

# *National GHG Inventory and Assumption Baselines for GHG Emission Projections*

**Prof. Dr. Tran Thuc**

Director General

Vietnam Institute of Meteorology, Hydrology and Environment

Ministry of Natural Resources and Environment

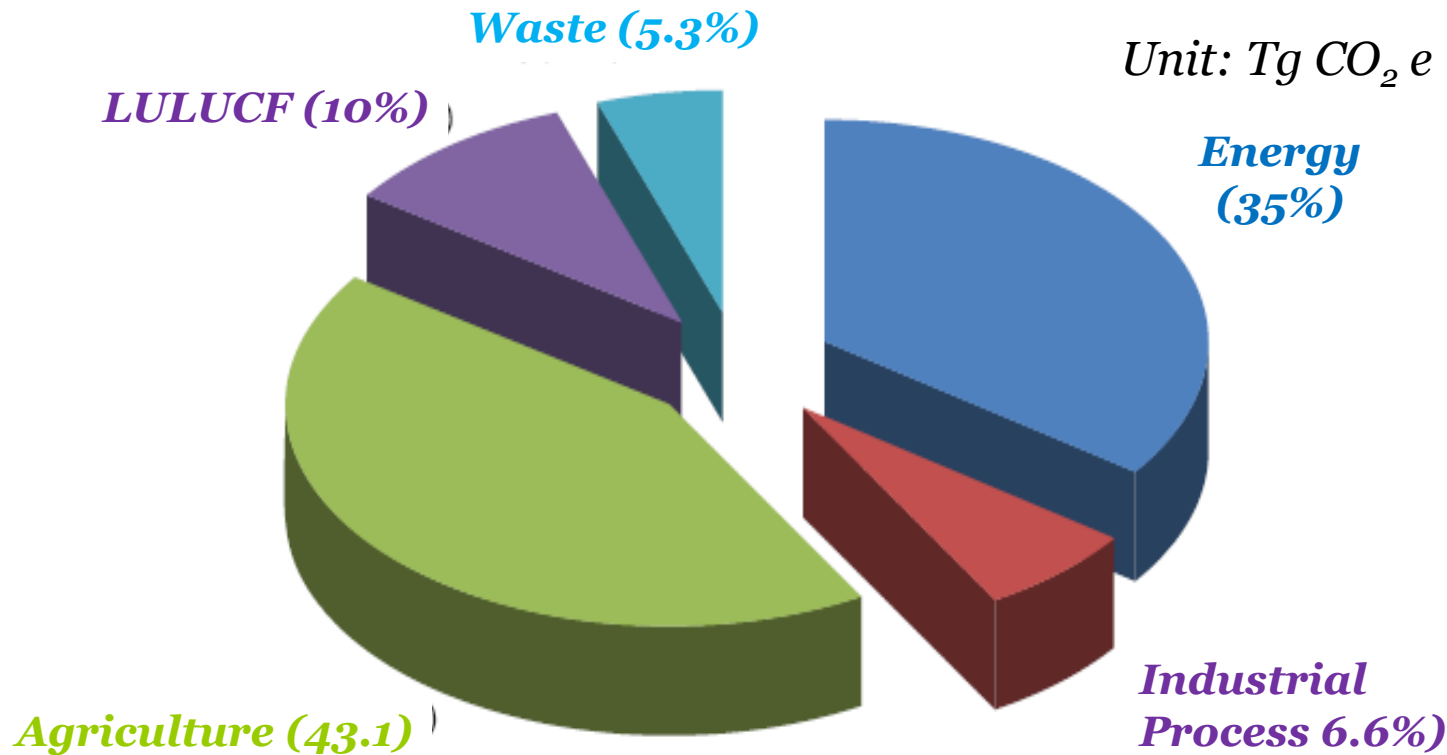
# Country Introduction

- **Area: 331,051.4 km<sup>2</sup>**
- **Population: 86.2 million**  
(2008)
- **Economic growth: 7.5%**  
(2000-2008)
- **Energy: increased 6.5%/year:**  
*32,235 KTOE (2000) to 50,221 KTOE (2007)*



# GHG Inventory for 2000

Sector: Energy, Industrial processes, Agriculture, LULUCF, Waste  
GHG: CO<sub>2</sub>, CH<sub>4</sub> and N<sub>2</sub>O



Total emissions in 2000 amounted to 151 Mtco<sub>2</sub>e

# GHG Emission Projection

## **1. Main emission sources/sectors:**

- **Energy**
- **Agriculture**
- **LULUCF**

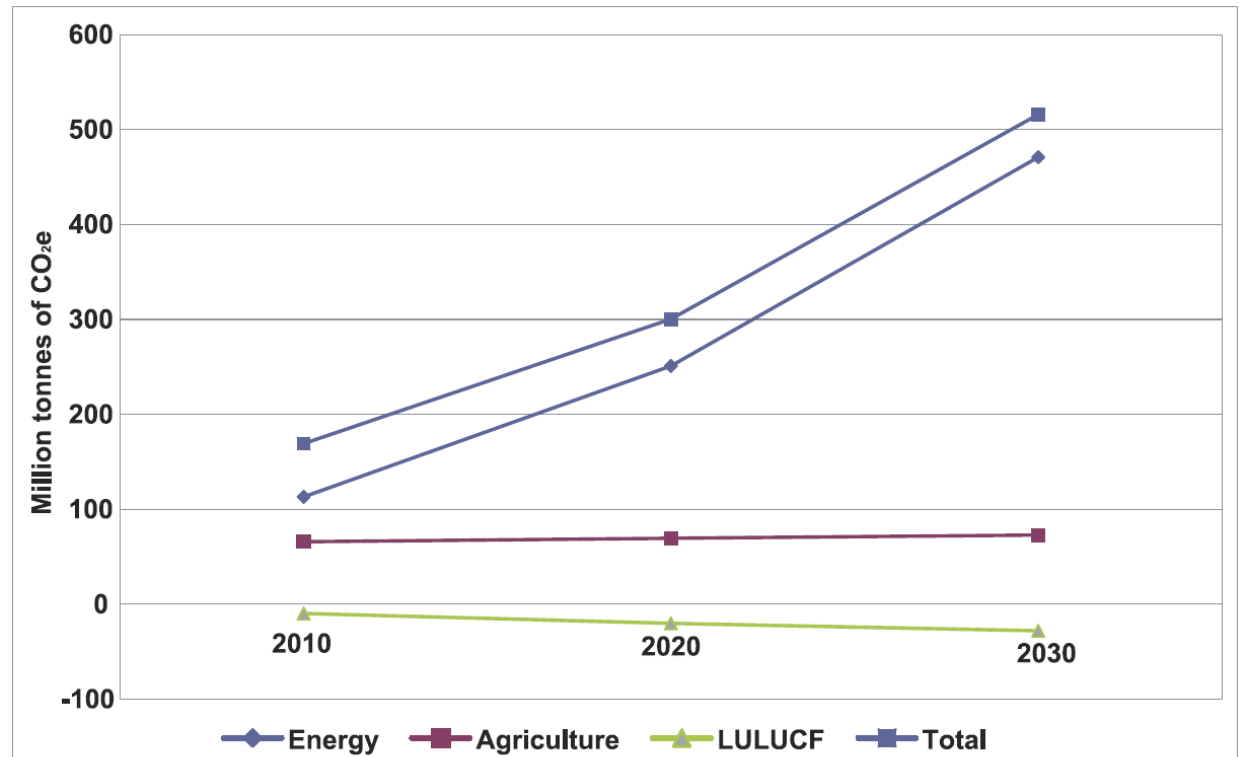
## **2. Data:**

- **National socio-economic development plan**
- **Sectoral plan and projection**

Sector	2010	2020	2030
Energy	113	251	471
Agriculture	65.8	69.5	72.9
LULUCF	-9.7	-20.1	-27.9
<b>Total</b>	<b>169</b>	<b>300</b>	<b>516</b>

Unit: million tonnes of CO<sub>2</sub>e

# GHG Emission Projections



# Main Assumptions for Projection

- 1) Efficiency of the energy system is not much improved
- 2) No major change in energy policy
- 3) Medium scenario → economic development with GDP for 2011-2020, 2021-2030 and share of value added
- 4) Population growth rate: 2010-2020: 1%, 2020-2030: 0.7%
- 5) Agriculture annual average share value added will reduce from 12.5% in 2020 to 8.7 % in 2030
- 6) Forestry: Assumed large projected increases in plantation as well as conservation of natural forests
- 7) Emission factors does not changed in the projected period

# Challenges for Assessment in Energy Sector

## 1. Activity Data

- Activity sectors and kinds of fuel used following IPCC categories
- National statistical data: Amount of coal, oil, gas production and export - import:  $U = \pm 2\%$ .
- Statistical data from sectors:
  - + Energy industry, machinery manufactures, construction:  $U = \pm 5-7\%$
  - + Agriculture, Services:  $U = \pm 10\%$
  - + Transportation:  $U = \pm 15-20\%$

## 2. Uncertainties of emission factors and calorific value of fuels:

- Using IPCC default emission factors:  $U = \pm 2\%$
- Fugitive emission factors from oil and gas exploitation are default factors from IPCC:  $U = \pm 15\%-20\%$
- $\text{CH}_4$  fugitive emission factors from coal mining:  $U = \pm 10-15\%$
- Calorific value of fuels used:  $U = \pm 2-3\%$

# Challenges for Assessment in Agricultural Sector

## 1. Difficulties in data collection:

- + Data on animal population: Categories, weight, milk production, feed intake...
- + Data on rate of processing, storage of animal wastes in different regions.
- + Data on agricultural residues used on burning biomass for fuels, making mushroom...

2. **EF for agricultural soil** at local conditions with different canopy, farming system, fertilizer applying....

3. **Need detailed Activities data** and EF in rice paddy.





# **GAPS for Forestry Sector**

- **Not enough information for biomass assessment, because forest resources are abundant and diverse.**
- **Data collected from official statistic may not be correct and as detailed as in IPCC categories.**
- **Lack of national and international cooperation and experience sharing.**
- **IPCC default values and coefficients in grassland conversion may not be applicable for Vietnam.**

# **Lessons learned/Recommendation from Energy Sector**

## **1) Activity data**

- Better data collection system is necessary
- Stable and experienced expert groups
- Case-survey to verify data
- Stakeholder consultation workshop on data activity
- Enhance task and force for public statistic to undertake national energy data collection and management

## **2) Emission factors and calorific value of fuels**

- Develop country emission factors (research, survey...)
- Identify and update calorific value for some fuels, e.g. coal, oil and gas, biomass.

# **Lessons learned/Recommendation from Agriculture Sector**

## **1. To improve GHG emission inventory and projection:**

- Survey and detailed inventory animal population: categories, weight, milk production, feed intake...
- Survey rate of processing, storage of animal wastes.
- Survey rate of agricultural residues used for biomass burning, mushroom production...

## **2. Verify in local conditions EF for agricultural soil**

# Thank you for your attention!

