

# **Growing Activity and Challenges to Curb Energy Use: Case of Manufacturing Industries in India**

Presentation by  
Joyashree Roy

Jadavpur University, Kolkata, India

@ Research dialogue in Beijing Nov. 14, 2011

# Introducing the theme

- In developing economies multiple opportunities and stressors are simultaneously driving and threatening output growth
- well governed innovation and well formulated policy have very fundamental roles to play
- Energy intensity continues to be in use as an index of progress in efficient management of energy security

# Components of the paper

- declining energy intensity balancing growth in energy demand from activity growth in Indian industries.
- role of technological progress in maintaining high output growth with lesser input use.
- Need to go beyond SEC- BAU
- How NEEEM is planned to achieve pledge of bringing down energy intensity by 20-25% at macro level between 2005- 2020.

# Background

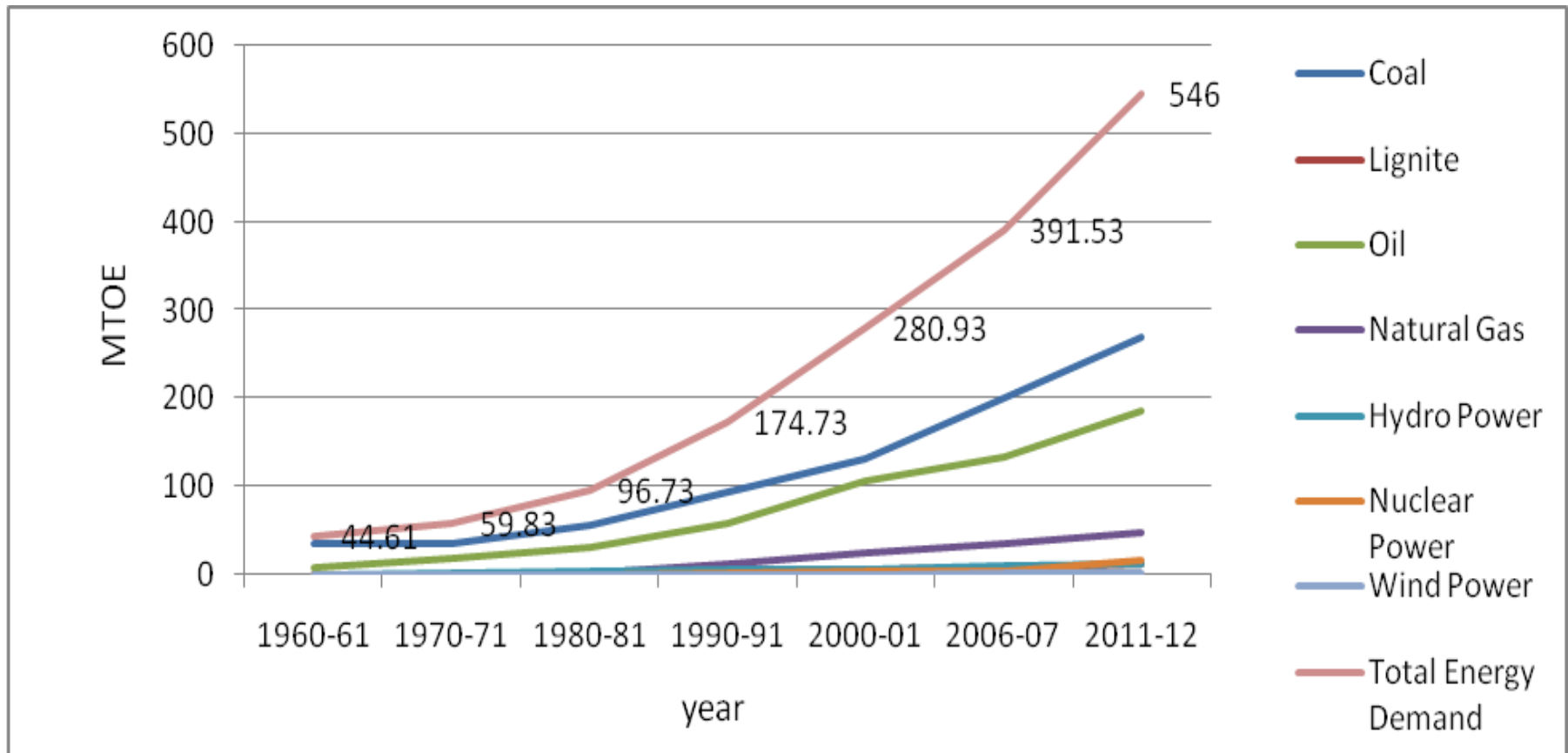
- Energy efficiency gain could pull down global emission by 33% in 1970-2004 period.
- Global effort towards decoupling of growth in output from fossil fuel consumption started in post 1973 period.
- in OECD countries the carbon intensity of manufacturing has declined more slowly than it did before 1990.
- For late comers in development process –the developing countries- the declining trend in intensity started almost a decade later in late 1980s and early 1990s.

# Declining energy intensity

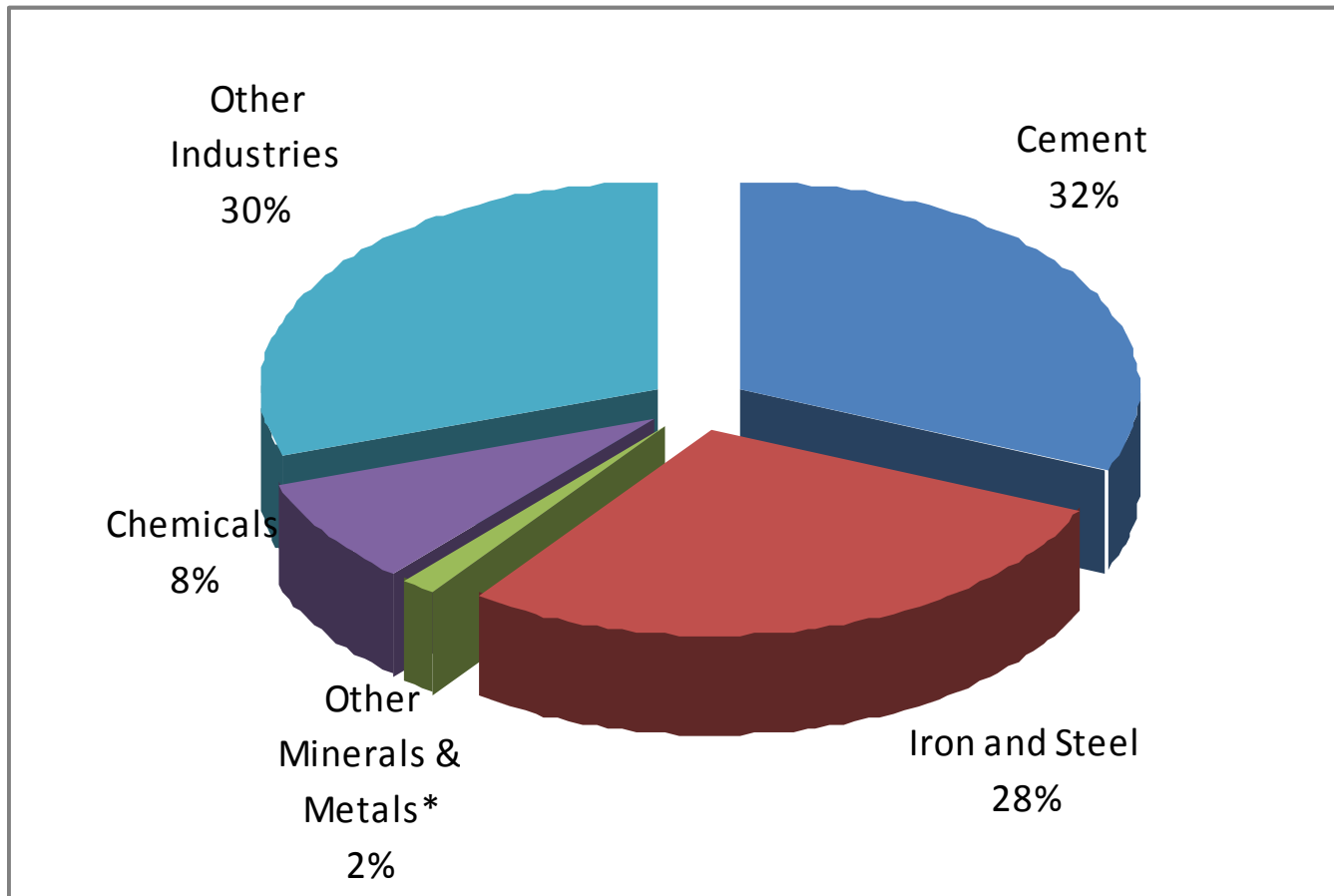
Emissions intensity of India's GDP declined by more than 30% during the period 1994-2007 due to the efforts and policies that are proactively being put in place.

Specially important for a country with high conventional fossil fuel share

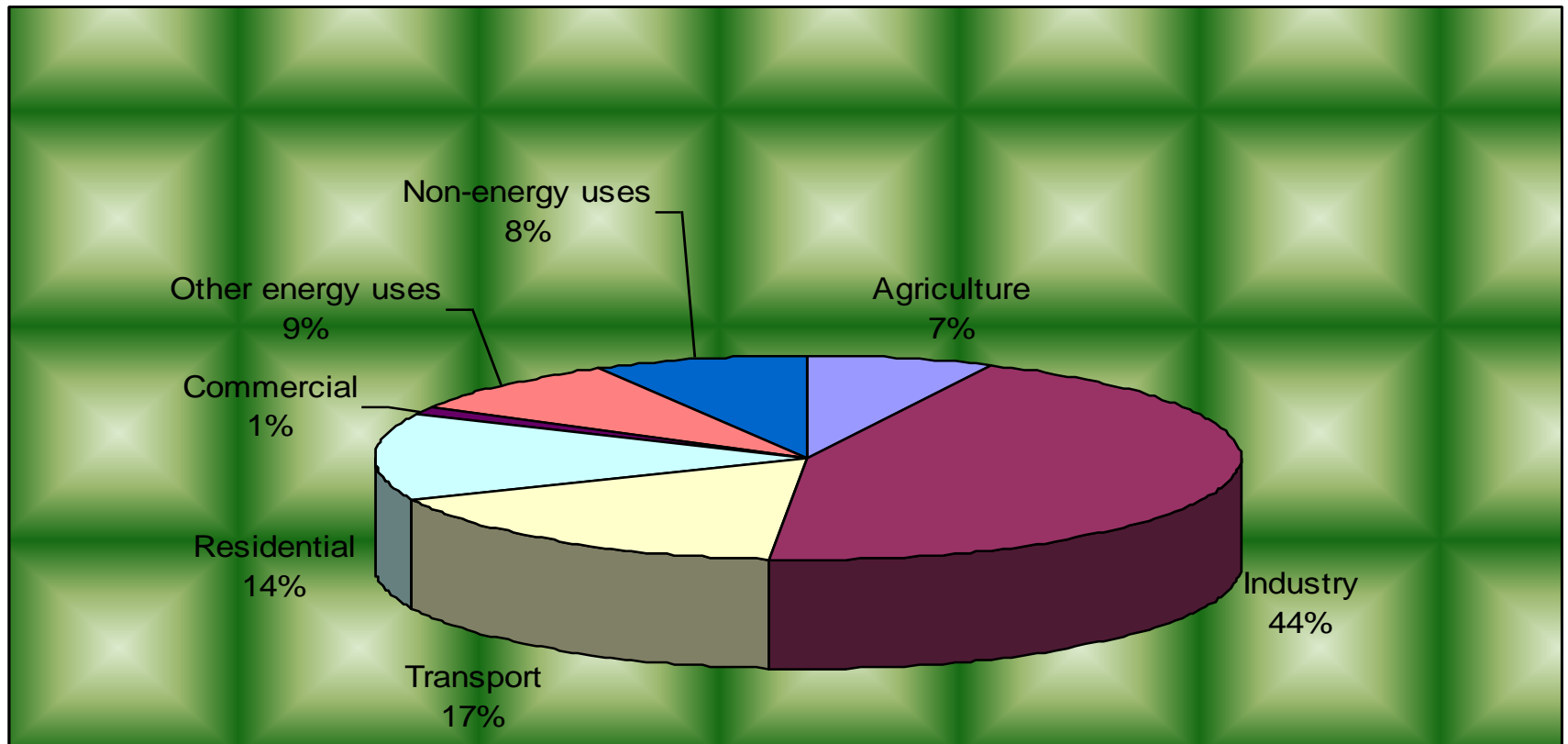
# Estimated Demand for Primary Fuel in India (1960-61 to 2011-12)



# GHG Emission by Industries in 2007 (Million tons CO<sub>2</sub>e)

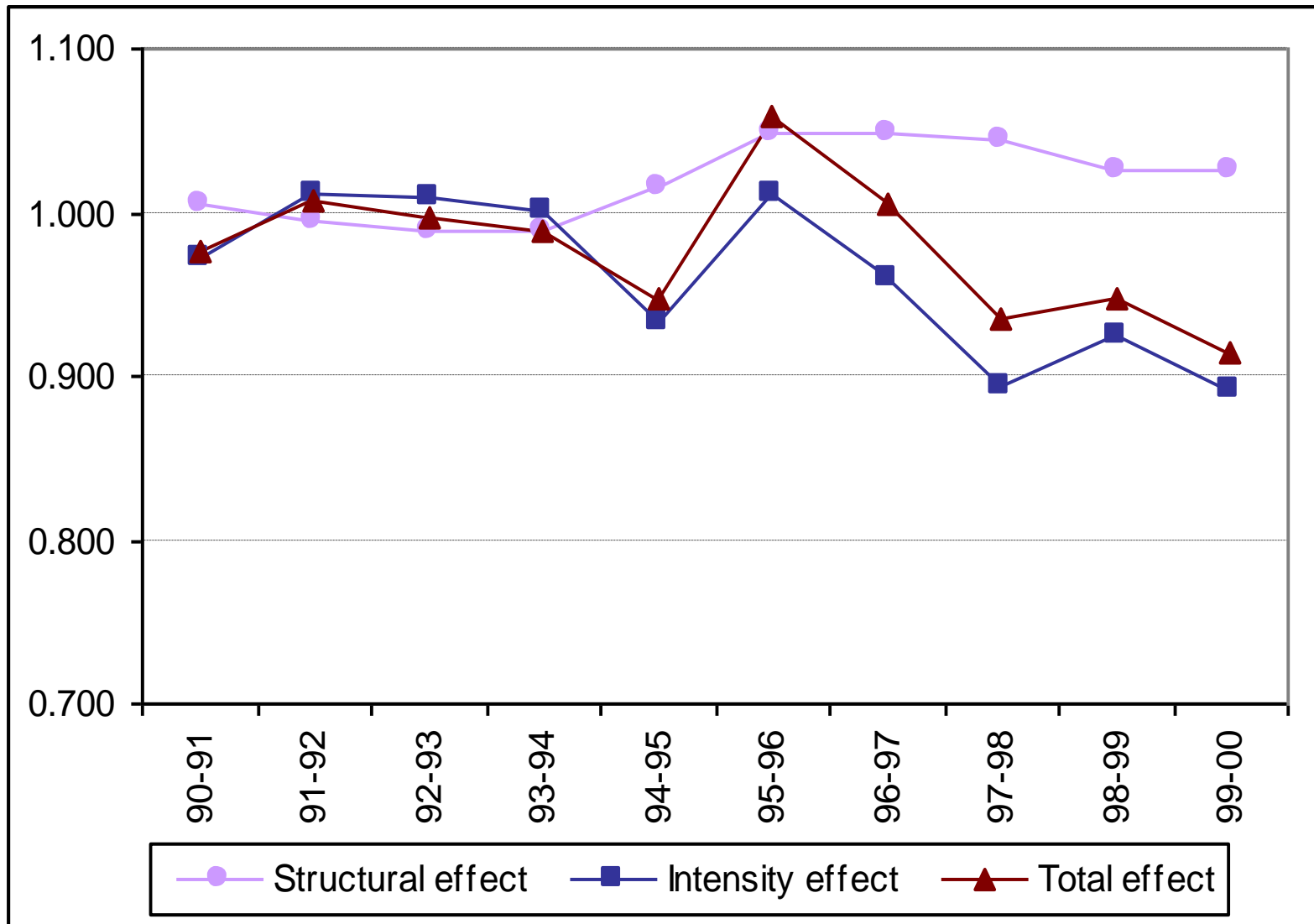


# Final Energy Consumption by sectors in India in 2005

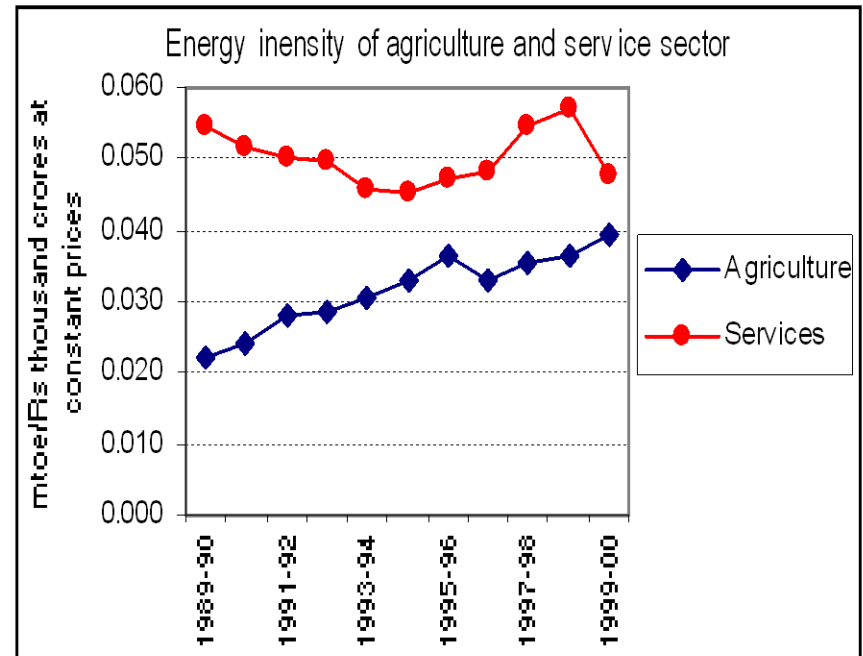
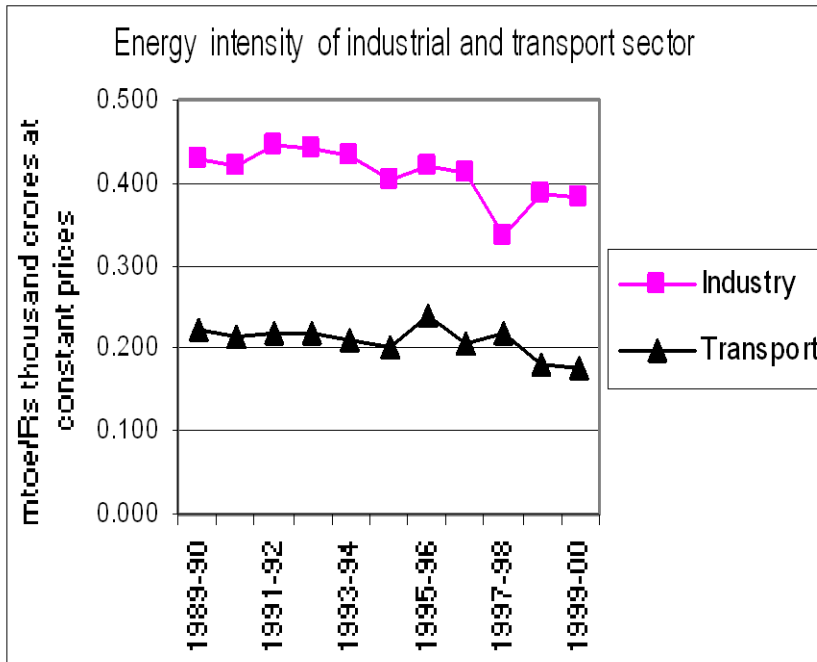




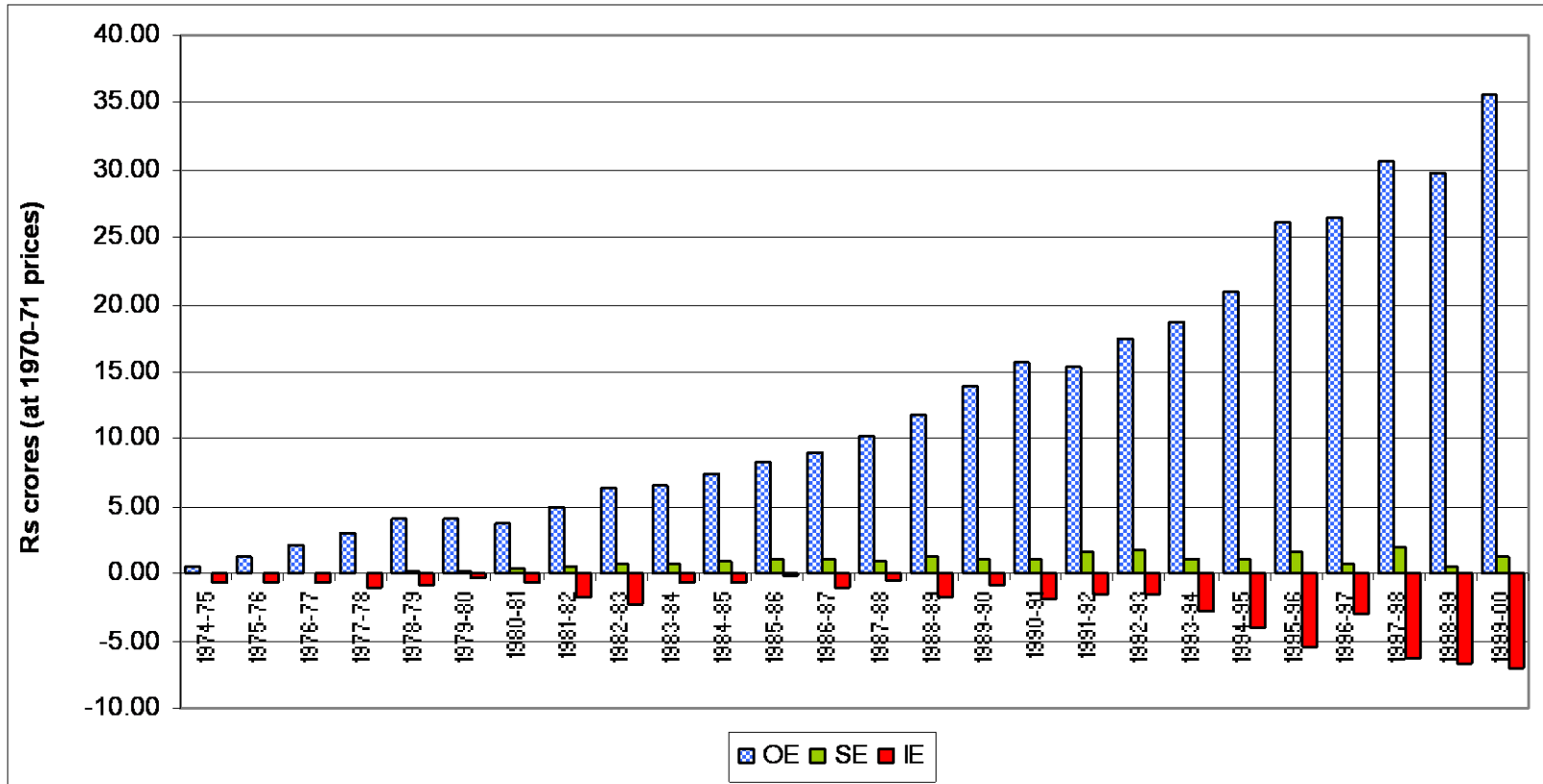
# Intensity Effect, Structural Effect and Total effect



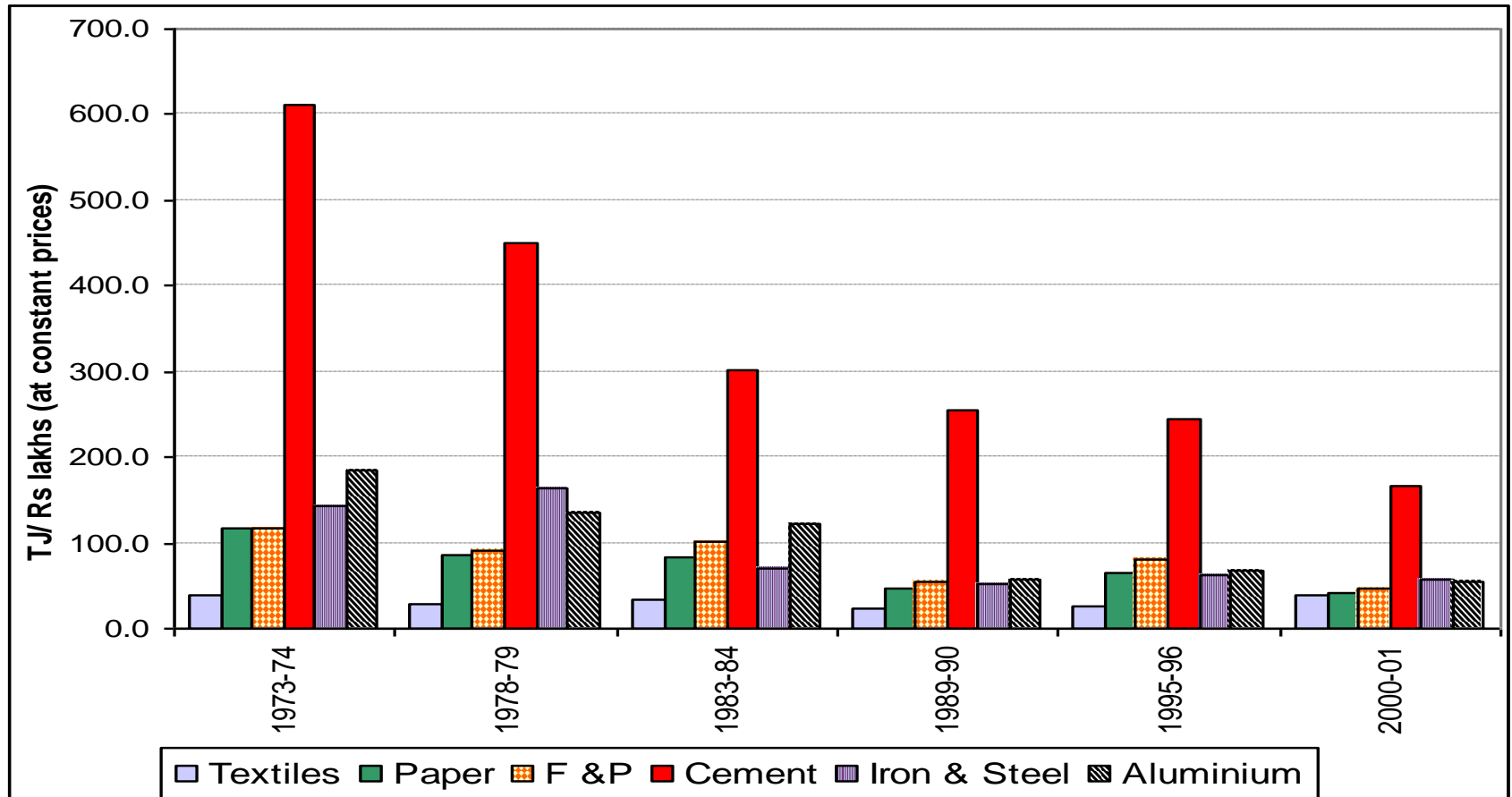
# Sectoral Energy Intensity in India



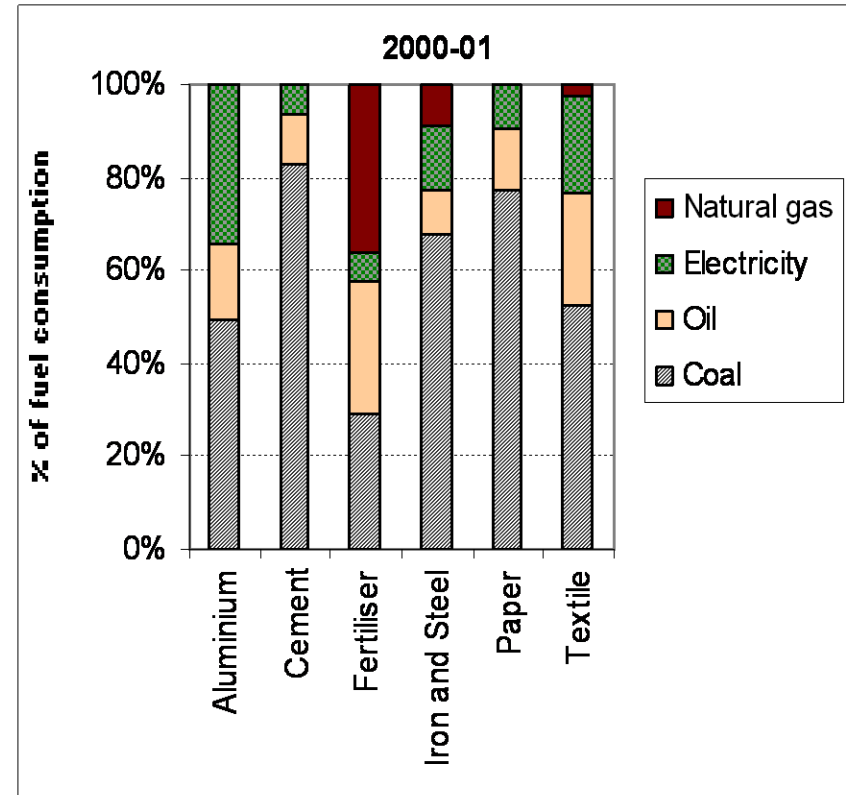
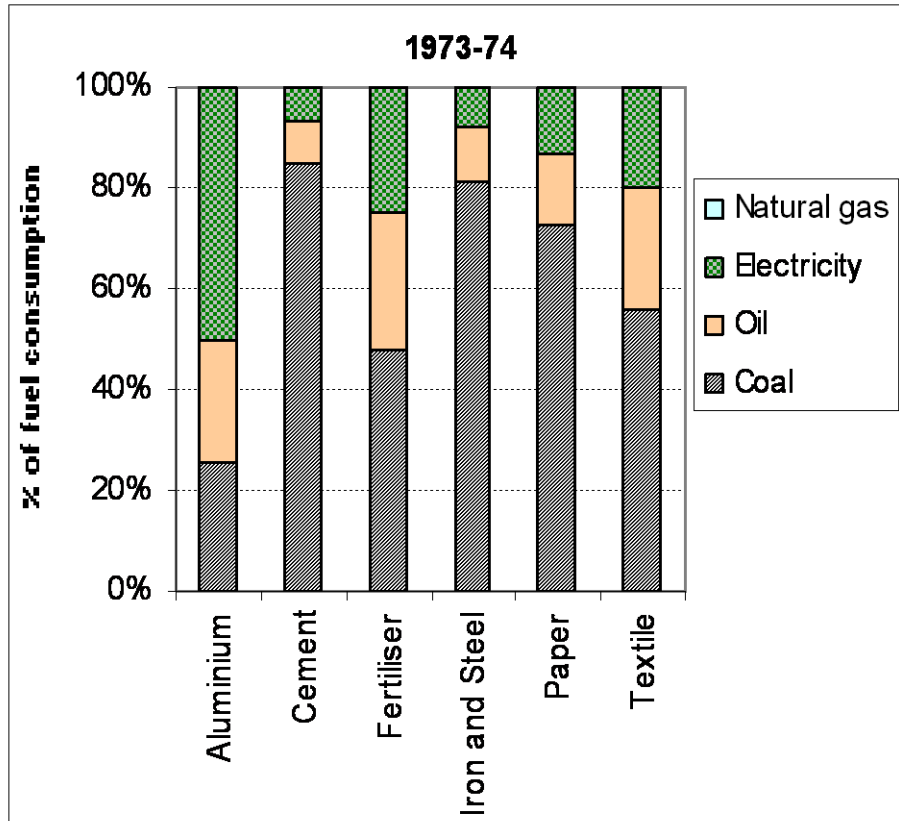
# Intensity decline vis-a-vis activity led increase in energy use



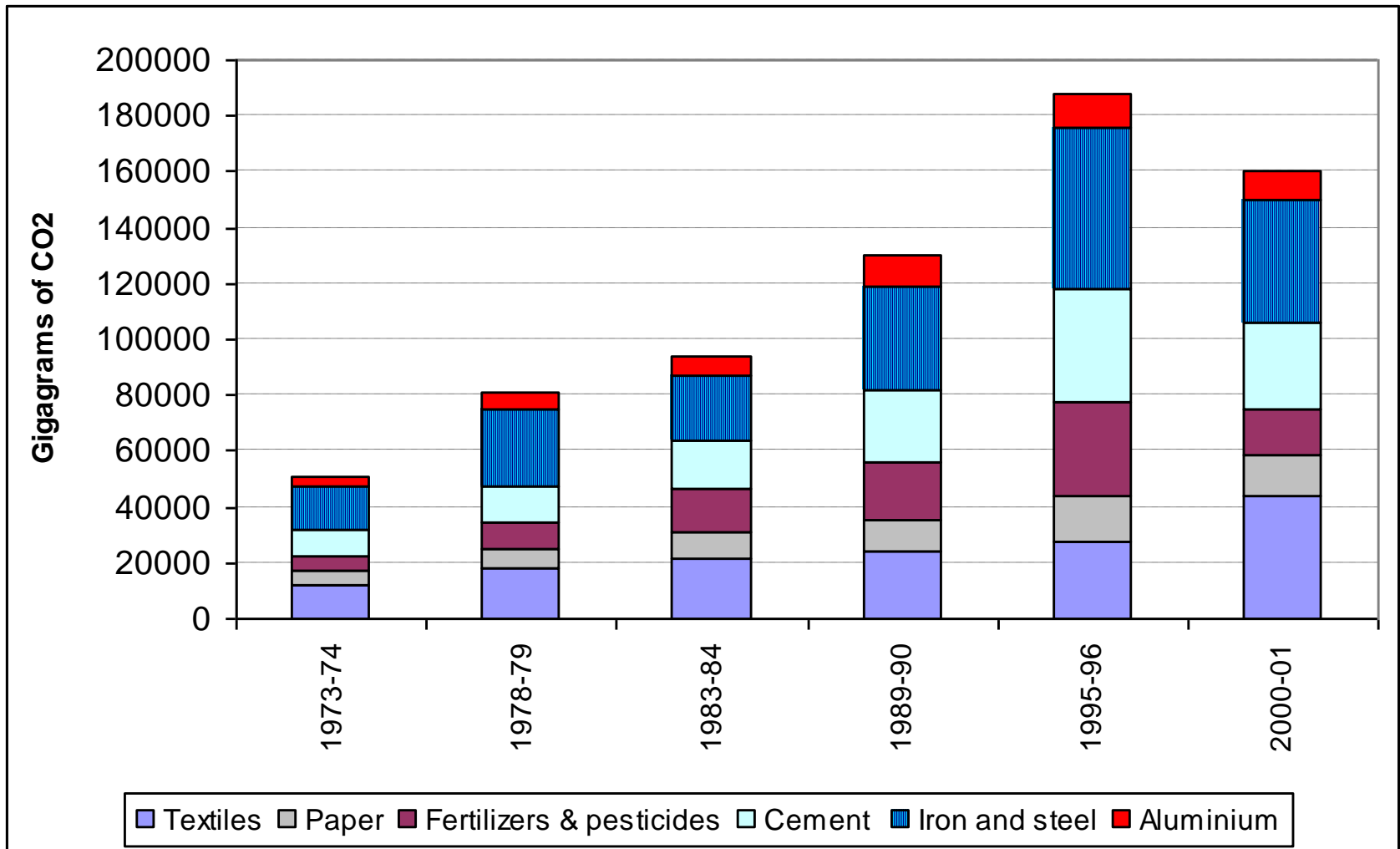
# Energy intensity of the industries



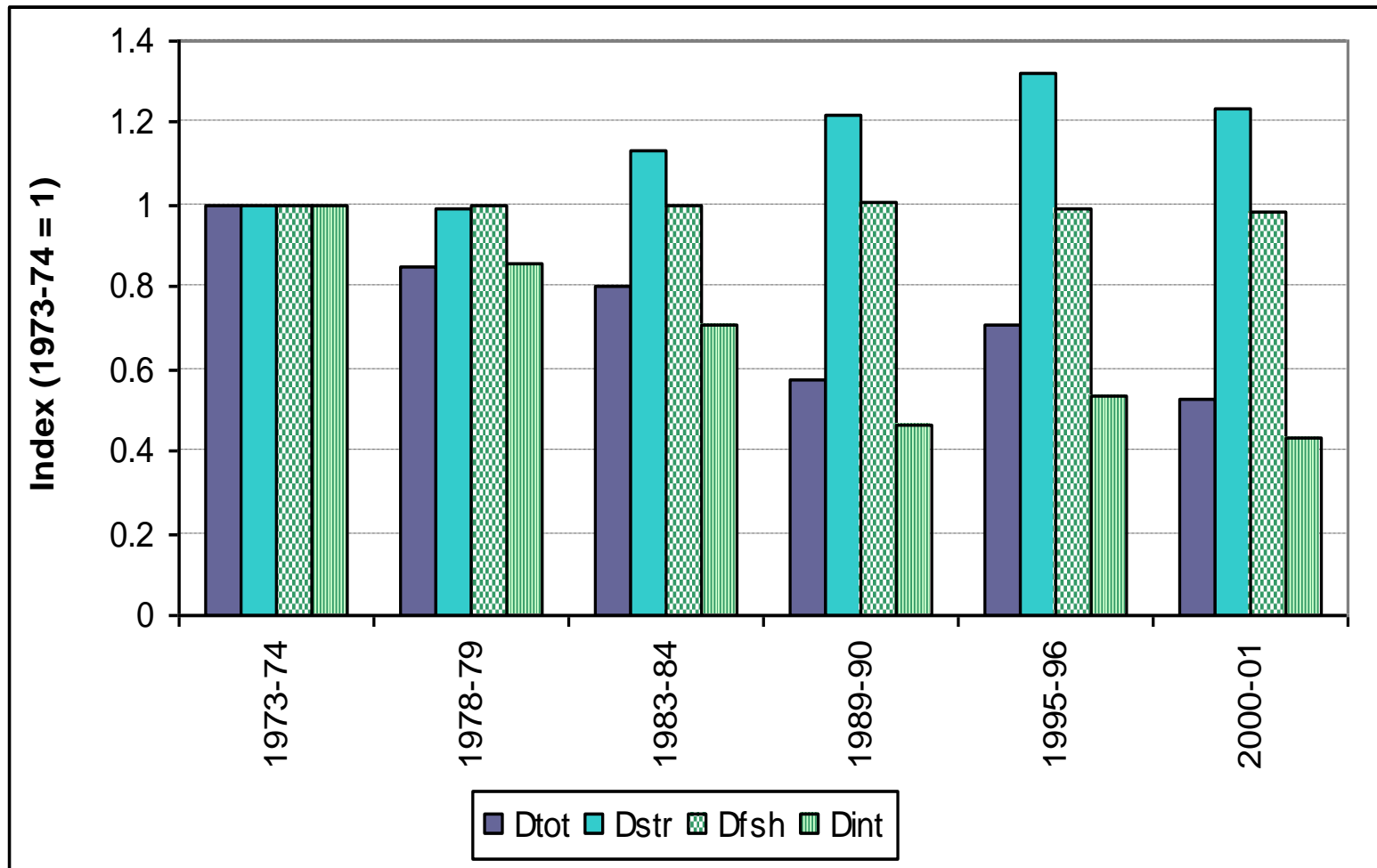
# Fuel mix pattern of industries



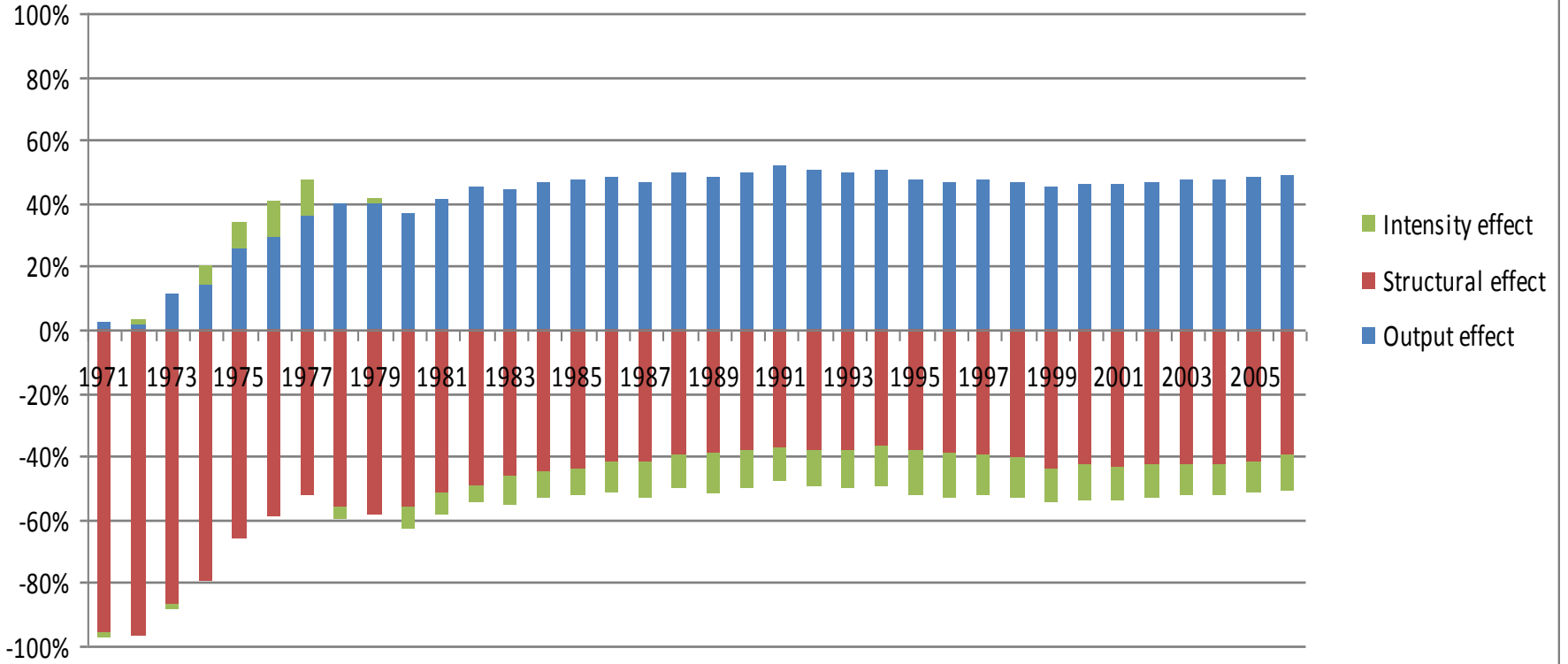
# Emissions trend and industry shares in India



# Decomposition method of total carbon emission intensity from the six energy intensive industries in India

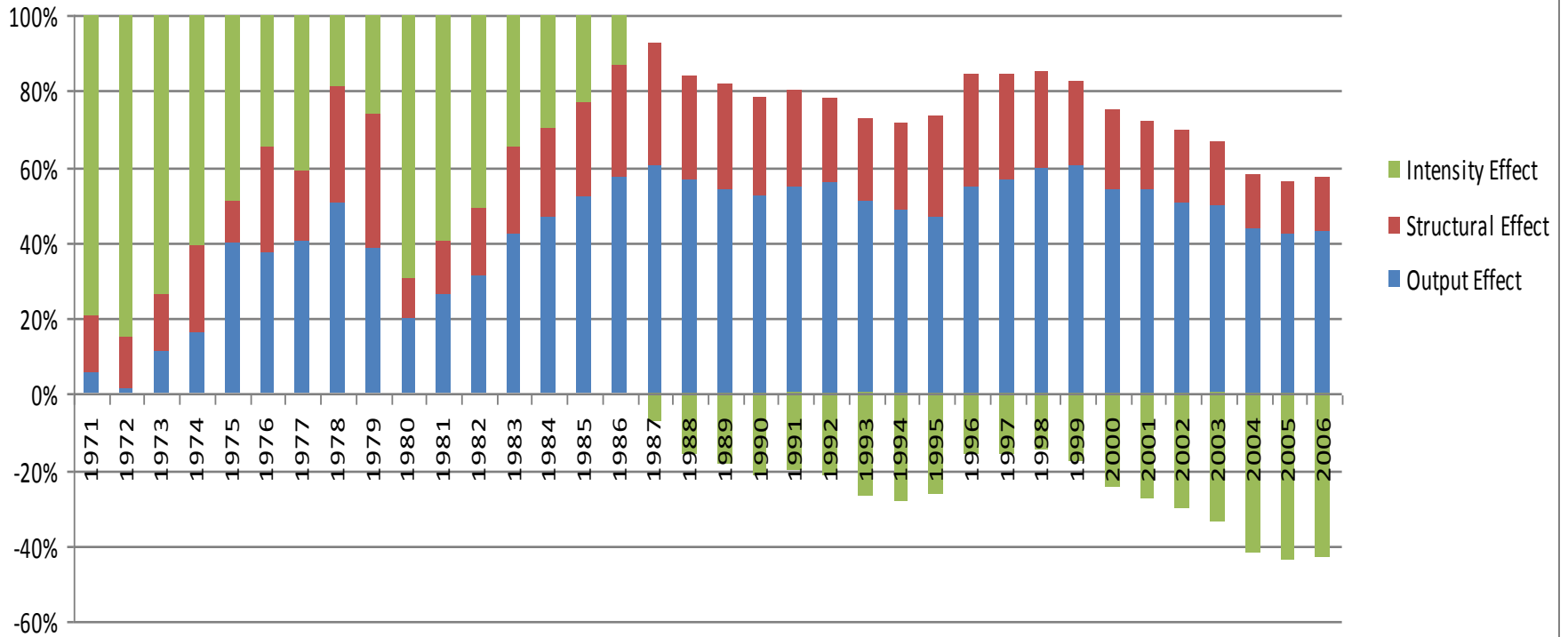


# Decomposition of Change in Coal Demand in Industry (in % for fixed base year 1970-71)

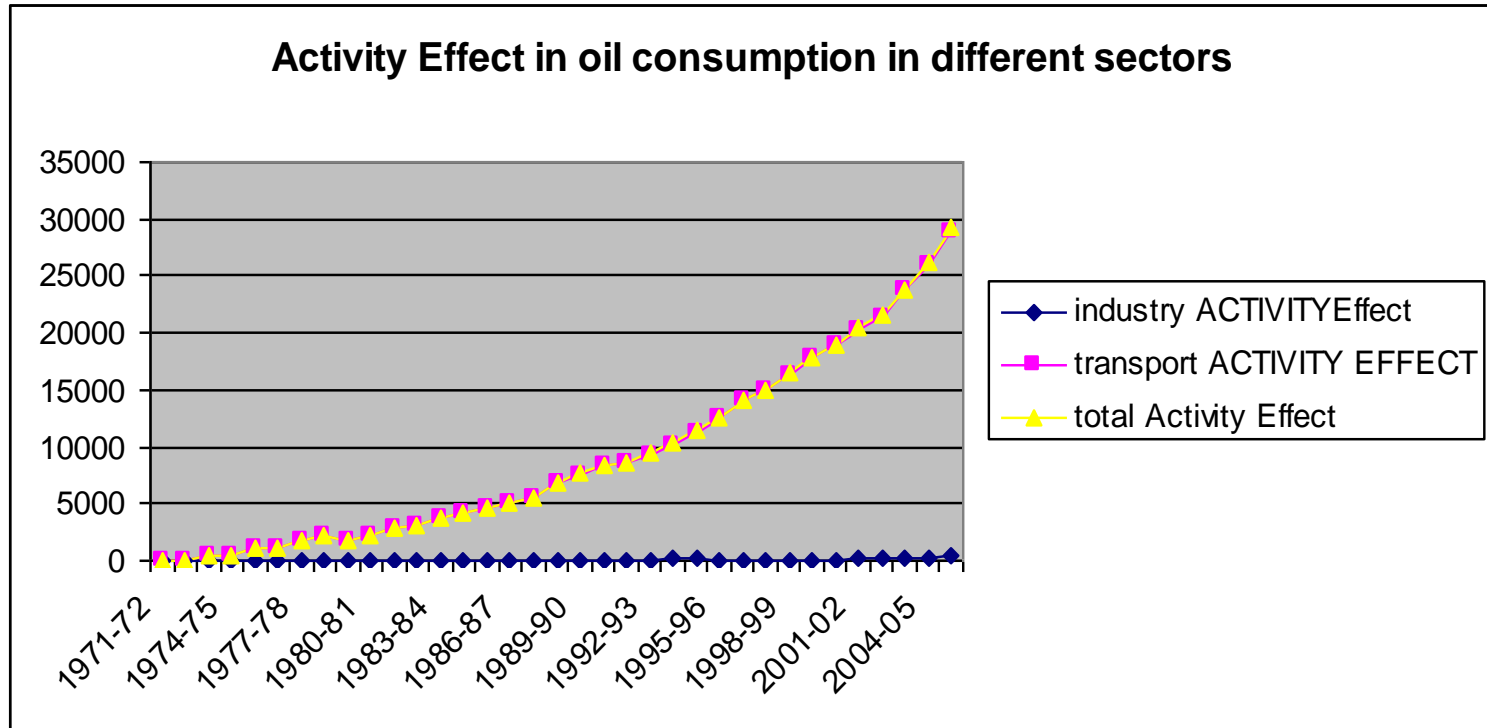




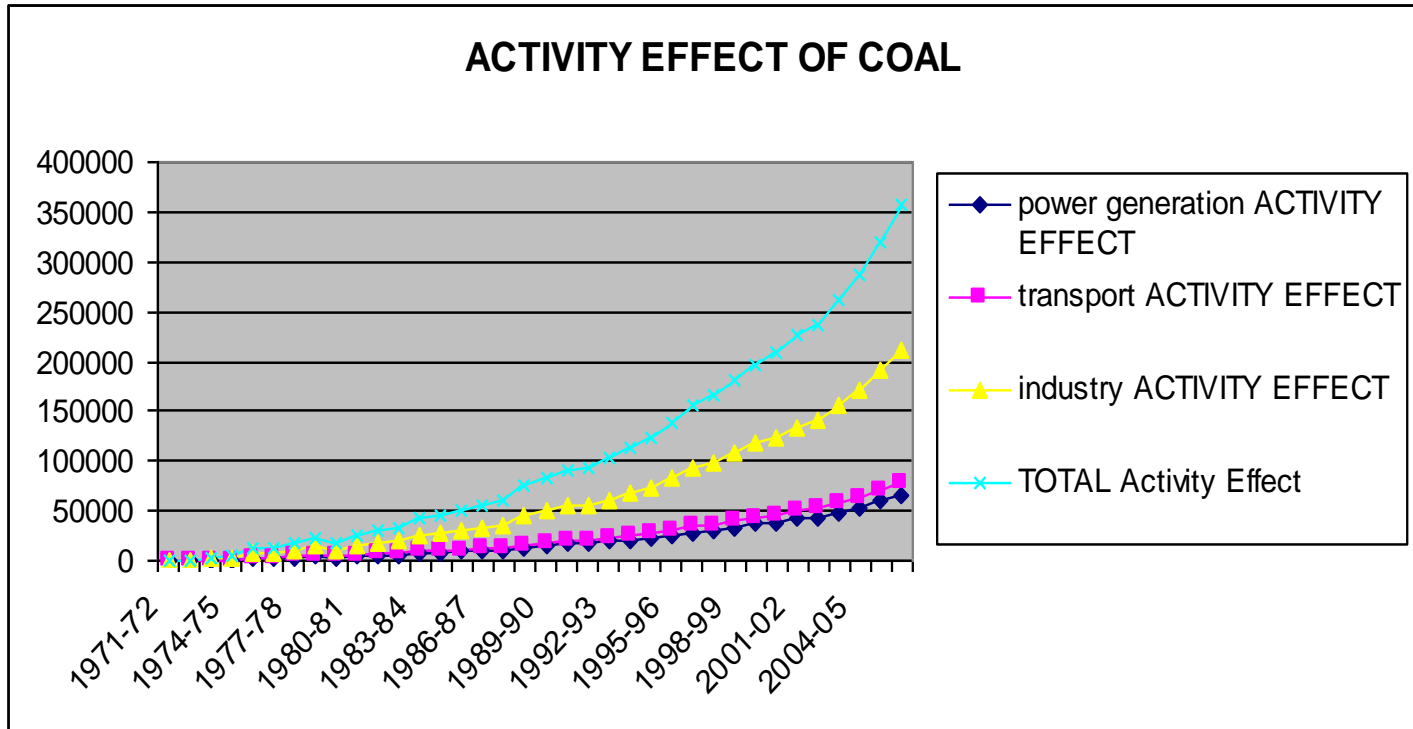
## Decomposition of Change in Oil Demand in Industry (in % for fixed base year 1970-71)



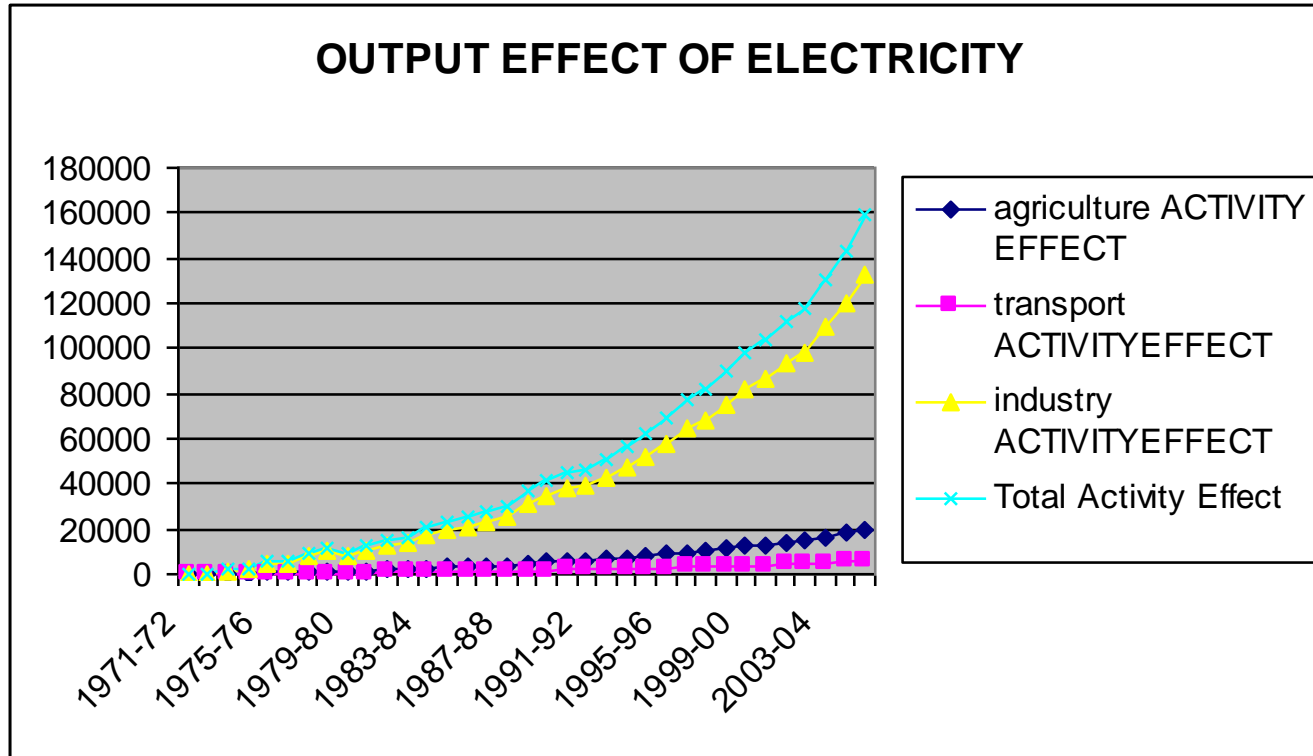
# Oil: Activity



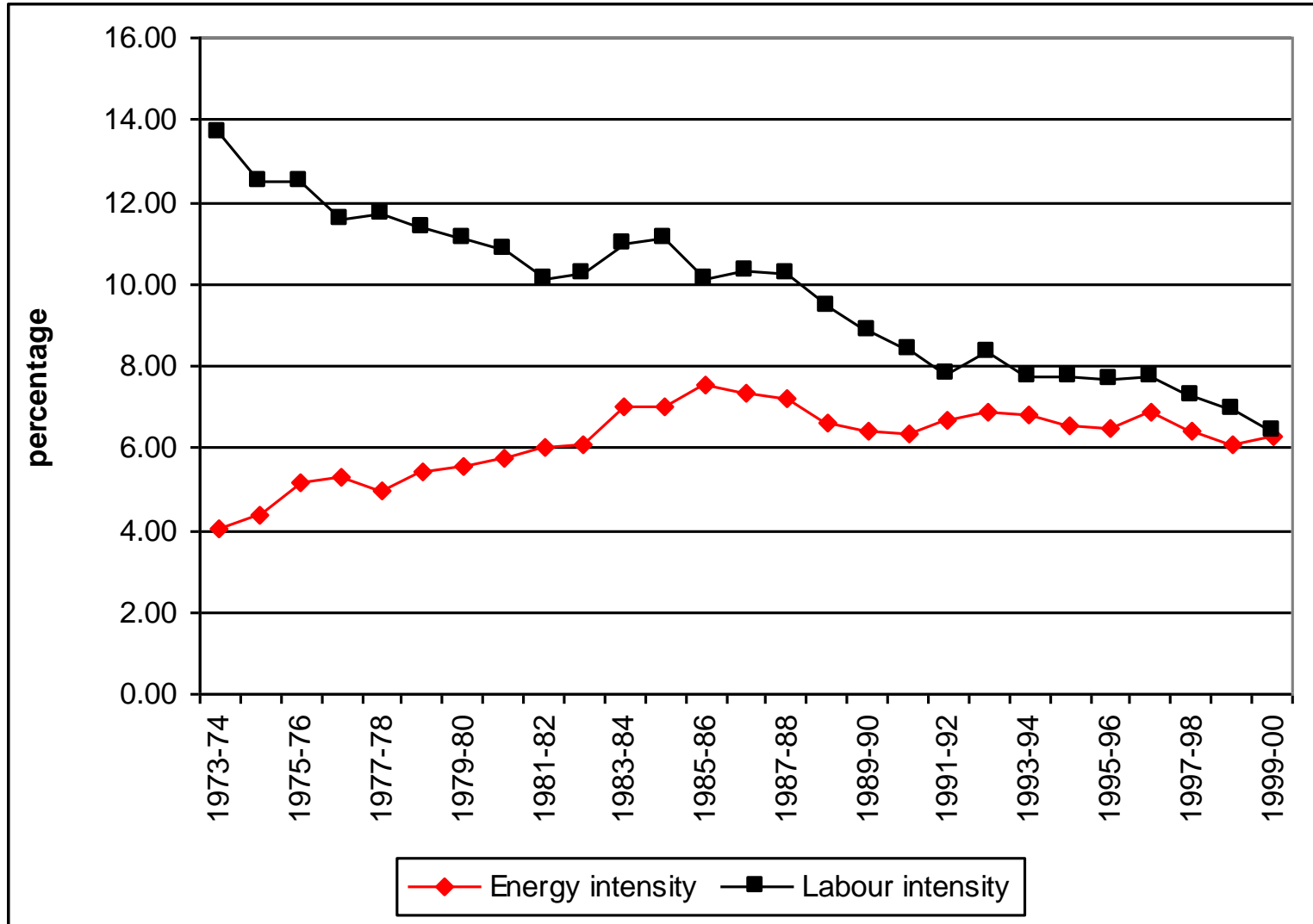
# Coal: Activity



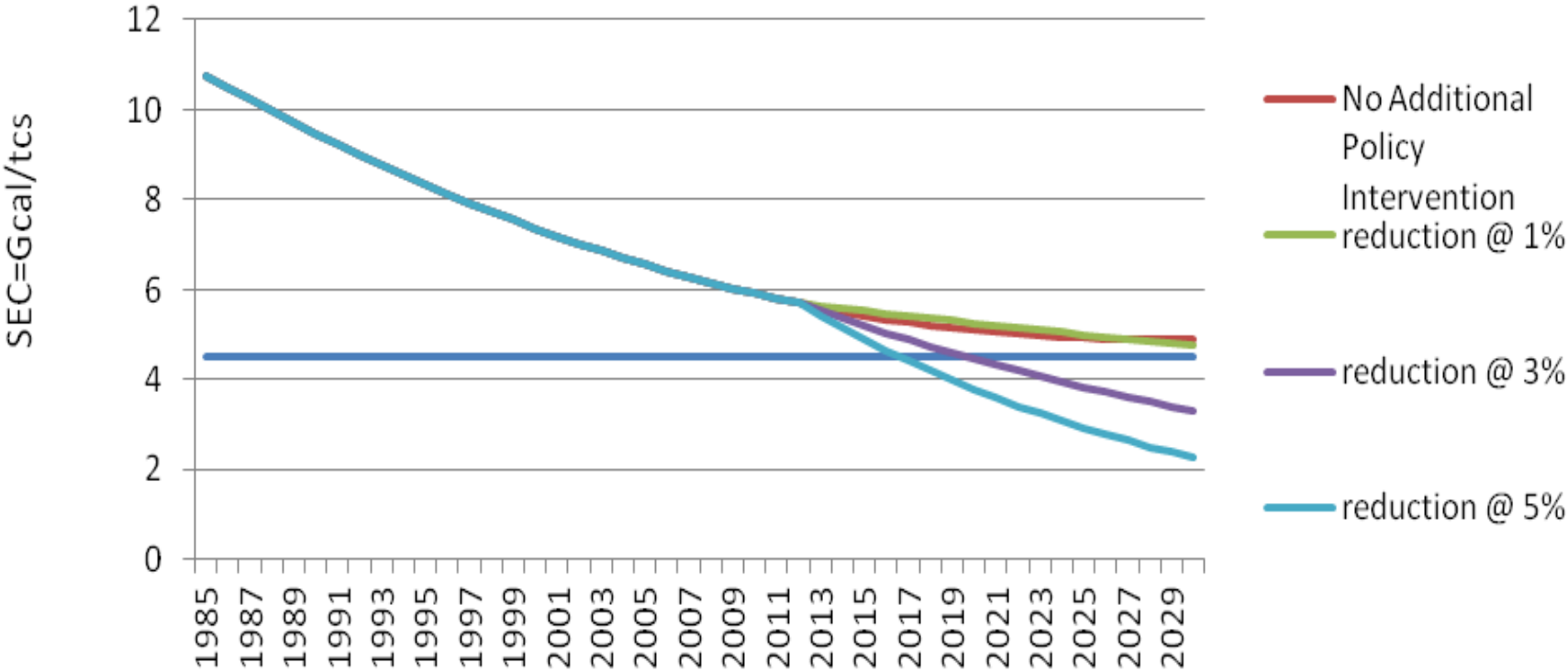
# Electricity : activity



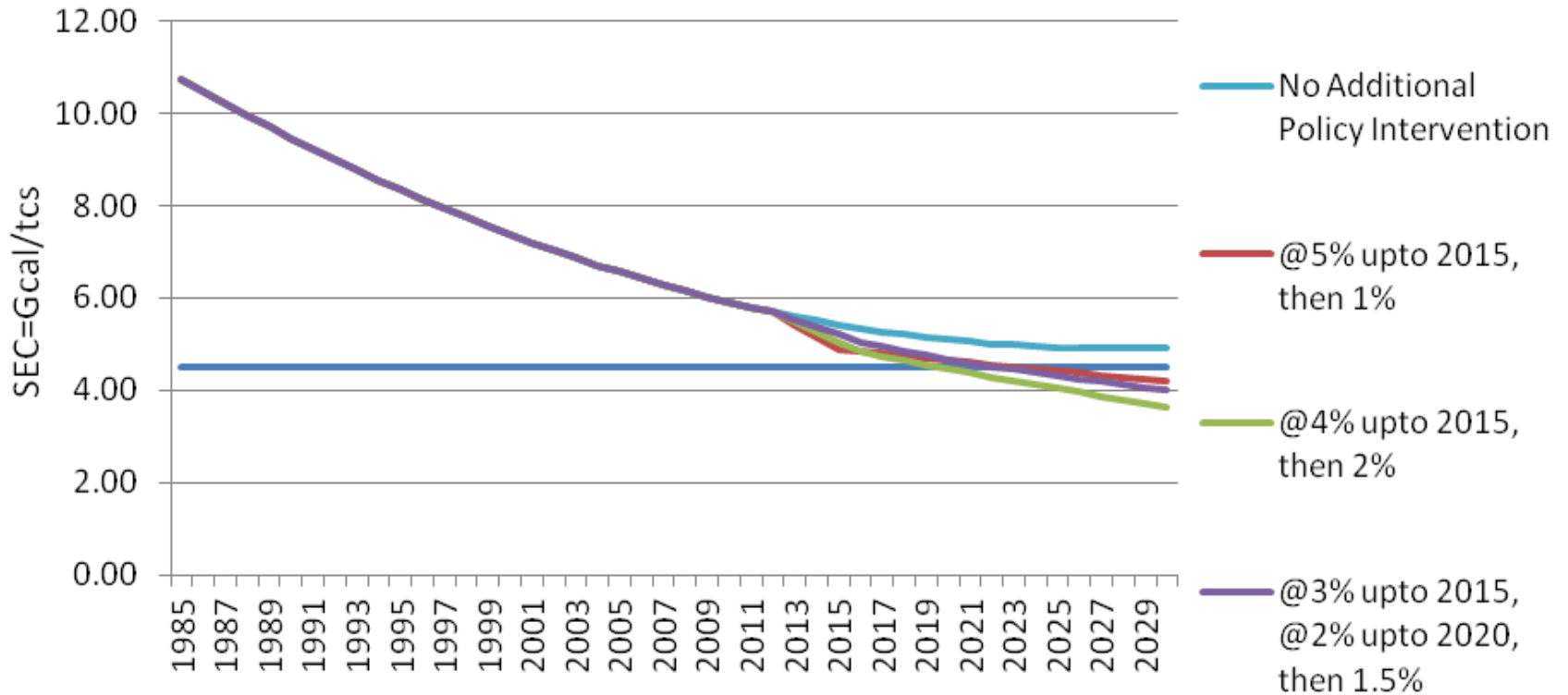
# Trend in labour and energy intensity



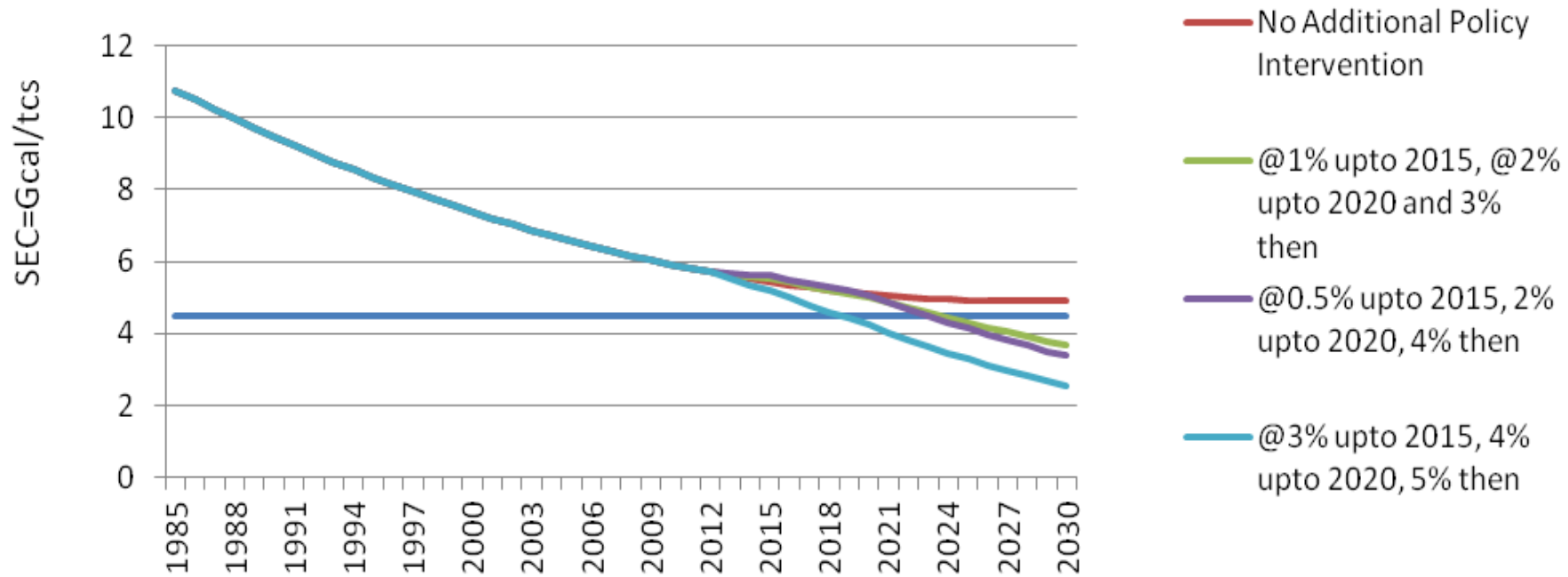
# Scenario 1: Constant Rate SEC Reduction Policy 2012 Onwards



## Scenario 2: Frontloading SEC Reduction Policy 2012 Onwards



### Scenario 3: Delaying SEC Reduction Policy 2012 Onwards





# Policy to Enhance Energy Efficiency

- EU-ETS: in absolute emission
- PAT: Energy Intensity
- Successive stringent caps
- Reward: ESCerts, Energy Savings Certificates
- Tradable with under performing companies

# How big an impact might the PAT have?

- Accelerate improvement in energy efficiency
- By 2015 to reduce projected annual emission by 1.4%
- 9.8 mtoe savings (2011-2014)
- Investment Rs 300 billion and USD 7 billion

# How big an impact might the PAT have?

- if the PAT could deliver an average 3% decrease in energy intensity per unit of output as a sector average, year-on-year, the industry could reach the world's average energy efficiency by 2020.

# Global negotiation

- PAT can become NAMA and get international finance
- Not currently planned.
- Possible competition from CDM for ESCert market.
- Investors might choose between PAT & CDM projects depending on price uncertainty and differentials.

# Global negotiation

- Even if the PAT does not generate international credits
- proof of India's commitment and progress towards mitigating climate change.
- good opportunity to national as opposed to a global scheme for mitigating climate change in a developing country.
- Possible SA example

Thank you