

GHG Inventories for Thailand's Second National Communication 2000

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Procedures and Methodology

❖ National Inventory Background

- ✓ Thailand launched the first national communication in 1994 and submitted the report to the UNFCCC in 2000.
- ✓ The inventory processes were based on the 1996 IPCC Revised Guidelines as suggested by the UNFCCC.
- ✓ Available emission factors were employed.
- ✓ Activity data were searched from domestic sources.
- ✓ The same methods were applied in the second communication.

Procedures and Methodology

❖ Key Concerns in the 2nd Communication

- GHG emissions estimated following the Revised 1996 IPCC Guidelines.
- Inventory processes carried out based on decision tree of the Good Practice Guidance and Uncertainty Management, and 2003 Good Practice Guidance for Land-Use, Land-Use Change and Forestry.
- Essential pathways involved the completeness, accountability, and transparency of data used.

Procedures and Methodology

❖ Scope of GHG Inventories

- Calculations used the year 2000 as baseline data.
- Five development sectors were investigated: (i) energy (ii) industrial processes (iii) agriculture (iv) land-use change and forestry and (v) waste sector .
- Six types of Greenhouse Gases were quantified including CO₂ and non-CO₂ emissions: (i) carbon dioxide (CO₂) (ii) methane (CH₄) (iii) nitrous oxide (N₂O) (iv) hydrofluorocarbon (HFC) (v) perfluorocarbon (PFC) and sulfur hexafluoride (SF₆)
- Net GHG emissions were represented in CO₂-equivalent by taking Global Warming Potential (GWP) into account.

Procedures and Methodology

❖ Calculation Factors

- Calculation pathways were conducted with Tier 1 and Tier 2 levels.
- Emission factors were gathered from domestic sources otherwise default values provided in the IPCC 1996 Revised Guidelines were used.
- Availabilities of emission factors were employed in agricultural activities and land-use change and forestry. Default values were employed in energy and industrial sectors.
- GWP was taken from the 1995 IPCC Second Assessment Report : CO₂ (1); CH₄ (21); N₂O (310); HFCs (140-11,700); PCFs (6,500-9,200); and SF₆ (23,900).

Procedures and Methodology

❖ Limitations in the Inventory Processes

Lack of Country Specific Factor

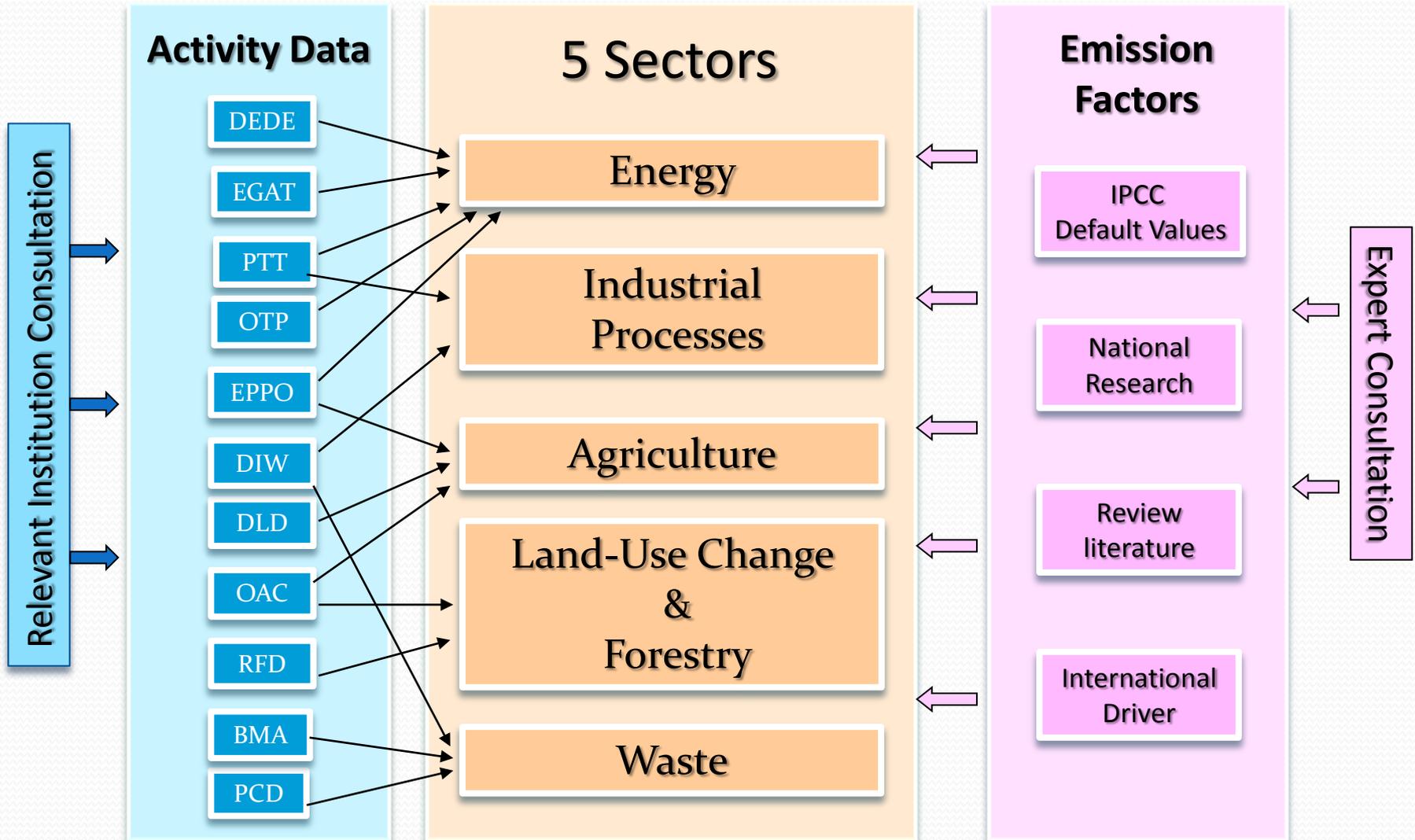


Application of Emissions Factors
from Default Values

- ✓ No access to associated data including data activities and emission factors;
- ✓ Insufficient of essential information/data;
- ✓ Unavailability of qualified data; and
- ✓ Lack of conformity of data-sets.

National GHG Inventories Calculation

$$\text{Emission} = \text{Activity Data} \times \text{Emission Factor}$$



(1) Energy**A. Fuel Combustion**

1. Energy Industries

2. Manufacturing Industries and Construction

3. Transport

4. Other Sectors

4a. Commercial/Institutional

4b. Residential

4c. Agricultural/Forestry/Fishing

5. Other

B. Fugitive Emissions from Fuels

1. Solid Fuels

2. Oil and Natural Gas

Tier 1

(2) Industrial Processes

A. Mineral Products

B. Chemical Industry

C. Metal Production

D. Other Production

E. Production of Halocarbons and SF₆F. Consumption of Halocarbons and SF₆

G. Other

Tier 1

(3) Solvent and Other Product Use**(4) Agriculture**

A. Enteric Fermentation

Tier 1

B. Manure Management
(Tier 2 for N₂O)

Tier ½

C. Rice Cultivation

Tier 2

D. Agricultural Soils

Tier 1

E. Prescribed Burning of Savannas

-

F. Field Burning of Agricultural Residues

Tier 2

G. Other

-

(5) Land-Use, Land-Use Change and Forestry

A. Changes in Forest and Other Woody Biomass Stocks

Tier 2

B. Forest and Grassland Conversion

Tier 2

C. Abandonment of Managed Lands

Tier 2

D. Other

-

(6) Waste

A. Solid Waste Disposal on Land

Tier 2

B. Wastewater Handling

Tier 2

C. Waste Incineration

Tier 2

D. Other

-

(7) Other

-

Emissions Sources by Sector

Energy Sector

Combustion Process :
Power Plant, Industries,
Transportation
Resultant Gases : CO_2 ,
(CH_4 , N_2O ,)

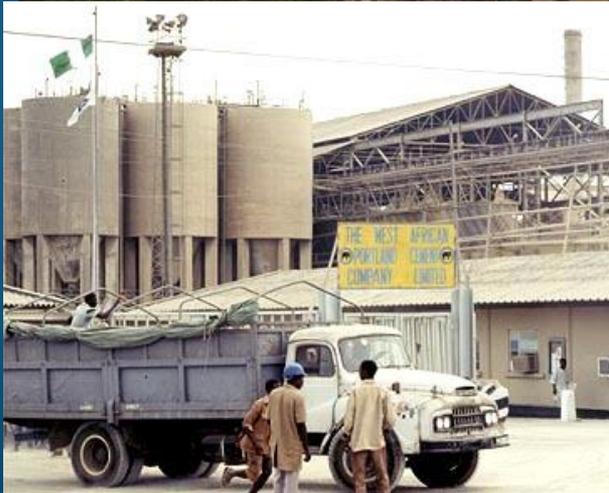


Emissions Sources by Sector

Industrial Processes



Chemical Processes: Cement Production (CO_2); Petrochemical (N_2O , CH_4); Iron and Steel (CH_4); and Carpolactam (N_2O)
Resultant Gases: CO_2 , (CH_4 , N_2O ,) HFC, PFC, SF_6



Emissions Sources by Sector

Agriculture



Agricultural Activity:
Rice Paddy Field
Resultant Gas: CH₄



Emissions Sources by Sector

Land-Use Change and Forestry

Land-Use Activities: Land Degradation
Thermal Process; Changes in Forest and Other
Woody Biomass Stocks; Forest and Grassland
Conversion; Abandonment of Croplands,
Pastures, Plantation Forests, or other
Managed Lands.
Resultant Gases: CO₂, CH₄, N₂O



Emissions Sources by Sector

Waste sector



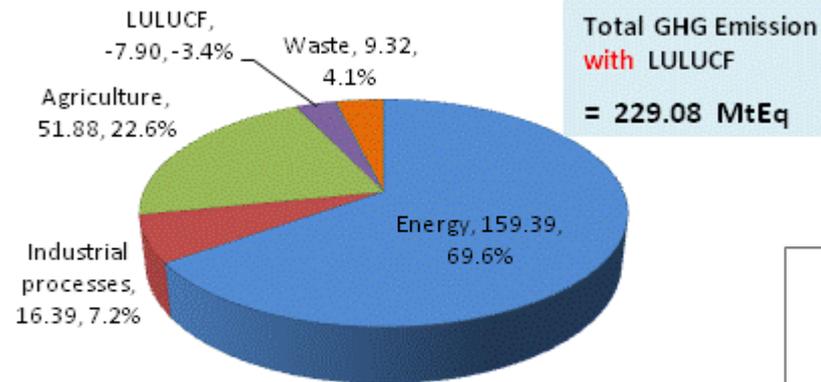
Waste Activities: Wastewater (domestic & industrial); Landfilled; Incineration; Biological and Thermal Processes; Anaerobic Digestion.
Resultant Gases: CH_4 , N_2O , CO_2



Key Results

National Total including LULUCF = 229.09 Mt CO₂-eq

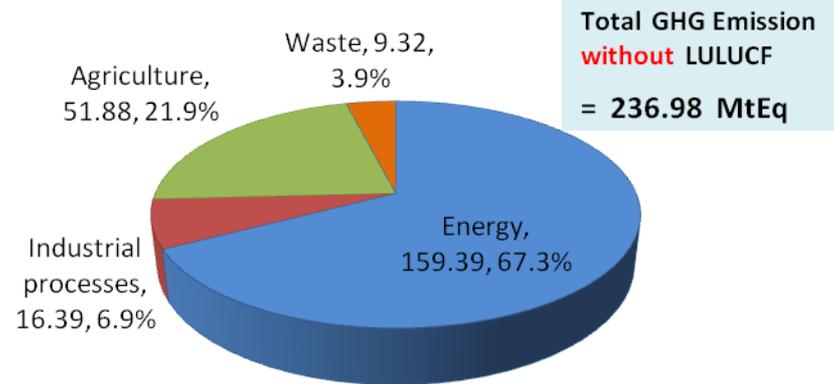
GHG emission in 2000 (Mt CO₂ eq, %) - by sector



LULUCF = -13.35(5a) + 44.47(5b) - 39.02(5c) Mt = **SINK - 7.90 Mt Eq**

**Emissions by Sector in 2000
(Mt CO₂-eq, %)**

GHG emission in 2000 (Mt CO₂ eq, %) - by sector



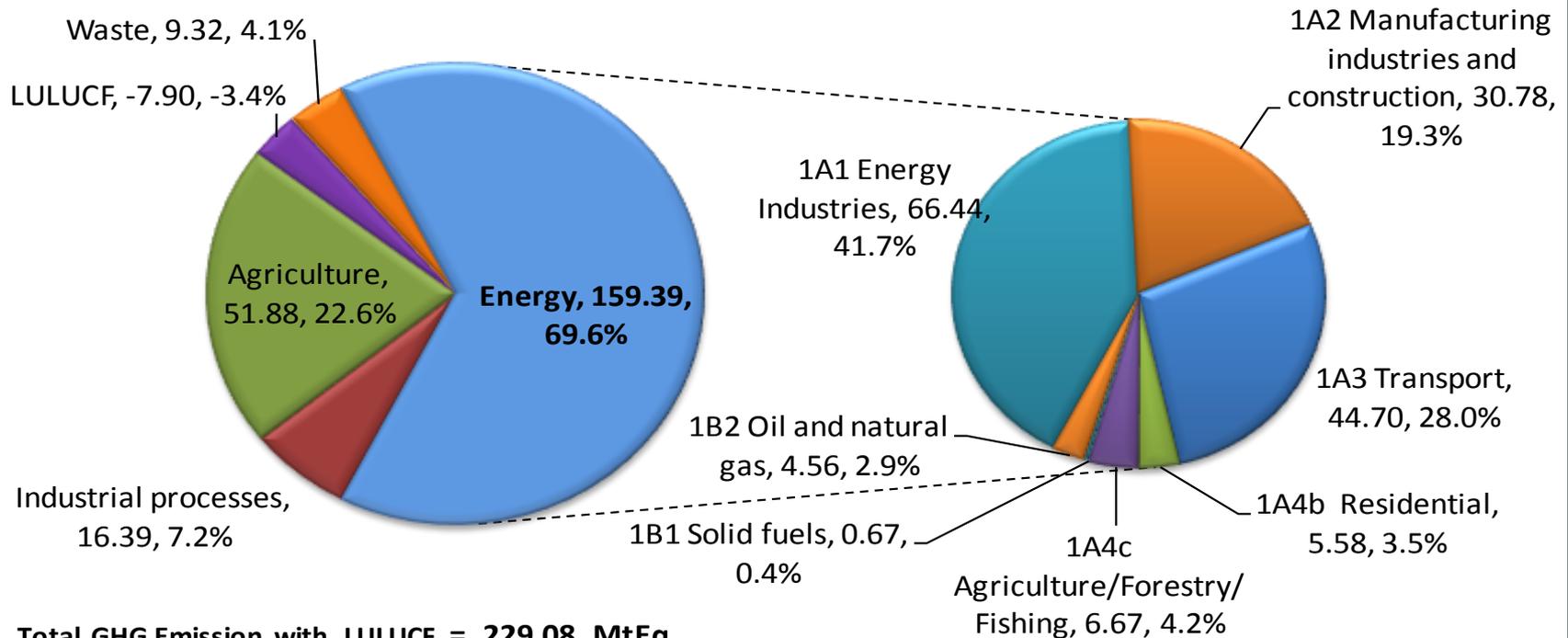
In yr 2000, F-gas = 0 Mt CO₂ Eq

Key Results

Emissions by Sector in 2000 (Mt CO₂-eq,%)

Energy sector

Emission in 2000 by 'Energy Sector' (Mt CO₂ eq, %)



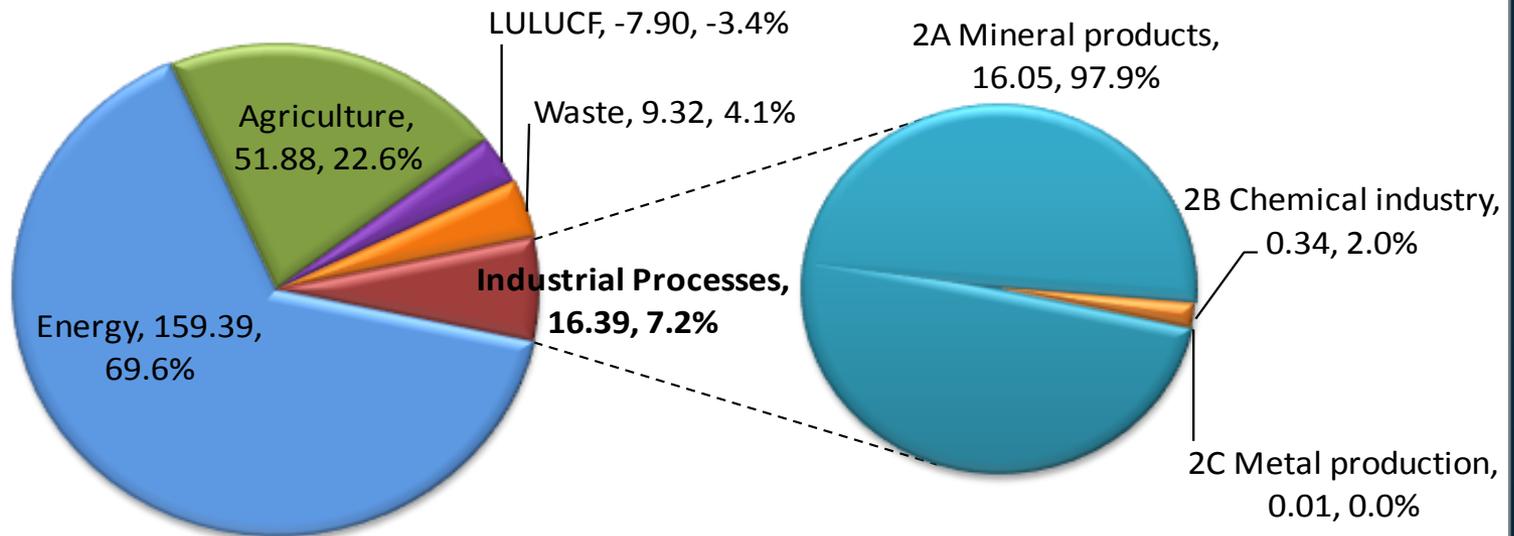
Total GHG Emission with LULUCF = 229.08 MtEq

Key Results

Emissions by Sector in 2000 (Mt CO₂-eq,%)

Industrial Processes

Emission in 2000 by 'Industrial Processes' (MtCO₂eq, %)



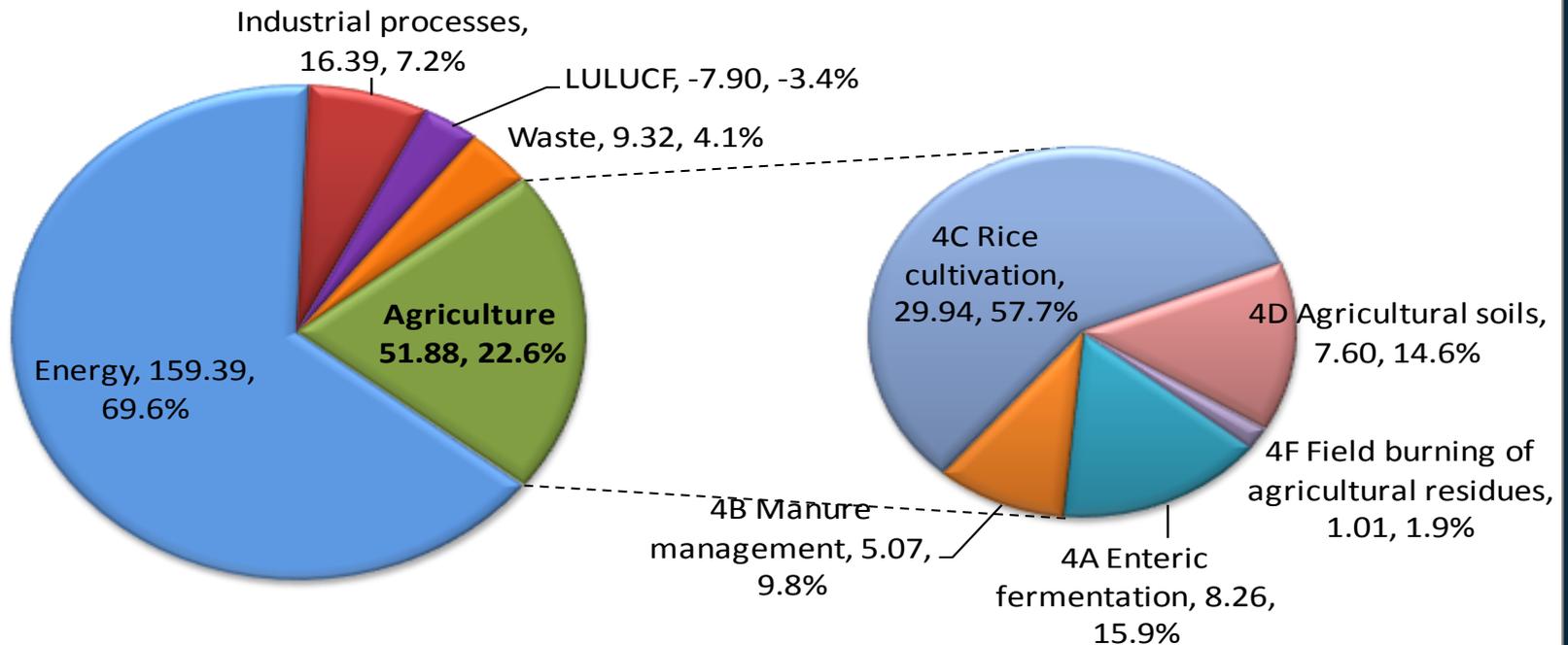
Total GHG Emission with LULUCF = 229.08 MtEq

Key Results

Emissions by Sector in 2000 (Mt CO₂-eq,%)

□ Agriculture

Emission in 2000 by 'Agriculture' (Mt CO₂ eq, %)



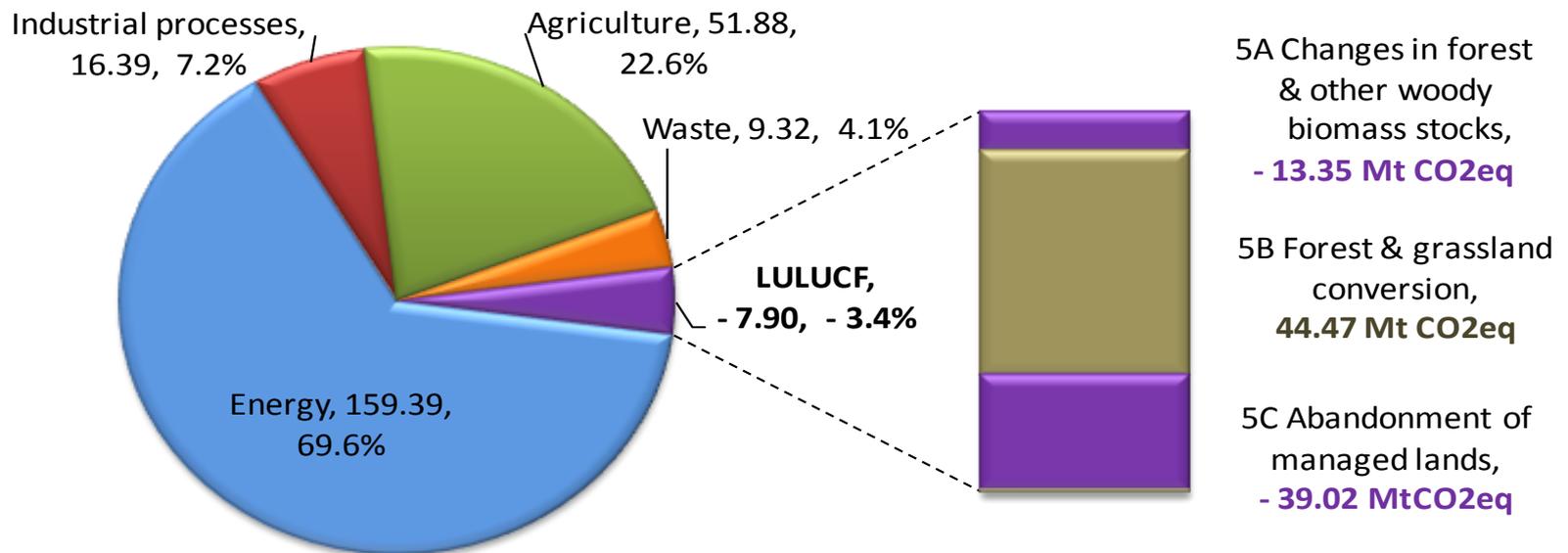
Total GHG Emission with LULUCF = 229.08 MtEq

Key Results

Emissions by Sector in 2000 (Mt CO₂-eq,%)

□ Land-Use Change and Forestry

Emission in 2000 by 'LULUCF' (Mt CO₂ eq, %)



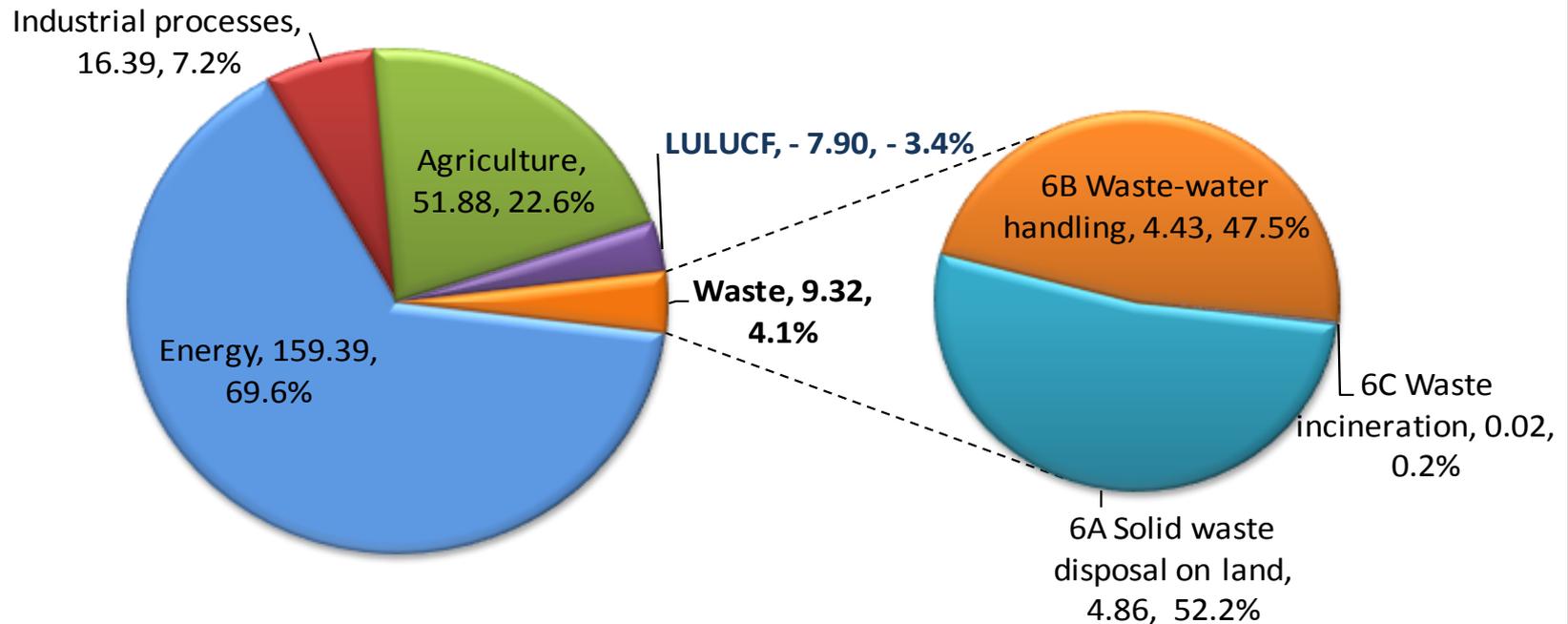
Total GHG Emission with LULUCF = 229.08 MtEq

Key Results

Emissions by Sector in 2000 (Mt CO₂-eq,%)

Waste Sector

Emission in 2000 by 'Waste Sector' (Mt CO₂ eq, %)

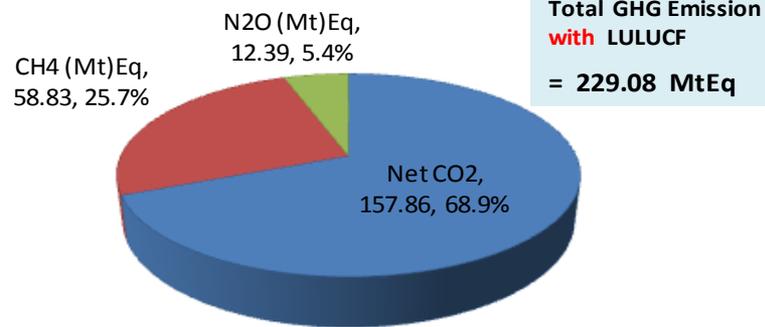


Total GHG Emission with LULUCF = 229.08 MtEq

Key Results

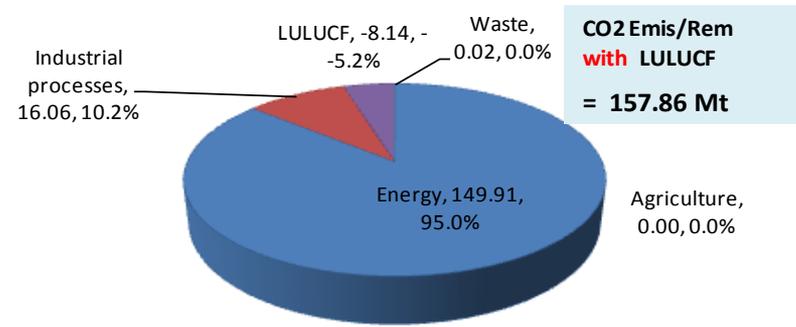
Shares of GHG Type by Sector

GHG emission in 2000 (Mt CO₂ eq) - by gas type



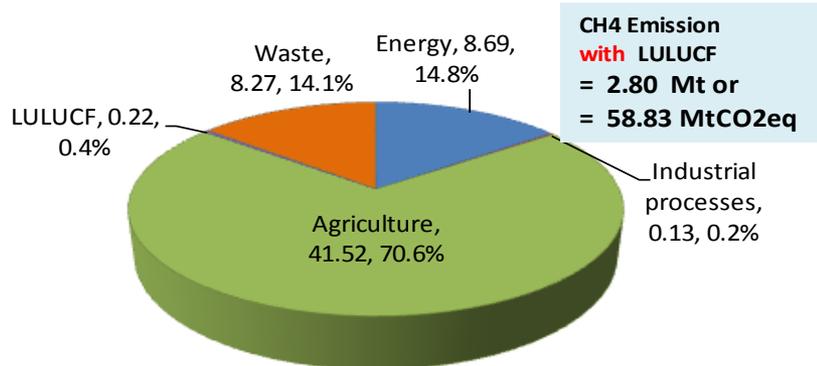
In yr 2000, F-gas = 0 Mt CO₂ Eq

CO₂ emission in 2000 (Mt CO₂ eq) - by sector

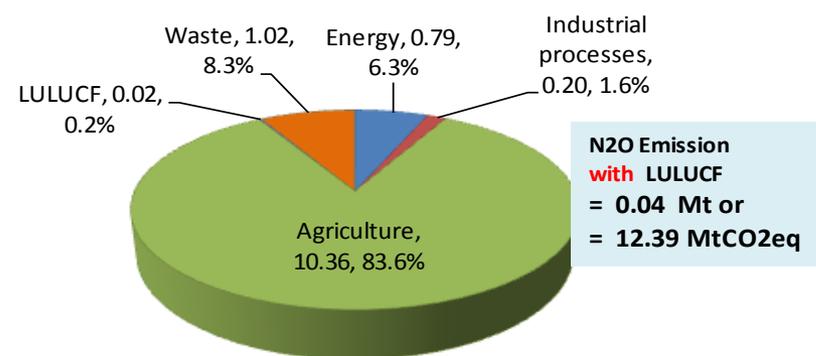


LULUCF CO₂ = -44.23 (emis.) + 52.37 (rem.) = **SINK -8.14 Mt CO₂**

CH₄ emission in 2000 (Mt CO₂ eq) - by sector



N₂O emission in 2000 (Mt CO₂ eq) - by sector



Thank you for your attention

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