



# Analysis of Energy Efficiency in Indian Manufacturing Sector: A Case Study of Select Manufacturing Industries

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## BACKGROUND

- The age of population in developed countries is increasing, so they shift more to techno advance products which leads to more increase in energy demand.
- The developing countries in their race to development are emerging fast in the global scenario, which leads to increase in their labour participation, more investment and adoption of better and modern technology; all these factors lead to increase in energy demand.
- Another change observed is the increase in urbanization in the developing countries which further accelerates the demand for energy.

## Drivers of Energy Demand



## OBJECTIVES OF THE STUDY

- To analyze the energy use in various industries and identify the most energy intensive industries of the Indian Manufacturing Sector (IMS).
- To analyze the energy efficiency in case of most energy intensive industries in the IMS.
- To decompose the energy use into its various causal factors in case of most energy intensive industries in the IMS.

## Data Sources and Methodology

- The data on fuel consumed and value of output is taken at 3-digit from the volumes of Annual Survey of Industries.
- Energy Efficiency is measured in the form of energy intensity and the trends of energy intensity is analysed.
- Energy use is decomposed through Index Decomposition Analysis.
- The method of decomposition used is Log Mean Divisia Index.

## Energy Intensive Industries of Indian Manufacturing Sector (1992-2012)

- Manufacture of Beverages (NIC-110)
- Spinning, weaving and finishing of textiles (NIC-131)
- Manufacture of paper and paper products (NIC-170)
- Manufacture of Chemical Products (NIC - 201)
- Manufacture of man-made fibre (NIC-203)
- Manufacture of rubber products (NIC-221)
- Manufacture of Plastic Products (NIC-222)
- Manufacture of glass and glass products (NIC-231)
- Manufacture of non-metallic mineral products (NIC-239)
- Manufacture of basic iron and steel (NIC-241)
- Manufacture of precious and non-ferrous metals (NIC-242)
- Casting of metals (NIC-243)
- Manufacture of other fabricated metals (NIC-259)
- Manufacture of electric lighting equipment (NIC-274)

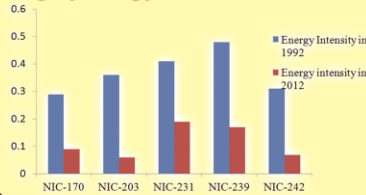
### The analysis of energy efficiency in 14

industries in IMS during the period 1992-2012 reveals that

- The industries whose energy intensity is highest among the select industries are NIC-170 (Paper and Paper Products), NIC-203 (Man-made fibre), NIC-231 (Glass Industry), NIC-239 (Non-Metallic Minerals) and NIC-242 (Basic Precious and Non-Ferrous Metals).

- The energy intensity is decreasing in all the industries; the substantial fall in energy intensity has been in NIC-203 (Man-made fibre) and NIC-274 (Electric lighting equipment).

## Highly Energy Intensive Industries



## Decomposition of Energy Use Energy Use in 14 Select Industries (value in Rs. Lakhs): 1992-2012

Sr.No	Total Energy Use in 1992	6044830
2	Total Energy Use in 2012	10586024
3	Change in Energy Use (2-1)	4541194

### Decomposition Analysis of Energy Use (Value in Rs. Lakhs) : 1992-2012

Sr.No	Intensity Effect	-7911887
2	Structural Effect	-228905
3	Activity Effect	12681987
Total Change		4541194

### Decomposition Analysis of Energy Use (Value in Rs. Lakhs) in sub-periods

Sr.No	Sub-Period	Intensity Effect	Structural Effect	Activity Effect
1	1992-1997	-1673340	-167472	3035501
2	1998-2002	-1596690	119815.7	940579.8
3	2003-2007	-1769984	41522.53	3603943
4	2008-2012	-1219681	-185546	3305913

## Decomposition of Energy Use of Indian Manufacturing Sector (1992-2012)



## Conclusion

- There has been improvement in energy efficiency of the select manufacturing industries during the period 1992-2012 and the highest fall in energy intensity is in NIC-203 (Man-made fibre) and NIC-274 (Electric lighting equipment).
- The intensity effect has contributed a lot in reducing the level of energy use in IMS during the period under study, though the level of contribution varies in different sub-periods.
- The activity effect has been the major driver of increase in energy use for the period under study and is expected to grow further with future increase in IMS output.