

# **AIM Activities in 1999 :**

# **India Report**

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**Presentation for**

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# OVERVIEW OF ACTIVITIES YEAR 1999

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**Greenhouse Gas Inventory for India**



**AIM/ENDUSE Models for India**



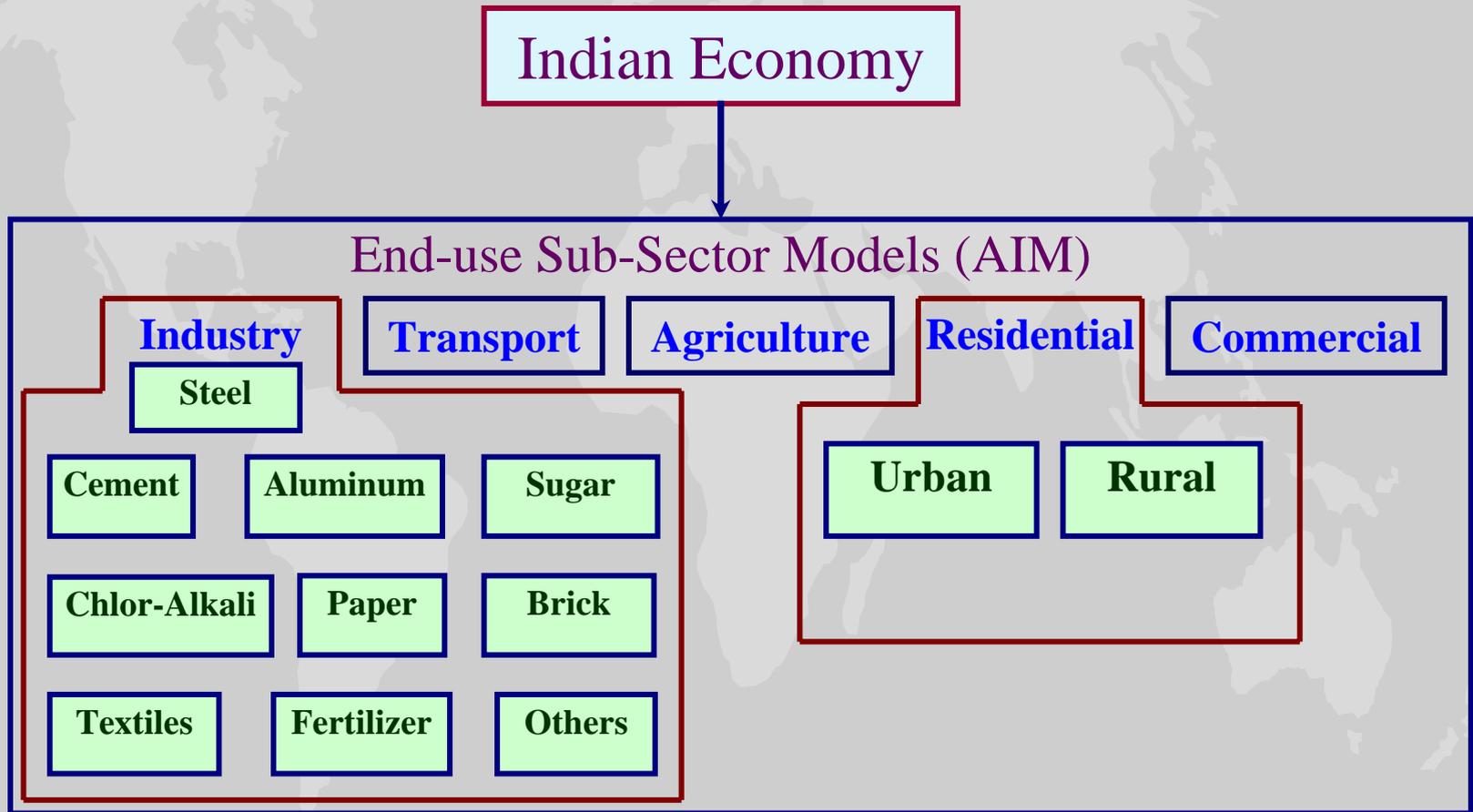
**Dissemination**

# GREENHOUSE GAS INVENTORY

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- 📄 **466 district level inventory data**
- 📄 **Coverage of gases:**
  - ☞ **CO<sub>2</sub>, CH<sub>4</sub>, SO<sub>2</sub>, N<sub>2</sub>O, NO<sub>x</sub>**
- 📄 **Emissions factors for India**
- 📄 **Sectoral and hot spot analysis**
- 📄 **Large Point Source Data**

# Sectors in Indian AIM/ENDUSE Model



# Sectoral and Technological Details in Indian AIM/ENDUSE

<u>Sector</u>	<u>Subsector</u>	<u>Technl</u>
<b>Industry</b>	<b>Steel</b>	<b>32</b>
	<b>Aluminum</b>	<b>10</b>
	<b>Cement</b>	<b>12</b>
	<b>Brick</b>	<b>7</b>
	<b>Paper</b>	<b>21</b>
	<b>Caustic Soda</b>	<b>11</b>
	<b>Soda Ash</b>	<b>14</b>
	<b>Fertilizer</b>	<b>12</b>
	<b>Sugar</b>	<b>18</b>
	<b>Textiles</b>	<b>11</b>
<b>Others</b>	<b>4</b>	

<u>Sector</u>	<u>Subsector</u>	<u>Technl</u>
<b>Transport</b>		<b>25</b>
<b>Residential</b>	<b>Urban</b>	<b>25</b>
	<b>Rural</b>	<b>21</b>
<b>Commercial</b>		<b>9</b>
<b>Agriculture</b>		<b>14</b>
<b>Total</b>		<b>246</b>

# AIM/ENDUSE MODEL: 1999 Work

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**Revised Sector Demand Projections**

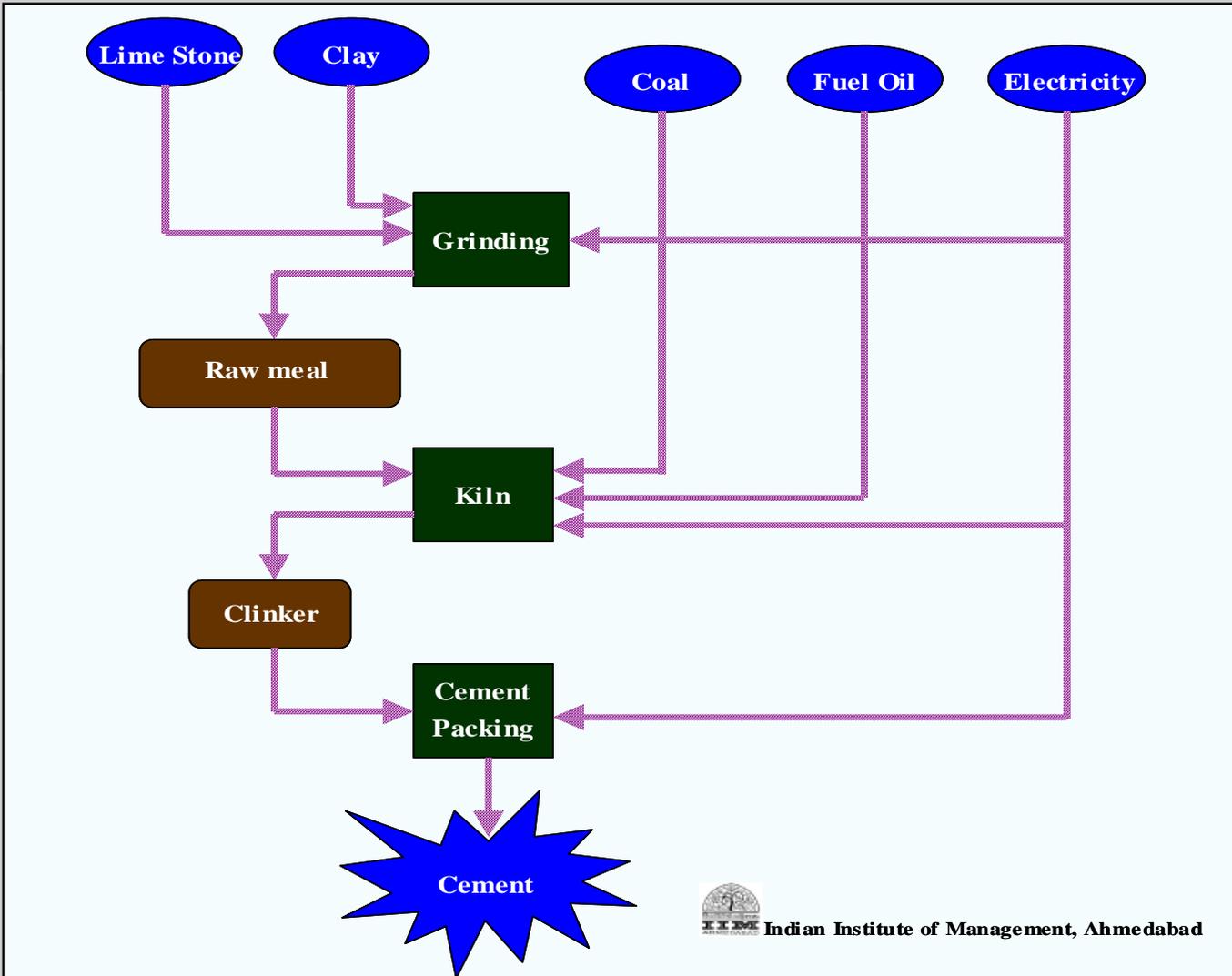


**Full GHG Coverage**



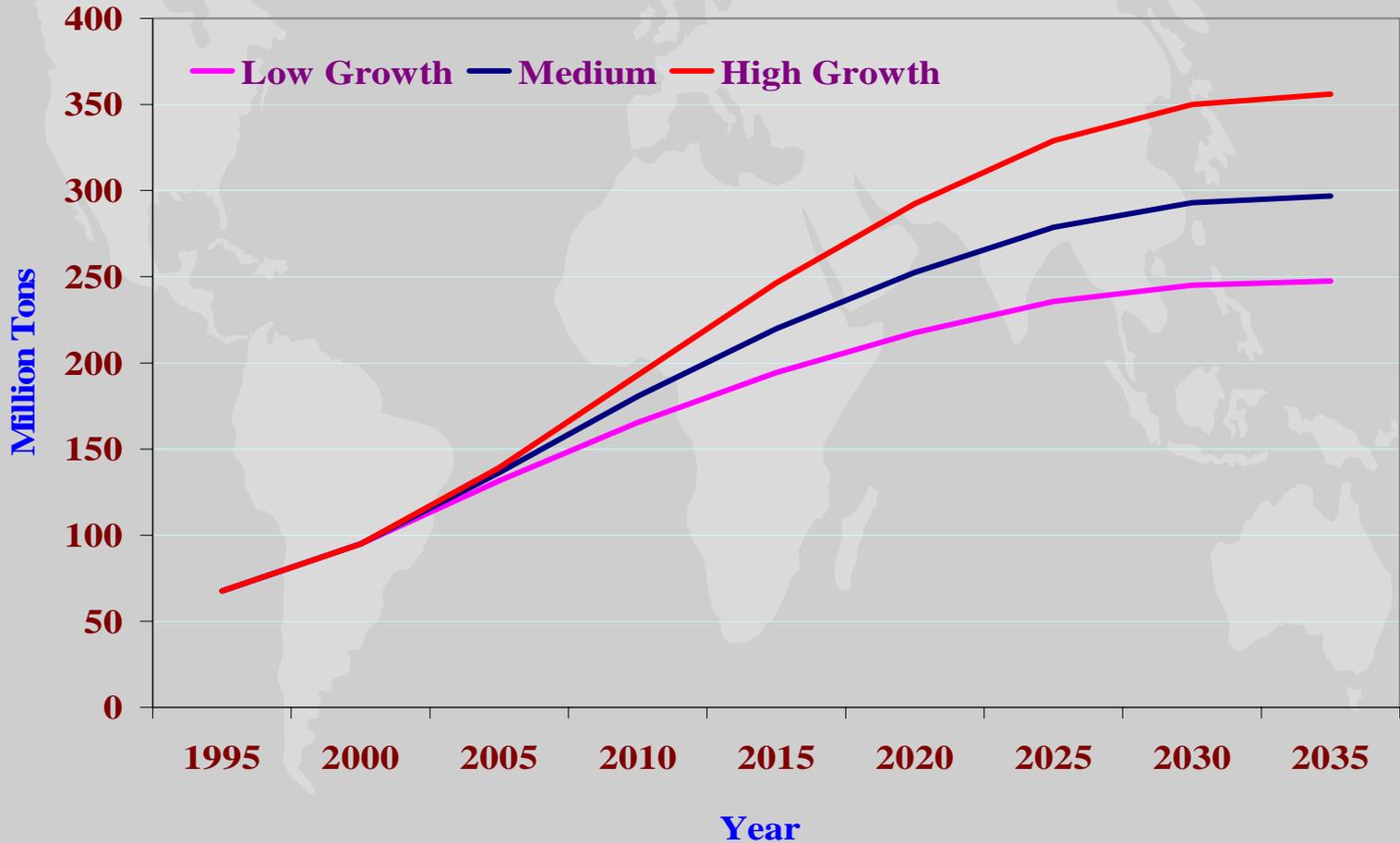
**Analysis of CDM Options**

# Cement Process



Indian Institute of Management, Ahmedabad

# Cement Demand Projection



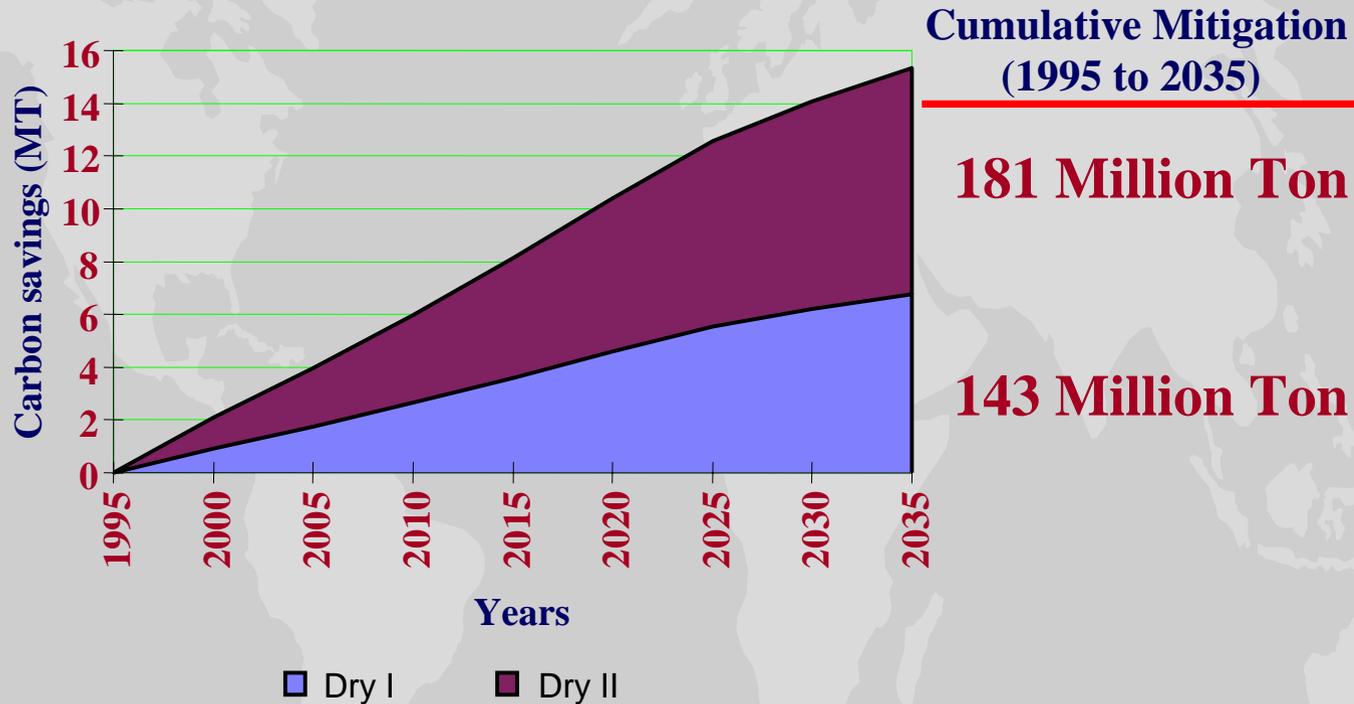
# Environmental Benefits of Technological Change

## Baseline: Existing Dry Technology

### Emissions Mitigation kg/ Ton of Cement

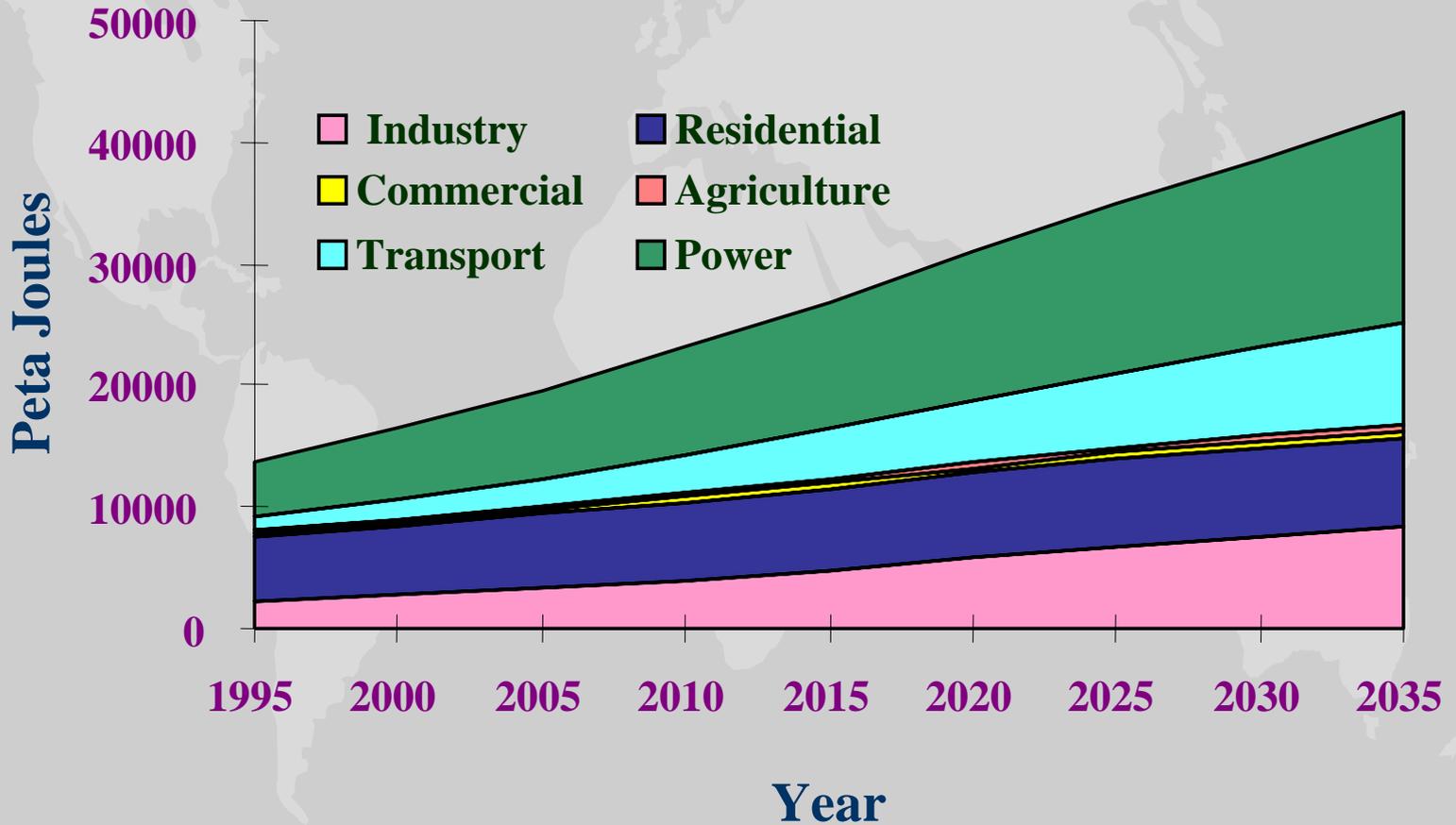
<u>Tech:</u>	<u>Carbon</u>	<u>SO<sub>2</sub></u>	<u>N<sub>2</sub>O</u>	<u>NO<sub>x</sub></u>
Dry I	26.7	0.40	0.0011	0.18
Dry II	27.1	0.44	0.0010	0.19

# Carbon Mitigation Potential in Cement Sector

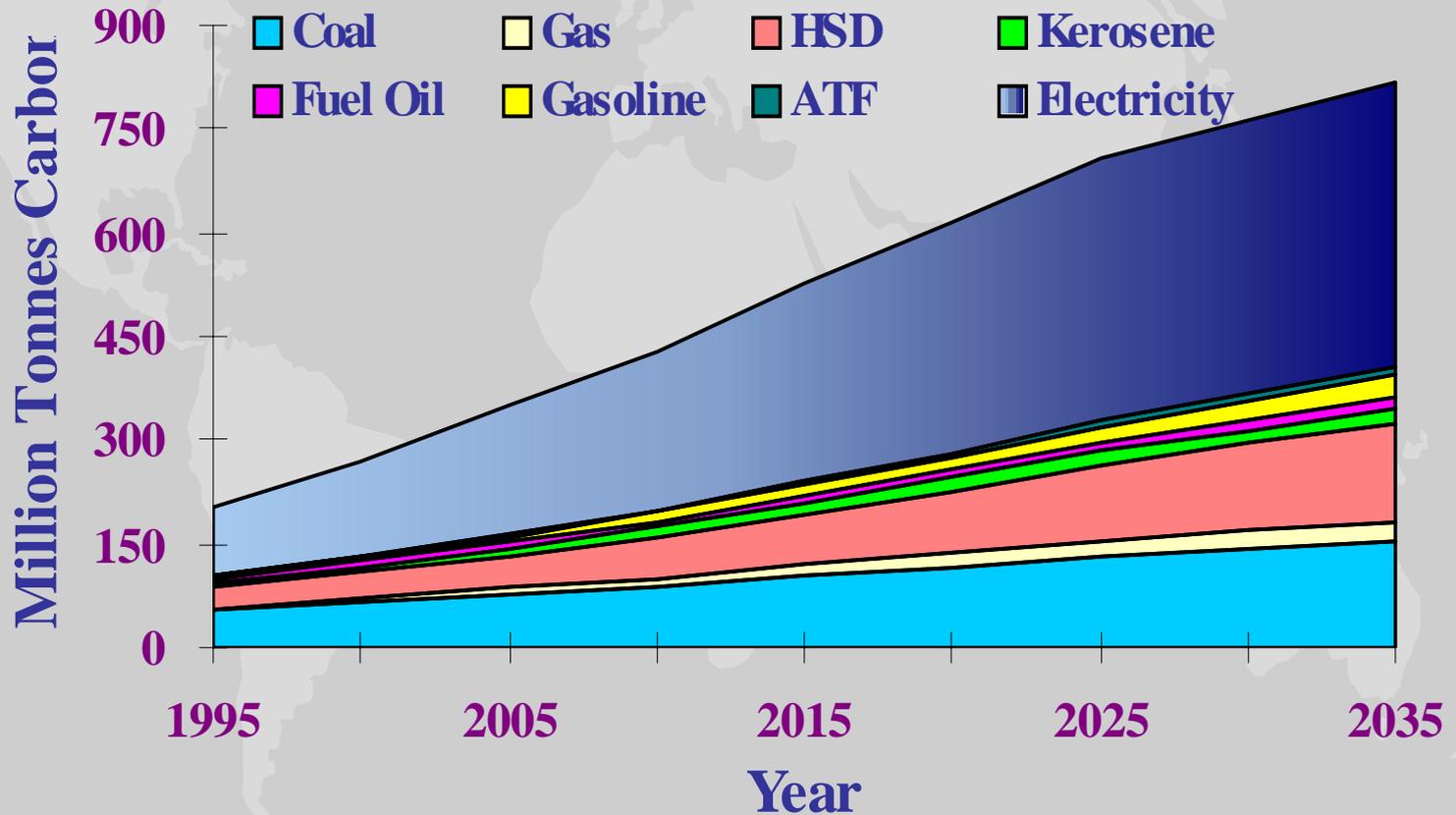


Besides, there will be Cumulative mitigation of 4.9 and 2 Million Tons of SO<sub>2</sub> and NO<sub>x</sub> respectively

# Sectoral Primary Energy Consumption

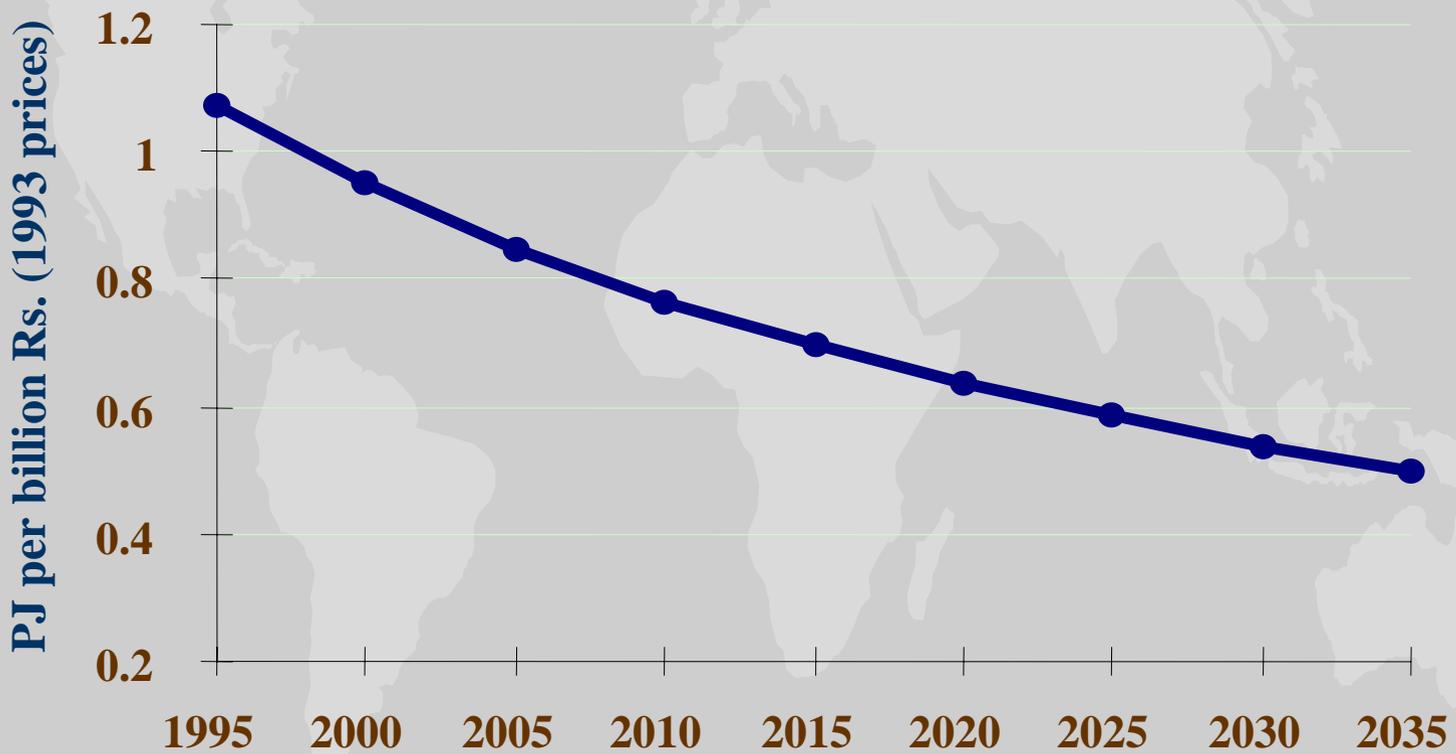


# Carbon Emissions by Fuels

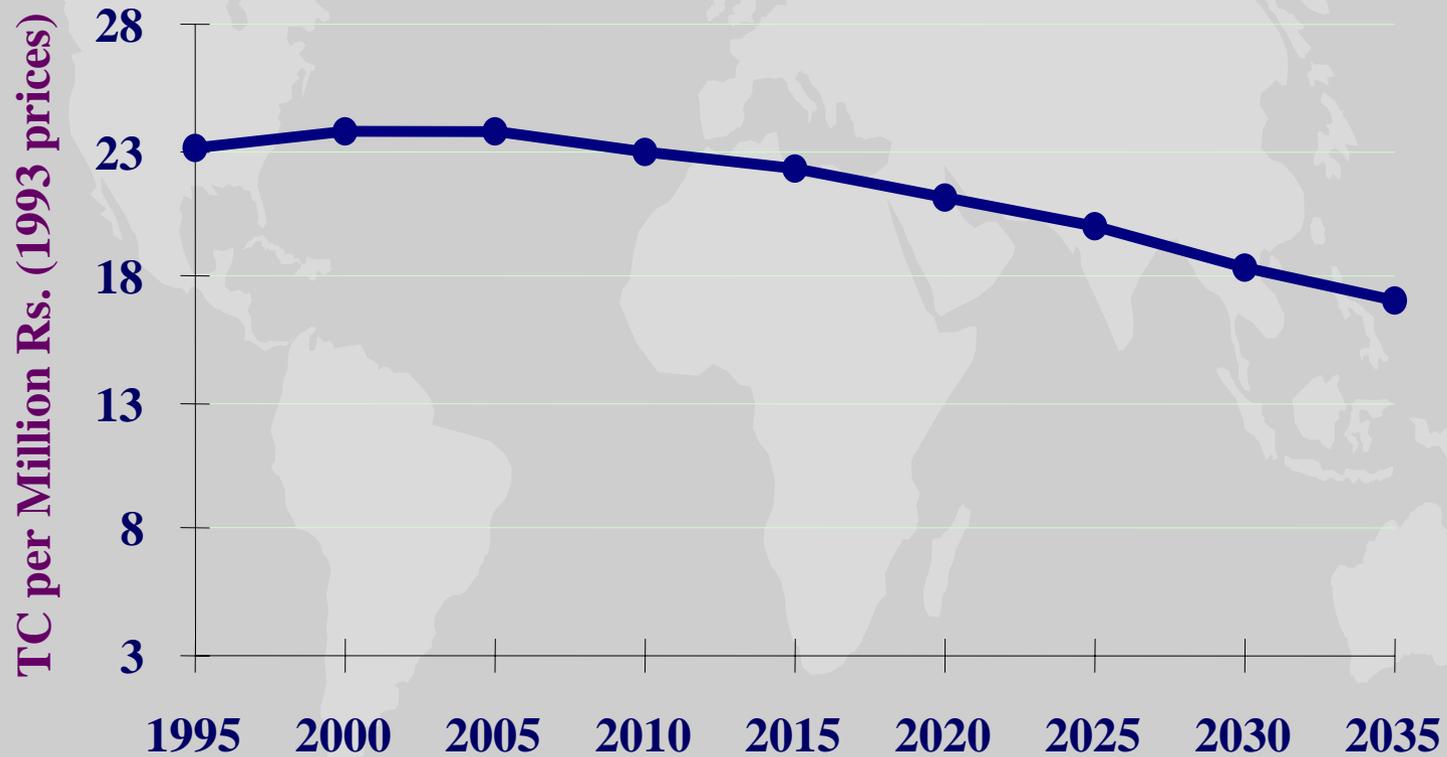


# Energy intensity of GDP

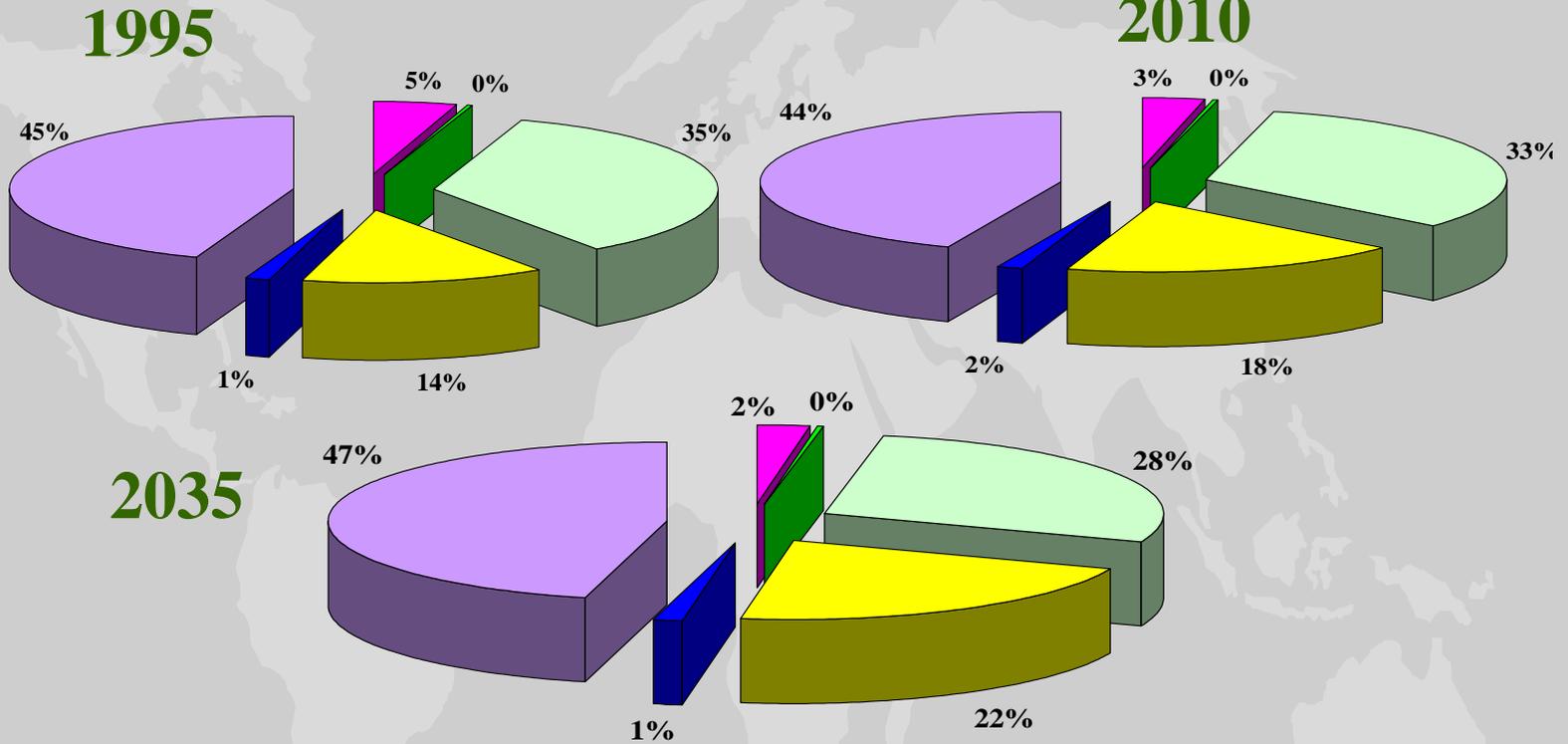
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# Carbon Intensity of GDP

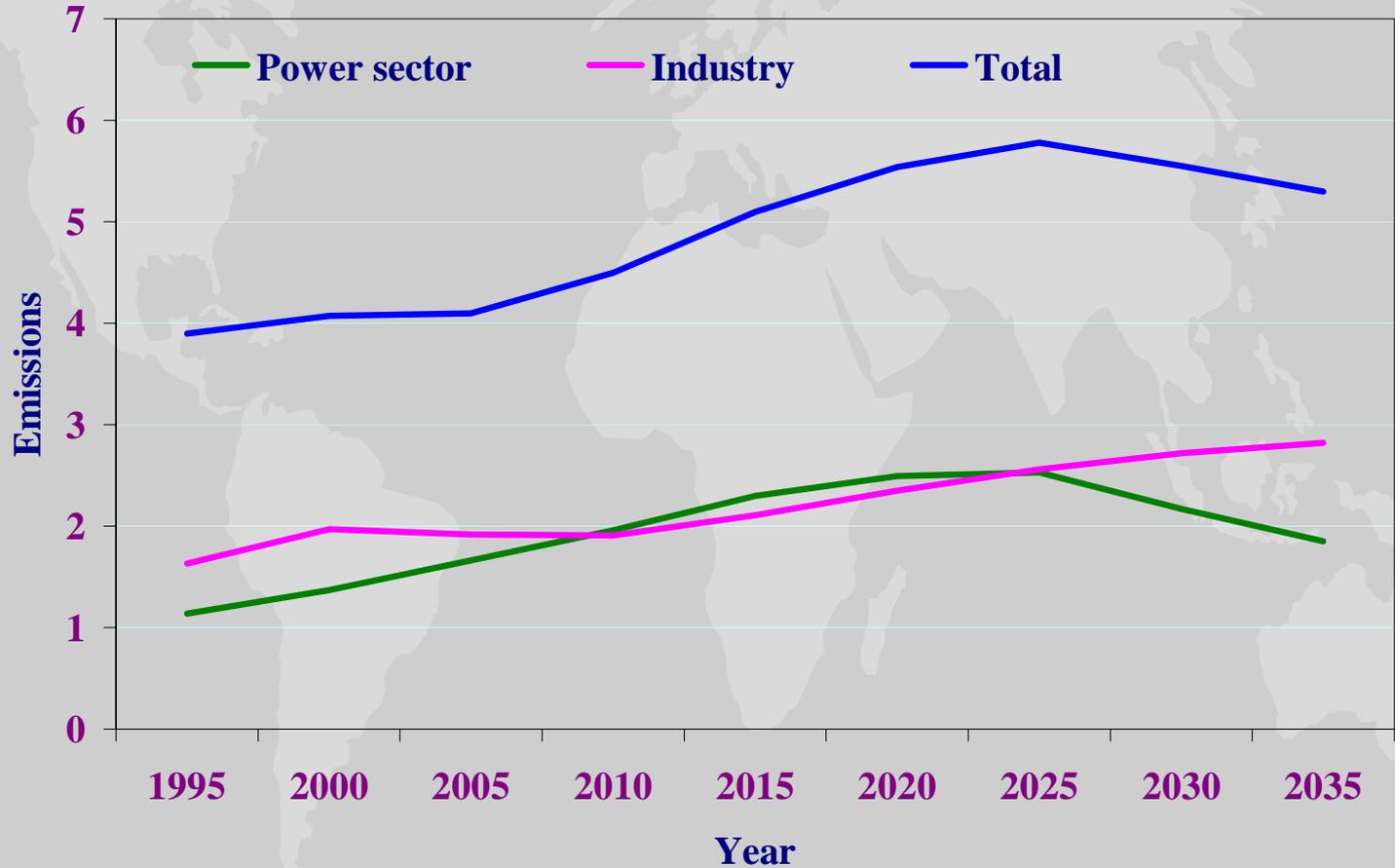


# Carbon Emissions

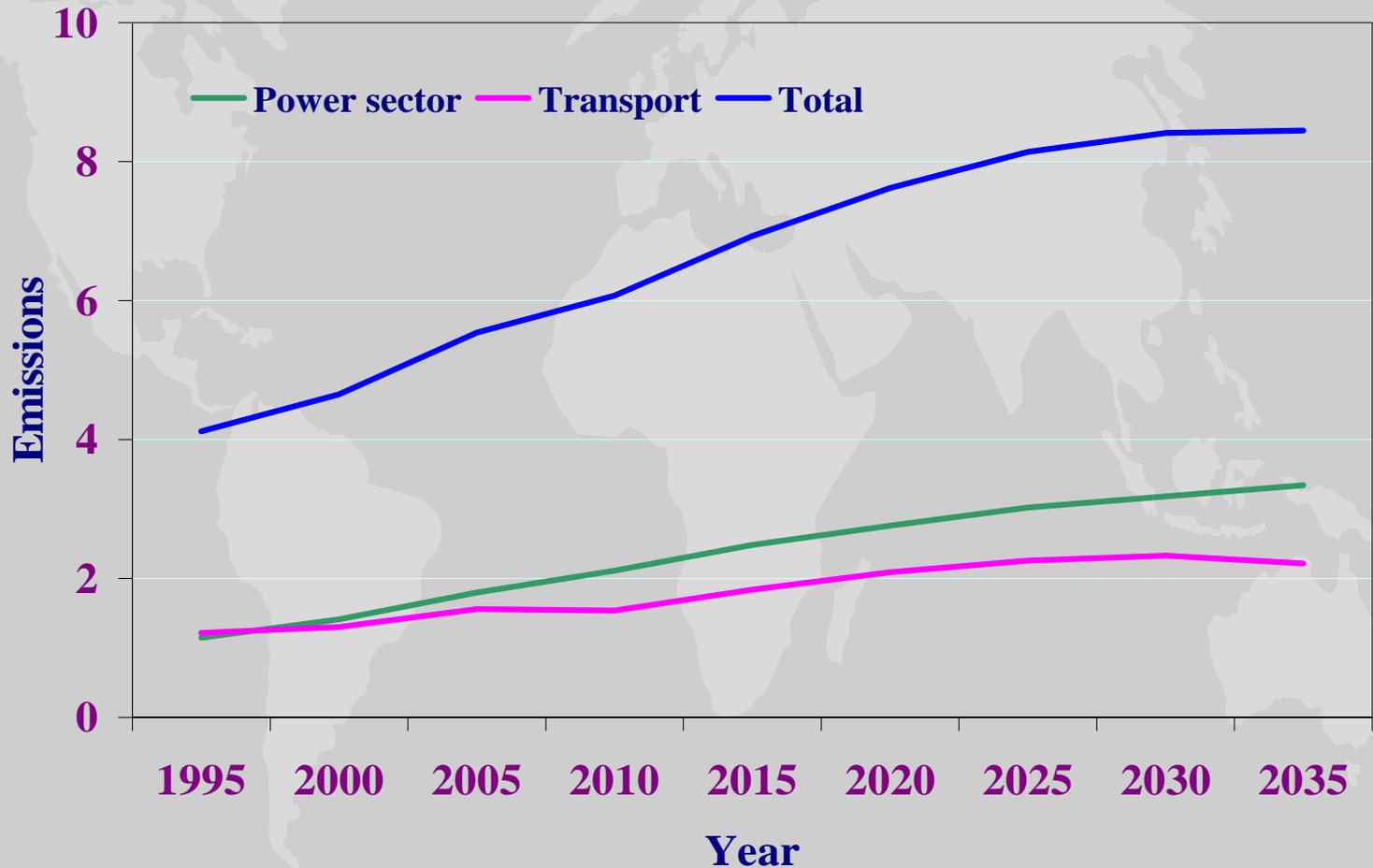


- RESIDENTIAL**
- COMMERCIAL**
- INDUSTRY**
- TRANSPORT**
- AGRICULTURE**
- POWER SECTOR**

# SO<sub>2</sub> Emissions (Million Tons)



# NO<sub>x</sub> Emissions (Million Tons)



# DISSEMINATION

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- 📄 **CDM workshops in India**
- 📄 **International Workshops**
- 📄 **Technology Strategy Workshop at PNNL**
- 📄 **Government Policy in India**
- 📄 **National Communication for India**
- 📄 **Modelling Forums**
- 📄 **IPCC Reports (SRTT, TAR)**

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# Plan for India: Year 2000

# **Plan for India: Year 2000**

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## **Assessment of CDM Strategy**



## **GHG Inventory**

- Maps using GIS Tool**
- LPS Analysis**
- Enhance Coverage of Gases**



## **Long-Term Emissions Scenarios for India**

# Expand AIM Database



**Scenario Database**



**Macro-economic Database**



**Sectoral Demand Database**



**Technology Database**

# Expand Coverage of Gases



## **Additional Kyoto Gases**



**HFCs**



**PFCs**



**SF<sub>6</sub>**



## **Local Pollution**



**SPM**



**Tropospheric Ozone**



**VOCs**

# Strategy for Kyoto Mechanisms

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-  **Assessment of Baseline and CDM Potential**
-  **Sector Mitigation Cost**
-  **Technology Transfer**

# Long-term Emissions Scenarios for India

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-  **New Scenarios for India to Match IPCC Scenarios**
-  **Mitigation Analysis for New Scenarios**

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# **Long-Term Plan for India: Years 2001-2006**

# **Plan for Modelling**

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-  **Work with AIM team to update AIM-India periodically**
-  **Adapt New Models developed by AIM team to Indian situation**

# **Plan for Database Preparation**

-  **Comprehensive technology, energy, and emissions database to support AIM**
-  **Prepare detailed inventory data base at the district level for different .**
-  **Policy related data base to assist policy makers**

# Plan for Policy Analysis

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- 📄 **Emissions scenarios and mitigation analysis for India (with AIM Team)**
- 📄 **Technology strategy for India to support the aims of UNFCCC and Kyoto Protocol**
- 📄 **Identify specific areas of technology transfer between Japan and India for climate change mitigation**
- 📄 **Identify CDM projects which can be developed under co-operation between Japan and India**

# Plan for Dissemination

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-  **Provide results of AIM studies to policy makers and researchers through publications, workshops etc.**
-  **Develop a Website in co-operation with the AIM team**
-  **Disseminate AIM work in publications of IPCC, Government Documents, National GHG Communication for India etc.**