investment Since the Global Financial Crisis



Source: World Bank.

- Investment in the utility sector has in particular slowed down in recent years. As a share of GDP, investment in utilities (electricity, gas and water) has been on a declining trend, falling from an average of 4.5 percent of GDP to 3.1 percent of GDP between 2003 and 2016.
- Vietnam’s external balance of payments position has strengthened in recent years on the back of strong export growth, robust remittances and FDI, bolstering reserve accumulation. The current account surplus is underpinned by export performance and remittances which are only partly offset by growing repatriation of profits (related to the sizable FDI sector in the country). The financial account also saw large net inflows of FDI as well as long-term loans, mostly in the form of official financing (e.g., concessional financing provided by official, noncommercial creditors). Persistent Balance of Payment (BoP) surplus in recent years have allowed for a gradual build up of foreign reserves. However, the level of the foreign reserves is still relatively low at only 3.5 months of imports, and could raise concerns by investors over the availability of sufficient foreign liquidity to convert and remit prospective returns from investments in the energy sector.

Graph 1.2. External Accounts and Total Reserves



Source: World Bank.

6. The SBV operates a crawling-peg foreign exchange rate regime. Since 2016, the SBV has moved to a more flexible and market-driven management of the exchange rate, moving from periodic devaluations toward daily setting of the reference rate based on the average interbank exchange rates against the U.S. dollar, allowing dollar/dong transactions to move in a band around this daily reference rate. The SBV has maintained a trading band of +/- 3 percent. Commercial banks can determine their own spread between currency selling and buying prices within the trading band set by the SBV.
7. The exchange rate has been relatively stable, bolstered by the strong external position. While the SBV continues to gradually devalue the VND, it has publicly stated that the objective is to maintain a stable exchange rate that moves in line with market developments.

Graph 1.3. Stable Exchange Rate

Nominal Exchange Rate: Vietnam Dong per US Dollar



Source: IMF.

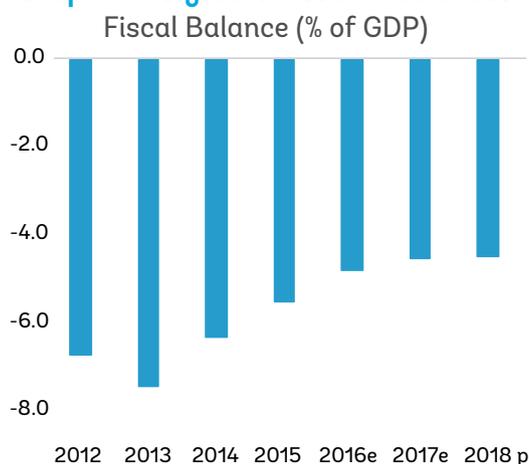
8. Vietnam has removed administrative restrictions on FOREX transactions. Conversion of the Vietnamese Dong into hard currency no longer requires FOREX approval, and Vietnam abolished FOREX surrender requirements in 2003. The Law on Investment (2014) allows foreign investors to purchase foreign currency at authorized banks to finance current and capital transactions and other permitted transactions. Foreign businesses are also allowed to remit in hard currencies all profits, shared profits, income from legally-owned capital, properties, and services as well as principal and interest on loans obtained for business operations and investment capital. Residents and nonresidents can open and maintain FOREX accounts and deposit foreign currencies with authorized banks in Vietnam, although there is an administrative cap of zero percent on the FOREX interest deposit rate.
9. The derivatives market, including for FOREX hedging instruments, remains at a nascent stage. Available derivatives are limited to basic currency products, such as FOREX transactions, short-tenor interest rate swap transactions, and commodity swap transactions entered for hedging purposes between a Vietnamese bank or a Vietnamese branch of a foreign bank and a Vietnamese counterparty. A licensed Vietnamese bank or a Vietnamese branch of a foreign bank could also participate in cross-border derivative transactions (e.g., interest rate swap) with an offshore coun-

terparty, depending on the transaction and counterparties involved and subject to SBV approval, which is granted on a case-by-case basis. Decree 42/2015 extends the range of permissible derivatives to also include options and futures.

10. Despite the elimination of FOREX controls, convertibility risk remains a key concern for foreign investors, more notably for those taking medium to long-term exposures. The availability of FOREX has been an intermittent problem in previous years. Perceived uncertainty over the convertibility of large-scale Dong-denominated income flows limits the bankability of projects for foreign partners. The government has provided specific foreign currency convertibility support for certain projects in case the banking system is unable to fully satisfy the demand for foreign currency.

1.2 Public Sector Debt

Graph 1.4. Sizeable Fiscal Imbalances



Source: World Bank based on official data.

11. Sizeable fiscal deficits over the past few years have led to rapidly rising public debt. The average fiscal deficit during 2009–16 increased to about 5 percent of GDP per year, markedly higher than the 1.2 percent per year during 2003–08. As a result, Vietnam’s public-debt-to-GDP ratio has increased rapidly over the past few years.
12. The nationally reported public debt figures show that Vietnam’s public and publicly guaranteed debt increased markedly, from 51.7 percent of GDP in 2010 to 63.7 percent in 2016, which is very close to the government’s statutory debt limit of 65 percent of GDP. Of this, 52.4 percent of GDP is debt directly owed by the government, 10 percent is debt guaranteed by the government, and about 1.3 percent is provincial government debt guaranteed by the government.
13. The government has increasingly relied on concessional financing and the domestic bond market to meet its growing financing needs. As Vietnam solidifies its middle-income status, access to highly concessional finance will naturally become tighter. While external loans from IFIs and bilateral DPs remain a large share of the debt

portfolio, Vietnam has increasingly relied on domestic (and to a lesser extent international) capital markets as a source of fiscal financing. This has helped contain exchange rate risks but has increased refinancing risks due to the shorter maturity of domestic debt. In such a context, it becomes fundamental to have a more proactive approach to debt management.

14. Public finances are expected to remain tight for some years to come, limiting the available fiscal space for infrastructure investment. The government has made a commitment to rein in the fiscal deficit and reduce public debt to ensure long-term fiscal sustainability. The draft Medium Term Financial and Budgetary Plan (2016–20) envisages a deficit reduction to around 3 percent of GDP by 2020. Achieving this deficit target would allow the government to stabilize and then gradually reduce public debt as a share of GDP, rebuild buffers, and ensure sustainable public finances. A credible fiscal consolidation plan would lower overall financing needs and reduce future financing costs by bolstering investor confidence and improving the country's creditworthiness in capital markets. At the same time, it means fiscal space for direct borrowing or for the provision of publicly guaranteed debt to finance infrastructure, including in the energy sector, will be increasingly limited.

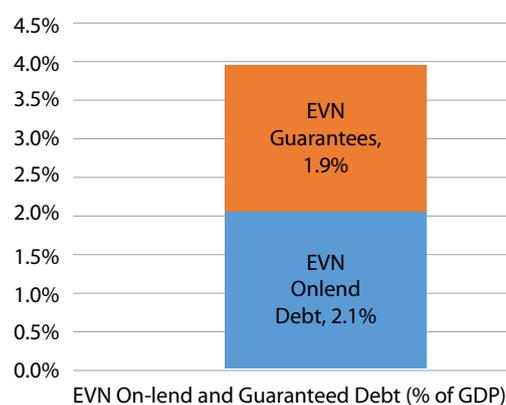
1.3 Public Investment and Fiscal Support for the Energy Sector

15. Fiscal space for public investment is increasingly constrained. Historically, the majority of infrastructure projects in Vietnam have been financed largely from the government budget and through central government bond investment programs and municipal bond issuance. Highly concessional finance (e.g., low-interest World Bank IDA credits and grants) and less concessional finance from IFIs and DPs (e.g., IBRD, EXIM banks) have also been key sources of funding for infrastructure development.
16. Vietnam has traditionally allocated significant public fiscal resources to infrastructure development, with public investment accounting for an average of about 9 percent of GDP per year (2006–16), contributing about 40 percent of total investment into the economy, mostly in the energy, transportation, and agriculture sectors. However, in recent years, budgetary capital spending has steadily declined to 7 percent of GDP per year. This reflects the phasing out of stimulus measures put in place earlier, as well as the curtailment of disbursement of ongoing investment projects. Furthermore, following the issuance of Decree 16 in 2016 on the management and utilization of ODA and concessional loans, the government has identified priority areas for the utilization of such funds, including support to priority sectors like transport and energy and for projects that can demonstrate cost recovery. These fiscal constraints, which limit public investment, mean that the private sector will need to play an increasing role in providing investments for infrastructure and especially energy.
17. In the past, there has been significant fiscal support to finance investment in the energy sector in the form of on-lending of official financing and publicly guaranteed loans. For example, EVN has received significant fiscal support, most of it provided



off-budget, in the form of either borrowing from MOF (on-lending of official financing) or direct borrowing by EVN with explicit publicly guaranteed debt. About 80 percent of EVN’s current debt (US\$9 billion) is subject to sovereign backstopping. In addition, there are also guarantees on nondebt-related payments, including minimum revenue and termination payments. Such liabilities are usually with MOIT, not EVN, and thus may not affect EVN’s credit. EVN essentially receives financing through three channels:

Graph 1.5. Fiscal Support to EVN (% of GDP)



Source: MoF.

- On-lending:** EVN has been a major recipient of on-lending of official financing (from multilateral and bilateral partners, such as the World Bank, ADB, JICA, KFW, etc). These liabilities are directly contracted by MOF (and therefore considered direct public debt and hence subject to the 65 percent of GDP statutory debt limit) and on-lent to EVN with EVN assuming all debt service obligations. Management of on-lending to SOEs, including EVN, is governed by Decree 78/2010, which sets out the requirements and terms for the use of on-lending.
- Loan guarantees:** MOF has provided sovereign debt guarantees on commercial borrowing by EVN from domestic and foreign banks. Government guaranteed commercial debt of EVN amounts to US\$3.9 billion, equal to 18 percent of Vietnam’s total publicly guaranteed debt or 1.9 percent of GDP. The underlying commercial debt is contracted by EVN, and the sovereign guarantees are recorded as publicly guaranteed debt (and hence subject to the 65 percent of GDP statutory debt limit). Issuance of loan guarantees is now governed by Decree 04/2017 (which took effect from March 2017) on Vietnam’s sovereign guarantees for loans borrowed by SOEs. The decree imposes stringent conditions on the issuance of new loan guarantees, including collateral, credit insurance, and other requirements; it also limits new guarantee coverage to a maximum of 70 percent of the debt obligation.
- Other payment guarantees (nondebt related):** The government has also provided credit support to backstop EVN’s payment obligations pursuant to long-term contractual agreements signed between EVN and private investors (e.g., PPAs for BOT projects). Several BOT projects, including Phu My 2.2 (2002—Gas), Phu My 3 (2003—

Gas), Mong Duong (2011—Coal) and more recently Vinh Tan 4 (2014—Coal), benefit from government support to cover the risk of default by EVN of its off-take and termination payment obligations under the relevant project documents. Such government nondebt-related liabilities are contingent in nature and thus—in line with international practice—are not recorded as part of Vietnam’s publicly guaranteed debt and not subject to the 65 percent of GDP statutory debt limit. This type of credit support from the government is contemplated under the PPP Decree that stipulates a list of sectors eligible for such support, including the key sectors of transportation; street lighting; water supply; waste treatment; power plants and transmission; commercial infrastructure; social infrastructure facilities for health care, culture, sports, industry, and agriculture; and other sectors for infrastructure development as decided by the prime minister.

18. In addition to borrowing, there are several types of government interventions to support private sector financing of the energy sector that result in forgone revenues, including: (i) corporate income tax holiday for four years, 5 percent tax [rate] for nine years, and 10 percent [tax rate] for 2–17 years for all new enterprises to generate power; (ii) corporate income tax reduction to 10 percent for all forms of clean or renewable energy through the life of their operation; (iii) import duty exemption for firms producing certain forms of renewable energy and for goods in service of petroleum activities if imports are not manufactured in Vietnam; (iv) accelerated depreciation for certain form of renewable energy; and (v) initial exemption from and later reduction of land tax for certain forms of renewable energy.

Annex 2. Financial Sector Profile

2.1 Financing Environment

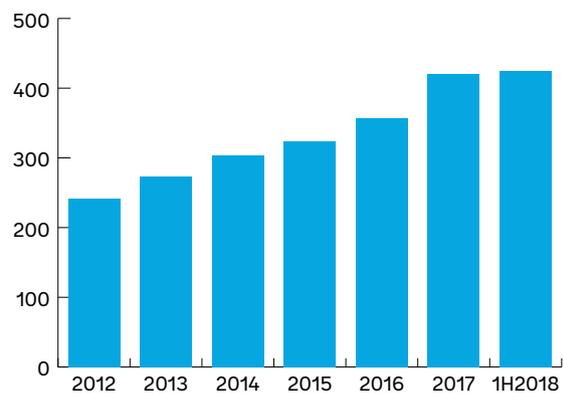
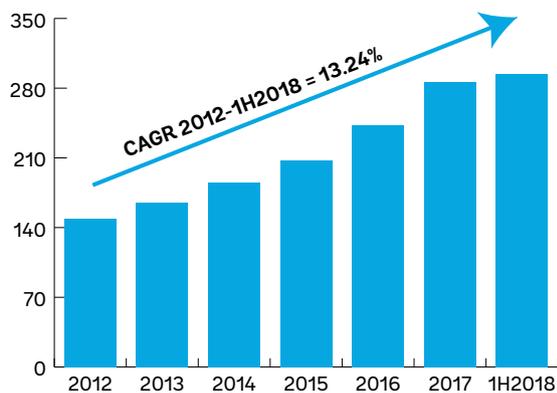
2.1.1 Commercial Banks

19. The assets of the Vietnamese banking system totaled US\$357 billion as at December 2016. This is equivalent to 95 percent of the total loans by all types of credit institutions. At the same time, the loan book of the banks totaled US\$246 billion. Credit growth averaged 12.2 percent (CAGR) over the period 2012–16.

Graph 2.1. Total Banking Sector Assets and Credit Growth

Credit Outstanding (US\$ billions)

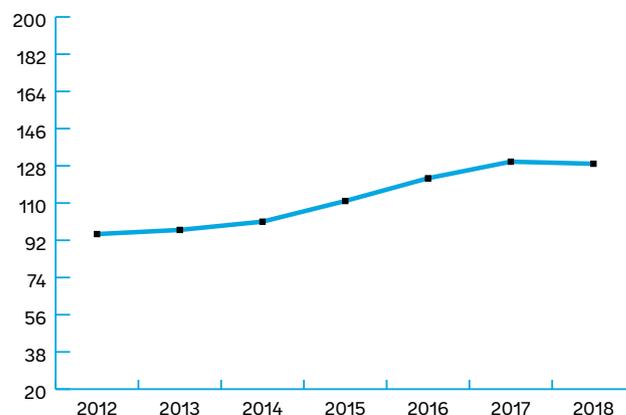
Credit Growth in the Banking Sector (US\$ billions)



Source: Stoxplus.

20. The ratio of total credit to GDP has been increasing, registering at 130 percent in 2017.

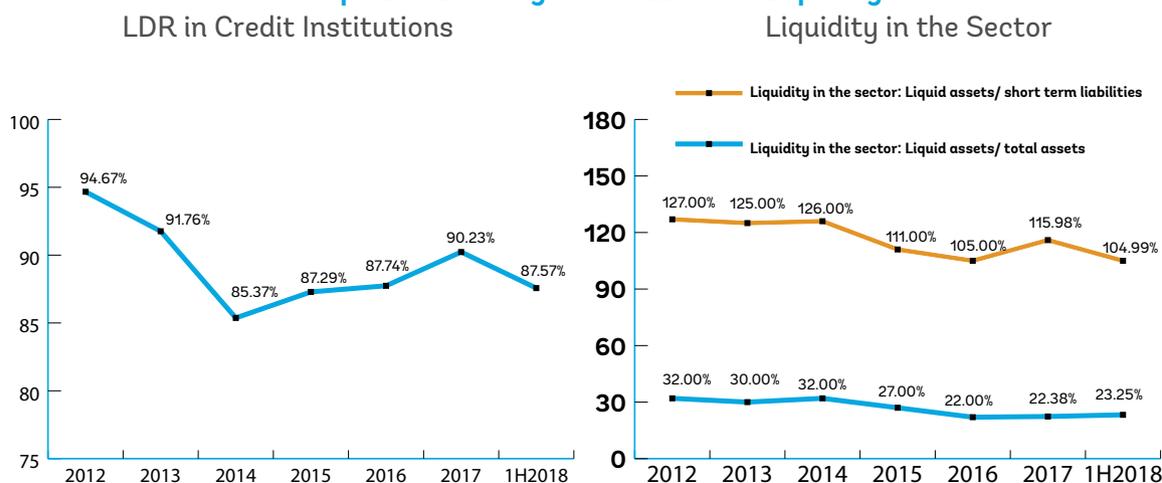
Graph 2.2. Vietnam's Total credit/Vietnam's GDP



Source: World Bank.

21. While still lower than in 2012, the loan-to-deposit ratio has seen an increasing trend, from 85.37 percent in 2014 to 87 percent by end of 2016, while the minimum ratio currently required by the State Bank of Vietnam is 80 percent. Meanwhile, liquid assets over total assets and short-term liabilities has been in decline. Furthermore, since the beginning of 2017, interbank interest rates also increased with overnight rates registering at 4.13 percent on average by early 2017.

Graph 2.3. Banking Sector LDR and Liquidity



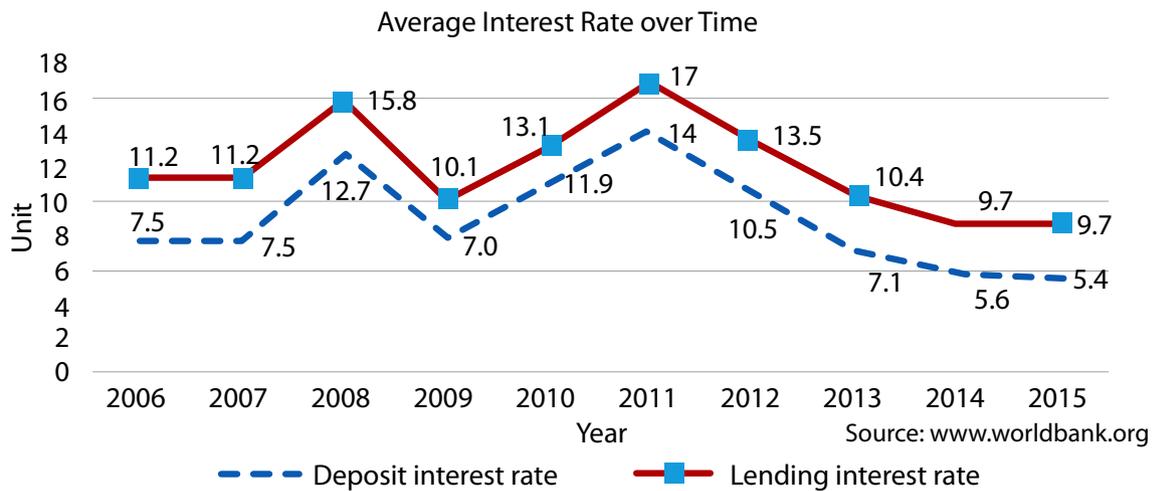
Source: Stoxplus.

22. By 2016, the banking sector consisted of 97 banking entities, including four fully state-owned commercial banks, 33 joint-stock banks, 51 foreign banks and branches, and two policy banks. State-owned commercial banks (SOCBs) account for 45 percent of total banking sector assets, followed by joint stock commercial banks (JSCBs) at 40 percent. In terms of credit provision, JSCBs maintain a 49 percent market share, followed by SOCBs (43 percent). While SOCBs and JSCBs are the key players in the banking sector, both are undercapitalized, with SOCBs generally less capitalized than JSCBs. The top 10 banks account for about 78 percent of the assets of the entire banking system. Much of the rapid credit growth in recent years has occurred through the banking system. Credit growth was approximately 19 percent in 2017.
23. Interest rates have been on a downward trend since 2012 and stabilized in 2016. The declining trend in interest rates resumed in the second half of 2017 with a reduction of 0.25 percent in the policy rate. Recently, a few banks attempted to cut deposit interest rates in response to favorable macro-conditions, including improved liquidity and low inflation, but smaller banks have kept the higher rates to maintain or expand market shares. Low inflation and declining deposit rates have also motivated many retail depositors to switch to higher-yield investments, such as stocks and properties. The SBV used several monetary policy tools for lowering lending interest rates, such as: (i) requiring credit institutions to reduce lending rates by cutting and managing operation costs; and (ii) keeping low discount rates and encouraging low interbank rates. To date, VND lending rates to prioritized sectors are commonly set at 6–9 percent per annum for short-term loans, while medium- and long-term rates charged by state-owned commercial banks remain in the 8–10 percent per annum range; lending rates to normal manufacturing/business sectors commonly range from 7–10 percent per annum for short-term loans and 9–12 percent per annum for longer-term loans.



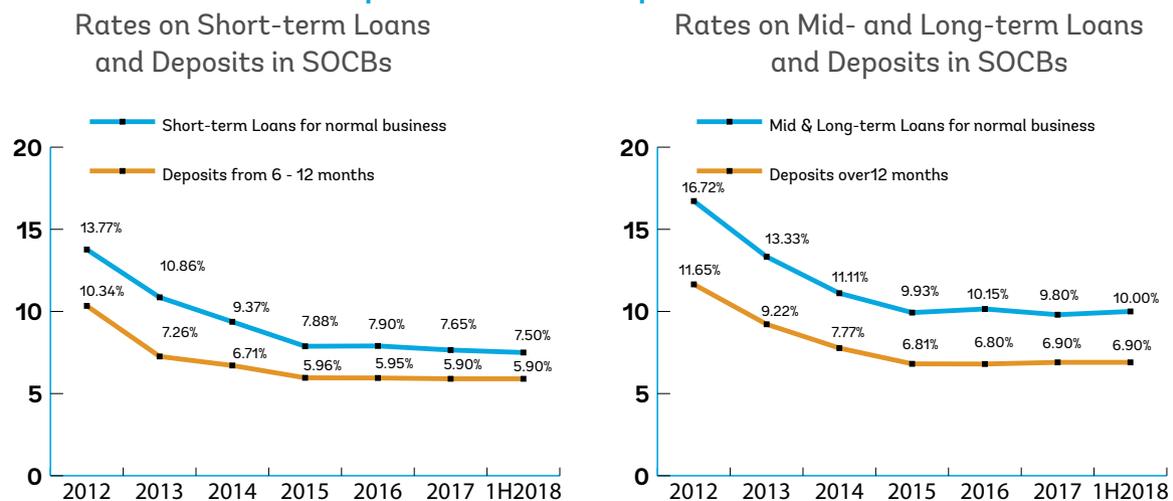
24. To put these interest rates into perspective, current lending rates are now lower than the low levels reached during the booming period of 2005–06. System liquidity has generally been stable, and banks generally rely on short-term deposits to support their medium- and long-term loans up to the threshold level set by the SBV. However, credit to deposits has declined from 95 percent in 2012 to around 89 percent in 2016, reflecting an absolute increase in deposits. Banks have also been issuing corporate bonds to fund their longer-term financing activities. However, local banks do very limited lending on either a long-term or fixed-rate basis, which constrains their ability to finance infrastructure projects.

Graph 2.4. Average Interest Rate

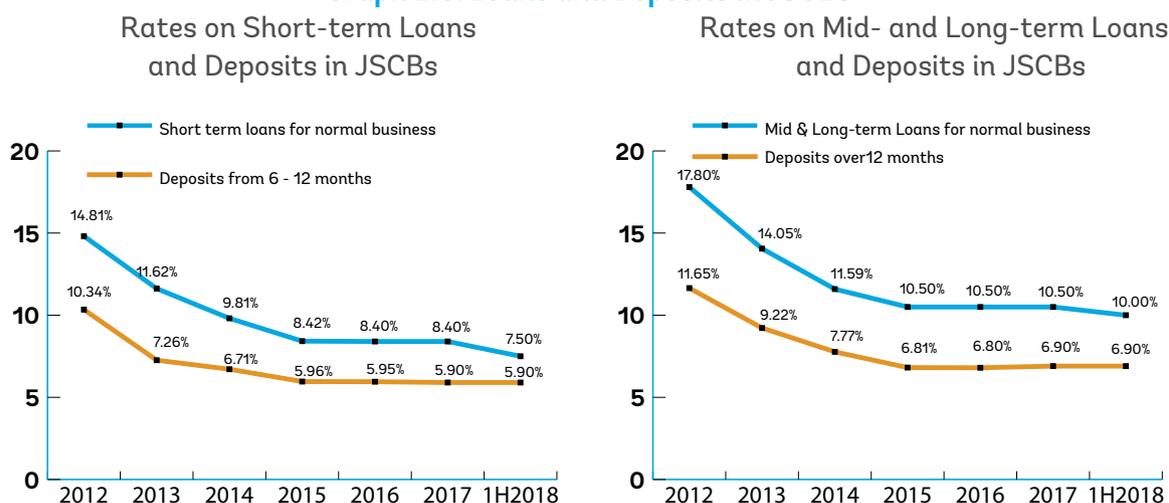


Source: Stoxplus.

Graph 2.5. Loans and Deposits of SOCBs



Source: Stoxplus.

Graph 2.6. Loans and Deposits in JSCBs

Source: Stoxplus.

2.1.2 State-Owned Banks

25. Vietnam's Development Bank (VDB), is a 100 percent state-owned policy bank. Equity holder rights and responsibilities are carried out by the prime minister or delegated to MOF. The bank is charged with ensuring the effectiveness of policies such as the government's credit for development or exports as well as other assigned roles. VDB's total assets are planned to increase at a CAGR of 10 percent during the period 2013–20. Total assets of VDB are expected to reach VND 500 trillion, or US\$22 billion (Decision 369/QD-TTg) by 2020. However, VDB has a large portfolio of nonperforming loans. The NPL ratio of VDB was 11.05 percent at the end of 2014, according to the state audit. Other than VDB, other state-owned commercial banks, such as Vietcombank, Agribank, Vietinbank, and BIDV, also act as the policy arms of the government since they are majority state-owned. The table outlines selected commercial banks and their lending to the electricity sector.

Table 2.1. Selected Banks and their Involvement in Electricity Sector (2016)

Unit: VND bn	VCB	CTG	BIDV	TCB	SHB
Total Assets	787,907	948,699	1,006,404	235,363	233,948
Outstanding Loan	460,808	661,988	723,697	142,616	162,376
Charter Capital	36,023	46,209	34,305	8,878	11,293
Owner's Equity	47,958	62,712	42,540	19,586	13,229
Profit After Tax	6,851	6,825	6,229	3,149	913
Loan for electricity sector/total loan book (%)	6.21	4.85	6.24	0.89	5.19

Source: Stoxplus.

2.1.3 Capital Adequacy

26. Low capital adequacy in the banking sector is a key concern in the Vietnamese banking system. To date, Vietnam has applied Basel I as the standard for capital adequacy. However, the country is now moving toward Basel II standards and the increased requirements for capital. It remains to be seen whether the banks can achieve these capital targets. It is likely that more banks will announce plans for capital increases, not only to finance loan growth and deal with the bad loans transferred to Vietnam Asset Management Company (VAMC), but also to meet the capital requirements for Basel II.

2.1.4 Capital Markets

27. Capital markets in Vietnam remain relatively small and underdeveloped, but they are growing. At the end of 2016, the combined stock market and bond capitalization was 86 percent of GDP, compared with 56 percent in 2014. However, capitalization remains low compared with other countries in the region, such as 108 percent in Thailand and 142 percent in Malaysia in 2016. The size of the bond market relative to GDP in Vietnam is also smaller than that of Malaysia, Thailand, and the Philippines.

Table 2.2. Size of Bond Market as Percentage of GDP

	2011	2012	2013	2014	2015	2016
Vietnam*	17	17	20	22	24	37**
Philippines	35	38	38	37	36	34
Malaysia	91	103	100	100	97	95
Thailand	63	69	70	70	73	76
Indonesia	13	13	14	14	15	18

Source: World Bank.

* Including government bonds, government guaranteed bonds, municipal bonds, and corporate bonds.

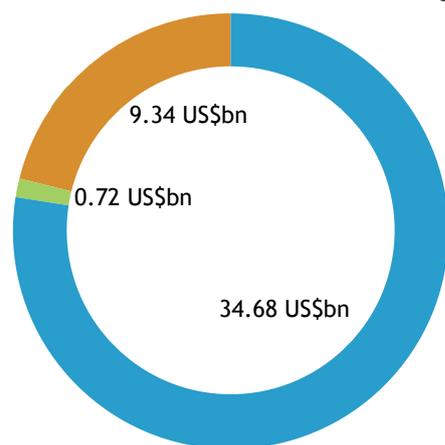
** A significant portion of the increase in ratio of bond market to GDP in Vietnam was driven by a conversion of loans by the Vietnam Social Security Fund's (VSSF) into government bonds.

28. The government has successfully issued government bonds to finance infrastructure projects and will likely to continue to do so in the coming period 2017–20. Bonds issued in the past have been concentrated in shorter maturities that have led to a flat yield curve, however this is evolving, and more recently, the government has been able to issue longer maturities. In the past, illiquid markets and a lack of reliance on long-term financing from capital markets hindered market development and deepening. During 2015–16, with stable macroeconomic conditions, MOF issued long-term tenor bonds from 15–30 years to investors, including insurance companies and pension funds, which is suitable for financing infrastructure projects. With the positive market development in recent years—larger size, increasing tenor, and higher liquidity—the government could further mobilize long-term funding to finance infrastructure projects as planned through government bond issuances. However, this could cover only a part of the total demand for long-term financing and is subject to the government's borrowing limit; therefore, there is an increasing demand for private sector investment in infrastructure and utilities.

29. Total government bond issuance in 2016 was approximately VND280 trillion (i.e., around US\$12 billion). Vietnam has issued international bonds three times: US\$750 million in 2005, US\$1 billion in 2010, and US\$1 billion in 2014.
30. Hanoi Stock Exchange was assigned the responsibility of designing a plan to issue “green bonds” pursuant to Decision 2183/QD-BTC, approved in October 2015, which outlines the National Strategy in Green Development by 2020. This includes a plan to complete the regulatory framework for mobilizing capital for green investments. Several corporations in the energy sector are considering green bond issuances to mobilize capital. The ASEAN capital markets forum, of which VN is a member, is putting together a green bond framework for all countries in the region. However, domestic investors, such as pension funds and insurance companies, are key to the development of local green bond markets, and it is not clear that those institutional investors in Vietnam are able or willing to invest in nongovernment bonds.

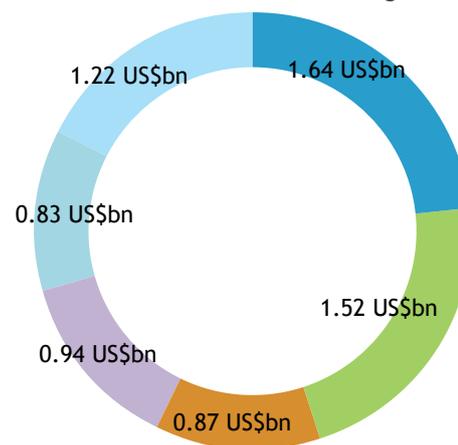
Graph 2.7. Government Bonds in 2017

Government Bonds Breakdown by Type



■ Treasury Bonds ■ Central Bank Bonds
■ State-Owned

Government Bonds Breakdown by Tenor



■ 5 years ■ 7 years ■ 10 years
■ 15 years ■ 20 years ■ 30 years

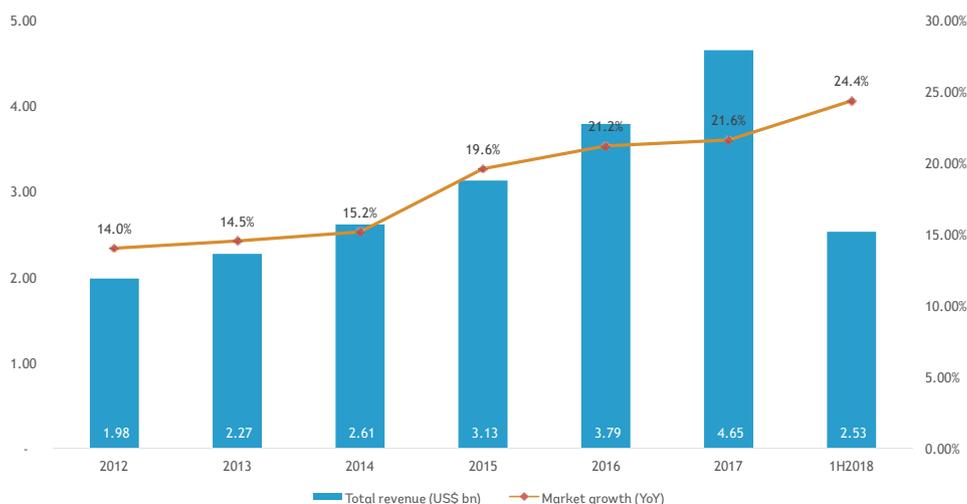
Source: Stoxplus.

2.1.5 Insurance Companies

31. There were 62 insurance enterprises (including insurance brokers, life insurance, nonlife insurance, and reinsurance) in Vietnam in 2016. The market size reached VND 239,413 billion (US\$4.6 billion) at the end of 2016, an 18.2 percent increase over 2015.



Graph 2.8.
Market Size and Growth of the Insurance Sector (US\$ billions)



Source: Stoxplus.

32. The investment portfolios of insurance companies lean heavily toward government bonds, with 70.5 percent of investments in government and government-guaranteed bonds. The insurance sector stepped up as a major player in the government bond market compared with the banks, accounting for 44.6 percent of government bonds purchase in 2016, a substantial increase from 23 percent in 2015. Most investments are in 10-years-plus terms to match their liability profiles. Life insurance companies have bought 89.8 percent of 30-year bonds, 41.2 percent of 20-year bonds and 19.1 percent of 15-year bonds issued by the government. Insurance companies are expected to take on an even more active role with the newly issued Decree 73/2016/NĐ-CP on investment of idle funds in insurance activity reserves. The decree allows insurance companies to invest in securities products beyond government bonds, such as government-guaranteed bonds, municipal bonds, fund certificates, and equity in other companies.

2.1.6 Pension Funds

33. The biggest institutional investor in Vietnam is the public Social Security Fund (VSSF). The fund manages the assets of approximately US\$20 billion (10 percent of GDP), with safety of invested funds as the predominant objective. VSSF investments have primarily been in the form of direct lending to the government (85 percent) and bank deposits with approved commercial banks (14 percent). All investments are held to maturity. However, with a negative real rate of return on investments, VSSF is exposed to the risk of not being able to meet its future obligations. There is a growing need for the VSSF to expand its investments in marketable and publicly traded securities with higher rate of returns. A scheme to convert most of the VSSF's direct budget lending portfolio into government bonds with various maturities was approved by the government; the conversion took place in December 2016. VSSF's is currently investing directly in government bonds. Nevertheless, investments in longer-term bonds

(20–30 years) may be challenging given Vietnam’s demographic projections over the coming 10 years.

34. Decree 88, also adopted in 2016, provides the legal framework for the establishment of private pension funds. Further work on the regulatory framework for private pensions is required to promote the development of this industry that could potentially become an important institutional investor category in capital markets.

2.1.7 Stock Market

35. By March 2017, stock market capitalization was US\$102 billion, accounting for 76 percent of GDP. This is still relatively small when compared with neighboring countries. Regarding liquidity, daily trading volumes in Vietnam’s stock market averaged US\$129 million in 2016.
36. The free-float in the Vietnamese stock market accounts for only 41.5 percent of the total outstanding shares. This is low because many privatized SOEs still have a controlling ownership by the government. This demonstrates one characteristic of the Vietnamese stock market, which is that although the listing of state SOEs is encouraged, the government still holds a tight grip on these enterprises. However, some large infrastructure companies, have been successfully raising capital from the stock market through public offerings and private placements to help finance their infrastructure projects.

2.1.8 Corporate Bonds

37. In 2016, listed corporate bonds formed only 1 percent of GDP, and the CAGR for corporate bonds over the period 2011–16 was relatively low at 1.8 percent. Most of the corporate bond issuances are done through private placements, which do not require any substantial disclosure requirements. The regulation guiding issuance in the private placement market, i.e., Decree 90, is currently being revised to improve disclosure standards to attract more institutional investors while protecting unsophisticated investors from the risks in this market.

2.1.9 Foreign Currency Liquidity

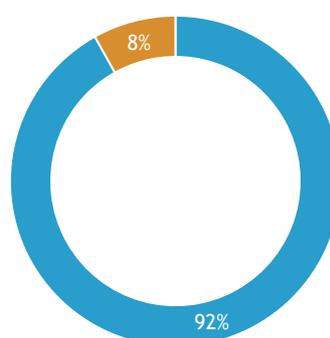
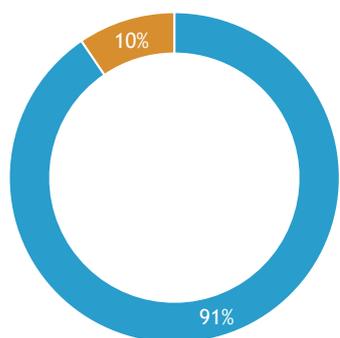
38. In the campaign for antidollarization, the SBV limited the number of companies allowed to borrow in foreign currency. However, despite this, Vietnamese still prefer to hold their savings in foreign currency rather than Dong, believing that it carries less risk. Hence, the portion of loans in foreign currency is significantly lower than deposits in foreign currencies.



Graph 2.9: Deposits/Loans by Currency

Deposits by Currency, 2018

Loans by Currency, 2018



■ VND
■ Foreign currencies

■ VND
■ Foreign currencies

Source: SBV.

2.1.10 Current Sources of Financing Available to the Energy Sector

39. The future availability of financing is still relatively small when compared with neighboring countries.

Table 2.3: Estimated Current Sources of Financing for the Energy Sector (US\$ billions)

Source of Financing	Current Total	Current to Energy	Notes
Domestic commercial banks, total loans, 2016	242.3	9.98	Based on total loans for electricity, fuel, and hot water generation category as reported by 24 commercial banks that form 61.4 percent of national loan book.
Vietnam Development Bank, total loans, 2016	13.2	0.45	Based on the loan amount announced by EVN and VDB for one wind power project in Bac Lieu province and one hydropower project in Lai Chau province.
Government bonds (domestic)	62.1	1.00	Proceeds from government bonds go to the general budget. It is unclear how much financed capital expenditure there is and within that how much was dedicated to energy projects. No government green bonds have been issued. An estimate of US\$1 billion from GENCO equitization will be earned.
Corporate/provincial/municipal bonds	11.7	0.04	Total corporate bonds issued by one listed company in the power sector. (Note: Many of the corporate bonds, particularly in the private placement market, are purchased by banks and may be included in the bank's credit/loan category).

Insurance companies	4.6	-	Insurance companies already invest in bonds, primarily government bonds. Potentially, they may subscribe to bonds issued by energy companies in the future.
Pension funds	16	0.10	VSS investment regulations/guidelines allow the pension fund to invest in: (i) government bonds/debt, (ii) high-yielding deposits, and (iii) projects deemed a strategic priority. To date, VSS invested in one strategic project for hydropower in Lai Chau province with VDB and a consortium of local banks.
Stock market	72.46	2.18	The total market cap of 31 listed companies in the energy sector is US\$2.18 billion. The total market capitalization of all stock markets in Vietnam is US\$72.46 billion.
Government bonds (international)	2.8	-	Past international bond issuance was for Vinashin (shipbuilding SOE) and other SOEs. There have been no international bond issuances for the energy sector in Vietnam.
International financial institutions and development partners	43.1	10.8	This figure may overlap with bank loans for development, as some projects involve domestic finance. As of 2015, loans for the electricity sector accounted for over 25 percent of total concessional loans.
Total	468.26	24.55	

Source: World Bank.

2.2 Financing for the Energy Sector

40. Financing for the energy sector has been provided through a combination of international and bilateral financial institutions; domestic development and commercial banks; offshore commercial banks; and private equity and government equity, including retained earnings by sector agencies and corporations. The vast majority of investment into the power sector in the past has been through EVN. However, with EVN now having outgrown its traditional sources of finance (domestic commercial bank market and IFIs), the significant scale-up of private sector involvement in the energy sector targeted by the government will require new sources of finance.

2.2.1 EVN's Sources of Investment Finance

41. Given the political economy constraints to large-scale tariff increases, EVN's capital expenditures over the 5-year period from 2010 to 2015 was almost all financed through debt (96 percent) borrowed by EVN to cover its investment in its generation, transmission, and distribution operations.



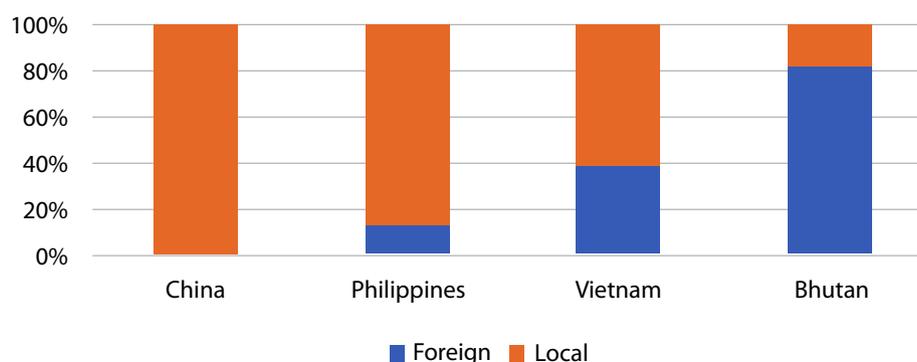
42. Only 30 percent of the loans were in local currency, with the balance being primarily denominated in US dollars and Japanese yen. The high percentage of loans in foreign currencies exposes EVN to substantial currency risks. The bulk of EVN's foreign currency loans are not provided on soft terms because they are typically provided through the government, which benefits from the concessionality but then passes the loans to EVN on less commercial terms, including passing on the foreign exchange risk. Furthermore, whereas much of EVN's borrowing is short-term, this is being used to acquire long-term assets of up to 25 years, thus causing a mismatch between EVN's assets and liabilities. The average interest rate on all loans was about 9.6 percent in 2011, decreasing to about 6.1 percent in 2015, as older more expensive loans were repaid and market conditions slowly improved for local borrowing. Out of total EVN debt of about US\$9 billion, approximately US\$8.1 billion (90 percent) is backstopped by MOF, with US\$4.1 billion being directly lent by MOF and about US\$4 billion being MOF guaranteed (about 19 percent of the government of Vietnam's guaranteed debt).
43. EVN is currently developing a corporate finance strategy centered around various types of fundraising for future investments, including: (i) issuance of domestic and international bonds, (ii) corporate finance debt restructuring, (iii) divestiture/equitization of assets, and (iv) concessional financing via MOF (to the extent available).

2.2.2 Financial Institutions

44. There are six international and bilateral financial institutions (ADB, AFD, JICA, KEXIM, KfW, and the World Bank) that are particularly active in Vietnam's energy sector. These institutions normally lend through the MOF, which in turn on-lends to the SOEs on commercial terms. The planned lending volume of these institutions to the Vietnamese energy sector in the period 2017–19 were estimated at US\$3.8 billion in 2017, which would have been less than 10 percent of the total investment requirement of the sector of about US\$40 billion over this period.
45. However, it is unlikely that these planned lending volumes will be achieved as the government has canceled or delayed many energy projects that were to benefit from such lending because of the requirement of the finance institutions for sovereign guarantees, which impacts the debt ceiling. Actual lending of IFIs between 2017-2018 was only US\$ 600 million. EVN and its subsidiaries are thus aiming to raise nonsovereign funds from IFIs. However, nonsovereign funding volumes are limited and interest rates are close to commercial financing with longer tenors and grace periods.

2.2.3 Local Commercial and Development Banks

46. Local commercial and development banks play an important role in financing infrastructure development jointly with international financiers. The graph below highlights the relatively high share of foreign investment in infrastructure in Vietnam compared with other countries in the region. In the energy sector, foreign investors have typically focused on large-scale BOT projects (mainly in gas and coal fired power generation) whereas smaller generation investments (especially privately financed small- and medium-sized hydropower projects) have come mostly from the domestic capital market.

Graph 2.10: Sources of Budget Financing for Infrastructure—Domestic versus Foreign

Note: Average of 2010–14 (China/Philippines), 2010–12 (Bhutan), 2012 (Vietnam).

Source: ADB.

47. Local commercial and development banks provide VND debt on domestic market terms and finance projects in the electricity and gas sectors, with the commercial banks tending to lend on a corporate rather than on a limited recourse project finance basis (although there are expectations of nonrecourse lending to new renewable energy projects, especially solar PV). These commercial banks also act as a conduit for on-lending to small scale renewable energy projects.
48. An important constraint with respect to lending to the electricity and gas sectors is that commercial banks are subject to single borrower lending limits: i.e., banks can only lend up to a maximum of 15 percent of their equity to a single borrower (SBV regulation). It is mainly due to these lending limits that some local banks are not able to provide new loans to EVN to help EVN and its subsidiaries contribute to the power sector investment targets set out in RPDP7.
49. Beyond lending to EVN, lending volumes to the electricity and gas sectors in general are currently still quite limited. Long-term financial intermediation is also constrained by the weak capital base and low capital adequacy ratios (CARs) of Vietnamese banks due to asset quality and provisioning for nonperforming loans (NPLs). Moreover, securitization of balance sheet assets to manage exposure is not possible due to the absence of regulations for securitization.

2.2.4 Lending to Renewables

50. Local financial institutions have been lending VND loans to renewable energy projects as these are currently being developed mostly by domestic investors.¹¹
51. Another important source of renewable energy financing to date (especially small hydropower) is the international and bilateral financing institutions. The financing mechanism for these institutions typically follows an “on-lending” modality, under which loan financing institutions are lent to MOF, which then on-lends the loans to SOEs, such as EVN. In most cases, MOF will on-lend through commercial banks, which

¹¹ Credit institutions can only provide short-term loans denominated in FOREX if the borrower has sufficient sources of FOREX revenue for the loan (Circular 31/2016 by SBV). Renewable energy projects that only have sources of income in VND would not qualify for FOREX loan scheme as per Circular 31.



are then responsible for collecting repayments and bearing the associated risks. The modality of renewable energy financing from international and bilateral financing institutions usually requires a sovereign debt guarantee, which the government is now reluctant to provide due to the public debt ceiling.

52. A successful example of an MFD enabling project is the Bank's Renewable Energy Development Project (REDP) which committed US\$200 million to private investors to finance 19 small hydropower projects (up to 30 MW) with total capacity of 300 MW. There have been no payment defaults by the Small Hydropower Projects (SHPs). Commercial banks charged margins to cover their costs/risks in line with commercial practice and no payment defaults by private investors to the lending banks have been reported. In addition, as a result of the knowledge and capacity created by the REDP, participating banks subsequently financed an additional 1,500 MW of private-sector-financed small hydropower projects outside of the REDP lending envelope.

2.2.4 Equity Funds

53. There are several equity funds operating in the energy sector in Vietnam. These funds typically focus on renewable energy investments. To date, their overall financial commitment to the energy sector has been minimal.

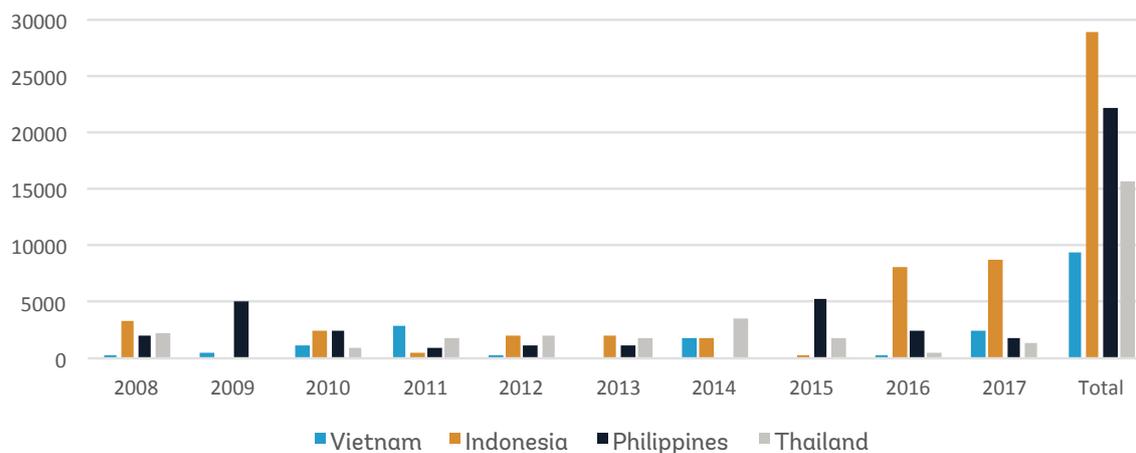
2.2.5 Large Corporates/Conglomerates

54. There are several large conglomerate businesses involved in the infrastructure and energy sectors, including Bitexco, HAGL, TTC/GEC, and Hung Loc Phat. In the past, these conglomerates have mostly focused their investments on small hydropower, but they are now looking more closely at investment opportunities in wind and solar.

2.2.6 Private Sector Participation in the Energy Sector

55. To date, there has been limited private participation in infrastructure (including energy, transport, water, and ICT) compared with other countries in the region. From 1992 to 2016, Vietnam attracted US\$13.8 billion in infrastructure investment. The energy sector, with over 60 percent of all IPP flows, dominated, with US\$8.3 billion of investments. Notable projects in the energy sector include Phu My 2.2 (gas-fired BOT power plant, 2002), Nam Con Son Gas Pipeline (2002), Phu My 3 (gas-fired BOT power plant, 2003) and Mong Duong (coal-fired BOT power plant, 2011). Together, these projects represented US\$6.7 billion of PPI, or 49 percent of all PPI in Vietnam from 1992–16. The four projects mentioned above were done under the BOT model, with majority foreign ownership and long-term international commercial debt, and benefitting from a government guarantee and undertaking (GGU) that provides participating companies with protection against certain political and project-related risks, including the inability of the company to secure the necessary amount of U.S. dollars at the time it wants to convert its Dong and remit the U.S. dollars offshore. Nam Con Son Gas Pipeline is the only project in the natural gas transmission and distribution segment to have received private sector investment (US\$1.3 billion).

Graph 2.11:
Energy Investments in Vietnam Compared with Other EAP Countries (last 10 years)



Source: World Bank PPI database.

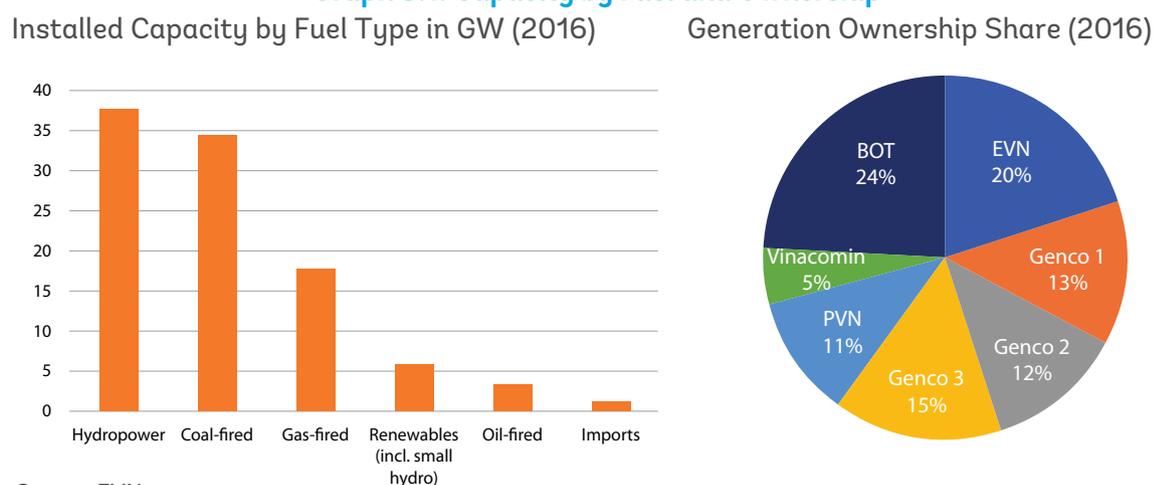
56. While the government has put in place some of the necessary enabling legislation to support the development of a successful IPP/PPP program, most energy projects are being procured outside of this legislation due to the lack of understanding of and capacity to conduct PPPs within various ministries.
57. However, there has been active support from several IFIs and donors to help develop a robust enabling environment for PPPs in Vietnam. Several donors have funded various technical assistance programs designed to improve the PPP enabling environment (legal, regulatory, and institutional) and build public sector capacity to select, structure, procure, and manage PPPs. Indeed, the government took on board some of this advice when drafting Decree No. 63/2018/ND-CP dated May 4, 2018. But while the overall PPP enabling environment has improved and the government is actively encouraging their use, there still seems to be a general lack of capacity to procure PPPs, as well as a reluctance on the part of the government to provide the necessary clarity and support required by investors (particularly international investors) to encourage them to bid for projects.
58. International investors (equity and debt) are keen to support energy projects in Vietnam and could serve an effective role in satisfying demand for financing as local capital markets develop. A key constraint to scaling up private sector investment seems to be the lack of bankable project documentation (PPA and support documents) combined with the length of time it takes to develop projects and secure the necessary approvals and the EVN creditworthiness as the counterparty to the PPA. One of the main drivers determining whether a project is bankable (for international investors) is the risk allocation provided in the contractual documentation. The general perception is that the government is trying to reallocate certain risks within the control of the government to the private sector.

Annex 3. Power Sector Profile

3.1 Overview of Power Sector

59. Power sector development and supply operations are dominated by EVN, the state-owned power utility, and its various subsidiaries. EVN is involved in all electricity activities and is the single power purchaser from generators. EVN also owns the transmission network and five subsidiary power corporations (PCs), which sell electricity within their franchise areas at voltage levels of 220 kV, 110 kV and below. As of 2016, about 85 percent of distribution networks supplying rural households are under PCs, and the remaining 15 percent belong to local distribution units (LDUs) in rural areas.
60. In 2016, Vietnam’s installed generation capacity was 42 GW. EVN held 60 percent (26 GW) of the installed generating capacity directly (e.g., strategic multipurpose hydropower plants) and through its subsidiaries (GENCOs 1,2, 3). The remaining 40 percent (16 GW) of generation capacity was owned by other state-owned enterprises (SOEs) and private investors. The total number of power plants in operation was 113 (excluding small hydropower plants up to 30 MW). Hydropower accounts for 37.6 percent (15.8 GW); coal-fired 34.3 percent (14.4 GW); gas-fired 17.8 percent (7.5 GW); renewables, including small hydropower, 5.8 percent (2.4 GW); oil-fired 3.3 percent (1.4 GW); and imports 1.2 percent (0.5 GW) of installed capacity.

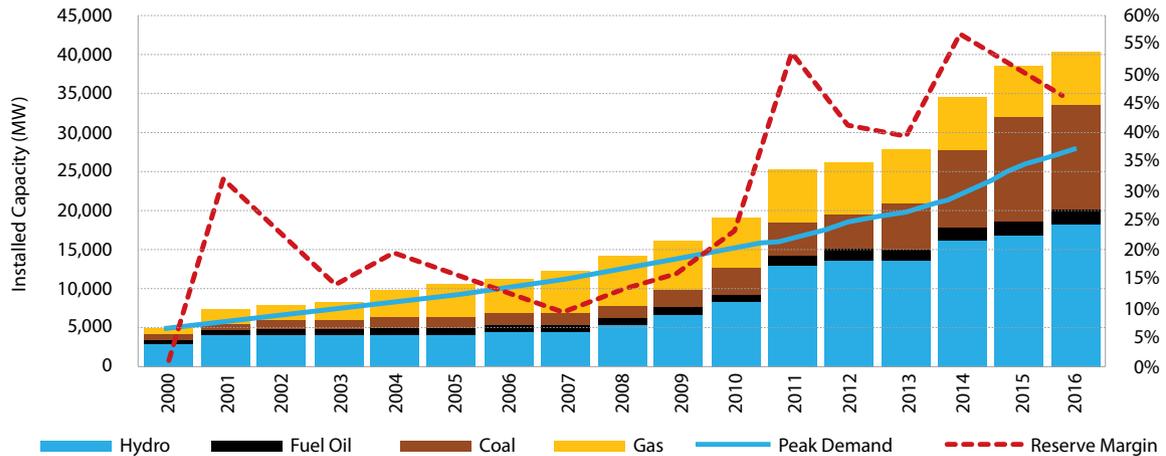
Graph 3.1: Capacity by Fuel and Ownership



61. In the north and central regions, electricity generation is dominated by hydropower plants and coal plants that run on indigenous coal sources. There are some power imports from China and Laos. The southern region is dominated by hydro and gas supplied from offshore fields. Vietnamese exports to Cambodia are relatively small. There are major plans to increase power trade with Lao PDR up to 5 GW by 2030.

62. There has been a significant increase in the reserve margin¹² since 2010 through the commissioning of new generation plants. However, electricity supply and demand, especially in the south, can become tight at times due to: (i) seasonality of hydro inflows; and (ii) transmission constraints, particularly between north and central Vietnam.

Graphs 3.2 Installed Generation Capacity and Systemwide Reserve Margin (2000–16)



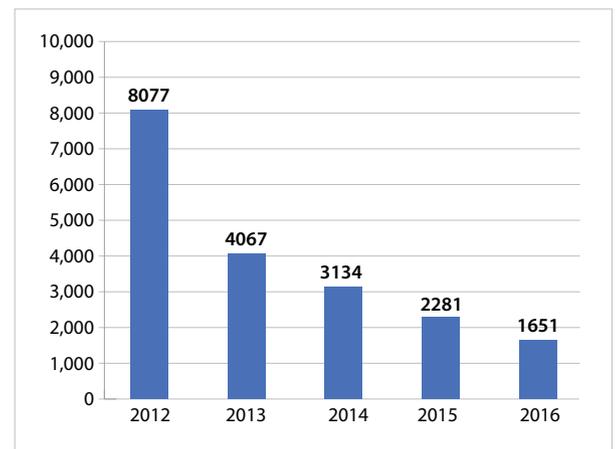
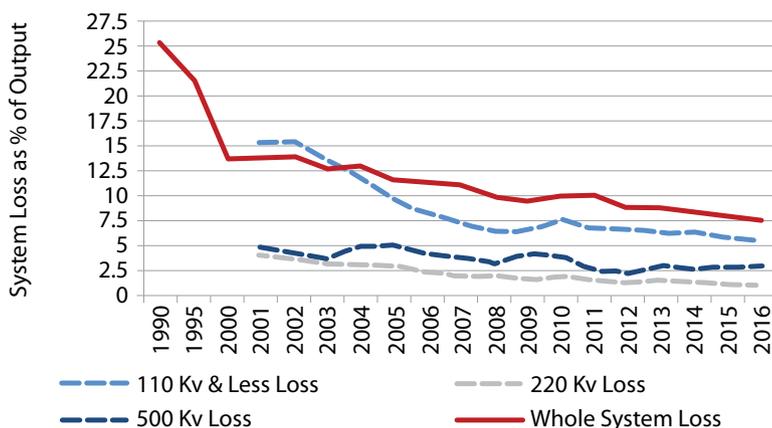
Source: Intelligent Energy System (IES).

63. **Significant improvement in power system performance:** Current total transmission and distribution losses are 7.6 percent which are low compared to similar countries and systems, reflecting the strong operational performance and capacity of EVN. The quality of service in electricity supply to consumers has steadily improved with less frequent power interruptions with lower duration.

Graph 3.3: Improvement in Power System Performance

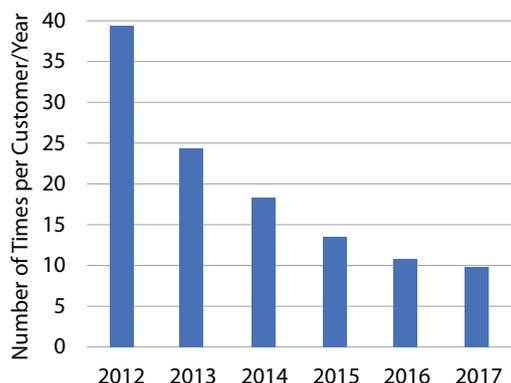
Transmission and Distribution System Losses

System Average Interruption and Duration Index

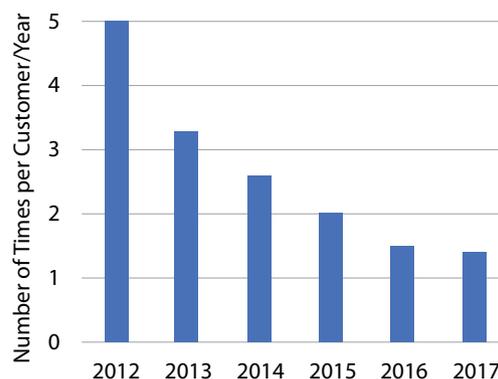


¹² The reserve margin measures available generation capacity above the capacity needed to meet peak demand.

System Average Interruption Frequency Index (time per customer)



Momentary Average Interruption Frequency Index (time per customer)



Source: National Load Dispatch Center (NLDC), EVN.

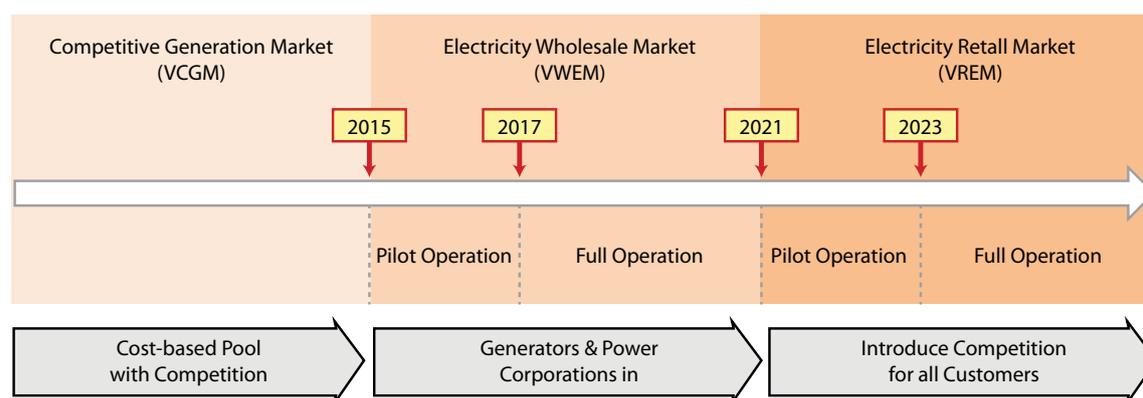
64. The quality of service in electricity supply has steadily improved. In 2015, shedding of capacity was a fifth of that in 2010, a year in which rotating load curtailments were common, as a result of a very dry hydro year and capacity shortages. In 2015, only six outages were recorded in EVN’s National Load Dispatch Center (NLDC): most load shedding was needed for protection during commissioning tests of new power plants. This demonstrates EVN’s effectiveness in providing adequate network investment to provide good consumer service.

3.2 Power Sector Reform

65. **Strategic sector:** The power sector in Vietnam is one of the largest and most strategic areas in the economy where restructuring is being implemented. The impetus for reform is the need to put the electricity sector on a sustainable footing to meet the fast-growing demand driven by industrial expansion and increased residential and commercial demands as disposable personal incomes increase. The guiding principles set by government to power sector development has been to: (i) ensure reliable, safe power system operation and security of supply; and (ii) minimize impacts on electricity tariffs (macroeconomic spillover effects and distributional impacts).
66. **The 2004 Electricity Law:** Power sector reform began in earnest with the approval of the 2004 Electricity Law. This law provides the guiding framework for developing a competitive electricity market, which requires the unbundling of the sector by breaking up the vertically integrated, state-owned power utility EVN. The law also directs electricity tariff reforms to move prices toward cost-reflectiveness to attract private investment in order to ensure sustainable sector development, reduce subsidies, and promote demand-side energy efficiency. It mandates MOIT to govern the energy sector. The Electricity Regulatory Authority of Vietnam (ERAV) was established in 2005 as an entity under MOIT. It is responsible for the issuance of licenses; the review of the power system’s expansion plans and financing needs; the preparation, issuance, and enforcement of regulations; and the review and recommendation of tariffs.

67. **The 2006 20-year Power Sector Reform Roadmap:** The roadmap set out the gradual development of a competitive electricity market in three stages: (i) competitive generation market; (ii) competitive wholesale market; and (iii) competitive retail market. The roadmap sets out a deliberately careful approach to rolling out reform—designing each stage of the process as a pilot to test, improve, and learn, followed by full implementation. This approach reflects the high priority given by the government to gradual, consensus-driven change to avoid negative shocks to the economy and final consumers.
68. **Commencement of EVN in 2008:** The unbundling of EVN started in 2008 with the creation of separate transmission and distribution businesses (i.e., National Transmission Company; distribution companies; National Load Dispatch Center; Electricity Power Trading Company). In 2012, EVN unbundled its generation business into three separate Gencos.
69. **Full operation of Vietnam’s competitive generation market (VCGM) in 2012:** The VCGM, the first stage of the reform agenda, became fully operational in 2012, with EVN-affiliated generation companies (Gencos) and independent power producers (IPPs) competing in a power pool to sell to the single buyer—the Electricity Power Trading Company (EPTC), a wholly owned EVN subsidiary.
70. **Pilot phase of Vietnam’s wholesale electricity market (VWEM) started in 2015:** In 2013, the government updated the roadmap starting the pilot VWEM in 2015 and aiming for it to be fully operational by 2021. The proposed VWEM trading arrangements are designed to have the PCs and eligible large customers connected to the transmission network¹³ contract directly with generators and allows electricity wholesalers to enter the market and contract with generators and then sell to PCs. The intended result of the VWEM over time is for: (i) PCs to enter contracts directly with generators such that their total contract portfolio should largely match their load profiles; and (ii) where mismatches between their contracts and actual demands occur, PCs will face spot-market exposure.

Graph 3.4: Electricity Sector Reform Roadmap



¹³ The grid code defines the transmission system in Vietnam to include “all power lines and substations at 220 kV or greater voltage levels, and 110 kV power lines and substations that have a power transmission function to receive electricity from generators and inject it into the national power system.”

71. At this stage, transmission charges and distribution charges will be unbundled, and EVN (i.e., EPTC) will cease to be the single buyer of electricity in Vietnam. Thus, the power costs for a PC over time will change from the bulk supply tariff to a combination of network charges, contract difference payments, and spot-market payments.
72. **Changing role of EVN:** The creation of a competitive electricity wholesale market requires significant changes in the current institutional structure of the power sector and the role of EVN. At present, EVN has unbundled and corporatized its affiliate operating companies in all segments: three Gencos, the National Power Transmission Company (NPT), and five PCs. The next phase of the reform agenda, as expressed by a 2017 PM Decision, aims to increase efficiency in the generation segment; improve transparency, fairness, and strong competition; ensure that the market structure supports effective wholesale competition; and raise the effectiveness of regulation. For these purposes, EVN generation assets will be equitized, starting from 2017, with EVN holding at least 51 percent of shares. After two years of equitization, the government of Vietnam will assess operational results aimed at continuing to fully divest the state’s share in power generation.
73. The NPT and the PCs will remain under full public ownership. From 2021 onward, the PCs will conduct separate accounting for their distribution and retail businesses to prepare for retail competition. The National Load Dispatch Center (NLDC) will function as an independent system and market operator (SMO) and will be converted to an independent accounting unit of EVN by 2021. By 2025, the SMO will be fully separated from EVN but will remain in government control.
74. The transition to a competitive power market requires the gradual elimination of cross ownership between agents participating in different segments of the electricity supply chain. In a fully competitive VWEM with multiple sellers and buyers, agents in each segment of the electricity supply chain are prevented from having control of companies operating in other segments. The SMO must be independent from any sector agent, unless specific arrangements to ensure equal rights for all market participants are adopted. 2015 MOIT and 2017 PM Decisions set out key parameters for a future power sector structure, as summarized in the table below:

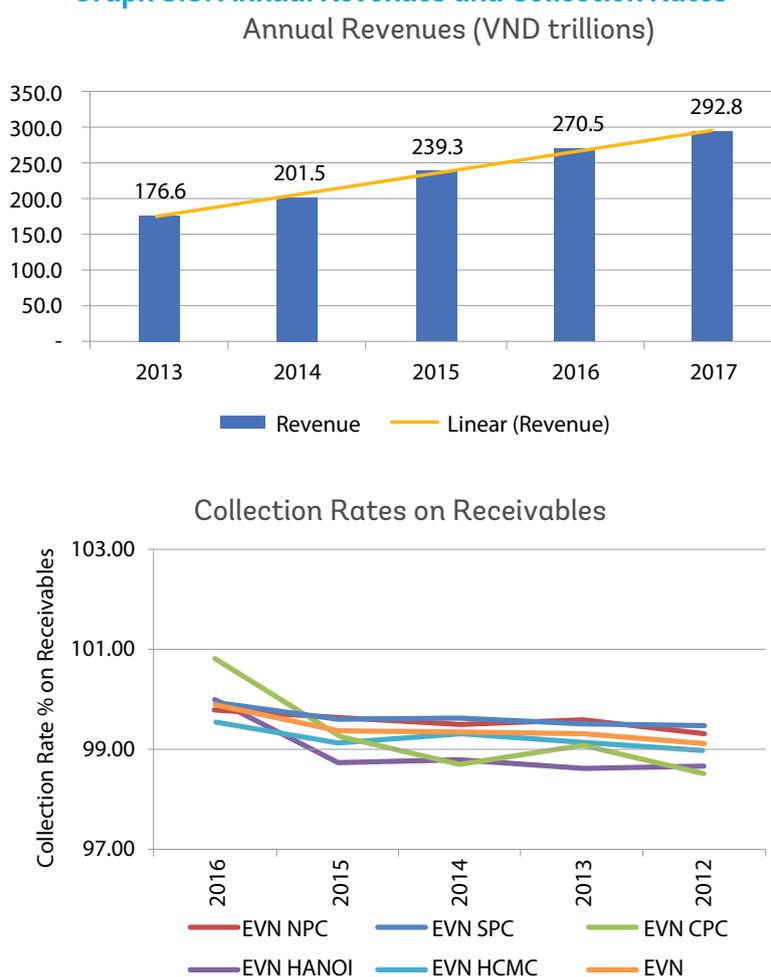
Table 3.1 Key Parameters for Future Power Sector Structure

Entity	Ownership
Multipurpose hydropower plants	EVN ownership
NPT (the national transmission company)	EVN ownership (100 percent)—independent accounting unit
PCs separate the functions of distribution and retail	EVN ownership, PCs retail business equitized starting 2021
NLDC acts as the SMO	EVN-dependent accounting unit 2018; SMO becomes independent accounting unit within EVN by 2021
EPTC—currently the single buyer	EVN-owned unit purchasing electricity from nonmarket participants, BOTs, and renewable energy power plants

3.4 EVN Financial Highlights

75. To assess the overall financial performance of EVN Holding, several key financial indicators are relevant, including; (i) annual revenues, (ii) solvency/liquidity, (iii) profitability, and (iv) debt service.
76. **Annual revenues:** EVN's annual revenues have been steeply increasing from 2013 to 2017. Revenues (of which revenues from sales of electricity accounted for 98 per cent) increased between 8 to 19 percent per year (14 percent in 2014, 19 percent in 2015, 13 percent in 2016 and 8 percent in 2017). In U.S. dollars, annual revenues increased from US\$8.4 billion (VND 177 trillion) in 2013 to 13 billion (VND 292 trillion) in 2017. Tariff as well as electricity demand increases were the major contributors for the large revenue increase. Tariff collection is one of the key credit strengths of EVN and its subsidiaries, the five power companies. Average collection rates against receivables has been improved progressively from 2012 to 2016 and ranged between 98 and 100 percent for all five power companies.

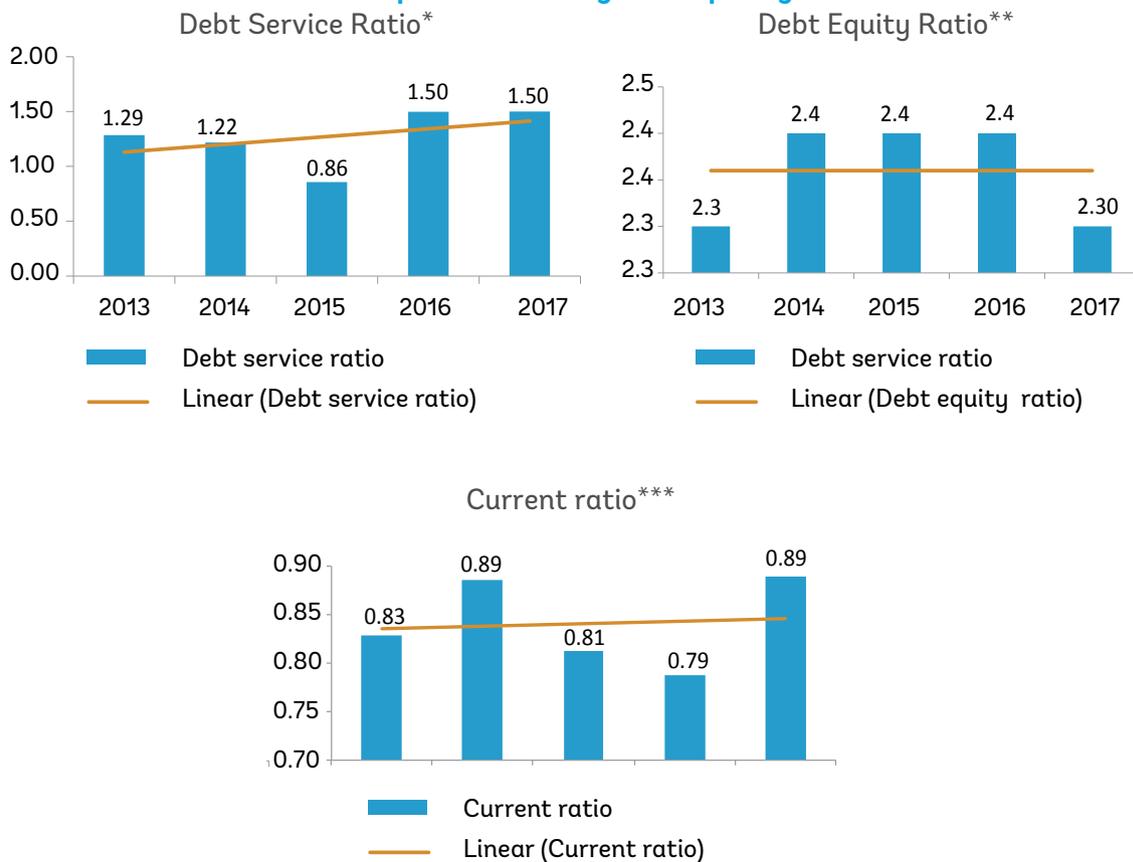
Graph 3.5: Annual Revenues and Collection Rates



Source: EVN.

77. **Solvency/liquidity:** With regard to solvency, a fluctuation in the debt service ratio has been observed during the period 2013–16. Starting at 1.29 times, it sharply fell in 2015 to 0.86 times, mainly due to the impact of FOREX losses of VND 13 trillion that year, before increasing again to 1.5 times in 2016 (FOREX losses VND 5 trillion) and continuing to maintain this position in 2017 (while FOREX losses VND 3 trillion). Ratios above 1 indicate that EVN earned sufficient income to meet the requirement of interest and principle payment, but this ratio is highly vulnerable to FOREX risk. The debt equity ratio has been consistently maintained at around 2.4 times, which is an acceptable level in the energy sector. However, the current ratio, indicating EVN’s liquidity, has been below 1 from 2013–17, indicating that current assets are insufficient to cover current liabilities. EVN’s cash flow from operating activities has been positive and increased year by year from 2013 to 2017.

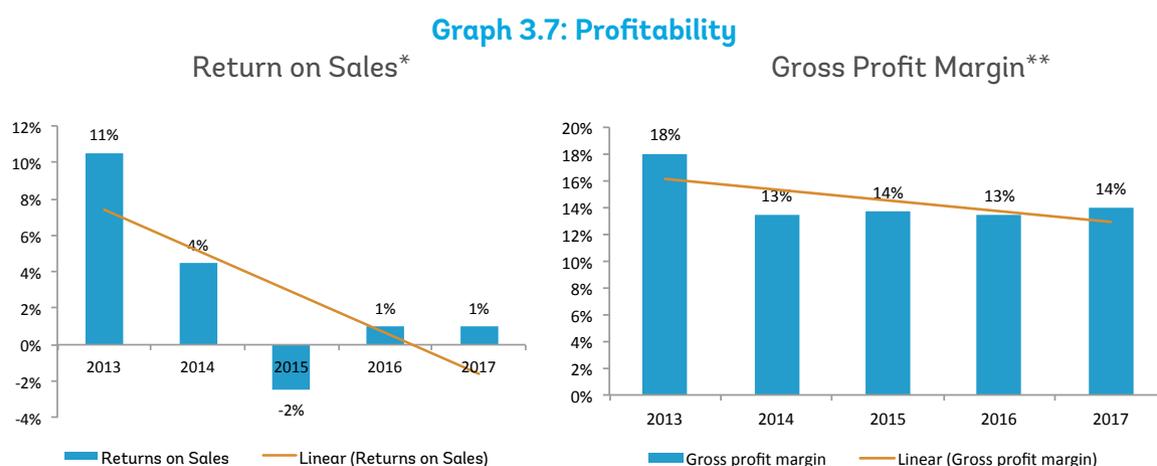
Graph 3.6. Solvency and Liquidity



Source: EVN.

* Debt service ratio: A solvency ratio calculated as EBITDA divided by loan and lease principle and interest payments.
 ** Debt equity ratio: A solvency ratio calculated as total debt divided by total shareholders’ equity.
 *** Current ratio: A liquidity ratio calculated as current assets divided by current liabilities.

78. **Profitability:** Profitability is best indicated by returns on sales and the gross profit margin. During the five-year period, gross profit margin recorded a peak of 18 percent in 2013 and maintained a stable level from 13 to 14 percent in 2014, 2015, 2016, and 2017, indicating the stability in the electric production process. Returns on sale, however, declined from 11 percent in 2013 to 4 percent in 2014 due to dramatical fluctuations in FOREX gains and losses as a result of the absence of suitable hedging instruments in the country. The situation became even more serious in 2015, when EVN recorded a FOREX loss of VND 13 trillion, making a total loss of VND 5 trillion. In 2016, the FOREX loss was reduced by VND 8 trillion to VND 5 trillion, and remained at VND 3 trillion in 2017, helping the entity generate a net profit after tax of VND 1.4 trillion and VND 3.7 trillion for 2016 and 2017, respectively, as well as returns on the sale of 1 percent for two last years of the analyzing period.



Source: EVN.

*Return on sales: Profitability ratio calculated as net profit after tax divided by sales.

**Gross profit margin: Profitability ratio calculated as gross profit divided by sales.

79. **Overall assessment:** Overall, EVN has been a profitable company in recent years, with strong and growing revenues, debt equity ratios, and a stable gross profit margin. The biggest financial challenge EVN faces is how to manage its exposure to foreign exchange risks, which impact the debt service ratio as well as its bottom line. Although it would be costly for EVN to explore hedging instruments with international banks, it is a recommended solution to stabilize the foreign exchange risks for a corporation whose international borrowing is its main source of asset financing. In addition, the combination of raising generation costs and the erosion of real average electricity tariffs has put EVN in a challenging financial situation moving forward.

3.5 Power Sector Investments

80. **Planned generation capacity:** The RPDP7 presents three scenarios (low, base, and high) for achieving installed generation capacity by 2030 to meet future electricity demand, ranging from 118 GW to 140 GW. In 2016, the MOIT issued Decision 2068/QD-TTg on Renewable Energy Development Strategy set out specific renewables targets. The renewables targets under RPDP7 and the Renewable Energy Development Strategy vary from 10.5 to 40.6 GW.



Table 3.2 Installed Generation Capacity under RPDP7 2015–30 (GW)—Base Case

	2015	2016	2017	2018	2019	2020	2025	2030
Hydropower	15.1	16.2	16.8	17.2	17.8	18.1	19.2	21.9
Coal-fired	12.8	14.2	16.3	18.4	22.3	25.8	47.5	58.7
Gas + oil	8.7	8.7	8.3	8.7	8.7	8.6	15.1	19.1
Small HPP/wind/solar/biomass	2.0	2.2	2.5	3.2	3.6	5.7	7.9	12.5
Nuclear power								4.6
Imports	1.0	1.2	1.2	1.4	1.4	1.4	1.4	1.5
Total capacity	39.6	42.5	45.2	48.9	53.9	59.7	91.2	118.4

Source: RPDP7

Table 3.3 Three Scenarios for Renewable Energy Additions under RPDP7 (GW) for Base Case Demand Forecast

	Installed Renewables Capacity 2015	Installed Renewables Capacity 2030	Renewables Additions 2015–30
PDP7	1.9	12.5	10.5
60 percent of Decision 2068/QD-TTg	1.9	27.1	25.2
Full target of 2068/QD-TTg	1.9	42.5	40.6

Source: PDP7, chapter 5 (Revised Power Generation Development Plan, table 5–19).

Note: Decision 2068/QD-TTg refers to Renewable Energy Development Strategy issued by MOIT (2016).

81. **Investment in generation:** The table below presents historic investment in each generation segment. During the five years leading up to 2015, EVN accounted for the bulk of generation investments—about US\$18 billion (US\$3.6 billion/year) out of a total of US\$33 billion (US\$6.6 billion/year).

Table 3.4 Historic Investment in Power Generation (US\$billion)

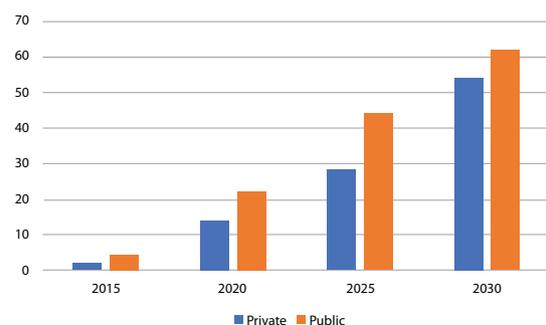
	2011	2012	2013	2014	2015
Coal	1.1	0.4	2.7	7.5	6.1
Oil	0	0	0	0.8	0
Gas	1.2	0	0	0	0
Hydro (large and small)	5.3	1.4	0.6	3.6	1.4
Biomass	0	0	0	0.1	0
Wind	0	0.1	0	0.1	0.1
Total	7.6	1.9	3.3	12.1	7.6

Source: World Bank calculations based on total capacity commissioned each year.

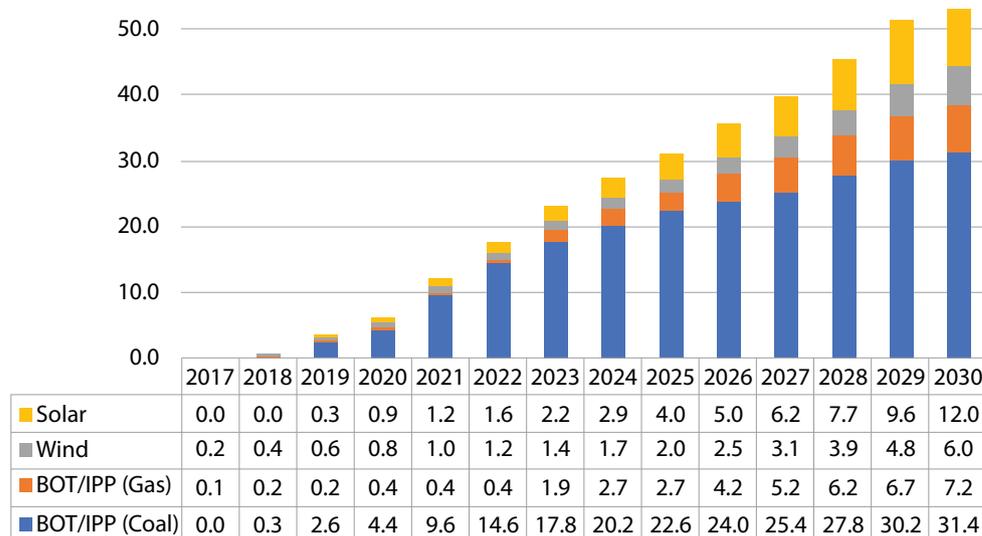
82. RPDP7 envisages generation investment requirements by 2030 of about US\$118–144 billion and US\$152–185 billion for the power sector as a whole. The share of renewable energy (excluding large hydro) in total generation investment is 22 percent for the entire period (US\$27–33 billion). The RPDP7 indicates an increasing share of private sector investment in generation from 36 percent today to 47 percent by 2020 and 70 percent by 2030.

Graph 3.8 Generation Investment Plan up to 2030

Total Public and Private Investments (GW)



Source: RPDP7.

BOT/IPP Investments (GW)

Source: RPDP7.

83. **Investments in transmission and distribution:** Transmission investments (at 500 kV and 220 kV) are implemented by the National Transmission Corporation (NPT), and distribution networks (110 kV and below) are implemented by the five power companies (PCs). The tables below show historic network investment data for 2011–15 and the planned network investments as set out in the RPDP7. To date, all wind, biomass, and small hydro renewable energy projects are connected at 110 kV, and any necessary network investments are undertaken by the PCs.¹⁴

Table 3.5 Historic Network Investment (US\$ billions)

Investment per year	2011	2012	2013	2014	2015
Transmission	0.3	0.4	0.6	0.6	0.7
Distribution	0.4	0.5	0.7	0.8	0.9
Total	0.7	0.9	1.3	1.4	1.6

Source: RPDP7.

¹⁴ Small renewable energy producers operating under the standardized power purchase agreement and the avoided cost tariff are obliged to assume the immediate connection costs to the nearest PC substation (or to a passing 110kV line).

Table 3.6 Forecast Investment in Transmission and Distribution by 2030 (US\$ billions)

Year	2016–20	2021–25	2026–30
Transmission	4.6	7.0	7.1
Distribution	5.1	6.2	7.3
Total	9.7	13.2	14.5

Source: RPDP7.

3.6 Renewable Energy Development

84. There are several existing mechanisms that encourage the development of renewable energy in general and private sector involvement in particular.
85. **Avoided cost tariff (ACT) for small hydropower:** The avoided cost tariff method for small hydropower producers (installed capacity of 30 MW or less) was introduced in 2009; the tariff is regionally differentiated, denominated in VND, and based on the marginal avoided cost of thermal generation combined cycle gas with fuel supply agreements tied to the Singapore oil price. This tariff has been successful in encouraging small, private-sector-financed hydropower, with some 1,900 MW of small hydro operating under the ACT tariff in 2016.
86. However, if this tariff, currently still around 5 USc/kWh, is not allowed to increase to its intended level under the ACT regulation (i.e., to the avoided cost of thermal energy at the margin, so well above 7 USc/kWh for gas), achieving the target for small hydropower (an additional 5,270 MW by 2030) is unlikely.¹⁵
87. **Feed-in tariff (FiT) for wind, biomass, solid waste, and solar:** Since 2011, FITs have been used as a policy tool to provide incentives to private investors to develop renewable energy projects. The FIT is fixed for the duration of the PPA (i.e., 20 years). Small hydropower plants (up to 30 MW) enjoy another scheme of incentives in the form of the avoided cost tariff (ACT), calculated annually.

Table 3.7 Current Feed-in Tariffs (FITs)

Type of Power Plant	U.S. cents per kWh (VAT not included)
Wind—onshore	8.5
Wind—near shore	9.8
Biomass—co-generation	5.8
Biomass—electricity	7.46
Solid waste	10.05
Solar	9.35

Source: MolT.

88. The onshore and near-shore wind FITs issued in 2011 have been insufficient to attract investment and are in the process of being revised by the government. Cur-

¹⁵ SHP faces a steep supply curve: most low-cost projects with capital costs below US\$1,500/kW have been developed.

rently, there are about 80 wind projects registered with the MOIT, but only five came onstream, with a total capacity of 190 MW. A solar FiT of 9.35 US¢/kWh was announced in early 2017 for a period of two years; the tariff is thought to be relatively generous and has attracted considerable interest, mostly from domestic private investors. Approximately one hundred solar projects (or 7 GW) had been registered by 2018, and several are under construction. However, the current wind and solar PPAs are not considered bankable by international standards and, as such, experienced international sponsors and debt providers will probably not be willing to invest the considerable sums necessary for the planned scale up of solar and wind. This experience is similar to the small hydropower projects and the handful of wind projects, which were mostly domestically driven.

89. **Auction mechanisms:** Auction mechanisms with internationally bankable project contractual structures have led to considerable reductions in the global cost of renewable energy (particularly solar) over the last three years. Most of these projects will generate power at costs lower than gas-fired projects or, in some cases, even coal. While it is not possible to compare production costs across countries due to differing resources (e.g., insolation, wind), tax regimes, and land costs, among other factors, the trend has been clear: if Vietnam introduces an auction system with internationally bankable project documentation, the cost of solar power generation could be considerably reduced from the FiT currently offered. The MOIT is currently designing an auction regime with a potential pilot auction to be conducted in 2020.
90. **Tax incentives:** Considerable tax incentives have been offered for energy projects. However, their impact on tariffs is much smaller than if these projects had access to long-tenor debt in VND or U.S. dollars and robust project documentation with equitable risk allocation.
91. **Invest in grid integration:** Under the standardized PPA for small renewable energy producers, developers are responsible for the immediate connection costs (to the nearest substation or passing 110 kV line). Based on recent experience with small hydro, incremental network costs have been estimated by ERAV in 2011 at US\$51/kW, compared with US\$4/kW for gas CCGT and US\$12/kW for coal. While equivalent figures do not exist for wind and solar, due to their remote location (particularly in the case of wind), these could be expected to fall toward the upper end of this range. Meeting targets for expansion of renewable energy generation capacity will therefore entail a concerted program of grid investment to provide the necessary connectivity.

3.7 The Role of Efficient Pricing and Energy Efficiency

92. The magnitude of financing requirements for the energy sector are directly a function of the demand forecast for grid-connected electricity. Vietnam has an unusually high electricity consumption per unit of GDP; and there remains a large potential for improving energy efficiency especially in the industrial sector. Such energy efficiency improvements would not just reduce the rate of electricity demand growth, but with great potential for cogeneration and waste-heat recovery, provide an additional source of electricity for the grid, directly financed by industry.



93. The need to increase electricity prices has been discussed mainly in the context of needing to improve the creditworthiness of EVN, NPT, and the PCs. Indeed, EVN’s main source of income is derived from the tariff it charges to end users. Nominal average electricity tariffs have increased by 53 percent from 2010 to 2015. However, cumulative inflation over the same period was 56 percent. The government increased the tariff to USc 7.6/kWh in November 2017. However, the current tariff level does not allow EVN to fully cover: (i) O&M costs and debt service; or (ii) future investments. To achieve full cost recovery, average electricity tariffs needed to increase to USc 12/kWh by 2020.

Table 3.8 Average Retail Tariff Increases - 2009–2017

Approval	3/ 2009	3/ 2010	3/ 2011	12/ 2011	6/2 012	12/ 2012	8/ 2013	3/ 2015	11/ 2017
VND/kWh	948	1,058	1,242	1,304	1,369	1,467	1,508	1,622	1,720
UScents/kWh	4.7	5.3	6.2	6.5	6.7	6.9	7.1	7.3	7.6
Increase (%)	–	11.5	17.4	5.0	5.0	5.0	5.0	7	6.1

Source: World Bank.

94. Even with an abrupt tariff adjustment, electricity expenditures for the poorest households will remain up to only around 4 percent of household expenditures. Hence, the proposed tariff increase will not adversely impact the social welfare of the poorest consumers. Furthermore, the negative impacts of any tariff increases can be mitigated by best practice subsidy provisions that combine incremental block tariffs—with low consuming customers paying low tariffs—and well-targeted conditional cash transfers to the poor by the Ministry of Labor, Invalids and Social Affairs (MOLISA).

95. There is a very important second benefit to bringing electricity prices to an economically efficient level, which is that under any reasonable assumption about the price elasticity of demand, electricity demand growth will decrease if tariffs increase, and therefore further reduce the need for additional generation. Recent studies conducted in relation to tariff increases and demand-side management (DSM) implementation indicate that, under conservative assumptions and an assumed demand elasticity of -0.15, DSM, measures have the following estimated impacts.

- Reduction in the total 2030 grid-connected energy-generation requirement from 540 TWh to 487 TWh, with a reduction in system load (at the generation bus) of some 8,800 MW; and
- Carbon emission reductions of 156 million tons (2016–30), equivalent to that achieved by 12.9 GW of additional renewable energy capacity, avoiding some US\$15 billion of RE investment.¹⁶

96. This emphasizes the importance of efficient pricing to not only enhance the creditworthiness of EVN, but also to reduce the overall financing requirements for the sector as a whole by reducing the need for additional capacity.

¹⁶ Because RE (and especially solar PV) has low capacity factors, the avoided installed capacity of RE is much greater than the average reduction in peak load.

3.8 The Importance of Scaling Up Solar Rooftop PV

97. In 2017, the World Bank conducted a geospatial analysis to assess the technical potential of rooftop solar PV for Ho Chi Minh City (HCMC) and Da Nang. To achieve this objective, satellite imagery was acquired with the highest commercially available spatial resolution (30 cm) over 370 km² in HCMC and 175 km² in Da Nang. It was processed using conventional (photogrammetry, classification) and advanced (deep learning) image processing techniques to build a database containing information such as building footprint, building height, and land use, as well as several rooftop characteristics, including surface area suitable for solar PV system installation, shape, slope, orientation, and shadows. This information was combined with solar radiation data from the Global Solar Atlas to assess the corresponding total capacity (power in MW) and the total potential generation (energy in MWh).
98. Nearly one million rooftops were analyzed for HCMC and 600,000 in Da Nang. The development of a rooftop database was complemented by a ground survey (interviews with building owners and various measurements) in both cities. The survey allowed for the collection of detailed information, including the name of the building's owner; electricity consumption and electricity-related specifications; and the owner's willingness to have solar panels installed, rooftop material, etc. for more than 200 buildings that were preidentified as the most suitable for solar PV installation.
99. The results show that HCMC could develop up to 6.4 GW rooftop solar PV capacity. Around 25 percent of this potential corresponds to public and industrial buildings, the most suitable in terms of rooftop size and owner ability/willingness to install PV systems. In the case of Da Nang, the total solar PV capacity is 1.1 GW, of which 41 percent corresponds to public and industrial buildings. Assuming that PV systems were to be installed on only 5 percent of all suitable rooftops, this could generate up to 900 GWh in HCMC and 160 GWh in Da Nang, respectively. This represents 6.6 percent of HCMC's needs (population of 8.6 million with per capita electric energy consumption of 1,565 kWh) and 6.9 percent of Da Nang's needs (population of 1.45 million with per capita energy consumption of 1,565 kWh) covered by solar PV sources.
100. The deployment of rooftop solar PV could substantially contribute to reducing the need for new thermal power generation to meet base and peaking load requirements, especially in central and southern Vietnam.



Annex 4. Gas Sector Profile

4.1 Overview of the Gas Sector

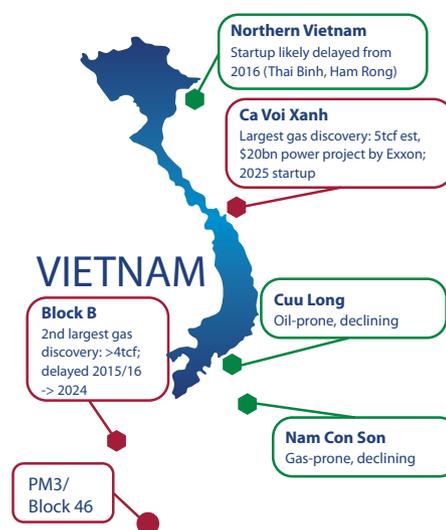
101. **Upstream gas production:** Vietnam is a coastal country with several hundred thousand square kilometers of continental shelf in which seven tertiary sedimentary basins have been identified. Major gas reserves have been found in four of the seven offshore basins: Song Hong, Nam Con Son, Cuu Long, and Malay-Tho Chu. The total proven and probable gas reserves are 871 billion cubic meter (bcm). Large-scale gas extraction has been carried out from 1995 at oil and gas fields in Cuu Long and Nam Con Son basin, and lately in the Malay-Tho Chu basin. In 2016, total offshore gas production was approximately 10 bcm.

Table 4.1 Upstream Gas Production

Region	Basin	Features
South East	Cuu Long Basin	<ul style="list-style-type: none"> Oil prone basin in operation since 1995 => Delivered > 55.66 Bcm (44%) of nation-wide gas production. <i>Production in decline.</i>
	Nam Con Son 1 & 2	<ul style="list-style-type: none"> Gas prone basin in operation since 2003 => delivered > 61.33 Bcm (48%) of nation-wide gas production. NCS2 in operation since 2016. <i>Production in decline.</i>
South West	Malay-Tho Chu	<ul style="list-style-type: none"> Offshore area administered jointly with Malaysia. Ca Mau pipeline in operation since 2007. Ca Mau supplied from Block PM3-CAA + Cai Nuoc field. Delivered > 10 Bcm (8%) of nation-wide gas production. <i>Not yet reached maximum production capacity.</i>
North-Centre	Song Hong	<ul style="list-style-type: none"> Gas extraction from small deposits has recently commenced. <i>Production expected to increase.</i> Production expected to be increased in future with Thai Binh, Ham Rong field, Ca Voi Xanh fields.

Source: MolT.

Graph 4.1 Overview of Gas Fields

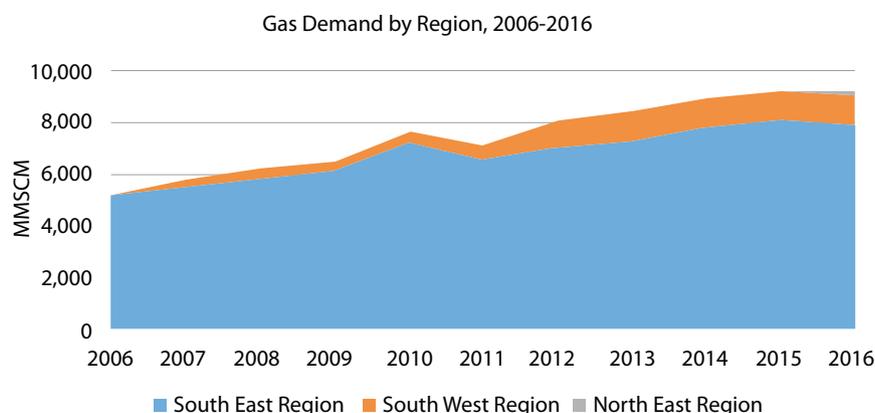


- Key regions: South East and South West, North, Centre
- No interconnection between SW and SE
- ~83% of gas for power generation most of the rest for fertilizer plants + industry

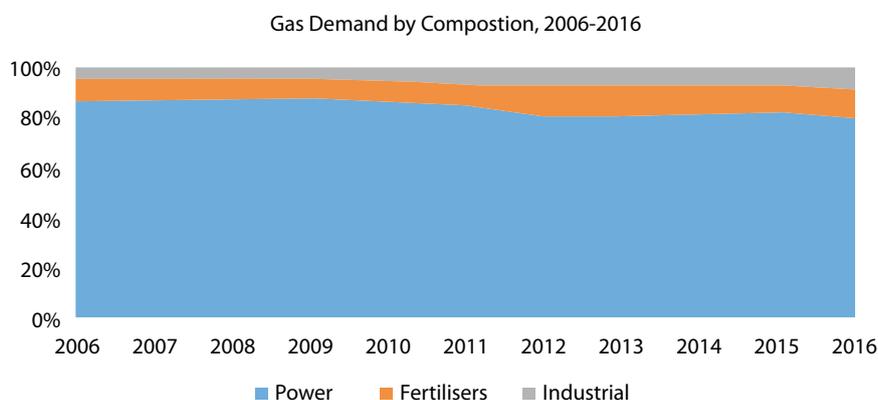
Disclaimer: The map shown is for illustration purpose. The boundaries, color, denominations, and other information shown on any map in this work do not imply any judgment on the part of the World Bank Group concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

102. **Gas demand:** Gas demand in 2016 was 9.2 bcm and was concentrated in the south-west near the major production sources. Power generation is the largest market segment, accounting for more than 80 percent of total gas demand. Fertilizer plants are the next most important segment at 11 percent of total demand. The remaining 9 percent are used by other industries. Demand in all regions is constrained by supply, and the plans to expand gas consumption in generation, fertilizers and industry depend on the development of new supply sources.

Graph 4.2 Gas Demand by Region (2006–16)



Graph 4.3 Gas Demand Composition (2006–16)



Source: MoIT.

103. **Gas pipeline infrastructure:** Vietnam's existing gas pipeline infrastructure is concentrated in the southern region. In the southeast, the pipeline infrastructure consists of the three pipelines transporting gas from the Cuu Long and Nam Con Son basins to power generation, fertilizer, and industrial users in Ba Ria, Phu My, and Nhon Trach.
- The Bach Ho-Phu My pipeline transports associated gas from the Cuu Long basin to the Dinh Co gas processing plant and to fertilizer and power plants at Phu My, Ba Ria, and Nhon Trach.

- The Lan Tay-Phy My pipeline (also known as the Nam Con Son 1 pipeline) transports nonassociated wet gas from the Nam Con Son basin to the Dinh Co gas processing terminal, and the processed gas is then delivered via an onshore pipeline to Ba Ria, Phu My, and further to Nhon Trach and Hiep Phuoc (known as the Phu My-Ho Chi Minh segment).
 - Phase 1 of the Nam Con Son 2 pipeline connects the Thien Ung and Dai Hung fields to the existing Bach Ho pipeline. A second-phase project will comprise connecting additional fields and construction of a pipeline parallel to the existing Bach Ho line. This second phase has not yet begun construction.
104. In the southwest, the PM3–Ca Mau pipeline routes gas from the PM3–CAA and Cai Nuoc fields in the Malay basin to the Ca Mau power/fertilizer complex, which includes the 1,500 MW Ca Mau power stations 1 and 2 and a fertilizer plant. There is no inter-connection between the southeast and southwest gas pipeline systems.
105. In the north, the recently completed Thai Binh pipeline will transport gas from the offshore fields in blocks 102, 106, 103, and 107 to the landfall in Thai Binh Province.
106. **All existing pipelines are owned by PVN and operated by PV Gas.** Two major proposed pipeline projects are linked to prospective new upstream gas developments:
- The Block B to O Mon pipeline will carry gas from Block B in the Malay Basin to proposed power plants at Kien Gian, Ca Mau, and O Mon.
 - The Cai Voi Xanh pipeline will be part of a planned US\$20 billion integrated gas-to-power project operated by Exxon in Central Vietnam.

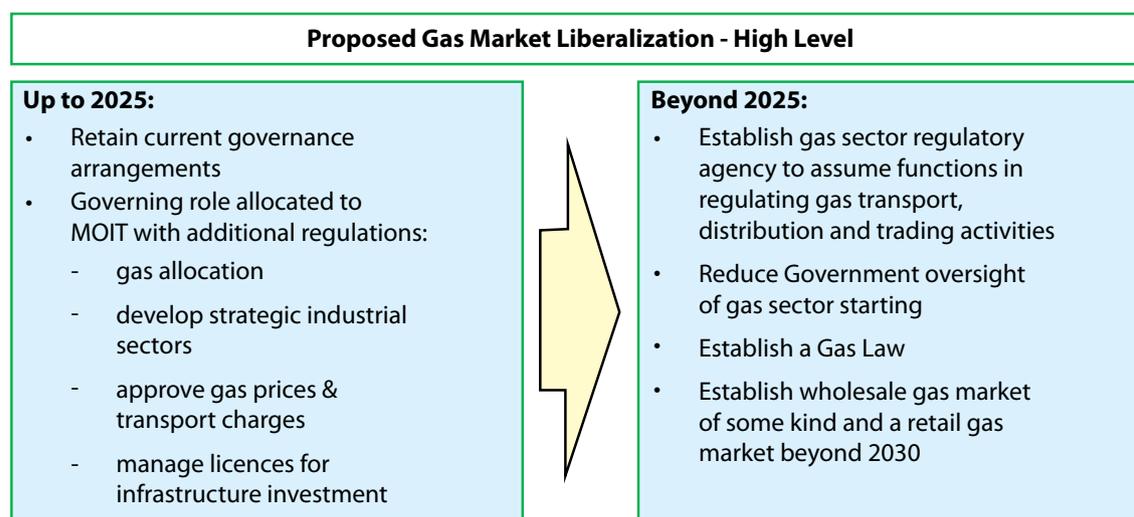
4.2 Gas Sector Reform

107. **Motivation for gas market liberalization:** Vietnam’s oil and gas industry has historically been a priority area of development by the government because oil and gas production stimulated economic development and made a significant contribution to the country’s fiscal balance. However, threats to the long-term viability of the gas sector have emerged, providing the impetus for policy makers to consider fundamental changes in the legal, regulatory, and institutional arrangements governing the sector:
- Existing gas fields are depleting, and new supplies have been slow to come onstream. Moreover, new domestic gas fields (such as Block B and Cai Voi Xanh) will be more expensive to develop and operate than existing fields.
 - PVN’s activities have expanded well beyond the core business of gas and oil, which has diluted their focus and raised concerns over whether they are serving the best interests of Vietnam.
 - PVN’s balance sheet has become stretched, and its ability to fund the required investment to increase domestic production has become limited.
 - Vietnam faces difficulties in attracting investors into new production-sharing contracts (PSCs) because of highly regulated domestic gas prices, high field-develop-

ment costs, and industry-wide capital constraints resulting from relatively low global oil and gas prices.

- To meet gas demand, Vietnam will need to import significant volumes of LNG over the next 5–10 years and will be subject to world market LNG pricing.
108. **Gas master plan:** To address these challenges, the government issued Prime Minister’s Decision No. 60/QĐ-TTg, dated January 2017, approving the plan for the development of the Vietnam gas industry by 2025, with a vision to 2035 (“GMP”) and setting out some specific directions for future development of the gas market:
- Complete the transition of the gas sector management model toward a free market direction in the post-2020 period;
 - Gradually progress to a model where the government only administers the gas industry’s operations through legislation with market participants being granted autonomy to negotiate their own commercial agreements involving gas sale, purchase, transportation and trade;
 - Enhance legislative documents related to the gas sector management commensurate with current and expected future conditions of the domestic gas industry; and
 - Establish rational gas market pricing policies with assurance that interests of the government, businesses and consumers will all be duly respected.

Table 4.2 GMP Directives for Gas Market Development



109. **PVN Divestiture:** PVN is planning the divestiture of several subsidiaries, starting in 2018, and will retain its sole ownership of only three subsidiaries, including the parent company PetroVietnam (PVN). PVN is expected to decrease its holdings in PetroVietnam Gas Corporation, PetroVietnam Transportation Corporation, Binh Son Refinery and Petrochemical Co., Ltd., PetroVietnam Oil Corporation, and PV Power.¹⁷

¹⁷ In addition, PV will entirely divest PVI Holdings, Phuoc An Port Investment and Exploitation Oil and Gas JSC, Green Indochina Development JSC, SSG Real Estate JSC, PetroVietnam Trade Union Finance JSC, PetroVietnam Construction Joint Stock Corporation, and Petrovietnam Maintenance and Repair JSC.



In January 2018, PV Power and Binh Son Refinery conducted successful IPOs selling 16 percent and 7.8 percent of its shares to private investors and now seeking a strategic investor.

110. All of those divestitures, if successful, will enable PVN to raise sizeable capital to contribute to the reduction of government debt and meet some future investment requirements focusing on its core gas and oil business.
111. **Major Challenges for Gas Market Liberalization:** The following are some of the key challenges that need to be addressed, including:
- The government is to retain the status quo to 2025. Given the urgent need to deal with potential gas shortages, the envisaged reform pace needs to be accelerated.
 - PVN is wholly government-owned and has its monopoly status for all gas activities written into the law in its charter. Hence, PVN restructuring will require strong government support and direction.
 - It will be critical to ensure coordination between ongoing developments in the electricity sector and gas sector—the Gas Market Roadmap and Electricity Industry Reforms Roadmap—particularly in relation to allowing gas prices to gradually become more cost reflective—as this will cause Vietnam’s electricity industry to become increasingly linked to global energy prices.
 - The importance of an economic valuation of natural gas and a shift away from a focus on current low gas pricing levels as a reference for gas prices in future developments.
 - The MOIT to be sufficiently resourced to effectively implement the Gas Market Roadmap.

4.3 Market Structure and the Role of PVN

112. The institutional arrangements applicable to Vietnam’s gas industry are:
- The **Prime Minister’s Office (PMO)** has direct oversight of the oil and gas industry. For gas, this includes promulgation of the legal framework and the final decision-making on policy, regulation, and long-term planning.
 - **Ministry of Industry and Trade (MOIT)** is responsible for overseeing all aspects of Vietnam’s energy sector, including gas. It has specific responsibility for formulating and submitting to the government draft laws, decrees, and policies; preparing and submitting to the government for approval of development strategies and master plans; promulgating circulars, decisions, directives, and other documents on state management and regulation. MOIT under PVN Charter Article 24 “is the direct superior of PVN Board Directors.” In relation to energy planning, MOIT prepares separate national development plans for the power, coal, gas, and petroleum sectors.

- **PetroVietnam (PVN)** is the state-owned oil and gas corporation. Under the direct control of the PMO, PVN maintains regulatory control over end-use oil and gas prices. PVN’s organization, roles, and functions are stipulated by the 2013 PVN Charter. The charter states that PVN’s core business is wide-ranging and includes “petroleum research, exploration, production, transportation, processing, storage and distribution of oil and gas products at home and abroad; trading and distribution of oil and gas products, petrochemical materials; and related businesses such as investment, production and trading of electricity and fertilizers.” Some of the key PVN wholly-owned subsidiaries include:
 - **PetroVietnam Exploration and Production Corporation (PVEP)**—responsible for upstream gas and oil exploration and production activities in Vietnam and the management of PSCs.
 - **PetroVietnam Gas Corporation (PVGas)**—manages the midstream and retail gas activities and is the sole entity that links gas from the upstream gas supplies to the end-users. PVGas has sole rights to distribution network development. PVN currently has regulatory control over all facets of gas transportation (via PVGas) and downstream oil and gas marketing.
 - **PetroVietnam Power Corporation (PV Power)**—is the second largest power producer after EVN. While the focus of projects was initially gas-fired power generation plants, the company has started the process of diversifying its power plant portfolio to include hydro, coal, and wind projects.
113. PVN’s size, structure, and roles are incompatible with the operation of a competitive gas market as PVN operates in every industry area, with no apparent segregation of roles. PVN is involved in numerous noncore businesses such as equipment and materials supply and manufacture, fertilizer manufacture, and shipbuilding. Thus, PVN’s corporate structure is complex, consisting of 27 business units and 32 subsidiary companies. The business units and subsidiaries report to the Board of Management which then reports to the Board of Directors.
114. The table below compares the current governance structure of gas industry with the electricity sector, where a transition to a liberalized market has been underway for several years. Although gas sector policy formulation and gas market operations have been segregated, the separation of regulation, pipeline operations, and other functional areas necessary for a liberalized gas market have not yet taken place.



Table 4.3 Current Governance Structure of Vietnam’s Petroleum, Gas and Power Industry

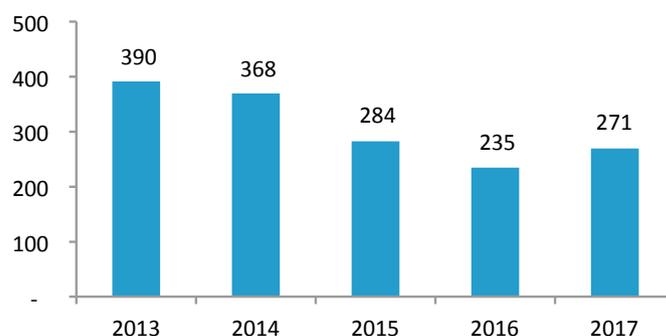
Supply Chain	Power	Upstream	Midstream Gas	Distribution
Policy Decision & Direction	PMO			Policy
Policy oversight, policy submission to PMO and advice	MOIT			
Policy formulation, strategy evaluation & master plans	GDE/MOIT			
Market Economic Regulation	ERAV	PVN (via PV Gas) PVN		
Technical & Safety Regulation	ERAV	PVN (via PV Gas)		
Purchase	EPTC	PVN		
Market Management/Operation	NLDC	PVEP	PV Gas	PV Gas
Transmission and Distribution	NPT	PV Gas		
End Users	EVN, PV Power and IPPs	PV Gas & Non-Power Users		

Note: Top line: upstream and downstream gas supply chain. Left side: Key functional areas of a liberalized gas market. ERAV = Electricity Regulatory Authority of Viet Nam; EPTC = Electric Power Trading Company; NLDC = National Load Dispatch Centre; NPTC = National Power Transmission Corporation.

4.4 PVN Financials

- 115. PVN is one of the most significant enterprises operating in the economy of Vietnam, accounting for about 20 percent of national GDP and contributing some 25–30 percent of the state budget revenues.
- 116. **Annual revenues:** PVN’s annual revenues recorded a dramatic decline from US\$18.5 billion (VND 390 trillion) in 2013 to US\$10.68 billion (VND 235 trillion) in 2016, before the recovery to US\$11.78 billion (VND 271 trillion) in 2017, partly due to the increase of oil price to around US\$60/barrel. Post-tax profits reduced from VND 46 trillion (\$2.1 billion) in 2013 to VND 17 trillion (\$0.7 billion) in 2016 and had an impressive result of VND 38 trillion (\$1.6 billion) in 2017.

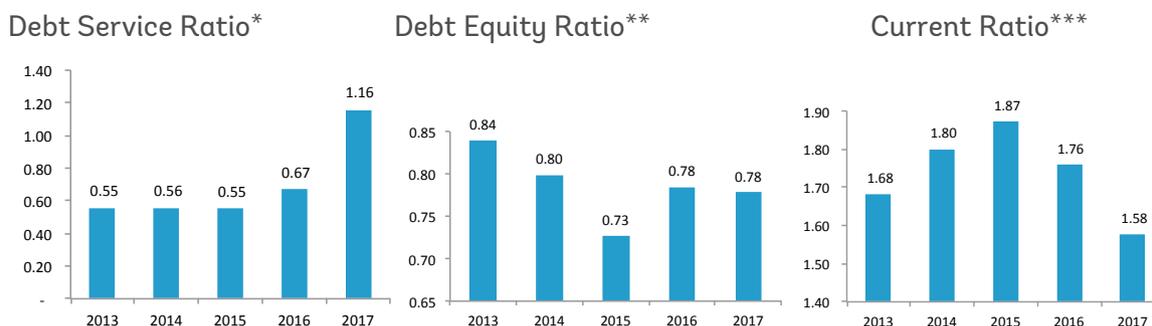
Graph 4.4: Annual Revenues (VND Trillion)



Source: PVM.

117. **Solvency/liquidity:** With regards to solvency and liquidity, a debt equity ratio of 0.8 times was maintained during the period from 2013 to 2017 implying that PVN is prudently operating its operations. However, debt service ratios are comparatively low (<1 times) during the period from 2013 to 2016 and significantly improve in 2017 to 1.16 times, mainly due to improvement in net income and the fall of substantial repayment obligations of loan principle. The current ratio, indicating PVN's liquidity, varied around more than 1.5 times for all five years indicating that current assets are sufficient to cover current liabilities.

Graph 4.5 Solvency and Liquidity



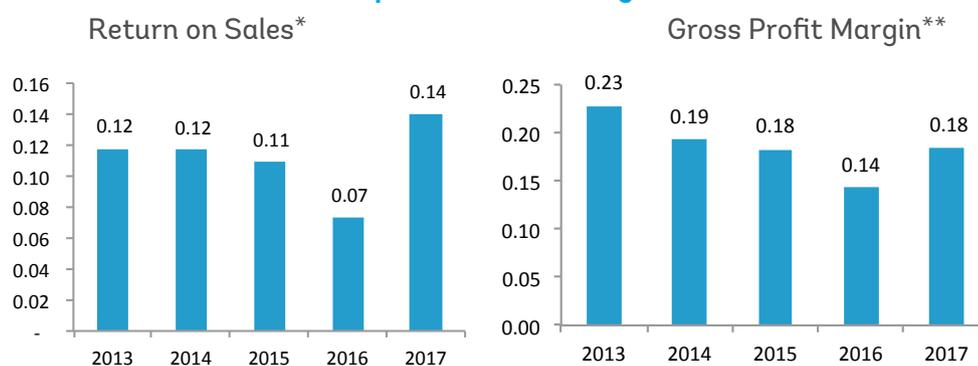
Source: PVM.

* Debt service ratio: A solvency ratio calculated as EBITDA divided by loan and lease principle and interest payments.

** Debt equity ratio: A solvency ratio calculated as total debt divided by total shareholders' equity.

*** Current ratio: A liquidity ratio calculated as current assets divided by current liabilities.

Graph 4.6: Profitability



Source: PVM.

*Return on Sales: profitability ratio calculated as net profit after tax divided by sales

**Gross Profit Margin: profitability ratio calculated as gross profit divided by sales

118. **Profitability:** From 2013 to 2016, gross profit margin and returns on sales decreased from 23 to 14 percent and from 12 to 7 percent. This resulted from changes to the composition of goods and services provided and the proportion of petrol and gas produced, achieving lower margins. However, the increase back of oil price together with better management of operating expense contributes to gross profit margin and returns on sales in 2017 of 18 and 14 percent, respectively.

119. **Overall assessment:** Overall, the financial indicators show that PVN is a profitable company, with high current ratio and relatively low debt equity ratio. The fall in oil prices are attributed to a downward trend in revenue and profit after tax for the period 2013–16. High payments for loan principle due and revenue declines are the main reasons for less-than-1 debt service ratio and negative cash flow in 2015 and 2016, impacting PVN’s ability to service its debt. In 2017, the recovery of oil prices is the main reason for the year’s better financial ratios of PVN.

4.5 Gas Sector Investments

120. **Future gas demand:** The total capacity of gas-fired power plants is targeted to increase from the current 7 GW to 9 GW by 2020 and 19 GW by 2030. The capacity expansion is concentrated in major power generation centers planned at O Mon and Kien Giang in the southwest, Mien Trung in the central region, and Son My in the southeast. Gas demand from the power sector will increase from 7 bcm in 2016 to 17 bcm by 2030. Including demand from fertilizer plants and industry, total gas demand will significantly increase from 9 bcm to 21 bcm over the same period.

121. With production from existing gas fields set to decline, meeting gas demand from the power, fertilizer, and industrial sectors will require the development of major new supply sources. The three most important pillars of future new supply are as follows:

- **Ca Voi Xanh (CVX):** Located 100 km from the Quang Nam coast, ExxonMobil’s CVX discovery has an estimated 150 bcm of gas reserves. In January 2017, ExxonMobil and PVN signed preliminary commercial agreements covering the first phase of development under which 8–9 bcm/year of gas will be produced for consumption at a 3,000 MW power development at the Chu Lai Open Economic Zone. The total cost of this integrated gas-to-power project is estimated at US\$20 billion, and target production start-up is 2023. PVN holds a 36 percent interest in CVX. Because of the project’s high capital costs, the gas sales arrangements (and related power sales agreements) will have to incorporate a high take-or-pay factor. Because of the high CO₂ content of the gas at CVX, it will not be possible to connect CVX to the pipeline systems in the South.¹⁸
- **Block B–O Mon:** The second critical upstream gas development is the PVN owned Block B–O Mon project. This project is expected to produce 5 bcm/year for consumption at the O Mon power center and the Ca Mau gas-power-fertilizer complex. As with other projects in the Gulf of Thailand, the gas reserves in Block B are contained in numerous small, compartmentalized reservoirs, making them complicated and expensive to exploit. In July 2017, PVN submitted a gas field development plan to the MOIT calling for up to 1,000 wells and a total investment requirement of up to US\$10 billion. The high gas price required to support such high-cost development has been a long-standing roadblock to the commercial development of Block B, and the timeline for future development is still uncertain. As with CVX, Block B will require a high take or pay factor to be commercially viable.

¹⁸ Even though the gas in the CVX field is 30 percent CO₂, using this gas in high-efficiency CCGT’s will still result in 45 percent lower CO₂ emissions per kWh than comparably sized coal plants.

- **LNG:** LNG will play a critical role in offsetting the expected decline in existing fields and meeting future gas demand for gas-fired power generation. The GMP shows LNG imports beginning in 2019 and then ramping up rapidly to 14 bcm by 2035. Further delays in developing Block B and CVX would further accelerate this trajectory.

The GMP sets out the broad sequencing of the three main new supply options and the resulting overall market supply and demand balance.

Table 4.4 Key Gas Development Sources and Sequencing

Period	Key Developments
2016–20	Gas supply in the southeast: stable at 8–9 bcm/year, meeting existing gas demand
	Total domestic supply: 10–11 bcm/year
2021–25	Southeast region fully developed with total supply of 9.1–9.7 bcm/year by 2024
	Ca Voi Xanh first gas in 2023, peaking at 6.2 bcm/year from 2025 onward
	Block B first gas in 2020
	First LNG import for the southeast in 2020–21. More imports will be followed for other regions, with total volume reaching 4 bcm in 2025
	Total domestic supply: 13–19 bcm/year
2026–35	Block B peaking at 3.84 bcm/year in 2031
	LNG import increasing up to 10 bcm/year
	Total domestic supply: 17–21 bcm/year

Source: MoIT.

122. Midstream Gas Sector Investment Plan: The table below provides historic investment data for the existing gas pipeline system in Vietnam.

Table 4.5 Historic Gas Pipeline Investments

Pipeline System	Transporter/ Operator	Capacity (mmcf/d)	Diameter (inch)	Length (km)	Tariff (US\$/mmbtu)	Unit cost (US\$/km)	Amount (\$m)
Bach Ho - Phu My	PV Gas	200	18	152	0.25	1.80	274
Nam Con Son 1	PV Gas	700	26 & 30	400	1	2.50	1000
PM3 CAA - Ca Mau	PV Gas	200	18	325	1	1.80	585
Phu My - Ho Chi Minh	PV Gas	200	22	40	0	2.10	84

Source: MoIT.

123. The GMP estimates the total investment requirements for gas infrastructure at US\$19 billion over the period 2015–35. LNG terminals comprise the largest category, accounting for US\$3.7 billion in 2015–25 and US\$4.3 billion in 2026–35. Off-shore pipelines are the second biggest category at US\$3 billion and US\$2.8 billion, onshore pipelines require US\$976 million and US\$180 million, gas treatment plants US\$1.9 billion and US\$960 million and LPG Storage/CNG plants US\$850 million and US\$460 million over the two periods, respectively.

Table 4.6 Midstream Gas Sector Investment Plan by Segment (US\$ millions)

Region	2015–25	2026–35
LNG terminals	3,673	4,271
Offshore pipelines	3,003	2,773
Onshore pipelines	976	180
Gas treatment plants	1,873	960
CNG/small scale LNG	166	34
LPG Storage	853	463
Total	10,544	8,681

Source: MoIT.

124. It is planned that PVN will carry out roughly half of the investments with the remaining being assigned to the private sector. However, even for projects assigned to PVN, commercial financing and other external capital will still be required as PVN typically targets to inject equity of around 30 percent in its projects requiring it to raise around 70 percent in debt to fund the balance.
125. Six LNG importing terminals are proposed, with total capacity of 19–27 million tons per year. Developments in the period 2021–25 are focused on the southeast and southwest regions, while developments beyond 2026 are smaller and concentrated in the central, north, and southeast regions. To date, attempts to bring private investment into development of LNG terminals have not gained momentum and government needs to develop an attractive LHG regulatory and pricing regime to ensure those terminals are being developed.

Table 4.7 Proposed LNG Import Terminals

	Location	LNG Import Terminal	Operation	Capacity	Main users
1	South East	Thi Vai (Ba Ria – VT)	2020–22	1–3 MT	Nhon Trach 3&4 CCGT
2	South West	Hon Khoai (Ca Mau)	2022–25 (stage 1)	1 MT &	Kien Giang and O Mon Power Centers, Ca Mau GDC
			2025– (stage 2)	2 MT	
3	South East	Tien Giang	2022–25	4–6 MT	
4	South East	Son My (Binh Thuan)	2023–25 (st. 1)	1–3 MT	Son My Power Center, Phu My GDC
			2027–30 (st. 2)	3 MT	
			2031–35 (st. 3)	3 MT	
5	North	Cat Hai (Hai Phong)	2030–35	1–3 MT	Hai Phong 3 CCGT
6	Central	My Giang (Khanh Hoa)	2030–35	3 MT	

Source: MoIT.

4.6 Gas Pricing and Contractual Regime

126. **Current Gas Pricing Approach:** Historically, wholesale gas in Vietnam has been priced based on a project-by-project, bi-lateral basis between project sponsors and PVN. There are some Prime Minister's Decisions setting gas prices and allocations for specific end-uses or locations, but the derivation of those prices appears to have been the result of bi-lateral negotiations involving end users as well as project sponsors and PVN.
127. For new projects, price negotiations are still heavily influenced by historical low gas prices—prices which were possible because the historic development costs of Nam Con Son and other early fields were very low by international standards. There is little apparent recognition that these earlier price benchmarks cannot apply to new discoveries further offshore, in deeper water, or in cases where the gas contains high levels of impurities or is contained in smaller, noncontiguous reservoirs. In addition, existing gas pricing appears also to be driven by a historical policy priority to achieve low electricity and fertilizer prices.
128. **Take-or-Pay Gas Prices for Power Plants and Fertilizer Plants:** The prices for gas up to take-or-pay quantities for power plants in the South-East region are set by negotiation between PVN/PVGas and the power plant owners. For gas delivered to power stations in the South West, quantities exceeding take-or-pay taken by power stations in the South East and South West, and for gas delivered to the Phu My fertilizer plant, a pricing formula is set out in the Office of the Government Directive 2175/VPCP-KTTH:
- Gas price for user = Market gas price plus transportation and distribution charges, where:
- The market gas price is the wellhead gas price calculated at 46 percent of the average Fuel Oil price of the Singapore market according to Platt's index (MFO).
 - Transportation and distribution charges are approved by the authorized agency, dependent on individual regions/pipelines.
129. **Gas prices for industrial users:** PVN sets annual gas pricing schemes based on the pricing of alternative fuels (fuel oil, LPG) and market acceptance.
130. **Gas prices for new developments and LNG:** Pricing for gas from proposed new gas developments continues to be driven by negotiation between PVN/PVGas (as the single buyer) and PVEP and its joint venture partners (as the gas producer). The evaluation of new gas projects against alternatives appears to use historic gas prices as a benchmark rather than the costs of current alternative fuel options—coal, imported LNG, fuel oil, or distillate. There appears to be no consideration of externalities such as pollution/greenhouse costs, taxation, or the impact on balance of payments of indigenous versus imported fuels in the evaluation of gas projects and the determination of the economic price for gas.



131. The expectation of the gas buyer that historical gas prices should be used as a benchmark has delayed the development of both Block B and CVX, despite each having identified technical challenges, which results in much higher production costs than previous gas developments.
132. As a relatively small market, Vietnam will be a price taker for LNG in the international market. Accordingly, negotiations can only focus on the costs for development and operation of the regasification infrastructure. Gas purchasing approaches, though, need to focus on maximizing competition and flexibility to supply the Vietnamese market, and this approach applied internationally has demonstrated that in this market buyers can achieve attractively priced LNG and good flexibility within the contracts. A project-specific approach, using historical prices as a benchmark is unlikely to be conducive to successful negotiations for proposed LNG imports.
133. Vietnam faces challenges coming to grips with international LNG prices because: (i) they are higher and more volatile than historical gas prices, and (ii) they are outside government control. Therefore, a new approach to pricing gas, which is not based on historical benchmarks, will be required if Vietnam is to successfully import LNG in the near future and if CVX and Block B are to be developed. One solution that other countries have used is to introduce a market-based pricing mechanism for LNG and use it as the first step in market liberalization.
134. **Current regulatory and contractual constraints:** The existing gas supply agreements appear to be ambiguous on the rights of gas buyers to on-sell gas to third parties as the contracts, apparently, neither expressly allow nor prohibit on-selling. For the Phu My complex, a Prime Minister's decision specifies the allocation of gas between the power station and the fertiliser plant, with no apparent scope for trading between those facilities. This decision is used to interpret other arrangements to prohibit the on-sale of gas and results in an inefficient allocation of gas on a daily basis. As a result of these contractual interpretations, power stations are curtailed on occasions while fertiliser plants receive their full allocation of gas despite there being a surplus of fertilizer in stockpiles.

Annex 5. Public Private Partnerships Framework

5.1 Overall Framework

The **relevant investment regulations** include:

- Law on Investment
- Decree No. 63/2018/ND-CP on PPP Investment Form (“Decree 63” or “New PPP Decree”)
- Decree No. 30/2015/ND-CP on Investor Selection (applicable to PPP Investors)
- Circular No. 38/2015/TT-BCT of the Ministry of Industry and Trade (MOIT) providing guidance for PPP projects in the sectors under the management of MOIT (including power)
- Circular No. 23/2015/TT-BCT of the MOIT on procedures for development of coal-fired power projects under BOT Contract form

135. The overall regulatory framework for private participation in infrastructure through PPPs has recently been improved with the introduction of Decree No. 63/2018/ND-CP, which replaces Decree No 15/20154/ND CP (Decree 15). Decree 15, in turn, replaced Decree 108, dated November 27, 2009 (as amended) and Decision 71 dated November 9, 2010, on the pilot PPP investment scheme and for the first time provided a single legal framework for private investment in public infrastructure sector.
136. Decree 108, which together with its predecessors dated back to 1998, served as the legal framework for four BOT power projects that received international financing—Phu My 2–2, Phu My 3, Mong Duong 2, and Vinh Tan 4. Decision 71, by contrast, was the first attempt to lay down PPP regulations on a trial basis. However, since its adoption, it is understood that no project has been completed under Decision 71.
137. Decree No.30/2015/ND-CP (Decree 30) sets out the procedures applicable to the selection of sponsors for PPP projects. The general rule is that sponsors must be selected through a competitive bidding process, although direct appointment is allowed under limited circumstances.
138. Although based on Decree 108, Decree 15 introduced several new features, useful clarifications, and incremental improvements from the existing regulations. Indeed, Decree 15 formed a more consistent and effective regime for a wider range of PPP projects and was drafted to provide the state authorities as well as investors with more detailed guidelines to help facilitate project preparation and implementation. More importantly, under Decree 15, investors no longer need to be concerned whether the project is being procured as a BOT project under Decree 108 or as a PPP project under Decision 71.



139. Decree 15 also removed the requirement under the pilot PPP regulations that a PPP project must be an important and large-scale project (as previously set out in decision No. 412 issued by the Prime Minister on April 11, 2007), thereby allowing the relevant governmental authorities to provide detailed guidance on a broader range of PPP.
140. However, while Decree 15 was a significant improvement on earlier legislation, it is understood that no PPP project was successfully procured under this legislation. One of the reasons for this may be due to the fact any project classified as a PPP must follow the processes and requirements set out in Decree 15, which includes, inter alia, preparation of feasibility studies and the running of a competitive tender process. Unfortunately, most ministries/agencies do not have the capacity to run competitive tenders and, as such, it seems that some projects that should be procured as a PPP under the PPP decree are instead being procured under different legislation and regulations. This has mostly been the case in energy sector where investment licenses have often been given to domestic and international investors on a negotiated rather than a competitive basis.
141. Given the limited success of Decree 15 in stimulating the PPP market in Vietnam, the government introduced a new PPP decree—Decree No. 63/2018/ND-CP on May 4, 2018, and it will take effect from 19 June 2018.
142. The objective of Decree 63 is to strengthen the framework for PPPs in Vietnam. Some of the key changes that have been introduced under Decree 63 include:
- More flexibility with respect to the type of PPP contracts being entered into;
 - An increase in the minimum amount of equity to be provided by investors (15–20 percent, depending on the total amount of investment);
 - Further clarification on the allocation of responsibilities across key state agencies covering, inter alia, designing and budgeting, evaluating and approving proposals, valuing land etc;
 - Further clarification on the forms by which state investment capital can be provided to a PPP project;
 - Requirement that all investor proposed PPP projects requiring state investment capital must be subject to the principles of open tendering;
 - Investors no longer need to obtain an investment registration certificate;
 - Ministries and line agencies are encouraged to provide detailed guidelines on a standard form of PPP contract(s) to be used in implementing projects within their sectors;
 - State agencies must publish key contents of the executed concession contracts on the national procurement portal; and
 - Investors will no longer be allowed to assign their equity to a new investor until: (i) after construction, and (ii) it has proved to the state that the new investor has the financial and managerial capacity to implement the project.

143. Decree 63 goes a long way in providing greater flexibility and clarity with respect to PPPs and, as such, it is hoped that the new decree will help stimulate the PPP sector in Vietnam. However, increases in the minimum amount of equity that needs to be invested and restrictions on transfers of equity until after construction may still act as a constraint on some investors. More importantly, there is still limited clarity on the application of guarantees to investors, particularly with respect to FOREX and termination payments.

5.2 Framework for BOT Power Generation

144. **Institutional Framework and Approval Process for BOT Power Generation:** Vietnam has recently issued a new set of legal documents governing investments into BOT power generation projects. These regulations include:
- Government's Degree No. 63/2018/ND-CP, dated May 4, 2018, on Public-Private Partnership Investment Forms (replacing Decree No. 15/2015/ND-CP, dated 14 February 2015).
 - MOIT's Circular No. 23/2015/TT-BCT, dated July 17, 2015, on Procedures for Investments of Thermal BOT Power Plants.
145. **Selection of the BOT Power Plant Investor:** BOT investors are selected to undertake the BOT projects listed in the approved RPDP7. Investor selections are carried out through international tenders, or by direct appointments approved by the prime minister for certain cases. A BOT investor could be selected to build a plant that has not been listed in the approved RPDP7 if that investor submits a proposal for the project and the proposal is approved by the prime minister. All final BOT investors' selections should be signed off by the prime minister.
146. **MOU and Project Documentation Agreements:** The memorandum of understanding (MOU) for the BOT project is negotiated between the MOIT and the investor. The MOU should outline general features of the project, responsibilities of the investor and MOIT and an overall implementation plan. The MOU should be approved by the MOIT and be signed by the authorized representatives of MOIT and the investor. After the MOU sign-off, the investor should prepare and submit to MOIT a detailed project implementation plan. The detailed plan shall specify the dates for feasibility study completion, negotiations, and agreement of the BOT contract; project financial closure; construction commencement; and commercial operation of each unit and the entire plant. The project's feasibility study is appraised and approved by the MOIT.
147. **BOT Contract Negotiations:** MOIT will engage a legal advisor and establish an inter-ministerial working group to assist in preparation and negotiations of the BOT contract, land lease agreement, the government support agreement, and MOIT's project approval and certification. The interministerial working group is chaired by an MOIT representative and has members from MPI, MOF, SBV, Provincial Authority, EVN, TKV, or PVN. The working group chairman is the leader for contract negotiations



with the BOT investor. The working group and the BOT investor should negotiate and sign an agreement in principle (PA) before commencing negotiation for the BOT contract and other agreements. The PA contains main definitions, contract duration, overall project plan, financial plan, COD, applicable laws, risk allocation mechanism, dispute resolution mechanism, taxes, electricity price structure, general land lease and fuel supply provisions, and general provisions of the government guarantee.

148. After the PA is signed between the MOIT and the investor, the working group and the investor commence negotiations for the master BOT contract, GGU and MOIT's project approval, and certification. This negotiation process is conducted in two rounds, with each round having three sessions and each session lasting for three days at most. In parallel with the BOT contract negotiations, the following agreements should be negotiated:
- Power purchase agreement (PPA) is negotiated between EVN and the BOT investor;
 - Coal supply agreement (CSA) is negotiated between TKV and the BOT investor if the power plant uses domestic coal;
 - Gas supply agreement (GSA) is negotiated between PVN and the BOT investor if the power plant uses domestic gas; and
 - Land lease agreement (LLA) is negotiated between the provincial authority and the BOT investor
149. On completion of the two rounds of the BOT contract negotiations, MOIT reports to the prime minister the negotiation results, including the agreed contents and any outstanding issues. At the prime minister's direction, the working group will continue the negotiations with the investor to resolve and agree on the outstanding items.
150. After completion of the final negotiation, MOIT submits for the prime minister's approval the BOT project investment agreement. The agreement is signed between the MOIT and the BOT investor after the BOT contract and all other agreements have been negotiated and initialized.
151. **Investment registration certificate:** After the investment agreement is signed, the BOT developer should apply to MOIT for the investment registration certificate. The certificate includes:
- Name and address of the investor and name of the project;
 - Objectives, scale, requirements, and conditions for implementation of the project (if any);
 - Project implementation location and area of land to be used;
 - Total investment capital of the project; structure of the capital sources;
 - Project term and implementation schedule;

- Value, proportion, schedule, and conditions for disbursement of state investment capital for the participation in the project implementation (if any); and
 - Investment incentives (if any).
152. After the issuance of the investment registration certificate, the BOT contract and GGU are officially signed between MOIT and the investor; the other agreements should also be formally signed by the BOT developer and the relevant parties.
153. **Government Guarantee:** For general BOT projects, based on the nature and requirements of project implementation, the prime minister shall appoint an agency to act on behalf of the government to provide a guarantee for provision of raw materials, sales of products, services, and other contractual obligations to the investor, project enterprise, or other enterprises participating in project implementation, and a guarantee for obligations of SOEs selling fuel, raw materials, purchasing products, and services of the investor or project enterprise. For development of BOT power plants, MOIT is the government guarantee provider on behalf of the government.
154. **Existing BOT power plants:** Around 6 percent of Vietnam’s installed capacity consists of 3 BOT projects. There are three foreign-owned thermal gas fired power plants developed under the BOT model who sell power to EVN under long-term PPAs.

Table 5.1 Existing Build Operate Transfer (BOT) Power Plants

Name	Capacity (MW)	Fuel	Region	Owner
Phu My 2.2	720	Gas	South	Me Kong Energy Co. Ltd.
Phu My 3	720	Gas	South	BOT Phu My 3 Ltd.
Mong Duong 2	1,200	Coal	North	AES—TKV Ltd.

155. The primary developers for these plants are BP (Phu My 3), as a means of utilizing their share of associated gas production from oil fields; EdF (Phu My 2.2), after a competitive tender by the government; and Muong Duong 2 (2011). Phu My 2.2 Power Plant came online in 2005; Phu My 3 in 2004. These are part of the Phu My complex, which also contains several EVN-owned CCGTs. Muong Duong 2 coal thermal plant began operating unit 1 in March 2015. Muong Duong 2 sells electricity to EVN under a 25-year PPA supported by a 25-year coal supply contract with Vinacomin.
156. **BOT power plants under implementation:** Another 18 thermal power projects have been planned in the RPDP7 to be developed under the BOT scheme. However, implementation of these BOT power projects encountered many challenges and obstacles resulting in lengthy negotiations and causing significant delays to the projects’ initial timelines—with many taking up to 10 years to negotiate. Major concerns are related to issues around the government guarantee for foreign currency conversion, application of international laws for dispute resolution, and contract payment. There have also been difficulties in negotiations of electricity prices and fuel supply/transportation contracts.

157. Institutional Framework and Approval Process for Transmission and Distribution Network Development: There is no private sector ownership of transmission and distribution network as all investments will be made by the state owned National Power Transmission Corporation (NPT) and Power Distribution Corporations (PCs) acting as exclusive operators of power transmission and distribution systems. EVN is responsible for: (i) coordinating with all government agencies and NPT and PCs, the project owners; and (ii) monitoring the implementation of investment projects.
158. NPT and PCs are the project owners of transmission and distribution projects. They coordinate the work with the project management boards established in each corporation, which, in turn, will provide status updates during project implementation in accordance with their internal procedures. NPT and PCs will report to EVN. As the project owners, they will be responsible for: (i) project preparation; (ii) appraising and approving sub-projects and organizing the management and implementation of programs/projects; (iii) ensuring adequate and capable management resources; (iv) conducting appraisal and approval of technical design, total cost estimates and cost estimates of subprojects; and (v) signing the onlending agreement with MOF for the loan, and repaying loan proceeds, if the loans are provided by IFIs. They will also provide technical assistance through its staff from various functional departments.

5.3 Competitive Bidding for New Generation

159. One of the biggest challenges of the Vietnamese power sector is to ensure long-term, competitively priced, adequate electricity supply to meet demand growing at high annual rates. To date, Vietnam has been successful in carrying out systematic power system planning, which makes it possible to identify the portfolio of generation projects that minimize the total cost of supply (investments + operation + unserved energy) from a country-wide perspective. To date, implementation of the outcomes of the planning process have been mainly based on the direct award of generation projects for development, either to EVN or other SOEs or private companies. To ensure long-term adequate electricity supply at least cost, it is necessary to move to a more competitive and transparent regime for procurement of new generation capacity, which is fully compatible with the market principles guiding the wholesale electricity market.
160. In 2006, the government issued a decision (MOI Decision 30/2006/QD-BCN) for the competitive procurement of power generated by independent power producers (IPPs). The decision outlines bidding procedures for IPPs, and sets out details on the preparation, appraisal, approval, and execution of private-sector-financed IPP projects. Specifically:
- IPPs shall be invested in the form of build-operate-transfer (BOT), build-own-operate (BOO) or other forms provided for by the law;
 - To ensure the efficiency and sustainability of projects, the selection of investors for execution of IPPs shall be carried out through bidding; and
 - Up to 30 days' time limit for agencies to reply to investment reports or applications.

161. In 2007, the government issued a Prime Minister Decree 78/2007 on Investment based on BOT, build-transfer-operate (BTO), and build-transfer (BT) contracts, which requires competitive tendering from an approved list but also allows for direct negotiations in urgent cases and for unsolicited proposals. In 2015, the government issued a Prime Minister Decree 105/2015 on public-private partnerships (PPP), which states that investors can be selected through tendering or direct appointment in accordance with public procurement laws.
162. While a competitive tendering process can be effectively implemented in accordance with the above-mentioned regulations (MOI Decision 30/2006, PM Decree 78/2007 and PM Decree 105/2015) the last internationally competitively tendered BOTs were Phu My 2.1 (gas) and Phu My 3 (gas) in the early 2000s; while the Mong Duong 2 plant (coal, awarded in 2011) was a negotiated bid. Since then, there have been no competitively awarded IPP projects that have reached financial close.
163. The bulk of new generation projects are allocated by Ministerial decision; rather than following a competitive tender process. The existing centralized project allocation process is at risk of being perceived as: (i) overly favouring SOEs (i.e., EVN, PVN) over privately-owned firms, both domestic and foreign; (ii) being less than transparent, and open to allegations of impropriety and corruption associated with lobbying; and (iii) producing lower value-for-money outcomes than might arise under a well-designed, transparent, and well-executed international competitive tender process. Other possible adverse consequences of the current arrangements could be: (i) state-sponsored generation investment crowding out private sector investment; (ii) “cherry-picking” by SOEs so that they are assigned the more commercially attractive new generation projects while the less attractive projects are assigned to private sector developers; and (iii) private investors being dissuaded from investing in Vietnam and preferring to invest in other countries.
164. The continued use of the existing procurement arrangements could be the delivery of new generation capacity at a significantly higher cost to what could be achieved under more transparent and competitive arrangements. Vietnam’s fast load growth means that it is imperative to deliver new generation capacity in a timely way. Vietnam cannot afford to have a shortfall in energy supply, which would have damaging impacts across the economy and society. As further structural reforms in the power sector are taking place, including the development of the VWEM and a shift to higher targets for renewable energy, it is becoming critical to assess the inadequacies of the current approach to attracting private investment in generation and propose robust mechanisms to effectively apply Decision 30 and related regulations, so that the needed capacity for reliable energy supply is procured competitively and efficiently at least cost.
165. An efficient and competitive framework is needed for procuring new capacity and to ensure long-term electricity supply beyond 2025 (when existing planned and allocated new generation projects should have all been commissioned). Given the timeframe, it is important that framework for competitively procuring IPPs and BOTs beyond



2025 should be ready by 2020 to allow time for bidding and construction. Those projects deferred or cancelled under the existing plan also need to be monitored and reallocated as part of a PDP review process. Underlining the importance of putting in place a robust competitive procurement framework is the fact that out of 188 power plants estimated to be required until 2030, only 50 new power plants are planned to be built by EVN and other SOEs, with the rest expected to be built through IPPs and BOTs.



The World Bank Vietnam Office
63 Ly Thai To
Hanoi, Vietnam
Tel: (84-24) 39346600
Fax: (84-24) 39350752
Website: www.worldbank.org.vn

The World Bank
1818 H Street, NW
Washington, D.C. 20433, USA
Tel: (202) 4731000
Fax: (202) 4776391
Website: www.worldbank.org

