MALAYSIA'S NC2 WITH SPECIAL EMPHASIS ON GHG INVENTORY

Abdul Rahim Nik

Ministry of Natural Resources and Environment, Malaysia

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Summary of NC2

- Submitted 14 April 2011
- 8 Chapters:
  - National Circumstances
  - GHG Inventory
  - Mitigation analysis
  - Vulnerability and adaptation assessment
  - Research, technology transfer and systematic observation
  - Capacity building, education, public awareness, information and networking
  - Constraints and need
  - Addressing climate change

Some Findings

- Energy is a key driver of the Malaysian economy and demand is increasing
- Recent policies are developed to encourage renewable energy and energy efficiencies
- Potential mitigation options are considered based on the key sources of emissions
- Downscaling of 2 climate models at 9 km resolution for vulnerability and adaptation assessment

NC2 Operational Framework

Good Practice Guidance Characteristics

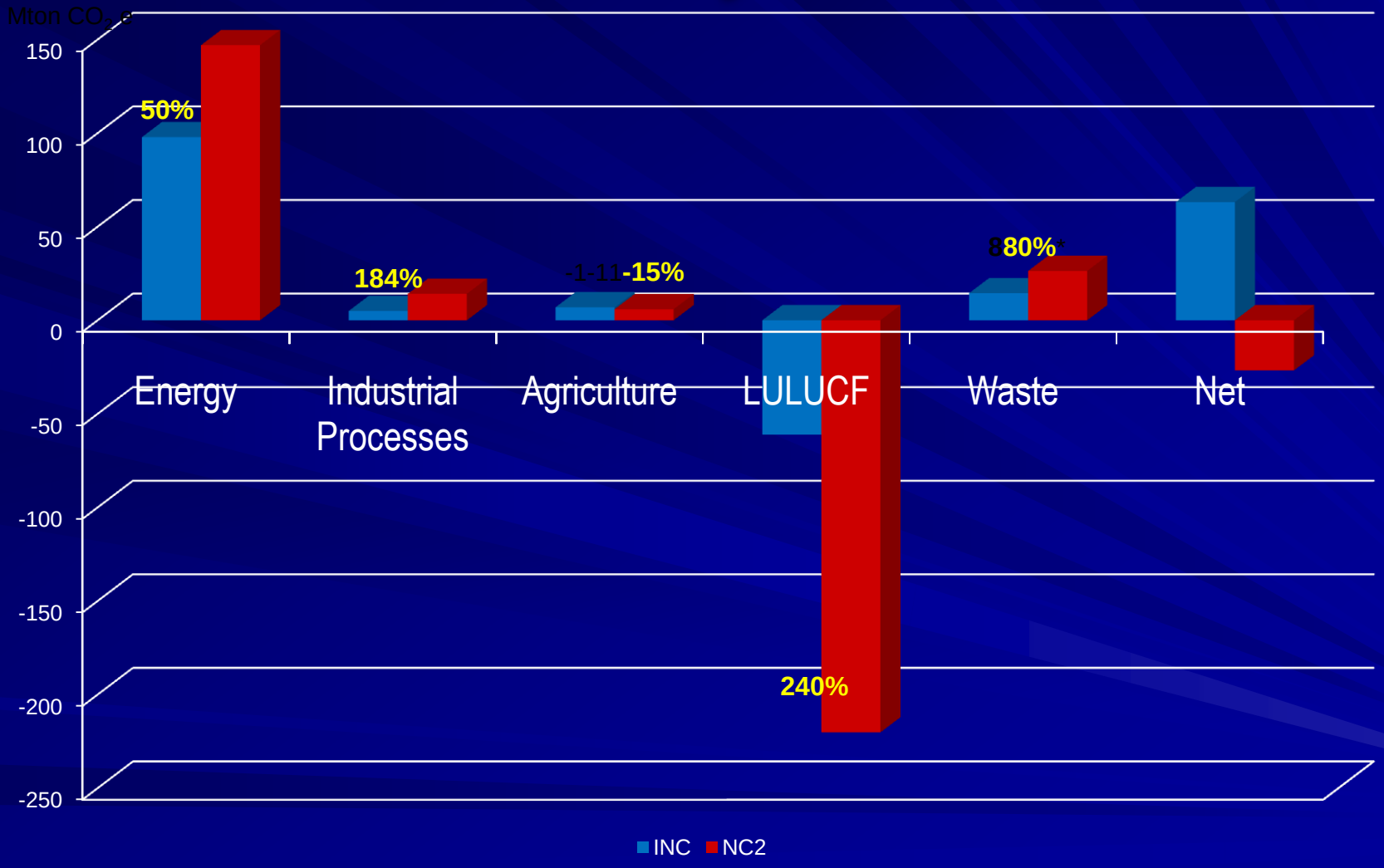
- Adequate approach
  - Improved key categories
- Consistent
- Complete
- Transparent
  - Data sources, definitions, methodologies, and assumptions clearly described
- Efficiency
  - Quality assurance and control

Sectors & Subsectors

1. **Energy**
   - Energy industries
   - Transportation
   - Manufacturing industrial
   - Residential &commercial
   - Agriculture
   - Others
2. **Industrial Processes**
   - **Mineral Products**
     - Cement production
     - Lime production*
     - Limestone & dolomite* use
   - **Chemical Industry***
     - Ammonia production
     - Carbide production
     - Petrochemicals
   - **Metal Production***
     - Iron & steel production
3. **Agriculture**
   - Domestic livestock enteric
   - Manure management
   - Flooded rice fields
   - Burning of agricultural residues
4. **Waste**
   - Landfill
   - Domestic & Commercial wastewater treatment
   - Industrial waste water treatment
5. **Land use change and forestry**
   - Natural forest*
     - Permanent forest reserve
     - Stateland
   - Plantation forest
   - Plantation crops
     - Rubber
     - Oil palm
   - Urban forestry*

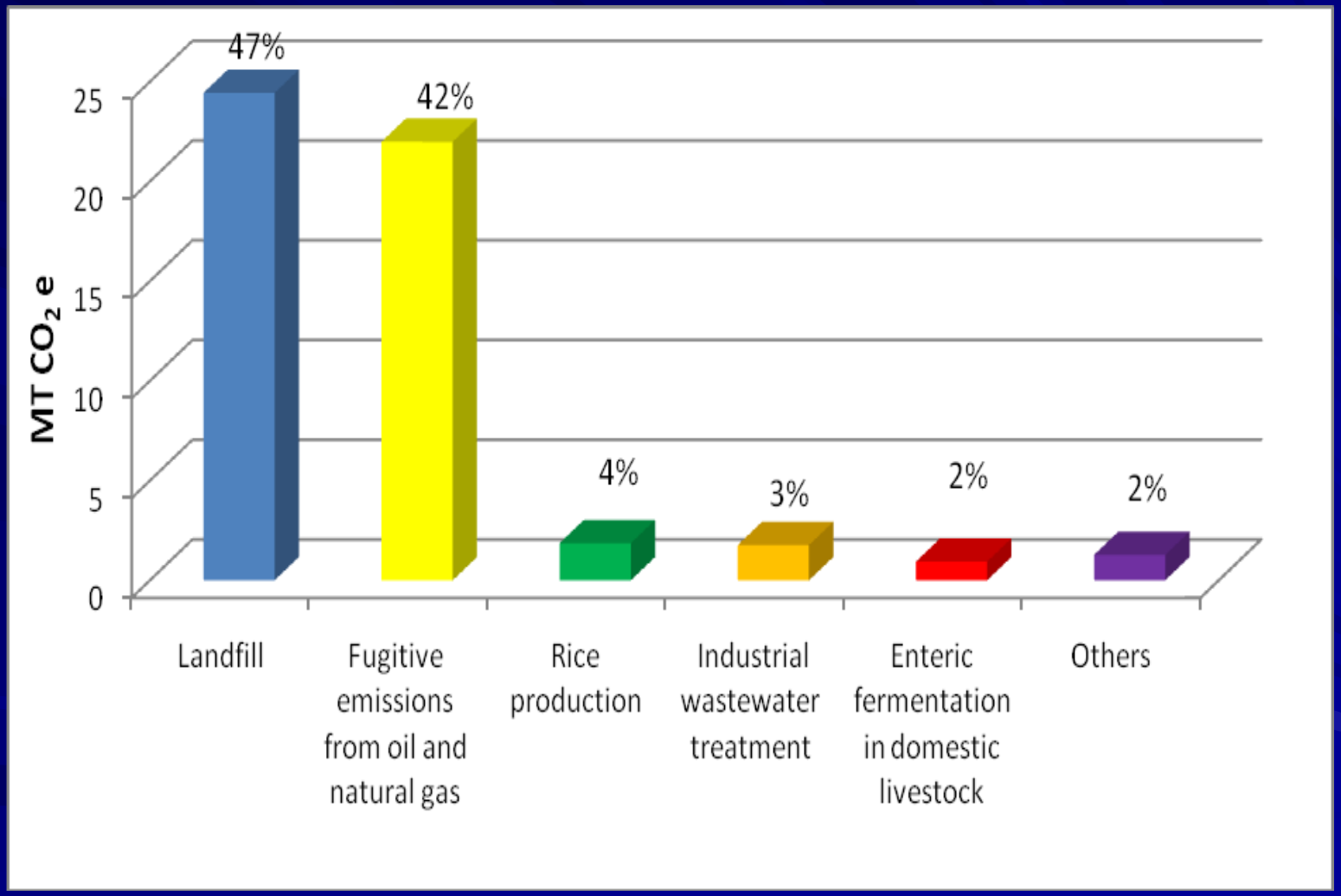
*New subsectors

GHG Emissions by Sectors in 2000

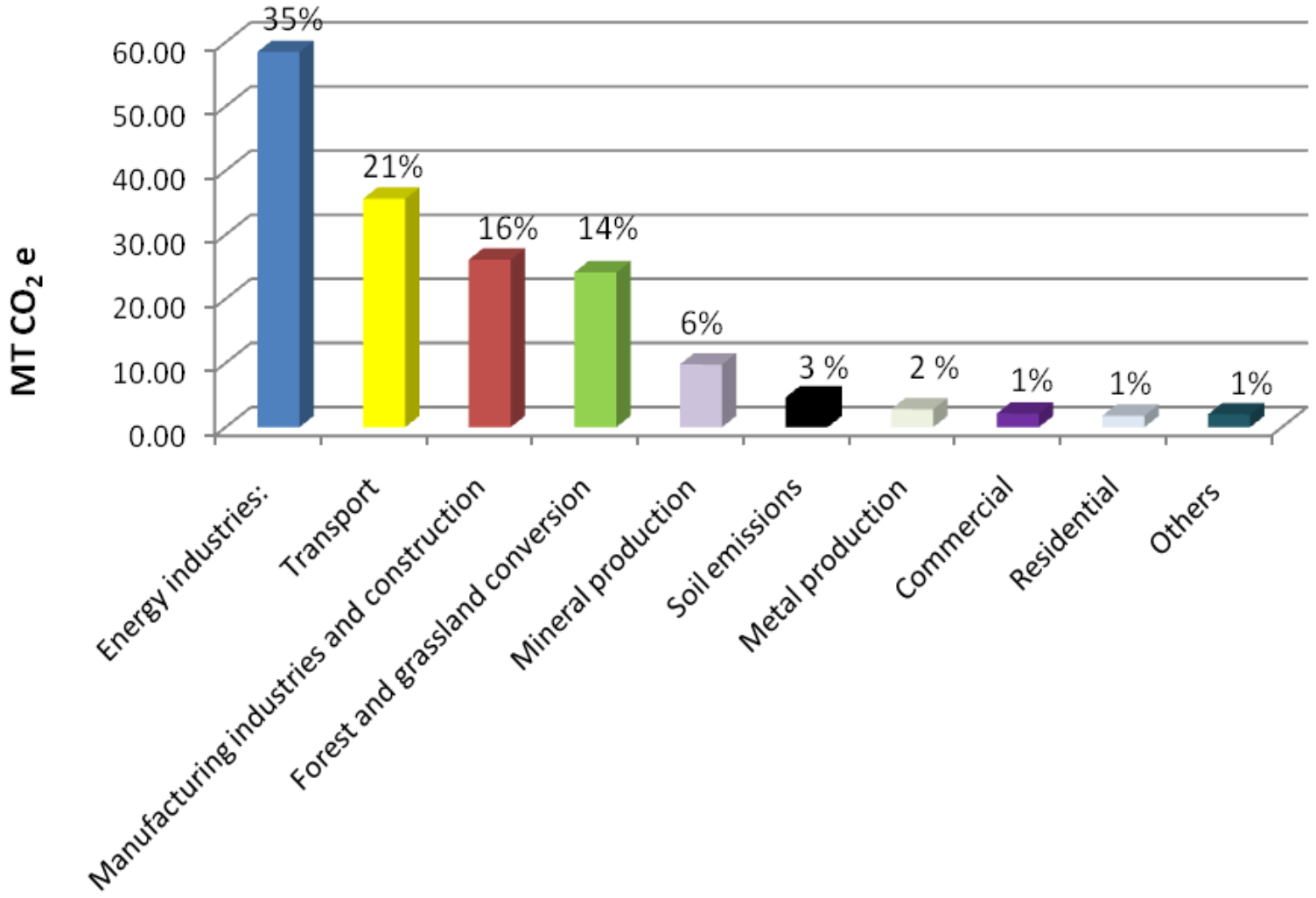


* Recalculated following IPCC 1996 GL

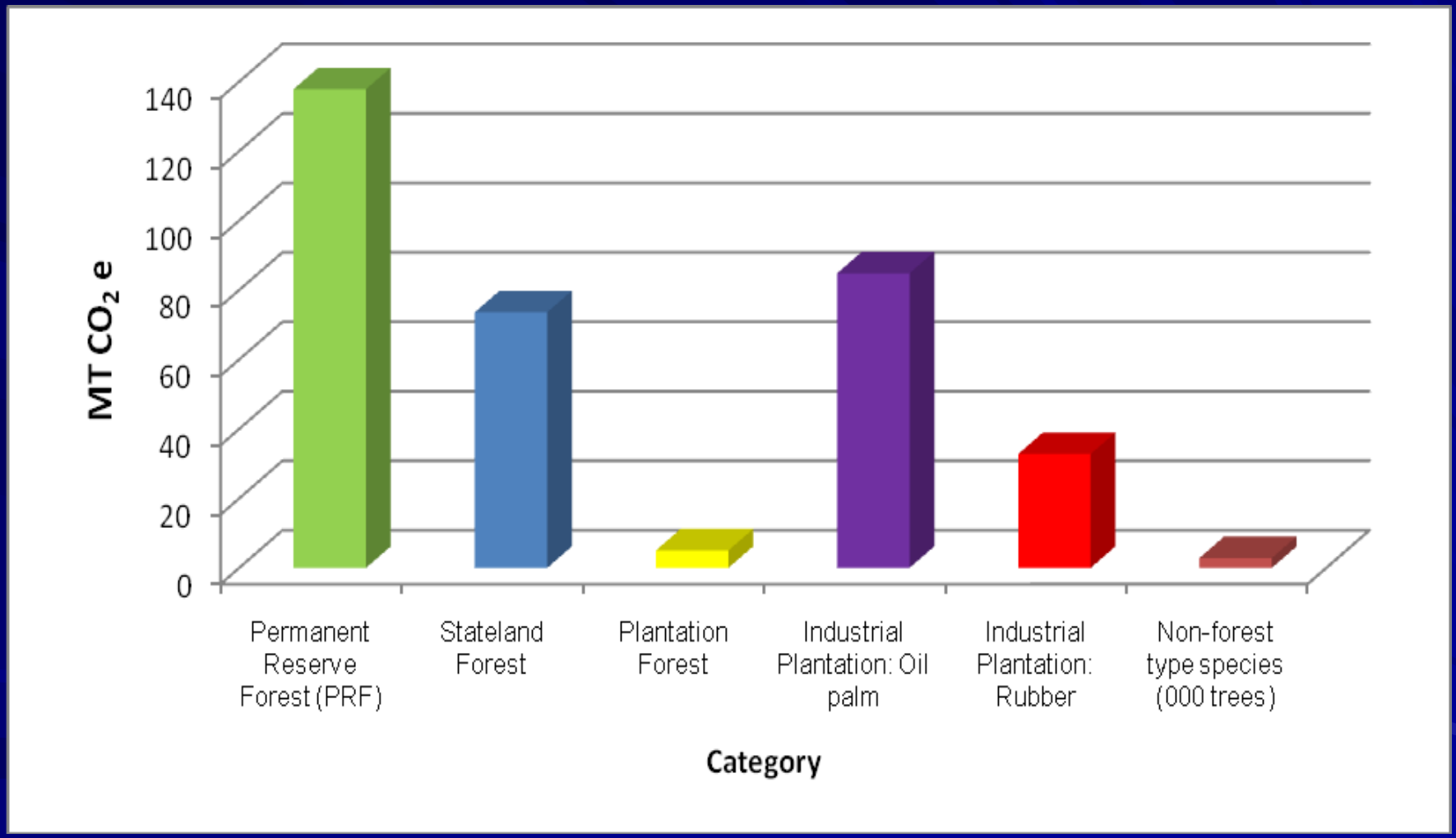
Major Sources of CH_4 Emissions



Major Sources of CO_2 Emissions



CO_2 Removals



Non forest refers to urban forest, rattan and bamboo planting

Trends in GHG Emissions Malaysia

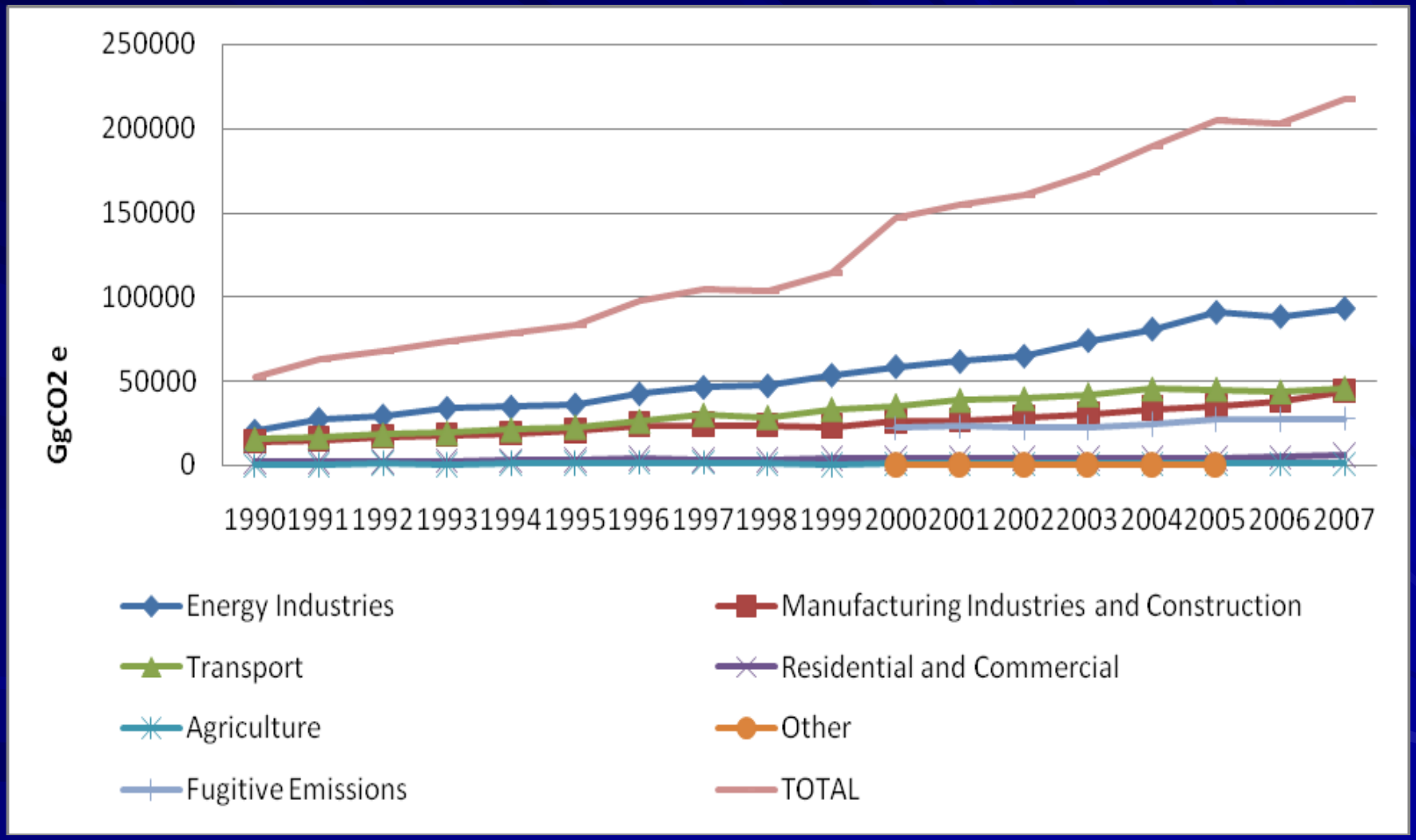
Sectors	CO_2 Equivalent (Mt)		
	2000	2005	2007
Energy	147.0	204.3	217.0
Industrial Processes	14.1	15.6#	17.1#
Agriculture	5.9	6.6#	7.2#
Land Use Change and Forestry (LULUCF)	29.6	25.3	19.7
Waste	26.4	27.4	31.9
Total emissions	223.0	279.2	292.9
Total sink (LULUCF)	-249.8	-240.5	-247.0
Net (after subtracting sink)	-26.8	38.7	45.9

GHG Emissions Against Development Indices

	Unit	2000	2005	2007
GDP	RM billion	356.401	449.250	505.353 (P)
Population	'000	24.495	26.128	27.170
CO_2 e emission	mil t	223.0	279.2	292.9
CO_2 e emission per capita	ton/capita	9.1	10.7	10.8
CO_2 e per GDP	ton/bil RM	0.63	0.62	0.58

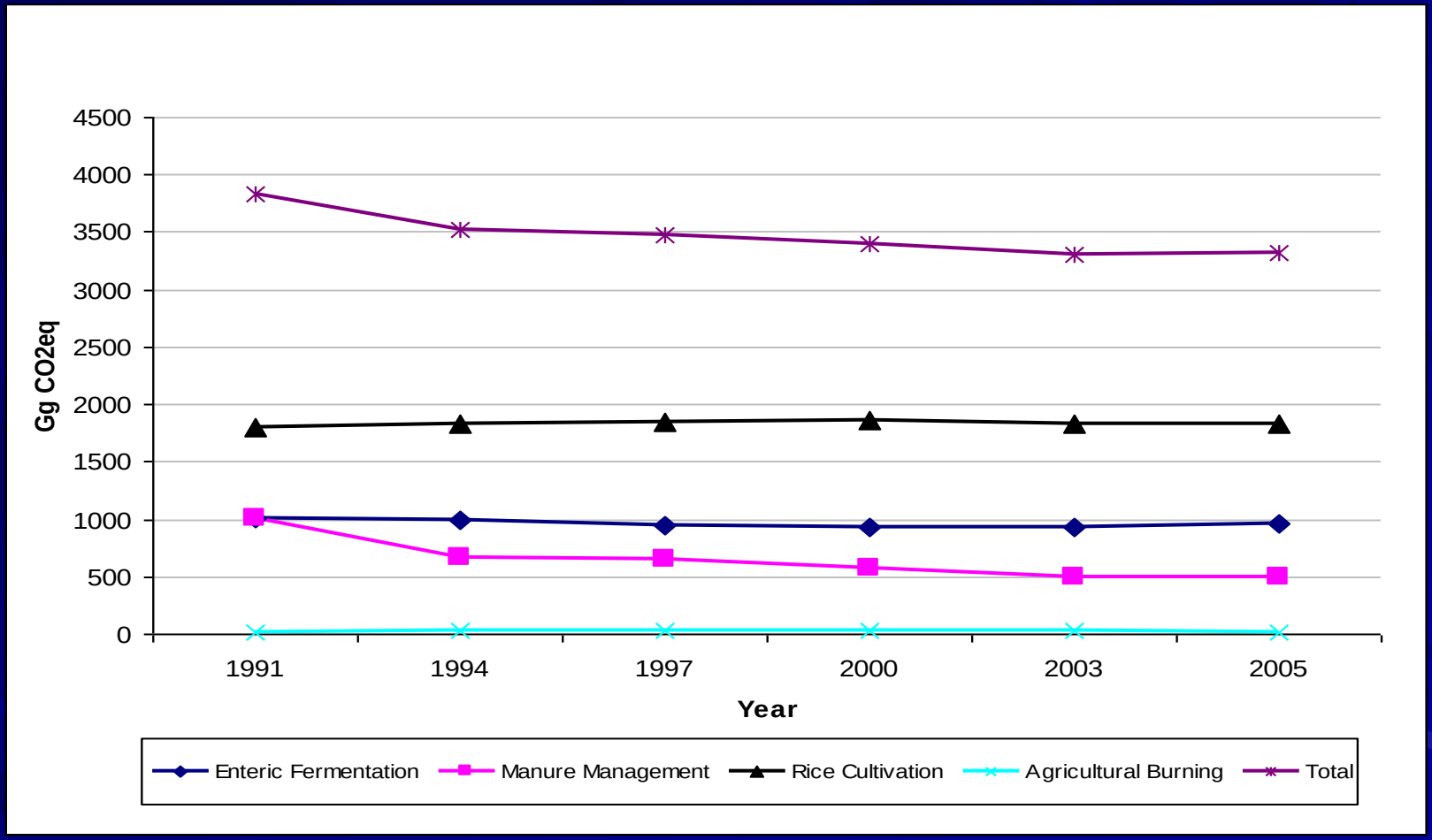
P= projected based on 2000 constant prices

Time series emission -Energy



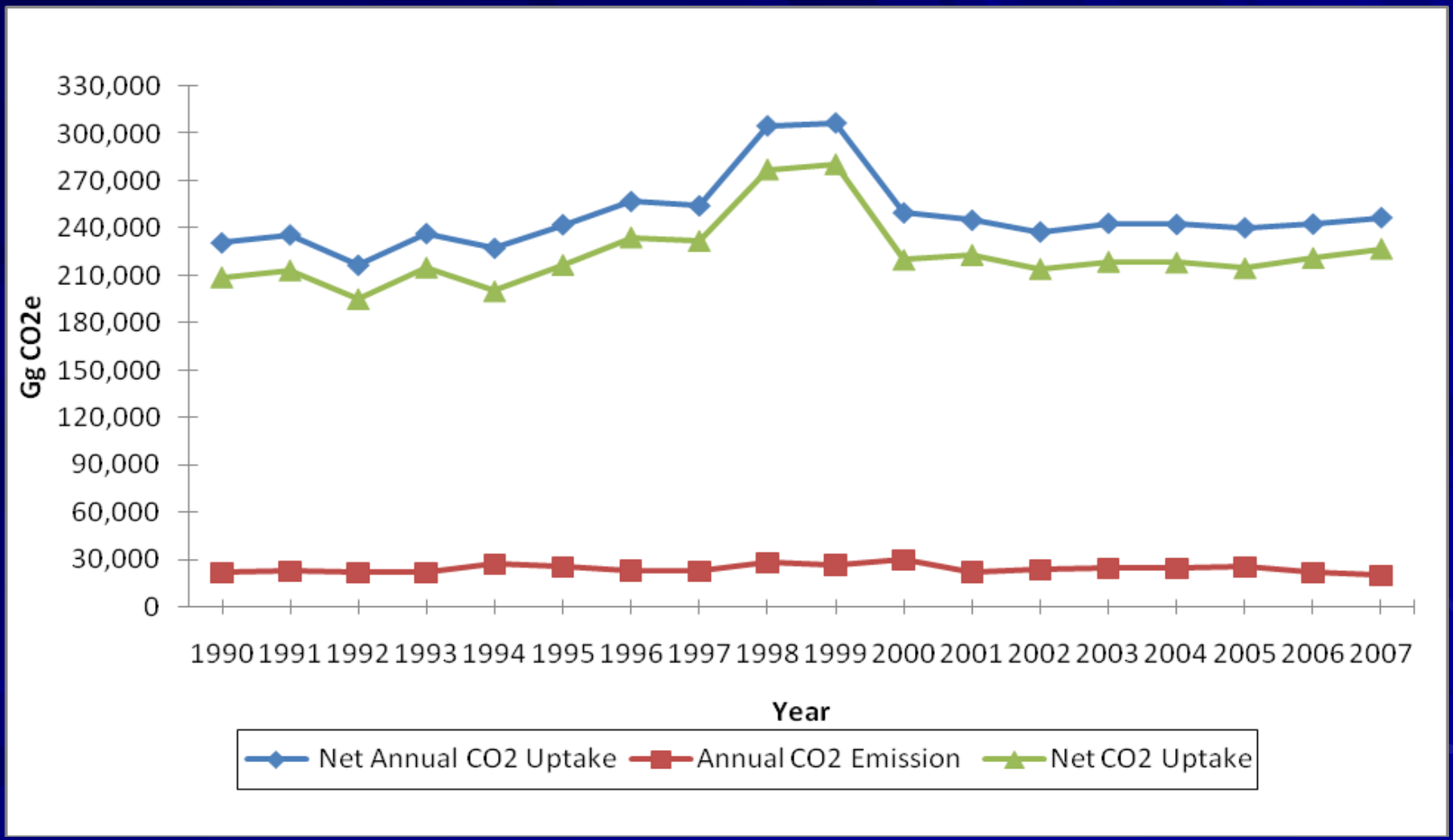
Fugitive emissions from 1990 to 1999 are not available. For the residential and commercial, the data was not available until the year 1996. For agriculture, there were no data for the year 1990.

Time series emission - Agriculture

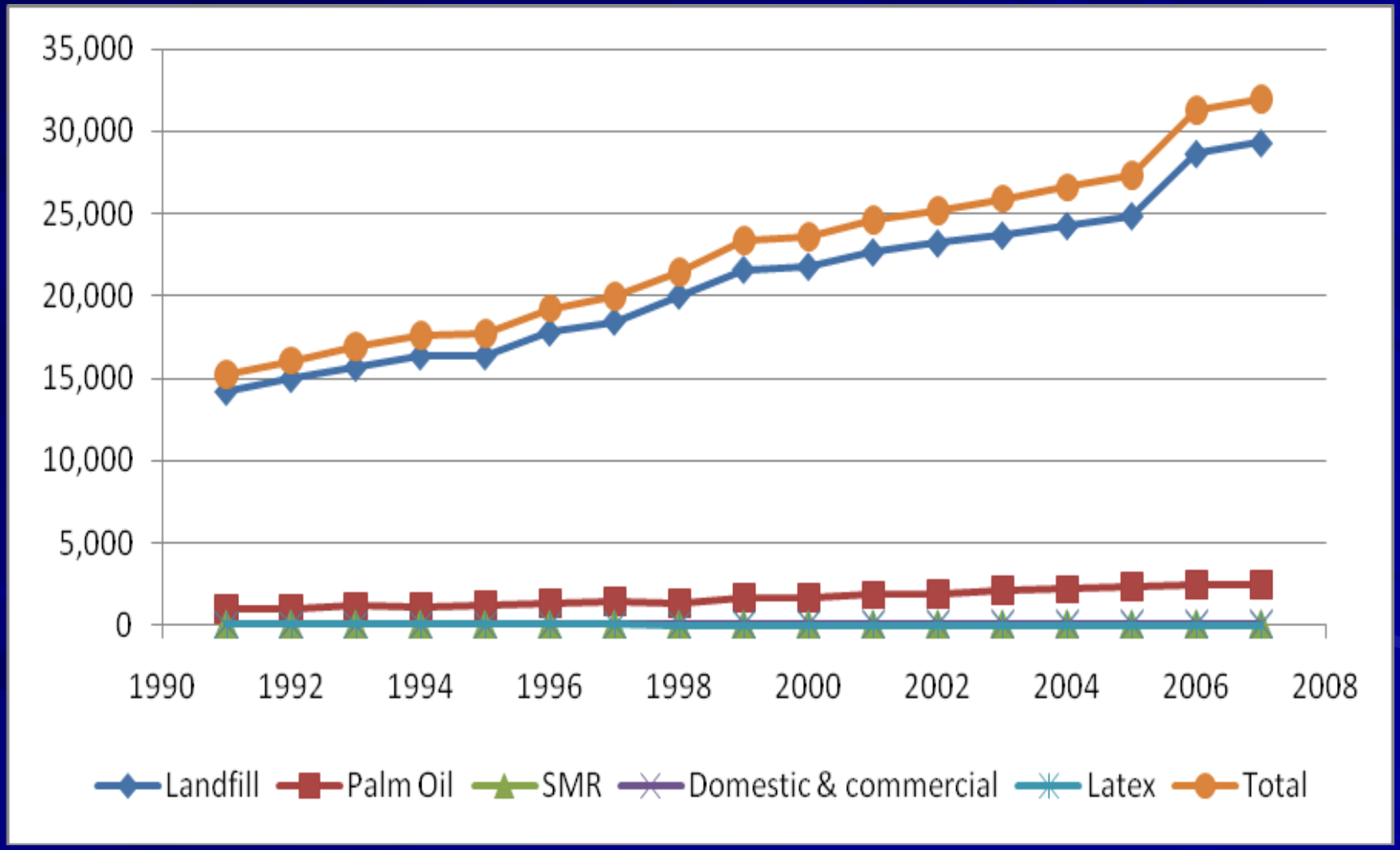


Emission from Agriculture Soils amounting to 1761Gg CO_2equivalent not included. Data for single year (1991, 1994, 1997, 2000, 2003 and 2005) was used for this graph. However, for the purpose of inventory for the base year 2000, an average of the years

Time series emission & removal-LULUCF



Time Series Emissions for Waste Sector



Key Sources of Emissions

Sub Sector	Key category	Direct GHG	Current year estimate (CO_2 e)	Level assessment (%)	Cummulative total
Energy	Emissions from Energy industries	CO_2	58,486	26.2	26.2
Energy	Transportation	CO_2	35,587	16.0	42.16
Energy	Manufacturing industries and construction	CO_2	26,104	11.7	53.87
Waste	Landfills	CH_4	24,541	11.0	64.88
Lulucf	Forest and grassland conversion	CO_2	24,111	10.8	75.69
Energy	Fugitive emissions from fuel	CH_4	21987	9.9	85.56
Industrial processes	Mineral products	CO_2	9,776	4.4	89.94
Lulucf	Emissions and removals from soil	CO_2	4,638	2.1	92.02
Industrial processes	Metal production	CO_2	2,797	1.3	93.28
Energy	Commercial	CO_2	2,122	1.0	94.23
Agriculture	Emissions from rice production	CH_4	1,861	0.8	95.06

Key Sources without LULUCF

Sub Sector	Key category	Direct GHG	Current year estimate (CO_2 e)	Level assessment (%)	Cummulative total
Energy	Emissions from Energy industries	CO_2	58,486	30	30.00
Energy	Transportation	CO_2	35,587	18.4	48.41
Energy	Manufacturing industries and construction	CO_2	26,104	13.50	61.91
Waste	Landfills	CH_4	24,541	12.69	74.60
Energy	Fugitive emissions from fuel	CH_4	21987	11.37	85.97
Industrial processes	Mineral products	CO_2	9,776	5.06	91.03
Industrial processes	Metal production	CO_2	2,797	1.45	92.47
Energy	Commercial	CO_2	2,122	1.10	93.57
Agriculture	Emissions from rice production	CH_4	1,861	0.96	94.53
Energy	Residential	CO_2	1,812	0.94	95.47

Way Forward

- GHG Inventory Process being institutionalized
- Development of local emission factors
- Development of national template for data compilation
- Development of procedures for national GHG Inventory
- Referencing on-going mitigation actions with GHG inventory

Concluding Remarks

- Number of improvements have been incorporated in NC2 inventory
  - More sectors covered
  - Activity data and guidelines used
- Energy sector remains the largest contributor of GHG emissions
- GHG emissions per capita increased by 13%
- Key Sources Category Analysis was undertaken to identify major emission activities
- Roles of government and supporting agencies crucial in building a sustainable inventory