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**VIETNAM'S ENERGY CONSUMPTION
AND GHG_s INVENTORY ISSUE.**

*Industrial Safety Techniques and Environment Agency
Ministry of Industry and Trade of Vietnam*

General Information

- The Capital: Hanoi
- Population:
 - ✓ 86.5 million in the year 2008
 - ✓ 98.6 million people by the year to 2020
- GDP (Gross Domestic Product)
 - ✓ 7.3 percent over the last ten years.
 - ✓ 6.23% specifically in 2008
 - ✓ 3.9% in the first 6 months of 2009
- Ratio of Urbanisation and industrialization
 - ✓ Cities: 500 (in 1990); 649 (2000); 656 (2003); 743 (2008)
 - ✓ Industrial Zones: 01 (in 1991); 82 (2003); 188 (2008)





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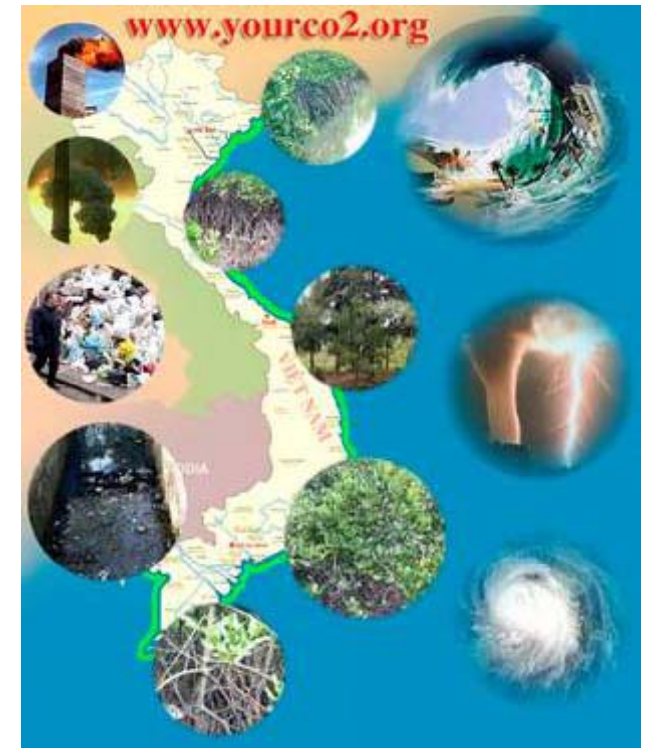
Ⓢ *Part II: GHGs emission issues*

About Energy Consumption and Combustion



State of resources consumption

- ❑ **Water** **power**
consumption: 65,000
million m3 (in 1990);
92,000 (2000);
121,000 (estimate by
the year to 2010) and
260,000 by 2040.
- ❑ **Energy consumption:**
 - ✓ **Primary: mainly coal,**
oil and natural gas



About Primary fuel



Primary Fuel	Coal	Oil	Gas
Potential	5.88 billion ton	1.98 Billion m3OE	2.42 Billion m3OE
Production 2008	39.8 million ton (40%)	14.94 million ton (37%)	7.4 Billion m³ (15%)
Import 2008		12.66 million ton	
Export 2008	19.7 million ton	13.91 million ton	

New and renewable energy

❑ Small hydro resource (≤ 30 MW):

- ✓ The potential of is 20,560 MW,
- ✓ In which for exploitation: 3,345 MW
- ✓ Production: estimated round 11.7% of primary fuel produced.

❑ Solar energy:

- ✓ Potential: 10 MW- 43.0 billion TOE per year (with 2,000-2,500 sunlight-hours/year, 150 kCal/cm²/year of total radiation energy on average)



New and renewable energy



Wind Energy

- ✓ Potential: 500 – 1,400 kWh/m²/year (location along the coastal zones)

Geo-thermal Energy:

- ✓ Potential: 661- 200 MW developed by the year to 2020 (more than 300 hot-temperature mineral water sites (30 -105oC) located in the North-West and Central of Vietnam)
- ✓ Power Generated: reached 72% and 476 MW

New and renewable energy

Biomass Energy

✓ Potential: 450 MW (43- 46 million TOE per year)

✓ 60% from woodfires, 40% heat from rice straw and agricultural waste...

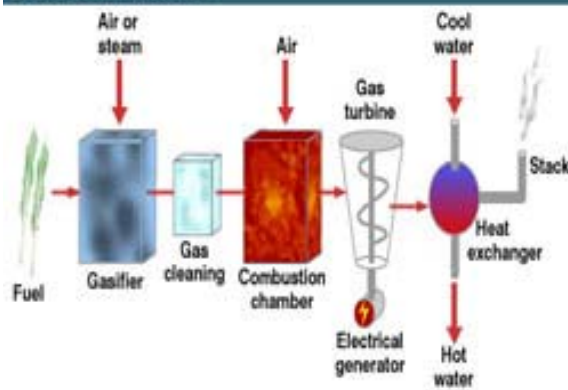
✓ Power generated: approximate 3% as 380 KTOE

✓ Heat supply: mostly 97% with 13,620 KTOE

Biogas Energy

✓ Potential in theory about 0.4 million TOE/year (10 billion m³/year), but we can exploit only 10% of it.

BIOMASS IN PRACTICE



energy consumption in industry sector from 1995 to 2000

	1995	1996	1997	1998	1999	2000	Growth 95-2000	Flexible index energy/GDP
GDP (Billion VND 1994)	56.237	63.572	74.178	79.473	88.400	100.520	12,3%	
Energy consumption, KTOE								
Coal Antracite	1.938	1.948	2.472	2.453	2.314	2.339	3,8%	0.31
Electricity	397	473	530	583	651	782	14,5%	1.18
DO	284	355	416	426	477	591	15,8%	1.28
LPG	7	11	9	34	33	92	67,4%	5.47
Natural Gas	22	21	20	19	19	19	-2,9%	-0.24
Oil	6	8	4	5	5	9	8,4%	0.68
FO	446	549	505	659	803	823	13,0%	1.06
Sinh khối	2.896	2.910	3.000	3.090	3.147	3.209	2,1%	0.17

Source: IEA, IE

energy consumption in commercial sector from 1995 to 2000

	1995	1996	1997	1998	1999	2000	Growth 95-2000	Flexible index energy/GDP
GDP (Billion VND 1994)	195.567	213.833	231.264	244.596	256.272	273.666	6,95%	
Energy consumption, KTOE								
LPG	18	53	54	109	89	94	39,2%	5,64
Electricity	77	84	95	105	117	160	15,8%	2,27
Coal	140	213	258	258	259	276	14,5%	2,09
DO	158	190	176	212	234	239	8,6%	1,24
Oil	205	258	135	146	147	253	4,3%	0,62
FO	59	80	74	95	117	129	16,9%	2,44

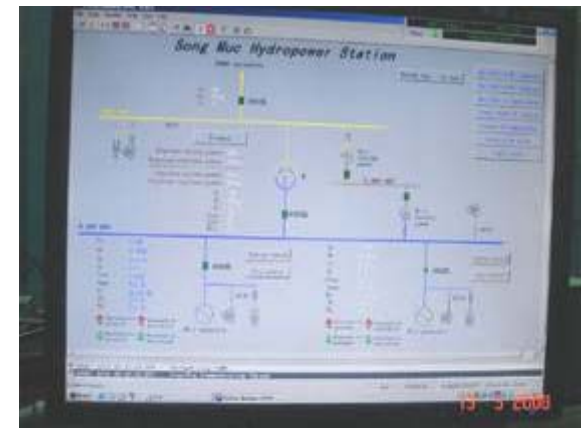
State of energy consumption

- ❑ In 2004, source by UN, the percentage of Vietnam's domestic energy consumption as below:
 - ✓ Oil: 50%
 - ✓ Coal: 18%
 - ✓ Natural gas: 12%
 - ✓ Hydro resource: 20%
- ❑ Energy consumption estimation
 - ✓ 4.2 million TOE per year (in 1990s). And Vietnam was one of the lowest GHGs emission countries in the world.
 - ✓ In 2001, 13.25 million TOE and its increase on



Energy Consumption in main sectors

- ❑ Manufacturing industries and construction: 40%
- ✓ Biomass: 24% with 3,330 KTOE
- ❑ Transportation: 33.9%
- ❑ Agriculture: 2.9%
- ❑ Commercial and residential: 22.44%
- ✓ Biomass: 76% as 10,670 KTOE



electricity capacity for demand and supply, 2008

- ❑ **Electricity power Demand: 13,000 MW per year;**
- ❑ **However, the capacity for supply has only 12,000 MW/ year. In which of:**
 - ✓ **Hydropower: about 4,500 MW to 5,000 MW**
 - ✓ **Thermal power by coal and natural gas generated**
 - ✓ **Imported from China: 400 MW**
- ❑ **Trend of Demand: increase frequently**



CAPACITY OF VIETNAM ENERGY FIELD TO 2015

- ❑ **Total Capacity:** 42,470 MW, including as:
 - ✓ Thermal power by coal generated: 12,100 MW.
 - ✓ Hydro power: 13,600 MW.
 - ✓ Thermal power by oil and natural gas generated: 13,400 MW.
 - ✓ Renewable energy: 1,270 MW.
 - ✓ Export Electricity: 2,100 MW
 - ✓ Nuclear Power plants: up to 2017 – 2020 (following by planned as 4,000 MW). After 2020, nuclear power will supply about 20% of total capacity.



GHGs emission issues



MAIN CONTENTS OF national GHGs inventory

- ❖ **By National GHGs Inventory in 1994, the total GHGs emission was 103.8 million tons CO2 equivalent; In 1998 with 120.8 million tons CO2 eq and in 2000, GHGs emission reached 130.5 million tons CO2 eq.**
- ❖ **GHGs mitigation options in following sectors: Energy, Land Use Change and Forestry LUCF, Agriculture.**
- ❖ **Climate change impacts and adaptation measures in the sectors: water resources,**

MAIN CONTENTS OF GHGs emission in energy sector

Year	Million tons CO ₂ eq (Tg).
1990	21.4
2004	98.6
2010	110.4 (of which transport as 31.5)
2020	224.5/ 60.6
2030	387.4/ 103.7

The amount of 2.27 tons CO₂ eq for one person per year.

National GHGs Inventory in 1994

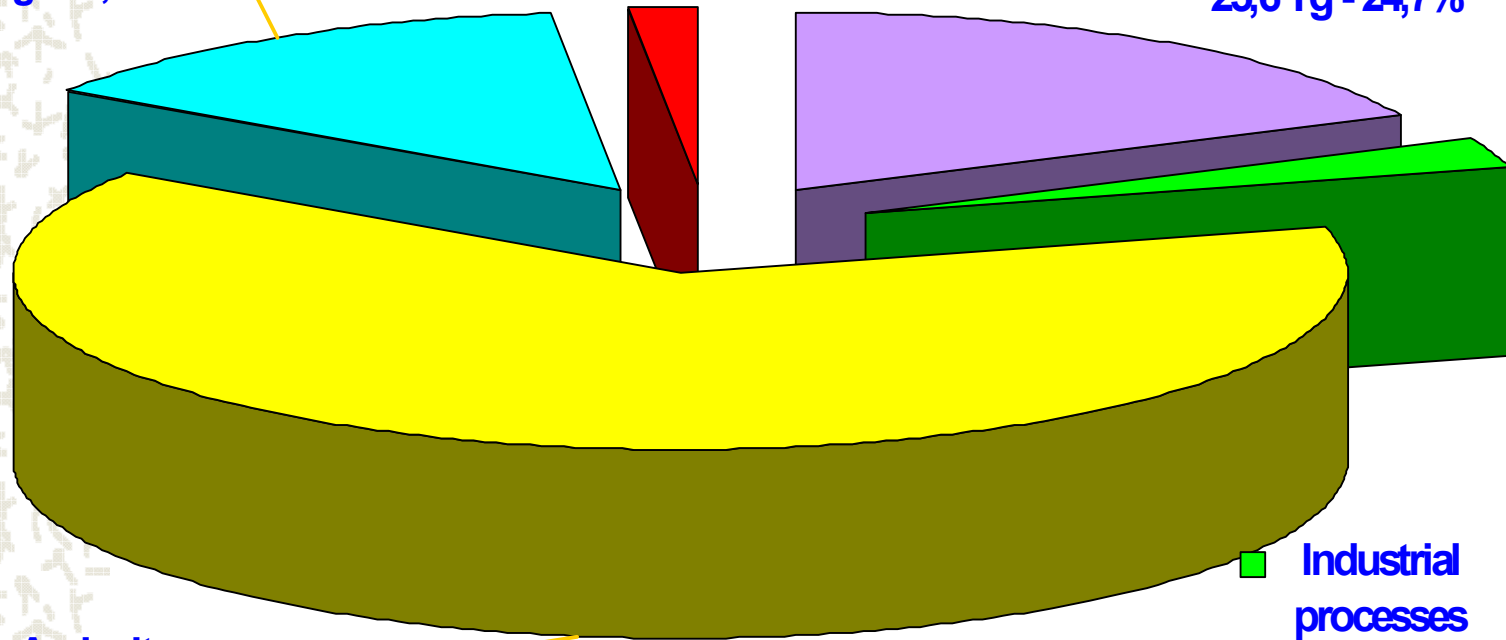
Land use change
and Forestry
19,4 Tg - 18,6%

Waste
2,5 Tg - 2,5%

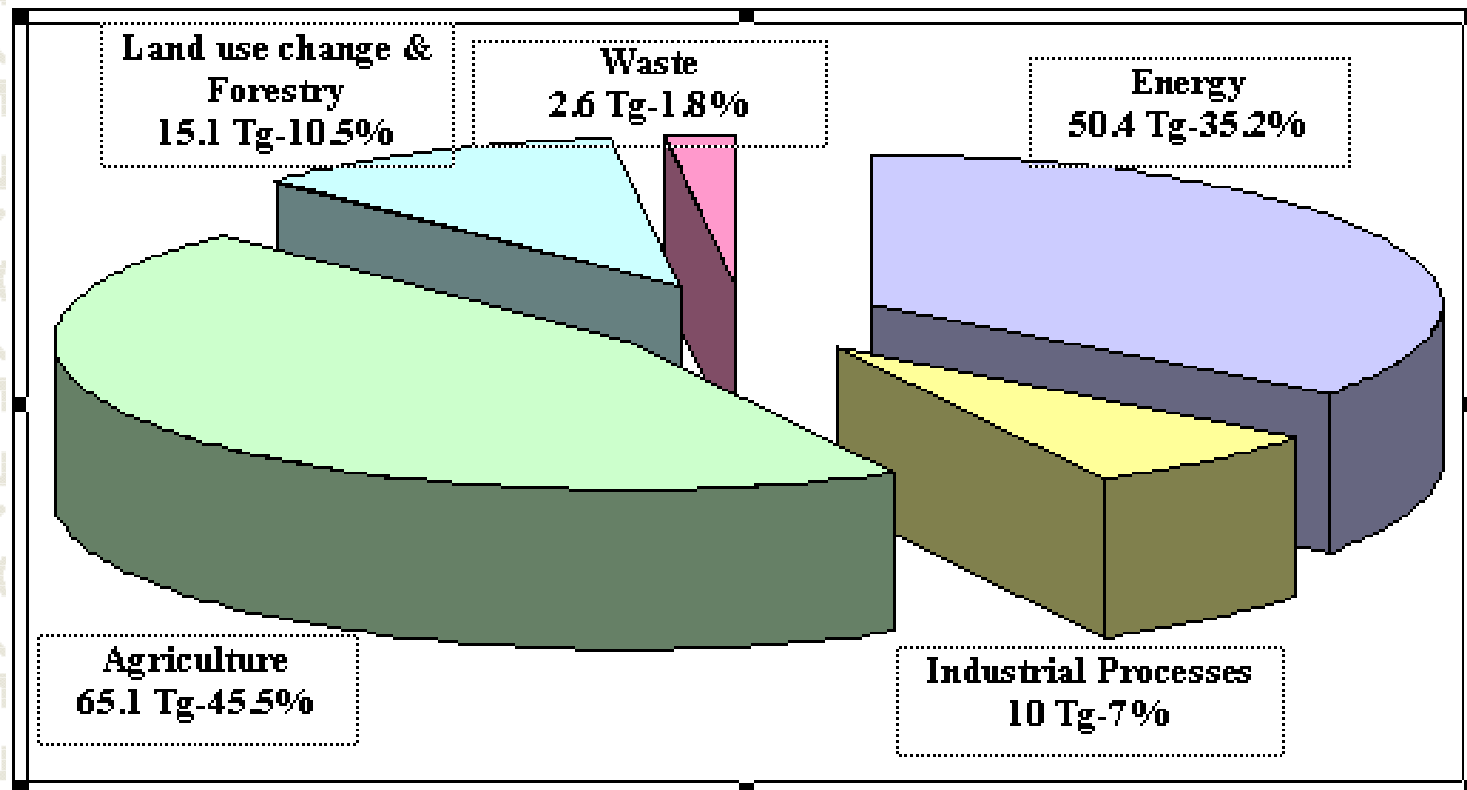
Energy
25,6 Tg - 24,7%

Agriculture
52,5 Tg - 50,5%

Industrial
processes
3,8 Tg - 3,7%

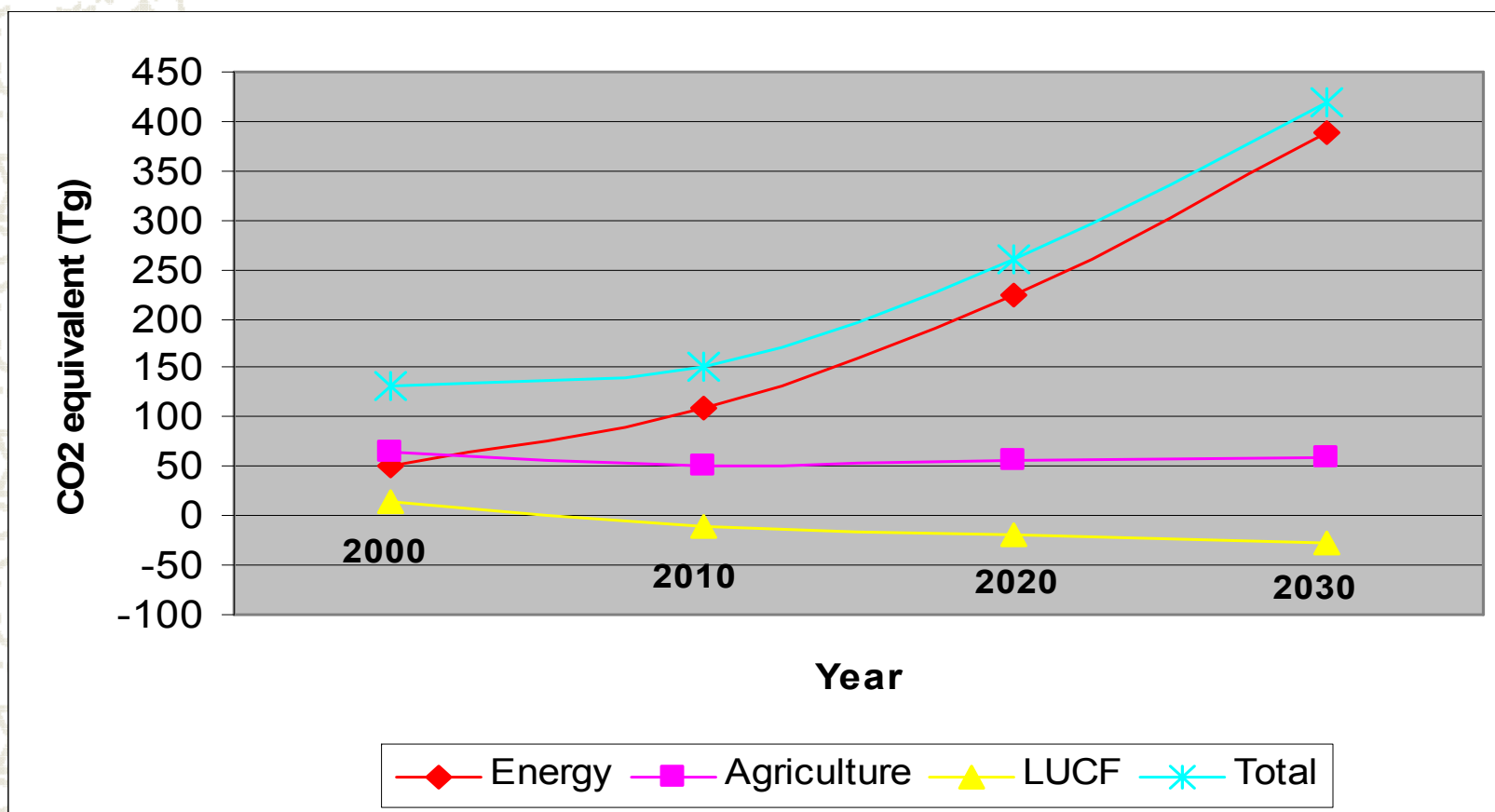


National GHGs Inventory in 2000



SNC: Estimation of GHGs emission in main sectors in Viet Nam

- Over 152 million tons of CO₂ eq in 2010
- Over 260 million tons of CO₂ eq in 2020
- Over 418 million tons of CO₂ eq in 2030



Thank you for your attention!

