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Overview of Energy Efficiency Trend in Industry Sector

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Domestic Division	International Division	Research Division	Forum of Parliamentarians	SEDF
Over 50 Sectoral Committees – Agri, Industry, Services Task forces in focus areas New areas – Sports, Business of Art	Over 100 Joint Business Councils (JBCs) Partner Govt of India in major Int'l Summits – EU, ASEAN, AFRICA, LATIN AMERICA	Regular Surveys and Studies State level initiative with KAF District Development Studies	Track II Diplomacy 12 Forums – US, UK, EU, Pakistan, Japan, Germany, China, Israel	Spearheads CSR activities of Corporate India FICCI-ADITYA BIRLA Centre for CSR

Services to Industry	BISNET, FACT, FQF, FRAC, FACC
Allied Bodies	ICA, AIOE, CIFTI, FLO, ICC-INDIA
We work with	Central / State Govts, Multilaterals (World Bank, IMF); Universities / Think Tanks (Yale, Columbia, Woodrow Wilson Centre, Brookings
INVEST INDIA	JV with Central and State Govt's; FICCI share of 51%; First port of call for foreign investors in India

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Our Mandate

- Promote Economic Growth and Development of India
- Deepen Market Economy
- Foster Entrepreneurship
- Promote Calibrated Globalization
- Represent needs of Indian business
- Policy Dialogue with the Government
- Track II Diplomacy
- Reform Governance
- Promote Social Development and Empowerment

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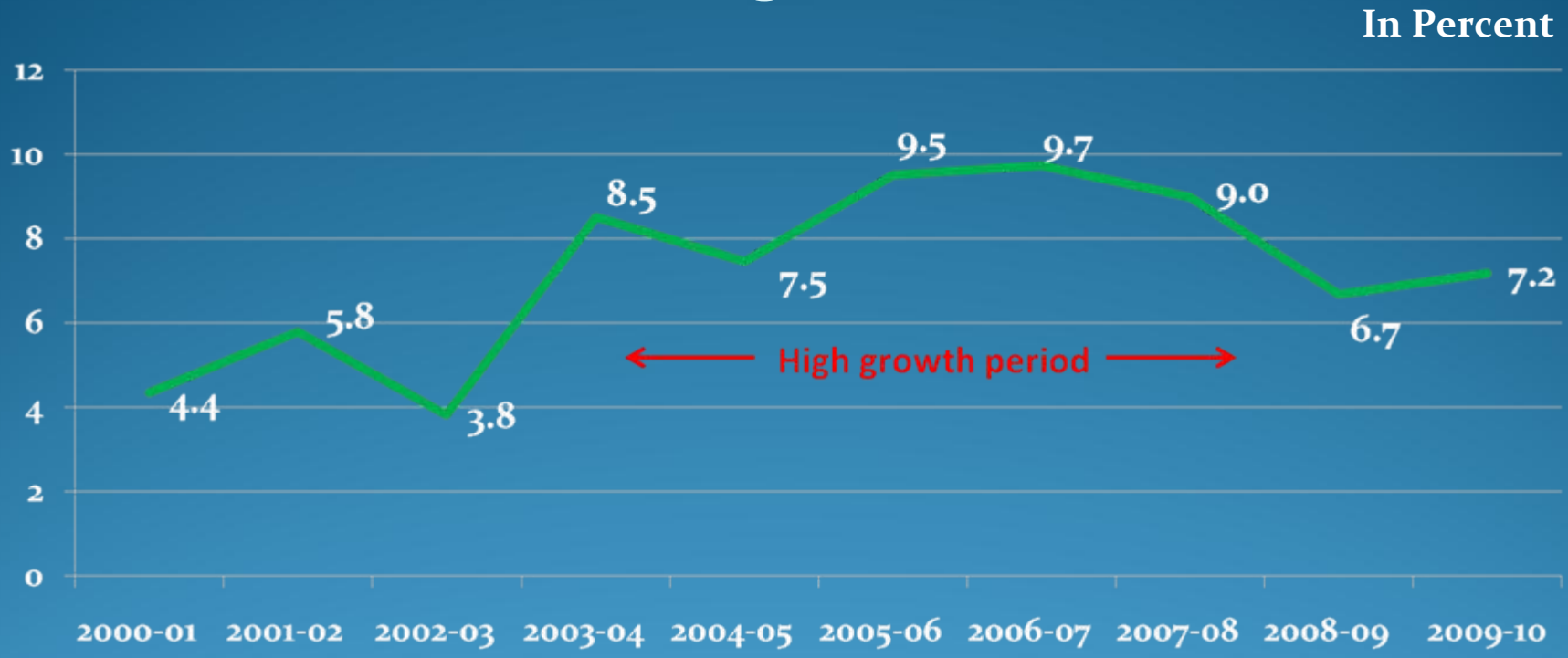
Trends in select macro-economic variables

GDP growth

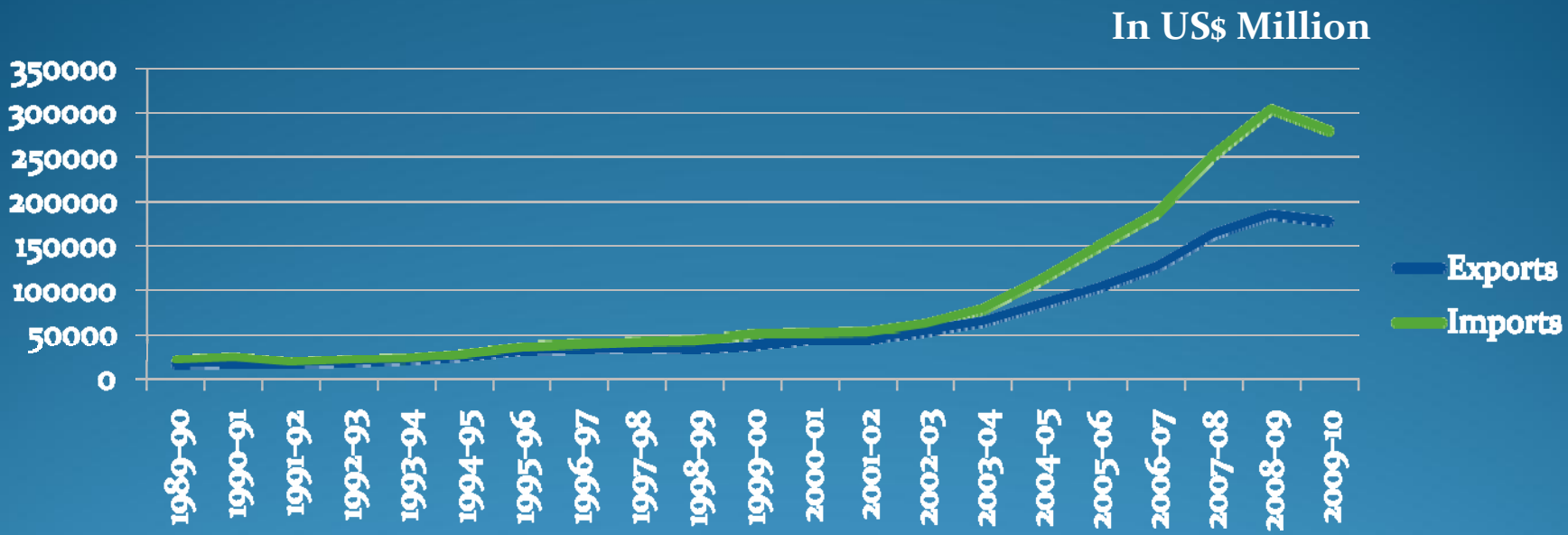


- Average growth (1991-92 to 1999-00) : **5.8%**
- Average growth (2003-04 to 2007-08) : **8.8%**
- Expected growth **8.5%** & **9.0%** in 2010-11 & 2011-12
- Looking at **double digit growth** in next 4 to 5 years

Inflation (WPI based)

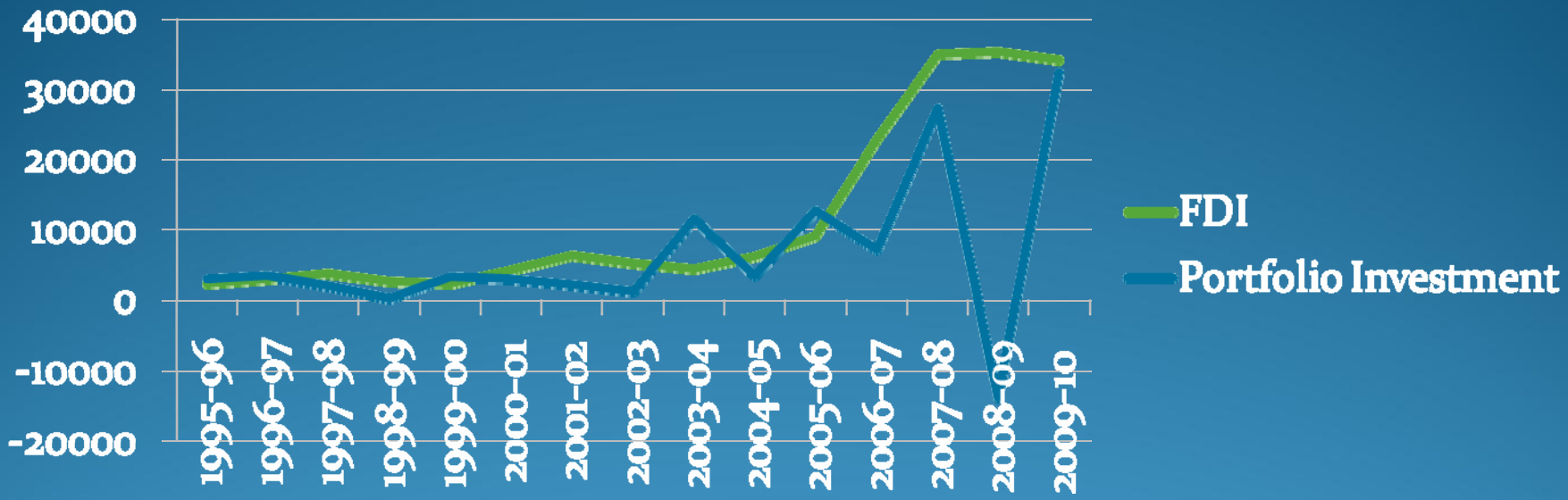
- Average inflation (1991-92 to 1999-00) : **7.9%**
- 2000-01 onwards inflation has been largely contained. 2008-09 however saw a spike due to global and domestic factors. August 2008 (**12.8%**)
- Inflation pressure continued in 2009-10. March 2010 (**9.59%**)
- Pressure no longer restricted to food products
- Good winter crop and optimistic monsoon outlook may result in **inflation tapering to 5% by March 2011**

Trade



- 1990-91 : Exports (US$ 18 billion), Imports (US$ 24 billion)
- 1999-00 : Exports (US$ 37 billion), Imports (US$ 50 billion)
- Strong growth seen in trade since 2000-01.
- Between 2000-01 and 2008-09, exports jumped from US$ 45 billion to US$ 185 billion. Imports increased from US$ 50 billion to US4 304 billion
- **2009-10 saw a dip in trade**. Exports (US$ 177 billion), Imports (US$ 278 billion)
- In **2010-11, global growth, oil price and currency movement** will impact trade

Foreign Investments

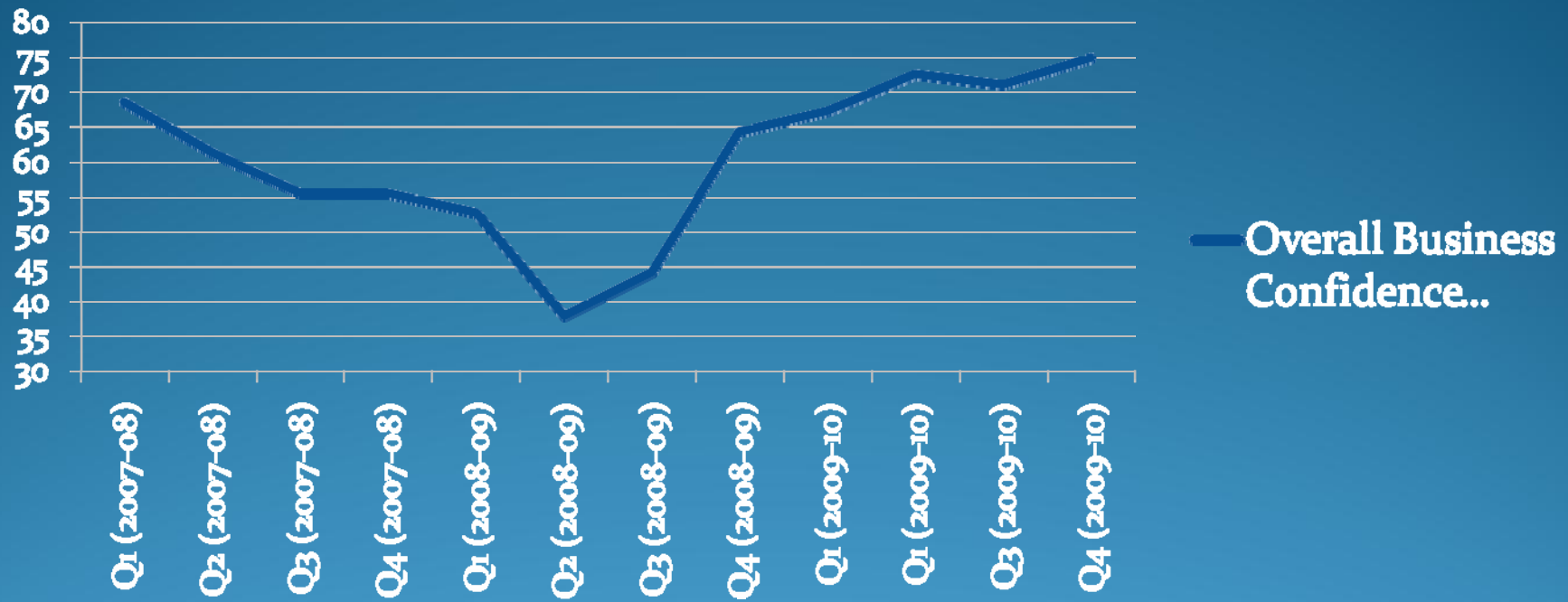


- Foreign Investment flows on the rise. The period from 2004-05 onwards has seen substantial increase in flows
- In last four years, FDI flows have totaled almost US$ 130 billion. 2006-07 (US$ 23 bn), 2007-08 (US$ 34.8 bn), 2008-09 (US$ 35.1 bn), 2009-10 (US$ 34.2 bn)
- Portfolio investment too have moved up from US$ 7 bn in 2006-07 to US$ 32 bn in 2009-10
- **Portfolio flows saw a reversal during the crisis period, FDI flows remained steady**
- Investment outlook is positive though development s in EU are a concern

Exchange Rate

- INR responds to market forces and has been very volatile
- In Jan 2008, INR to US$ was 39.4, in Jan 2009 value was 48.8 and in Mar 2020 45.5
- Appreciation of the INR is causing anxiety amongst exporters especially when Chinese Renminbi is fixed against US$
- Given India's strong growth prospects and expectations of capital flows, the long term trend will be one of appreciation

Business Confidence



- FICCI Business Confidence Index is on the rise. Results of our latest survey show
- Demand situation is improving; Companies are looking at ramping production
- Concerns about inflation remain
- Cost pressures building up fast – Raw materials and Wages – Price rise in the offing
- Outlook for exports a little uncertain; Demand from EU getting wobbly

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Sectoral Energy Consumption v/s Contribution to the country's GDP

Sector	% Energy Consumption	% Contribution to GDP
Industry	40	27
Agri, AH & Fisheries	7	16
Commercial & Services	43	56
Household & Others	10	1

Source : Energy Conservation Guide, PCRA

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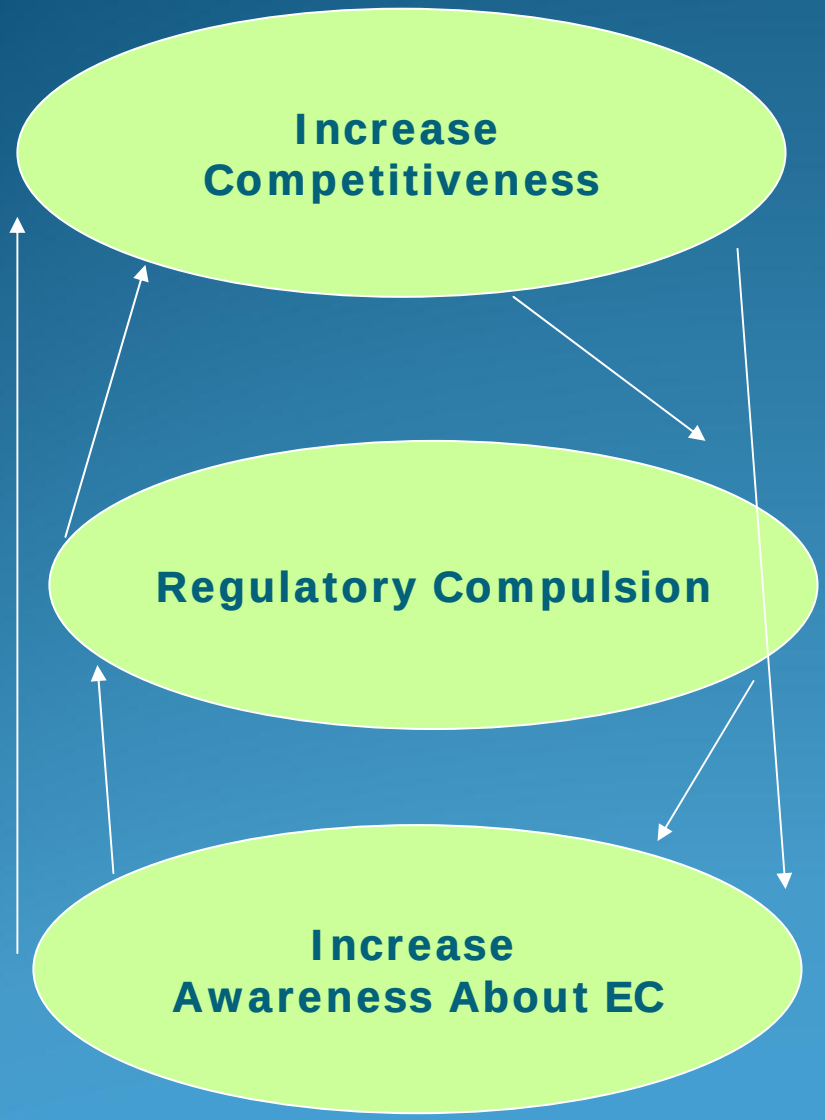
Sector Wise Energy Saving Potential

(Source : Energy Conservation Guide Book, PCRA)

Sector Energy Consumption (Mtoe)		Saving Potential (%)	Energy Saving (Mtoe)
INDUSTRY	165	20-30	24.75
TRANSPORT	60	15-20	4.2
AGRI	29	20-25	4.25
HOUSEHOLD	60	25-30 (K) 10-15 (LPG) 15-20 (EL)	0.42 0.28 -
COMM. BLDG	30	25-30	0.30
Non-Energy Uses	32	-	-
Others	29	-	-
TOTAL	405		34.2

Drivers for Energy Efficiency



-Change in Technology
-Retrofit Options
-- In-House R&D
--Adoption of EE Techniques
--Fuel Shift

-EC Act 2001
-Energy Audits
-- Separate EC Cell
--NAPCC (NMEEE)

-More Publicity thru various media
-Concept of CB options
-- NECA
--Rigorous Activities by various agencies

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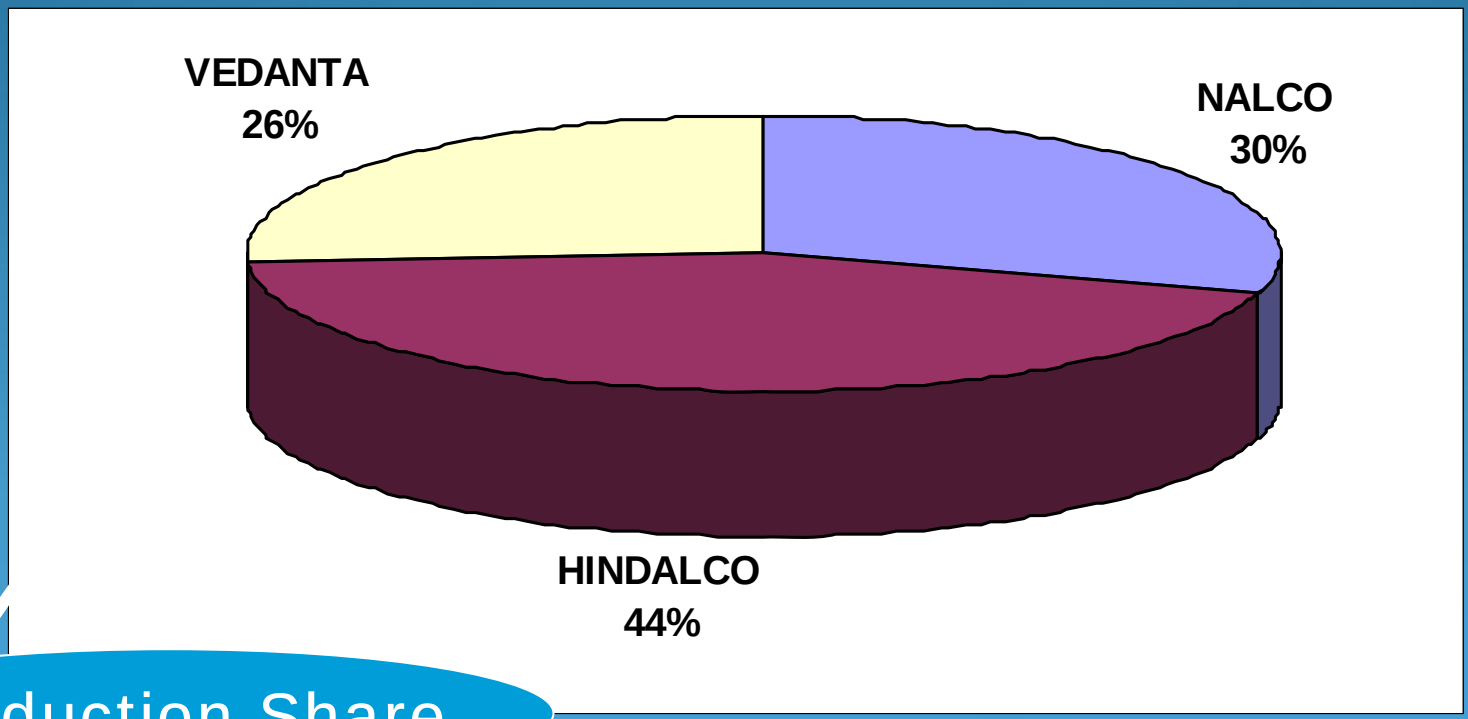
ALUMINIUM SECTOR

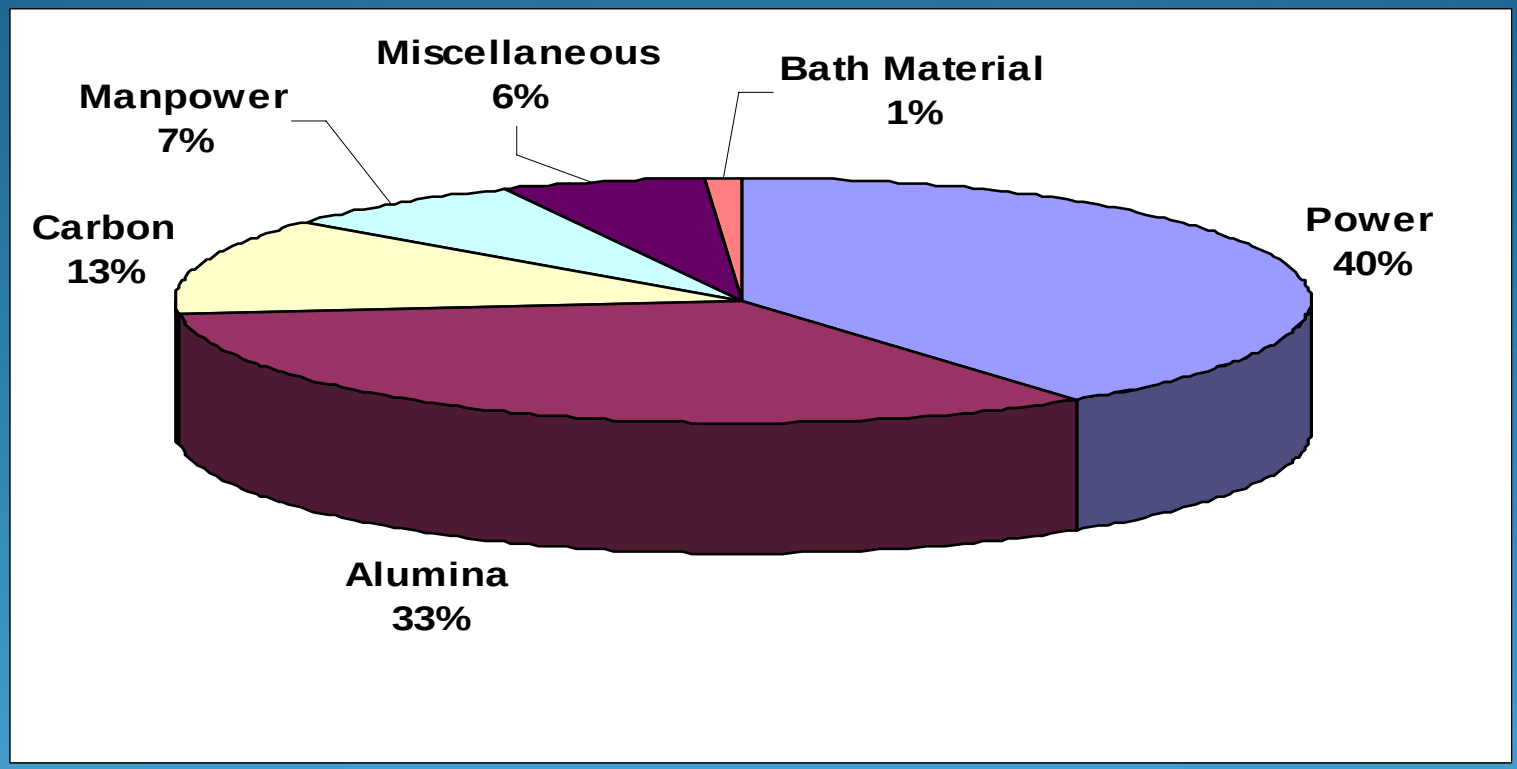
Industry Profile

- Production of Aluminium has gone up to 1.153 million tons in 2007 from 0.619 million tons in 2000 accounting about 86% growth.



Production Share

INPUT COST FOR ALUMINIUM PRODUCTION



Varies from 31% to 44% in different plants

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Summary of Energy Usage in Indian Aluminium Industry

Area / Type of Energy	KWH/T	% of Total Energy	% of Smelter Energy
Alumina Refinery			
Thermal	*7676*	*30.2%*	
Electrical	*458*	*1.8%*	
Total	***8134***	***32.0%***	
Aluminium Smelter			
Thermal	*640*	*2.5%*	4%
Electrical	*16635*	*65.5%*	96%
- Smelter	15630	61.5%	90%
- Auxilliaries	1006	4.0%	6%
Total	***17276***	***68.0%***	
Grand Total	**25410**	**100%**	

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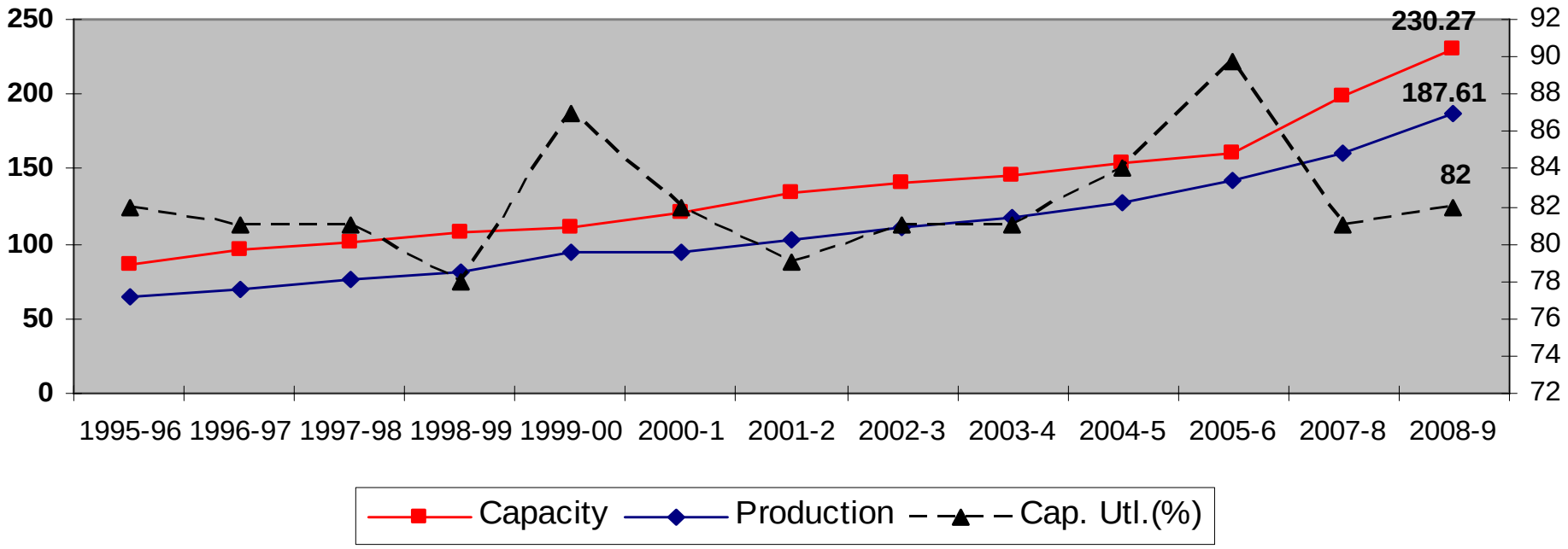
CEMENT SECTOR

Trend of Installed Capacity & Actual Production (Million Tons)



Source: CMA

148 Major Plants (219.17 mnT) & 11 Mini Plants (11.10 mnT)

Turnover = About 18,500 mn US $ in 2008

India is 2nd Largest Producer of Cement (6% of world) after China

Major Energy Saving Initiatives…

Energy audit studies carried out by NCCBM in 36 Cement Plants during last five years indicated potential savings ranging from **4 to 210 kcal/kg clinker** and **0.78 to 27 kWh/tonne** cement.

Various Activities:

Comprehensive Energy Audits through Certified Energy Auditors

Formation of Energy Conservation Cell

Adoption in Energy Efficient Technologies

- Waste Heat Recovery
- Co-Generation options
- Use of VRM in place of conventional ball mills, external re-circulation system for VRMs, high-efficiency separators in grinding circuits etc.
- Installation of pre-calcinators and five or six stage pre-heaters with low pressure drop cyclones, use of new generation coolers etc.
- Use of VFDs / VSDs

Participation in NECA

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THERMAL POWER PLANT

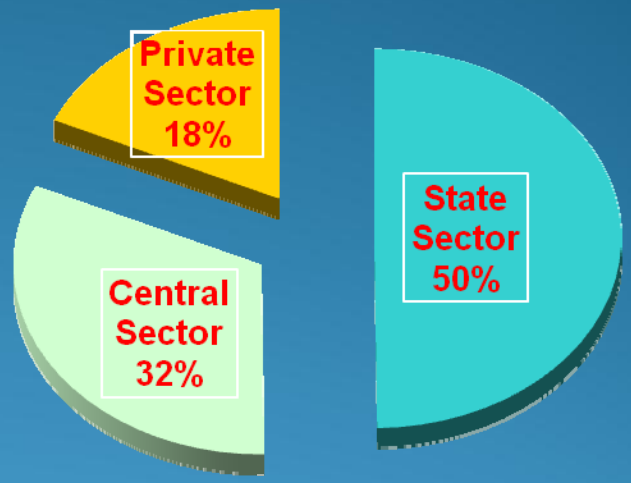
Existing Generating Capacity- March 2010

Fuel wise break-up (MW)

Thermal	102,453.98	64.3%
Hydro	36,863.4	23.1%
Nuclear	4,560	2.9%
Renewable	15,521.11	9.5%
TOTAL	**159,398.49**	**100.0%**

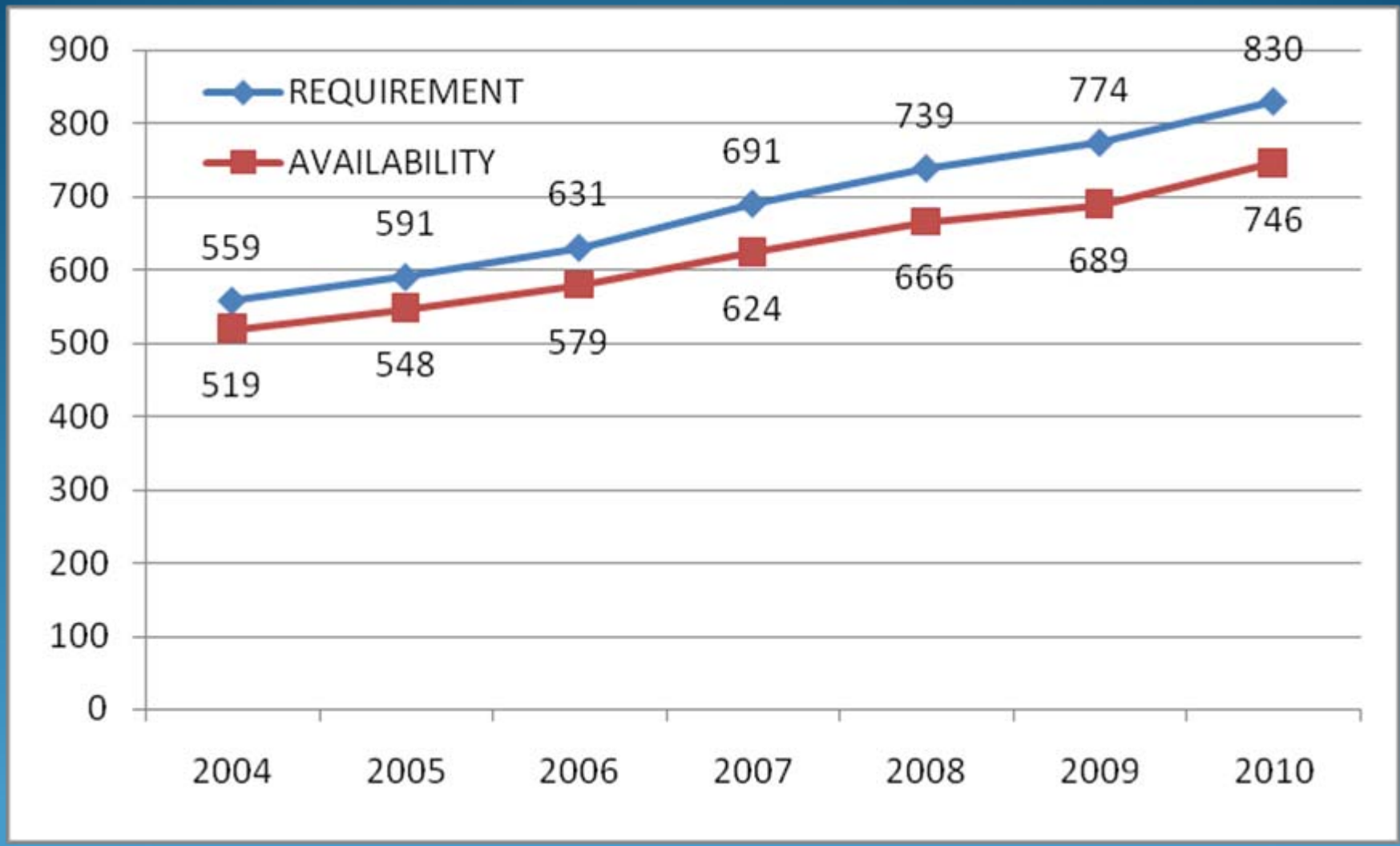
Source: Central Electricity Authority

Sector wise break-up (MW)



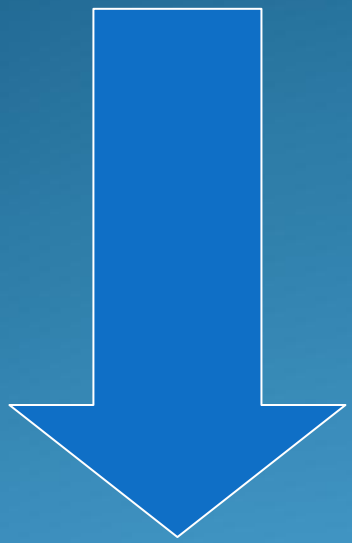
Total generation in 2009-10 – 771.17 BU

Energy Shortage



DURING 2009-10, PEAKING SHORTAGES WERE 13.3%

Power Plants have Focused in



Reduction in APC

(from 10% to 7%)

Improvement in HR

(improved by 12%)

Initiatives for Energy Efficiency

1) Introduction of Supercritical Technology
   - Ultra mega power projects (UMPP) of about 4000MW capacity each
2) Renovation & Modernization of old thermal power stations
3) Retirement of older small size units
4) Incentive awards for Efficiency improvement
5) Improvement in Performance Parameter Monitoring
6) Comprehensive Energy Audits
7) Setting-Up of Norms for Energy Usage

Barriers to Higher Generation Efficiency

- Emphasis on plant load factor instead of efficient generation.
- Degradation of equipment resulting in loss of capacity.
- Delayed overhauls
- Financial and procedural constraints lead to inadequate maintenance (more importance to financial consideration rather than technical requirements)
- Lack of awareness on efficiency related issues:
  - **Inadequate MIS systems (analysis of financial impact of various operating parameters)**
  - **Inadequate monitoring system for vital operating parameters**
  - **Non availability of performance measuring instruments at station.**
  - **Absence of dedicated group for efficiency improvement**
  - **Poor Operation & Maintenance planning**

NATIONAL MISSION ON ENHANCED ENERGY EFFICIENCY (NMEEE)

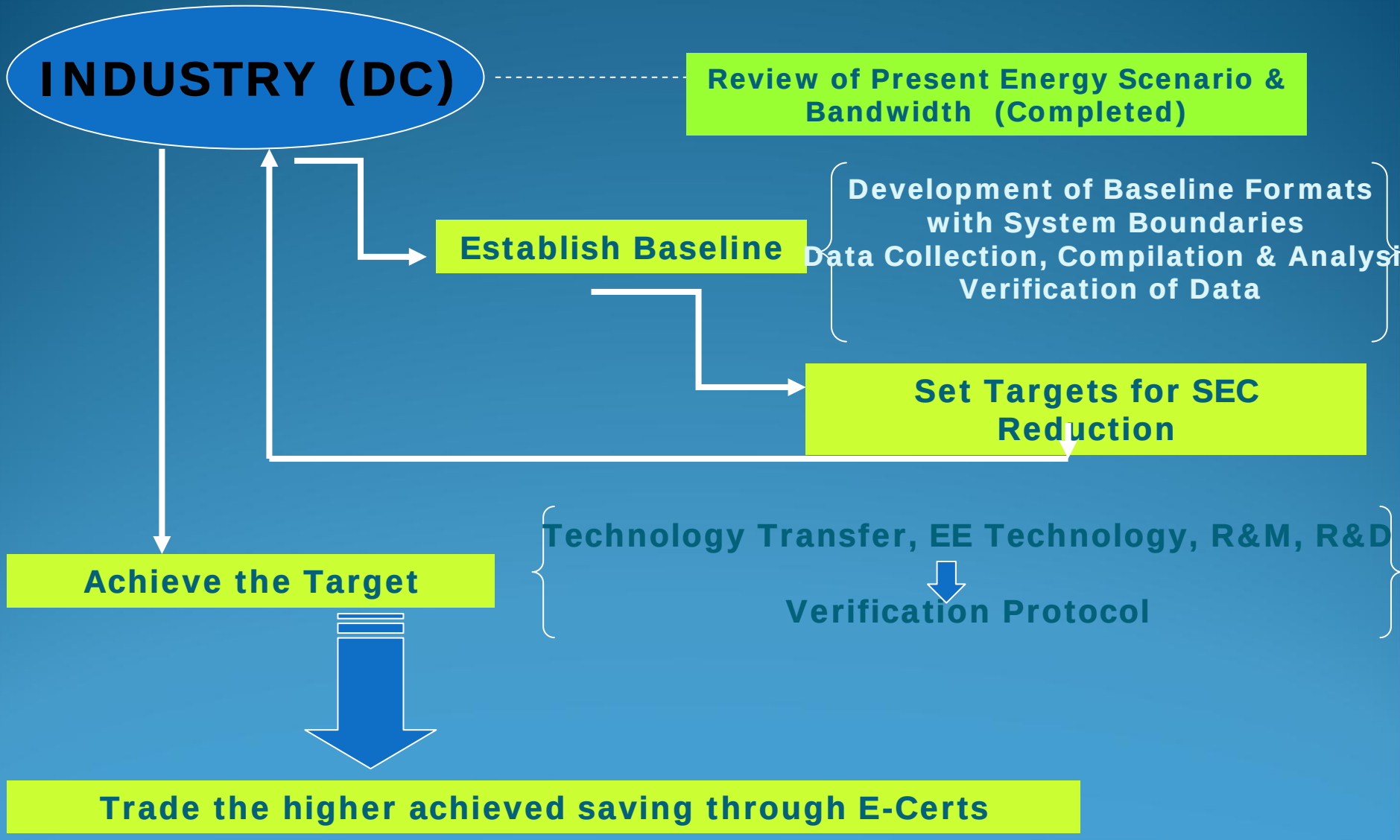
- The National Action Plan on Climate Change was released by Honorable Prime Minister of India in June 2008

- The Action Plan Outlines **8 Missions** including National Mission on Enhanced Energy Efficiency (**NMEEE**)

NMEEE…. 4 new initiatives

- **The market based mechanism to enhance cost effectiveness of improvements in EE in energy intensive industries through certification of energy saving which can be traded. (Perform, Achieve & Trade)**
- Accelerating the shift to energy efficient appliances in designated sectors through innovative measures to make the product more affordable **(Market Transformation for Energy Efficiency)**
- Creation of a mechanism that would help finance DSM programs in all sectors by capturing future energy saving **(Energy Efficiency Financing Platform (EEFP))**
- Developing fiscal instruments to promote energy efficiency **(Framework for energy Efficient Economic Development (FEEED))**

THE PAT SCHEME ..... Approach



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Impact#1

Bridging the Gap of Energy Usage Bandwidth

The energy usage pattern varies widely in industries of a particular sector due to various **diversities** like

- Scale of Production (Installed Capacities)
- Use of Raw Material
- Process Technology
- Vintage of Technology
- O & M Practices
- Type of Product Output etc……

Sectoral studies by BEE on '*Setting Up of Standard & Norms for DCs*' have revealed the impact on SEC due to above diversities

Impact#2

Technology Transfer at Affordable Cost

In order to achieve the target set for the industry in a sector, the industry has to look for

- **Efficiency improvement in existing plant through retrofit options**
- **Introduce best available technology**
- **R & M of existing plants**
- **Recovery of Waste Energy**

This will call for wide range 'Technology Transfer' at an affordable cost and acceptable mechanism

It is quite necessary to overcome the barrier (High Initial Cost) to make the energy efficient technologies as an attractive option.

Impact#3

Promotion of R&D in Energy Efficiency

The industries will engage in rigorous R&D (in-house) activities in developing low-cost solutions towards energy efficiency

Govt. may also facilitate the R&D activities for developing sector specific new technologies through

- Collaboration with existing R&D infrastructures (CSIR etc)
- Establishing Centre of Excellences for each sector
- International tie-ups
- Existing Technology-Providers

Impact#4

Promotion of ESCOs

As new options may require substantial investment, the industries will look towards ESCOs for taking up energy saving projects through performance contract / guaranteed saving schemes.

Hence :

- Good market opportunities for ESCOs
- Opportunity for bankers / financial institutions for funding the ESCOs
- More attractive option for SMEs due to their financial constraints

Thank You

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