

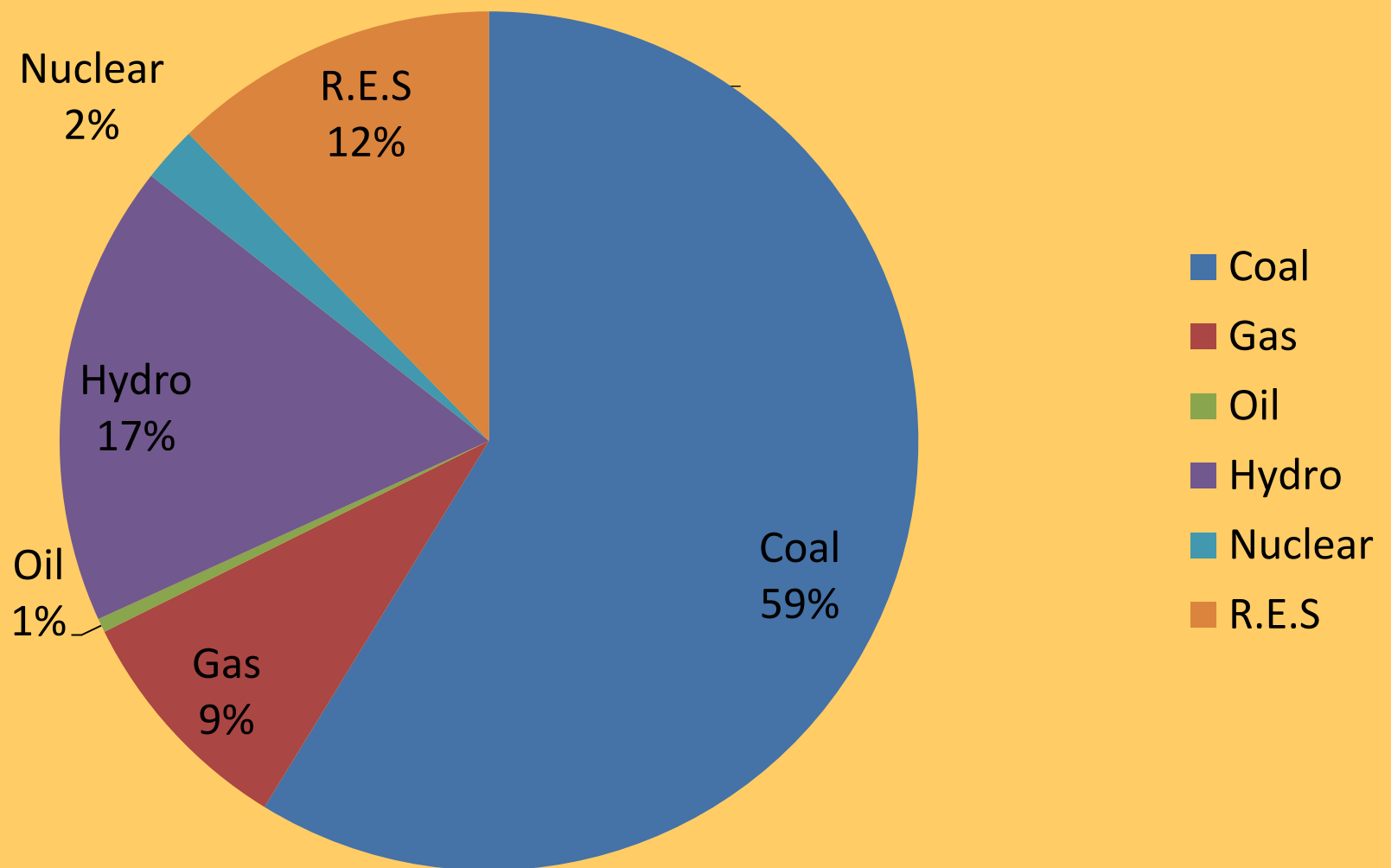
CURRENT SCENARIO AND ENERGY EFFICIENCY IN THERMAL POWER PLANTS IN INDIA

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für Internationale
Zusammenarbeit (GIZ) GmbH

Installed Capacity as on 30.06.2013 (Type Wise)



Installed Capacity = 2,28,721.73 MW

GROWTH OF ELECTRICITY GENERATION IN INDIA (Utility Only)



CAPACITY ADDITION DURING 11TH PLAN (2007-2012)

(in MW)

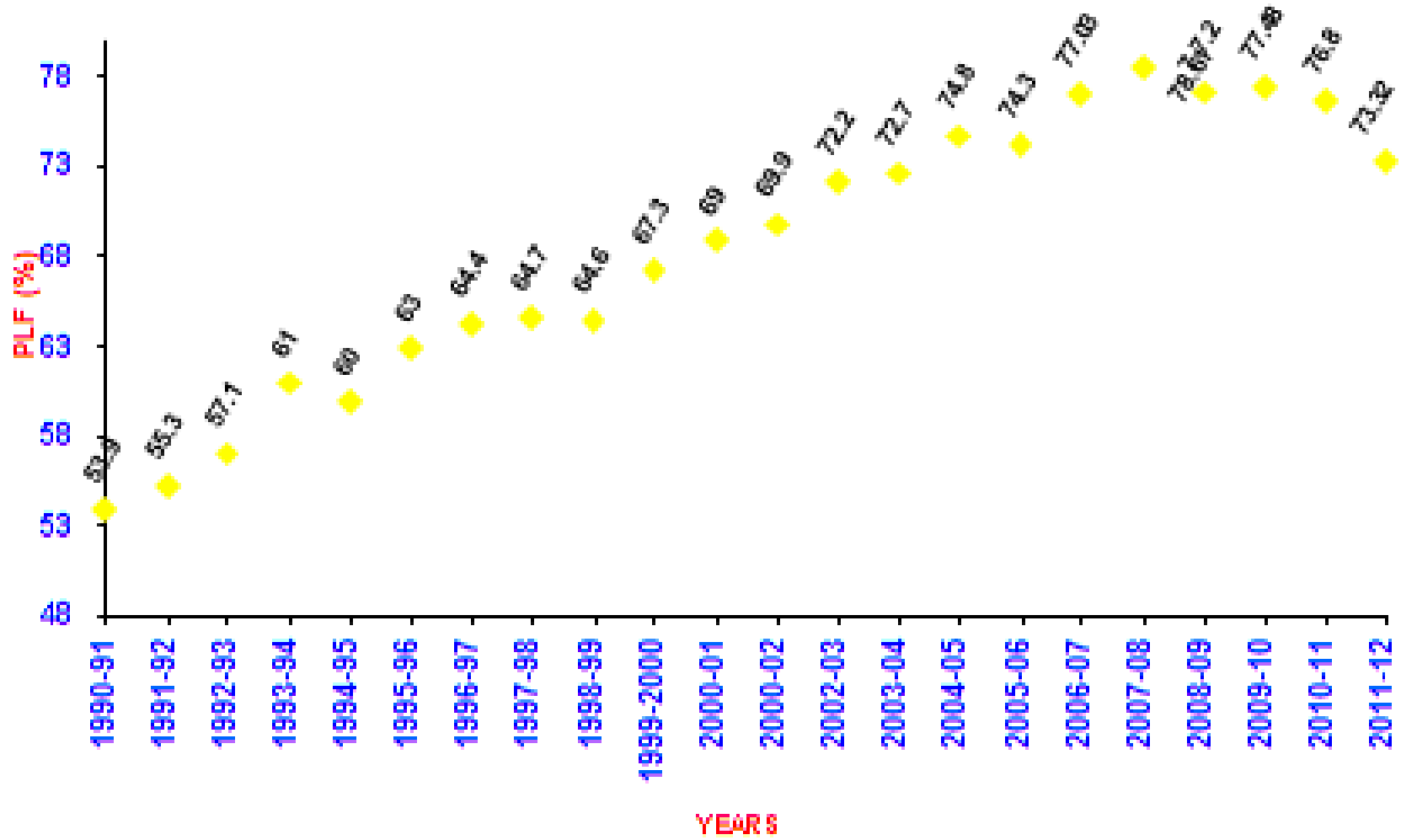
Capacity addition target during 11 th Plan	78,700
Capacity addition likely as per Mid Term Assessment	62,374
Capacity Commissioned during 11 th Plan	54,964 MW 43384 MW coal 5156MW gas 5544MW hydro

CAPACITY ADDITION DURING 12TH PLAN (2012-2017)

(in MW)

Capacity addition target during 12 th Plan	88,537
Capacity already Commissioned during 12 th Plan (as on 31 Jan 2013)	Total- 10731 10,055 coal 250 gas 426 hydro

ALL INDIA PLANT LOAD FACTOR OF COAL BASED POWER PLANTS (%)



All India Station Heat Rate Deviations

S.No	Particulars	2011-12
1.	Total Stations analyzed	74
2.	Capacity (MW)	74234
3.	Weighted Average Design SHR (kcal/kWh)	2335
4.	Weighted Average Operating SHR (kcal/kWh)	2603.2
5.	% Operating SHR Deviation with respect to Design SHR	11.49

Actual Heat Rate Deviations

S.No	Particulars	2011-12
1.	Total Stations analyzed	74
2.	No. of Stations in the range of SHR deviation(0-5%)	20
3.	No. of Stations in the range of SHR deviation(5-10%)	17
4.	No. of Stations in the range of SHR deviation(10-20%)	21
5.	No. of Stations with SHR deviation of more than 20%	16

Efforts towards improvement in Efficiency of Thermal Power Generation

Adoption of Supercritical Technology

- Expected Efficiency gain of approximate 5% over present 500 MW units (170 kg/cm², 535/535 °C)
- First Supercritical unit of 660 MW Commissioned in Dec-2010, 800 MW in July, 12
- 15 Units with total capacity 10,460 MW operating
- Supercritical to constitute ~40% (~25000MW) coal fired capacity addition in 12th Plan ((2012-17)
- 100% coal fired capacity addition in 13th Plan and beyond to be supercritical

Advance Ultra Supercritical Technology

- Efforts underway for indigenous development of 700 deg C technology
- MoU between IGCAR, NTPC & BHEL
- Indigenous design and manufacturing of materials proposed

PAT Scheme

- Perform, Achieve and Trade scheme- aim is to improve Efficiency of the thermal plants both coal & gas based.
- Total Target Set for thermal power stations= 3.2 MTOE out of total 6.686 MTOE
- Threshold limit to be DC = 30,000 tons of oil equivalent (TOE)per annum (all power plants above 11-12 MW will be covered in PAT scheme)
- MOP notified net heat rate reduction targets to 144 Thermal power Stations.
- Stations to achieve the targets within 3 years from date of notification i.e by 31.3.2015
- Penalty for non achievement

Renovation & Modernization of old thermal power stations

- CEA has prepared a National Enhanced Efficiency Renovation and Modernization Program for implementation during 11th and 12th Plans. This covers R&M of 4971 MW and LE of 16532 MW during 12th Plan

RETIREMENT OF POWER PLANTS

- **Retirement in a systematic manner an ongoing activity with focus on closing down**
 - **Small and Old units**
 - **Units of non-reheat type**
 - **Units having very low design efficiencies**
 - **Units having very low actual efficiency**

PRESENT METHODOLOGY FOR RETIREMENT

Units deviating more from design to retire

- first

Retirement is linked to commissioning of

- new units

In case of Gas based , Technology changing

- rapidly. Faster retirement could be considered to keep abreast with technology development

RETIREMENTS OF OLD UNITS

- Details of Retirements :
 - 11th plan- 2398 MW has already been retired comprising mainly of small size (<100 MW) old and non reheat units.
 - 12th plan (planned)- 4075 MW (<100 MW coal units) more than 35 years old gas stations.
 - 13th- plan (planned) about 4000MW

THANKS