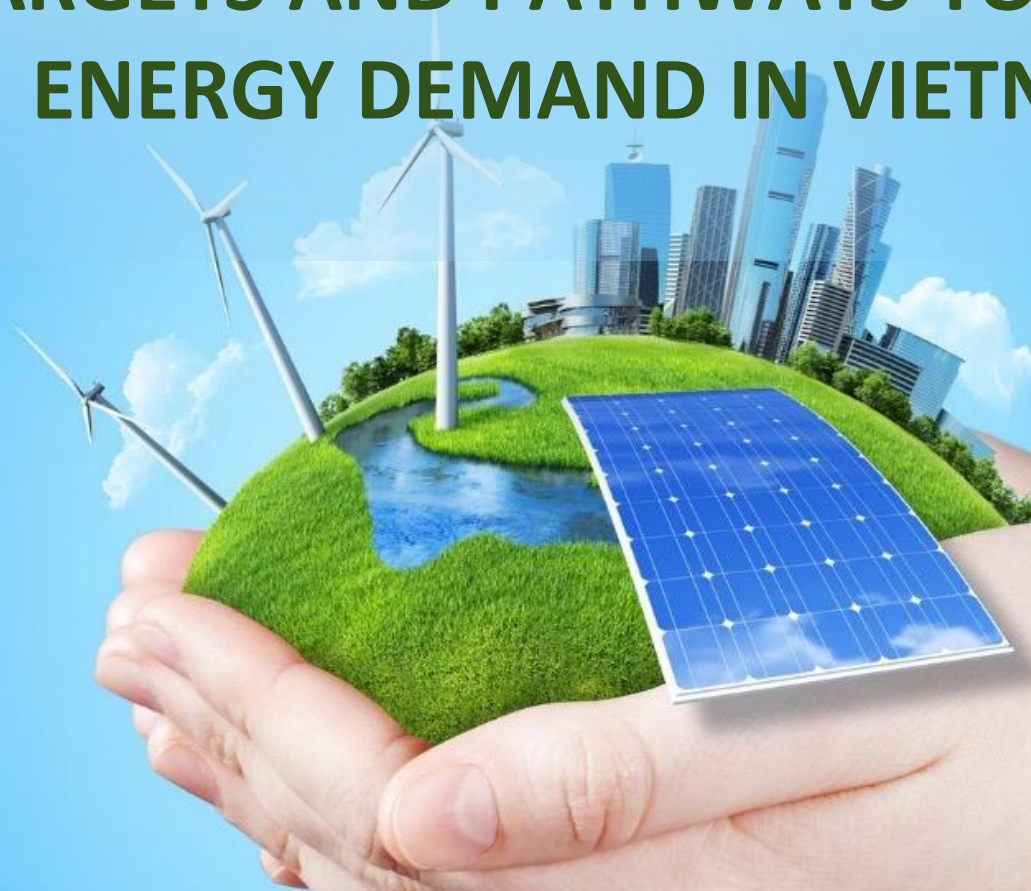




**Ministry of Industry  
and Trade of Vietnam**

# **RE TARGETS AND PATHWAYS TO MEETING ENERGY DEMAND IN VIETNAM**





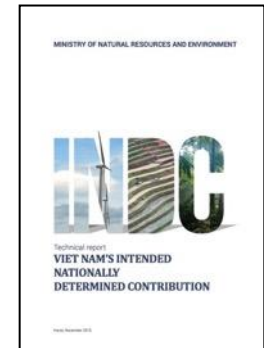
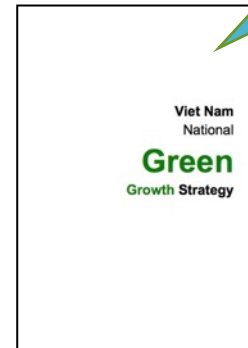
# Strategic Energy Planning



Reduce GHG emissions from energy activities by 10% to 20% compared to the BAU case.

## POLICIES IN PLACE

- National Green Growth Strategy (VGGs)
- Nationally Determined Contributions (NDC)
- National RE Development Strategy (NREDS)
- Revised Power Development Plan 7



“Viet Nam’s INDC promotes *effective exploitation and increase the proportion of new and renewable energy sources in energy production and consumption*, by developing and implementing financial and technical mechanisms and policies, and developing a renewable energy technology market, domestic industries and local service providers”

“The Government of Vietnam has approved the Vietnam Renewable Energy Development Strategy to 2030 with outlook up to 2050, which aims to *give priority to renewable energy*, especially biomass, biogas, wind and solar, for energy and electricity uses.”



# RE Targets: A Long-term Vision

➤ Announcing the National Renewable Energy Development Strategy (NREDS) late 2015

Targets	2015	2020	2030	2050
<b>Greenhouse Gases Emission Reductions (compared to business-as-usual)</b>				
Energy sector		5%	25%	45%
<b>Net energy import reduction</b>				
Coal	0	0	40 million ton	150 million ton
Oil	0	0	3.7 million ton	10.5 million ton
<b>Power production sources</b>				
Total	58 TWh	101 TWh	186 TWh	452 TWh
Hydro	56 TWh	90 TWh	96 TWh	N/A
Wind	0.18 TWh	2.5 TWh	16 TWh	53 TWh
Solar	0.01 TWh	1.4 TWh	35 TWh	210 TWh
Biomass	N/A	N/A	N/A	N/A
Biogas	4 million m <sup>3</sup>	8 million m <sup>3</sup>	60 million m <sup>3</sup>	100 million m <sup>3</sup>
<b>Biomass/biogas utilization for power generation</b>				
Agricultural residues	45%	50%	60%	70%
Husbandry's residues	5%	10%	50%	~100%
MSW	0%	N/A	30%	70%
<b>Solar water heating</b>				
Installed capacity	3 million m <sup>2</sup>	8 million m <sup>2</sup>	22 million m <sup>2</sup>	41 million m <sup>2</sup>
Energy saved	0 MTOE	1.1 MTOE	3.1 MTOE	6 MTOE

Offshore wind: after 2030!



# Overall Objectives for Power Planning 2016-2020

Fully supply for the domestic electricity demand, meeting the national socio-economic development objectives with ***an average GDP growth rate of around 7.0%/year during 2016-2030:***

- Mobilization of all domestic and international resources for power development in order to ensure the sufficient supply of electricity with increasingly quality and reasonable electricity prices for the country's socio-economic development;
- Use of primary energy sources in diversified, efficient way for power generation;

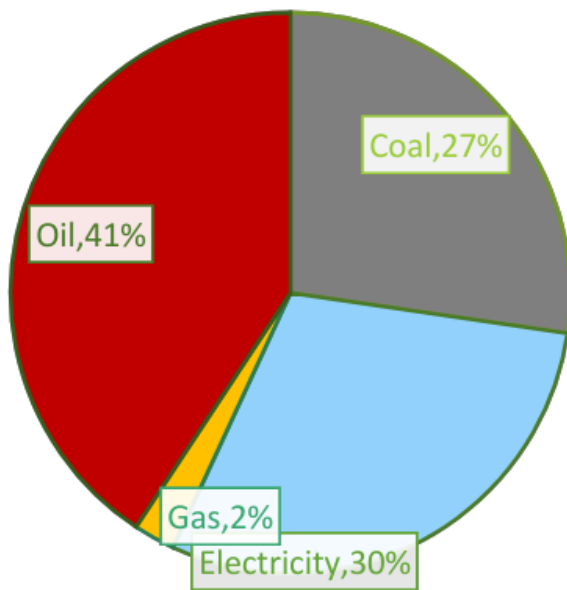
***Boosting development and use of renewable energy sources for electricity production, step by step raise the proportion of electricity produced from renewable energy sources so as to reduce dependence on electricity sources from imported coal, contributing to ensuring energy security, mitigating climate change, protecting the environment and sustainable development of socio-economic;***

- Forming and developing intelligent electricity systems, ***capable of integrating with renewable energy sources.***

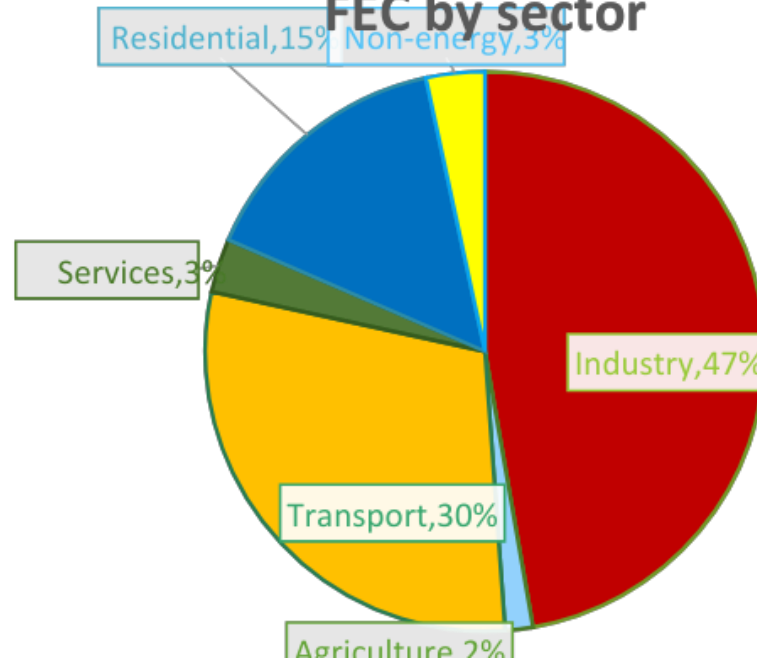


# Current Status: Final Energy Consumption

### FEC by fuel



### FEC by sector



Source: MOIT's Energy Statistics Yearbook 2015



# Current Status: Renewable Energy

## Small Hydro



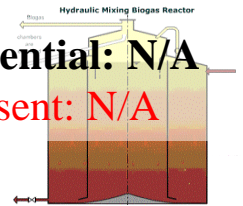
**Potential: ~ 7.000 MW**  
**Present: ~ 1670 MW**

## Biomass



**Potential: ~ 2000 MW**  
**Present: ~ 150 MW**

## Biogas



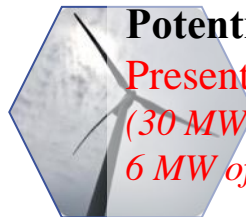
**Potential: N/A**  
**Present: N/A**

## Solar energy



**Potential: ~ 4-5kWh/m<sup>2</sup>**  
**Present: ~ 4 MW**  
(Households, pilot projects)

## Wind energy



**Potential: ~8,000 MW (≥6 m/s)**  
**Present: 146 MW**  
(30 MW onshore, 99.2 MW grid-connected, 6 MW off-grid)

## Geothermal



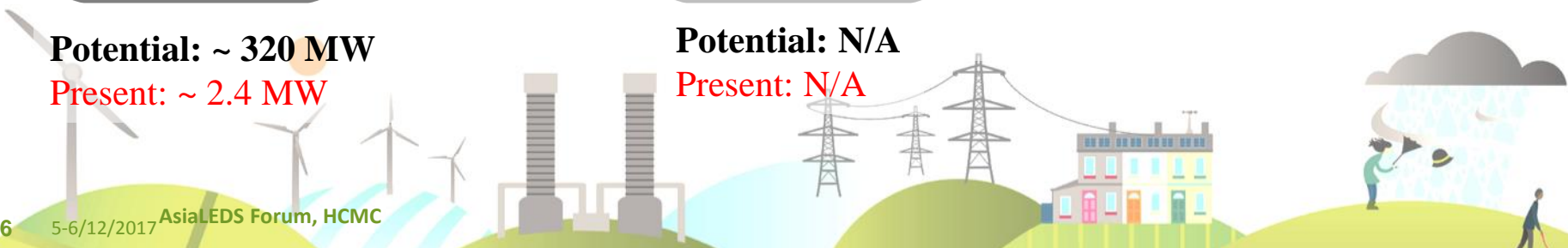
**Potential: N/A**  
**Present: N/A**

## M.Solid wastes

**Potential: ~ 320 MW**  
**Present: ~ 2.4 MW**

## Ocean energy

**Potential: N/A**  
**Present: N/A**





# Demand Forecast

➤ Reconsidered to reflect new target of GDP growth rate

Items	Unit	2015	2020	2025	2030
Power sale	GWh	143.300	234.558	352.288	506.001
Production	GWh	164.300	265.406	400.327	571.752
Pmax	MW	25.254	42.080	63.471	90.651



# Role of Renewable Energy in the Power Mix

- Total capacity of **hydropower** (including pump storage) will range from approximately 17,000 MW to around 21,600 MW by 2020, about 24,600 MW by 2025 (pump storage 1,200 MW) and about 27,800 MW by 2030 ( pump storage 2,400 MW ). Electricity production will account for about 29.5% by 2020, about 20.5% by 2025 and about 15.5% by 2030.
- The total capacity of **wind power** from current 140 MW to about 800 MW by 2020, about 2,000 MW by 2025 and about 6,000 MW by 2030. The generated electricity will account for about 0.8% by 2020, 1% by 2025 and about 2.1% by 2030.
- Development of electricity using **biomass**: the proportion of electricity produced will be about 1% by 2020, about 1.2% by 2025 and about 2.1% by 2030.
- The total capacity of **solar power** from the current insignificant level to about 850 MW by 2020, about 4,000 MW by 2025 and about 12,000 MW by 2030. The electricity produced from solar power accounts for approximately about 0.5% in 2020, about 1.6% in 2025 and about 3.3% in 2030.





# Summary of Power Sources by 2030

	2020	2025	2030
Hydro power	18.060	17.962	25.400
Small hydro power	3.540	4,239	5.915
Pump storage		1,200	2,400
Wind power	800	2,000	6,000
Biomass	750	1,824	3,281
Solar power	850	4,000	12,000
Coal fired	26.000	47.600	55.300
Gas fired	9.000	15.000	19.000
Others	1.440	1.448	6.154
<b>Total</b>	<b>60.000</b>	<b>96.500</b>	<b>129.500</b>
<b><i>Pmax (MW)</i></b>	<b>44.224</b>	<b>68.367</b>	<b>100.215</b>

Source: Decision 428/QĐ-TTg dated 18<sup>th</sup> March 2016





# Summary of Power Grid by 2030

Items	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 line	km	2.746	3.592	3.714
220 kV line	km	7.488	4.076	3.435

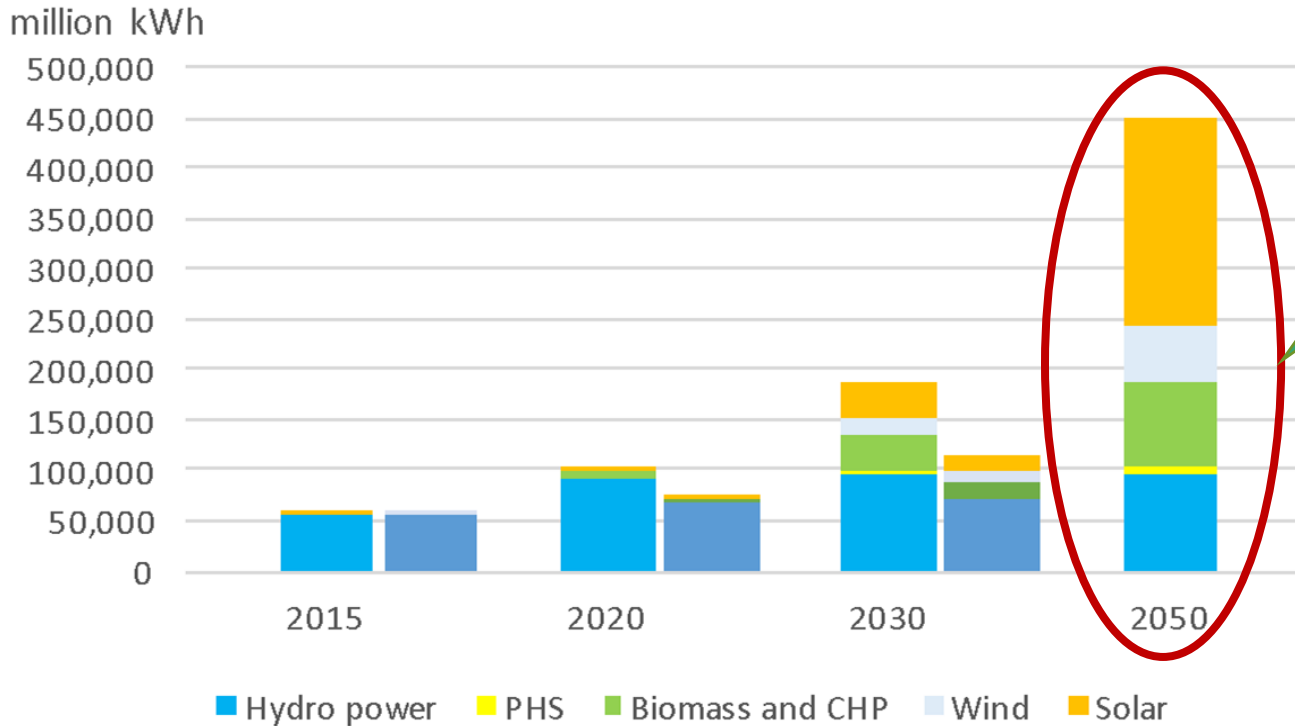
- Build and upgrade power grid, step by step to meet the technical standards of transmission grids; By 2020, transmission grids will meet N-1 reliability standards for main equipment and ensure to meet the required quality standards.
- 220 kV transmission grid is constructed in a double ring structure. Application of smart grid technology in power transmission





# Adjusted RE Targets compared to NREDS

## NREDS vs. Revised PDP7



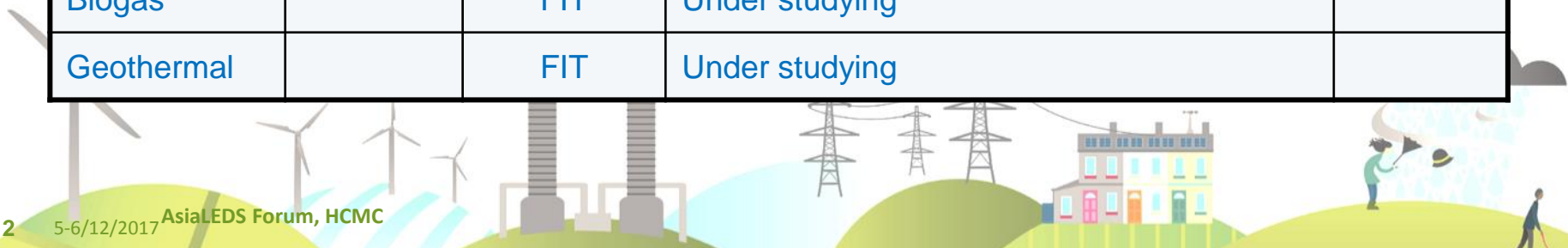
New long-term RE targets in line with NDC?





# RE Incentivization Policies

RE type	Status		Level	Note
	Existing	Proposing		
Small hydro	Avoided cost		By year, by season (about 5 UScents/kWh)	
Wind power	FIT	revising	7.8 UScents/kWh (Decision 37/2011/QD-TTg)	Revising
Biomass	FIT		- (Combined Heat & Power) CHP: 5.8 UScent/kWh - Generation Cost from imported coal power plant.	
MSW	FIT		- Land fill gas: 7.28 UScent/kWh - Incineration: 10.05 UScent/kWh	
Solar PV	FIT	FIT	-9.35 US cents/kWh	
Biogas		FIT	Under studying	
Geothermal		FIT	Under studying	





# Investment Capital Needs

Total investment capital for development of power sources and grids (excluding BOT sources) in the 2016-2030 will be about US\$ 148 billion, divided into phases as follows:

- For the period of 2016-2020 period: about US\$ 40 billion, on average US\$ 7.9 billion a year. Of which 75% for power generation; 25% for power grid construction.
- For the period of 2021 - 2030: about US\$ 108 billion, on average US\$ 10.8 billion a year. Of which 74% is for power generation; 26% for power grid construction.

*Source: Decision 428/QĐ-TTg dated 18<sup>th</sup> March 2016*



# Challenges

- Vietnam will face a shortage of primary energy and must import coal (2017) and LNG (2023) to ensure adequate supply of energy for socio-economic development.
- The investment capital for the energy sector infrastructure which is estimated at over USD 310 billion in the period up to 2035, is a great pressure on the economy, especially the power industry (over 66%). For power sector alone, the demand for investment by the year 2030 is \$ 148 billion (excluding BOT projects).
- To ensure reasonable energy prices so as not to put pressure on the socio-economic sectors.
- To ensure the sustainable development objectives, paying attention to environmental factors in the development of the energy industry, especially the coal-fired thermal power projects.



# Pathway: Clean Energy for Energy Security

*While looking forward to securing the supply of conventional fossil fuels:*

## 1. Development of efficient energy infrastructure

- development of strategic reserve storage
- explore and discover new natural resources: increase of reserve and local supply.

## 2. Diversify energy system, with focus on renewable energy and efficient use of energy.

- higher integration of renewable renewable energy into the grid
- encouraging and promoting efficient use of energy.



# Pathway: Enabling Private Financings

- Boosting equitization of the generation corporations, State owned enterprises where as per regulations it is not necessary for the State to hold the dominant shares.
- Step by step increase the ability of mobilizing internal finance in the enterprises operating in the power sector through the solutions: Improvement of efficiency and operation of the enterprises, ensure the ratio of the equity for development investment as required by the local and international financial institutions.
- Attract more foreign direct investment (FDI) for development of power projects.
- Sector restructuring to gradually develop healthily competitive market given the basis of ensuring energy security and cost reduction.
- Develop market and suitable policies to provide price signal in transparent manner to attract investment and development of sustainable energy sector





# Pathway: Toward Sustainable Energy Development

## Apply clean technology in coal-fired power plants

- Selected technologies must be advanced, highly efficient, with little impact on the environment
- Utilization of ash residue of the coal-fired power plants for construction materials and other industries.

## Attracting investment

- To implement electricity prices according to the market mechanism and regulated by the State, ensuring harmony combination between the socio-economic objectives of the State and the objectives of production and business, financial autonomy of the enterprises.
- Electricity prices should stimulate the development of electricity, create an environment that attracts investment and encourages competition in the generation, transmission, distribution, retail and electricity use; Encourage the rational use of energy forms and the use of domestic energy, reducing the dependence on imported energy.

## Renovation, upgrading and modernization of power transmission and distribution grids to reduce losses, ensure safety and reliability.

**Step-by-step applying incentives and compulsory for renovation of technologies and equipment of electricity-intensive industries** (steel, cement and chemicals); Limit and prepare to ban the import of old equipment, low efficiency in the production and use of electricity.



Tiết kiệm điện  
vì một hành tinh Xanh

Thank you!