



MINISTRY OF INDUSTRY AND TRADE

# **DRAFT STRATEGY AND MASTER PLAN ON NATIONAL ENERGY FOR PERIOD 2021-2030 VISION TO 2050**

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# Part 1: Current status of National Energy





# Summary of Energy Economic Indicators 2010-2020

Targets	Unit	2010	2015	2020	Increase in 2020 compared to 2010 (times)
GDP at prices 2010	Billions dong	2,157,828	2,875,856	3,847,182	1.78
Population	Thousand people	87,067.30	92,228.60	97,582.69	1.12
Urban population	%	30.39	33.48	36.82	
GDP per capita at real prices	USD	1,273	2,097	2,779	2.18
Total Primary Energy Supply (TPES)	Thousand TOE	51,610	63,002	95,762	1.86
Total Final Energy Consumption (TFES)	Thousand TOE	39,831	47,561	66,014	1.66
Total Primary Energy per capita	kgOE/person	593	683	981	1.65
Total Primary Energy to GDP	kgOE/1000USD	445	408	463	1.04
Ratio of Net Energy Imports to Total Primary Energy	%	-17.6	8.4	48.0	
Electricity consumption per capita	kWh/person	972	1,548	2,229	2.29
Ratio of final power consumption/total energy consumption	%	18.3	25.7	28.4	
Total CO <sub>2</sub> emissions from energy activities	Million tons of CO <sub>2</sub>	147	158	273	1.86



# Final Energy Consumption 2010-2020

Unit: KTOE

Energy	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Coal	7,513	7,663	7,710	7,838	7,905	7,960	8,613	9,154	13,478	15,528	20,455
Petroleum	14,361	15,418	15,036	15,004	15,636	18,030	18,840	20,130	21,208	22,093	19,604
Gas	493	849	1,088	1,110	1,128	1,167	1,374	1,446	1,498	1,475	1,495
RE	10.185	9,680	9,227	8,467	8,387	8,159	7,915	7,755	7,793	7,453	5,710
Electricity	7,278	8,052	8,941	9,800	10,986	12,246	13,718	14,946	16,480	17,994	18,749
<b>Total</b>	<b>39,831</b>	<b>41,661</b>	<b>42,002</b>	<b>42,219</b>	<b>44,043</b>	<b>47,561</b>	<b>50,460</b>	<b>53,432</b>	<b>60,457</b>	<b>64,542</b>	<b>66014</b>

	Average annual growth rate (%)		Proportion in total Final Energy (%)		
	2011-20	2016-20	2010	2015	2020
Coal	10.5%	20.8%	18.9%	16.7%	31.0%
Petroleum	3.2%	1.7%	36.1%	37.0%	29.7%
Gas	11.7%	5.1%	1.2%	2.0%	2.3%
RE	-5.6%	-6.9%	25.6%	23.2%	8.7%
Electricity	9.9%	8.9%	18.3%	19.3%	28.4%
<b>Total</b>	<b>5.2%</b>	<b>6.8%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>



# Primary Energy Supply 2010-2020

Unit: KTOE

Energy	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Coal	13,850	14,673	15,617	16,418	19,136	22,590	25,594	25,943	35,877	44,852	49,752
Crude Oil & Oil SP	16,099	15,964	16,528	16,766	17,700	17,984	19,101	19,736	22,594	25,057	23,387
Gas	8,316	7,560	8,253	8,522	9,124	8,223	9,351	8,622	8,730	8,964	7,821
RE	12,959	13,679	14,337	14,037	13,830	14,121	14,664	16,546	16,801	15,514	14,672
Export/import of electricity	386	308	104	157	72	84	114	61	139	107	130
<b>Total</b>	<b>51,610</b>	<b>52,184</b>	<b>54,838</b>	<b>55,901</b>	<b>59,862</b>	<b>63,002</b>	<b>68,824</b>	<b>70,908</b>	<b>84,141</b>	<b>94,494</b>	<b>95,762</b>

	Average annual growth rate (%)		Share of total primary energy (%)		
	2011-20	2016-20	2010	2015	2020
Coal	13.6%	17.1%	26.8%	35.9%	52.0%
Petroleum	3.8%	5.4%	31.2%	28.5%	24.4%
Gas	-0.6%	-1.0%	16.1%	13.1%	8.2%
RE	1.2%	0.8%	25.1%	22.4%	15.3%
Electricity	-10.3%	9.1%	0.7%	0.1%	0.1%
<b>Total</b>	<b>6.4%</b>	<b>8.7%</b>	<b>100.0%</b>	<b>100.0%</b>	<b>100.0%</b>



# Exploiting and import-export primary energy 2010-2020

Unit: KTOE

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Import	12,088	13,449	11,931	10,765	12,527	17,074	22,225	24,642	32,149	45,608	53,605
Export	21,186	20,310	19,804	17,207	14,856	11,798	10,948	11,525	9,368	8,144	7,666
Net Imports	-9,098	-6,861	-7,873	-6,442	-2,328	5,276	11,277	13,116	22,781	37,464	45,939
Ratio of net imports to Primary energy (%)	-17.6	-13.1	-14.4	-11.5	-3.9	8.4	16.4	18.5	27.1	39.6	48.0

- The proportion of primary energy imports increased from 8.4% in 2015 to 48% in 2020.
- Imports of coal and crude oil contribute mainly to the proportion of net imports.



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Part 2:  
Vietnam's national energy development strategy to  
2030, vision to 2045  
(draft)





# Development

In the context of the implementation of Vietnam's commitment at COP26 to "zero" Net Emissions by 2050, the proposed main targets of the Energy Development Strategy are proposed to be in line with and higher than with Resolution No. 55-NQ/TW, details are as follows :

	Unit	2030	2045
Total primary energy	million TOE	175-195	260-350
Ratio of renewable energy in total primary energy	%	20 %- 25 %	60 %- 65 %
Total final energy	million TOE	105-115	140-190
Primary energy intensity	kgOE/1000 USD	400-460	330 -410
Oil Refining Facility	million tons of crude oil	70% of domestic demand	
Strategic petroleum reserve	million m <sup>3</sup>	90 days of net import	
Sufficient capacity to import LNG	billion m <sup>3</sup>	8	15
Ratio of total energy saving of final energy compared to normal development scenario	%	7.0-9.0 %	14.0 -30.0 %
Reducing greenhouse gas emissions compared to the normal development scenario	%	20.0 %	70.0 %



# Development Orientation of Energy Sub-sectors

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## **1. Development orientation of oil and gas sub-sector :**

- To step up basic investigation and exploration in order to increase oil and gas reserves and output; improve recovery coefficient, make full use of small mines, marginal residual volume.
- Develop a complete gas industry, synchronously all stages, from: exploitation - collection - transportation - processing - storage - distribution of gas and import and export of gas products.
- Continue to attract all sources of investment capital in the field of refining - petrochemical in the direction of deep processing, improve the quality of petroleum products, actively meet the maximum domestic demand and export orientation .



## **2. Development orientation of coal sub-sector**

- Promote exploration to upgrade existing coal resources to ensure reliability for mining design and promote exploration of new mines, ensuring that exploration is always one step ahead.
- To develop mining output in a sustainable and efficient manner; safe, economical and efficient exploitation of resources assigned to management .
- Promote research and application of science and technology in coal processing in order to diversify coal products , meeting the requirements of environmental protection and Vietnam's commitments at COP26 .



## **3. Development orientation of electricity sub-sector**

- To synchronously, rationally develop and diversify types of power sources. Continue to promote the development of renewable energy sources, new energy and domestic gas in order to effectively exploit the national energy source.
- There should be a suitable roadmap in place to gradually switch LNG powered sources to use hydrogen (gradually increase the proportion of combustion), gradually switch from coal powered sources to using biomass or ammonia (gradually increase the proportion of combustion).
- The transmission system is built to meet the requirements of the national power system for safe operation, capable of integrating a high rate of renewable energy sources.



## **4. Development orientation of new and renewable energy sub-sectors**

- To strongly encourage and promote the development of renewable energy sources in order to maximally replace fossil energy sources. Prioritize the use of wind and solar energy for power generation.
- To form and develop a number of renewable energy centers in advantageous regions and localities.
- Researching technology, developing a number of pilot projects to produce and encourage the use of hydrogen energy in line with the general trend of the world.



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Part 3:  
Master plan on national energy for the period of 2021-  
2030, vision to 2050  
(draft)





# Primary Energy Supply Capability according to Base Scenario

Unit: KTOE

Base case Scenarios	Fuel types	2020	2025	2030	2035	2040	2045	2050
	Coal	49,752	47,553	62,475	57,732	51,341	37,173	16,780
	Oil	23,387	26,959	31,263	32,816	32,904	31,579	17,176
	Gas	7,821	16,433	30,869	42,191	39,955	36,335	31,080
	Imported Electricity	130	1,325	1,355	1,828	2,340	2,852	3,184
	Hydropower	6,269	7,897	8,251	8,627	8,876	9,155	9,756
	Biomass fuel	7,431	9,033	12,579	16,519	20,164	22,904	24,423
	Biofuel	64	574	1,356	2,423	4,043	6,062	10,557
	solar energy	824	2,349	3,109	9,642	26,442	59,404	96,043
	Wind	84	2,489	3,435	12,349	32,575	67,020	101,753
	Hydrogen-based fuel	-	18	246	1,745	6,083	15,023	24,135
	Total	95,762	114,631	154,937	185,873	224,722	287,505	334,889
	Total RE	14,672	22,360	28,975	51,305	98,182	179,567	266,668
	Proportion of renewable energy in primary energy	15.3%	19.5%	18.7%	27.6%	43.7%	62.5%	79.6%



# Primary Energy Supply Capability according to High Scenario

Unit: KTOE

High scenario	Fuel types	2020	2025	2030	2035	2040	2045	2050
	Charcoal	49,752	48,755	63,775	59,335	52,896	38,220	16,780
	Oil	23,387	27,733	33,027	36,039	37,410	37,067	19,267
	Gas	7,821	16,500	34,370	47,894	46,313	42,939	37,738
	Import of Electricity	130	1,444	1,616	2,340	2,980	3,184	3,184
	Hydropower	6,269	8,163	8,640	9,469	9,547	9,640	9,769
	Biomass fuel	7,431	9,266	13,117	17,194	21,046	23,981	25,640
	Biofuel	64	600	1,481	2,796	4,931	7,783	14,136
	solar energy	824	2,355	3,199	11,290	33,097	66,653	114,185
	Wind	84	2,785	5,138	17,534	46,244	86,634	130,852
	Hydrogen-based fuel	-	23	361	2,720	9,972	21,582	37,671
	Total	95,762	117,624	164,723	206,612	264,434	337,683	409,223
	Total RE	14,672	23,193	31,934	61,004	124,836	216,273	332,254
	Proportion of renewable energy in primary energy	15.3%	19.7%	19.4%	29.5%	47.2%	64.0%	81.2%



# Forecast of Final Energy Demand according to the Base Scenario

Unit: KTOE

	Base case Scenario						
	2020	2025	2030	2035	2040	2045	2050
Coal	15,847	18,013	18,183	16,453	13,534	9,571	3,573
Car gasoline	6,669	7,187	7,620	7,275	6,509	5,506	334
Airplane Gasoline	975	1,174	1,400	1,607	1,590	1,536	467
Kerosene	18	21	22	21	18	12	-
DO	10,493	12,494	14,485	15,847	16,429	15,988	7,696
FO	329	382	420	412	382	326	212
LPG	2,574	2,850	3,015	3,080	3,067	3,035	2,863
Nature gas	774	1,910	3,581	5,448	7,880	10,739	14,628
Biogasoline	81	229	521	956	1,474	2,111	3,395
Biological DO	-	345	835	1,468	2,328	3,406	5,256
Synthetic airplane gasoline	-	-	-	-	240	545	1,906
Hydrogen	-	-	-	140	941	2,390	9,247
Ammonia	-	-	-	-	352	828	3,004
Biomass	7,059	8,977	10,801	10,661	11,571	12,249	12,484
solar energy	2	6	38	84	147	230	401
Electricity	18,654	28,809	42,234	56,003	67,046	76,257	84,172
<b>Total</b>	<b>63,476</b>	<b>82,398</b>	<b>103,155</b>	<b>119,454</b>	<b>133,508</b>	<b>144,728</b>	<b>149,637</b>



# Forecast of Final Energy Demand according to the High Scenario

Unit: KTOE

	High scenario						
	2020	2025	2030	2035	2040	2045	2050
Coal	15,847	18,562	19,179	17,641	14,733	10,617	4,181
Car gasoline	6,674	7,379	8,089	8,112	7,592	6,755	379
Airplane Gasoline	975	1,198	1,458	1,718	1,741	1,724	537
Kerosene	18	21	23	23	20	14	-
DO	10,507	12,914	15,529	17,844	19,335	19,563	9,050
FO	329	394	446	463	452	411	290
LPG	2,574	2,905	3,131	3,244	3,280	3,313	3,212
Nature gas	774	1,967	3,785	5,879	8,661	12,018	16,742
Biogasoline	81	235	552	1,052	1,734	2,621	4,558
Biological DO	-	365	929	1,744	2,933	4,551	7,389
Synthetic airplane gasoline	-	-	-	-	263	612	2,190
Hydrogen	-	-	-	152	1,030	2,800	11,661
Ammonia	-	-	-	-	425	1,064	4,098
Biomass	7,059	9,218	11,355	11,358	12,475	13,345	13,708
solar energy	2	27	67	125	204	309	457
Electricity	18,654	29,799	45,610	63,361	80,675	94,681	107,113
<b>Total</b>	<b>63.495</b>	<b>84,984</b>	<b>110,154</b>	<b>132,716</b>	<b>155,554</b>	<b>174,396</b>	<b>185,564</b>



# CO<sub>2</sub> Emission according to the Various Scenarios

*Unit: million tons of CO<sub>2</sub>*

Scenario	Fuel type	2020	2025	2030	2035	2040	2045	2050	21-30	31-50
Base _	Coal	65.2	74.1	74.8	67.7	55.7	39.4	14.7	1.4%	-7.8%
	Gas	1.8	4.5	8.4	12.8	18.5	25.2	34.4	16.6%	7.3%
	Oil	62.7	71.9	80.5	84.5	83.9	79.2	34.5	2.5%	-4.2%
	Energy exploitation	15.8	14.8	22.3	17.9	14.6	13.9	13.0	3.5%	-2.6%
	Power production	129.6	157.0	215.0	200.0	192.0	148.0	26.0	5.2%	-10.0%
	Total emissions	275.1	322.3	401.0	382.9	364.7	305.7	122.6	3.8%	-5.8%
	CO2 capture	-	-	-	-	1.0	5.0	20.0		
	<b>Net CO2 emission</b>	<b>275.1</b>	<b>322.3</b>	<b>401.0</b>	<b>382.9</b>	<b>363.7</b>	<b>300.7</b>	<b>102.6</b>	<b>3.8%</b>	<b>-6.6%</b>
High	Coal	65.2	76.4	78.9	72.6	60.6	43.7	17.2	1.9%	-7.3%
	Gas	1.8	4.6	8.9	13.8	20.3	28.2	39.3	17.2%	7.7%
	Oil	62.7	74.0	85.7	94.1	97.3	95.5	40.2	3.2%	-3.7%
	Energy exploitation	15.8	14.8	24.7	21.4	18.2	17.6	16.7	4.6%	-1.9%
	Power production	129.6	157.0	231.0	250.0	242.0	175.0	42.0	5.9%	-8.2%
	Total emissions	275.2	326.8	429.2	451.9	438.5	360.0	155.4	4.5%	-5.0%
	CO2 capture	-	-	-	-	1.0	6.0	30.0		
	<b>Net CO2 emission</b>	<b>275.1</b>	<b>326.8</b>	<b>429.2</b>	<b>451.9</b>	<b>437.5</b>	<b>354.0</b>	<b>125.4</b>	<b>4.5%</b>	<b>-6.0%</b>



# Oil and Gas Sub-sector Planning

## **Oil and gas investigation and exploration**

- In each 5-10 year cycle, the overall assessment of the potential and reserves of oil and gas on the mainland and continental shelf of Vietnam is made.
- Increase of reserves:
  - Period 2021-2025: 16-22 million tons of oil equivalent/year, compensation coefficient 0.9-1.1 times;
  - Period 2026-2030: 16-22 million tons of oil equivalent/year, compensation coefficient 0.9-1.1 times;
  - Period 2031-2050: 16-27 million tons of oil equivalent/year, compensation coefficient 0.6-1.0 times.

## **Petroleum exploitation**

- Domestic crude oil: crude oil extraction output in the periods is as follows:
  - The period 2021-2025 will reach 6.8-12.5 million tons/year;
  - The period 2026-2030 will reach 6.8-12.5 million tons/year;
  - The period 2031-2050 will reach 7.0-9.0 million tons/year.
- Natural gas ashore: gas extraction output in the period is as follows:
  - The period 2021-2025 will reach 8.2-25.0 billion m<sup>3</sup>/year;
  - The period 2026-2030 will reach 8.2-25.0 billion m<sup>3</sup>/year;
  - The period 2031-2050 will reach 15.0-33.0 billion m<sup>3</sup>/year.



# Oil and Gas Sub-sector Planning

## **Gas industry field**

- Maximum collection of associated petroleum gas of the plots / mines of PVN and the exploitation contractor in Vietnam ;
- Development of infrastructure to ensure the capacity to supply 100% of the demand for raw materials for electricity and fertilizer, in which the import capacity of liquefied natural gas (LNG) is about 1.5 billion m<sup>3</sup>/year by 2025. , 16 billion m<sup>3</sup>/year by 2030 and 15 billion m<sup>3</sup>/year by 2050;;
- Development of the gas market to reach 10 billion m<sup>3</sup>/year by 2025, 31 billion m<sup>3</sup>/year by 2030 and 2050;

## **Oil and gas processing industry**

- Output of petroleum products meets at least 70% of domestic demand;
- Operate factories safely and stably with designed capacity, while continuing to improve, optimize, diversify products and reduce costs..

## **Petroleum reserves**

- The total scale of Vietnam ' s crude oil and petroleum products reserve system will reach at least 90 days of net import after 2030 .



# Coal Sub-sector Planning

## **Coal exploration field**

- Period 2021-2025: completing 07 exploration projects in the previous phase, implementing 17 new coal exploration projects;
- Period 2026-2030: completing exploration projects in the previous phase, implementing 13 new coal exploration projects;
- Period 2031-2050: completing exploration projects in the previous phase, implementing 23 new coal exploration projects

## **Coal mining sector**

- In the period of 2021-2025: The output of raw coal exploited in the whole industry is about 48-55 million tons (corresponding to about 40-48 million tons of commercial coal);
- In the period 2026-2030: The output of raw coal exploited in the whole industry is about 54-56 million tons (equivalent to about 45-50 million tons of commercial coal);
- In the period 2031-2050: The output of raw coal exploited in the whole industry is about 55-45 million tons (corresponding to about 50-40 million tons of commercial coal)..



# Power Sub-sector Planning

## Power development

**By 2025: The total installed capacity of power plants will be around 94,558-98,794 MW, of which:**

- Hydropower accounts for 27.1-27.3%;
- Coal thermal power accounts for 30.4-31.8%;
- Domestic gas thermal power, gas turbine and LNG accounts for 14.1-14.7%;
- Wind power (onshore, nearshore and offshore) accounts for 11.8-13.8%;
- Concentrated solar power accounts for 8.8-9.4%;
- Biomass electricity, waste and other renewable energy accounts for 1.0-1.2%;
- Imported power accounts for 4.1-4.5%.



# Power Sub-sector Planning

## Power development

**By 2030: The total capacity of power plants will be around 121,757-145,989 M , of which:**

- Hydropower accounts for 19.8-22.5%;
- Pump storage and battery storage accounts for 1.2-1.8%;
- Coal thermal power accounts for 20.3-29.8%;
- Domestic gas thermal power, oil gas turbine and LNG accounts for 24.9-27.0%;
- Wind power (onshore, nearshore and offshore) accounts for 9.8-19.5%;
- Concentrated solar power accounts for 6.0-7.2%;
- Biomass electricity, waste and other renewable energy accounts for 1.0-1.6%;
- Import accounts for 3.4%.



# Power Sub-sector Planning

## Power development

**Orientation to 2050: The total capacity of power plants is about 368,461-501,608 MW, of which:**

- Hydropower accounts for 7.2-9.7%;
- Pump storage and battery storage account for 6.3-8.5%;
- Coal thermal power 0%;
- Thermal power operated entirely by biomass/ammonia accounts for 5.1-7.8%;
- Domestic gas-fired thermal power plant rate 1.6-2.1%;
- Domestic gas-fired thermal power completely converts hydrogen, accounting for 1.4-1.9%;
- Hydrogen-fired LNG thermal power accounts for 1.5-3.7%;
- LNG thermal power converted entirely by hydrogen accounts for 4.2-4.9%;
- Wind power accounts for 25.8-30.5%;
- Concentrated solar power accounts for 27.2-27.3%;
- Imported power accounts for 2.2-3.0%.



# Power Sub-sector Planning

## Grid development

- Period 2021-2030: New construction of 46,550-50,250 MVA and renovation of 35,550-37,800 MVA of 500 kV substation; new construction of 10,884-12,560 km and renovating 1,324 km of 500 kV transmission line; new construction of 70,525-79,775 MVA and renovation of 33,497-35,747 MVA of 220 kV substation; new construction of 15,599-16,381 km and renovation of 6,484-6,500 km of 220 kV transmission line.
- Orientation for period 2031-2050: New construction of 6,000-60,000 MVA capacity of HVDC stations and 2,100-8,300 km of HVDC transmission lines; new construction of 77,400-95,400 MVA and renovating 110,700-114,750 MVA substation 500 kV; new construction of 8,748-9,500 km and renovating 801 km of 500 kV transmission line; new construction of 101,125-119,125 MVA and renovating 95,500-98,375 MVA 220 kV substation; new construction of 9,995-10,763 km, renovating 504-654 km 220 kV transmission line.



# Renewable Energy Sub-sector Planning

## **Renewable energy for heat production :**

### a. Orientation

- Promote the development of renewable energy technology; total renewable energy sources for heat production and co-generation of thermal power in 2030 will be about 10.0-11.5 million TOE, by 2050 about 45-49 million TOE.

### b. Specific goals

#### (i) Development of solar power

- Increasing the absorption area of solar hot water rigs in commercial, service, residential and industrial production will provide 3.1 million tons of oil equivalent in 2030 and 6 million tons of oil equivalent in 2050.

#### ( ii ) Development of biomass and biogas \_

- Increase the use of biomass energy and alternative fuels for heat and thermal power cogeneration in industrial production to reach 8.5-9.4 million TOE by 2030 and 42-45 million TOE by 2050;
- Increase the scale of using biogas technology with a construction volume of about 60 million m<sup>3</sup> by 2030 and about 100 million m<sup>3</sup> by 2050.



# Renewable Energy Sub-sector Planning

## Renewable energy for other purposes

### a . Orientation

- Development of renewable energy technologies including biofuels, hydrogen, ammonia and hydrogen-derived synthetic fuels used in power generation, transportation, industry, residential buildings and trade (heat) in order to contribute to accelerating the energy transition and gradually decarbonizing the economy.
- Develop a technology roadmap for the production and use of hydrogen fuel and hydrogen-derived fuels..

### b. Specific goals

- Increase the production of hydrogen produced through electrolysis and other processes with carbon capture to 400-450 thousand tons (300-400 thousand tons for power generation) by 2030 and 40-50 million tons by 2050.
- Increasing the application of green hydrogen fuel in electricity production, industry (iron and steel, chemicals, electronics...), transportation vehicles using fuel cells.
- To increase the output of biofuels and synthetic fuels (e-fuels) of all kinds to about 3.2-3.7 million tons of oil equivalent, by 2030; 32-36 million tons of oil equivalent in 2050 to meet the fuel demand of the transportation industry.
- Strengthen carbon capture, use and storage measures in industrial facilities and power plants to achieve a capture capacity of 1 million tons by 2040 and 20-30 million tons by 2050.



# Needs for Capital Investment according to Base Case Scenario

Sub-sectors	2021-2030	2031-2050	2021-2050
Power source	2,133,100	6,357,475	8,490,575
Transmission grid	355,517	636,677	992,194
<b>Total power</b>	<b>2,488,617</b>	<b>6,994,151</b>	<b>9,482,768</b>
Searching, Exploration and Production of Oil and Gas	621,000	1,228,000	1,849,000
Gas industry	168,000	58,000	226,000
Petroleum processing	346,000	113,000	459,000
Storage, transportation, distribution	191,000	143,000	334,000
<b>Total oil and gas</b>	<b>1,326,000</b>	<b>1,542,000</b>	<b>2,868,000</b>
Coal production	74,146	166,980	241,126
Serving for coal production	34,305	37,565	71,870
<b>Total coal</b>	<b>108,451</b>	<b>204,545</b>	<b>312,996</b>
<b>Total ( VND billion )</b>	<b>3,855,068</b>	<b>8,482,696</b>	<b>12,337,764</b>
Annual average (billion VND)	385,507	424,135	411,259
<b>Total ( billion USD)</b>	<b>165.9</b>	<b>365.1</b>	<b>531.0</b>
Annual average (billion USD)	16.6	18.3	17.7



# Needs for Capital Investment according to High Scenario

Sub-sectors	2021-2030	2031-2050	2021-2050
Power source	3,048,614	10,049,736	13,098,349
Transmission grid	355,517	659,913	1,015,430
<b>Total power</b>	<b>3,404,130</b>	<b>10,709,649</b>	<b>14,113,779</b>
Searching, Exploration and Production of Oil and Gas	620,000	1,269,000	1,889,000
Gas industry	446,000	130,000	576,000
Petroleum processing	346,000	113,000	459,000
Storage, transportation, distribution	191,000	143,000	334,000
<b>Total oil and gas</b>	<b>1,603,000</b>	<b>1,655,000</b>	<b>3,258,000</b>
Coal production	113,353	111,744	225,097
Serving for coal production	34,305	37,565	71,870
<b>Total coal</b>	<b>147,658</b>	<b>149,309</b>	<b>296,967</b>
<b>Total ( VND billion )</b>	<b>5,154,788</b>	<b>12,513,958</b>	<b>17,668,746</b>
Annual average (billion VND)	515,479	625,698	588,958
<b>Total ( billion USD)</b>	<b>221.8</b>	<b>538.6</b>	<b>760.4</b>
Annual average (billion USD)	22.2	26.9	25.3



# Implementation Measures

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- (i) Measures on promoting and encouraging investment;
- (ii) Measures on mechanisms and policies;
- (iii) Measures on environmental protection and response to climate change, science and technology;
- (iv) Measures on human resource development;
- (v) Measures on international cooperation;
- (vii) Measures on planning management.



MINISTRY OF INDUSTRY AND TRADE

**Thank you!**

