

IEEJ: May 2009

MINISTRY OF INDUSTRY AND TRADE

**ENERGY BALANCE OF
VIETNAM BY 2020**



April-2009

CONTENTS



- **General information about Vietnam's energy resources**
- **Current status of Vietnam's energy supply vs. demand**
- **Forecasted energy supply-demand balance in Vietnam by 2020**
- **Major difficulties and bottlenecks**

VIETNAM ENERGY RESOURCES



- **Hydropower**

- Total estimated potential: 300 billion kWh/year:
 - + The North: 60%
 - + The Central: 26%
 - + The South: 14%
- The eco-technical potential: about 80 billion kWh
- Total capacity of existing hydropower plants: 5245 MW (2008)

VIETNAM ENERGY RESOURCES



- **Coal resources**

- Total explored reserves as of early 2005:
about 4,5 billion ton, of which:

- + *Quảng Ninh*:

- Exploited Anthracite reserve: 3,1 bil tons

- Domestic mines: 200 mm tons

- + *Under-explored reserves*:

- Khoái Châu –Đông Hưng: 30 billion tons

VIETNAM ENERGY RESOURCES



- **Oil and gas**

- Total oil and gas in place: 3-4 billion m³ oil equivalent, of which
 - + Oil/condensate: 1,2 – 1,5 billion m³
 - + Gas: 1,8 – 2,5 thousands of billion m³
- 70 oil and gas discoveries found with total reserves of 900MM m³ oil equivalent (500 MM m³ for oil and 400 billion m³ for gas).

VIETNAM ENERGY RESOURCES



- **Oil and gas (continues)**
 - As at 2004 year end, 10/20 oil and natural gas fields have been put into production with total output of:
 - 169,9 billion tons crude oil
 - 18,67 BCM gas which have been used for power generation and residential purpose.
 - Undiscovered oil and gas (about 50% of the oil and gas in place) locate in coastal deep water (Phu Khanh basin), offshore and sensitive areas of the East Sea and overlapping areas.

VIETNAM ENERGY RESOURCES



- **New and renewable sources of energy**
 - ***Geo-thermal***: More than 300 sources of hot mineral water existing (30°C – 105°C)
 - Focus Area: North Western and Central part
 - No available assessment of potential
 - ***Solar energy***
 - + Average sunshine hours: 2000 – 2500 hours/year
 - + Total of average heat radiating energy: 150kCal/cm²/year
 - + Estimated potential: around 43,9 billion TOE/year

VIETNAM ENERGY RESOURCES



- **New and renewable sources of energy**
 - ***Wind energy***: Small potential, Distribution of wind energy density:
 - Island area: 800 – 1400 kWh/m²/year
 - Coastal and highland area: 500-1000 kWh/m²/year
 - Other area: below 500 kWh/m²/year
 - ***Uranium***: World medium potential
 - + Total estimated reserves: more than 200 thousand tons of U₃O₈.

VIETNAM ENERGY RESOURCES



– *Bio-mass energy*

- + Total potential reserves (wood, straw, sub-farming products): 43-46 MM TOE/year:
 - Wood energy: 60% (26-27 MM TOE)
 - Straw and sub-farming products energy: 40% (17-19 MM TOE)
- + Producing reserves: 10%

CURRENT STATUS OF VIETNAM'S ENERGY SUPPLY AND DEMAND



Primary energy supply: Total of primary energy produced increased by 13.7%/year during the period of 1990-2004 (from 7,1 to 43,6 MM TOE):

- Coal: 22,7%/year (4,5 MM tons - 25,05 MM tons) **50 MM tons -2008**
- Crude oil: 15.5%/year (2,7 MM tons – 20,3 MM tons)
- Natural gas: 44,1%/year (unremarkable - 4,67 bil m³)
- Electricity: 13,8%/year (8,7 billions kWh – 47,1 billions kWh) **75,9 billions kWh -2008**

CURRENT STATUS OF VIETNAM'S ENERGY SUPPLY AND DEMAND

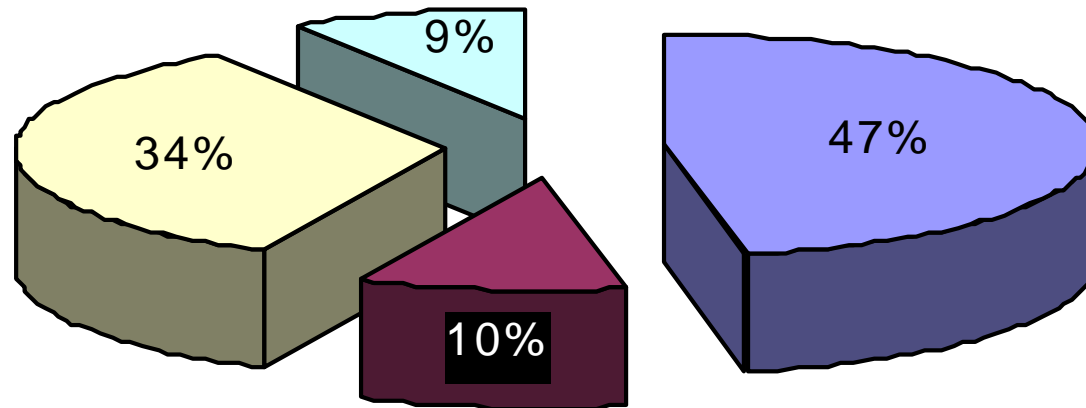


- + Hydropower: 6,9 bil. kWh – 18,1 bil. kWh (2001); 18 bil. kWh (2004), **25 billions kWh (2008)**,
- + Coal-plants: 4,3 bil. kWh (2001); 7,8 bil. kWh (2004), **11,5 billions kWh (2008)**,
- + Gas & Diesel: 8,1 bil. kWh (2001); 20,3 bil. kWh (2004), **33,3 billions kWh (2008)**,
- + Commercial electricity: 6,2 bil. kWh – 39,7 bil. kWh (1990 -2004:14,2%/year; 01-04: 15,4%/year), **65,9 billions kWh -2008**

CURRENT STATUS OF VIETNAM'S ENERGY SUPPLY AND DEMAND



STRUCTURE OF ENERGY CONSUMPTION IN 2004

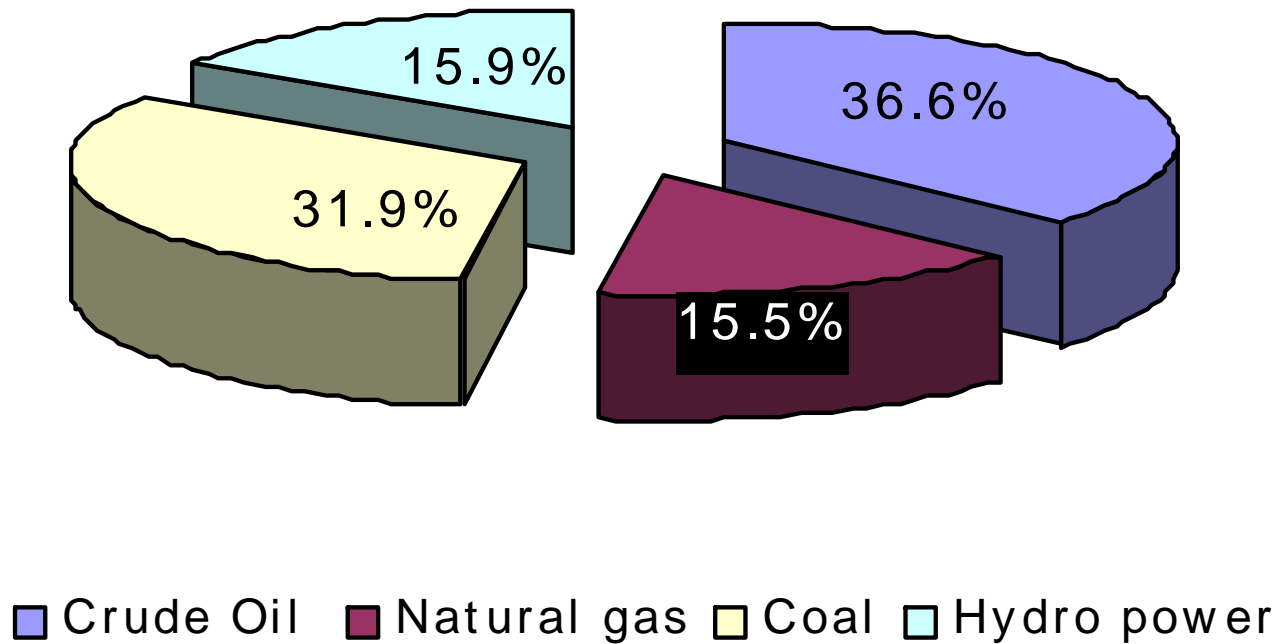


■ Industry ■ Commerce and service ■ Transportation ■ Agriculture

CURRENT STATUS OF VIETNAM'S ENERGY SUPPLY AND DEMAND



STRUCTURE OF ENERGY PRODUCTION IN 2004



ENERGY IMPORT AND EXPORT DURING PERIOD 1990 -2004

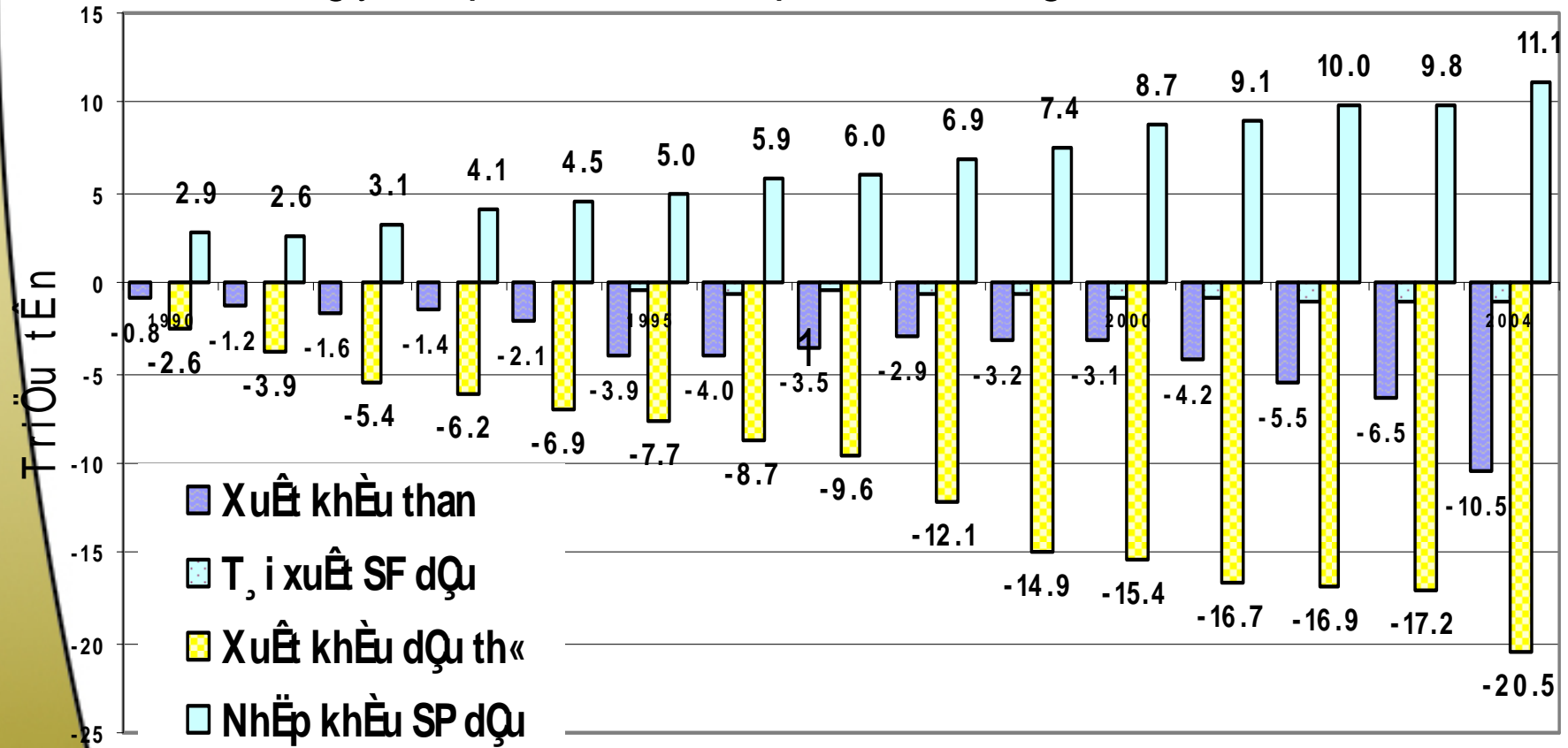


Import and Export	1990	2004
Crude Oil export	2,6 MM tons	20 MM tons
Coal export	0.8 MM tons	10.5 MM tons (2003)
Energy export turnover		Around 6 billions USD (increase by 50%/year in 2003)
Petroleum product import	1,9 MM tons	11 MM tons
Petroleum product import turnover		3,57 billions USD (11% total turnover)
Net export	0.3 MM TOE	16,2 MM TOE

ENERGY IMPORT AND EXPORT DURING PERIOD 1990 -2004



Energy Export and Import during 1990-2004



ENERGY IMPORT AND EXPORT DURING PERIOD 1990 -2004



- **Total final energy consumption during 1991-2004**

increased by 10,8%

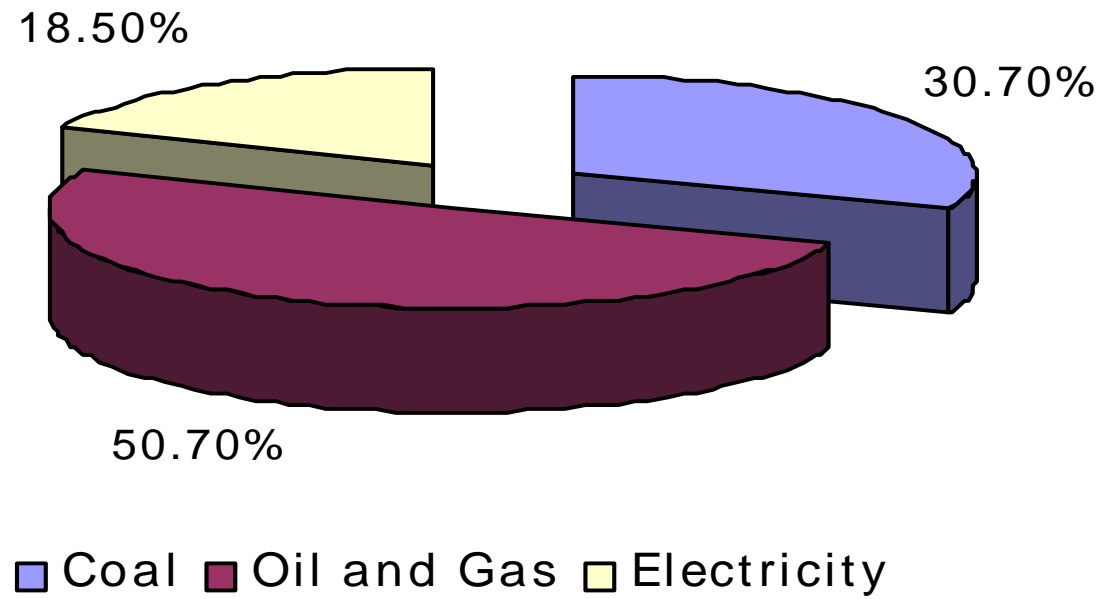
- Year 1990: 4,14 MM TOE
- Year 2000: 12,2 MM TOE
- Year 2004: 17,7 MM TOE

STRUCTURE OF ENERGY COMSUMPTION DURING 1990-2004



Product	1990 (%)	2004 (%)
Coal	31,4	30,7
Oil and gas	55,9	50,7
Electricity	12,6	18,5

STRUCTURE OF ENERGY COMSUMPTION DURING 1990-2004



ENERGY COMSUMPTION DURING 1990-2004



The average consumption per capita of Vietnam is estimated at 20% of the world's average level

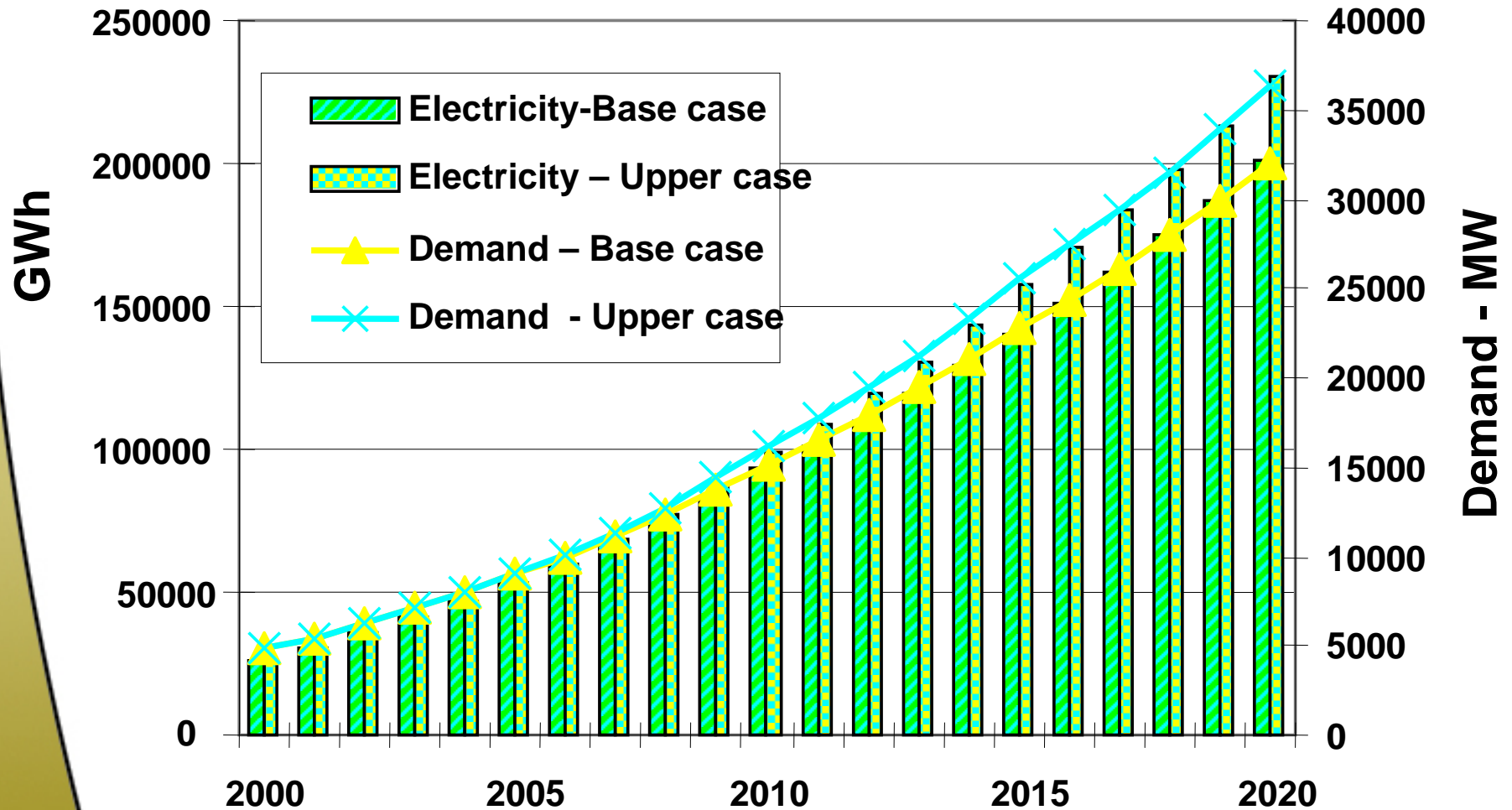
Item	1990	1995	2000	2004
Supply of primary energy, kgOE/capita/year	100	152	249	318
Primary energy consumption kgOE/capita/year	64	110	157	218
Commercial power, kgOE/capita/year	94	155	286	488

FORECASTED OIL AND GAS PRODUCT DEMAND

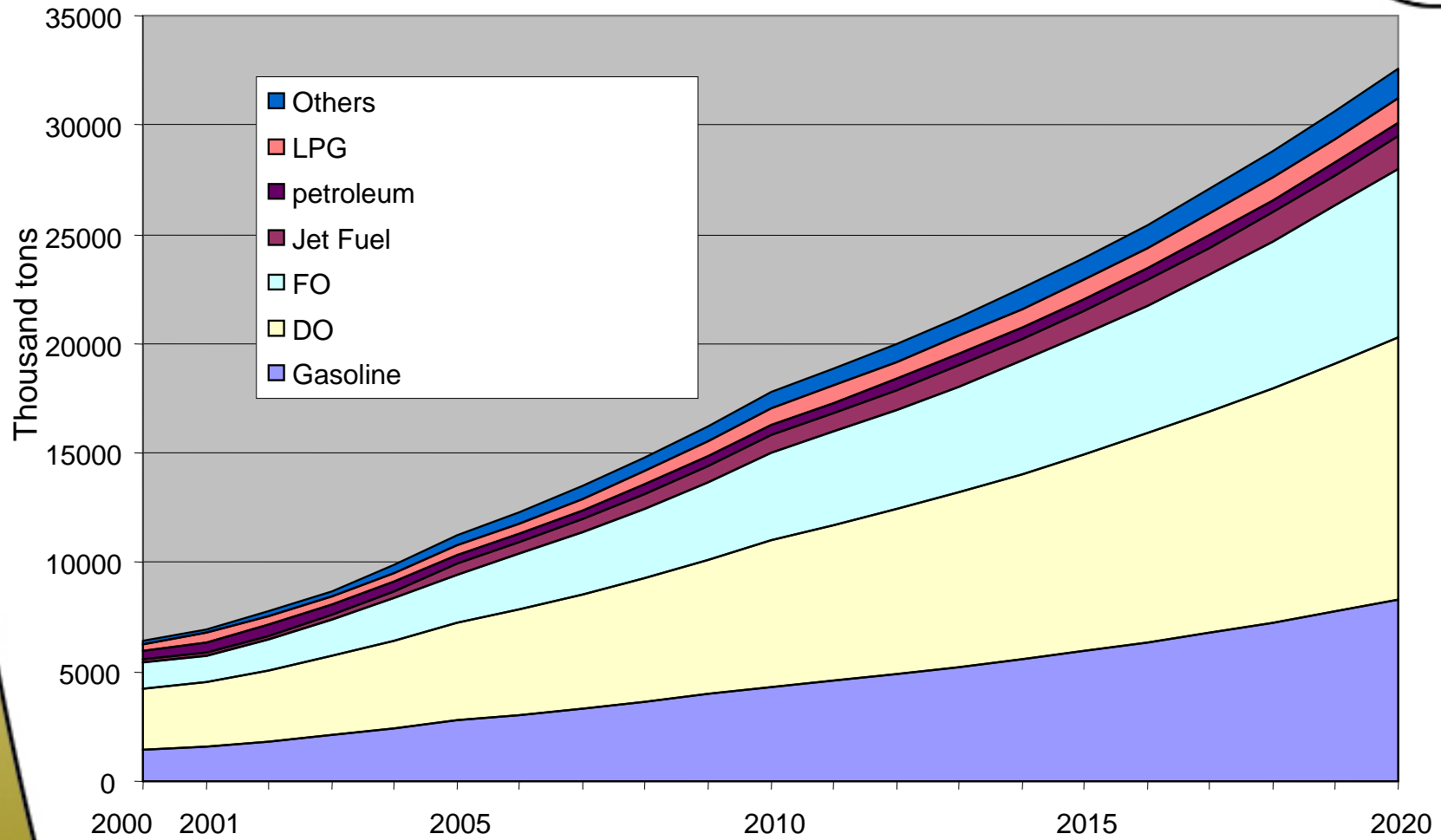


Product	2010 (MMtons)	2020 (MMtons)	2001-2010 (%/year)	2010-2020 (%/year)
Gasoline	15-16	26-28,6	7,5 - 8	6,4 – 6,8
Petrochemical	8	17	10%	5%
Gas	10 billion m ³	15-16 billion m ³		

FORECASTED ELECTRICITY DEMAND BY 2020



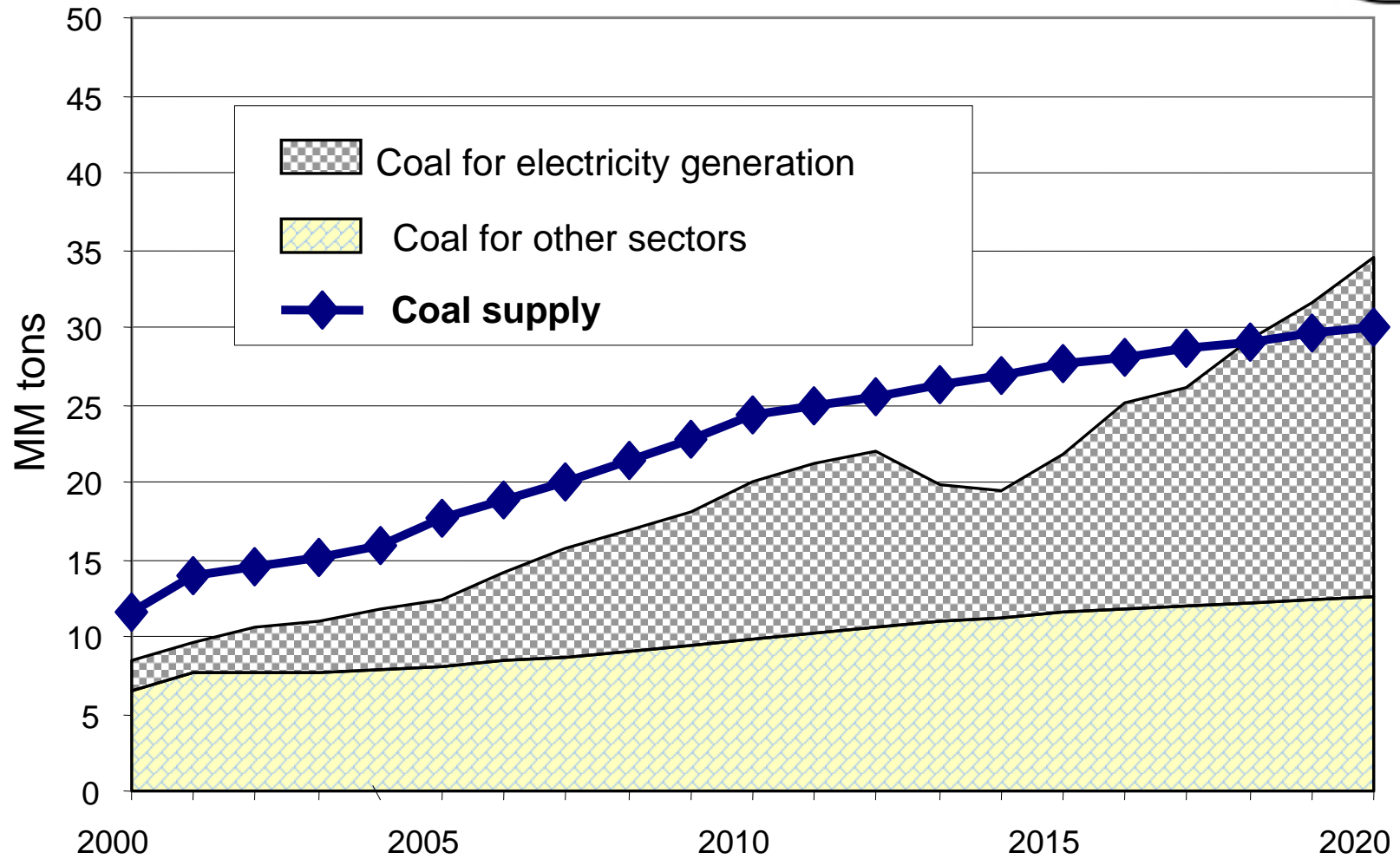
FORECASTED PETROLEUM PRODUCT DEMAND BY 2020





ENERGY BALANCE BY 2020

COAL SUPPLY-DEMAND BALANCE



FORECAST OF CRUDE OIL PRODUCTION



- *Vietnam remains to be the crude oil export country up to 2010*

Duration	Production (MM tons)	Domestic production (MM tons)
2006 - 2010	18,2 - 20	18 - 19
2011 - 2015	17,2 - 21	16 - 18
2016 - 2020	16,5 - 20,5	13 - 15

FORECAST OF CRUDE OIL IMPORT DEMAND



- *Vietnam become crude oil import country from 2015*

Crude oil import	2015 (MM tons)	2020 (MM tons)
Base case	1,2	10
Low case	5	14

CRUDE OIL SUPPLY AND DEMAND BALANCE



- *Vietnam remains crude oil import country by 2020*

Crude Oil product import	2010	2020
	10 MM tons	10-13 MM tons

Assumption:

- *Dungquat refinery comes into operation by 2009*
- *Refinery #2, #3 comes into operation by 2015 and 2020*

NATURAL GAS SUPPLY-DEMAND BALANCE



Production by 2020 (billion m³)	Demand		
	2005 (billion m³)	2010 (billion m³)	2020 (billion m³)
15-16	5,3 - For electricity: 4,1 - Others: 1,2	10 - 8 - 2	15-16 - 12-13 - 3

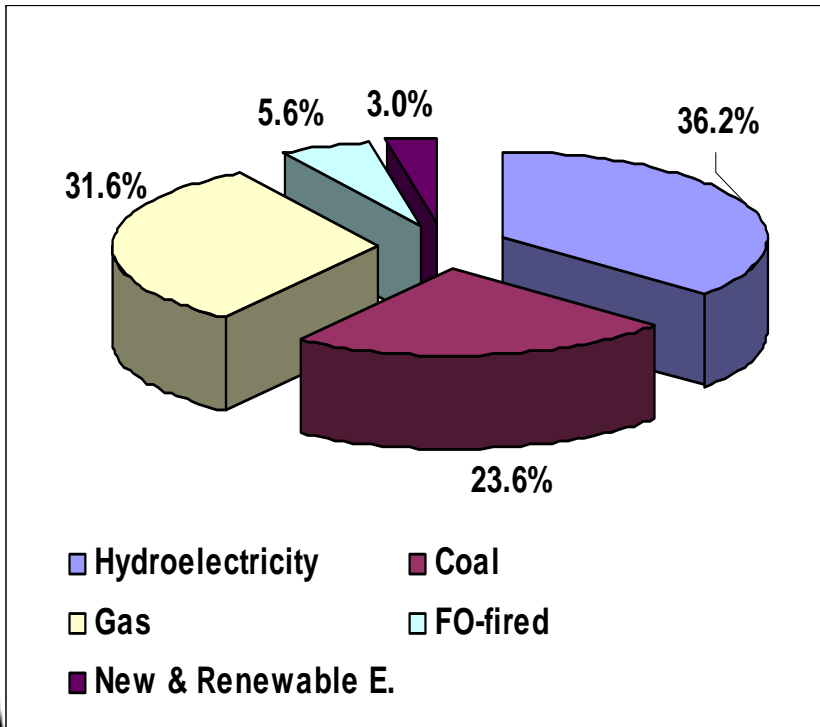
PRIMARY ENERGY BLANCE FOR ELECTRICITY GENERATION



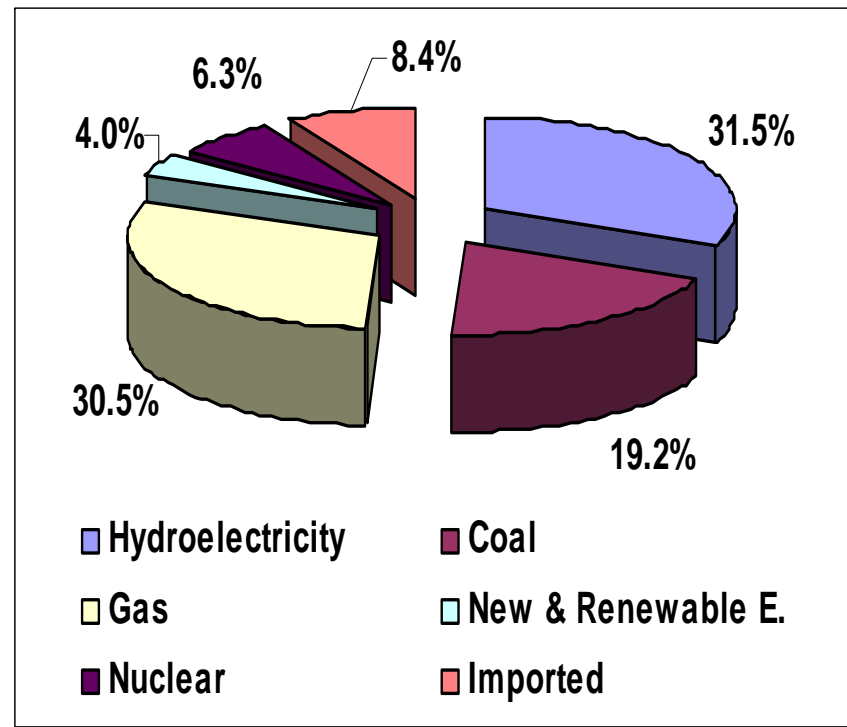
- For base case (gas supply of 12billion m³)

Total energy consumption	Hydropower	Coal	Natural Gas	FO fired electricity	New and renewable energy
2010: 20 MM TOE	36,2%	23,6%	31,6%	5,6%	3%
2020: 35,6 MM TOE	31,5%	19,2%			Nuclear power: 6,3% Renewable energy: 4%

PRIMARY ENERGY BLANCE FOR POWER GENERATION



Year 2010



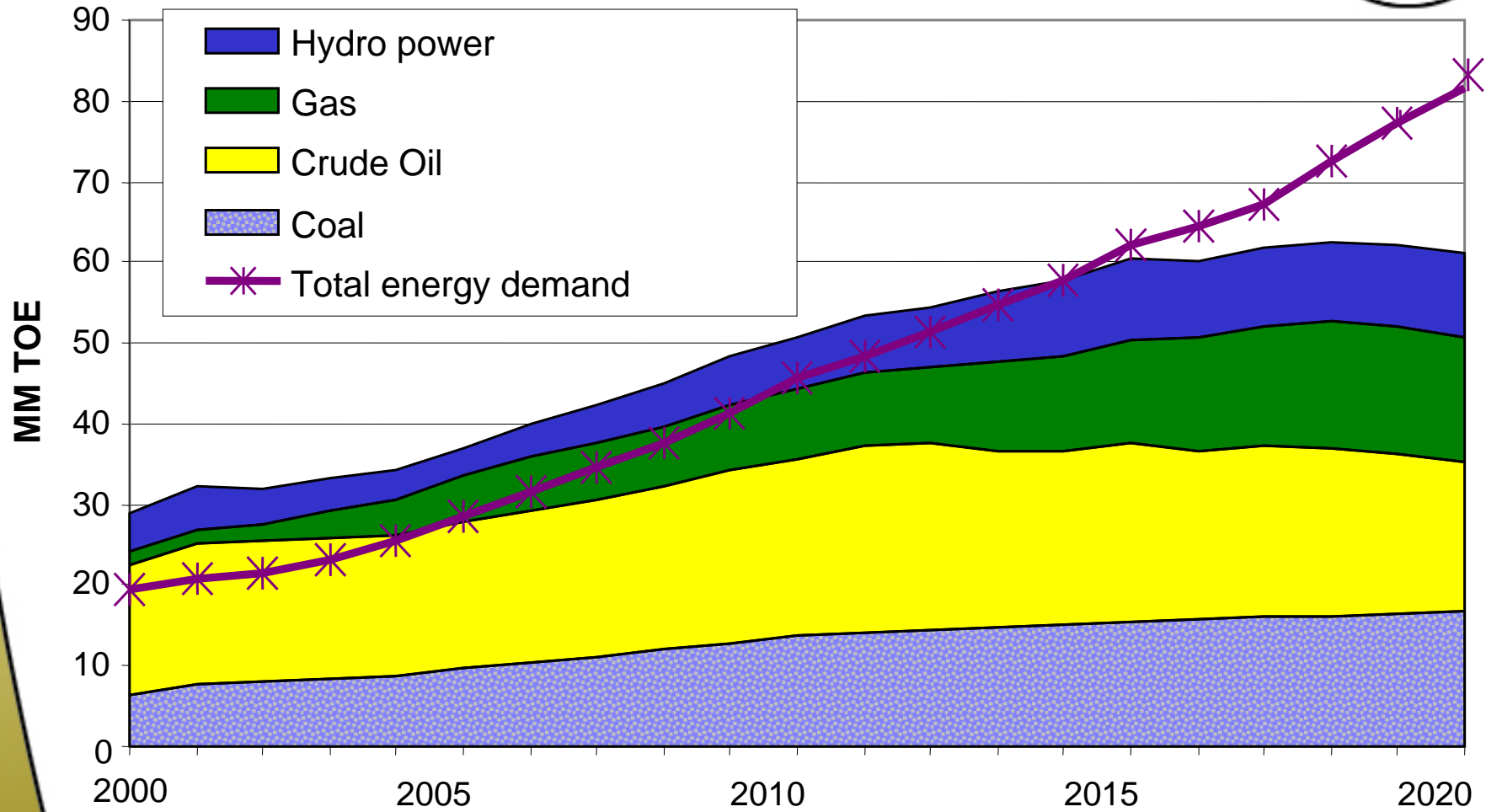
Year 2020

GENERAL ENERGY SUPPLY-DEMAND BALANCE



Energy	2010 (%)	2020 (%)
New and renewable	2,1	3,3
Nuclear power		2,9
Hydro power	<20	15-17
Crude Oil products	35	32
Natural Gas	18-20	14-15
Coal	33,6	29-30

GENERAL ENERGY SUPPLY-DEMAND BALANCE



Major difficulties and bottlenecks



- 1. Balance between conversion energy development and new-renewable energy development issues.**
- 2. Balance between energy development and environment protection issues.**
- 3. Balance between energy export for social-economic development and energy conservation issues.**

CONCLUSION



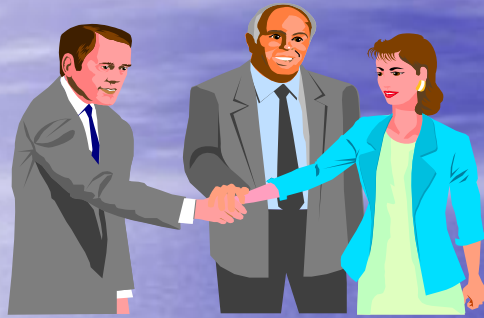
4. Energy price increasing and low-income people issues.

5. Energy development to fulfill increasing demand while shortage of fossil energy.

6. Balance between energy development and Transportable system

7. Energy development to fulfill increasing demand while shortage of capital investment.

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Thank you!



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