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## Vietnam Country Report on **Cleaner Coal**

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# Outline

- **Vietnam in brief**
- **Vietnam energy sector**
- **VN power development strategy 2004-2010 and upto 2020**
- **VN clean coal ...**

# Vietnam in brief

- **Location:** Eastern Seaboard of the Indochina Peninsula
- **Area:** 330,991 km<sup>2</sup>
- **Population:** 82 mil. (2004)
- **Capital:** Hanoi
- **Climate:** Tropical, monsoon
- **Main religion:** Buddhism
- **GDP:** 40 bil. USD (2004), growth 7.5% pa
- **Annual income per capita:** 545 US\$ (2004)

# Vietnam energy sector

- **Presently Vietnam is net energy exporter until 2020:** domestic consumption 24.6 mil. TOE (2004).
- **Role of Energy Sector in Economy:** Energy sector contributed annually (2004):
  - 15% GDP
  - 30% Government Revenues
  - 23% Exports (crude oil), 11% Imports (petrol)
  - US\$ 261 mil. to State Budget

## Energy consumption (2004)

Present energy consumption level: 320 kgOE/capita

Electricity consumption: 480 kWh/capita

Rural electricity consumption: <15 kWh/month per household

# Vietnam energy sector

## Energy resources - Potential exploit. for power

- **Coal:** 3.88 bil. T 6-8 mil. T
- **Oil:** 2.3 bil. T  
(615-957 bil. T proven)
- **Gas:** 1,207-1,507 bil. m<sup>3</sup> 12 bil. m<sup>3</sup>  
(600 bil. m<sup>3</sup> proven)
- **Tech. feasible hydropower:**  
75-80 bil. kWh 55-65 bil. kWh  
18,000-20,000 MW
- **Uranium deposits:** 210,000 T of U<sub>3</sub>O<sub>8</sub>
- **Geothermal resources:** 200-400 MW
- **Solar, Wind, ...:** 200-300 MW
- **Biomass energy:** 310-410 MW

# Vietnam energy sector

## Energy production

- **Coal (2003): 26.3** mil. T (growth 10.4% pa during 1991-2003)
- **Oil (2003): 20.3** mil. T (growth 16.4% pa during 1991-2003)
- **Gas (2003): 3.72** bil. m<sup>3</sup> (2.98 bill. m<sup>3</sup> for power generation)
- **Hydropower (2005): 16.5** mil. kWh
- **Electricity (2005, incl. Hydropower): 53.5** mil. kWh

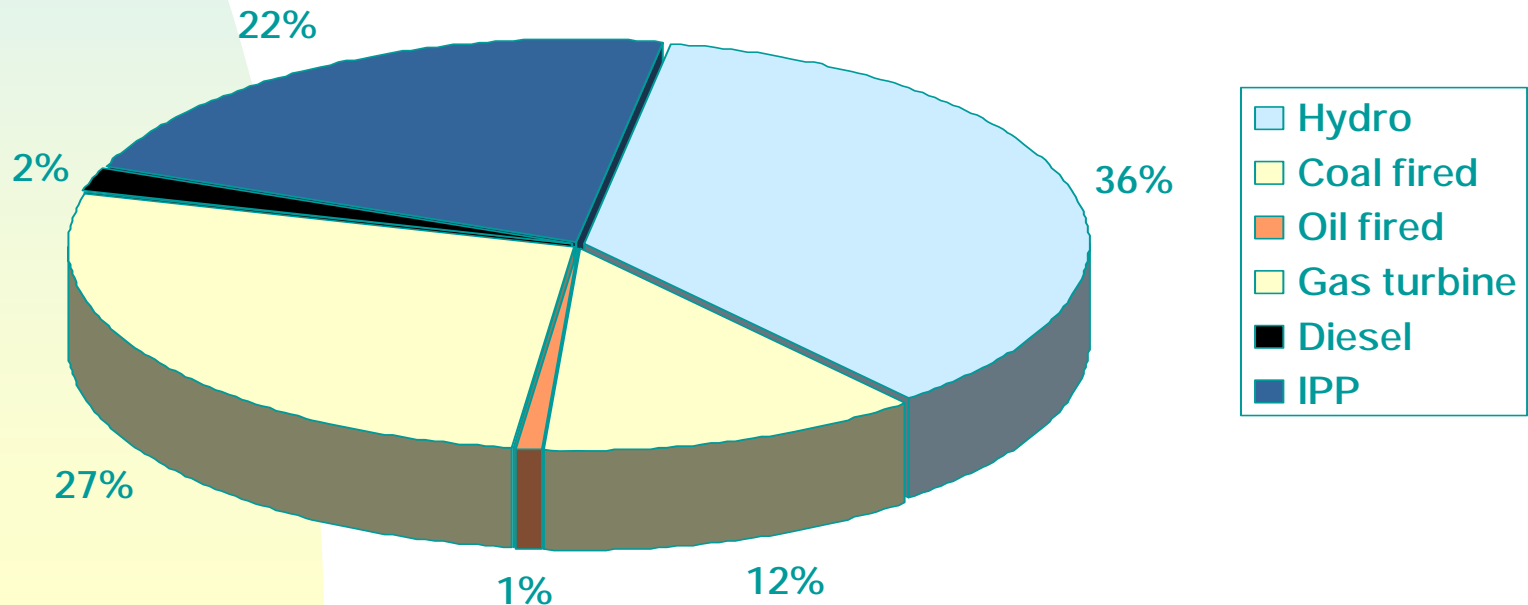
## Energy demand forecast (2015 total) 43241 kTOE:

- **Coal: 6,743** kTOE
- **Petroleum products: 23,898** kTOE
- **Gas: 1,800** kTOE
- **Electricity: 10,799** kTOE

# Vietnam energy sector

## Power sector (2005)

- Installed capacity: **11,298** MW (Pmax: 10,500 MW)
- Electricity output: **53.5** bil. kWh (com.: **45.6** bil. kWh)
- Aver. growth rate of production 1995 - 2002: 13.7%  
2001 - 2005: 15.3%



# VN power development strategy 2004-2010 and upto 2020

1. Power development should go first;
2. Develop various resources for electricity, especially from new and renewable;
3. Diversify supplies of electricity and give priority to development of domestic resources;
4. Encourage all kind of investment in power generation and grid.

# VN power development strategy 2004-2010 and upto 2020

4. Give subsidies for power projects in rural and mountainous areas;
5. Ensure the sustainability of power development;
6. Formulate policies for a competitive power tariff for establishment of electricity market;
7. Formulate energy science & technology policies.

# PROJECTION TO 2025

<b>Projected Structure of Primary Energy, % in OE</b>				
<b>Types</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>
Coal	31.8	31.6	33.6	34.3
Cruide Oil	27.5	22.6	19.5	18
Gas	10.5	13.5	14.5	16.1
Hydro	9.5	13.1	13.4	12.8
Small Hydro	0.5	0.7	0.9	1
Renewables	20.1	18.6	18.1	17.7
Total	99.9	100.1	100	99.9

# COAL USEAGE TO 2025

<b>Projected Balance of Supply-Demand on Coal, thousands Ton</b>					
	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>
Coal Production	32396	42780	49088	61052	64501
Coal Export	-17987	-22606	-15542	-5381	
Coal Import	101	3067	6130	7633	37163
Total Coal Supply	14510	23241	39676	63304	101664
Coal for Power	3807	11735	22622	40033	76249
Coal for Other	8840	11506	17054	23271	25415
Total Coal Demand	12647	23241	39676	63304	101664

# POWER FUELS TO 2025

<b>Projected Structure of Power Generation by Fuels, GWh</b>					
<b>Fuel</b>	<b>2005</b>	<b>2010</b>	<b>2015</b>	<b>2020</b>	<b>2025</b>
Coal Fired	9013	28547	56558	104515	200281
Oil and Gas Fired	26952	44019	69229	85757	112656
Hydro	17497	33345	52977	63589	62702
Small Hydro		1881	3289	5072	6618
Import Power		4858	7997	24815	24830
Nuclear Power				10268	24566
Total	53462	112650	190050	294016	431653

## Cleaner Coal Options for:

- Power Generation – CFB, deNO<sub>x</sub>, deSO<sub>x</sub>, ...
- Industrial Use – FB, CFB, ...
- Residential Use – Brickquete, ...

## VINACOMIN CFB Power Plants:

- Na Duong 100 MW, CFB unit 50 MW
- Cao Ngan 100 MW, CFB unit 50 MW
- Cam Pha 600 MW, CFB unit 150 MW
- Mao Khe 440 MW, CFB unit 220 MW
- Son Dong 220 MW, CFB unit 110 MW
- ...

# **EVN CFB Power Plants:**

- Mong Duong 1: 1000 MW, CFB unit 250 MW
- ...



**Thanks for  
Attention !**