MINISTRY OF INDUSTRY AND TRADE

General Directorate of Energy

IEEJ:August 2015

VIET NAM ENERGY POLICY

CONTENTS

(Decision No. 1855/QD-TTg dated 27 December 2007)

Viewpoints from Energy Development Strategy

- Developing sustainable energy is in line with the national socio economic development strategy.
- Developing complete energy market, diversifying the ownerships in the energy field. Reducing energy subsidies gradually.
- Balancing energy system: electricity, oil and gas, coal, new and renewable energy. Focus on clean energy, new and renewable energy.
- Increasing energy efficiency and reducing energy loss in transmission.
- Developing sustainable energy sector along with environment protection.

Overall Objectives

- Ensuring the national energy security;
- Supplying sufficiently high quality energy for socio-economic development;
- Exploiting and using reasonably and efficiently the domestic resources;
- Diversifying energy investments and business models;
- Developing a competitive energy market;
- Promoting new and renewable energy sources, nuclear power;
- Effective and sustainable development in association with environment protection.

Specific Goals

- Primary energy is about 100 to 110 million TOE by 2020, 110 - 120 million TOE by 2025 and 310 to 320 million TOE by 2050.

- Capacity of oil refinery plants to gradually meet the domestic demand on oil products with the total capacity of about 25 to 30 million tons of crude oil by 2020.

- National strategic oil stockpiling at 45 consumption days by 2010, at 60 days by 2020 and 90 days by 2025.

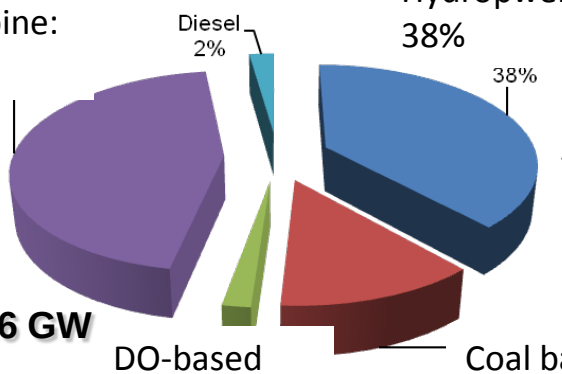
- The share of new and renewable energy will be up to 3% of the total primary energy sources by 2010, 5% by 2020 and 11% by 2050.

Existing power system & Review of the implementation of the Power Master Plan VII

II. REVISED POWER MASTER PLAN VII

EXISTING POWER SYSTEM & REVIEW OF THE IMPLEMENTATION OF THE POWER MASTER PLAN VII

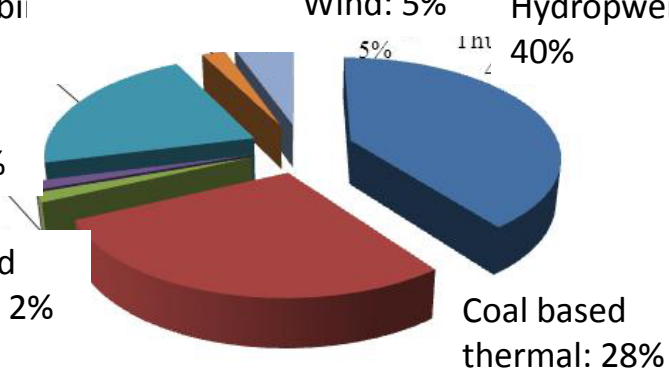
2005

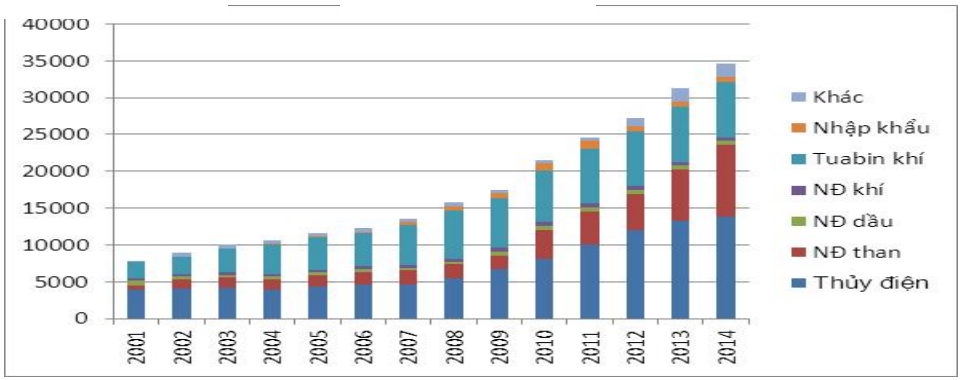


Pinstalled = 11.6 GW

2014

Pinstalled = 33,9 GW





➢ Growth of 13%/year.

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EXISTING POWER SYSTEM & REVIEW OF THE IMPLEMENTATION OF THE POWER MASTER PLAN VII

❖ Total national electricity consumption

STT	Danh mục	2010		2011		2012		2013		2014		Growth rate	
		(GWh)	(%)	(GWh)	(%)	(GWh)	(%)	(GWh)	(%)	(GWh)	(%)	06-10	11-14
1	Agriculture	944	1.1%	1079	1.1%	1265	1.2%	1532	1.3%	1893	1.5%	10.4%	19.0%
2	Industry	45568	52.5%	50085	52.9%	55300	52.4%	60337	52.4%	69185	53.9%	16.3%	11.0%
3	Service/Hotel & restaurant	3894	4.5%	4335	4.6%	4988	4.7%	5412	4.7%	6126	4.8%	12.5%	12.0%
4	Management & residents	33139	38.2%	34456	36.4%	38691	36.7%	42177	36.7%	45695	35.6%	10.4%	8.4%
5	Other activities	3212	3.7%	4703	5.0%	5230	5.0%	5611	4.9%	5535	4.3%	19.2%	14.6%
6	Com. electricity	***86756***	100.0%	***94658***	100.0%	***105474***	100.0%	***115069***	100.0%	***128434***	100.0%	**13.7%**	**10.3%**
7	Distr. & trans.'s		*10.3%*		*9.5%*		*9.0%*		*8.9%*		*8.9%*		
8	Self supplied		*3.0%*		*3.4%*		*3.3%*		*3.3%*		*3.3%*		
9	Electricity generated	**100007**		**108725**		**120300**		**130992**		**145540**		**13.3%**	**9.8%**
10	Pmax (MW)	15476		16490		18603		20010		22210		10.7%	9.5%

Commercial Electricity in 2014 approx. 128,4 billion kWh, with the growth of 11.4% compared with 2013, the commercial electricity growth rate for 2011-2014 period was 10.3%

Power generation in 2014 increases 10.8% compared with 2013

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SOCIO-ECONOMIC DEVELOPMENT FORECAST & POWER DEMAND FORECAST 2015-2030

❖ Power demand Scenario

Item	Unit	2014	2015	2016	2017	2018	2019	2020	2025	2030
Low scenario										
Total power generation	GWh	145 540	161 250	179 044	197 738	217 395	238 099	258 777	382 648	515 747
Total commercial electricity	GWh	128 434	141 800	157 487	173 970	191 308	209 585	227 724	336 730	456 436
Pmax	MW	22 210	25 295	28 140	31 135	34 293	37 628	41 029	60 668	81 771
BAU scenario										
Total power generation	GWh	145 540	161 250	180 075	199 933	220 901	243 076	265 406	400 327	571 752
Total commercial electricity	GWh	128 434	141 800	158 394	175 901	194 393	213 966	234 558	352 288	506 001
Pmax	MW	22 210	25 295	28 302	31 481	34 846	38 415	42 080	63 471	90 651
High scenario										
Total power generation	GWh	145 540	161 250	182 167	204 388	228 023	253 206	278 927	431 207	632 078
Total commercial electricity	GWh	128 434	141 800	160 234	179 820	200 660	222 883	245 456	379 462	559 389
Pmax	MW	22 210	25 295	28 631	32 182	35 969	40 015	44 224	68 367	100 215

II. REVISED POWER MASTER PLAN VII

SOCIO-ECONOMIC DEVELOPMENT FORECAST & POWER DEMAND FORECAST 2015-2030

Commercial Electricity Growth Rate				Electricity Generation Growth Rate			
Period	BAU	High scenario	Low scenario	**Period**	BAU	High scenario	Low scenario
2011-2015	10.3%	10.3%	10.3%	**2011-2015**	10.0%	10.0%	10.0%
2016-2020	10.6%	11.8%	9.9%	**2016-2020**	10.5%	11.6%	9.9%
2021-2025	8.5%	9.1%	8.1%	**2016-2020**	8.6%	9.1%	8.1%
2026-2030	7.5%	7.9%	6.3%	**2016-2020**	7.4%	7.9%	6.2%

II. REVISED POWER MASTER PLAN VII

SUPPLY-DEMAND BALANCE AND ELECTRICITY SUPPLY OPTIONS TO 2020

❖ Coal demand for electricity generation and supply – demand balance (BAU load)

Items	Unit	2015	2016	2017	2018	2019	2020	2025	2030	2015-2020	2015-2030
Coal demand for electricity generation											
Domestic coal mining in the North	10^3 ton	16 967	19 180	21 510	25 569	27 002	26 127	33 270	36 840	136 356	479 036
Coal import in the North	10^3 ton	244	294	281	303	310	2 480	15 916	34 300	3 912	175 733
Domestic coal mining in the Central	10^3 ton	25	44	47	47	72	91	37	38	325	788
Coal import in the Central	10^3 ton	0	0	0	0	0	0	2 392	2 444	0	21 429
Domestic coal mining in the South (Vinh Tan 2, Duyen Hai 1, Vinh Tan 1)	10^3 ton	4 979	7 576	7 576	7 571	8 876	11 291	11 257	11 202	47 869	160 135
Coal import in the South	10^3 ton	506	827	3 189	5 248	10 760	15 002	25 593	41 590	35 532	319 753
Balance of local coal demand and supply for electricity generation (Vinh Tan 1, Nam Dinh 1 to consume domestic coal)											
Total local coal demand for electricity generation (4800kCal/kg)	10^3 ton	**21 972**	**26 800**	**29 132**	**33 187**	**35 949**	**37 509**	**44 565**	**48 080**	**184 550**	**639 959**
Total commercial coal mining	10^3 ton	**40 411**	**41 999**	**43 012**	**44 524**	**46 742**	**47 441**	**50 673**	**52 679**	**264 129**	**767 946**
Coal Export	10^3 ton	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**2 000**	**12 000**	**32 000**
Estimated supply for non-power sector (priority set for coal for electricity generation)	10^3 ton	**11 225**	**9 880**	**9 880**	**9 880**	**10 380**	**10 880**	**10 880**	**10 880**	**62 125**	**170 925**
Total capacity of domestic coal supply for electricity generation	**10^3 ton**	**27 186**	**30 119**	**31 132**	**32 644**	**34 362**	**34 561**	**37 793**	**39 799**	**190 004**	**565 021**
Balance (+), (-)	10^3 ton	**5 214**	**3 319**	**2 000**	**-543**	**-1 587**	**-2 948**	**-6 772**	**-8 281**	**5 454**	**-74 938**
Total coal import demand for electricity generation (6000kCal/kg)											
Total coal import demand	10^3 ton	**750**	**1 121**	**3 470**	**5 550**	**11 070**	**17 482**	**43 901**	**78 334**	**39 444**	**516 915**

II. REVISED POWER MASTER PLAN VII

SUPPLY-DEMAND BALANCE AND ELECTRICITY SUPPLY OPTIONS TO 2020

❖ Gas demand for electricity generation and Demand-Supply Balance (BAU load)

Items	Unit	2014	2015	2016	2017	2018	2019	2020	Total 2015-2020
Gas capacity in South Eastern Vietnam	billion m3	8.30	9.68	8.93	8.69	8.71	8.57	7.76	52.3
Maximum Supply of Gas brought offshore	billion m3	7.56	7.56	8.06	8.60	8.60	8.57	7.76	49.2
Demand of non-power sectors in South Eastern Vietnam	billion m3	1.15	1.30	1.39	1.45	1.51	1.56	1.62	8.8
Demand for electricity generation in South Eastern Vietnam (Phu My, Nhon Trach, Ba Ria)	billion m3	6.58	6.28	6.45	6.59	6.72	6.47	5.95	38.5
Supply-Demand Balance in South Eastern Vietnam	billion m3	-0.17	-0.01	0.22	0.56	0.38	0.54	0.19	1.88

IMPORT/EXPORT WITH NEIGHBORING COUNTRIES

❖ **From China: present import of 700-800MW (via 03 110kV transmission lines, and via 02 220kV transmission lines)**

❖**From Lao PDR: presently import from XeKaman 3 (250MW); from Xekaman 1+ Xansay (322MW) operated since 2016; from Xe Kong 3A, 3B (205MW), from XeKaman 4 (80MW) to be operated in 2017 – 2018. Total capacity imported from Lao to 2020 reaches 860MW.**

❖**Cambodia: presently export approx. 200MW via 220kV transmission lines to Cambodia.** As of Power Development Master Plan VII, 04 hydropower plants located in North Eastern Cambodia are expected to import electricity to Vietnam after 2015 with the total capacity of more than 1,200MW.

POWER DEVELOPMENT PROGRAM TO 2030
PRIMARY ENERGY ISSUES

- **Hydropower:** Total Pinstalled of large and medium scale will be 18,000MW by 2020 – almost utilized. The present capacity of small HPP is of 1,635MW and will be of 3,100MW by 2020, and 4,600MW by 2030.
- **Domestic coal production:** coal for electricity generation for 2015 – 2030 period: 565 mil. ton, which can only be sufficient for the demand of the existing power plants (with the capacity of approx. 6,700MW) and new installations with the total capacity of 7,600MW. Coal production will not be sufficient for the 2021 – 2030 period.
- **Coal import:** presently at least 600,000 ton/year (For Formosa Dong Nai Coal-fired Power Plant) and will increase by 17 mil. Ton in 2020, 44 mil. ton in 2025 and 78 mil. Ton in 2030. Estimated coal import for 2015-2030 period will be 520 mil. ton (6,000kcal/kg).
- **Gas supply-demand:**
  - After 2023, VN will have to import LNG to supply for Son My gas-fired Power Plant of 2,000MW to be operated in 2022 and of 4,000MW in 2030.

II. REVISED POWER MASTER PLAN VII

POWER DEVELOPMENT PROGRAM TO 2030

POWER/CAPACITY BALANCE TO 2030

Unit: GWh

Targets/year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
National										
Total demand	289544	315116	342256	371088	400327	430886	463305	497715	534283	571752
Total power generation	289544	315136	342261	371092	400307	430887	463282	497702	534275	571781

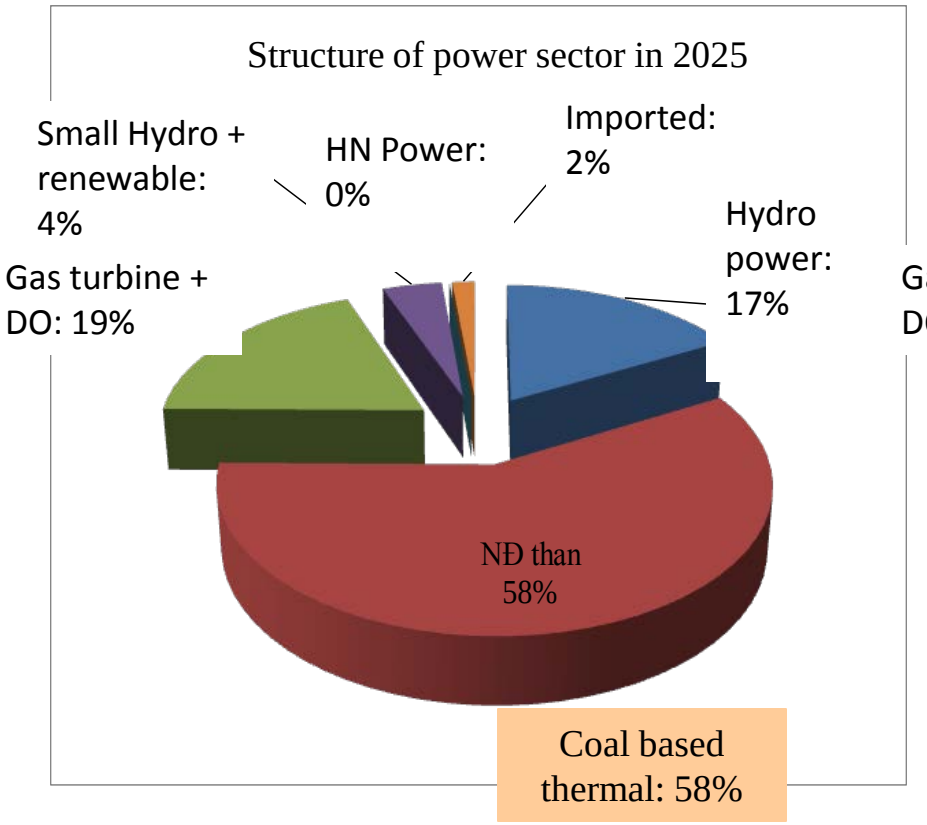
Unit: MW

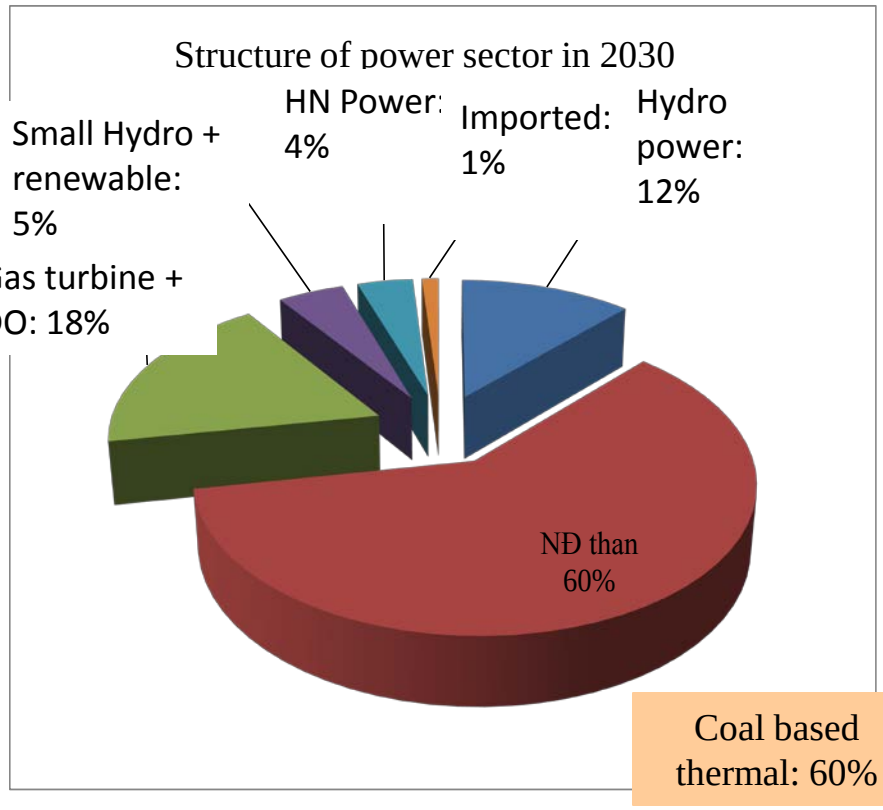
Targets/year	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
NATIONAL										
Total Demand	**45907**	**49961**	**54264**	**58836**	**63471**	**68317**	**73457**	**78912**	**84710**	**90651**
Total Installed Capacity	**67639**	**72269**	**76579**	**80943**	**85812**	**91254**	**96524**	**102824**	**109904**	**116564**
Total Installed Capacity (excluded wind and solar power)	***66839***	***71019***	***74929***	***78893***	***83347***	***88429***	***93189***	***98849***	***105179***	***111109***
Reserve (repairs, technical errors & others)	20932	21057	20664	20057	19875	20112	19732	19936	20469	20458
Reserve ratio	**45.6%**	**42.1%**	**38.1%**	**34.1%**	**31.3%**	**29.4%**	**26.9%**	**25.3%**	**24.2%**	**22.6%**

II. REVISED POWER MASTER PLAN VII

POWER DEVELOPMENT PROGRAM TO 2030

POWER/CAPACITY SHARE TO 2030





II. REVISED POWER MASTER PLAN VII

TOTAL INVESTMENT FOR POWER DEVELOPMENT TO 2030

Period	2014-2015	2016-2020	2021-2025	2026-2030	2014-2030
I- Total power generation plants - billion USD per year on average	8.10 4.05	21.36 4.26	25.63 5.13	26.39 5.28	84.43 4.79
II- Total power network - billion USD per year on average	3.23 1.62	9.13 1.83	10.23 2.05	12.93 2.59	35.53 2.09
Total power sector- billion USD per year on average	11,34 5,67	30,43 6,09	35,86 7,17	39,33 7,87	116,96 6,88

II. REVISED POWER MASTER PLAN VII

TOTAL INVESTMENT FOR POWER DEVELOPMENT TO 2030

STRUCTURE OF INVESTMENT CAPITALS

No.	Items	2014-2015	2016-2020	2021-2025	2026-2030	2014-2030
I	Power sources	71.5%	70.0%	71.5%	67.1%	69.6%
	- Coal-fired power	47.9%	34.7%	22.8%	17.4%	26.5%
	- Hydropower	16.2%	6.4%	0.4%	1.3%	3.8%
	- Pumped storage	0.0%	0.5%	2.4%	2.8%	1.8%
	- Gas-oil fired	0.0%	9.9%	5.9%	11.9%	8.4%
	- Nuclear	0.0%	4.5%	26.3%	19.1%	15.7%
	- Renewable	7.4%	13.9%	13.6%	14.6%	13.4%
II	Power Network	28.5%	30.0%	28.5%	32.9%	30.4%
1	*Transmission Network*	*44.7%*	*47.6%*	*47.0%*	*52.0%*	*48.8%*
	- 500kV transmission lines	11.7%	15.0%	12.9%	23.8%	17.3%
	- 500kV Substations	5.0%	6.6%	7.9%	7.4%	7.1%
	- 220kV transmission lines	16.2%	11.0%	10.3%	9.3%	10.7%
	- 220kV Substations	11.9%	15.0%	15.9%	11.4%	13.7%
2	*Distribution network*	*49.6%*	*46.5%*	*47.0%*	*41.9%*	*45.3%*
3	*IDC network*	*5.7%*	*5.8%*	*6.0%*	*6.1%*	*6.0%*
	Total	100.0%	100.0%	100.0%	100.0%	100.0%

II. REVISED POWER MASTER PLAN VII

ENERGY DEVELOPMENT MASTER PLAN (POWER SECTOR)

Main targets of the Master Plan for 2014 – 2020 period:

1.Electricity demand forecast of 10.5%/year increase for 2016-2020 period, electricity generation in 2020 reaches: **262.4 TWh, Pmax=41.600 MW,**

2.Total installed power capacity to 2020: 62.300 MW**.**

3.For 2014 -2020 period, supplementing 26.500 MW of power sources (Coal-fired power plants of 19.600 MW, hydro power: 3.800 MW, gas turbine power plants: 780 MW, small HPPs and RE: 2.190 MW).

4. Construction of more than 3000 km transmission lines of 500 kV, 7000 km transmission lines of 220 kV, more than 23.000 MVA of 500 kV power generation stations và 39.000 MVA of 220 kV power generation stations.

5. Total investment : 41.8 billion USD, average 5.97 billion USD/ year (58% for power sources, 42% for power transmission and distribution.

6. Cost of the power by 2020: 9.2 US cent/kWh (in which 6.7 $c/kWh for power generation, 2.5 $c/kWh for power transmission and distribution).

CHALLENGES AND NEXT STEPS

III. CHALLENGES AND NEXT STEPS

- Development of Energy Policy for 2016-2035 period
- Development of Energy Development Master Plan for next period
- Development of energy database system.
- Development of Energy sector overview for short-term interventions, including scenarios for power system development and diversification of primary power sources

THANK YOU FOR YOUR ATTENTION!

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