



# VIETNAM ELECTRICITY

ANNUAL REPORT 2017



**EVN**

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# Message from the Chairman

Keeping one step ahead to satisfy electricity demands for Vietnam's socio-economic development, Vietnam Electricity has set the following objectives in accordance with the five year 2016 – 2020 power development plan; prioritizing safe and reliable power supply:

- (i) To stably and safely operate the national power system and provide sufficient electricity to foster the socio – economic development of the country, with due attention to be paid to occupational safety;
- (ii) To perform power generation and network investment projects on schedule and with satisfactory quality. There will be increased investment in environmental protection and management, both newly constructed facilities and those currently operating;
- (iii) To pursue the ongoing corporate restructuring and reforms in the light of the power sector restructuring of the Government;
- (iv) To succeed in implementing the 2017 theme, “Science and Technology Promotion”, by application of science and technology advances to the whole management and business chain of EVN in enhancing corporate efficiency and effectiveness;
- (v) To increase profitability through increased operational and business efficiencies, as well as productivity improvements.

The theme chosen for the year 2017, “Science and Technology Promotion,” demonstrates the strong commitment of EVN to developing and applying science and technology advances in corporate governance, management, operation of the power system, business and customer service, investment and construction. This will help to enhance power system reliability, business efficiency, productivity, and environmental protection.

In confronting the emerging difficulties and challenges, I strongly believe that, in the spirit of best efforts, endless creativity and constant renovation of the devoted staff, Vietnam Electricity shall accomplish all the targeted tasks and assignments, deserving the trust of the Party, the Government and the People of Vietnam.

*Chairman of the Board*



**Duong Quang Thanh**





# Message from the President and CEO


Starting the five-year development plan 2016 - 2020, EVN successfully accomplished the assigned targets for 2016 and laid a solid foundation for further achievements in subsequent years.

Specifically, EVN supplied sufficient electricity to foster Vietnam's socio-economic development, where power sales grew at a pace of 11.2% compared to the previous year. The power system has been operated in a stable, safe and efficient manner, in spite of many complications such as difficult weather and climate change, power deficiencies in Southern part of the country, imperfection of the system configuration and status, etc. Power generation and grid investment projects have been pushed with investment value reaching USD 6.5 billion equivalent. Power losses, labor productivity, reliability indices and customer service quality have significantly improved. Besides, EVN has made remarkable achievements in human resource training and development, corporate culture development, international cooperation, science, technology, environmental protection, public communication, etc.

Choosing the year 2017 as a momentum for science and technology promotion, EVN aims to enhance efficiency and effectiveness within the whole corporation. EVN has devised and determined to exceptionally accomplish a set of challenging objectives for the year 2017, including (i) securing power needs of the country; (ii) implementing targeted power system expansion plans; (iii) persisting with EVN's reform and restructuring process; and (iv) increasing science and technology applications, and improving business efficiency and productivity.

These challenging tasks need continuous efforts and devotion from EVN management and staff to accomplish the mission "to supply power with ever higher quality and better services," and ultimately to create favorable conditions for the country's economic development and improved quality of life for the People in Vietnam. I strongly believe that we will continue working hard together to fulfill the objectives and tasks set forth for the year 2017.

*President & CEO*



**Dang Hoang An**



## Board of Directors



**Mr. Duong Quang Thanh**  
*Chairman*



**Mr. Dang Hoang An**  
*Board Member,  
President & CEO*



**Mr. Dao Hieu**  
*Board Member*



**Mr. Mai Quoc Hoi**  
*Board Member*



**Mr. Pham Manh Thang**  
*Board Member*

## Executive Management



**Mr. Dang Hoang An**  
*President & CEO*



**Mr. Dinh Quang Tri**  
*Vice President  
Economics and Finance*



**Mr. Nguyen Cuong Lam**  
*Vice President  
Hydropower and  
Renewable Energy  
Investment*



**Mr. Nguyen Tai Anh**  
*Vice President  
Thermal Power and  
Transmission Investment*



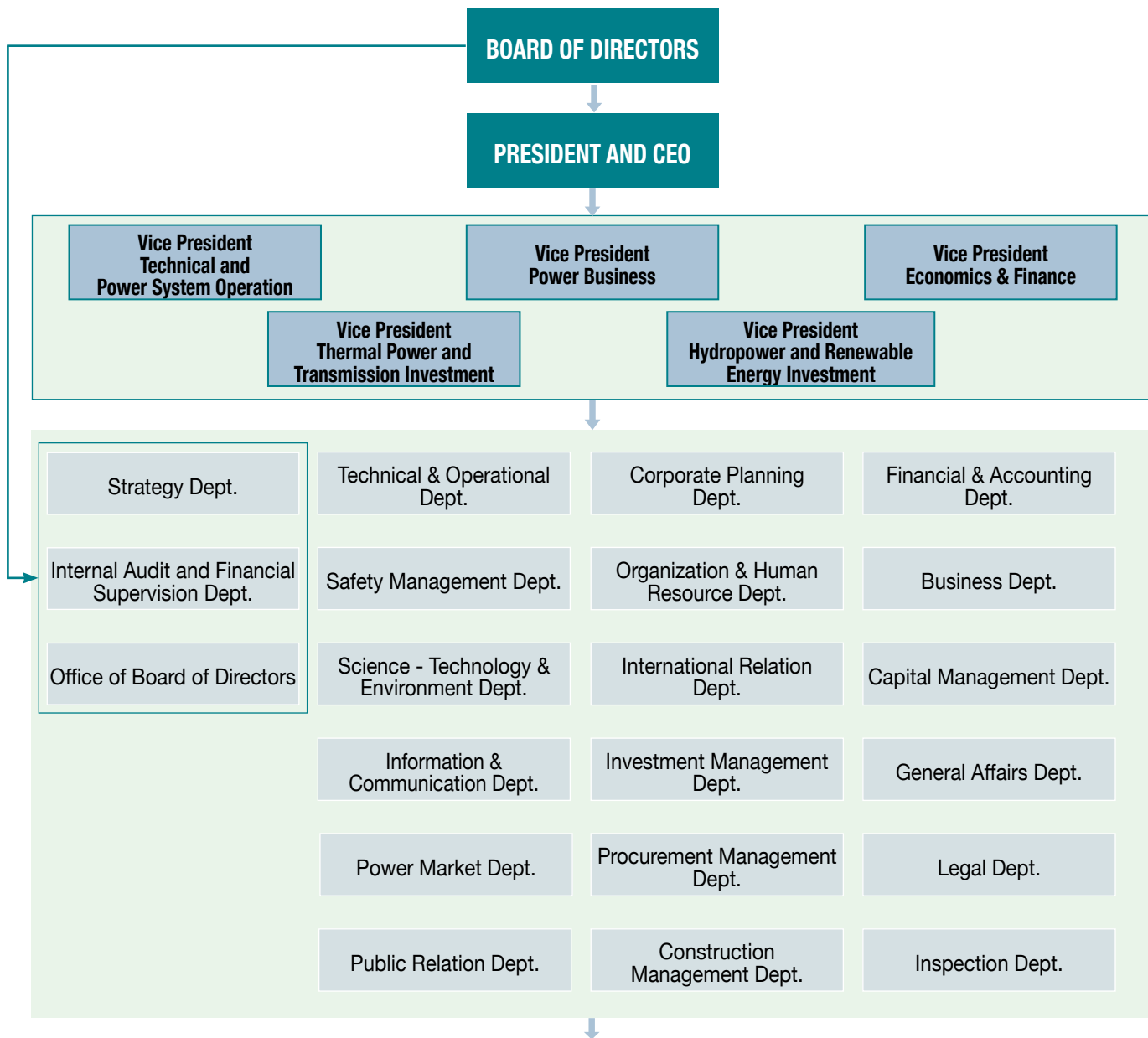
**Mr. Ngo Son Hai**  
*Vice President  
Technical and Power  
System Operation*



**Mr. Vo Quang Lam**  
*Vice President  
Power Business*



# Organization Chart





#### DEPENDENT ACCOUNTING UNITS

1. Hoa Binh Hydropower Company
2. Ialy Hydropower Company
3. Tri An Hydropower Company
4. Tuyen Quang Hydropower Company
5. Se San Hydropower Development Company
6. Son La Hydropower Company
7. Huoi Quang – Ban Chat Hydropower Company
8. Nghi Son 1 Thermal Power Company
9. Hydropower Project Management Board No.1
10. Hydropower Project Management Board No. 4
11. Hydropower Project Management Board No. 5
12. Hydropower Project Management Board No. 6
13. Son La Hydropower Project Management Board
14. Thermal Power Project Management Board No. 2
15. Ninh Thuan Nuclear Power Project Management Board
16. EVN Construction and Technology Investment Management Board
17. Electric Power Trading Company
18. National Load Dispatch Center
19. Electric Information Center
20. Information and Communications Technology Company of Vietnam Electricity

#### ONE MEMBER LIMITED LIABILITY COMPANIES

1. Power Generation Corporation 1
2. Power Generation Corporation 2
3. Power Generation Corporation 3
4. National Power Transmission Corporation
5. Northern Power Corporation
6. Central Power Corporation
7. Southern Power Corporation
8. Hanoi Power Corporation
9. Ho Chi Minh City Power Corporation

#### JOINT STOCK COMPANIES

1. Thu Duc Electro - Mechanical JSC.
2. Dong Anh Electrical Equipment Corporation JSC.
3. Power Engineering Consulting No. 1 JSC.
4. Power Engineering Consulting No. 2 JSC.
5. Power Engineering Consulting No. 3 JSC.
6. Power Engineering Consulting No. 4 JSC.

#### AFFILIATES

1. Vinh Tan 3 Energy JSC.
2. Thuan Binh Wind Power JSC.
3. EVN Finance JSC.

# Corporate Introduction

Vietnam Electricity (EVN) was established by the Government of Vietnam as a State-owned company in 1994, and officially operated as a one-member limited liability company in 2010.

Entrusted with the mission to sufficiently meet customers' electricity demands with ever higher quality and better services, EVN concentrates on power development and investment while supporting the Government as an important macro regulatory tool for national economic development.

Key business areas of the corporation include power generation, transmission, distribution and supply. EVN contributed up to 61.4% of the national power generation system, including large-scale hydropower, coal-fired, gas-fired power plants with a total installed capacity of 25,884 MW out of 42,135 MW of the national system by the end of 2016. EVN owns the entire national power transmission and distribution network, and controls operation of the national power system through the National Load Dispatch Center in a safe and reliable manner.

Under EVN are three Power Generation Corporations (EVNGENCOs 1, 2, 3), one power transmission corporation (National Power Transmission Corporation - EVNNPT), five regional power distribution corporations (for the North, Central, South and the two cities of Hanoi and Ho Chi Minh), and 20 dependent-accounting units. Together, more than 103,640 employees work to ensure adequate power supply for the development of the national economy and society.

EVN is determined to increase productivity and efficiency in both corporate management and business operations of the whole organization. Serving 24.85 million customers, EVN pursues the application of new technology and innovation, as well as streamlines procedures to improve customer services.

EVN is dedicated to the vision of becoming a leading power corporation in the region, playing a key role in ensuring national energy security with committed responsibility to its customers and the whole community.

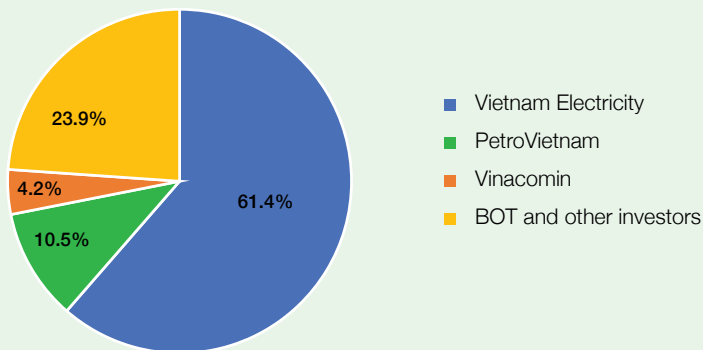




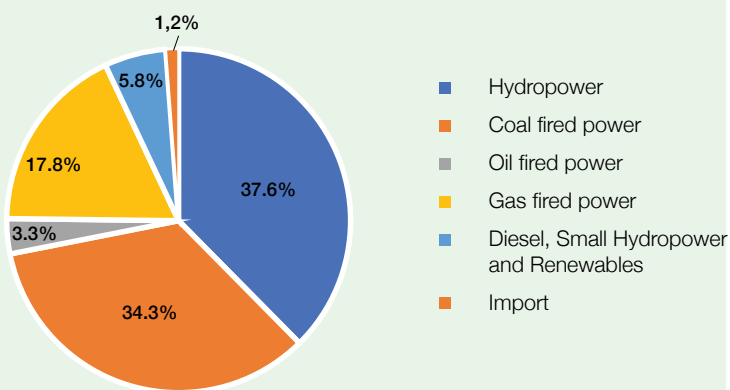
# Power Generation

## Installed capacity portfolio as of 31<sup>st</sup> December 2016

Owner	Capacity MW	%
Vietnam Electricity	25,884	61.4
PetroVietnam	4,435	10.5
Vinacomin	1,785	4.2
BOT and other investors	10,031	23.9
<b>Total</b>	<b>42,135</b>	<b>100</b>



Power source	Capacity MW	%
Hydropower	15,857	37.6
Coal fired power	14,448	34.3
Oil fired power	1,370	3.3
Gas fired power	7,502	17.8
Diesel, Small Hydropower and Renewables	2,418	5.8
Import	540	1.2
<b>Total</b>	<b>42,135</b>	<b>100</b>







*Hoa Binh Hydropower Plant*

# EVN's and GENCOs' Power Plants

No.	Name of Power plant	Installed capacity MW
<b>A</b>	<b>EVN</b>	<b>9,042</b>
	<i>Hydropower</i>	<b>8,442</b>
1	Hoa Binh	1,920
2	Son La	2,400
3	Lai Chau	1,200
4	Tuyen Quang	342
5	Ialy	720
6	Se San 3	260
7	Pleikrong	100
8	Se San 4	360
9	Tri An	400
10	Ban Chat	220
11	Huoi Quang	520
<b>B</b>	<b>GENCO 1</b>	<b>6,389</b>
	<i>Hydropower</i>	<b>1,965</b>
1	Ban Ve	320
2	Dai Ninh	300
3	Dong Nai 3	180
4	Dong Nai 4	340
5	Song Tranh 2	190
6	Da Nhim	160
7	Ham Thuan	300
8	Da Mi	175
	<i>Coal fired power</i>	<b>4,424</b>
1	Uong Bi	105
2	Uong Bi Extension 1	300
3	Uong Bi Extension 2	330
4	Quang Ninh 1	600
5	Quang Ninh 2	600
6	Duyen Hai 1	1244
7	Duyen Hai 3	1245
8	Nghi Son 1	600
<b>B</b>	<b>GENCO 2</b>	<b>4,058</b>
	<i>Hydropower</i>	<b>973</b>
1	Quang Tri	64
2	An Khe - Kanak	173
3	Song Bung 4	156
4	Thac Mo	150
5	A Vuong	210
6	Song Ba Ha	220
	<i>Coal fired power</i>	<b>2,240</b>
1	Pha Lai 1	440
2	Pha Lai 2	600
3	Hai Phong 1	600
4	Hai Phong 2	600
	<i>Oil fired power</i>	<b>695</b>
1	Can Tho	35
2	O Mon 1	660
	<i>Gas fired power (oil)</i>	<b>150</b>
1	Can Tho	150
<b>D</b>	<b>GENCO 3</b>	<b>6,395</b>
	<i>Hydropower</i>	<b>842</b>
1	Buon Kuop	280
2	Buon Tua Srah	86
3	Srepok 3	220
4	Thac Ba	120
5	Vinh Son	66
6	Song Hinh	70
	<i>Coal fired power</i>	<b>2,424</b>
1	Ninh Binh	100
2	Vinh Tan 2	1,244
3	Mong Duong 1	1,080
	<i>Gas fired power</i>	<b>2,964</b>
1	Phu My 2.1	896
2	Phu My 1	1,108
3	Phu My 4	458
4	Ba Ria	389
5	Thu Duc	114
	<i>Oil fired power</i>	<b>165</b>
1	Thu Duc	165



*Inspection of Power Transmission Lines*



# Power Transmission and Distribution

## National Power Transmission Corporation (EVNNPT)

*The national power transmission system as of 31<sup>st</sup> December 2016*

Item	Unit	Quantity
500 kV lines	km	7,446
220 kV lines	km	16,071
500 kV transformers	MVA	26,100
220 kV transformers	MVA	41,538

*Transmission system expansion plan up to 2030*

Item	Unit	2016-2020	2021-2025	2026-2030
500 kV substation	MVA	26,700	26,400	23,550
220 kV substation	MVA	34,966	33,888	32,750
500 kV lines	km	2,746	3,592	3,714
220 kV lines	km	7,488	4,076	3,435

*The power distribution networks as of 31<sup>st</sup> December 2016*

Item	Unit	Quantity
220 kV lines	km	108
110 kV lines	km	19,335
Medium and low voltage lines	km	495,688
220 kV transformers	MVA	3,250
110 kV transformers	MVA	52,360
Medium and low voltage transformers	MVA	89,609

## Northern Power Corporation (EVNNPC)

Item	Unit	Quantity
110 kV lines	km	9,241
Medium and low voltage lines	km	216,487
220 kV transformers	MVA	750
110 kV transformers	MVA	18,369
Medium and low voltage transformers	MVA	28,620

## Central Power Corporation (EVNCPC)

Item	Unit	Quantity
110 kV lines	km	3,333
Medium and low voltage lines	km	70,845
110 kV transformers	MVA	4,604
Medium and low voltage transformers	MVA	9,188

## Southern Power Corporation (EVNSPC)

Item	Unit	Quantity
110 kV lines	km	5,260
Medium and low voltage lines	km	152,632
110 kV transformers	MVA	14,590
Medium and low voltage transformers	MVA	29,204

## Hanoi City Power Corporation (EVNHANOI)

Item	Unit	Quantity
220 kV lines	km	8
110 kV lines	km	753
Medium and low voltage lines	km	36,840
220 kV transformers	MVA	250
110 kV transformers	MVA	4,905
Medium and low voltage transformers	MVA	10,939

## Ho Chi Minh City Power Corporation (EVNHCMC)

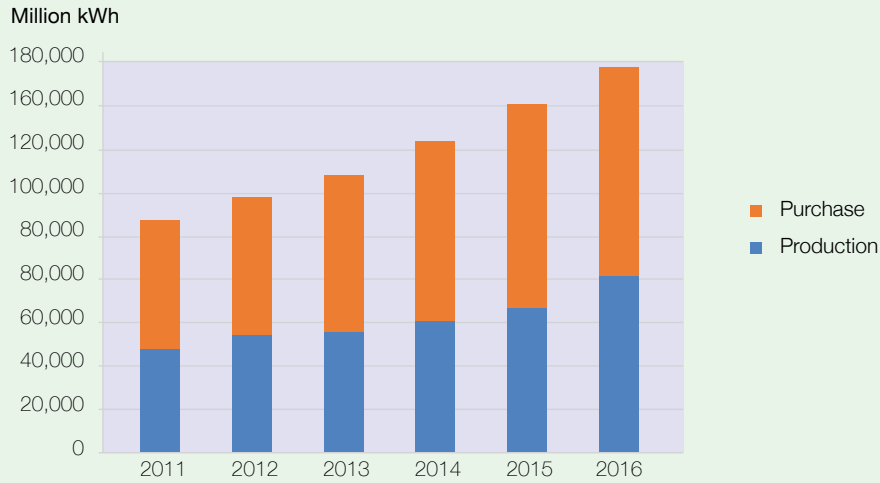
Item	Unit	Quantity
220 kV lines	km	100
110 kV lines	km	706
Medium and low voltage lines	km	18,885
220 kV transformers	MVA	2,250
110 kV transformers	MVA	6,331
Medium and low voltage transformers	MVA	11,658



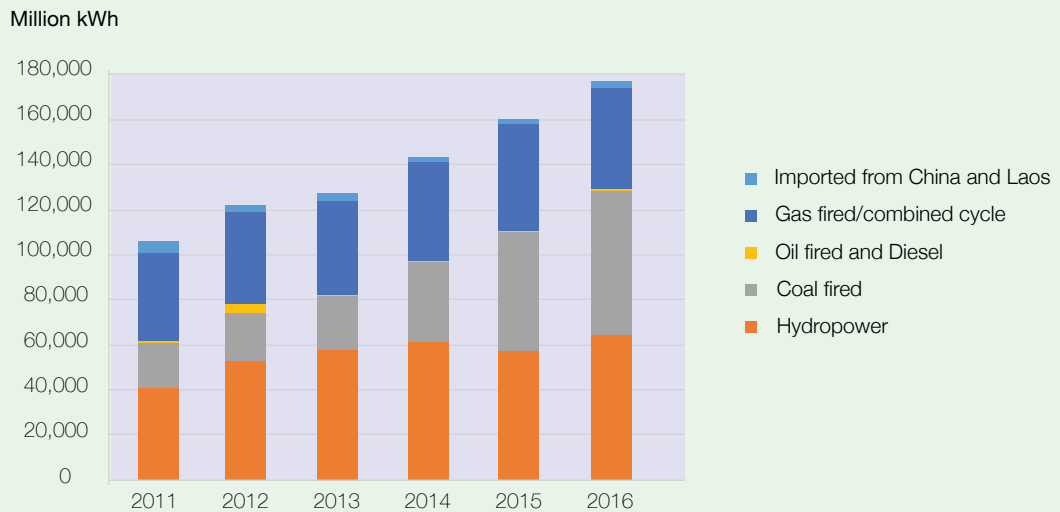


# Meeting Power Demand

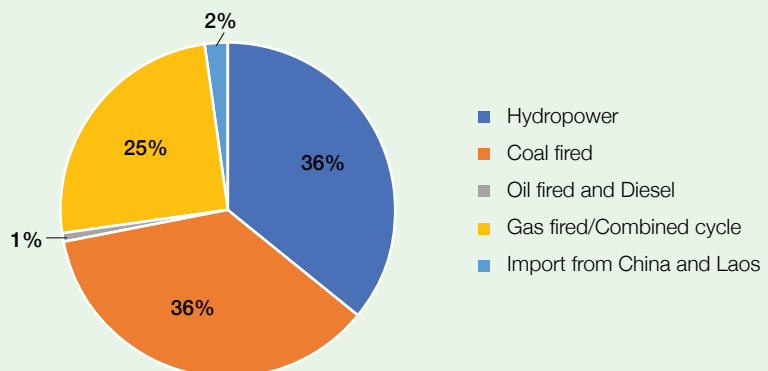
## Power production and purchase



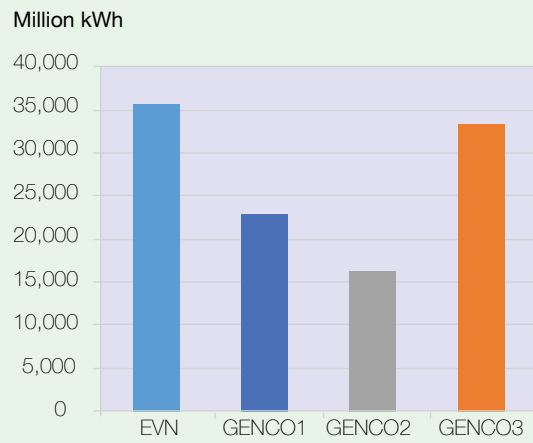
## Power generation output portfolio



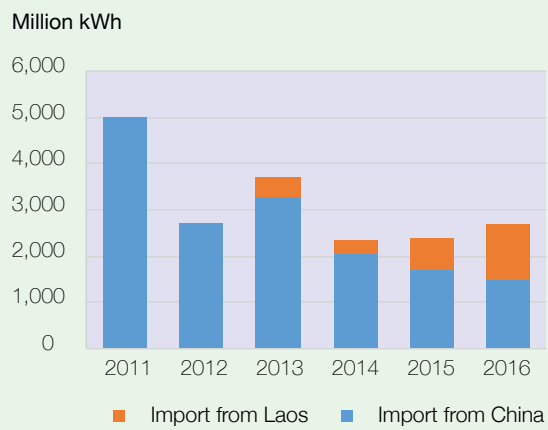
## Power generation output as of 31<sup>st</sup> December 2016



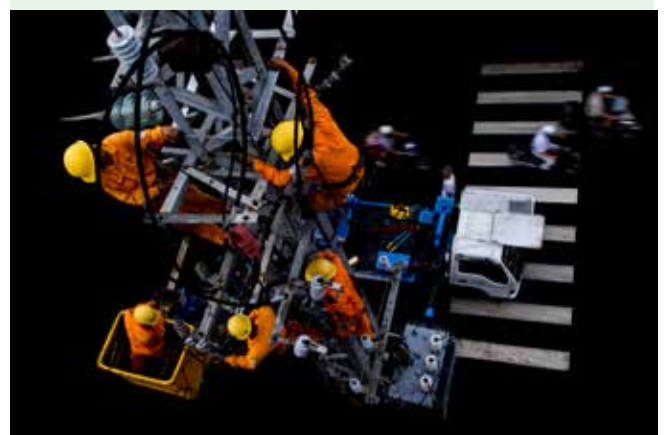
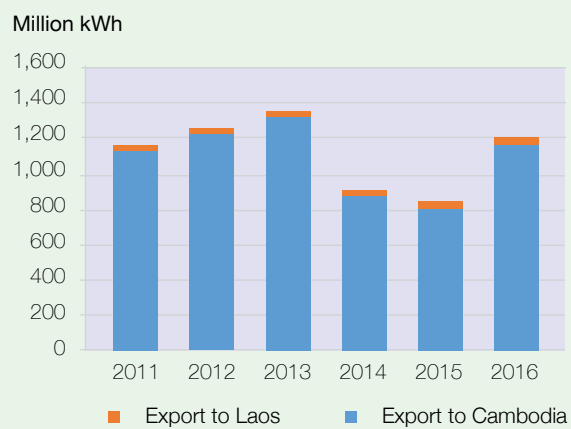
### Power production by EVN and GENCOs in 2016



### Power import



### Power export



# Power Business and Customer Service

In 2016, Vietnam Electricity satisfied demands for electricity to serve the national socio – economic development in a sufficient and reliable manner. The total power production and purchase by EVN experienced an increase of 10.8% to reach 176.99 billion kWh. The power sales grew substantially at a rate of 11.2%, achieving 159.79 billion kWh in 2016. By the end of 2016, EVN had delivered electricity to more than 24.85 million customers - an increase of 1.17 million customers compared to 2015. The average electricity tariff of EVN stayed at around VND 1,660/kWh (or US cent 7.3/kWh). Electrification of rural areas and remote islands gained significant accomplishments with 99.97% of the communes and 98.69% of the rural households having access to electricity.

A noteworthy improvement in the power supply quality was seen in 2016. The System Average Interruption Duration Index (SAIDI) remarkably declined to 1,651 minutes per

customer from 2,281 minutes in 2015. The System Average Interruption Frequency Index (SAIFI) dropped to only 10.6 times per customer, equivalent to a 21% decrease as compared to 2015. The Momentary Average Interruption Frequency Index (MAIFI) experienced a considerable decrease of 28.7% to 1.51 times per customer. The power losses of the entire power system gently fell to 7.57% from 7.94% in 2015.

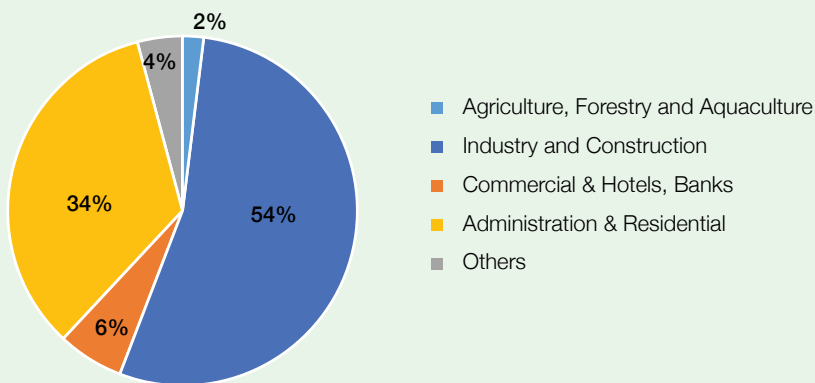
Customer services have been improved further in a significant manner. By reducing the number of procedures and shortening the wait for electricity connection, the Getting Electricity Indicator of Vietnam has moved 32 steps upwards from 96<sup>th</sup> in 2016 to 64<sup>th</sup> in 2017 out of 190 nations according to a World Bank Group publication's ranking (Doing Business 2017). This improvement is attributed to EVN's great efforts in reforming and renovating its business and customer service activities.



*Customer Service in a Call Centre*

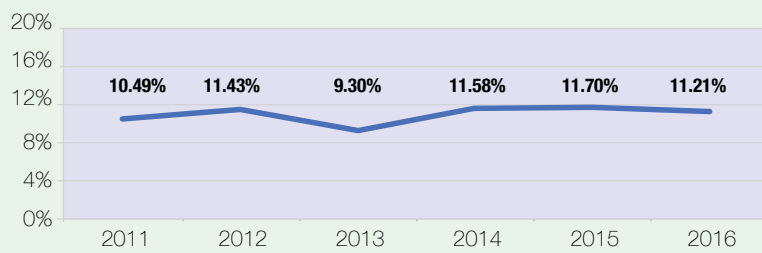


### Power sales by customer type in 2016



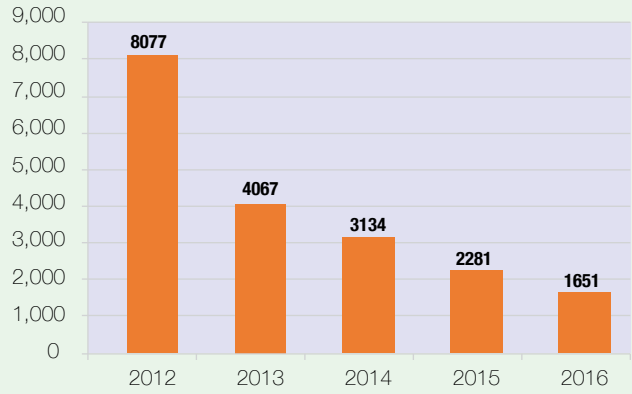
### Power sales growth

Year	2011	2012	2013	2014	2015	2016
Power sales growth (%)	10.49	11.43	9.30	11.58	11.70	11.21

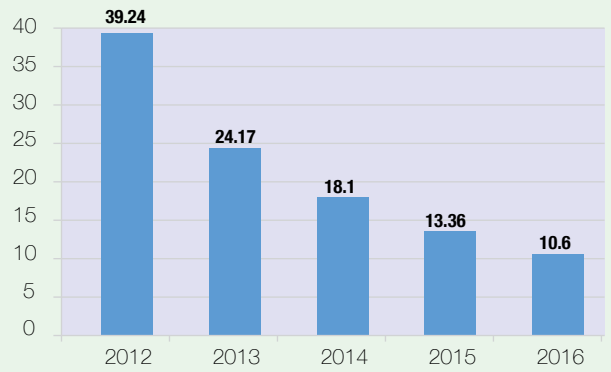




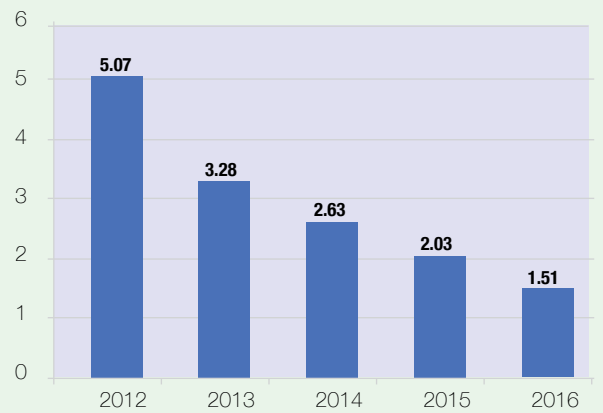
**SAIDI (minutes per customer)**



**SAIFI (times per customer)**

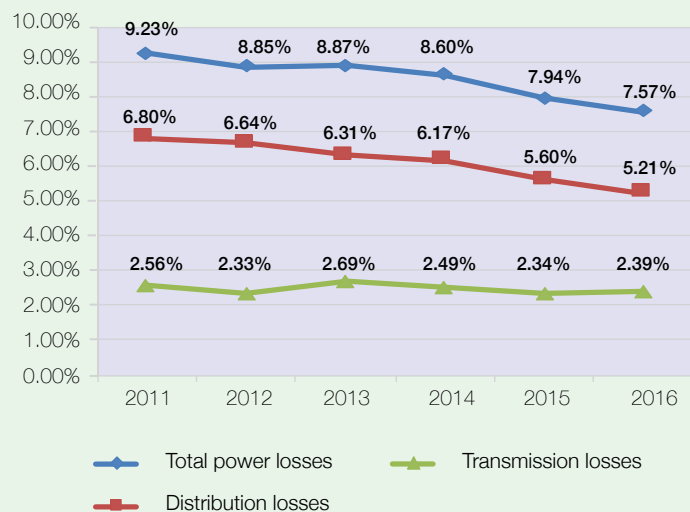


**MAIFI (times per customer)**



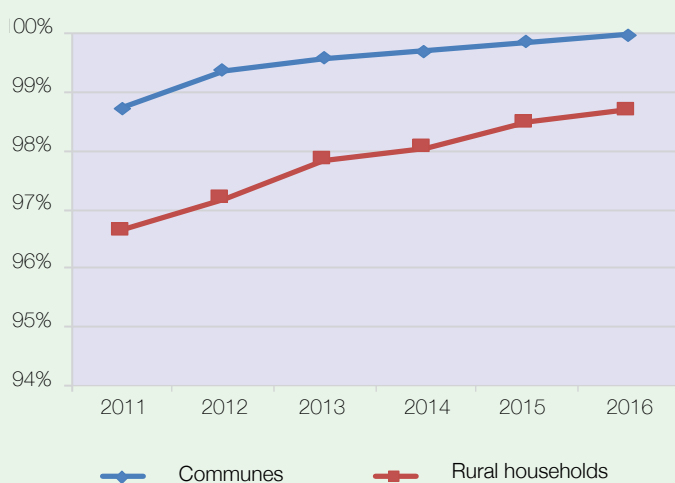


### Power loss rate

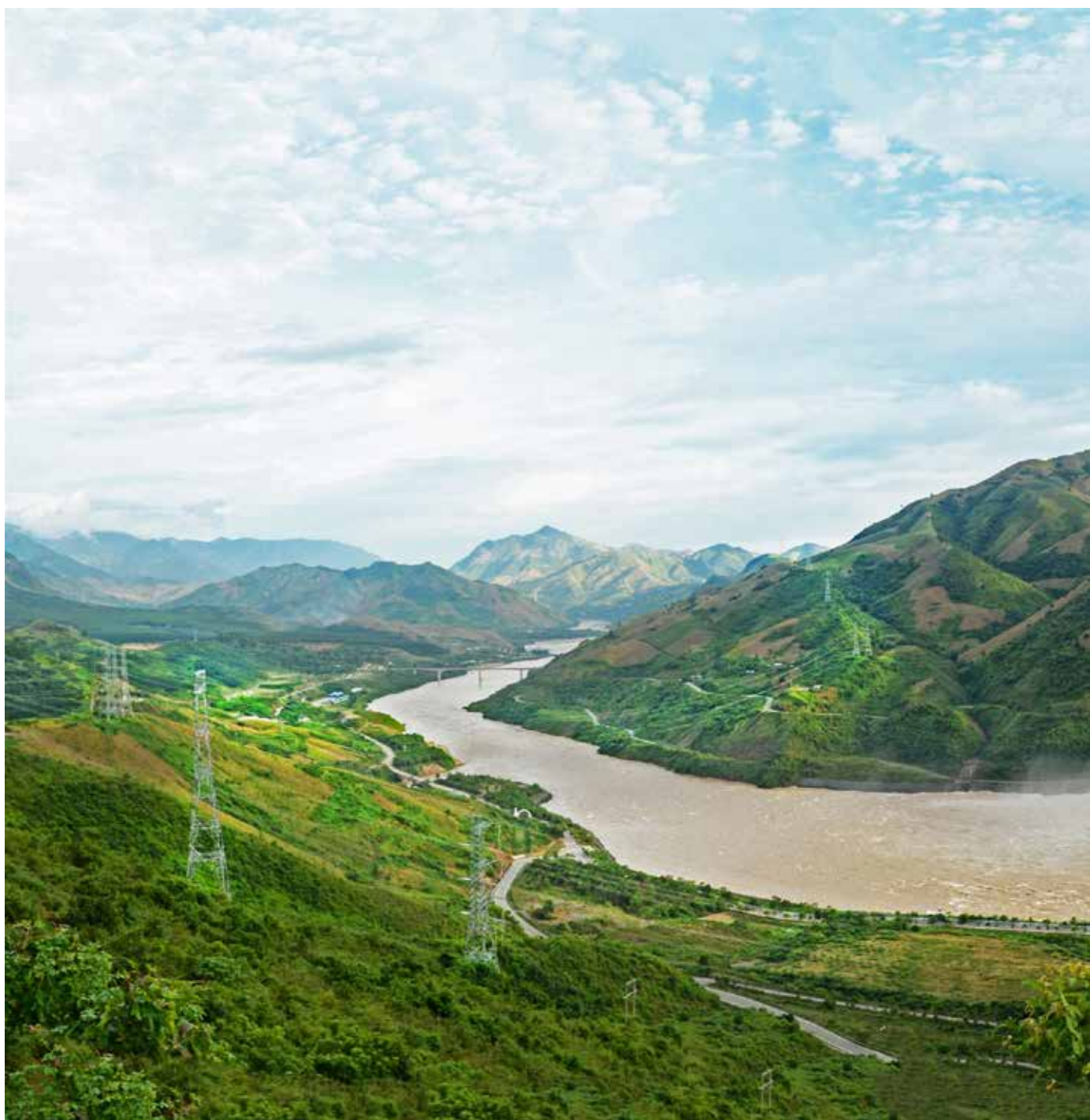


### Rural electrification

Year	2011	2012	2013	2014	2015	2016
Communes	98.72%	99.36%	99.57%	99.70%	99.85%	99.97%
Rural households	96.65%	97.19%	97.85%	98.05%	98.49%	98.69%

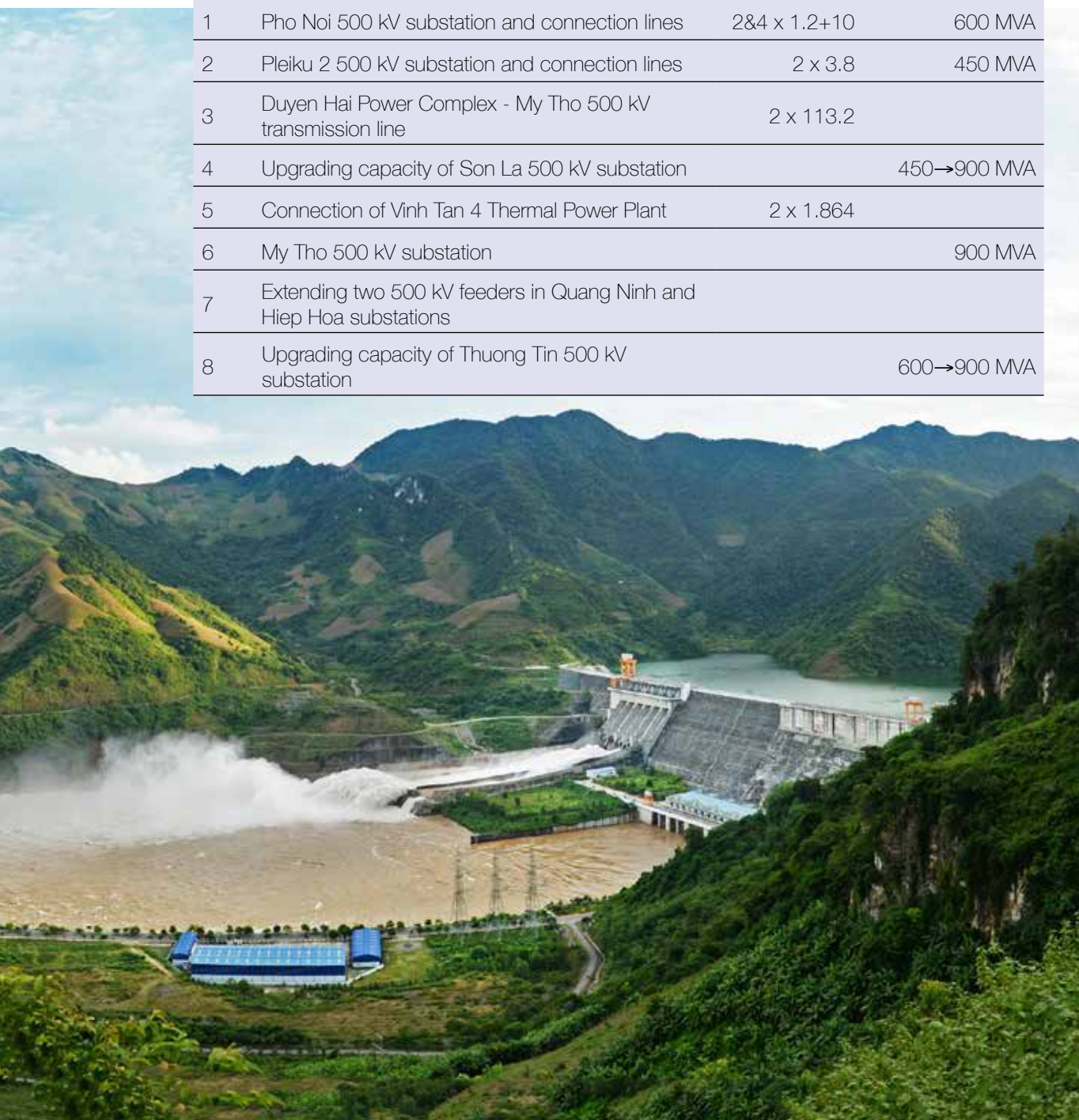


# Power Plant and 500 KV Transmission Network Projects Commisioned in 2016





No.	Project name	Scale	
		Length (km)	Capacity
<b>POWER PLANT</b>			<b>2,305 MW</b>
1	Huoi Quang Hydropower Plant unit 2		1 x 260 MW
2	Lai Chau Hydropower Plant units 2 & 3		2 x 400 MW
3	Duyen Hai 3 Thermal Power Plant units 1 & 2		2 x 622.5 MW
<b>500 KV TRANSMISSION NETWORK</b>			
1	Pho Noi 500 kV substation and connection lines	2&4 x 1.2+10	600 MVA
2	Pleiku 2 500 kV substation and connection lines	2 x 3.8	450 MVA
3	Duyen Hai Power Complex - My Tho 500 kV transmission line	2 x 113.2	
4	Upgrading capacity of Son La 500 kV substation		450→900 MVA
5	Connection of Vinh Tan 4 Thermal Power Plant	2 x 1,864	
6	My Tho 500 kV substation		900 MVA
7	Extending two 500 kV feeders in Quang Ninh and Hiep Hoa substations		
8	Upgrading capacity of Thuong Tin 500 kV substation		600→900 MVA



Son La Hydropower Plant

# Power Plant and Network Investment Projects

## Power plant projects to be put into operation in the period 2017 – 2020 and afterwards

No.	Project name	Capacity MW	No.	Project name	Capacity MW
<b>I 2017 1,235</b>			<b>IV 2020 300</b>		
1	Trung Son HPP	4 x 65	1	Phuoc Thai 2 & 3 Solar Power Plant	150
2	Thac Mo Extension HPP	75	2	Song Binh 2 & 3 Solar Power Plant	150
3	Thai Binh 1 TPP (unit 1)	300	<b>V After 2020 6,860</b>		
4	Vinh Tan 4 TPP (unit 1)	600	1	Ialy Extension HPP	2 x 180
<b>II 2018 1,760</b>			2	Hoa Binh Extension HPP	2 x 240
1	Song Bung 2 HPP	2 x 50	3	O Mon 3 CCGT Power Plant	750
2	Da Nhim Extension HPP	80	4	O Mon 4 CCGT Power Plant	750
3	Vinh Tan 4 TPP (unit 2)	600	5	Quang Trach 1 TPP	2 x 600
4	Duyen Hai 3 Extension TPP	660	6	Dung Quat 1 CCGT Power Plant	750
5	Thai Binh 1 TPP (unit 2)	300	7	Tri An Extension HPP	2 x 100
<b>III 2019 969</b>			8	Quang Trach 2 TPP	2 x 600
1	Upper Kon Tum HPP (units 1, 2)	2 x 110	9	Dung Quat 3 CCGT Power Plant	750
3	Vinh Tan 4 Extension TPP	600	10	EVN's Solar Power Plants	420
4	Phuoc Thai 1 Solar Power Plant	50	11	Tan Phuoc 1 CCGT Power Plant	1,000
5	Se San 4 Solar Power Plant	49	12	Tan Phuoc 2 CCGT Power Plant	1,000
6	Song Binh 1 Solar Power Plant	50			



Duyen Hai 3 Thermal Power Project



**New 500 kV substation projects to be put into operation in the period 2017 – 2020**

No.	Project name	Capacity MVA
<b>I Northern</b>		<b>5,700</b>
1	Tay Ha Noi 500 kV substation	900
2	Dong Anh 500 kV substation	2 x 900
3	Viet Tri 500 kV substation	2 x 450
4	Lai Chau 500 kV substation	2 x 450
5	Thanh Hoa 500 kV substation	2 x 600
<b>II Southern</b>		<b>6,300</b>
1	Cu Chi 500 kV substation	900
2	Tan Uyen 500 kV substation	2 x 900
3	Chon Thanh 500 kV substation	900
4	Long Thanh 500 kV substation	900
5	Duc Hoa 500 kV substation	2 x 900


**500 kV transmission line projects to be put into operation in the period 2017 – 2020**

No.	Project name	Length Km
<b>I Northern</b>		
1	Hiep Hoa – Pho Noi 500 kV transmission line	1 x 71
2	Tay Ha Noi – Thuong Tin 500 kV transmission line	2 x 40
3	Nho Quan – Thuong Tin 500 kV transmission line	1 x 75
4	Connection line from Thang Long TPP to Quang Ninh – Pho Noi 500 kV transmission line	2 x 5
5	Nghi Son – Nho Quan – Ha Tinh 500 kV transmission line	4 x 30
6	Connection line from Viet Tri to Son La – Hiep Hoa 500 kV transmission line	2 x 5
7	Cong Thanh TPP – Nghi Son 500 kV transmission line	2 x 10
8	Nam Dinh 1 TPP – Pho Noi 500 kV transmission line	2 x 133
<b>II Central</b>		
1	Vung Ang – Doc Soi – Pleiku 2 500 kV transmission line	2 x 720
2	Van Phong TPP – Vinh Tan 500 kV transmission line	2 x 195
<b>III Southern</b>		
1	Connection line from Duc Hoa to Phu Lam – Cau Bong 500 kV transmission line	4 x 8
2	Song May – Tan Uyen 500 kV transmission line	2 x 22
3	My Tho – Duc Hoa 500 kV transmission line	2 x 60
4	Long Phu TPP – O Mon 500 kV transmission line	2 x 84
5	Vinh Tan – Song May – Tan Uyen transmission line	2 x 235
6	Song Hau TPP – Duc Hoa 500 kV transmission line	2 x 138
7	Connection line from Long Thanh to Phu My – Song May 500 kV transmission line	2 x 16
8	Chon Thanh – Duc Hoa 500 kV transmission line	2 x 127
9	Connection line from Cu Chi to Chon Thanh – Duc Hoa 500 kV transmission line	2 x 30



# Renewable Energy Development

Following the Prime Minister's Decision No. 11/2017/QĐ-TTg dated April 11th 2017 on Mechanism for solar power development in Vietnam, EVN has planned for investment in several solar power projects in the Southern provinces of Vietnam such as Ninh Thuan, Binh Thuan, Kon Tum, Dong Nai, Gia Lai, Binh Phuoc with a total capacity of 870 MW.

## EVN's grid-connected solar power projects

No.	Project name	Capacity MW	Location
1	Phuoc Thai Solar Power Project	200	Ninh Phuoc district, Ninh Thuan province
2	Song Binh Solar Power Project	200	Bac Binh district, Binh Thuan province
3	Se San 4 Solar Power Project	49	la H'Drai district, Kon Tum province
4	Tri An Solar Power Project	126	Tri An hydropower area, Vinh Cuu district, Dong Nai province
5	Floating Solar Power Project on Se San 4 reservoir	49	la Grai district, Gia Lai province
6	Loc Ninh 1 Solar Power Project	200	Loc Ninh district, Binh Phuoc province
7	Phuoc Trung Solar Power Project	46	Bac Ai district, Ninh Thuan province
<b>Total</b>		<b>870</b>	

Since the completion of the first wind power project of 24 MW Phu Lac plant in Binh Thuan province in 2016, Thuan Binh Wind Power JSC, an EVN's affiliate, has developed another 30 MW Loi Hai wind power project. The power plant is going to operate in 2018. Besides, EVN has approved the investment in two new wind power projects, namely Huong Phung of 30 MW in Quang Tri province and Cong Hai of 25 MW in Ninh Thuan province, to be developed by EVNGENCO2.



*Solar Power in Spratly Islands*

# Environmental Protection



*Duyen Hai Thermal Power Plant*

Demonstrating EVN's commitment to green development, sophisticated De-NO<sub>x</sub> Selective Catalytic Reduction Systems (SCR) have been established and stably operating in Vinh Tan 2 and Duyen Hai 1 thermal power plants. Moreover, two seawater Flue Gas Desulphurization systems (FGDs) have been installed in these power plants as the first ones ever used in Vietnam instead of traditional limestone – based FGD systems. New thermal power plants have opened to public visitors to demonstrate new environmental control technologies applied in these power plants. Latest environmental protection equipment are being installed in other new thermal power plants such as Thai Binh 1, Duyen

Hai 3, Duyen Hai 3 extension, Vinh Tan 4, Vinh Tan 4 extension, etc., which serve as a proof of EVN's consistent commitment to environmental protection and sustainable development of the country.

To meet environmental requirements, EVN has drastically improved the system of environmental protection equipment for the old thermal power plants. EVN has installed automatic monitoring systems for dust parameters and smoke emission stacks in all thermal power plants, all of which are connected to the local Department of Natural Resources and Environment for monitoring and inspection.

# International Cooperation



The power infrastructure development goals set by EVN will be accomplished through an ambitious investment plan requiring approximately USD 22 billion by 2020. The development program requires financially and operationally robust operators across the value chain of EVN. In this context, the international cooperation activities of EVN focus on strengthening the relationship with international financial institutions, diversifying forms of financial arrangements for investment as well as broadening the relationship with various partners, especially national power utilities and corporations, deepening the cooperation among Greater Mekong Sub-region (GMS) countries and ASEAN nations.

To support EVN in developing a comprehensive strategy for addressing financial performance constraints and raising commercial financing to meet its future investment requirements, the World Bank (WB) has launched a Financial Performance Improvement Advisory Services (FPIAS). The WB will advise EVN as it gradually shifts away from the current predominantly public sector financing model (combined with Official Development Assistance – ODA). In the phase 3 of the FPIAS, the WB has provided international credit rating and capital market

experts to help EVN to prepare for and obtain a credit rating and strategize on potential international bond issuance. EVN targets to get an official international rating and bond issuance in 2018 for financing mobilization from the international capital market.

With respect to ODA, EVN has received preferential loans with total amount of USD 1,034 million from international financial organizations (WB, Asian Development Bank - ADB, International Cooperation Agency of Japan - JICA and German Bank for Reconstruction - KfW) for the year 2016. In addition, EVN has been working with the French Development Agency (Afd) on a non-sovereign financing scheme for new power projects. Afd has agreed to provide EVN with two new non-sovereign loans with a total value of EUR 100 million for Se San 4 Solar Power Plant and Ialy Hydropower Plant Extension projects.

In cooperation with foreign development agencies, the U.S. Trade and Development Agency (USTDA), Italian Agency for Development Cooperation, and others, EVN has prepared for technical studies of new power projects using LNG as a fuel and renewable energies in integration with the national power system.



# Human Resource Training

In 2016, EVN and its subsidiaries focused on improving human resource capability such as training for managers at all levels, technical specialists and skilled workers. The international cooperation among ASEAN countries in human resource development and training activities have been strengthened under the cooperation framework of the power utilities with EVN's proactive attendance in many training programs. EVN also dispatched many officials and experts to study in developed countries such as Japan, US, France, Germany, etc. to learn and exchange experience in various fields of the electric power industry.

With the goal of becoming one of the leading power corporations among ASEAN nations by the year 2020, EVN aims to attain management personnel with advanced business administration competency, as well as skilled and knowledgeable workers with the capabilities to improve the reliability and safety of the power system in Vietnam.



# Corporate Restructure and Equitization



*Duyen Hai Thermal Power Plant*

On June 14, 2017, the Prime Minister issued Decision No. 852/QD-TTg approving a Master Plan on Restructuring and Rearranging Enterprises under EVN for the period 2017 – 2020. The objectives of this Master Plan are to develop and strengthen EVN (i) to be a strong and financially healthy economic group; and (ii) to play a fundamental role in securing electricity supply for the socio – economic development of the nation.

According to Decision No. 852/QD-TTg, the holding Vietnam Electricity corporation will remain a one member limited liability company with 100% of the charter capital owned by the Government. Seven Hydropower Companies including Son La, Hoa Binh, Ialy, Tri An, Tuyen Quang, Se San, Huoi Quang – Ban Chat remain financially dependent on Vietnam Electricity. The National Power Transmission Corporation, five Power Corporations, the National Load Dispatch Center remain 100% owned by EVN. The majority of charter capital of Power Engineering and Consulting Companies No.1 and No.2 continue to be owned by EVN. Power Generation Corporations will be equitized and

EVN will retain ownership of at least 51% of their charter capital by the end of 2019. As of 2020 EVN will consider selling its shares in these GENCOs and taking a minority stake below 50% of their charter capital.

In addition, EVN will fully divest its capital in six companies including EVN Finance JSC, Thu Duc Electro Mechanical JSC, Dong Anh Electrical Equipment Manufacturing JSC, Thuan Binh Wind Power JSC, Power Engineering Consulting Company No.3 and Power Engineering Consulting Company No.4.

EVN's restructuring and divestment process will be performed under close instructions by the Government, Ministry of Industry and Trade, Ministry of Finance, and Ministry of Planning and Investment in compliance with the current legal regulations.

In the future, newly dependent accounting Power Generation Companies will be established to take over the operation and maintenance of EVN's ongoing power generation investment projects and then equitized later on.



# Electricity Market

The Vietnam's competitive generation market pilot project (VCGM) started on July 01, 2011 and was followed by full VCGM on July 01, 2012. The VCGM has operated for more than 5 years with the tasks including: (i) Construction and operation of the IT infrastructure for the electricity market; (ii) Development of procedures, regulations for electricity market and (ii) Training human resources for the electricity market operation.

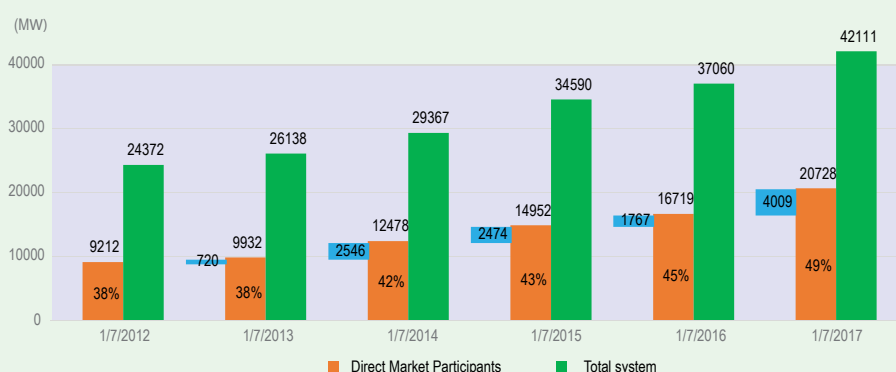
Participating in VCGM, there have been 76 power plants with a total capacity of 20,728 MW out of a total of 120 power plants with installed capacity of 42,111 MW.

This accounts for 49% of the total installed capacity as shown in the chart below.

For the period of 2016 to 2020, EVN has been assigned by the Government to build a modern and integrated information technology infrastructure and training human resources, ready for the operation of the Vietnam Wholesale Electricity Market (VWEM). The pilot VWEM is to start from January 01, 2018.

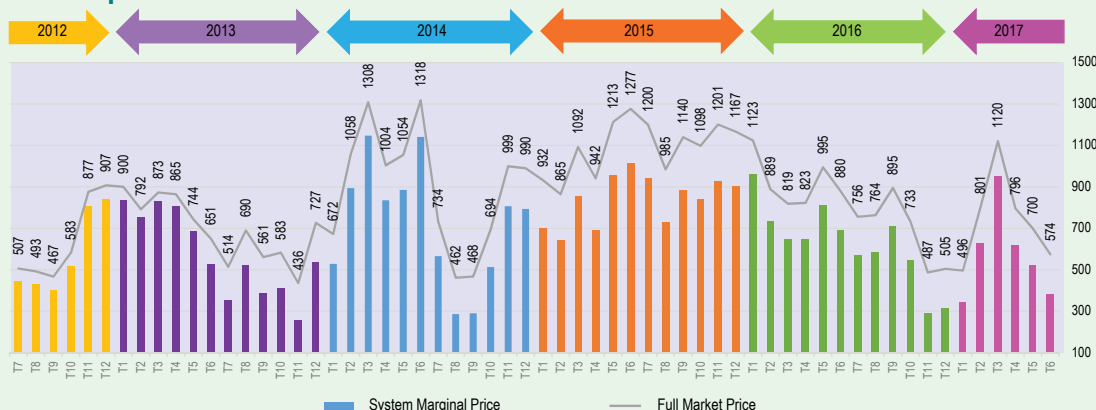
According to the roadmap for electricity market development, the Vietnam Retail Electricity Market (VREM) is expected to be in full operation from 2023.

**The total installed capacity of generators participating in the VCGM per the total installed capacity of the power system**



## Market price

Monthly Average System Marginal Price and Full Market Price (VND/kWh)



# Consolidated Financial Statement



	Mil. VND	
	2015	2016
1. Total revenue	240,735,176	272,703,546
2. Less	1,264	1,024
3. Net sales	240,733,912	272,702,522
4. Cost of goods sold	204,486,241	233,671,119
5. Gross profit	36,247,671	39,031,403
6. Revenue from financial activities	2,107,064	4,276,266
7. Financial activities expenses	19,563,128	22,360,080
8. Profit in affiliates	311,515	427,465
9. Selling expenses	5,237,475	5,989,331
10. Overhead expenses	9,440,746	10,535,903
11. Net profit from operations	4,424,901	4,849,821
12. Other incomes	666,841	713,943
13. Other expenses	496,560	399,022
14. Other profit	170,281	314,921
15. Gross profit before tax	4,595,182	5,164,742
16. Current corporate income tax	985,587	852,735
17. Deferred corporate income tax	-89,647	-119,562
18. Profit after tax	3,699,242	4,431,569
18.1. Profit of minority shareholders	142,341	905,351
18.2. Profit of majority shareholders	3,556,901	3,526,218

# Consolidated Balance Sheet



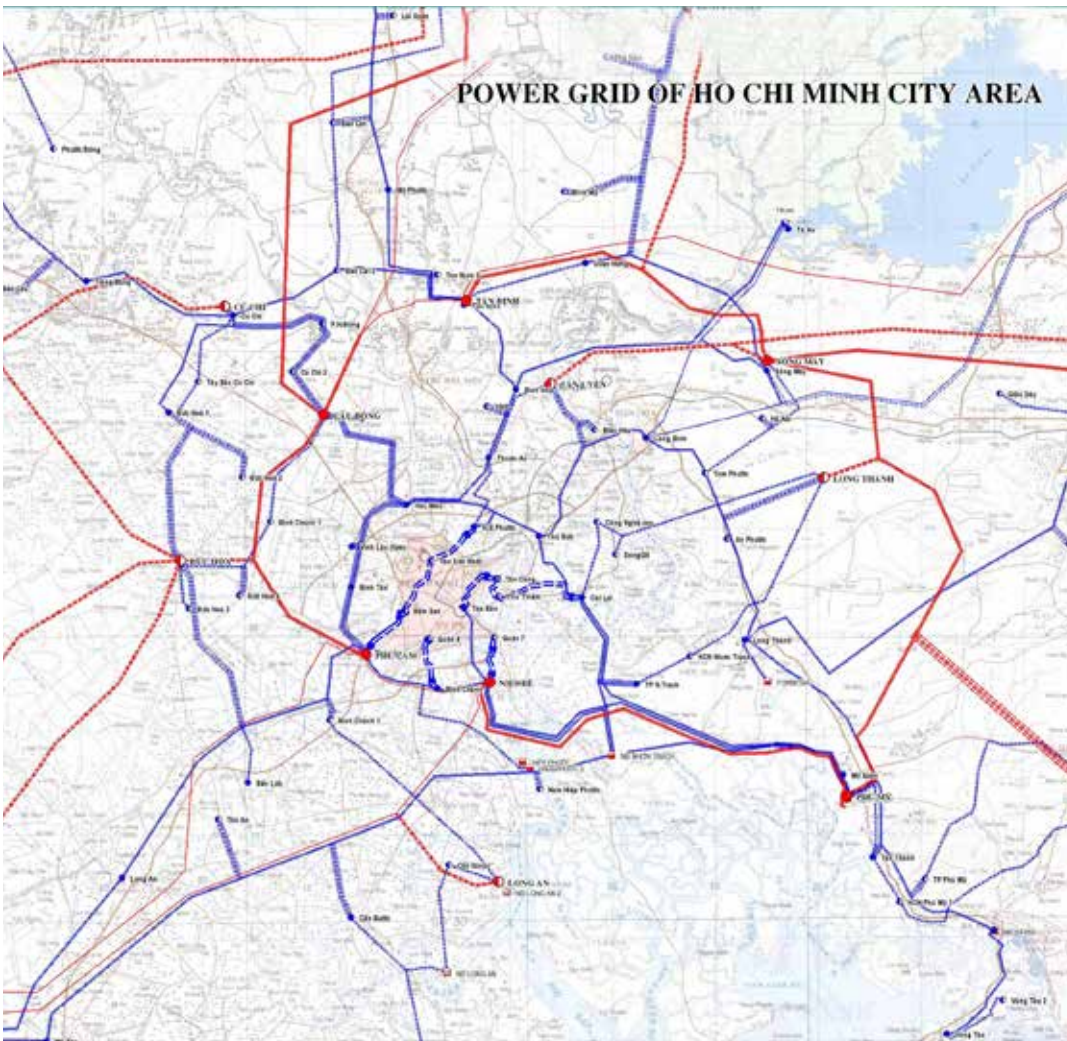
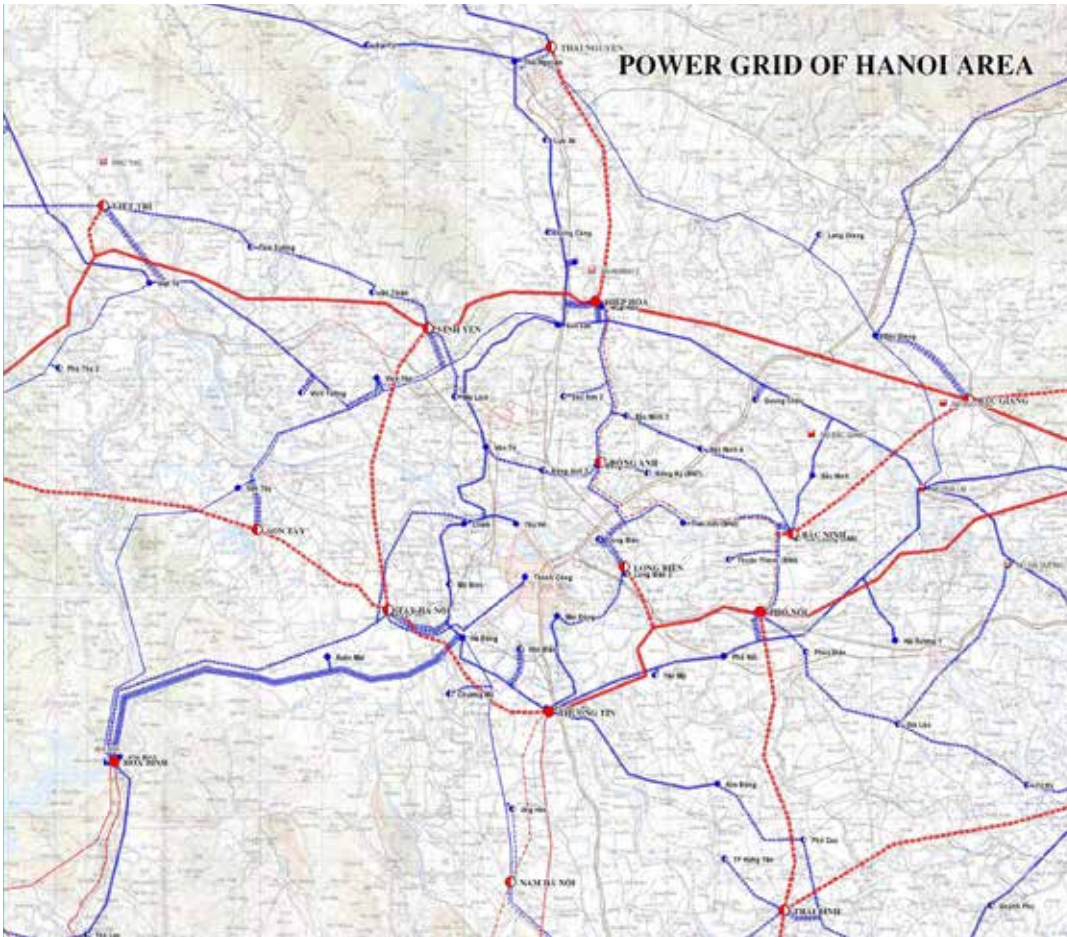
	Mil. VND	
	2015	2016
<b>ASSETS</b>		
A. Current assets	105,607,929	99,943,065
I. Cash and cash equivalent	41,968,868	41,513,150
II. Short-term investment in securities	17,360,700	18,615,518
III. Short-term receivables	24,288,899	19,165,554
IV. Inventories	17,063,073	15,798,792
V. Other current assets	4,926,389	4,850,051
B. Non-current assets	535,432,761	592,273,769
I. Long-term receivables	1,497,334	1,212,578
II. Fixed assets	425,426,007	473,737,393
III. Real assets investment	1,192	
IV. Long-term financial investments	5,032,379	5,150,869
V. Other non-current assets	3,459,048	5,455,773
VI. Unfinished long-term assets	100,106,801	106,717,157
<b>Total assets</b>	<b>641,040,690</b>	<b>692,216,834</b>
<b>EQUITY AND LIABILITIES</b>		
A. Liabilities	454,760,498	486,981,104
I. Current liabilities	120,237,063	121,192,983
II. Non-current liabilities	334,523,436	365,788,120
B. Owner's equity	186,280,192	205,235,730
I. Owner's equity	186,308,318	205,252,024
II. Other funds	-28,126	-16293
<b>Total equity and liabilities</b>	<b>641,040,690</b>	<b>692,216,834</b>



# Geographical Scheme of Vietnam Power System







# Member Companies

## Dependent-accounting units

No.	Company	Address	Phone	Fax
1	Hoa Binh Hydropower Company	No. 428 Hoa Binh road, Tan Thinh ward, Hoa Binh city, Hoa Binh province	0218 2210344	0218 3854155
2	Ialy Hydropower Company	No. 727 Pham Van Dong street, Yen The, Pleiku city, Gia Lai province	0269 2214323	0269 3866470
3	Tri An Hydropower Company	No. 767, Vinh An town, Vinh Cuu district, Dong Nai province	0251 3929500	0251 3861257
4	Tuyen Quang Hydropower Company	No. 403 Truong Chinh street, Y La ward, Tuyen Quang city, Tuyen Quang province	0207 2214555	0207 3980919
5	Se San Hydropower Development Company	No. 114 Le Duan road, Tra Ba, Pleiku city, Gia Lai province	0269 2222565	0269 2222369
6	Son La Hydropower Company	56 Lo Van Gia street, Chieng La district, Son La city, Son La province	0212 2240030	0212 3751106
7	Huoi Quang – Ban Chat Hydropower Company	Na Khiet village , Muong Cang commune, Than Uyen town, Than Uyen district, Lai Chau province	0213 2489565	0213 3783579
8	Nghi Son 1 Thermal Power Company	Km 11, road 513, Hai Ha commune, Tinh Gia district, Thanh Hoa province	0237 3613456	0237 3613333
9	Electric Power Trading Company	Floor 12 – 14, Tower A, EVN Building, No. 11 Cua Bac street, Ba Dinh district, Hanoi	024 22218219	024 22218214
10	National Load Dispatch Centre	Floor 8 – 11, Tower A, EVN Building, No. 11 Cua Bac street, Ba Dinh district, Hanoi	024 39276180	024 39276181
11	Hydropower Project Management Board No. 1	Floor 8, Tower B, EVN Building, No. 11 Cua Bac street, Ba Dinh district, Hanoi	024 66941001	024 66941002
12	Hydropower Project Management Board No. 4	No. 114 Le Duan road, Pleiku city, Gia Lai province	0269 2222565	0269 3874880
13	Hydropower Project Management Board No. 5	Le Thanh Tong street, My Binh ward, Phan Rang city, Ninh Thuan province	0259 3828393	0259 3828394
14	Hydropower Project Management Board No. 6	No. 25 Tan Dinh street, district 1, Hochiminh City	028 22100423	028 38206776

15	Son La Hydropower Project Management Board	Floor 6 – 7, Tower B, EVN Building, No. 11 Cua Bac street, Ba Dinh district, Hanoi	024 66911110	024 35541371
16	Ninh Thuan Nuclear Power Project Management Board	16/4 My Hai street, Phan Rang city, Thap Cham, Ninh Thuan province	0259 2222227	0259 3922991
17	Thermal Power Project Management Board No. 2	Hon La Economic Zone, Quy Dong commune, Quang Trach district, Quang Binh province	02323 902678	02323 902679
18	Information and Communications Technology Company of Vietnam Electricity	Floor 16 – 18, Tower A, EVN Building, No. 11 Cua Bac street, Ba Dinh district, Hanoi	024 22225210	024 22225211
19	EVN Construction and Technology Investment Management Board	Floor 4, Tower B, EVN Building, No. 11 Cua Bac street, Ba Dinh district, Hanoi	024 66946650	024 37162789
20	Electric Information Centre	Floor 15, Tower A, EVN Building, No. 11 Cua Bac street, Ba Dinh district, Hanoi	024 66946700	024 37725192

### One member limited liability companies

No.	Company	Address	Phone	Fax
1	Power Generation Corporation No. 1	Floor 17 – 19, Tower B, EVN Building, No. 11 Cua Bac street, Ba Dinh district, Hanoi	024 66941234	024 66941235
2	Power Generation Corporation No. 2	No. 1 Le Hong Phong street, Binh Thuy ward, Can Tho city	029 2461507	029 26255500
3	Power Generation Corporation No. 3	Phu My town, Tan Thanh District, Ba Ria – Vung Tau province	0254 3876927	0254 3876930
4	National Power Transmission Corporation	No. 18 Tran Nguyen Han street, Hoan Kiem district, Hanoi	024 22204444	024 22204455
5	Northern Power Corporation	Floor 20 – 29, Tower B, EVN Building, No. 11 Cua Bac street, Ba Dinh district, Hanoi	024 22466338	024 38244033
6	Central Power Corporation	78A Duy Tan street, Hai Chau district, Da Nang city	0236 2221028	0236 3625071
7	Southern Power Corporation	No. 72 Hai Ba Trung street, district 1, Hochiminh city	028 38221605	028 39390138
8	Ha Noi Power Corporation	No. 69 Dinh Tien Hoang street, Hoan Kiem district, Hanoi	024 22222000	024 22200899
9	Ho Chi Minh City Power Corporation	No. 35 Ton Duc Thang, Ben Nghe ward, district 1, Hochiminh city	028 22201177	028 22201166



## Joint stock companies

No.	Company	Address	Phone	Fax
1	Thu Duc Electro - Mechanical Joint Stock Company	Km 9 Ha Noi highway, Thu Duc district, Ho Chi Minh city	028 22144647	028 38963159
2	Dong Anh Electrical Equipment Manufacturing Joint Stock Corporation	No. 189 Lam Tien street, Dong Anh town, Hanoi	024 38833779	024 38833113
3	Power Engineering Consulting Joint Stock Company 1	Km 9 + 200, Nguyen Trai road, Thanh Xuan district, Hanoi	024 38544270	024 38541208
4	Power Engineering Consulting Joint Stock Company 2	No. 32 Ngo Thoi Nham street, ward 7, district 3, Hochiminh city	028 22216468	028 22210408
5	Power Engineering Consulting Joint Stock Company 3	No. 32 Ngo Thoi Nham street, ward 7, district 3, Hochiminh city	028 39307938	028 39307938
6	Power Engineering Consulting Joint Stock Company 4	No. 11 Hoang Hoa Tham street, Nha Trang city, Khanh Hoa province	0258 3563999	0258 3824208

## Affiliates

No.	Company	Address	Phone	Fax
1	Vinh Tan 3 Energy Joint Stock Company	8th floor, V building, 125 – 127 Ba Trieu street, Hai Ba Trung district, Hanoi	024 39748320	024 39748321
2	Thuan Binh Wind Power Joint Stock Company	Lac Tri hamlet, Phu Lac commune, Tuy Phong district, Binh Thuan province	0252 3822024	0252 3823024
3	EVN Finance Joint Stock Company	Floor 14 – 16, Tower B, EVN Building, No. 11 Cua Bac street, Ba Dinh district, Hanoi	024 22229999	024 22221999



