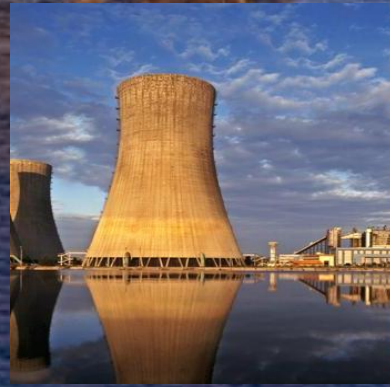
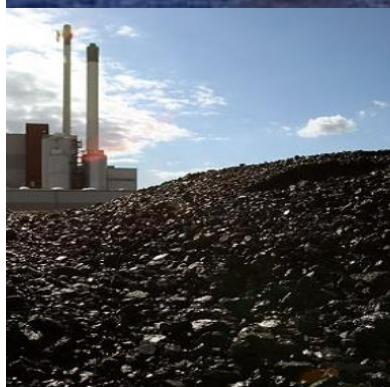




2014

**MINISTRY OF STATISTICS AND PROGRAMME IMPLEMENTATION**



# ENERGY STATISTICS

CENTRAL STATISTICS OFFICE,  
GOVERNMENT OF INDIA

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# ENERGY STATISTICS

2014  
(Twenty First Issue)

CENTRAL STATISTICS OFFICE  
MINISTRY OF STATISTICS AND PROGRAMME IMPLEMENTATION  
GOVERNMENT OF INDIA  
NEW DELHI

## FOREWORD

Energy is one of the most fundamental parts of our universe. Energy has come to be known as a 'strategic commodity' and any uncertainty about its supply can threaten the functioning of the economy, particularly in developing economies. Achieving energy security in this strategic sense is of fundamental importance not only to India's economic growth but also for the human development objectives that aim at alleviation of poverty and unemployment and meeting the Millennium Development Goals (MDGs). Holistic planning for achieving these objectives requires quality energy statistics that is able to address the issues related to energy demand, energy poverty and environmental effects of energy growth.

This publication titled "Energy Statistics" is brought out every year by Central Statistics Office (CSO) and the present one is the 21st in the series. The publication contains the latest data on reserves, installed capacity, potential for generation, production, consumption, import, export and wholesale price of different energy commodities. The data has been sourced from the concerned line Ministries of the Government of India in respect of different energy sources as per their mandate. The publication includes analytical indicators viz. Growth Rates, Compound Annual Growth Rates (CAGR) and Percentage Distributions in certain tables to increase the utility of the publication. Further, for the benefit of the data users and readers, Metadata on Energy Statistics has been included for the first time in this publication.

I wish to take this opportunity to thank to all those who worked hard in Ministry of Petroleum and Natural Gas, Central Electricity Authority, Office of Coal Controller, Ministry of New and Renewable Energy and Office of the Economic Advisor, Ministry of Commerce and Industry to provide the requisite information for this publication in time.

I would like to put on record my appreciation to the team of officers in the Economic Statistics Division for their dedicated services in bringing out this publication in time. This publication is an attempt to cater to the needs of the planners, policy makers and researchers by making available the entire energy data at a single place. I hope that "Energy Statistics 2014" shall fulfill the expectations of all. Comments for improvement are most welcome and may be sent to [gs.rathore@nic.in](mailto:gs.rathore@nic.in).

(S.Jeyalakshmi)  
DIRECTOR GENERAL (CSO)

New Delhi  
March 2014.

**Officers associated with the publication:**

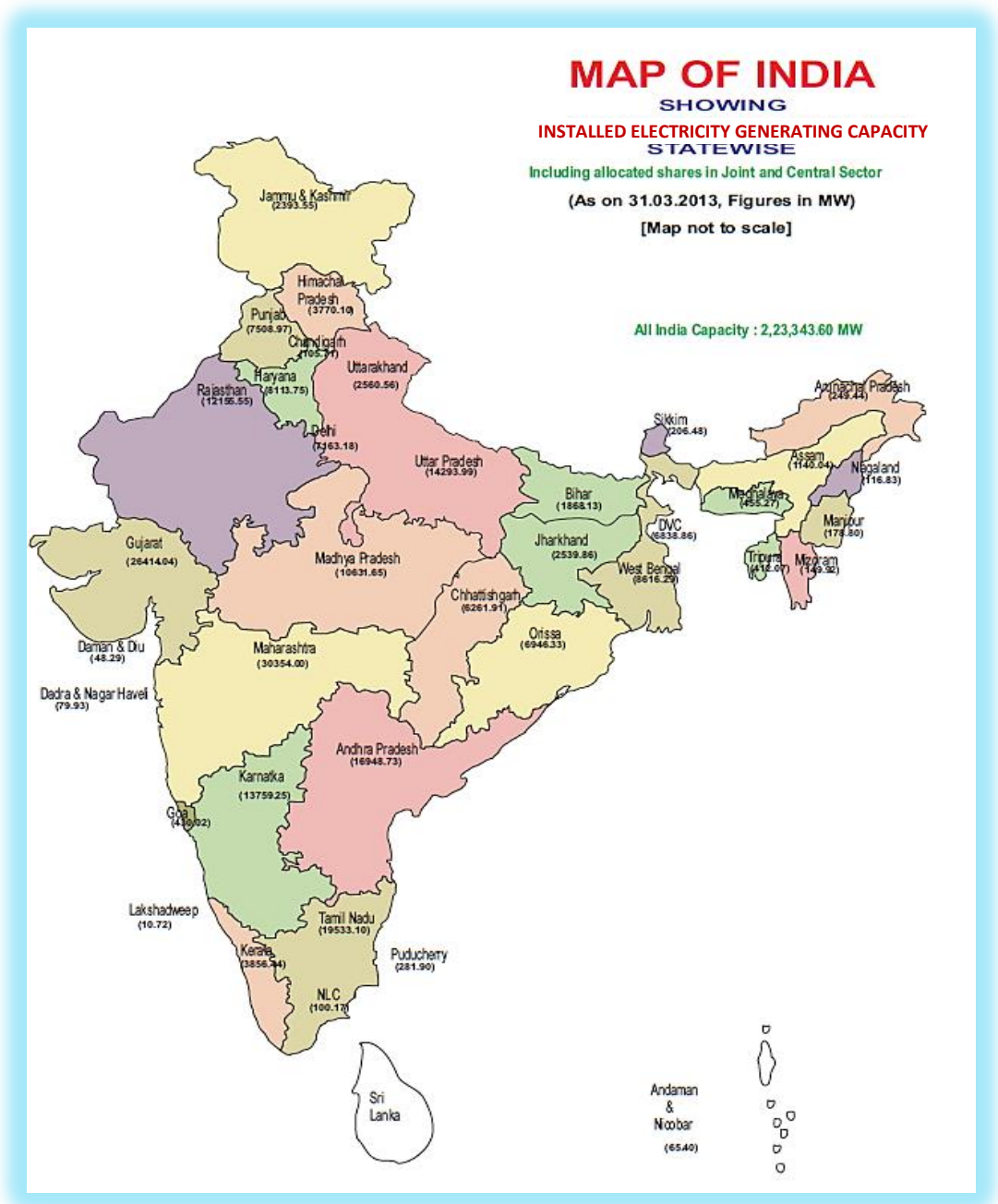
Dr. G.C. Manna	Additional Director General
Shri Baljeet Singh Chhabra	Deputy Director General
Smt Geeta Singh Rathore	Director
Shri Sushil Kumar	Senior Statistical Officer
Shri Aditya Singh Hada	Statistical Investigator
Smt Rekha Bajaj	Personal Assistant

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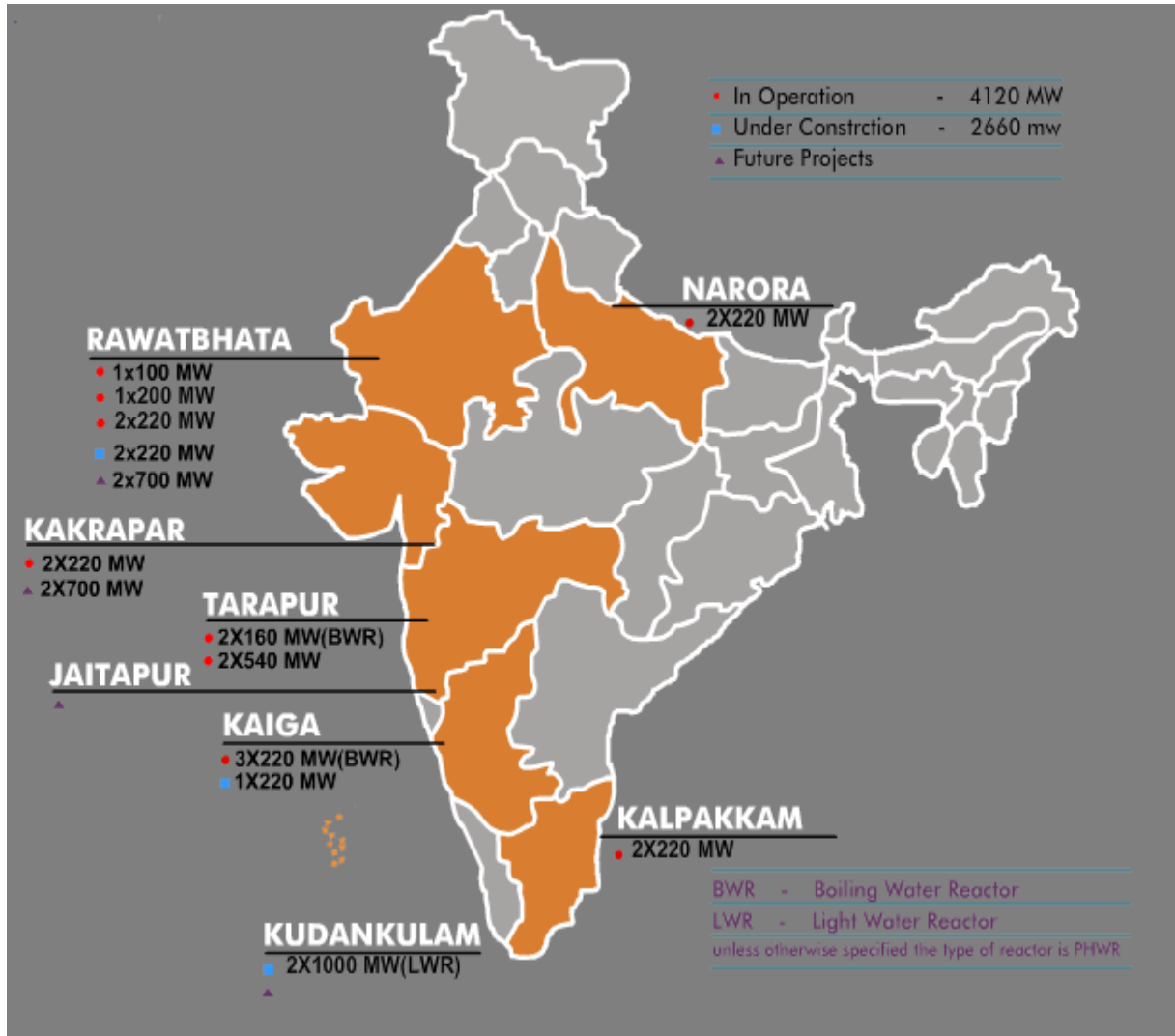


## ENERGY MAP OF INDIA



Source: Growth of Electricity sector in India (1947 to 2013), CEA

## Nuclear Facilities in India



Source : Nuclear Power Corporation of India Ltd.



## METADATA-ENERGY STATISTICS

1. Contact	
1.1. Contact organisation	Central Statistical Office(CSO), M/o Statistics & Programme Implementation (MOSPI)
1.2. Contact organisation unit	Economic Statistics Division, CSO
1.3. Contact mail address	9 <sup>th</sup> Floor, Jeevan Prakash Building, 25 K. G. Marg, New Delhi-110001
1.4. Contact emails	<a href="mailto:gc.manna1@gmail.com">gc.manna1@gmail.com</a> <a href="mailto:bschhabra15@gmail.com">bschhabra15@gmail.com</a> <a href="mailto:gs.rathore@nic.in">gs.rathore@nic.in</a>
1.5. Homepage	<a href="http://www.mospi.gov.in">http:// www.mospi.gov.in</a>

2. Statistical presentation	
<b>2.1 Data sources</b>	
The data has been sourced from the concerned line Ministries of the Government of India, in respect of different energy sources as per their mandate. These Ministries are Ministry of Petroleum and Natural Gas, Central Electricity Authority, Office of Coal Controller, Ministry of New and Renewable Energy and Office of the Economic Advisor, Ministry of Commerce and Industry.	
<b>2.2. Data description</b>	
The statistics present information about the reserves, installed capacity, potential for generation, production, consumption, import, export and wholesale price of different energy commodities.	
<b>2.3. Sector coverage</b>	
Coal & Lignite, Petroleum & Natural Gas, Renewable Energy Resources and Electricity.(Data collection Mechanism is given in <b>Annex:IV</b> )	
<b>2.4. Data content</b>	
The Statistics are given by type of fuel and energy source. The publication includes analytical indicators viz. Growth Rates, Compound Annual Growth Rates (CAGR), Percentage Distributions.	
<b>2.5. Statistical unit</b>	
Data are aggregated appropriately at national and state level.	
<b>2.6. Statistical population</b>	
Data covers all the energy commodity sources.	
<b>2.7. Reference area</b>	
The energy industries of the entire country are covered.	
<b>2.8. Time coverage</b>	
In the current publication the data given is for the period 2005-06 to 2012-13. Data prior to this publication is from the year 1970-71 and is based on statistics compiled by the Ministry of Petroleum and Natural Gas, Central Electricity Authority, Office of Coal Controller, Ministry of New and Renewable Energy and Office of the Economic Advisor, Ministry of Commerce and Industry.	
<b>2.9. Base period</b>	
2004-05	
<b>2.10. Statistical concepts and definitions</b>	
The main Concepts and Definitions are given in <b>Annex: I.(Annex.II &amp; Annex.III</b> respectively give certain Conversion Factors and Abbreviations used)	

**3. Unit of measure**

Energy quantities data are recorded in physical units relevant to the product in question (GWh for electricity, 1000 tonnes for petroleum products etc.). Prices are indicated by Wholesale Price Index. The Energy Balance is given in ktoe. Consumption and Production of the Energy resources is also given in petajoules.

**4. Reference period**

Reference period of the Publication of "Energy Statistics -2014" is the financial year 2012-13 and the previous financial years since 2005-06.

**5. Institutional mandate****6.1. Legal acts and other agreements**

No legal acts, however this statistics is collected in view of the mandate of the Ministry in allocation of Business rules.

**6.2. Data sharing**

The publication is disseminated on the website of the Ministry(MOSPI) and is available free of cost.

**6. Confidentiality****7.1. Confidentiality – policy and data treatment**

Confidentiality of the data is maintained by the data source ministries.

**7. Release policy****7.1. Release calendar**

Publication of Energy Statistics is released on MOSPI's web-site in March every year.

**7.2. User access**

MOSPI disseminates Economic statistics on its website in an objective, professional and transparent manner in which all users are treated equitably. The detailed arrangements are governed by the dissemination policy of Government of India.

**8. Dissemination format****8.1. News release**

Publication on Energy Statistics is released annually.

**8.2. Publications**

Annual publication in pdf format is available on the website of MOSPI

**9. Accessibility of documentation****9.1. Documentation on methodology**

Information on the relevant Energy indicators methodology can be found in the publication.

**10. Accuracy and reliability****10.1. Overall accuracy**

Data on energy is published on the basis of information received from the source agencies. This Division compiles and analyses data received from the source agencies and then presents in the form of publication.

**11. Timeliness and punctuality****11.1. Timeliness**

Preliminary data on energy production and consumption statistics and few energy indicators are available 12 months after the reference year. Preliminary data on energy consumption and supply are complete and published before the end of the next financial year. Final data for the year are published 24 months after the end of the statistical reference year.

**11.2. Punctuality**

Annual publication on Energy Statistics is released by the end of March every year.

**12. Data revision****12.1. Data revision - policy**

The annual publication provide data on the last reference year and revisions for the year before. Revisions of entire time series when made by source agencies due to specific survey or data revision are incorporated in due time.

**12.2. Data revision - practice**

Preliminary data on energy production and consumption statistics is published in current publication. Final data will be given in the next publication in March 2015.

**13. Statistical processing****13.1. Source data**

Energy data are collected from the source agencies at national level and presented in publication. It is published in the ministry's web-site.

**13.2. Frequency of data collection**

Annual.

**13.3. Data collection**

Data is collected through e-mail or by post from the source ministries.

**13.4. Data validation**

Checks are carried out to the data before publishing it.

**13.5.5. Data compilation**

Data is calculated by summing up the national figures.

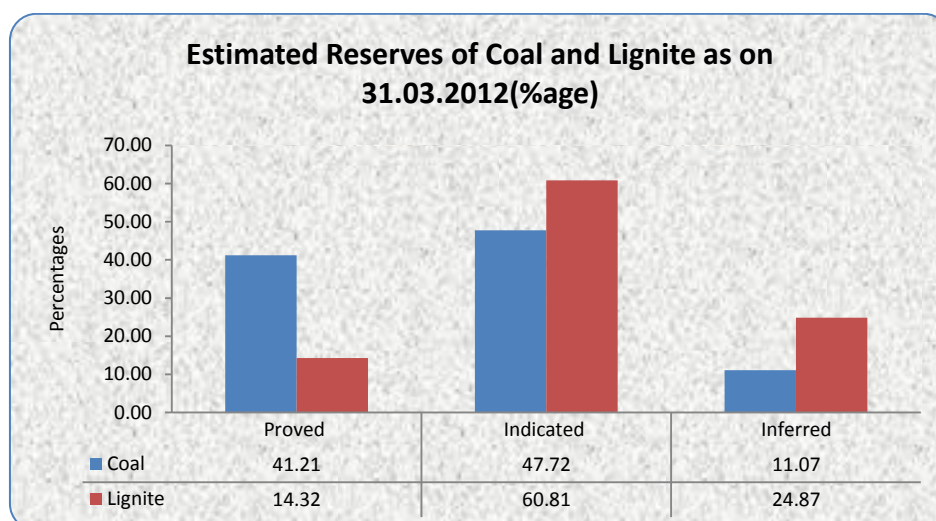
**13.6. Adjustment**

No seasonal adjustment or temperature correction of the energy consumption is applied.

## RESERVES AND POTENTIAL FOR GENERATION

### 1.1 Coal and Lignite

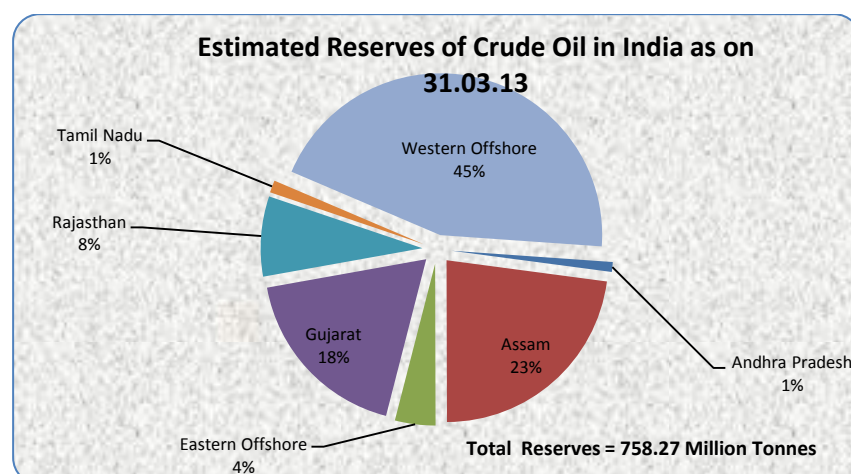
- ❖ Coal deposits are mainly confined to eastern and south central parts of the country. The states of Jharkhand, Odisha, Chhattisgarh, West Bengal, Andhra Pradesh, Maharashtra and Madhya Pradesh account for more than 99% of the total coal reserves in the country. The State of Jharkhand had the maximum share(27.0) in the overall reserves of coal in the country as on 31<sup>st</sup> March 2013 followed by the State of Odisha(24.7%).(Table 1.1).
- ❖ As on 31.03.13 the estimated reserves of coal was 298.94 billion tones, an addition of 5.44 billion over the last year (Table 1.1). There has been an increase of 1.85% in the estimated coal reserves during the year 2012-13 with Odisha accounting for the maximum increase of 3.16 %.



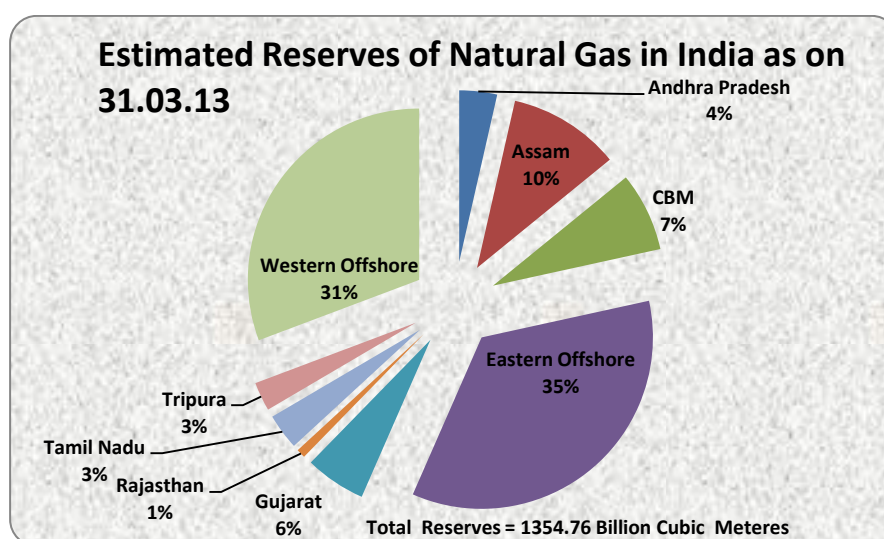
- ❖ The estimated total reserves of lignite as on 31.03.13 was 43.22 billion tonnes against 41.96 billion tonnes as on 31.03.12. (Table 1.1(A)).

### 1.2 Petroleum and Natural gas

- ❖ The estimated reserves of crude oil in India as on 31.03.2013 stood at 758.27 million tonnes (MT).
- ❖ Geographical distribution of Crude oil indicates that the maximum reserves are in the Western Offshore (44.34%) followed by Assam (22.68%), whereas the maximum reserves of Natural Gas are in the Eastern Offshore (34.95%) followed by Western offshore (30.68%). (Table 1.2).



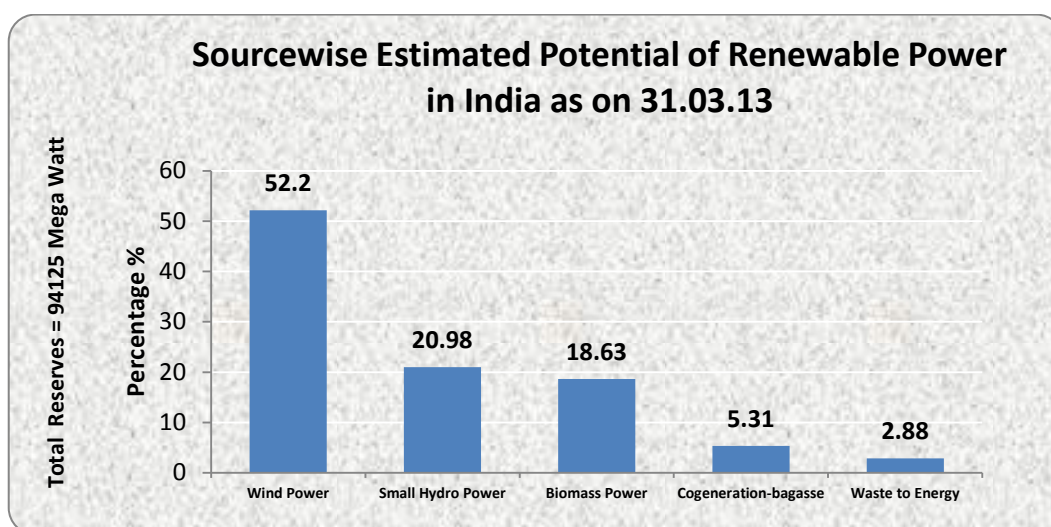
- ❖ There was decrease of 0.17% in the estimated reserve of crude oil for the country as a whole during 2012-13. During the same period, estimated reserves of crude oil in Western offshore and Assam decreased by 0.44% and 0.35% respectively, while the same in Gujarat increased by 0.74%.
- ❖ The estimated reserves of natural gas in India as on 31.03.2013 stood at 1354.76 billion cubic meters (BCM) (Table 1.2).



- ❖ In case of Natural Gas, the increase in the estimated reserves over the last year was 1.84%. The maximum contribution to this increase has been from Tamil Nadu (16.6%), followed by Andhra Pradesh (13.9%).

### 1.3 Renewable energy sources

- ❖ There is high potential for generation of renewable energy from various sources- wind, solar, biomass, small hydro and cogeneration bagasse.
- ❖ The total potential for renewable power generation in the country as on 31.03.13 is estimated at 94125 MW (Table 1.3). This includes wind power potential of 49130 MW (52.2%), SHP (small-hydro power) potential of 19750 MW (20.98%), Biomass power potential of 17,538 MW(18.63%) and 5000 MW (5.31%) from bagasse-based cogeneration in sugar mills.



- ❖ The geographic distribution of the estimated potential of renewable power as on 31.03.2013 reveals that Karnataka has the highest share of about 15.37% (14,464 MW), followed by Gujarat with 13.27% share (12,494 MW) and Maharashtra with 10.26% share (9,657 MW), mainly on account of wind power potential.

**Table 1.1 :Statewise Estimated Reserves of Coal in India as on 31.03.2012 and 31.03.2013**

(in Billion Tonnes)

States/ UTs	Proved		Indicated		Inferred		Total		Distribution (%)	
	31.03.2012	31.03.2013	31.03.2012	31.03.2013	31.03.2012	31.03.2013	31.03.2012	31.03.2013	31.03.2012	31.03.2013
Andhra Pradesh	9.57	9.60	9.55	9.55	3.03	3.05	22.16	22.20	7.55	7.43
Arunachal Pradesh	0.03	0.03	0.04	0.04	0.02	0.02	0.09	0.09	0.03	0.03
Assam	0.47	0.47	0.05	0.05	0.00	0.00	0.51	0.52	0.17	0.17
Bihar	0.00	0.00	0.00	0.00	0.16	0.16	0.16	0.16	0.05	0.05
Chhattisgarh	13.99	14.78	33.45	34.11	3.41	3.28	50.85	52.17	17.32	17.45
Jharkhand	40.16	41.16	33.61	32.99	6.58	6.56	80.36	80.71	27.38	27.00
Madhya Pradesh	9.31	9.82	12.29	12.36	2.78	2.88	24.38	25.06	8.31	8.38
Maharashtra	5.67	5.67	3.11	3.19	2.11	2.11	10.88	10.97	3.71	3.67
Meghalaya	0.09	0.09	0.02	0.02	0.47	0.47	0.58	0.58	0.20	0.19
Nagaland	0.01	0.01	0.00	0.00	0.31	0.31	0.32	0.32	0.11	0.11
Odisha	25.55	27.28	36.47	37.11	9.43	9.32	71.45	73.71	24.34	24.66
Sikkim	0.00	0.00	0.06	0.06	0.04	0.04	0.10	0.10	0.03	0.03
Uttar Pradesh	0.88	0.88	0.18	0.18	0.00	0.00	1.06	1.06	0.36	0.35
West Bengal	12.43	13.40	13.36	13.00	4.83	4.89	30.62	31.29	10.43	10.47
<b>All India Total</b>	<b>118.15</b>	<b>123.19</b>	<b>142.17</b>	<b>142.66</b>	<b>33.18</b>	<b>33.09</b>	<b>293.50</b>	<b>298.94</b>	<b>100.00</b>	<b>100.00</b>
<b>Distribution (%)</b>	<b>40.25</b>	<b>41.21</b>	<b>48.44</b>	<b>47.72</b>	<b>11.31</b>	<b>11.07</b>	<b>100.00</b>	<b>100.00</b>		

**Table 1.1(A) :Statewise Estimated Reserves of Lignite in India as on 31.03.2012 and 31.03.2013**

(in Billion Tonnes)

States/ UTs	Proved		Indicated		Inferred		Total		Distribution (%)	
	31.03.2012	31.03.2013	31.03.2012	31.03.2013	31.03.2012	31.03.2013	31.03.2012	31.03.2013	31.03.2012	31.03.2013
Gujarat	1.28	1.28	0.28	0.28	1.16	1.16	2.72	2.72	6.49	6.29
Jammu & Kashmir	0.00	0.00	0.02	0.02	0.01	0.01	0.03	0.03	0.06	0.07
Kerala	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02
Pondicherry	0.00	0.00	0.41	0.41	0.01	0.01	0.42	0.42	0.99	0.97
Rajasthan	1.17	1.17	2.15	2.67	1.59	1.85	4.91	5.69	11.69	13.17
TamilNadu	3.74	3.74	22.90	22.90	7.24	7.71	33.88	34.35	80.73	79.48
West Bengal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>India</b>	<b>6.18</b>	<b>6.19</b>	<b>25.76</b>	<b>26.28</b>	<b>10.02</b>	<b>10.75</b>	<b>41.96</b>	<b>43.22</b>	<b>100.00</b>	<b>100.00</b>
<b>Distribution (%)</b>	<b>14.73</b>	<b>14.32</b>	<b>61.40</b>	<b>60.81</b>	<b>23.88</b>	<b>24.87</b>	<b>100.00</b>	<b>100.00</b>		

Source:Office of Coal Controller, Ministry of Coal



**Table 1.2 : Statewise Estimated Reserves @ of Crude Oil and Natural Gas in India as on in 31.03.2012 and 31.03.2013**

States/ UTs/ Region	Crude Petroleum (million tonnes)				Natural Gas (billion cubic metres)			
	31.03.2012		31.03.2013		31.03.2012		31.03.2013	
	Estimated Reserves	Distribution (%)	Estimated Reserves	Distribution (%)	Estimated Reserves	Distribution (%)	Estimated Reserves	Distribution (%)
Andhra Pradesh	5.59	0.74	7.42	0.98	42.30	3.18	48.21	3.56
Arunachal Pradesh	3.41	0.45	3.37	0.44	2.15	0.16	1.96	0.14
Assam	172.54	22.71	171.94	22.68	139.82	10.51	142.77	10.54
CBM	0.00	0.00	0.00	0.00	97.54	7.33	100.76	7.44
Eastern Offshore <sup>1</sup>	24.12	3.18	30.43	4.01	462.03	34.73	473.51	34.95
Gujarat	135.72	17.87	136.73	18.03	78.19	5.88	77.53	5.72
Nagaland	2.69	0.35	2.69	0.35	0.12	0.01	0.12	0.01
Rajasthan	68.87	9.07	60.19	7.94	12.13	0.91	11.50	0.85
Tamil Nadu	8.86	1.17	9.21	1.21	39.30	2.95	45.83	3.38
Tripura	0.07	0.01	0.07	0.01	36.05	2.71	36.92	2.73
Western Offshore <sup>2</sup>	337.72	44.46	336.22	44.34	420.63	31.62	415.65	30.68
<b>Total</b>	<b>759.59</b>	<b>100.00</b>	<b>758.27</b>	<b>100.00</b>	<b>1330.26</b>	<b>100.00</b>	<b>1354.76</b>	<b>100.00</b>

CBM : Cold Bed Methane

@ Proved and indicated Balance Recoverable Reserves.

1 Includes JVC/Pvt. Parties for Crude Oil and includes West Bengal for Natural Gas

2 Includes Bombay High offshore, Rajasthan and JVC for Crude Oil and Bombay High offshore, Rajasthan and Madhya Pradesh (Coal Bed Methane) for Natural Gas

Source: Ministry of Petroleum & Natural Gas

**Table 1.3 :Sourcewise and Statewise Estimated Potential of Renewable Power in India as on 31.03.2013**

(in MW)

States/ UTs	Wind Power	Small Hydro Power	Biomass Power	Cogeneration-bagasse	Waste to Energy	Total	
						Estimated Reserves	Distribution (%)
1	2	3	4	5	6	7	8
Andhra Pradesh	5394	978	578	300	123	7373	7.83
Arunachal Pradesh	201	1341	8	0	0	1550	1.65
Assam	53	239	212	0	8	512	0.54
Bihar	0	223	619	300	73	1215	1.29
Chhattisgarh	23	1107	236	0	24	1390	1.48
Goa	0	7	26	0	0	33	0.04
Gujarat	10609	202	1221	350	112	12494	13.27
Haryana	0	110	1333	350	24	1817	1.93
Himachal Pradesh	20	2398	142	0	2	2562	2.72
Jammu & Kashmir	5311	1431	43	0	0	6785	7.21
Jharkhand	0	209	90	0	10	309	0.33
Karnataka	8591	4141	1131	450	151	14464	15.37
Kerala	790	704	1044	0	36	2574	2.73
Madhya Pradesh	920	820	1364	0	78	3182	3.38
Maharashtra	5439	794	1887	1250	287	9657	10.26
Manipur	7	109	13	0	2	131	0.14
Meghalaya	44	230	11	0	2	287	0.30
Mizoram	0	169	1	0	2	172	0.18
Nagaland	3	197	10	0	0	210	0.22
Odisha	910	296	246	0	22	1474	1.57
Punjab	0	441	3172	300	45	3958	4.21
Rajasthan	5005	57	1039	0	62	6163	6.55
Sikkim	98	267	2	0	0	367	0.39
Tamil Nadu	5374	660	1070	450	151	7705	8.19
Tripura	0	47	3	0	2	52	0.06
Uttar Pradesh	137	461	1617	1250	176	3641	3.87
Uttarakhand	161	1708	24	0	5	1898	2.02
West Bengal	22	396	396	0	148	962	1.02
Andaman & Nicobar	2	8	0	0	0	10	0.01
Chandigarh	0	0	0	0	6	6	0.01
Dadar & Nagar Haveli	0	0	0	0	0	0	0.00
Daman & Diu	0	0	0	0	0	0	0.00
Delhi	0	0	0	0	131	131	0.14
Lakshadweep	16	0	0	0	0	16	0.02
Puducherry	0	0	0	0	3	3	0.00
Others*	0	0	0	0	1022	1022	1.09
<b>All India Total</b>	<b>49130</b>	<b>19750</b>	<b>17538</b>	<b>5000</b>	<b>2707</b>	<b>94125</b>	<b>100.00</b>
<b>Distribution (%)</b>	<b>52.20</b>	<b>20.98</b>	<b>18.63</b>	<b>5.31</b>	<b>2.88</b>	<b>100.00</b>	

\* Industrial waste

Source: Ministry of New and Renewable Energy

## INSTALLED CAPACITY AND CAPACITY UTILIZATION

### INSTALLED CAPACITY AND CAPACITY UTILIZATION

#### 2.1 Coal Washeries

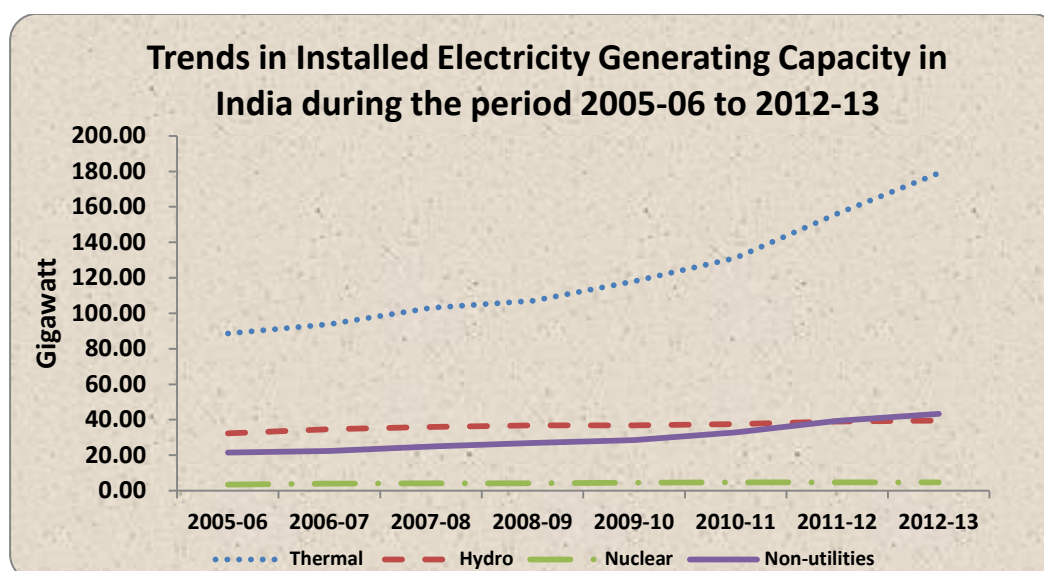
- ❖ Coal washing is an integral part of coal production. Raw coal coming from mines is washed to remove the ash contents to make them fit for feeding into boilers, particularly those of steel plants. Barring a few instances, a coal washery does not form part of a coal mine in India.
- ❖ Total installed capacity of washeries in the country is around 131.24 Million tonne per year (MTY) as on 31.3.2013 (Table 2.1). As on 31.03.13, a total of 52 washeries, both PSUs and Private, were operating in the country considering both Coking (29.69 MTY) and Non-Coking Coal (101.55 MTY).

#### 2.2 Refineries of crude oil

- ❖ As on 31.03.13 there were a total of 22 refineries in the country (Table 2.2), 17 in the Public Sector, 3 in the private sector and 2 in joint venture.
- ❖ There has been a considerable increase in refining capacity in the country over the years. There was an increase in domestic refining capacity by 0.94% to reach 215 Metric Million Tonne Per Annum (MMTPA) as on 31.03.2013 as compared to 213 MMTPA as on 31.03.2012.
- ❖ The Refinery production (crude throughput) achievement was 219.212 MMT during 2012-13 which marks net increase of 7.39% over 2011-12 (204.121 MMT)
- ❖ Capacity utilization of the refineries was 95.8% during 2011-12 which increased to 101.9% during 2012-13. In the Public Sector the maximum increase in capacity utilization (10.2%) was at IOC, Barauni, Bihar.
- ❖ In the Private Sector the highest increase (23.9 %) in capacity utilization was at Essar Oil Ltd., Vadinar.
- ❖ Indian Oil Corporation, the state owned corporation had highest refining capacity of 54,200 TMTY. All units of IOC together processed 54,649 TMT during 2012-13 as compared to 55,621 TMT during 2011-12. The capacity utilization of these refineries was 100.8% during 2012-13 as against 102.6% during 2011-12.
- ❖ All the private refineries taken together processed 88,273 TMT during 2012-13 as compared to 81,179 TMT during 2011-12. The capacity utilization of these refineries during 2011-12 and 2012-13 stood at 104.1% and 110.8% respectively.

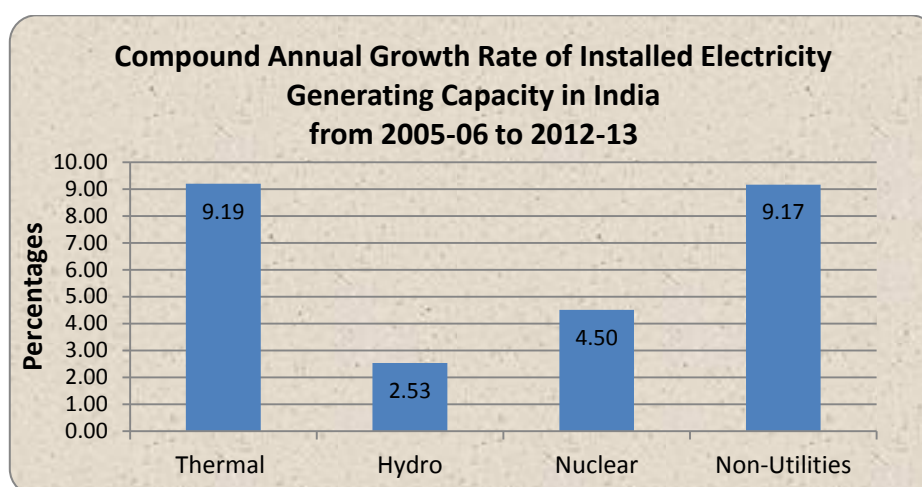
### 2.3 Installed generating capacity of electricity

- ❖ The total installed capacity for electricity generation in the country has increased from 145755 MW as on 31.03.2006 to 266644 MW as on 31.03.2013, registering a compound annual growth rate (CAGR) of 7.84% (Table 2.3).

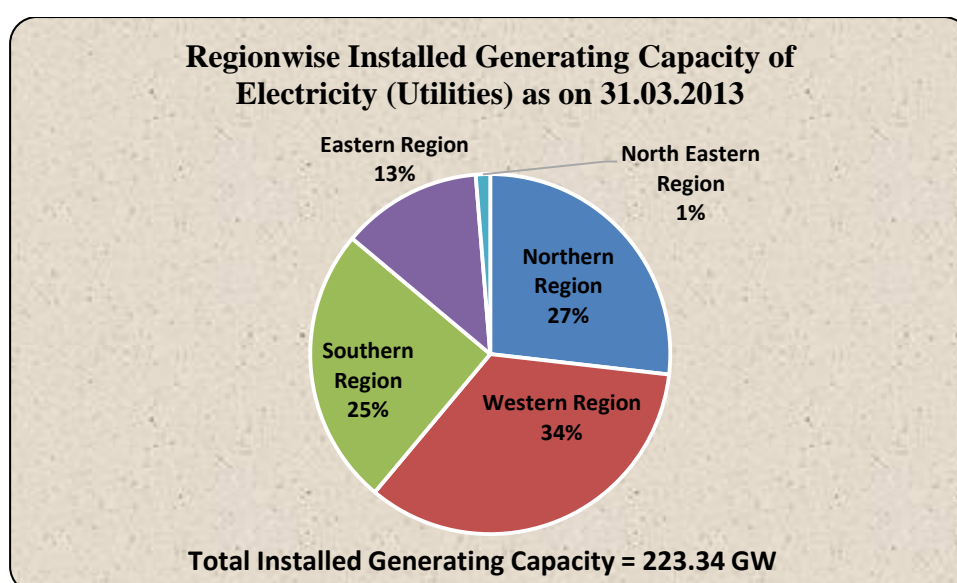


- ❖ There has been an increase in generating capacity of 27391 MW over the last one year the annual increase being 11.45%.
- ❖ The highest rate of annual growth (14.71%) from 2011-12 to 2012-13 in installed capacity was for Thermal power followed by Hydro Power (1.28%).
- ❖ The total Installed capacity of power utilities in the country increased from 124287 MW in 2005-06 to 223344 MW as on 31.3.2013, with a CAGR of 7.60 % over the period.
- ❖ At the end of March 2013, thermal power plants accounted for an overwhelming 67.16% of the total installed capacity in the country, with an installed capacity of 179072 MW. The share of Nuclear energy was only 1.79% (4.78 GW).
- ❖ Hydro power plants come next with an installed capacity of 39491 MW, accounting for 14.81% of the total installed Capacity.
- ❖ Non-utilities accounted for 16.24% (43300 MW) of the total installed generation capacity.

- ❖ The highest CAGR (9.19%) was in case of Thermal utilities followed by Nuclear (4.50%) and Hydro (2.53%).



- ❖ The geographical distribution of Installed generating capacity of electricity as on 31.03.13 (Table 2.4) indicates that Western Region (both central and state sector) accounted for the highest share (34.27%) followed by Southern Region (25.02%), Northern Region (26.81%), Eastern Region (12.61%) and North Eastern Region (1.29%).

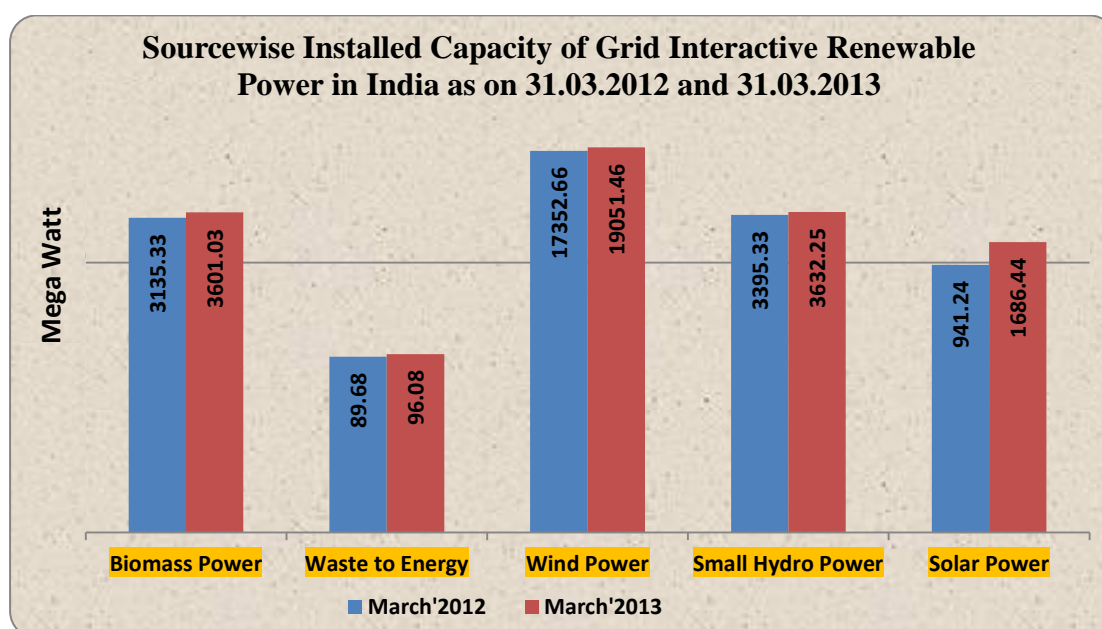


- ❖ Region wise growth in the installed capacity during 2012-13 reveals that Western Region registered the highest annual growth of about 18.86%, followed by Northern Eastern Region (17.92%) and Northern Region (11.05%).
- ❖ Among the States in the Western Region that accounted for the highest growth of 18.86%, Madhya Pradesh registered the highest (26.80%) followed by Gujarat (19.91%).

- ❖ Among all the states Madhya Pradesh registered highest annual growth (26.80%) growth in the installed capacity followed by Arunachal Pradesh (26.48%) and Odisha (21.69%).

#### 2.4 Grid Interactive Renewable Power

- ❖ The total installed capacity of grid interactive renewable power, which was 24914.24 MW as on 31.03.2012 had gone up to 28067.26 MW as on 31.03.2013 indicating growth of 12.66% during the period (Table 2.5).
- ❖ Out of the total installed generation capacity of renewable power as on 31-03-2013, wind power accounted for about 67.88%, followed by small hydro power (12.94%) and Biomass power (12.83%).
- ❖ Tamil Nadu had the highest installed capacity of grid connected renewable power (7849.09 MW) followed by Maharashtra (4188.40 MW) and Gujarat (4078.58 MW), mainly on account of wind power.
- ❖ As on 31.03.2013 out of total number of Biogas plants installed (46.69 lakh) (Table 2.6), maximum number of plants installed were in Maharashtra (8.43lakh) followed by Andhra Pradesh, Karnataka, Uttar Pradesh and Gujarat each with more than 4 lakh biogas plants.



- ❖ Out of 1221.26 MW Solar Cookers installed as on 31.03.2013, 824.09 MW were installed in Gujarat and 222.9 MW in Rajasthan.
- ❖ As on 31.03.2013 there were 1,418 water pumping Wind mills systems installed and 7971 remote villages and 2183 hamlets were electrified.



**Table 2.1: Installed Capacity of Coal Washeries in India  
as on 31.03.13**

Sl. No.	Washery & Operator	State of Location	Capacity (MTY)
			31.03.2013
<b><u>COKING COAL :</u></b>			
1	Dudga-II, CIL	Jharkhand	2.00
2	Bhojudih, CIL	West Bengal	1.70
3	Patherdih, CIL	Jharkhand	1.60
4	Moonidih, CIL	Jharkhand	1.60
5	Sudamdih, CIL	Jharkhand	1.60
6	Mahuda, CIL	Jharkhand	0.63
7	Kathara, CIL	Jharkhand	3.00
8	Swang, CIL	Jharkhand	0.75
9	Rajrappa, CIL	Jharkhand	3.00
10	Kedla, CIL	Jharkhand	2.60
11	Nandan, CIL	Madhya Pradesh	1.20
	<b>(A) CIL</b>		<b>19.68</b>
12	Durgapur, SAIL	West Bengal	1.50
13	DCOP, DPL	West Bengal	1.35
14	Chasnala, IISCO	Jharkhand	1.50
15	Jamadoba, TISCO	Jharkhand	0.90
16	West Bokaro-II, TISCO	Jharkhand	1.80
17	West Boakaro-III, TISCO	Jharkhand	2.10
18	Bhelatand	Jharkhand	0.86
	<b>(B) PSU &amp; Private</b>		<b>10.01</b>
	<b>TOTAL (A + B)</b>		<b>29.69</b>
<b><u>NON-COKING COAL</u></b>			
1	Dugda-I, CIL	Jharkhand	2.50
2	Madhuban, CIL	Jharkhand	2.50
3	Gidi, CIL	Jharkhand	2.50
4	Piparwar, CIL	Jharkhand	6.50
5	Kargali, CIL	Jharkhand	2.72
6	Bina, CIL	Uttar Pradesh	4.50
	<b>(A) CIL</b>		<b>21.22</b>
7	Dipka, Aryan coal beneficiation pvt. ltd.	Chattisgarh	12.00
8	Gevra, -do-	Chattisgarh	5.00
9	Panderpauni, -do-	Maharashtra	3.00
10	Chakabuwa, Aryan Energy private ltd.	Chattisgarh	4.00
11	Indaram, Aryan Coal Benefication Pvt.Ltd.	Andhra Pradesh	-
12	Talcher, Aryan Energy Pvt. Ltd.	Odisha	2.00

**Table 2.1(Contd.): Installed Capacity of Coal Washeries in India as on 31.03.13**

Sl. No.	Washery & Operator	State of Location	Capacity
			31.03.2013
13	Wani, Kartikay Coal washeries pvt. ltd.(Aryan)	Maharashtra	2.50
14	Korba, ST-CLI Coal washeries ltd.	Chattisgarh	5.20
15	Ramagundam, Gupta coalfield & washeries ltd.	Andhra Pradesh	2.40
16	Sasti, Gupta coalfield & washeries ltd.	Maharashtra	2.40
17	Wani, Gupta coalfield & washeries ltd.	Maharashtra	1.92
18	Umrer, Gupta coalfield & washeries ltd.	Maharashtra	0.75
19	Bhandara, Gupta coalfield & washeries ltd.	Maharashtra	0.75
20	Gondegaon, Gupta coalfield & washeries ltd.	Maharashtra	2.40
21	Majri, Gupta coalfield & washeries ltd.	Maharashtra	2.40
22	Bilaspur, Gupta coalfield & washeries ltd.	Chattisgarh	3.50
23	Ghugus, Gupta coalfield & washeries ltd.	Maharashtra	2.40
24	Talcher, Global coal Mining (P) Ltd.	Odisha	2.50
25	Ib Valley, Global coal Mining (P) Ltd.	Odisha	3.25
26	Ramagundam, Global coal Mining (P) Ltd.	Andhra Pradesh	1.00
27	Wani, Bhatia International Ltd.	Maharashtra	3.73
28	Ghugus, Bhatia International Ltd.	Maharashtra	4.00
29	Jharsuguda, Bhatia International Ltd.	Odisha	1.50
30	Tamnar, Jindal Steel & Power Ltd.	Chattisgarh	6.00
31	Wani, Indo Unique Flame Ltd.	Maharashtra	2.40
32	Nagpur, Indo Unique Flame Ltd.	Maharashtra	0.60
33	Punwat, Indo Unique Flame Ltd.	Maharashtra	2.40
34	Dharamsthal, BLA Industries	Madhya Pradesh	0.33
<b>(B) Private</b>			<b>80.33</b>
<b>TOTAL (A+B)</b>			<b>101.55</b>
<b>Gross Total (Coking+Non-Coking)</b>			<b>131.24</b>

Source:Office of Coal Controller, Ministry of Coal

**Table 2.2: Installed Capacity and Capacity Utilization of Refineries of Crude Oil during 2011-12 and 2012-13**

Sl. No.	Refinery	Installed Capacity (TMIPA)		Crude Oil Processed (TMT)		Capacity Utilisation (%)		
		01.04.2012	01.04.2013	2011-12 <sup>^</sup>	2012-13*	2011-12	2012-13	Change in Utilisation
<b>A</b>	<b>Public Sector Refineries</b>	<b>120066</b>	<b>120066</b>	<b>120895</b>	<b>120303</b>	<b>100.7</b>	<b>100.2</b>	<b>-0.5</b>
<b>I</b>	<b>IOC RFINERIES</b>	<b>54200</b>	<b>54200</b>	<b>55621</b>	<b>54649</b>	<b>102.6</b>	<b>100.8</b>	<b>-1.8</b>
	IOC, Guwahati, Assam	1000	1000	1058	956	105.8	95.6	-10.2
	IOC, Barauni, Bihar	6000	6000	5730	6344	95.5	105.7	10.2
	IOC, Koyali, Gujarat	13700	13700	14253	13155	104.0	96.0	-8.0
	IOC, Haldia, West Bengal	7500	7500	8072	7490	107.6	99.9	-7.8
	IOC, Mathura, Uttar Pradesh	8000	8000	8202	8561	102.5	107.0	4.5
	IOC, Digboi, Assam	650	650	622	660	95.7	101.6	5.9
	IOC, Panipat, Haryana	15000	15000	15496	15126	103.3	100.8	-2.5
	IOC, Bongaigaon, Assam	2350	2350	2188	2356	93.1	100.3	7.2
<b>III</b>	<b>BPCL RFINERIES</b>	<b>21500</b>	<b>21500</b>	<b>22828</b>	<b>23183</b>	<b>106.2</b>	<b>107.8</b>	<b>1.6</b>
	BPCL, Mumbai, Maharashtra	12000	12000	13355	13077	111.3	109.0	-2.3
	BPCL, Kochi, Kerala	9500	9500	9472	10105	99.7	106.4	6.7
<b>III</b>	<b>HPCL RFINERIES</b>	<b>14800</b>	<b>14800</b>	<b>16189</b>	<b>15777</b>	<b>109.4</b>	<b>106.6</b>	<b>-2.8</b>
	HPCL, Mumbai, Maharashtra	6500	6500	7506	7748	115.5	119.2	3.7
	HPCL, Visakh, Andhra Pradesh	8300	8300	8682	8028	104.6	96.7	-7.9
<b>IV</b>	<b>CPCL RFINERIES</b>	<b>11500</b>	<b>11500</b>	<b>10565</b>	<b>9745</b>	<b>91.9</b>	<b>84.7</b>	<b>-7.1</b>
	CPCL, Manali, Tamil Nadu	10500	10500	9953	9105	94.8	86.7	-8.1
	CPCL, Narimanam, Tamil Nadu	1000	1000	611	640	61.1	64.0	2.8
<b>V</b>	<b>NRL, Numaligarh, Assam</b>	<b>3000</b>	<b>3000</b>	<b>2825</b>	<b>2478</b>	<b>94.2</b>	<b>82.6</b>	<b>-11.6</b>
<b>VI</b>	<b>MRPL, Mangalore, Karnataka</b>	<b>15000</b>	<b>15000</b>	<b>12798</b>	<b>14415</b>	<b>85.3</b>	<b>96.1</b>	<b>10.8</b>
<b>VII</b>	<b>ONGC, Tatipaka, Andhra Pradesh</b>	<b>66</b>	<b>66</b>	<b>69</b>	<b>57</b>	<b>105.0</b>	<b>85.6</b>	<b>-19.3</b>
<b>B</b>	<b>Private Sector Refineries</b>	<b>78000</b>	<b>80000</b>	<b>81179</b>	<b>88273</b>	<b>104.1</b>	<b>110.3</b>	<b>6.3</b>
<b>I</b>	<b>RIL RFINERIES</b>	<b>60000</b>	<b>60000</b>	<b>67683</b>	<b>68504</b>	<b>112.8</b>	<b>114.2</b>	<b>1.4</b>
	RIL, DTA, Jamnagar, Gujarat	33000	33000	32497	32613	98.5	98.8	0.3
	RIL(SEZ), Jamnagar, Gujarat	27000	27000	35186	35892	130.3	132.9	2.6
<b>II</b>	<b>Essar Oil Ltd.(EOL), Vadinar</b>	<b>18000</b>	<b>20000</b>	<b>13496</b>	<b>19769</b>	<b>75.0</b>	<b>98.8</b>	<b>23.9</b>
								<b>0.0</b>
<b>C</b>	<b>JOINT VENTURE</b>	<b>15000</b>	<b>15000</b>	<b>2048</b>	<b>10636</b>	<b>13.7</b>	<b>70.9</b>	<b>57.3</b>
<b>I</b>	<b>BORL, Bina***</b>	<b>6000</b>	<b>6000</b>	<b>2048</b>	<b>5732</b>	<b>34.1</b>	<b>95.5</b>	<b>61.4</b>
<b>II</b>	<b>HMEL, Bathinda**</b>	<b>9000</b>	<b>9000</b>	<b>-</b>	<b>4904</b>	<b>-</b>	<b>54.5</b>	<b>-</b>
	<b>Total (A+B+C)</b>	<b>213066</b>	<b>215066</b>	<b>204121</b>	<b>219212</b>	<b>95.8</b>	<b>101.9</b>	<b>6.1</b>

\* Provisional TMT:Thousand metric Tonnes TMTPA:Thousand metric Tonr ^:Revised

\*\* : HPCL & Mittal Energy Investments Pvt. Ltd., a Joint Venture, Bathinda commissioned on April,2012.

\*\*\*: BPCL & Oman Oil Company, a Joint Venture, Bina Commissioned on May,2011

**Note:** Excludes other Inputs from RIL Refineries Crude throughput during 2010-11 to 2012-13

Source: Ministry of Petroleum and Natural Gas

**Table 2.3 : Trends in Installed Generating Capacity of Electricity in Utilities and Non-utilities in India from 2005-06 to 2012-13**

(Mega Watt ) = (10<sup>3</sup> x Kilo Watt )

As on	Utilities				Non-utilities Total**	Grand Total
	Thermal *	Hydro	Nuclear	Total		
1	2	3	4	5	6	7
31.03.2006	88,601	32,326	3,360	124,287	21,468	145,755
31.03.2007	93,775	34,654	3,900	132,329	22,335	154,664
31.03.2008	103,032	35,909	4,120	143,061	24,986	168,047
31.03.2009	106,968	36,878	4,120	147,966	26,980	174,946
31.03.2010	117,975	36,863	4,560	159,398	28,474	187,872
31.03.2011	131,279	37,567	4,780	173,626	32,900	206,526
31.3.2012	156,107	38,990	4,780	199,877	39,375	239,252
31.3.2013(p)	179,072	39,491	4,780	223,344	43,300	266,644
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>14.71</b>	<b>1.28</b>	<b>0.00</b>	<b>11.74</b>	<b>9.97</b>	<b>11.45</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>9.19</b>	<b>2.53</b>	<b>4.50</b>	<b>7.60</b>	<b>9.17</b>	<b>7.84</b>

\* Thermal includes Renewable Energy Resources.

\*\* Capacity in respect of Self Generating Industries includes units of capacity 1 MW and above.

CAGR: Compound Annual Growth Rate =  $\left[ \left( \frac{\text{Current Value}}{\text{Base Value}} \right)^{\frac{1}{\text{nos. of years}}} - 1 \right] * 100$

Source: Central Electricity Authority.

**Table 2.4 : Regionwise and Statewise Installed Generating Capacity of Electricity (Utilities) in India as on 31.03.2012 and 31.03.2013**

(in GigaWatt)

States/UTs	Hydro		Thermal		Nuclear		New & Renewable**		Total		Growth* Rate(2011-12 to 2012-13)
	31.03.12	31.03.13	31.03.12	31.03.13	31.03.12	31.03.13	31.03.12	31.03.13	31.03.12	31.03.13	
Delhi	0.00	0.00	1.54	1.79	0.00	0.00	0.02	0.02	1.56	1.81	16.04
Haryana	0.88	0.88	3.85	4.81	0.00	0.00	0.12	0.12	4.86	5.82	19.78
Himachal Prd.	2.07	2.14	0.00	0.00	0.00	0.00	0.53	0.59	2.60	2.73	5.02
Jammu & Kashmir	0.78	0.78	0.18	0.18	0.00	0.00	0.13	0.13	1.09	1.09	0.00
Punjab	2.23	2.23	2.66	3.02	0.00	0.00	0.35	0.39	5.24	5.63	7.52
Rajasthan	0.99	0.99	4.60	5.55	0.00	0.00	2.37	3.33	7.95	9.86	24.04
Uttar Pradesh	0.52	0.52	7.12	8.01	0.00	0.00	0.69	0.82	8.33	9.36	12.40
Uttarakhand	1.65	1.65	0.00	0.00	0.00	0.00	0.19	0.19	1.84	1.84	0.22
Chandigarh	-	0.00	-	0.00	-	0.00	-	0.00	-	0.00	-
Central Sector NR	5.99	6.27	12.84	13.84	1.62	1.62	0.00	0.00	20.46	21.73	6.23
Sub-Total (NR)	15.12	15.47	32.79	37.21	1.62	1.62	4.39	5.59	53.93	59.88	11.05
Chhatisgarh	0.12	0.12	3.89	4.57	0.00	0.00	0.27	0.31	4.29	4.99	16.49
D & N Haveli	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
Daman & Diu	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-
Goa	0.00	0.00	0.05	0.05	0.00	0.00	0.03	0.03	0.08	0.08	0.00
Gujarat	0.77	0.77	14.73	18.04	0.00	0.00	3.50	3.97	19.00	22.78	19.91
Madhya Pradesh	1.70	1.70	2.81	4.10	0.00	0.00	0.48	0.53	4.99	6.32	26.80
Maharashtra	3.33	3.33	13.39	16.24	0.00	0.00	3.63	4.16	20.35	23.73	16.59
Central Sector WR	1.52	1.52	12.33	15.27	1.84	1.84	0.00	0.00	15.69	18.63	18.74
Sub-Total (WR)	7.45	7.45	47.20	58.26	1.84	1.84	7.91	8.99	64.39	76.54	18.86
Andhra Pradesh	3.73	3.73	8.38	8.95	0.00	0.00	0.89	1.11	13.00	13.79	6.11
Karnataka	3.60	3.60	5.01	5.01	0.00	0.00	3.18	3.51	11.80	12.13	2.80
Kerala	1.88	1.88	0.43	0.43	0.00	0.00	0.16	0.17	2.47	2.49	0.49
Lakshadweep	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.01	0.01	0.00
Puducherry	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.03	0.03	0.09
Tamil Nadu	2.12	2.14	4.66	6.01	0.00	0.00	7.34	7.46	14.12	15.60	10.52
Central Sector SR #	0.00	0.00	10.00	10.50	1.32	1.32	0.00	0.00	11.32	11.82	4.42
Sub-Total (SR)	11.34	11.35	28.52	30.94	1.32	1.32	11.57	12.25	52.75	55.87	5.92
A & N Island	0.00	0.00	0.06	0.06	0.00	0.00	0.01	0.01	0.07	0.07	0.00
Bihar	0.00	0.00	0.53	0.43	0.00	0.00	0.08	0.11	0.61	0.54	-10.79
Jharkhand	0.13	0.13	2.60	1.82	0.00	0.00	0.00	0.02	2.73	1.97	-27.84
Odisha	2.06	2.06	2.22	3.17	0.00	0.00	0.10	0.10	4.38	5.33	21.69
Sikkim	0.00	0.00	0.01	0.01	0.00	0.00	0.05	0.05	0.06	0.06	0.00
West Bengal	0.98	0.98	6.48	6.42	0.00	0.00	0.16	0.17	7.62	7.57	-0.66
DVC	-	0.00	-	1.05	-	0.00	-	0.00	-	1.05	-
Central Sector ER	0.71	0.81	10.27	10.77	0.00	0.00	0.00	0.00	10.98	11.58	5.46
Sub-Total (ER)	3.88	3.98	22.17	23.73	0.00	0.00	0.40	0.46	26.44	28.17	6.52
Arunachal Prd.	0.00	0.00	0.02	0.02	0.00	0.00	0.08	0.10	0.09	0.12	26.48
Assam	0.10	0.10	0.38	0.38	0.00	0.00	0.03	0.03	0.51	0.51	0.79
Manipur	0.00	0.00	0.05	0.05	0.00	0.00	0.01	0.01	0.05	0.05	0.00
Meghalaya	0.24	0.28	0.00	0.00	0.00	0.00	0.03	0.03	0.27	0.32	16.25
Mizoram	0.00	0.00	0.05	0.05	0.00	0.00	0.04	0.04	0.09	0.09	0.00
Nagaland	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.03	6.98
Tripura	0.00	0.00	0.15	0.15	0.00	0.00	0.02	0.02	0.17	0.17	0.00
Central Sector NER	0.86	0.86	0.38	0.74	0.00	0.00	0.00	0.00	1.24	1.60	29.42
Sub-Total (NER)	1.20	1.24	1.02	1.39	0.00	0.00	0.22	0.25	2.45	2.88	17.92
<b>Total States</b>	<b>29.90</b>	<b>30.03</b>	<b>85.88</b>	<b>100.41</b>	<b>0.00</b>	<b>0.00</b>	<b>24.49</b>	<b>27.54</b>	<b>140.27</b>	<b>157.98</b>	<b>12.62</b>
<b>Total Central</b>	<b>9.09</b>	<b>9.46</b>	<b>45.82</b>	<b>51.12</b>	<b>4.78</b>	<b>4.78</b>	<b>0.00</b>	<b>0.00</b>	<b>59.68</b>	<b>65.36</b>	<b>9.51</b>
<b>Total All India</b>	<b>38.99</b>	<b>39.49</b>	<b>131.70</b>	<b>151.53</b>	<b>4.78</b>	<b>4.78</b>	<b>24.49</b>	<b>27.54</b>	<b>199.96</b>	<b>223.34</b>	<b>11.70</b>

\*\*:- Renewable Energy Sources includes Small Hydro Projects, Wind Power, Biomass Power Biomass Gasifier, Urban & Industrial Waste and Solar Power.

\* Growth rate of total installed electricity generating capacity of India

# Includes NLC-Central capacity also

Sub-totals/Totals may not tally due to conversion to Gw and rounding off.

Source : Central Electricity Authority.

**Table 2.5: Statewise and Sourcewise Installed Capacity of Grid Interactive Renewable Power as on 31.03.2012 and 30.03.2013**

States/ UTs	(In MW)					
	Biomass Power		Waste to Energy		Wind Power	
	31.03.12	31.03.13	31.03.12	31.03.13	31.03.12	31.03.13
Andhra Pradesh	363.25	380.75	43.16	43.16	245.55	447.65
Arunachal Pradesh	-	-	-	-	-	-
Assam	-	-	-	-	-	-
Bihar	15.50	43.30	-	-	-	-
Chhattisgarh	249.90	249.90	-	-	-	-
Goa	-	-	-	-	-	-
Gujarat	20.50	30.50	-	-	2966.28	3174.58
Haryana	35.80	45.30	-	-	-	-
Himachal Pradesh	-	-	-	-	-	-
Jammu & Kashmir	-	-	-	-	-	-
Jharkhand	-	-	-	-	-	-
Karnataka	441.18	491.38	1.00	1.00	1933.50	2135.15
Kerala	-	-	-	-	35.10	35.10
Madhya Pradesh	8.50	16.00	3.90	3.90	376.40	386.00
Maharashtra	603.70	756.90	5.72	9.72	2733.30	3021.85
Manipur	-	-	-	-	-	-
Meghalaya	-	-	-	-	-	-
Mizoram	-	-	-	-	-	-
Nagaland	-	-	-	-	-	-
Odisha	20.00	20.00	-	-	-	-
Punjab	90.50	124.50	9.25	9.25	-	-
Rajasthan	83.30	91.30	-	-	2070.65	2684.65
Sikkim	-	-	-	-	-	-
Tamil Nadu	532.70	538.70	5.65	8.05	6987.58	7162.18
Tripura	-	-	-	-	-	-
Uttar Pradesh	644.50	776.50	5.00	5.00	-	-
Uttarakhand	10.00	10.00	-	-	-	-
West Bengal	16.00	26.00	-	-	4.30	-
Andaman & Nicobar	-	-	-	-	-	-
Chandigarh	-	-	-	-	-	-
Dadar & Nagar Haveli	-	-	-	-	-	-
Daman & Diu	-	-	-	-	-	-
Delhi	-	-	16.00	16.00	-	-
Lakshadweep	-	-	-	-	-	-
Puducherry	-	-	-	-	-	-
Others	-	-	-	-	-	4.30
<b>All India Total</b>	<b>3135.33</b>	<b>3601.03</b>	<b>89.68</b>	<b>96.08</b>	<b>17352.66</b>	<b>19051.46</b>
<b>Distribution (%)</b>	<b>12.58</b>	<b>12.83</b>	<b>0.36</b>	<b>0.34</b>	<b>69.65</b>	<b>67.88</b>

Source: Ministry of New and Renewable Energy

**Table 2.5 (contd): Statewise and Sourcewise Installed Capacity of Grid Interactive Renewable Power as on 31.03.2011 and 30.03.2012**

States/ UTs	(In MW)						Growth* Rate(2011-12 to 2012-13)
	Small Hydro Power		Solar Power		Total		
	31.03.12	31.03.13	31.03.12	31.03.13	31.03.12	31.03.13	
Andhra Pradesh	217.83	219.03	21.75	23.35	891.54	1113.94	24.95
Arunachal Pradesh	79.23	103.91	0.03	0.03	79.26	103.93	31.13
Assam	31.11	31.11	-	-	31.11	31.11	0.00
Bihar	64.30	70.70	-	-	79.80	114.00	42.86
Chhattisgarh	20.25	52.00	4.00	4.00	274.15	305.90	11.58
Goa	0.05	0.05	-	-	0.05	0.05	0.00
Gujarat	15.60	15.60	604.89	857.90	3607.27	4078.58	13.07
Haryana	70.10	70.10	16.80	7.80	122.70	123.20	0.41
Himachal Pradesh	527.66	587.91	-	-	527.66	587.91	11.42
Jammu & Kashmir	130.53	130.53	-	-	130.53	130.53	0.00
Jharkhand	4.05	4.05	4.00	16.00	8.05	20.05	149.07
Karnataka	882.45	963.76	9.00	14.00	3267.13	3605.29	10.35
Kerala	149.67	158.42	0.84	0.03	185.61	193.55	4.28
Madhya Pradesh	86.16	86.16	2.10	37.32	477.06	529.38	10.97
Maharashtra	281.33	299.93	20.00	100.00	3644.05	4188.40	14.94
Manipur	5.45	5.45	-	-	5.45	5.45	0.00
Meghalaya	31.03	31.03	-	-	31.03	31.03	0.00
Mizoram	36.47	36.47	-	-	36.47	36.47	0.00
Nagaland	28.67	28.67	-	-	28.67	28.67	0.00
Odisha	64.30	64.30	13.00	13.00	97.30	97.30	0.00
Punjab	154.50	154.50	9.33	9.33	263.58	297.58	12.90
Rajasthan	23.85	23.85	197.65	552.90	2375.45	3352.70	41.14
Sikkim	52.11	52.11	-	-	52.11	52.11	0.00
Tamil Nadu	123.05	123.05	15.05	17.11	7664.03	7849.09	2.41
Tripura	16.01	16.01	-	-	16.01	16.01	0.00
Uttar Pradesh	25.10	25.10	12.38	17.38	686.98	823.98	19.94
Uttaranchal	170.82	174.82	5.05	5.05	185.87	189.87	2.15
West Bengal	98.40	98.40	2.05	2.05	120.75	126.45	4.72
Andaman & Nicobar	5.25	5.25	0.01	5.10	5.26	10.35	96.77
Chandigarh	-	-	-	-	0.00	0.00	-
Dadar & Nagar Haveli	-	-	-	-	0.00	0.00	-
Daman & Diu	-	-	-	-	0.00	0.00	-
Delhi	-	-	2.53	2.56	18.53	18.56	0.14
Lakshadweep	-	-	0.75	0.75	0.75	0.75	0.00
Puducherry	-	-	0.03	0.03	0.03	0.03	-16.67
Others	-	-	-	0.79	-	5.09	-
<b>All India Total</b>	<b>3395.33</b>	<b>3632.25</b>	<b>941.24</b>	<b>1686.44</b>	<b>24914.24</b>	<b>28067.26</b>	<b>12.66</b>
<b>Distribution (%)</b>	<b>13.63</b>	<b>12.94</b>	<b>3.78</b>	<b>6.01</b>	<b>100.00</b>	<b>100.00</b>	

Source: Ministry of New and Renewable Energy



**Table 2.6 : Installation of Off-grid / Decentralised Renewable Energy Systems/ Devices as on 31.03.2013**

Sl. No.	State/UT	Biogas Plants (Nos.)	Water Pumping Wind Mills (Nos.)	SPV Pumps (Nos.)	Solar Photovoltaic			
					SLS	HLS	SL	PP
					(Nos.)	(Nos.)	(Nos.)	(KWP)
1	2	3	4	5	6	7	8	9
1	Andhra Pradesh	505,712	6	613	6,454	14,545	41,360	871.60
2	Arunachal Pradesh	3,472	-	18	1,071	18,945	14,433	17.10
3	Assam	102,302	3	45	98	6,040	1,211	910.00
4	Bihar	129,823	46	139	955	7,119	50,117	775.60
5	Chhattisgarh	44,594	1	240	2,042	7,254	3,311	12186.72
6	Goa	4,039	-	15	707	393	1,093	1.72
7	Gujarat	426,374	945	85	2,004	9,231	31,603	374.60
8	Haryana	58,577	-	469	22,018	56,364	93,853	864.25
9	Himachal Pradesh	46,949	-	6	8,058	22,592	23,909	601.50
10	Jammu & Kashmir	3,033	-	39	5,806	62,133	44,059	308.85
11	Jharkhand	7,237	-	-	620	9,317	23,374	480.90
12	Karnataka	459,071	28	551	2,694	48,399	7,334	294.41
13	Kerala	137,717	79	810	1,735	33,100	54,367	214.39
14	Madhya Pradesh	336,703	-	87	9,198	3,835	9,444	1983.00
15	Maharashtra	843,011	26	239	8,420	3,467	68,683	913.70
16	Manipur	2,128	-	40	928	3,865	4,787	216.00
17	Meghalaya	9,996	-	19	1,273	7,840	24,875	50.50
18	Mizoram	4,520	-	37	431	6,801	9,589	241.00
19	Nagaland	7,399	-	3	271	1,045	6,766	1050.00
20	Odisha	260,056	-	56	5,834	5,177	9,882	84.52
21	Punjab	155,289	-	1,857	5,354	8,620	17,495	281.00
22	Rajasthan	68,647	222	4,501	6,852	124,446	4,716	8366.00
23	Sikkim	8,577	-	-	504	10,059	23,300	150.00
24	Tamil Nadu	220,861	60	829	6,350	7,905	16,818	609.77
25	Tripura	3,218	-	151	1,199	32,723	64,282	365.00
26	Uttar Pradesh	435,554	-	575	124,828	223,083	62,015	3491.46
27	Uttarakhand	16,535	-	26	8,568	91,349	64,023	280.03
28	West Bengal	366,018	-	48	8,726	143,133	17,662	889.00
29	Andaman & Nicobar	137	2	5	390	468	6,296	167.00
30	Chandigarh	97	-	12	898	275	1,675	0.00
31	Dadar & Nagar Haveli	169	-	-	-	-	-	0.00
32	Daman & Diu	-	-	-	-	-	-	0.00
33	Delhi	681	-	90	301	-	4,807	332.00
34	Lakshadweep	-	-	-	1,725	-	5,289	1090.00
35	Puducherry	578	-	21	417	25	1,637	0.00
36	Others*	-	-	-	9,150	24,047	125,797	9707.00
	<b>Total</b>	<b>4,669,074</b>	<b>1,418</b>	<b>11,626</b>	<b>255,879</b>	<b>993,595</b>	<b>939,862</b>	<b>48,168.61</b>

Source : Ministry of New and Renewable Energy

\* Others includes installations through NGOs/IREDA in different states

SLS = Street Lighting System; HLS = Home Lighting System; SL = Solar Lantern; PP = Power Plants; SPV = Solar Photovoltaic; SHP = Small Hydro Power; MW = Mega Watt; KWP = Kilowatt peak; BOV = Battery Operated Vehicles

**Table 2.6(contd.) : Installation of Off-grid / Decentralised Renewable Energy Systems/ Devices as on 31.03.2013**

Sl. No.	State/UT	Aerogen. Hybrid System	Solar Cooker #	Biomass Gasifiers (Rural+ Industrial)	Waste to Energy	Remote Village Electrification Villages	
						Villages	Hamlets
		(KW)	(MW)	(Nos.)	(MW)	(Nos.)	(Nos.)
1	2	3	4	5	6	7	8
1	Andhra Pradesh	16.00	23.15	22914	10.61	-	13
2	Arunachal Pradesh	6.80	0.03	750	-	297	-
3	Assam	6.00	-	2,933	-	1,883	-
4	Bihar	-	-	10224	-	-	-
5	Chhattisgarh	-	4.00	1210	0.33	568	-
6	Goa	163.80	1.69	-	-	-	19
7	Gujarat	20.00	824.09	21530	14.64	38	-
8	Haryana	10.00	7.80	1963	4.00	-	286
9	Himachal Pradesh	-	-	-	-	21	-
10	Jammu & Kashmir	15.80	-	200	-	334	15
11	Jharkhand	-	16.00	500	-	493	-
12	Karnataka	39.20	14.00	7447	6.84	16	14
13	Kerala	8.00	0.03	-	-	-	607
14	Madhya Pradesh	24.00	11.75	9008	0.48	515	-
15	Maharashtra	1382.10	34.50	7,150	16.49	340	-
16	Manipur	110.00	-	-	-	237	3
17	Meghalaya	121.50	-	250	-	149	-
18	Mizoram	-	-	250	-	20	-
19	Nagaland	-	-	2,100	-	11	-
20	Odisha	-	13.00	270	0.02	946	4
21	Punjab	50.00	9.33	-	1.81	-	-
22	Rajasthan	14.00	222.90	2464	3.00	292	90
23	Sikkim	15.50	-	-	-	-	13
24	Tamil Nadu	24.50	17.06	11762	11.42	-	131
25	Tripura	2.00	-	1050	-	60	782
26	Uttar Pradesh	-	12.38	23702	40.76	98	86
27	Uttarakhand	4.00	5.05	1,400	4.02	476	118
28	West Bengal	74.00	2.00	26168	-	1,177	2
29	Andaman & Nicobar	-	-	-	-	-	-
30	Chandigarh	-	-	-	-	-	-
31	Dadar & Nagar Haveli	-	-	-	-	-	-
32	Daman & Diu	-	-	-	-	-	-
33	Delhi	-	2.53	-	-	-	-
34	Lakshadweep	-	-	250	-	-	-
35	Puducherry	5.00	-	-	-	-	-
36	Others*	-	-	-	-	-	-
<b>Total</b>		<b>2112.20</b>	<b>1221.26</b>	<b>155495</b>	<b>114.41</b>	<b>7971</b>	<b>2183</b>

# Data repeated for 2012

\* Others includes installations through NGOs/IREDA in different states

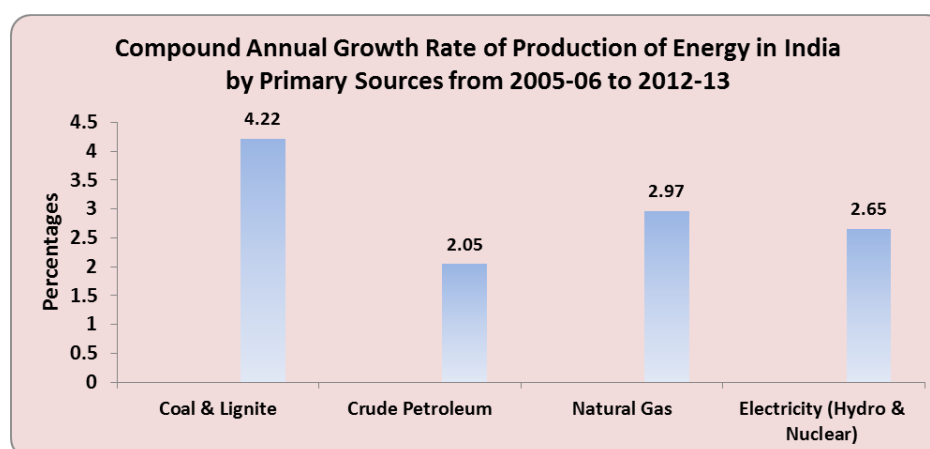
SLS = Street Lighting System; HLS = Home Lighting System; SL = Solar Lantern; PP = Power Plants; SPV = Solar Photovoltaic; MW = Mega Watt; KWP = Kilowatt peak; MWe=Mega Watt electric

Source : Ministry of New and Renewable Energy

## PRODUCTION OF PRIMARY SOURCES OF CONVENTIONAL ENERGY

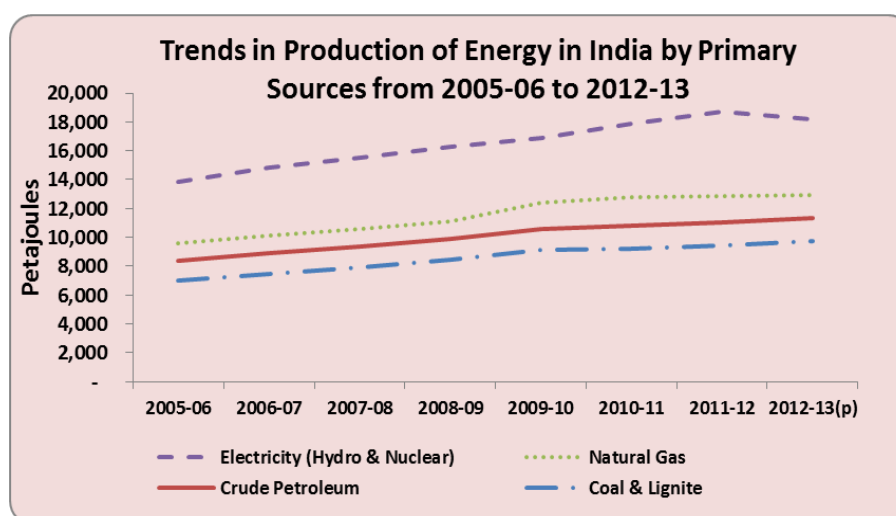
### 3.1 Production of Coal, lignite, crude petroleum, natural gas, & electricity

- ❖ Coal production in the country during the year 2012-13 was 551.71 million tonnes(MTs) as compared to 539.95 MTs during 2011-12, registering a growth of 3.29% (Table 3.1)
- ❖ The Lignite production during the same period increased by 10.08%.
- ❖ Considering the trend of production from 2005-06 to 2012-13, it is observed that coal production in India was about 407.04 MTs during 2005-06, which increased to 557.71 MTs during 2012-13 with a CAGR of 4.02%.
- ❖ During the same period the CAGR of Lignite was about 5.56% with production increasing from 30.23 MTs in 2005-06 to 46.60 MTs in 2012-13.
- ❖ Production of crude petroleum increased from 32.19 MTs during 2005-06 to 37.86 MTs during 2012-13, a CAGR of about 2.05%.
- ❖ The CAGRs for natural gas and electricity were 2.96% and 2.65% respectively. Lignite has experienced the highest CAGR among all the conventional sources of energy since 2005.



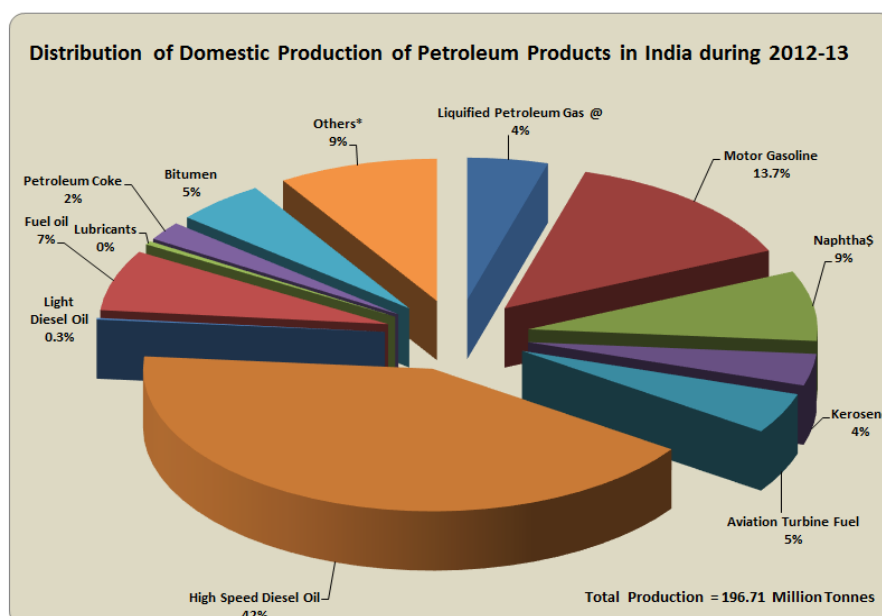
- ❖ For more meaningful comparison in the trends and patterns of growth of different energy resources, it is desirable to convey all the resources to their energy equivalents by applying appropriate conversion factors and express them in energy units(Joules/peta Joules/Terra Joules).
- ❖ The total production of energy from conventional sources increased from 18,722 peta joules during 2011-12 to 18,180 peta joules during 2012-13, showing a decrease of 2.90%.

- ❖ The production of energy in petajoules by primary sources (Table 3.2) shown that Coal and Lignite were the major sources of energy, accounting for about 53.65% of the total production during 2012-13. Electricity was second (29.01%), while Crude Petroleum (8.72%) was third.



### 3.2 Production of petroleum products and Natural Gas

- ❖ In the year 2012-13, the production of Petroleum Products in the country was 217.74 MTs as against 203.20 during 2011-12, an increase of 7.15% (Table 3.4).
- ❖ In the total production of Petroleum products during 2012-13, High speed diesel oil accounted for the maximum share(41.83%), followed by Motor Gasoline(13.83%), Naptha(7.97%), Fuel Oil(6.91%), Bitumen(5.03%) and Aviation Turbine Fuel(4.63%).
- ❖ Production of Natural Gas decreased from 46.33 billion cubic meters (BCM) in 2011-12 to 38.94 CM in 2012-13 registering a negative growth of 15.94% and a CAGR of 2.76% from 2005-06 to 2012-13 (Table 3.5).



### 3.3 Generation of electricity

- ❖ The all India gross electricity generation from utilities, excluding that from the captive generating plants, was 6,23,819 Giga Watt-Hours(GWh) during 2005-06(Table 3.6). It rose to 7,45,626 GWh during 2008-09 and further rose to 9,63,722 GWh during 2012-13
- ❖ The production of electricity from utilities has increased from 9,22,451 GWh during 2011-12 to 9,63,722 GWh during 2012-13, registering an annual growth rate of about 9.19%.
- ❖ Total Electricity generation in the country, from utilities and non-utilities taken together during 2012-13 was 11,11,722 GWh. Out of this 8,17,225 GWh was generated from thermal and 1,13,626 GWh was from hydro and 32,871 GWh was generated from nuclear sources. Total output from non-utilities was 1,48,000 GWh.

**Table 3.1 : Trends in Production of Primary Sources of Conventional Energy in India**

Year	Coal (million tonnes)	Lignite (million tonnes)	Crude Petroleum (million tonnes)	Natural Gas (Billion Cubic Metres)	Electricity* Hydro & Nuclear (GWh)
1	2		3	4	5
2005-06	407.04	30.23	32.19	32.20	118,818
2006-07	430.83	31.29	33.99	31.75	132,304
2007-08	457.08	33.98	34.12	32.42	137,344
2008-09	492.76	32.42	33.51	32.85	142,576
2009-10	532.04	34.07	33.69	47.50	125,316
2010-11	532.69	37.73	37.68	52.22	140,524
2011-12	539.95	42.33	38.09	47.56	163,796
2012-13(p)	557.71	46.60	37.86	40.68	146,497
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>3.29</b>	<b>10.08</b>	<b>-0.60</b>	<b>-14.47</b>	<b>-10.56</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>4.02</b>	<b>5.56</b>	<b>2.05</b>	<b>2.96</b>	<b>2.65</b>

GWh = Giga Watt hour =  $10^6$  x Kilo Watt hour

\* Thermal electricity is not a primary source of energy

- Sources:
1. Ministry of Coal
  2. Ministry of Petroleum & Natural Gas.
  3. Central Electricity Authority.

**Table 3.2 : Trends in Production of Energy in India by Primary Sources**

(in Peta Joules) @

Year	Coal & Lignite	Crude Petroleum	Natural Gas	Electricity (Hydro & Nuclear) *	Total
1	2	3	4	5	6= 2 to 5
2005-06	7,009	1,348	1,240	4,277	13,874
2006-07	7,459	1,423	1,223	4,763	14,868
2007-08	7,926	1,429	1,248	4,944	15,547
2008-09	8,476	1,403	1,265	5,133	16,277
2009-10	9,137	1,411	1,830	4,511	16,889
2010-11	9,207	1,579	2,012	5,059	17,857
2011-12	9,398	1,595	1,832	5,897	18,722
2012-13(p)	9,753	1,585	1,567	5,274	18,180
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>3.78</b>	<b>-0.63</b>	<b>-14.47</b>	<b>-10.56</b>	<b>-2.90</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>4.22</b>	<b>2.05</b>	<b>2.97</b>	<b>2.65</b>	<b>3.44</b>

\* Thermal electricity is not a primary source of energy

@ Conversion factors have been applied to convert production of primary sources of conventional energy into peta joules

- Sources: 1. Office of Coal Controller, Ministry of Coal  
2. Ministry of Petroleum & Natural Gas.  
3. Central Electricity Authority.



**Table 3.3 : Trends in Production of Coal and Lignite in India.**

( million tonnes)

Year	Coal			Lignite	Grand Total
	Coking	Non-coking	Total		
1	2	3	4=(2)+(3)	5	6=(4)+(5)
2005-06	31.51	375.53	407.04	30.23	437.27
2006-07	32.10	398.74	430.83	31.29	462.12
2007-08	34.46	422.63	457.08	33.98	491.06
2008-09	33.81	457.95	491.76	32.42	524.18
2009-10	44.41	487.63	532.04	34.07	566.11
2010-11	49.55	483.15	532.69	37.73	570.43
2011-12	51.65	488.29	539.94	42.33	582.27
2012-13	51.83	505.87	557.71	46.60	604.31
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>0.35</b>	<b>3.60</b>	<b>3.29</b>	<b>10.08</b>	<b>3.78</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>6.42</b>	<b>3.79</b>	<b>4.02</b>	<b>5.56</b>	<b>4.13</b>

Source : Ministry of Coal.Office of Coal Controller

**Table 3.4 : Trends in Domestic Production of Petroleum Products In India**

(million tonnes)

Year	Light distillates			Middle distillates			
	Liquified Petroleum Gas @	Motor Gasoline	Naphtha\$	Kerosene	Aviation Turbine Fuel	High Speed Diesel Oil	Light Diesel Oil
1	2	3	4	5	6	7	8
2005-06	7.71	10.50	16.09	9.24	6.20	47.59	0.92
2006-07	8.41	12.54	18.14	8.63	7.81	53.48	0.80
2007-08	8.79	14.17	17.96	7.97	9.11	58.38	0.67
2008-09	9.16	16.02	16.45	8.39	8.07	62.91	0.61
2009-10	10.33	22.54	18.79	8.70	9.30	73.30	0.47
2010-11	9.71	26.14	19.20	7.81	9.59	78.06	0.59
2011-12	9.55	27.19	18.83	7.86	10.06	82.88	0.50
2012-13(p)	9.82	30.12	17.35	7.87	10.08	91.08	0.40
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>2.91</b>	<b>10.78</b>	<b>-7.82</b>	<b>0.09</b>	<b>0.12</b>	<b>9.90</b>	<b>-20.42</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>3.08</b>	<b>14.08</b>	<b>0.95</b>	<b>-1.99</b>	<b>6.27</b>	<b>8.45</b>	<b>-9.94</b>

(p) : Provisional

\$: includes other Light distillates from 2005-06

@: Excludes LPG production from natural gas.

\*: Estimated from calendar year figures.

Source : Ministry of Petroleum &amp; Natural Gas.

**Table 3.4 (Contd.): Trends in Domestic Production of Petroleum Products in India**

(million tonnes)

Year	Heavy ends				Others*	Total
	Fuel oil	Lubricants	Petroleum Coke	Bitumen		
1	9	10	11	12	13	14= 2 to 13
2005-06	14.31	0.68	3.18	3.58	4.42	124.41
2006-07	15.70	0.83	3.78	3.89	5.75	139.75
2007-08	15.81	0.88	4.13	4.51	7.10	149.47
2008-09	17.68	0.87	4.24	4.71	6.03	155.15
2009-10	18.35	0.95	3.71	4.89	13.28	184.61
2010-11	20.52	0.88	2.71	4.48	15.14	194.82
2011-12	18.43	1.03	7.84	4.61	14.43	203.20
2012-13(p)	15.05	0.90	10.94	4.67	19.45	217.74
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>-18.33</b>	<b>-12.79</b>	<b>39.64</b>	<b>1.30</b>	<b>34.78</b>	<b>7.15</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>0.64</b>	<b>3.57</b>	<b>16.70</b>	<b>3.39</b>	<b>20.35</b>	<b>7.25</b>

\* : Includes those of light &amp; middle distillates and heavy ends.

Source : Ministry of Petroleum &amp; Natural Gas.

**Table 3.5 : Trends in Gross and Net Production of Natural Gas in India**

(Billion Cubic Metres)

<b>Year</b>	<b>Gross Production</b>	<b>Reinjected</b>	<b>Flared</b>	<b>Net Production</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5=2-4</b>
2005-06	32.20	4.47	0.88	31.33
2006-07	31.75	4.37	0.96	30.79
2007-08	32.42	4.50	0.94	31.48
2008-09	32.85	4.68	1.09	31.75
2009-10	47.50	5.66	1.01	46.49
2010-11	52.22	5.21	0.99	51.23
2011-2012	47.56	5.31	1.23	46.33
2012-2013(p)	39.83	5.43	0.89	38.94
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>-16.25</b>	<b>2.18</b>	<b>-27.98</b>	<b>-15.94</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>2.69</b>	<b>2.47</b>	<b>0.16</b>	<b>2.76</b>

(P) : Provisional

Source : Ministry of Petroleum & Natural Gas.

**Table 3.6 : Trends in Gross Generation of Electricity and Non-utilities in India**

(Giga Watt hour) = (10<sup>6</sup> x Kilo Watt hour)

Year	Utilities				Non-Utilities	Grand Total
	Thermal *	Hydro	Nuclear	Total		
1	2	3	4	5 = 2 to 4	7	9=5+8
2005-06	505,001	101,494	17,324	623,819	73,640	697,459
2006-07	538,350	113,502	18,802	670,654	81,800	752,454
2007-08	585,282	120,387	16,957	722,626	90,477	813,102
2008-09	617,832	113,081	14,713	745,626	95,905	842,531
2009-10	670,965	106,680	18,636	796,281	109,693	905,974
2010-11	704,323	114,257	26,266	844,846	114,224	959,070
2011-12	708,427	130,511	32,287	922,451	128,172	1,051,375
2012-13(p)	817,225	113,626	32,871	963,722	148,000	1,111,722
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>0.58</b>	<b>14.23</b>	<b>22.92</b>	<b>9.19</b>	<b>12.21</b>	<b>9.62</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>6.20</b>	<b>1.42</b>	<b>8.34</b>	<b>5.59</b>	<b>9.12</b>	<b>6.00</b>

\* From 1995-96 onwards, Thermal includes Renewable Energy Sources also.

Source : Central Electricity Authority.

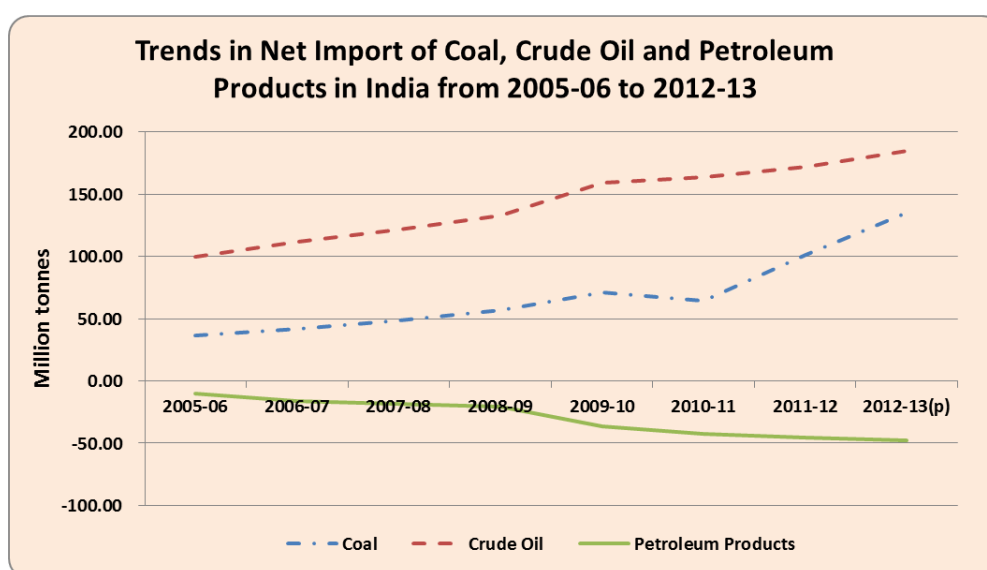
## FOREIGN TRADE IN CONVENTIONAL SOURCES OF ENERGY

### 4.1 Import and export of coal

- ❖ The average quality of the Indian coal is not very high and this necessitates the import of high quality coal to meet the requirements of steel plants. There has been an increasing trend in the import of coal.
- ❖ Import of coal has steadily increased from 36.60 MTs during 2005-06 to 134.73 MTs during 2012-13 (Table 4.1). During the said period, the quantum of coal exported increased from 1.99 MTs during 2005-06 to 2.83 MTs during 2012-13.
- ❖ There was an increase of 33.74% in gross import and 33.63% in net imports of coal in 2012-13 over the previous year. However there was an increase of 40.10% in export of coal during the same period.

### 4.2 Crude oil and petroleum products

- ❖ India is highly dependent on import of crude oil. Net imports of crude oil have increased from 99.41 MTs during 2005-06 to 184.80 MTs during 2012-13.



- ❖ There has been an increase of 7.61% in the net imports of crude oil during 2012-13 over 2011-12, as the net import increased from 171.73 MTs to 184.80 MTs (Table 4.1).
- ❖ Although more than 70% of its crude oil requirements and part of the petroleum products is met from imports, India has developed sufficient processing capacity over the years to produce different petroleum products so as to become a net exporter of petroleum products.

- ❖ The export of petroleum product has increased from a 23.46 MT during 2005-06 to 63.41MTs during 2012-13. During 2012-13 exports recorded an increase of 4.23% from previous year (Table 4.1).
- ❖ The import of petroleum products has increased from 13.44 MT in 2005-06 to 15.77 MT during 2012-13, although there are some fluctuations in the trend (Table 4.1). However, there was a decline of 0.47% in import of petroleum products over the previous year.

**Table 4.1: Trends of Foreign Trade in Coal, Crude Oil and Petroleum Products in India**

(in Million Tonnes)

Year	Coal			Crude Oil			Petroleum Products		
	Gross Imports	Exports	Net Imports	Gross Imports	Exports	Net Imports	Gross Imports	Exports	Net Imports
1	2	3	4=(2)-(3)	5	6	7=(5)-(6)	8	9	10=(8)-(9)
2005-06	38.59	1.99	36.60	99.41	0.00	99.41	13.44	23.46	-10.02
2006-07	43.08	1.55	41.53	111.50	0.00	111.50	17.76	33.62	-15.86
2007-08	49.79	1.63	48.17	121.67	0.00	121.67	22.46	40.78	-18.32
2008-09	59.00	1.66	56.83	132.78	0.00	132.78	18.52	38.90	-20.38
2009-10	73.26	2.45	70.80	159.26	0.00	159.26	14.66	50.97	-36.31
2010-11	68.92	1.88	64.51	163.60	0.00	163.60	16.82	59.08	-42.26
2011-12	102.85	2.02	100.82	171.73	0.00	171.73	15.85	60.84	-45.84
2012-13(p)	137.56	2.83	134.73	184.80	0.00	184.80	15.77	63.41	-47.63
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>33.74</b>	<b>40.10</b>	<b>33.63</b>	<b>7.61</b>	<b>0.00</b>	<b>7.61</b>	<b>-0.47</b>	<b>4.23</b>	<b>3.91</b>

(p): Provisional.

Note: Figures in brackets are in negative.

Sources: 1. Office of Coal Controller, Ministry of Coal  
2. Ministry of Petroleum & Natural Gas.



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## AVAILABILITY

### *5.1 Availability of Coal and Lignite*

- ❖ The total availability of raw coal in India in 2012-13 stood at 704.34 MTs and that of lignite at 46.05 (Table 5.1).
- ❖ The availability of coal in the year 2012-13 increased by 10.25% compared to 2011-12. The availability of lignite decreased by 66.97% during the same period.
- ❖ The availability of coal has increased at a CAGR of about 6.26% during the period from 2005-06 to 2012-13. This increased availability might be attributed to the secular increase in the coal production (407.04 MTs during 2005-06 to 557.71 MTs during 2012-13) supplemented by imports (Table 5.2).
- ❖ The availability of lignite has decreased at a CAGR of about 4.55% during the period from 2005-06 to 2012-13.

### *5.2 Availability of Natural Gas*

- ❖ The production of natural gas has steadily increased from a mere 31.33 BCMs during 2005-06 to 39.78 BCMs during 2012-13, registering a CAGR of 3.03%. Most of this increase in the indigenous production is due to discovery of new reserves.(Table 5.1)

### *5.3 Availability of Electricity*

- ❖ Since thermal electricity is not a primary source of energy, being produced either from coal or natural gas in India, electricity availability is considered only for that electricity which is generated from Hydro and Nuclear sources.
- ❖ Without taking into account the transmission and distribution losses, the total availability is equal to the total generation, and this figure increased from 592194 GWh during 2005-06 to 908574 GWh during 2012-13, registering a CAGR of 5.5% over the period(Table 5.1).

### *5.4 Availability of Crude Oil and Petroleum Products*

- ❖ The availability of crude oil in the country increased from 131.60 MTs during 2005-06 to 222.66 MTs during 2012-13 (Table 5.3).
- ❖ During this period crude oil production increased from 32.19 MTs to 37.86 MTs and the net import increased from 99.41 MTs to 184.80 MTs during period from 2005-06 to 2012-13. There was 6.12% increase in availability of crude oil during 2012-13 over 2011-12.

**Table 5.1 : Trends in Availability of Primary Sources of Conventional Energy in India**

Year	Coal	Lignite	Crude Petroleum	Natural Gas	Electricity
	(Million Tonnes)	(Million Tonnes)	(Million Tonnes)	(Billion Cubic Metres)	(GWh)
1	2		3	4	5
2005-06	433.27	66.84	130.11	31.33	592,194
2006-07	462.35	72.34	146.55	30.79	639,008
2007-08	502.82	82.82	156.10	31.48	689,780
2008-09	549.57	89.19	160.77	31.75	712,540
2009-10	585.30	105.21	192.77	46.52	761,934
2010-11	589.87	102.20	196.99	51.25	809,455
2011-12	638.84	139.44	204.12	46.48	811,506
2012-13(p)	704.34	46.05	219.21	39.78	908,574
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>10.25</b>	<b>-66.97</b>	<b>7.39</b>	<b>-14.43</b>	<b>11.96</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>6.26</b>	<b>-4.55</b>	<b>6.74</b>	<b>3.03</b>	<b>5.50</b>

(p) - Provisional

GWh = Giga Watt hour =  $10^6$  x Kilo Watt hour

- Sources:
1. Office of Coal Controller, Ministry of Coal
  2. Ministry of Petroleum & Natural Gas.
  3. Central Electricity Authority.

**Table 5.2 : Trends in Availability of Raw Coal and Lignite for Consumption in India**

( Million tonnes)

Year	COAL					LIGNITE		
	Production (Coking + Non-coking)	Changes Vendible Stock (Closing - Opening)	Imports	Exports	Availability for Consumption	Production	Changes Vendible Stock (Closing - Opening)	Availability for Consumption
1	2	3	5	6	7=2-3+4+5-6	8	9	10=8-9
2005-06	407.04	10.365	38.59	1.99	433.27	30.23	-0.01	30.24
2006-07	430.83	10.014	43.08	1.55	462.35	31.29	0.48	30.81
2007-08	457.08	2.431	49.79	1.63	502.82	33.98	-0.67	34.65
2008-09	492.76	0.538	59.00	1.66	549.57	32.42	0.58	31.85
2009-10	532.04	17.546	73.26	2.45	585.30	34.07	-0.34	34.41
2010-11	532.69	7.329	68.92	4.41	589.87	37.73	0.05	37.69
2011-12	539.95	1.848	102.85	2.02	638.94	42.33	0.44	41.89
2012-13(p)	557.71	-11.898	137.56	2.83	704.34	46.60	0.44	46.16
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>3.29</b>	<b>-743.83</b>	<b>33.74</b>	<b>40.20</b>	<b>10.24</b>	<b>10.08</b>	<b>0.23</b>	<b>10.18</b>

Note: Figures in brackets are in negative.

Source : Office of the Coal Controller, Ministry of Coal

**Table 5.3 : Trends in Availability of Crude Oil, Petroleum Products and Natural Gas in India**

Year	Crude Oil*			Petroleum Products*			Natural Gas**		
	Production	Net Imports	Gross Availability	Production @	Net Imports	Gross Availability	Production	Net Imports	Gross Availability
1	2	3	4=2+3	5	6	7=5+6	8	9	10=8+9
2005-06	32.19	99.41	131.60	124.41	-10.02	114.39	31.33	3.69	35.02
2006-07	33.99	111.50	145.49	139.75	-15.96	123.78	30.79	4.97	35.76
2007-08	34.12	121.67	155.79	149.47	-18.38	131.10	31.48	6.02	37.50
2008-09	33.51	132.78	166.28	155.15	-20.38	134.77	31.75	5.81	37.56
2009-10	33.69	159.26	192.95	184.61	-36.31	148.30	46.49	6.51	53.00
2010-11	37.68	163.60	201.28	194.82	-42.26	152.56	51.23	7.10	58.33
2011-12	38.09	171.73	209.82	203.20	-44.99	158.21	46.33	8.49	54.82
2012-13(p)	37.86	184.80	222.66	217.74	-47.63	170.10	39.83	7.96	47.79
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>-0.60</b>	<b>7.61</b>	<b>6.12</b>	<b>7.15</b>	<b>5.88</b>	<b>7.51</b>	<b>-14.02</b>	<b>-6.28</b>	<b>-12.82</b>

MMT: Million Metric Tons

\*: Million Tonne

\*\* : Billion Cubic Meter

.@ Excludes LPG Production from Natural Gas

Source : Ministry of Petroleum & Natural Gas.

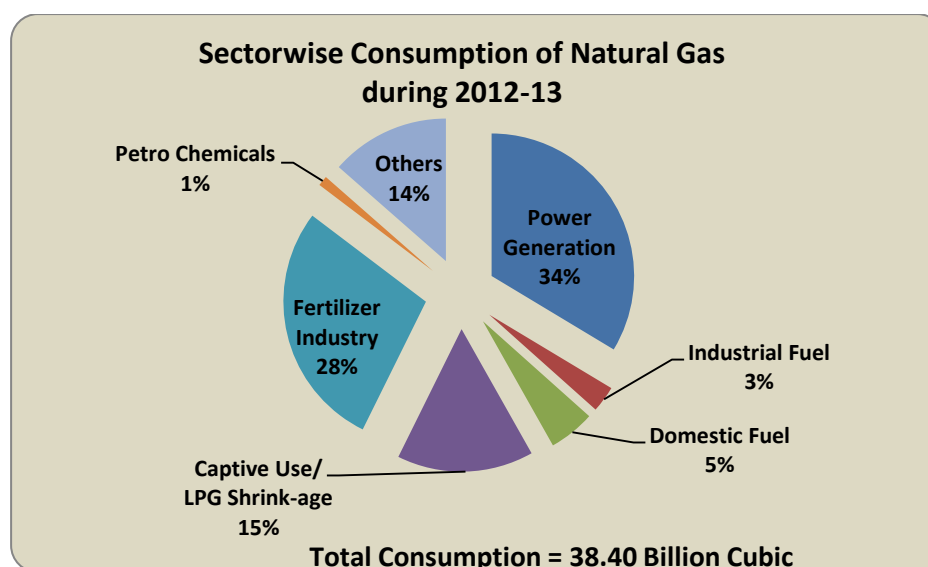
## CONSUMPTION OF ENERGY RESOURCES

### 6.1 Consumption of coal and lignite

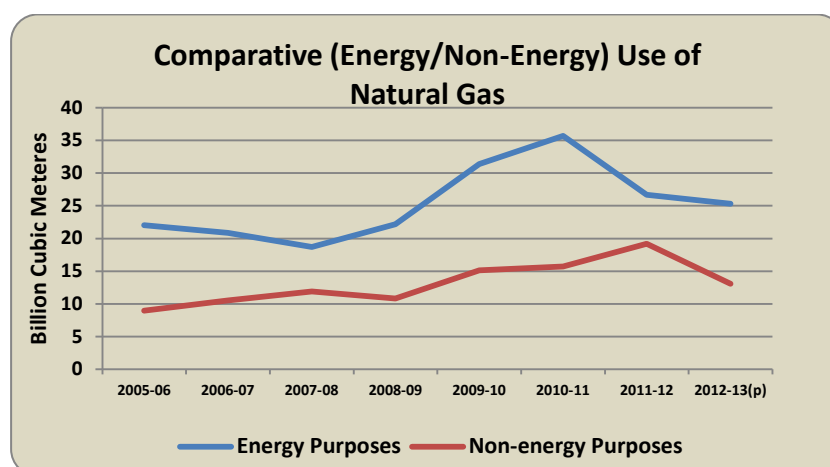
- ❖ The estimated total consumption of raw coal by industry has increased from 407.04 MTs during 2005-06 to 570.23 MTs during 2012-13 with a CAGR of 4.30% (Table 6.1). The annual growth rate from 2011-12 to 2012-13 was 6.41%.
- ❖ Consumption of Lignite increased from 30.23MTs in 2005-06 to 46.41 MTs in 2012-13 registering a compound growth of 5.51%. Consumption of Lignite is highest in Electricity Generation sector, accounting for about 80.38%(Table 6.5) of the total lignite consumption.
- ❖ Electricity generation is the biggest consumer of coal, followed by steel industries. Industry-wise estimates of consumption of coal(Table 6.4) shows that during 2012-13 electricity generating units consumed 444.29 MTs of coal, followed by steel & washery industries (15.88 MTs), cement industries(13.55 MTs) and paper industries (2.13 MTs).

### 6.2 Consumption of Crude Oil and Natural Gas

- ❖ The estimated consumption of crude oil has a steady increase, from 130.11 MMTs during 2005-06 to 219.21 MMTs during 2012-13 with CAGR of 6.74%. It increased from 204.12 MMTs in 2011-12 to 219.21 MMTs in 2012-13 (Table 6.1).
- ❖ The maximum use of Natural Gas is in power generation (33.46%) followed by fertilizers industry (27.87%) and 5.20% natural gas was used for domestic fuel (Table 6.8).

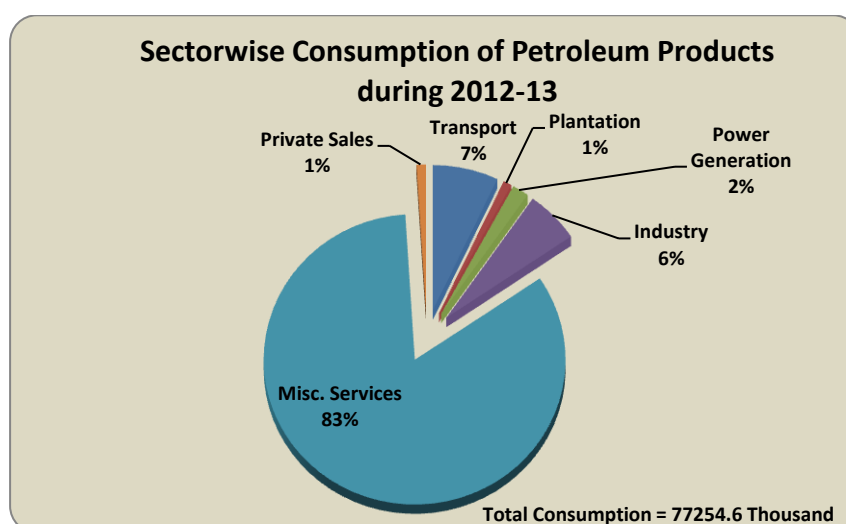


- ❖ Industry wise off-take of natural gas shows that natural gas has been used both for Energy(65.91%) and Non-energy(34.09%) purposes (Table 6.8).



### 6.3 Consumption of Petroleum Products

- ❖ High speed diesel oil accounted for 39.55% of total consumption of all types of petroleum products in 2012-13. This was followed by Refinery(10.49%), Petrol(9.0%), LPG(8.92%) and Naptha(7.05%). Consumption of Light Diesel oil continuously decreased from 2005-06(0.88 MTs) to 2012-13(0.40 MTs)(Tables 6.6 & 6.7).
- ❖ Sector-wise consumption of different petroleum products reveals that miscellaneous service sector accounts for the lion’s share (83.44%) of the total consumption of petroleum products (Tables 6.6 & 6.7).

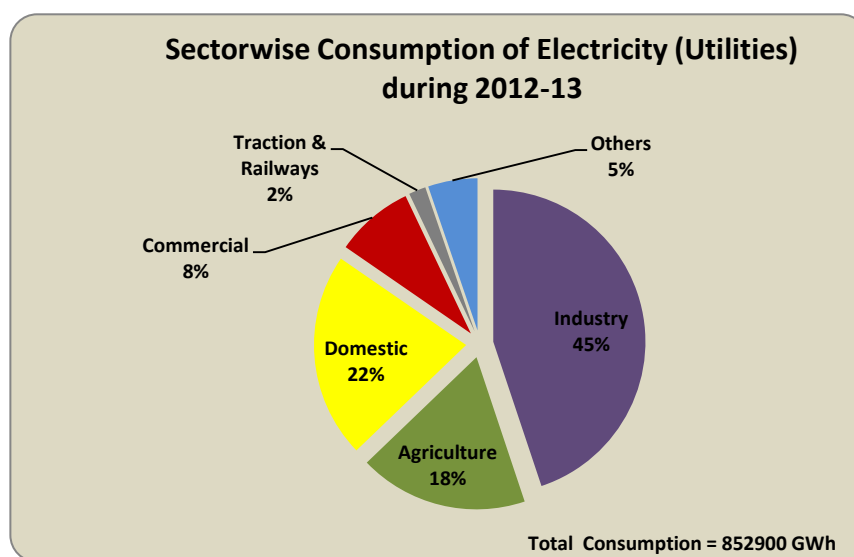


### 6.4 Consumption of Electricity

- ❖ The estimated electricity consumption increased from 4,11,887 GWh during 2005-06 to 8,52,900 GWh during 2012-13, showing a CAGR of 9.53%(Table 6.9). The increase

in electricity consumption is 8.62% from 2011-12 (7,85,193 GWh) to 2012-13 (8,52,900 GWh).

- ❖ Of the total consumption of electricity in 2012-13, industry sector accounted for the largest share (44.87%), followed by domestic (21.79%), agriculture (17.95%) and commercial sectors (8.33%).

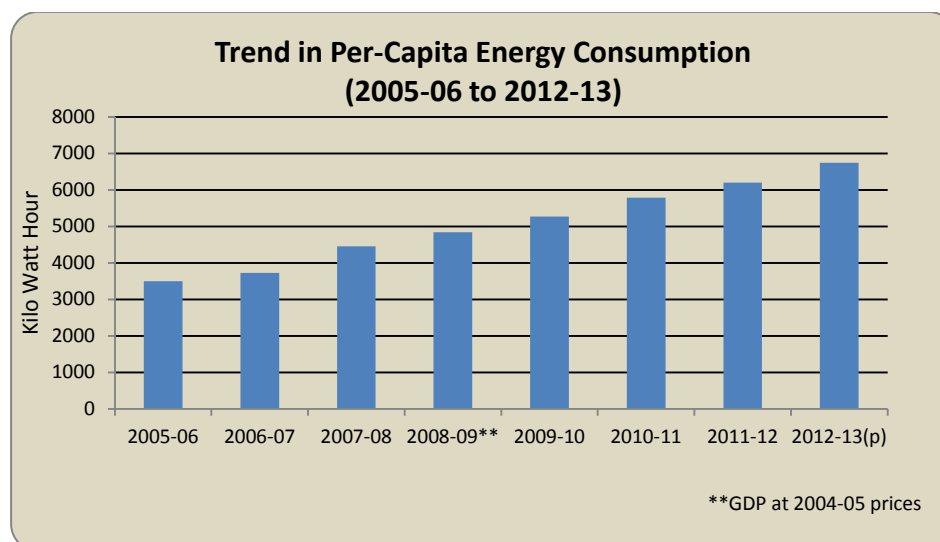


- ❖ The electricity consumption in Industry sector and commercial sector has increased at a much faster pace compared to other sectors during 2005-06 to 2012-13 with CAGRs of 12.27% and 8.88% respectively.
- ❖ Loss of electricity due to transmission has decreased from 30.42% during 2005-06 to 23.65% during 2012-13 (Table 6.10).

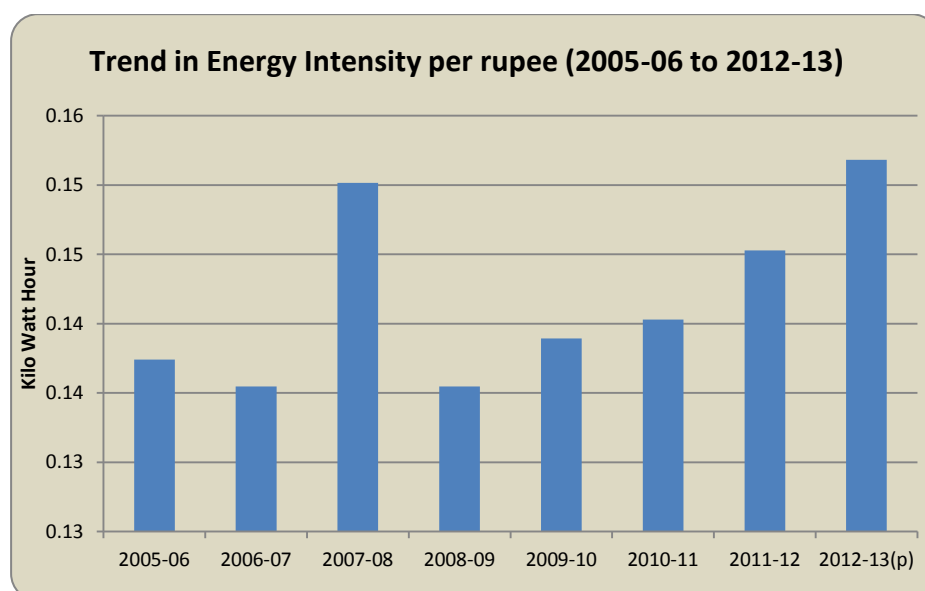
### 6.5 Per-Capita Energy Consumption & Energy Intensity

- ❖ Per-capita Energy Consumption (PEC) during a year is computed as the ratio of the estimate of total energy consumption during the year to the estimated mid-year population of that year. Energy Intensity is defined as the amount of energy consumed for generating one unit of Gross Domestic Product (at constant prices). PEC and Energy intensity are the most used policy indicators, both at national and international levels. In the absence of data on consumption of non-conventional energy from various sources, particularly in rural areas in the developing countries, including India, these two indicators are generally computed on the basis of consumption of conventional energy. The consumption of energy in petajoules was in the form of Electricity which accounted for about 59.28% of the total consumption during 2012-13. Coal and Lignite were second (19.61%), while Crude Petroleum (18.09%) was third.
- ❖ The total consumption of energy from conventional sources increased from 46,958 petajoules during 2011-12 to 50,741 petajoules during 2012-13, showing an increase of 8.06%.

- ❖ Per-capita Energy Consumption (PEC) (the ratio of the estimate of total energy consumption during the year to the estimated mid-year population of that year) increased from 3,497.59 KWh in 2005-06 to 6748.61 KWh in 2012-13, a CAGR of 8.56% (Table 6.2). The annual increase in PEC for 2012-13 over 2011-12 was 8.76%.



- ❖ The Energy Intensity (amount of energy consumed for generating one unit of Gross Domestic Product) (at 1999-2000 prices) increased from 0.1374 KWh in 2005-06 to 0.1518 KWh in 2012-13 (Table 6.2).





**Table 6.1: Trends in Consumption of Conventional Sources of Energy in India**

Year	Coal #	Lignite	Crude Oil**	Natural Gas ***	Electricity*
	(Million Tonnes)		(MMT)	(Billion Cubic Metres)	(GWh)
1	2	3	4	5	6
2005-06	407.04	30.23	130.11	26.86	411,887
2006-07	430.83	31.29	146.55	26.77	455,748
2007-08	457.08	33.98	156.10	26.97	510,899
2008-09	492.76	32.42	160.77	27.06	562,888
2009-10	532.04	34.07	192.77	40.83	620,251
2010-11	532.69	37.73	196.99	46.04	684,324
2011-12	535.88	41.88	204.12	41.03	755,847
2012-13(p)	570.23	46.41	219.21	34.30	835,513
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>6.41</b>	<b>10.81</b>	<b>7.39</b>	<b>-16.39</b>	<b>10.54</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>4.30</b>	<b>5.51</b>	<b>6.74</b>	<b>3.11</b>	<b>9.24</b>

(p): Provisional

GWh = Giga Watt hour =  $10^6$  x Kilo Watt hour

\* Includes thermal, hydro & nuclear electricity from utilities.

\*\* Crude oil in terms of refinery crude throughput.

\*\*\* Gas available for sale, which is derived by deducting internal use of gas by producing companies from Net Availability.

# Does not include Lignite and imports.

Sources: 1. Office of Coal Controller, Ministry of Coal  
2. Ministry of Petroleum & Natural Gas.  
3. Central Electricity Authority.

**Table 6.2 : Trends in Per-Capita Energy Consumption (PEC) and Energy intensity in India**

Year	Energy Consumption in billion KWH	Mid year population in '000 numbers	GDP ( Rs. crore)	Per Capita Energy Consumption (KWH)	Energy Intensity (KWH)* per rupee
2005-06	3909.37	1117734	2844942	3497.59	0.1374
2006-07	4226.78	1134023	3120029	3727.24	0.1355
2007-08	5108.99	1147677	3402716	4451.59	0.1501
2008-09**	5628.88	1161495	4154973	4846.24	0.1355
2009-10	6202.51	1175480	4464081	5276.58	0.1389
2010-11	6843.24	1182105	4877842	5789.03	0.1403
2011-12	7558.47	1218076	5202514	6205.25	0.1453
2012-13(p)	8355.13	1238052	5503476	6748.61	0.1518
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>10.54</b>	<b>1.64</b>	<b>5.78</b>	<b>8.76</b>	<b>4.49</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>9.96</b>	<b>1.29</b>	<b>8.60</b>	<b>8.56</b>	<b>1.25</b>

\* Estimated value based on sourcewise availability of Coal, Crude Petroleum, Natural Gas and Electricity (Hydro & Nuclear) as given in table 5.1 and by applying fuel specific conversion factors as given in annex II

Energy Intensity=Amount of energy consumed for producing one unit of Gross Domestic Product.

\*\* from 2008-09 GDP estimates are with 2004-05 base year

**Table 6.3 : Trends in Consumption of Conventional Energy in India ( Peta Joules)**

(in Peta Joules) @

Year	Coal & Lignite	Crude Petroleum **	Natural Gas	Electricity *	Total
1	2	3	4	5	6= 2 to 5
2005-06	7,009	5,448	1,207	14,828	28,492
2006-07	7,459	6,136	1,186	16,407	31,188
2007-08	7,926	6,536	1,213	18,392	34,067
2008-09	8,476	6,732	1,223	20,264	36,695
2009-10	9,137	8,071	1,792	22,329	41,329
2010-11	9,207	8,248	1,974	24,636	44,064
2011-12	9,410	8,547	1,790	27,210	46,958
2012-13(p)	9,953	9,178	1,532	30,078	50,741
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>5.76</b>	<b>7.39</b>	<b>-14.43</b>	<b>10.54</b>	<b>8.06</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>4.48</b>	<b>6.74</b>	<b>3.03</b>	<b>9.24</b>	<b>7.48</b>

\* Includes thermal, hydro & nuclear electricity from utilities.

\*\* Crude oil in terms of refinery crude throughput.

Sources:

1. Office of Coal Controller, Ministry of Coal
2. Ministry of Petroleum & Natural Gas.
3. Central Electricity Authority.

**Table 6.4 : Trends in Industrywise Consumption of Raw Coal in India**

( Million tonnes)

Year	Electricity	Steel & Washery	Cement	Paper	Textile	Others *	Total
1	2	3	4	5	6	7	8=2 to 7
2005-06	306.04	19.66	14.97	2.77	0.29	51.85	395.59
2006-07	321.91	17.30	14.71	2.50	0.30	63.08	419.80
2007-08	350.58	16.99	15.27	2.64	0.37	67.72	453.57
2008-09	377.27	16.58	13.12	2.16	2.53	77.52	489.17
2009-10	390.58	16.45	14.66	2.34	0.27	89.50	513.79
2010-11	395.84	17.26	15.08	2.43	0.28	92.58	523.47
2011-12	410.37	16.05	13.18	2.03	0.26	94.00	535.88
2012-13(p)	444.29	15.88	13.55	2.13	0.30	94.08	570.23
<b>Distribution (%)</b>	<b>77.91</b>	<b>2.78</b>	<b>2.38</b>	<b>0.37</b>	<b>0.05</b>	<b>16.50</b>	<b>100.00</b>
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>8.27</b>	<b>-1.03</b>	<b>2.82</b>	<b>5.13</b>	<b>15.50</b>	<b>0.08</b>	<b>6.41</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>4.77</b>	<b>-2.63</b>	<b>-1.24</b>	<b>-3.24</b>	<b>0.43</b>	<b>7.73</b>	<b>4.68</b>

\* Includes Sponge Iron, colliery consumn.,jute, bricks, coal for soft coke, colliery, fertilisers & other industries consumption.

@ From 1996-97 and onwards Cotton includes 'Rayon' also.

Source : Office of the Coal Controller, Ministry of Coal

**Table 6.5 : Trends in Industrywise Consumption of Lignite in India**

( Million tonnes)

Year	Electricity	Steel & Washery	Cement	Paper	Textile	Others *	Total
1	2	3	4	5	6	7	8=2 to 7
2005-06	23.36	-	0.79	0.23	1.11	4.86	30.34
2006-07	23.92	-	0.77	0.22	0.84	5.06	30.80
2007-08	26.76	-	0.96	0.35	0.77	5.83	34.66
2008-09	25.71	-	0.34	0.36	-	6.01	32.42
2009-10	28.14	-	0.38	0.82	-	4.09	33.43
2010-11	29.90	-	0.36	0.84	1.18	6.25	38.53
2011-12	32.06	0.03	1.01	0.63	3.67	4.47	41.88
2012-13(p)	37.31	0.05	1.10	0.70	3.47	3.79	46.41
<b>Distribution (%)</b>	<b>80.38</b>	<b>0.11</b>	<b>2.36</b>	<b>1.50</b>	<b>7.47</b>	<b>8.18</b>	<b>100.00</b>
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>16.36</b>	<b>53.13</b>	<b>8.22</b>	<b>10.14</b>	<b>-5.47</b>	<b>-15.19</b>	<b>10.81</b>

\* Includes Sponge Iron, colliery consmn., jute, bricks, coal for soft coke, colliery, chemicals, fertilisers & other industries consumption. And from 2008-09 onwards cotton is included in others.

**Note:** Industrywise breakup of consumption for the period 1970-71 to 1999-2000 are not readily available, hence estimated by production data as it is observed, approximately for lignite, production= despatch= consumption.

Source : Office of the Coal Controller, Ministry of Coal

**Table 6.6 : Trends in Consumption of Petroleum Products in**

(Million Tonnes)

Year	Light Distillates			Middle Distillates			
	LPG	Petrol	Naphtha	Kerosene	ATF	HSDO	LDO
1	2	3	4	5	6	7	8
2005-06	10.46	8.65	12.19	9.54	3.30	40.19	0.88
2006-07	10.85	9.29	13.89	9.51	3.98	42.90	0.72
2007-08	12.17	10.33	13.29	9.37	4.54	47.67	0.67
2008-09	12.34	11.26	13.91	9.30	4.42	51.71	0.55
2009-10	13.14	12.82	10.13	9.30	4.63	56.24	0.46
2010-11	14.33	14.19	10.68	8.93	5.08	60.07	0.46
2011-12	15.35	14.99	11.22	8.23	5.54	64.75	0.42
2012-13(p)	15.61	15.74	12.34	7.50	5.27	69.17	0.40
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>1.66</b>	<b>5.02</b>	<b>9.98</b>	<b>-8.83</b>	<b>-4.80</b>	<b>6.83</b>	<b>-3.86</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>5.13</b>	<b>7.78</b>	<b>0.15</b>	<b>-2.96</b>	<b>6.04</b>	<b>7.02</b>	<b>-9.45</b>

(p) : Provisional

Contd...

**Table 6.6 (Contd.) : Trends in Consumption of Petroleum Products in India**

(Million' Tonnes)

Year	Heavy Ends				Refinery Fuel	Others*	Total
	Fuel Oils	Lubricants	Bitumen	Petroleum Coke			
	9	10	11	12	13	14	15=2 to 14
2005-06	12.83	2.08	3.51	4.93	9.14	4.66	122.36
2006-07	12.62	1.90	3.83	5.44	10.92	5.83	131.67
2007-08	12.72	2.29	4.51	5.95	11.75	5.45	140.70
2008-09	12.59	2.00	4.75	6.17	11.91	4.60	145.51
2009-10	11.63	2.54	4.93	6.59	14.58	5.40	152.39
2010-11	10.79	2.43	4.54	4.98	16.38	4.57	157.42
2011-12	9.31	2.63	4.64	6.14	17.29	4.92	165.43
2012-13(p)	7.68	2.69	4.66	9.95	18.35	5.52	174.88
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>-17.45</b>	<b>1.97</b>	<b>0.43</b>	<b>62.06</b>	<b>6.09</b>	<b>12.13</b>	<b>5.71</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>-6.21</b>	<b>3.24</b>	<b>3.61</b>	<b>9.18</b>	<b>9.10</b>	<b>2.13</b>	<b>4.57</b>

(p) : Provisional

\* : Includes those of light & middle distillates and heavy ends and sales through private parties.

Source: Ministry of Petroleum & Natural Gas.

**Table 6.7 : Sector-wise (end use) Consumption of Selected Petroleum Products in India**

('000 tonnes)

Petroleum Product	Year	Transport	Plantation	Power Generation	Industry	Misc. Services	Private Sales	Total
1	2	3	4	5	6	7	8	9=3 to 8
<b>High Speed Diesel Oil</b>	2005-06	4,264	431	498	964	30,151	3,884	40,192
	2006-07	4,316	499	433	1,234	34,133	2,279	42,894
	2007-08	5,003	504	313	1,241	40,577	31	47,669
	2008-09	5,292	490	336	1,309	44,221	62	51,710
	2009-10	5,365	594	303	1,503	48,385	94	56,244
	2010-11	5,416	616	166	1,440	52,240	193	60,071
	2011-12	5,528	684	168	1,649	56,659	62	64,750
	2012-13(p)	5,159	617	214	1,628	61,414	141	69,173
<b>Growth rate of 2012-13 over 2011-12(%)</b>		<b>-6.68</b>	<b>-9.80</b>	<b>27.38</b>	<b>-1.27</b>	<b>8.39</b>	<b>127.42</b>	<b>6.83</b>
<b>CAGR 2005-06 to 2012-13(%)</b>		<b>2.41</b>	<b>4.59</b>	<b>-10.02</b>	<b>6.77</b>	<b>9.30</b>	<b>-33.93</b>	<b>7.02</b>

('000 tonnes)

Petroleum Product	Year	Transport	Plantation	Power Generation	Industry	Misc. Services	Private Sales	Total
1	2	3	4	5	6	7	8	9=3 to 8
<b>Light Diesel Oil</b>	2005-06	52.00	28.00	65.00	325.00	362.00	49.00	881.00
	2006-07	53.00	13.00	67.00	244.00	343.00	0.00	720.00
	2007-08	35.00	3.00	77.00	200.00	351.00	0.00	666.00
	2008-09	15.00	4.00	175.00	155.00	203.00	0.00	552.00
	2009-10	6.00	3.00	152.00	143.10	154.00	0.00	458.10
	2010-11	4.90	1.80	136.90	127.30	184.40	0.00	455.30
	2011-12	3.01	1.00	127.00	102.10	182.00	0.00	415.11
	2012-13(p)	3.10	1.30	142.40	74.00	177.80	0.00	398.60
<b>Growth rate of 2012-13 over 2011-12(%)</b>		<b>2.99</b>	<b>30.00</b>	<b>12.13</b>	<b>-27.52</b>	<b>-2.31</b>	<b>-</b>	<b>-3.98</b>
<b>CAGR 2005-06 to 2012-13(%)</b>		<b>-29.71</b>	<b>-31.87</b>	<b>10.30</b>	<b>-16.89</b>	<b>-8.50</b>	<b>-</b>	<b>-9.44</b>

Contd...



**Table 6.7 (Contd.) : Sector-wise (End Use) Consumption of Selected Petroleum Products in India**

('000 tonnes)

Petroleum Product	Year	Transport	Plantation	Power Generation	Industry	Misce. Services	Private Sales	Total
1	2	3	4	5	6	7	8	9=3 to 8
<b>Furnace Oil</b>	2005-06	478	0	302	1,828	5,613	700	8,921
	2006-07	502	0	254	1,830	5,600	1,071	9,257
	2007-08	315	0	281	1,634	6,401	839	9,470
	2008-09	469	55	749	2,843	4,391	913	9,420
	2009-10	560	68	688	3,134	4,196	499	9,145
	2010-11	780	70	823	2,774	3,986	374	8,807
	2011-12	371	70	647	2,409	3,420	631	7,548
	2012-13(p)	277	79	587	2,019	2,720	635	6,317
<b>Growth rate of 2012-13 over 2011-12(%)</b>		<b>-25.34</b>	<b>12.86</b>	<b>-9.27</b>	<b>-16.19</b>	<b>-20.47</b>	<b>0.63</b>	<b>-16.31</b>
<b>CAGR 2005-06 to 2012-13(%)</b>		<b>-6.59</b>	<b>-</b>	<b>8.66</b>	<b>1.25</b>	<b>-8.66</b>	<b>-1.21</b>	<b>-4.22</b>

('000 tonnes)

Petroleum Product	Year	Transport	Plantation	Power Generation	Industry	Misce. Services	Private Sales	Total
1	2	3	4	5	6	7	8	9=3 to 8
<b>Low Sulphur Heavy Stock</b>	2005-06	0	0	560	1,390	1,957	0	3,907
	2006-07	0	0	298	1,358	1,705	0	3,361
	2007-08	0	0	344	1,304	1,600	0	3,248
	2008-09	0	1	1,347	1,293	526	0	3,167
	2009-10	2	936	0	1,225	321	0	2,484
	2010-11	0	0	469	1,030	483	0	1,982
	2011-12	0	0	399	1,067	293	0	1,759
	2012-13(p)	0	0	439	778	149	0	1,366
<b>Growth rate of 2012-13 over 2011-12(%)</b>		<b>-</b>	<b>-</b>	<b>10.03</b>	<b>-27.09</b>	<b>-49.15</b>	<b>-</b>	<b>-22.34</b>
<b>CAGR 2005-06 to 2012-13(%)</b>		<b>-</b>	<b>-</b>	<b>-3.00</b>	<b>-7.00</b>	<b>-27.52</b>	<b>-</b>	<b>-12.31</b>

(p) : Provisional, @ : LSHS sales through pvt. parties included in FO sales. Break-up not available.

\*\* : Included in Miscellaneous services. Break-up is not available.

Source: Ministry of Petroleum & Natural Gas.

**Table 6.8 : Industry-wise Off-take of Natural Gas in India**

(in Billion Cubic Metres)

Year	Energy Purposes							Non-energy Purposes				Grand Total
	Power Generation	Industrial Fuel	Tea Plantation	Domestic Fuel	Captive Use/ LPG Shrinkage	Others	Total	Fertilizer Industry	Petrochemicals	Others @	Total	
1	2	3	4	5	6	7	8=2 to 7	9	10	11	12=9 to 11	13=8+12
2005-06	11.88	3.78	0.15	0.08	5.05	1.12	22.052	7.76	1.18	0.04	8.97	31.03
2006-07	11.96	3.21	0.17	0.44	5.03	0.04	20.86	8.50	1.38	0.64	10.51	31.37
2007-08	12.04	3.32	0.16	0.04	1.80	1.32	18.69	9.82	1.43	0.64	11.89	30.58
2008-09	12.60	5.91	0.15	0.10	1.89	1.54	22.19	9.08	1.11	0.61	10.80	32.99
2009-10	21.37	2.32	0.17	0.25	5.43	1.84	31.37	13.17	1.26	0.70	15.14	46.51
2010-11	23.58	1.00	0.19	1.58	5.77	6.55	38.68	10.44	0.47	1.42	12.34	51.02
2011-12	18.91	1.13	0.18	1.91	6.34	5.76	34.23	10.41	0.58	1.51	12.49	46.72
2012-13(p)	12.85	1.14	0.18	2.00	5.92	3.22	25.31	10.70	0.44	1.95	13.09	38.40
<b>Distribution (%)</b>	<b>33.46</b>	<b>2.97</b>	<b>0.47</b>	<b>5.20</b>	<b>15.42</b>	<b>8.40</b>	<b>65.91</b>	<b>27.87</b>	<b>1.14</b>	<b>5.08</b>	<b>34.09</b>	<b>100.00</b>
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>-32.06</b>	<b>1.06</b>	<b>4.00</b>	<b>4.34</b>	<b>-6.65</b>	<b>-44.02</b>	<b>-26.05</b>	<b>2.84</b>	<b>-24.13</b>	<b>29.31</b>	<b>4.80</b>	<b>-17.81</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>0.99</b>	<b>-13.92</b>	<b>2.36</b>	<b>50.71</b>	<b>2.01</b>	<b>14.13</b>	<b>1.74</b>	<b>4.10</b>	<b>-11.63</b>	<b>64.71</b>	<b>4.83</b>	<b>2.70</b>

@ : Excludes offtakes of natural gas by ONGC.

\$. Sales of City Gas Distribution Companies like IGL, MGL, Bhagyanagar Gas, TNGCL, BMC Green Gas,

CUGL & GGCL. Includes Industrial sale, domestic sale and CNG sale.

\*\* : Sponge iron use.

Source : Ministry of Petroleum & Natural Gas.

**Table 6.9: Consumption of Electricity (from utilities) by Sectors in India**

(in Giga Watt hour) = (10<sup>6</sup> x Kilo Watt hour)

Year	Industry	Agriculture	Domestic	Commercial	Traction & Railways	Others	Total Electricity Consumed
1	2	3	4	5	6	7	8=2 to 7
2005-06	151,557	90,292	100,090	35,965	9,944	24,039	411,887
2006-07	171,293	99,023	111,002	40,220	10,800	23,411	455,749
2007-08	189,424	104,182	120,918	46,685	11,108	29,660	501,977
2008-09	209,474	109,610	131,720	54,189	11,425	37,577	553,995
2009-10	236,752	120,209	146,080	60,600	12,408	36,595	612,645
2010-11	272,589	131,967	169,326	67,289	14,003	39,218	694,392
2011-12	352,291	140,960	171,104	65,381	14,205	41,252	785,193
2012-13(p)	382,670	153,116	185,855	71,019	15,431	44,809	852,900
<b>Distribution (%)</b>	<b>44.87</b>	<b>17.95</b>	<b>21.79</b>	<b>8.33</b>	<b>1.81</b>	<b>5.25</b>	<b>100.00</b>
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>8.62</b>	<b>8.62</b>	<b>8.62</b>	<b>8.62</b>	<b>8.63</b>	<b>8.62</b>	<b>8.62</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>12.27</b>	<b>6.82</b>	<b>8.04</b>	<b>8.88</b>	<b>5.65</b>	<b>8.10</b>	<b>9.53</b>

Source : Central Electricity Authority.

**Table 6.10 : Electricity Generated(from Utilities), Distributed, Sold and Lost in India**(in Giga Watt Hour) = (10<sup>6</sup> x Kilo Watt hour)

Year	Gross Electricity Generated from Utilities	Consumption in Power Station Auxiliaries	Net Electricity Generated from Utilities	Purchases from Non-Utilities + Imported from Other Countries	Net Electricity Available for Supply	Sold to Ultimate Consumers & Other Countries	Loss in transmission	Loss in transmission (%)
1	2	3	4=2-3	5	6=4+5	7	8=6-7	9
2005-06	623,819	41,970	581,849	10,345	592,194	412,096	180,145	30.42
2006-07	670,654	43,577	627,077	11,931	639,008	455,964	183,012	28.64
2007-08	722,626	45,531	677,095	12,685	689,780	502,267	187,620	27.20
2008-09	746,626	47,573	699,053	13,487	712,540	527,564	178,420	25.04
2009-10	796,281	49,706	746,576	15,359	761,934	569,723	193,455	25.39
2010-11	844,846	52,380	792,466	16,989	809,455	617,097	194,026	23.97
2011-12	922,451	57,238	865,213	19,839	811,506	663,392	191,921	23.65
2012-13(p)	963,722	59,799	903,923	20,577	924,500	705,856	218,644	23.65
<b>Growth rate of 2012-13 over 2011-12(%)</b>	<b>6.10</b>	<b>5.38</b>	<b>6.15</b>	<b>10.62</b>	<b>6.24</b>	<b>8.32</b>	<b>0.30</b>	<b>-5.59</b>
<b>CAGR 2005-06 to 2012-13(%)</b>	<b>5.59</b>	<b>4.52</b>	<b>5.66</b>	<b>8.98</b>	<b>5.73</b>	<b>6.96</b>	<b>2.45</b>	<b>-3.10</b>

Source : Central Electricity Authority.

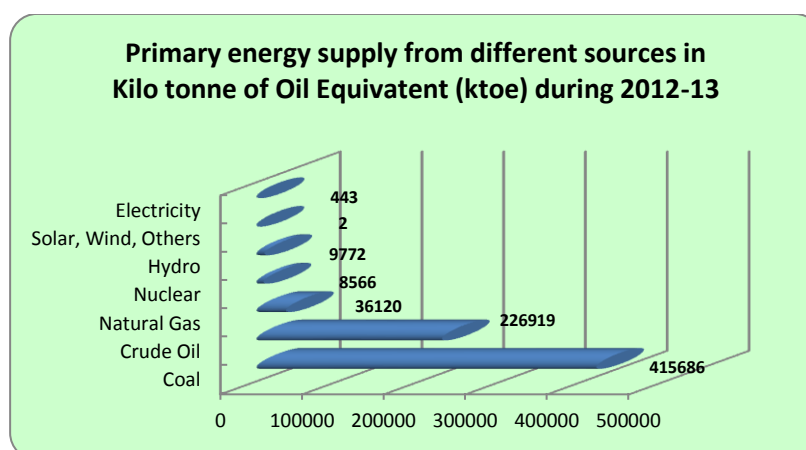
## ENERGY BALANCE

### 7.1 Definition

- ❖ **Commodity balance:** The purpose of commodity balance is to show the sources of supply and various uses of particular energy product with reference to national territory of the compiling country. The balance is compiled for any energy commodity provided that the commodity remains homogeneous at each point in the balance.
- ❖ International Recommendations on Energy Statistics (IRES) recommends that the format of energy balance and all applicable concepts are consistently used in the compilation of a commodity balance to ensure data consistency. The major sources for commercial energy in India are coal, oil products, natural gas and electricity. Non-energy producing sectors derive energy from the resources available in primary form such as coal, crude oil, natural gas, hydro-power and nuclear power. Some of the energy resources are converted into other (final) energy products that are used for purposes other than energy generation.
- ❖ Coal is also used as a final product or intermediate for power generation. Similarly, natural gas is also used directly or as an intermediate in power generation. Many petroleum products, such as HSDO, Naphtha etc. are used as a final product by the non-energy producing sectors and also used for power generation.
- ❖ This indicates that the same energy source can be used in various forms at various stages of consumption. This creates a possibility of over-estimation or under-estimation of energy consumption in totality as well as for different sources.

### 7.2 Components

- ❖ Two major components of the energy balance statistics are Total Primary Energy Supply and Total Final Consumption of energy commodity.
- ❖ In 2012-13, primary energy production added up to 642792 Kilo tonnes of Oil equivalent (ktoe). The share of Crude oil accounted for 35% and the contribution of coal was 64%.



- ❖ In 2012-13, national energy consumption was 332935 ktoe. The industrial sector used 50% of the total final energy consumption.
- ❖ Within the industry sector, the most energy-intensive industries were iron and steel, which accounted for 22.5% of the industrial energy use, Chemical and petrochemicals (9.5%) and construction(6.5%),.
- ❖ The transport sector accounted for 7.6% of total final consumption. The consumption of the residential, commercial and public sectors represented 36.8%.

**Table 7.1 : Energy Commodity Balance for the years 2011-12 and 2012-13(p)**

Supply	Coal	Lignite	LPG	Naphtha	Kerosene	Diesel	Heavy fuel oil	Electricity
	(000 tonnes)							(Gwh)
	2012-13	2012-13	2012-13	2012-13	2012-13	2012-13	2012-13	2012-13
Production	557707	46598	7694	17354	7868	91085	15054	963722
From Other Sources			2130	1664	103	18		148000
Imports	137559		8176	1489		626	1068	5152
Exports	2825	107	200	10179	23	22464	5922	
Intl. marine bunkers								
Stock changes	-11890	442	563	-1987	400	-458	-8869	
<b>Domestic Supply</b>	<b>704331</b>	<b>46049</b>	<b>17237</b>	<b>12315</b>	<b>7548</b>	<b>69723</b>	<b>19069</b>	<b>1116874</b>
Transfer								
Statistical difference	104667	8741	1666	-27	46	-4478	-8059	18869
<b>Transformation</b>	<b>460172</b>	<b>37308</b>		<b>342</b>		<b>214</b>	<b>5752</b>	<b>59799</b>
Electricity plants	444292	37308		342		214	5752	59799
CHP plants								
Heat plants								
Blast furnaces/ gas works								
Coke/pat.fuel/BKB plants	15880							
Petroleum refineries								
Petrochemical industry								
Liquefaction plants								
Other Transform. sector								
<b>Energy Sector</b>	<b>466</b>					<b>3084</b>		
Coal mines	466					1073		
Fuel mining and extraction								
Petroleum refineries						2011		
Elec., CHP and heat plants								
Pumped storage (elec.)								
Other energy sector								
Distribution losses								185306
<b>Final Consumption</b>	<b>599664</b>	<b>37308</b>	<b>15571</b>	<b>12342</b>	<b>7502</b>	<b>74201</b>	<b>27128</b>	<b>1098005</b>
<b>Industry Sector</b>	<b>139026</b>		<b>112</b>	<b>10310</b>	<b>37</b>	<b>4645</b>	<b>11065</b>	<b>382670</b>
Iron and steel	36708					289	2473	
Chemical and petroleum	2502		11	9412		192	3759	
Non-ferrous metals			78					
Non-metallic minerals			2					
Transport equipment			10					
Machinery			19			54		
Mining & Quarrying						1073		
Food and tobacco								
Paper, pulp and print	2130							
Wood and wood products								
Construction	15533					529		
Textile and leather	298					242		
Non-specified	81855		23	898		2266	4833	
<b>Transport Sector</b>			<b>719</b>			<b>5159</b>	<b>2341</b>	<b>15431</b>
International aviation								
Domestic aviation						1		
Road			214			2207	783	
Rail						2538	143	15431
Pipeline transport								
Domestic navigation						413	986	
Non-specified			505				429	
<b>Other Sectors</b>			<b>14740</b>	<b>203</b>	<b>7464</b>	<b>61099</b>	<b>7970</b>	<b>454799</b>
Residential			13568		7349			185855
Comm. And public services								71019
Agriculture/forestry			4			617	1047	153116
Fishing								
Non-specified			1168	203	115	60482	6923	44809
<b>Non-Energy Use</b>				<b>1487</b>				

Statistical Difference= Estimated Production - Estimated Consumption

Final consumption = Transformation+Energy sector+Total Industrial Consumption+Consumption by Other sectors+Non energy Use

Table 7.2 : Energy Balance of India for 2012-13(p)

in Kilotonne of Oil Equivalent

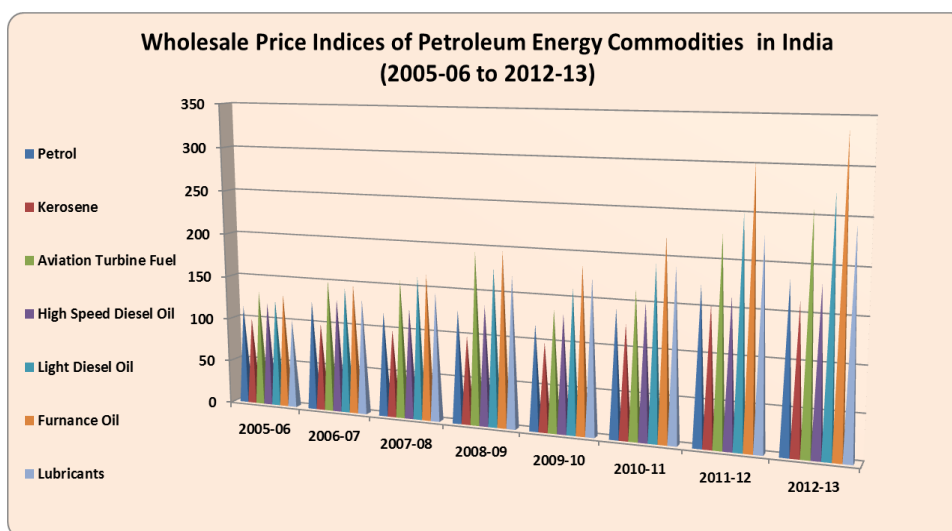
	Coal	Crude Oil	Oil Products	Natural Gas	Nuclear	Hydro	Solar, Wind, Others	Electricity	Total
Production	334,089	38,695	-	30,104	8,566	9,772	2	-	421,228
Imports	91,027	188,224	14,219	6,016	-	-	-	443	299,930
Exports	-2,634	-	-63,041	-	-	-	-	-	-65,675
International marine bunkers	-	-	-	-	-	-	-	-	-
International aviation bunkers	-	-	-5,027	-	-	-	-	-	-5,027
Stock changes	-6,795	-	-688	-	-	-	-	-	-7,484
<b>Total primary energy supply</b>	<b>415,686</b>	<b>226,919</b>	<b>-54,537</b>	<b>36,120</b>	<b>8,566</b>	<b>9,772</b>	<b>2</b>	<b>443</b>	<b>642,972</b>
Transfers	-	-	-	-	-	-	-	-	-
Statistical differences	3,015	-	23,050	-7,097	-	0	-	-25,832	-6,864
Main activity producer electricity plants	-307,757	-	-6,112	-9,712	-8,566	-9,772	-2	82,880	-259,041
Autoproducer electricity plants	-	-	-	-862	-	-0	-	12,728	11,866
Main activity producer CHP plants	-	-	-	-	-	-	-	-	-
Autoproducer CHP plants	-	-	-	-	-	-	-	-	-
Main activity producer heat plants	-	-	-	-	-	-	-	-	-
Autoproducer heat plants	-	-	-	-	-	-	-	-	-
Heat pumps	-	-	-	-	-	-	-	-	-
Electric boilers	-	-	-	-	-	-	-	-	-
Chemical heat for electricity production	-	-	-	-	-	-	-	-	-
Gas works	-	-	-	-	-	-	-	-	-
Oil refineries	-	-226,919	200,843	-	-	-	-	-	-26,076
Coal transformation	-3,617	-	-	-	-	-	-	-	-3,617
Liquefaction plants	-	-	-	-	-	-	-	-	-
Non-specified (transformation)	-	-	-	-	-	-	-	-	-
Energy industry own use	-270	-	-3,189	-6,908	-	-	-	-	-10,368
Losses	-	-	-	-	-	-	-	-15,936	-15,936
<b>Final consumption</b>	<b>107,056</b>	<b>-</b>	<b>160,055</b>	<b>11,541</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>54,283</b>	<b>332,935</b>
<b>Industry</b>	<b>103,977</b>	<b>-</b>	<b>24,556</b>	<b>8,420</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>30,297</b>	<b>167,250</b>
Iron and steel	35,061	-	2,673	-	-	-	-	-	37,735
Chemical and petrochemical	1,685	-	13,936	333	-	-	-	-	15,954
Non-ferrous metals	-	-	4,729	8,087	-	-	-	-	12,816
Non-metallic minerals	-	-	2	-	-	-	-	-	2
Transport equipment	-	-	11	-	-	-	-	-	11
Machinery	-	-	77	-	-	-	-	-	77
Mining and quarrying	-	-	1,110	-	-	-	-	-	1,110
Food and tobacco	-	-	-	-	-	-	-	-	-
Paper, pulp and print	1,435	-	-	-	-	-	-	-	1,435
Wood and wood products	-	-	-	-	-	-	-	-	-
Construction	10,462	-	547	-	-	-	-	-	11,009
Textile and leather	201	-	250	-	-	-	-	-	451
Non-specified (industry)	55,133	-	1,220	-	-	-	-	30,297	86,650
<b>Transport</b>	<b>397</b>	<b>-</b>	<b>23,696</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1,222</b>	<b>25,314</b>
Road	-	-	17,837	-	-	-	-	-	17,837
Domestic aviation	-	-	3,364	-	-	-	-	-	3,364
Rail	-	-	138	-	-	-	-	1,222	1,360
Pipeline transport	-	-	-	-	-	-	-	-	-
Domestic navigation	-	-	1,374	-	-	-	-	-	1,374
Non-specified (transport)	397	-	982	-	-	-	-	-	1,379
<b>Other</b>	<b>2,682</b>	<b>-</b>	<b>95,520</b>	<b>1,648</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>22,764</b>	<b>122,614</b>
Residential	-	-	23,016	1,512	-	-	-	1,471	25,999
Commercial and public services	-	-	-	-	-	-	-	5,623	5,623
Agriculture/forestry	-	-	1,648	136	-	-	-	12,123	13,907
Fishing	-	-	-	-	-	-	-	-	-
Non-specified (other)	2,682	-	70,856	-	-	-	-	3,548	77,086
<b>Non-energy use</b>	<b>-</b>	<b>-</b>	<b>16,283</b>	<b>1,474</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>17,757</b>
Non-energy use industry/transformation/energy	-	-	16,283	1,474	-	-	-	-	17,757
Non-energy use in transport	-	-	-	-	-	-	-	-	-
Non-energy use in other	-	-	-	-	-	-	-	-	-
Feedstock use in petro-chemical industry	-	-	1,598	-	-	-	-	-	1,598



## WHOLE SALE PRICE INDEX OF ENERGY COMMODITIES

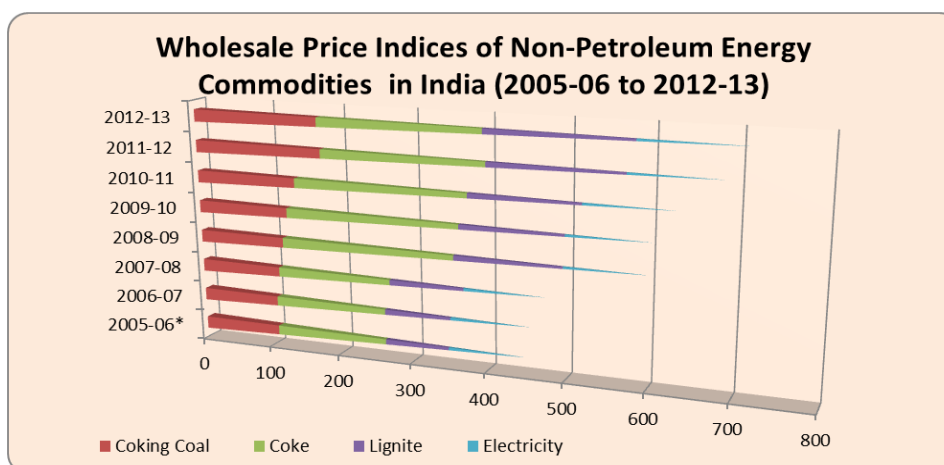
### 8.1 The Wholesale Price Index of Petroleum Products

- ❖ Wholesale Price Index of Petroleum Products recorded an increase ranging from 5.47% to 12.40% from 2011-12 to 2012-13.
- ❖ The maximum increase was observed in Aviation Turbine Fuel (12.40%) followed by High Speed Diesel oil(11.56%).



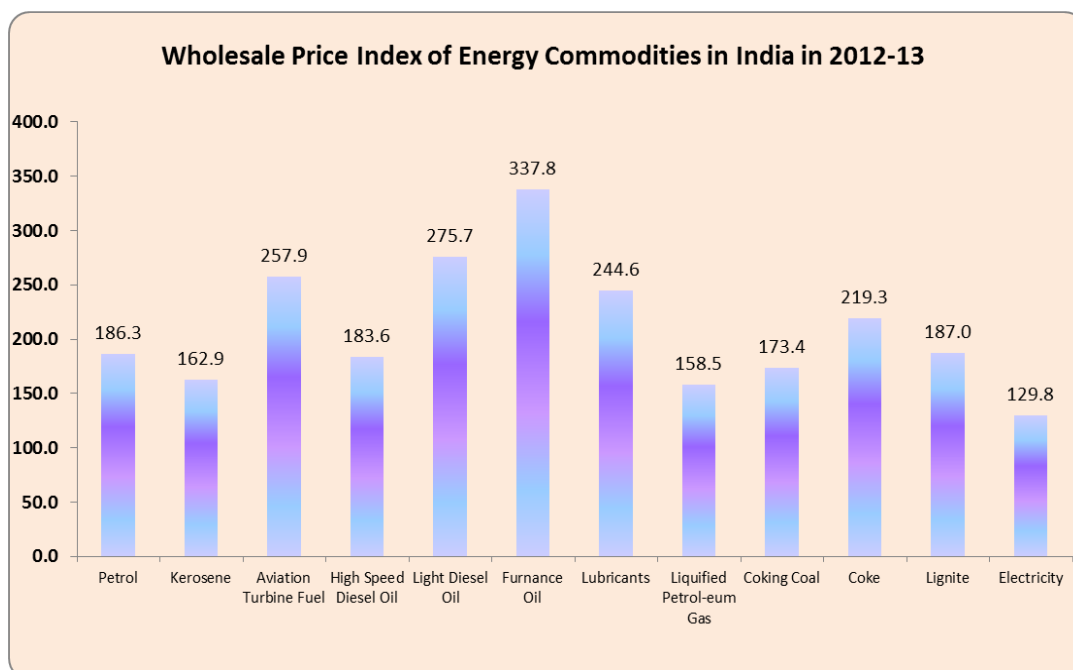
### 8.2 The Wholesale Price Index of Non-Petroleum Products

- ❖ The wholesale price index remained constant for Coke at 219.3 for the period 2011-2013.
- ❖ Wholesale Price Index of Electricity recorded an increase of 12.87% during 2012-13 over 2011-12.



## 8.2 Inter-Year Movement of WPI

- ❖ The yearly movement of index shows that from 2005-06 to 2009-10, the WPI of Kerosene has not changed mainly due to administered prices, whereas for Electricity and Lubricants the WPI has increased continuously from 2005-06. The trend is same in almost all other products also.



**Table 8.1 : Wholesale Price Index of Energy Commodities in India**

(2004-05=100)

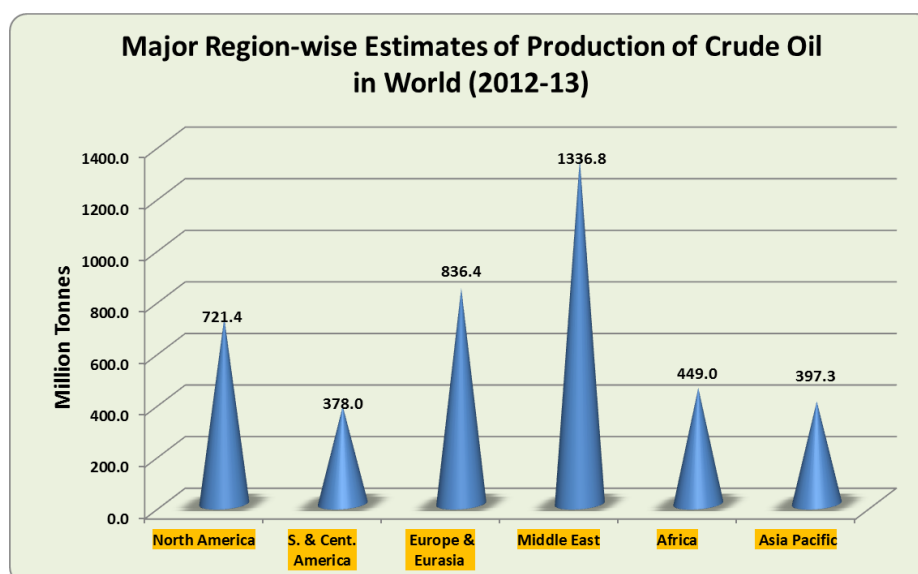
Year	Petroleum Products							Liquified Petroleum Gas	Coking Coal	Coke	Lignite	Electricity
	Petrol	Kerosene	Aviation Turbine Fuel	High Speed Diesel Oil	Light Diesel Oil	Furn-ance Oil	Lubricants					
1	2	3	4	5	6	7	8	9	10	11	12	13
2005-06	113.6	99.9	132.0	119.7	123.4	131.2	101.9	106.1	106.7	152.7	85.7	102.6
2006-07	125.3	99.9	151.6	130.2	143.8	148.4	131.8	106.1	106.7	152.7	88.5	105.3
2007-08	119.1	99.9	157.4	125.6	162.3	166.0	145.8	106.1	111.4	155.4	99.1	106.2
2008-09	128.3	99.9	194.5	135.8	178.3	197.9	171.1	117.2	119.0	234.4	140.0	106.4
2009-10	119.3	99.9	137.0	133.0	161.5	187.6	174.5	111.9	126.3	234.4	134.9	107.4
2010-11	143.0	127.2	164.9	151.7	192.5	223.7	192.6	125.9	139.2	233.1	144.1	113.2
2011-12	174.4	154.4	229.4	164.5	252.0	304.6	230.4	143.2	177.1	219.3	172.6	115.0
2012-13	186.3	162.9	257.9	183.6	275.7	337.8	244.6	158.5	173.4	219.3	187.0	129.8
<b>Increase in 2012-13 over 2011-12(%)</b>	<b>6.79</b>	<b>5.47</b>	<b>12.40</b>	<b>11.56</b>	<b>9.40</b>	<b>10.89</b>	<b>6.15</b>	<b>10.72</b>	<b>-2.11</b>	<b>0.00</b>	<b>8.35</b>	<b>12.87</b>

Source :Office of the Economic Advisor, Ministry of Commerce &amp; Industry.

## WORLD PRODUCTION AND CONSUMPTION OF CRUDE OIL & NATURAL GAS

### 9.1 Production and consumption of crude oil

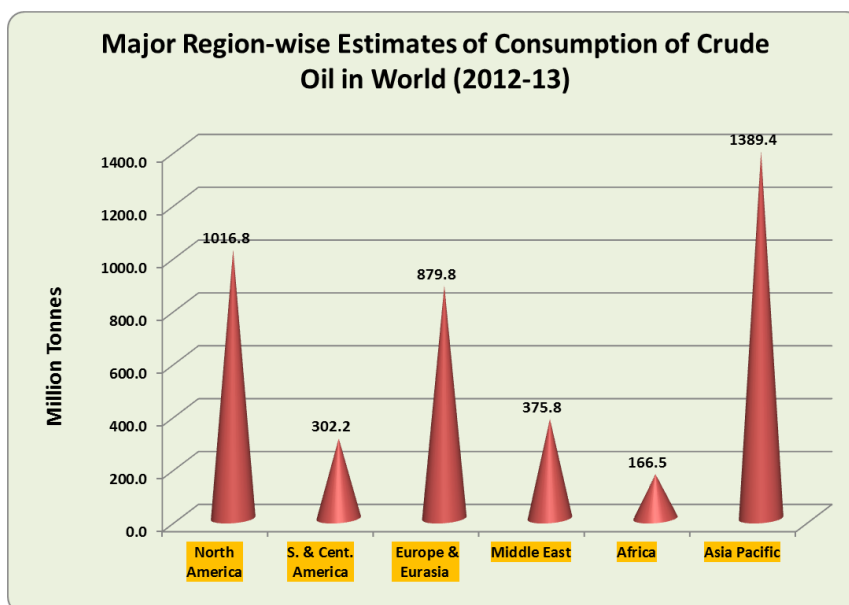
- ❖ The total estimated production of crude oil in the world has increased from about 3943.1 MT in 2005-06 to about 4,018.8 MT during 2011-12, and further increased to 4,118.9 MT during 2012-13 (Table 9.1). The production increased by 2.5% from 2011-12 to 2012-13.
- ❖ Geographical distribution of total world production during 2012-13 across major regions reveals that Middle East accounted for the highest share (32.5%), followed by Europe & Eurasia (20.3%), North America (17.5%), Africa (10.9%), Asia Pacific (9.6%) and South & Central America (9.2%) (Table 9.1)
- ❖ Distribution of total world production according to countries shows that Saudi Arabia and Russian Federation were the first and second highest producers with 13.3% and 12.8% respectively. They were followed by USA (9.6%), China (5.0%), Canada (4.4%), Iran (4.2%), Iraq, Kuwait & UAE having 3.7% share each, Mexico (3.5%) and Venezuela (3.4%). India accounted for only 1% of the world production.



- ❖ Major region-wise consumption (Table 9.2) shows that Asia Pacific accounted for the highest share (33.6%) of total world consumption, followed by North America (24.6%), and Europe & Eurasia (21.3%). African countries accounted for the lowest share in the world consumption (4.0%).
- ❖ Country-wise distribution of consumption reveals that the United States was the largest consumer of crude oil, consuming 19.8% of the world consumption during

2012-13. China was the second largest consumer (11.7%), followed by Japan (5.3%), India (4.2%) and Russian federation (3.6%).

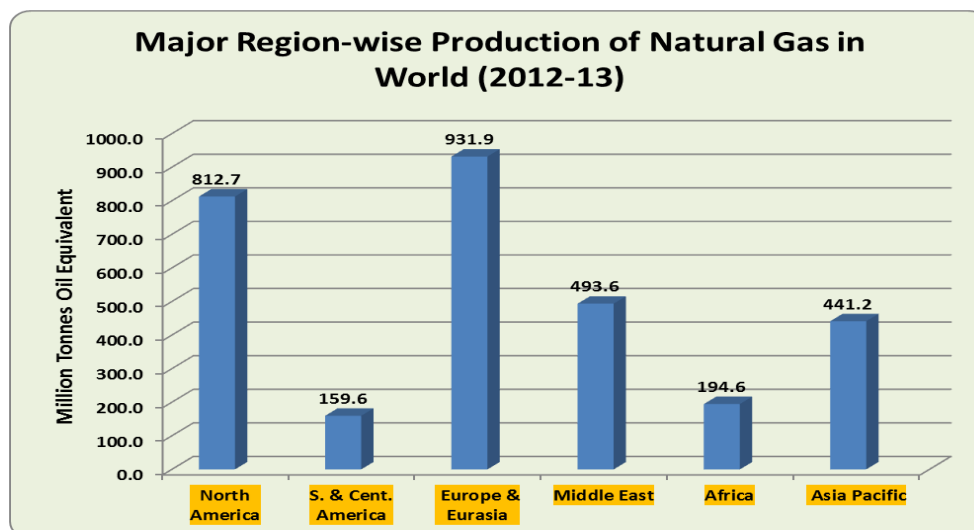
- ❖ India was the fourth largest consumer of crude oil in the world and the third largest crude oil consumer in the Asia-Pacific region after China and Japan.



## 9.2 Production and Consumption of Natural Gas

- ❖ The total world production of Natural Gas increased from 2,509.6 million tonnes oil equivalent (Mtoe) in 2005-06 to 3033.5 Mtoe in 2012-13. The production has increased by 2.2% from 2011-12 to 2012-13 (Table 9.3).
- ❖ Distribution of production of natural gas over major regions shows that Europe & Eurasia (30.7%) and North America (26.8%) are the highest and the second highest producers, together accounting for 57.5% of the total world production.
- ❖ Country-wise, USA was the largest producer of natural gas (20.4%) in the world during 2012-13, followed by the Russian Federation (17.6%) and Iran (4.8%). India's share in the total world production of natural gas during 2012-13 was only 1.2% (36.2 Mtoe).
- ❖ The growth in production of natural gas from 2011-12 to 2012-13 was highest in Middle East (5.7%), followed by North America and South & Central America (3.4% each).
- ❖ The total world consumption of natural gas has increased from 2499.5 Mtoe in 2005-06 to 2,987.1 Mtoe in 2012-13 (Table 9.4).

- ❖ United States of America was the largest consumer of natural gas, consuming 21.9% of the world consumption during 2012-13 while Europe & Eurasia accounted for 32.6% of the total world consumption.



- ❖ Country-wise distribution of consumption of natural gas indicates that USA was the largest consumer (21.9%), followed by Russian federation (12.5%). India with a consumption of 49.1 Mtoe accounted for only 1.6% of total world consumption.
- ❖ Consumption of natural gas over major regions shows that Europe & Eurasia (32.6%) and North America (27.5%) are the highest and the second highest consumers, together accounting for 60.1% of the total world consumption.

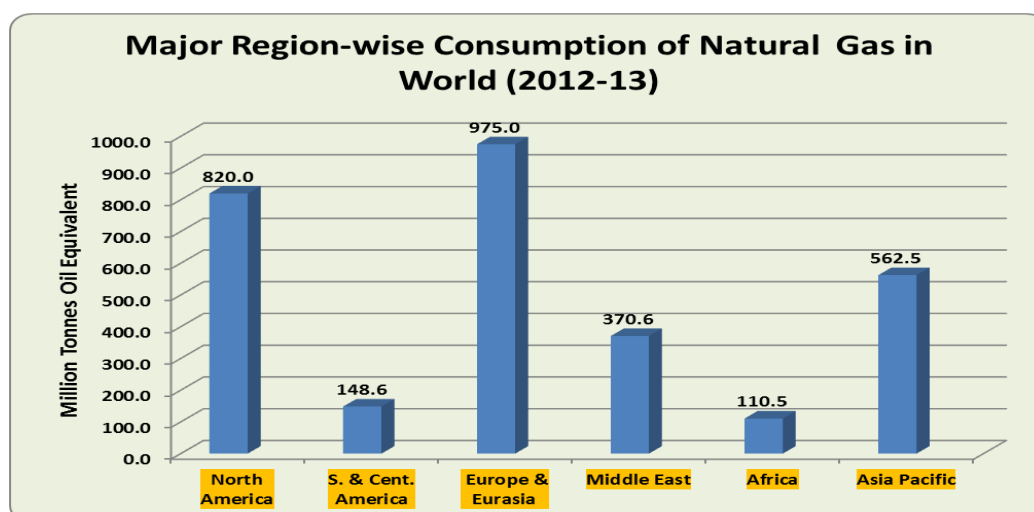


Table 9.1:Country-wise Estimates of Production of Crude Oil\*

Country/ Region	(Million tonnes)									
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	% Change 2012-13 over 2011- 12	2012-13 % Share of World's Total Production
<b>North America</b>										
USA	309.1	304.7	305.2	302.3	322.4	332.9	345.7	394.9	14.2	9.6
Canada	142.3	150.6	155.3	152.9	152.8	160.3	170.4	182.6	7.1	4.4
Mexico	186.5	182.5	172.2	156.9	146.7	145.6	144.5	143.9	-0.5	3.5
<b>Total North America</b>	<b>637.9</b>	<b>637.8</b>	<b>632.7</b>	<b>612.0</b>	<b>621.9</b>	<b>638.8</b>	<b>660.7</b>	<b>721.4</b>	<b>9.2</b>	<b>17.5</b>
<b>South and Central America</b>										
Argentina	39.4	39.1	38.0	36.5	34.9	34.0	32.2	31.0	-3.5	0.8
Brazil	88.7	93.7	95.2	98.8	105.6	111.4	114.2	112.2	-1.8	2.7
Colombia	27.7	27.9	28.0	31.1	35.3	41.4	48.2	49.9	3.4	1.2
Ecuador	28.6	28.8	27.5	27.2	26.1	26.1	26.8	27.1	1.1	0.7
Peru	4.5	4.6	4.6	4.7	4.8	5.1	4.9	4.8	-2.7	0.1
Trinidad & Tobago	9.0	9.6	8.2	8.7	7.6	7.4	6.9	6.0	-13.4	0.1
Venezuela	169.7	171.0	165.5	165.6	155.7	145.7	141.5	139.7	-1.2	3.4
Other S. & Cent. America	7.4	7.1	7.2	7.1	6.9	6.9	7.0	7.3	4.8	0.2
<b>Total S. &amp; Cent. America</b>	<b>374.9</b>	<b>381.8</b>	<b>374.2</b>	<b>379.7</b>	<b>376.9</b>	<b>377.9</b>	<b>381.7</b>	<b>378.0</b>	<b>-1.0</b>	<b>9.2</b>
<b>Europe and Eurasia</b>										
Azerbaijan	22.2	32.3	42.6	44.5	50.4	50.8	45.6	43.4	-4.9	1.1
Denmark	18.4	16.7	15.2	14.0	12.9	12.2	10.9	10.1	-7.7	0.2
Italy	6.1	5.8	5.9	5.2	4.6	5.1	5.3	5.4	1.7	0.1
Kazakhstan	62.6	66.1	68.4	72.0	78.2	81.6	82.4	81.3	-1.3	2.0
Norway	138.7	129.0	118.6	114.7	108.8	98.9	93.8	87.5	-6.7	2.1
Romania	5.4	5.0	4.7	4.7	4.5	4.3	4.2	4.1	-2.6	0.1
Russian Federation	474.8	485.6	496.8	493.7	500.8	511.8	518.5	526.2	1.5	12.8
Turkmenistan	9.5	9.2	9.8	10.3	10.4	10.7	10.7	11.0	2.8	0.3
United Kingdom	84.6	76.5	76.7	72.0	68.2	62.8	51.9	45.0	-13.2	1.1
Uzbekistan	5.4	5.4	4.9	4.8	4.5	3.6	3.6	3.2	-11.7	0.1
Other Europe & Eurasia	22.0	21.7	21.6	20.6	19.9	19.2	19.2	19.2	-0.4	0.5
<b>Total Europe &amp; Eurasia</b>	<b>849.8</b>	<b>853.2</b>	<b>865.2</b>	<b>856.6</b>	<b>863.1</b>	<b>861.0</b>	<b>846.1</b>	<b>836.4</b>	<b>-1.2</b>	<b>20.3</b>
<b>Middle East</b>										
Iran	206.4	209.2	210.9	214.5	205.5	208.8	208.2	174.9	-16.0	4.2
Iraq	89.9	98.0	105.1	119.3	119.9	121.5	136.7	152.4	11.5	3.7
Kuwait	130.4	133.7	129.9	136.1	121.2	122.5	139.7	152.5	9.2	3.7
Oman	38.5	36.6	35.3	37.7	40.3	42.9	44.1	45.8	3.8	1.1
Qatar	52.6	56.8	57.9	65.0	62.4	72.1	78.2	83.3	6.6	2.0
Saudi Arabia	521.3	508.9	488.9	509.9	456.7	473.8	526.0	547.0	4.0	13.3
Syria	22.3	21.0	20.1	20.3	20.0	19.2	16.3	8.2	-49.8	0.2
United Arab Emirates	135.8	144.3	139.6	141.4	126.2	133.3	151.3	154.1	1.9	3.7
Yemen	19.8	18.1	15.9	14.8	14.3	13.5	10.6	8.3	-21.1	0.2
Other Middle East	9.1	8.9	9.3	9.3	9.4	9.4	10.0	10.1	1.5	0.2
<b>Total Middle East</b>	<b>1226.0</b>	<b>1235.7</b>	<b>1213.0</b>	<b>1268.2</b>	<b>1176.1</b>	<b>1217.2</b>	<b>1321.0</b>	<b>1336.8</b>	<b>1.2</b>	<b>32.5</b>

Contd....

**Table 9.1(Contd.):Country-wise Estimates of Production of Crude Oil\***

Country/ Region	(in Million Tonnes)									
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	% Change 2012-13 over 2011-12	2012-13 % Share of World's Total
<b>Africa</b>										
Algeria	86.4	86.2	86.5	85.6	77.2	74.1	73.5	73.0	-0.7	1.8
Angola	68.9	69.3	82.1	93.1	87.6	90.5	83.8	86.9	3.7	2.1
Chad	9.1	8.0	7.5	6.7	6.2	6.4	6.0	5.3	-11.1	0.1
Rep. of Congo (Brazzaville)	12.3	14.0	11.4	12.1	13.9	15.1	15.1	15.3	1.1	0.4
Egypt	33.2	34.5	33.8	34.7	35.3	35.0	35.3	35.4	0.4	0.9
Equatorial Guinea	16.4	15.6	15.9	16.1	14.2	12.6	11.6	13.2	13.7	0.3
Gabon	13.5	12.1	12.3	12.0	12.0	12.7	12.7	12.3	-3.3	0.3
Libya	82.2	85.3	85.3	85.5	77.4	77.7	22.5	71.1	216.0	1.7
Nigeria	122.1	116.6	110.2	102.8	106.6	121.3	118.2	116.2	-1.6	2.8
South Sudan	-	-	-	-	-	-	-	1.5		0.0
Sudan	15.0	16.3	23.1	23.7	23.4	22.9	22.3	4.1	-81.8	0.1
Tunisia	3.4	3.3	4.6	4.2	4.0	3.8	3.2	3.1	-4.5	0.1
Other Africa	8.6	11.2	9.7	9.5	9.2	8.3	11.5	11.6	1.3	0.3
<b>Total Africa</b>	<b>471.1</b>	<b>472.3</b>	<b>482.2</b>	<b>486.0</b>	<b>466.8</b>	<b>480.6</b>	<b>415.7</b>	<b>449.0</b>	<b>8.0</b>	<b>10.9</b>
<b>Asia Pacific</b>										
Australia	24.2	23.3	24.3	24.8	24.6	25.4	21.7	19.9	-8.3	0.5
Brunei	10.1	10.8	9.5	8.6	8.3	8.5	8.1	7.8	-4.0	0.2
China	181.4	184.8	186.3	190.4	189.5	203.0	202.9	207.5	2.3	5.0
<b>India</b>	<b>36.6</b>	<b>37.8</b>	<b>37.9</b>	<b>37.9</b>	<b>37.2</b>	<b>40.8</b>	<b>42.3</b>	<b>42.0</b>	<b>-0.7</b>	<b>1.0</b>
Indonesia	53.7	50.2	47.8	49.4	48.4	48.6	46.3	44.6	-3.6	1.1
Malaysia	34.6	32.7	33.8	34.0	32.2	32.0	28.9	29.7	2.9	0.7
Thailand	11.4	12.5	13.2	14.0	14.6	14.8	14.8	16.2	9.4	0.4
Vietnam	19.0	17.2	16.3	15.2	16.7	15.3	15.5	17.0	10.1	0.4
Other Asia Pacific	12.4	13.1	13.9	14.8	14.4	13.8	13.1	12.5	-4.7	0.3
<b>Total Asia Pacific</b>	<b>383.3</b>	<b>382.4</b>	<b>383.1</b>	<b>389.3</b>	<b>385.8</b>	<b>402.3</b>	<b>393.6</b>	<b>397.3</b>	<b>0.9</b>	<b>9.6</b>
<b>TOTAL WORLD</b>	<b>3943.1</b>	<b>3963.3</b>	<b>3950.4</b>	<b>3991.8</b>	<b>3890.6</b>	<b>3977.8</b>	<b>4018.8</b>	<b>4118.9</b>	<b>2.5</b>	<b>100.0</b>

\* Includes crude oil, shale oil, oil sands and NGLs (the liquid content of natural gas where this is recovered separately). Excludes liquid fuels from other sources such as biomass & coal derivatives.

^ Less than 0.05.

Note: Annual changes and shares of total are calculated using million tonnes per annum figures.

Source : Ministry of Petroleum & Natural Gas.



Table 9.2 : COUNTRY-WISE ESTIMATES OF CONSUMPTION OF CRUDE OIL\*

(Million tonnes)										
Country/ Region	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	% Change 2012-13 over 2011- 12	2012-13 % Share of World's Total Consumption
<b>North America</b>										
US	939.8	930.7	928.8	875.4	833.0	847.4	837.0	819.9	-2.1	19.8
Canada	99.9	99.4	102.3	101.2	95.2	101.3	105.0	104.3	-0.7	2.5
Mexico	90.8	89.7	92.0	91.6	88.5	88.5	90.3	92.6	2.6	2.2
<b>Total North America</b>	<b>1130.5</b>	<b>1119.7</b>	<b>1123.1</b>	<b>1068.2</b>	<b>1016.8</b>	<b>1037.3</b>	<b>1032.3</b>	<b>1016.8</b>	<b>-1.5</b>	<b>24.6</b>
<b>South and Central America</b>										
Argentina	20.7	21.7	24.0	24.7	24.0	26.0	27.5	28.2	2.6	0.7
Brazil	94.2	95.8	101.8	108.6	109.1	118.3	122.2	125.6	2.8	3.0
Chile	11.8	13.2	17.0	17.8	17.4	15.4	17.5	17.9	2.2	0.4
Colombia	10.5	10.7	10.7	10.8	11.1	11.9	12.5	12.7	1.2	0.3
Ecuador	7.9	8.3	8.5	8.7	8.9	10.3	10.5	11.0	3.9	0.3
Peru	7.1	6.9	7.1	8.0	8.1	8.5	9.2	9.6	3.5	0.2
Trinidad & Tobago	1.2	1.4	1.7	1.8	1.7	1.9	1.6	1.6	0.5	0.0
Venezuela	28.8	30.3	30.4	34.8	35.2	35.8	35.6	36.6	2.8	0.9
Other S. & Cent. America	58.8	59.5	60.1	57.8	57.0	58.2	58.7	59.0	0.5	1.4
<b>Total S. &amp; Cent. America</b>	<b>241.0</b>	<b>247.7</b>	<b>261.3</b>	<b>272.9</b>	<b>272.5</b>	<b>286.1</b>	<b>295.4</b>	<b>302.2</b>	<b>2.3</b>	<b>7.3</b>
<b>Europe and Eurasia</b>										
Austria	14.0	14.2	13.4	13.4	12.8	13.4	12.6	12.4	-0.9	0.3
Azerbaijan	5.4	4.8	4.5	3.6	3.3	3.2	4.0	4.2	5.7	0.1
Belarus	7.1	8.1	7.3	8.3	9.4	7.3	9.0	9.1	1.4	0.2
Belgium	33.5	33.4	33.7	36.8	32.2	33.5	32.3	30.6	-5.2	0.7
Bulgaria	4.8	5.0	4.8	4.8	4.3	3.9	3.8	3.8	0.4	0.1
Czech Republic	9.9	9.8	9.7	9.9	9.7	9.1	9.0	9.1	0.5	0.2
Denmark	9.4	9.6	9.7	9.5	8.5	8.4	8.1	7.6	-6.1	0.2
Finland	11.0	10.6	10.6	10.5	9.9	10.4	9.7	9.1	-6.0	0.2
France	93.1	93.0	91.4	90.8	87.5	84.5	83.7	80.9	-3.3	2.0
Germany	122.4	123.6	112.5	118.9	113.9	115.4	112.0	111.5	-0.4	2.7
Greece	21.1	22.1	21.7	21.3	20.1	18.0	17.0	15.4	-9.3	0.4
Hungary	7.4	7.8	7.7	7.5	7.1	6.7	6.4	6.0	-7.5	0.1
Republic of Ireland	9.3	9.3	9.4	9.0	8.0	7.6	6.7	6.2	-7.4	0.2
Italy	86.7	86.7	84.0	80.4	75.1	73.1	70.5	64.2	-8.9	1.6
Kazakhstan	9.8	10.3	11.3	11.0	8.9	9.3	11.6	12.8	10.5	0.3
Lithuania	2.8	2.8	2.8	3.1	2.6	2.7	2.6	2.6	-0.9	0.1
Netherlands	50.1	50.8	50.7	47.3	45.9	45.9	46.1	44.1	-4.2	1.1
Norway	10.2	10.5	10.7	10.4	10.6	10.8	10.6	10.8	1.6	0.3
Poland	22.4	23.3	24.2	25.3	25.3	26.7	26.6	25.1	-5.5	0.6
Portugal	16.0	14.4	14.4	13.6	12.8	12.5	11.6	10.9	-5.9	0.3
Romania	10.5	10.3	10.3	10.4	9.2	8.8	9.1	8.8	-3.3	0.2
Russian Federation	126.1	130.3	130.0	133.9	128.2	134.3	143.5	147.5	2.8	3.6
Slovakia	3.8	3.4	3.6	3.9	3.7	3.9	3.9	3.5	-9.0	0.1
Spain	79.3	79.3	80.3	77.9	73.5	69.6	68.5	63.8	-6.9	1.5
Sweden	16.1	16.5	16.0	15.7	14.6	15.3	14.5	13.8	-4.5	0.3
Switzerland	12.2	12.6	11.3	12.1	12.3	11.4	11.0	11.2	1.9	0.3
Turkey	30.9	32.7	33.5	31.9	31.6	31.8	30.7	31.5	2.6	0.8
Turkmenistan	4.3	4.1	4.6	5.1	4.6	4.5	4.7	4.8	3.6	0.1
Ukraine	13.7	14.2	15.6	14.9	13.4	13.0	12.9	13.2	2.2	0.3
United Kingdom	83.0	82.3	79.2	77.9	74.4	73.5	71.1	68.5	-3.7	1.7
Uzbekistan	5.0	5.0	4.6	4.5	4.3	3.6	3.8	3.9	2.4	0.1
Other Europe & Eurasia	30.8	31.5	32.5	33.1	32.6	32.8	32.8	32.8	-0.1	0.8
<b>Total Europe &amp; Eurasia</b>	<b>962.0</b>	<b>972.1</b>	<b>956.4</b>	<b>956.7</b>	<b>910.6</b>	<b>904.7</b>	<b>900.3</b>	<b>879.8</b>	<b>-2.3</b>	<b>21.3</b>

contd.....

Table 9.2(Contd.) : COUNTRY-WISE ESTIMATES OF CONSUMPTION OF CRUDE OIL

Country/ Region	(Million tonnes)									
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	% Change 2012-13 over 2011-12	2012-13 % Share of World's Total Consumption
<b>Middle East</b>										
Iran	80.7	86.5	88.6	92.2	93.5	88.3	85.6	89.6	4.6	2.2
Israel	12.2	11.9	12.4	12.2	11.4	10.9	11.5	13.6	18.1	0.3
Kuwait	19.5	17.7	17.9	19.0	20.3	21.7	20.4	20.9	2.8	0.5
Qatar	4.0	4.5	5.2	6.0	6.0	6.9	7.8	8.0	2.8	0.2
Saudi Arabia	88.2	92.4	98.1	106.8	115.8	123.5	124.4	129.7	4.2	3.1
United Arab Emirates	24.5	26.3	28.2	29.4	28.1	30.0	31.8	32.6	2.5	0.8
Other Middle East	63.5	59.3	60.0	68.6	71.3	74.6	77.1	81.4	5.6	2.0
<b>Total Middle East</b>	<b>292.7</b>	<b>298.6</b>	<b>310.3</b>	<b>334.1</b>	<b>346.4</b>	<b>356.1</b>	<b>358.7</b>	<b>375.8</b>	<b>4.8</b>	<b>9.1</b>
<b>Africa</b>										
Algeria	11.0	11.5	12.9	14.0	14.9	14.8	15.5	16.7	7.2	0.4
Egypt	29.8	28.7	30.6	32.6	34.4	36.3	33.7	35.2	4.7	0.9
South Africa	24.6	25.3	26.2	25.3	24.7	26.1	26.2	26.9	2.9	0.7
Other Africa	73.1	72.9	75.7	80.5	82.1	86.4	82.7	87.7	6.1	2.1
<b>Total Africa</b>	<b>138.5</b>	<b>138.4</b>	<b>145.4</b>	<b>152.5</b>	<b>156.0</b>	<b>163.6</b>	<b>158.0</b>	<b>166.5</b>	<b>5.4</b>	<b>4.0</b>
<b>Asia Pacific</b>										
Australia	40.7	42.1	42.4	43.2	42.9	43.7	46.1	46.7	1.2	1.1
Bangladesh	4.3	4.3	4.2	4.1	3.8	4.2	5.3	5.6	6.6	0.1
China	327.8	351.2	369.3	376.0	388.2	437.7	459.4	483.7	5.3	11.7
China Hong Kong SAR	13.8	15.0	16.1	14.6	16.6	17.9	18.1	17.9	-1.0	0.4
India	121.9	128.3	138.1	144.7	152.6	155.4	163.0	171.6	5.3	4.2
Indonesia	59.5	57.8	59.3	58.7	60.6	65.2	71.1	71.6	0.7	1.7
Japan	248.8	239.6	232.6	226.3	202.2	204.1	204.7	218.2	6.6	5.3
Malaysia	25.0	26.6	29.2	28.8	28.3	28.4	29.1	29.8	2.4	0.7
New Zealand	7.0	7.1	7.2	7.2	6.9	7.0	7.0	7.0	0.2	0.2
Pakistan	15.3	17.6	19.3	19.4	20.8	20.6	20.8	20.0	-4.0	0.5
Philippines	14.8	13.3	14.1	12.3	13.1	13.2	12.8	13.0	1.0	0.3
Singapore	43.2	46.5	50.5	53.7	57.3	62.9	65.7	66.2	0.7	1.6
South Korea	104.6	104.7	107.6	103.1	103.7	105.0	105.8	108.8	2.8	2.6
Taiwan	49.3	48.6	50.4	45.1	44.3	46.3	42.8	42.2	-1.5	1.0
Thailand	44.3	44.4	44.4	44.3	47.2	47.1	50.5	52.4	3.9	1.3
Vietnam	12.2	12.0	13.3	14.1	14.1	15.1	16.5	16.6	0.9	0.4
Other Asia Pacific	14.2	14.5	15.2	14.7	16.7	16.7	18.0	18.3	1.6	0.4
<b>Total Asia Pacific</b>	<b>1146.9</b>	<b>1173.6</b>	<b>1213.3</b>	<b>1210.5</b>	<b>1219.3</b>	<b>1290.5</b>	<b>1336.6</b>	<b>1389.4</b>	<b>4.0</b>	<b>33.6</b>
<b>TOTAL WORLD</b>	<b>3911.6</b>	<b>3950.1</b>	<b>4009.7</b>	<b>3994.8</b>	<b>3921.6</b>	<b>4038.2</b>	<b>4081.4</b>	<b>4130.5</b>	<b>1.2</b>	<b>100.0</b>

Notes: Growth rates are adjusted for leap years.

\* Inland demand plus international aviation and marine bunkers and refinery fuel and loss. Consumption of fuel ethanol and biodiesel ^ Less than 0.05.

Differences between these world consumption figures and world production statistics are accounted for by stock changes, consumption of non-petroleum additives and substitute fuels, and unavoidable disparities in the definition, measurement or conversion of oil supply and demand data.

Source : Ministry of Petroleum & Natural Gas.

Table 9.3: Country-wise Estimates of Production of Natural Gas\*

Country/ Region	(Million tonnes oil equivalent)									
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	% Change 2012-13 over 2011-12	2012-13 % Share of World's Total Production
<b>North America</b>										
USA	467.6	479.3	498.6	521.7	532.7	549.5	589.8	619.2	5.0	20.4
Canada	168.4	169.6	164.4	158.9	147.6	143.9	143.7	140.9	-2.0	4.6
Mexico	47.1	51.6	48.3	48.0	53.4	51.8	52.4	52.6	0.4	1.7
<b>Total North America</b>	<b>683.1</b>	<b>700.5</b>	<b>711.3</b>	<b>728.6</b>	<b>733.7</b>	<b>745.2</b>	<b>786.0</b>	<b>812.7</b>	<b>3.4</b>	<b>26.8</b>
<b>South and Central America</b>										
Argentina	41.1	41.5	40.3	39.7	37.2	36.1	34.9	34.0	-2.7	1.1
Bolivia	10.7	11.6	12.4	12.9	11.1	12.8	14.8	16.8	13.7	0.6
Brazil	9.8	10.0	10.1	12.6	10.5	13.0	15.1	15.7	4.0	0.5
Colombia	6.0	6.3	6.8	8.2	9.5	10.1	9.9	10.8	9.3	0.4
Peru	1.4	1.6	2.4	3.1	3.1	6.5	10.2	11.6	14.0	0.4
Trinidad & Tobago	29.7	36.1	38.0	37.8	39.3	40.3	38.6	38.0	-1.6	1.3
Venezuela	24.7	28.3	26.6	27.0	25.8	27.9	28.1	29.5	4.9	1.0
Other S. & Cent. America	3.1	3.4	3.5	3.3	3.8	3.2	2.8	3.2	14.7	0.1
<b>Total S. &amp; Cent. America</b>	<b>126.5</b>	<b>138.9</b>	<b>140.1</b>	<b>144.4</b>	<b>140.3</b>	<b>150.0</b>	<b>154.3</b>	<b>159.6</b>	<b>3.4</b>	<b>5.3</b>
<b>Europe and Eurasia</b>										
Azerbaijan	4.7	5.5	8.8	13.3	13.3	13.6	13.3	14.0	5.4	0.5
Denmark	9.4	9.4	8.3	9.1	7.6	7.4	6.4	5.8	-9.2	0.2
Germany	14.2	14.1	12.9	11.7	11.0	9.6	9.0	8.1	-9.6	0.3
Italy	10.0	9.1	8.0	7.6	6.6	6.8	6.9	7.0	2.0	0.2
Kazakhstan	12.2	12.5	15.0	16.8	16.0	15.8	17.3	17.7	2.3	0.6
Netherlands	56.3	55.4	54.5	60.0	56.4	63.5	57.8	57.5	-0.5	1.9
Norway	76.6	79.1	80.7	89.4	94.3	96.9	91.6	103.4	12.9	3.4
Poland	3.9	3.9	3.9	3.7	3.7	3.7	3.8	3.8	-0.9	0.1
Romania	11.2	10.7	10.4	10.3	10.1	9.8	9.8	9.8	0.3	0.3
Russian Federation	522.1	535.6	532.8	541.5	474.9	530.0	546.3	533.0	-2.4	17.6
Turkmenistan	51.3	54.3	58.9	59.5	32.7	38.1	53.6	57.9	8.1	1.9
Ukraine	16.7	16.9	16.9	17.1	17.3	16.3	16.8	16.7	-0.5	0.6
United Kingdom	79.4	72.0	64.9	66.1	56.2	53.7	42.8	36.9	-13.9	1.2
Uzbekistan	48.6	49.0	53.2	56.0	54.0	53.7	51.3	51.2	-0.1	1.7
Other Europe & Eurasia	9.8	10.3	9.7	9.2	8.8	9.1	9.1	8.8	-4.0	0.3
<b>Total Europe &amp; Eurasia</b>	<b>926.2</b>	<b>937.9</b>	<b>938.8</b>	<b>971.4</b>	<b>862.9</b>	<b>928.0</b>	<b>935.9</b>	<b>931.9</b>	<b>-0.4</b>	<b>30.7</b>
<b>Middle East</b>										
Bahrain	9.6	10.2	10.6	11.4	11.5	11.8	12.0	12.8	7.2	0.4
Iran	93.2	97.7	100.7	104.7	118.0	131.5	136.6	144.5	5.7	4.8
Iraq	1.3	1.3	1.3	1.7	1.0	1.2	0.8	0.7	-9.1	0.0
Kuwait	11.0	11.3	10.9	11.5	10.3	10.6	12.2	13.1	7.5	0.4
Oman	17.8	21.3	21.6	21.7	22.3	24.4	23.9	26.1	9.2	0.9
Qatar	41.2	45.6	56.9	69.3	80.4	105.0	130.7	141.3	8.1	4.7
Saudi Arabia	64.1	66.2	67.0	72.4	70.6	78.9	83.0	92.5	11.4	3.0
Syria	4.9	5.1	5.0	4.8	5.0	7.2	7.9	6.8	-13.2	0.2
United Arab Emirates	43.0	44.1	45.3	45.2	43.9	46.2	47.1	46.5	-1.2	1.5
Yemen	-	-	-	-	0.7	5.6	8.7	6.8	-21.1	0.2
Other Middle East	1.7	2.3	2.7	3.3	2.7	3.0	4.0	2.4	-39.9	0.1
<b>Total Middle East</b>	<b>287.9</b>	<b>305.1</b>	<b>322.0</b>	<b>345.8</b>	<b>366.6</b>	<b>425.4</b>	<b>466.8</b>	<b>493.6</b>	<b>5.7</b>	<b>16.3</b>

Contd...

• Less than 0.05%

Table 9.3(Contd.): Country-wise Estimates of Production of Natural Gas\*

Country/ Region	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	(Million tonnes oil equivalent)	
									% Change over 2011-12	2012-13 % Share of World's Total Production
<b>Africa</b>										
Algeria	79.4	76.0	76.3	77.2	71.6	72.4	74.4	73.4	-1.5	2.4
Egypt	38.3	49.2	50.1	53.1	56.4	55.2	55.3	54.8	-0.9	1.8
Libya	10.2	11.9	13.8	14.3	14.3	15.1	7.1	11.0	55.2	0.4
Nigeria	22.5	26.7	32.4	32.1	23.4	33.6	36.5	38.9	6.5	1.3
Other Africa	8.9	9.4	11.1	14.2	14.7	16.6	16.7	16.6	-0.8	0.5
<b>Total Africa</b>	<b>159.3</b>	<b>173.2</b>	<b>183.7</b>	<b>190.9</b>	<b>180.4</b>	<b>192.8</b>	<b>190.0</b>	<b>194.6</b>	<b>2.4</b>	<b>6.4</b>
<b>Asia Pacific</b>										
Australia	33.4	35.0	36.0	34.4	38.1	41.0	40.5	44.1	9.1	1.5
Bangladesh	12.4	13.6	14.3	15.3	16.7	17.9	18.1	19.6	8.5	0.6
Brunei	10.8	11.3	11.0	10.9	10.3	11.1	11.5	11.3	-1.8	0.4
China	44.4	52.7	62.3	72.3	76.7	85.4	92.4	96.5	4.4	3.2
<b>India</b>	<b>26.7</b>	<b>26.4</b>	<b>27.1</b>	<b>27.5</b>	<b>35.3</b>	<b>45.8</b>	<b>41.5</b>	<b>36.2</b>	<b>-12.8</b>	<b>1.2</b>
Indonesia	64.1	63.2	60.9	62.7	64.7	73.8	68.3	64.0	-6.3	2.1
Malaysia	55.0	57.0	58.1	58.2	57.0	58.7	58.7	58.7	0.0	1.9
Myanmar	11.0	11.3	12.2	11.2	10.4	11.2	11.5	11.5	-0.3	0.4
Pakistan	32.0	32.5	33.1	33.8	34.6	35.7	35.2	37.3	5.9	1.2
Thailand	21.3	21.9	23.4	25.9	27.8	32.7	33.3	37.3	11.8	1.2
Vietnam	5.8	6.3	6.4	6.7	7.2	8.5	7.6	8.5	10.9	0.3
Other Asia Pacific	9.9	13.1	15.6	16.5	16.7	16.3	16.5	16.3	-1.6	0.5
<b>Total Asia Pacific</b>	<b>326.7</b>	<b>344.3</b>	<b>360.4</b>	<b>375.4</b>	<b>395.6</b>	<b>437.8</b>	<b>435.2</b>	<b>441.2</b>	<b>1.4</b>	<b>14.5</b>
<b>TOTAL WORLD</b>	<b>2509.6</b>	<b>2599.9</b>	<b>2656.5</b>	<b>2756.6</b>	<b>2679.5</b>	<b>2879.3</b>	<b>2968.3</b>	<b>3033.5</b>	<b>2.2</b>	<b>100.0</b>

\* Excluding gas flared or recycled.

Source : Ministry of Petroleum & Natural Gas.

Table 9.4 : Country-wise Estimates of Consumption of Natural Gas

Country/ Region	(Million tonnes oil equivalent)									
	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	% Change 2012-13 over 2011-12	2012-13 % Share of World's Total Consumption
<b>North America</b>										
USA	568.5	560.0	597.3	600.6	590.1	619.3	626.5	654.0	4.4	21.9
Canada	88.0	87.3	86.6	86.5	85.4	85.5	90.8	90.6	-0.1	3.0
Mexico	54.9	60.0	57.1	59.6	65.2	65.2	69.0	75.3	9.2	2.5
<b>Total North America</b>	<b>711.5</b>	<b>707.2</b>	<b>741.0</b>	<b>746.7</b>	<b>740.7</b>	<b>770.1</b>	<b>786.2</b>	<b>820.0</b>	<b>4.3</b>	<b>27.5</b>
<b>South and Central America</b>										
Argentina	36.4	37.6	39.5	40.0	38.8	39.0	41.1	42.6	3.6	1.4
Brazil	17.6	18.5	19.1	22.4	18.1	24.1	24.0	26.2	9.2	0.9
Chile	7.5	7.0	4.1	2.4	2.8	4.8	4.8	5.4	12.1	0.2
Colombia	6.0	6.3	6.7	6.8	7.8	8.2	8.0	8.9	11.2	0.3
Ecuador	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	31.2	0.0
Peru	1.4	1.6	2.4	3.1	3.1	4.9	5.5	6.7	22.0	0.2
Trinidad & Tobago	14.7	19.1	19.7	19.2	19.9	20.9	20.8	19.5	-6.0	0.7
Venezuela	24.7	28.3	26.6	28.3	27.5	29.9	30.0	31.4	4.7	1.1
Other S. & Cent. America	2.9	3.5	4.0	4.3	4.5	4.8	6.0	7.1	18.7	0.2
<b>Total S. &amp; Cent. America</b>	<b>111.5</b>	<b>122.4</b>	<b>122.7</b>	<b>126.8</b>	<b>123.1</b>	<b>137.0</b>	<b>140.8</b>	<b>148.6</b>	<b>5.5</b>	<b>5.0</b>
<b>Europe and Eurasia</b>										
Austria	9.0	8.5	8.0	8.6	8.4	9.1	8.5	8.1	-4.5	0.3
Azerbaijan	7.7	8.2	7.2	8.2	7.0	6.7	7.3	7.6	4.0	0.3
Belarus	16.5	17.1	17.0	17.3	14.5	17.7	16.5	16.7	1.4	0.6
Belgium	14.7	15.0	14.9	14.8	15.1	17.0	14.9	15.2	1.9	0.5
Bulgaria	2.8	2.9	2.9	2.9	2.1	2.3	2.6	2.5	-6.8	0.1
Czech Republic	8.5	8.4	7.8	7.8	7.4	8.4	7.6	7.4	-2.7	0.2
Denmark	4.5	4.6	4.1	4.1	4.0	4.5	3.8	3.5	-6.7	0.1
Finland	3.6	3.8	3.5	3.6	3.2	3.6	3.1	2.8	-10.6	0.1
France	40.9	39.6	38.3	39.8	38.3	42.7	36.8	38.2	4.0	1.3
Germany	77.6	78.5	74.6	73.1	70.2	75.0	67.1	67.7	1.0	2.3
Greece	2.4	2.8	3.4	3.6	3.0	3.3	4.1	3.8	-7.6	0.1
Hungary	12.1	11.5	10.7	10.6	9.1	9.8	9.4	8.8	-6.2	0.3
Republic of Ireland	3.5	4.0	4.3	4.5	4.3	4.7	4.1	4.0	-2.9	0.1
Italy	71.2	69.7	70.0	70.0	64.4	68.5	64.2	61.8	-3.7	2.1
Kazakhstan	8.4	8.9	7.5	7.3	7.0	7.4	8.3	8.5	2.9	0.3
Lithuania	2.9	2.9	3.3	2.9	2.5	2.8	3.1	3.0	-2.3	0.1
Netherlands	35.4	34.3	33.3	34.7	35.0	39.2	34.3	32.8	-4.3	1.1
Norway	4.0	4.0	3.8	3.9	3.7	3.7	3.9	3.9	-0.8	0.1
Poland	12.2	12.4	12.4	13.5	13.0	14.0	14.1	14.9	5.4	0.5
Portugal	3.8	3.7	3.9	4.3	4.2	4.6	4.7	4.2	-9.6	0.1
Romania	15.8	16.3	14.5	14.3	11.9	12.2	12.5	12.1	-3.2	0.4
Russian Federation	354.6	373.5	379.8	374.4	350.7	372.7	382.1	374.6	-2.0	12.5
Slovakia	5.9	5.4	5.1	5.2	4.4	5.0	4.6	5.4	16.1	0.2
Spain	29.1	30.3	31.6	34.8	31.1	31.2	29.0	28.2	-2.6	0.9
Sweden	0.7	0.8	0.9	0.8	1.0	1.4	1.1	1.0	-12.6	0.0
Switzerland	2.8	2.7	2.6	2.8	2.7	3.0	2.7	2.9	7.9	0.1
Turkey	24.2	27.4	32.5	33.8	32.1	35.1	41.2	41.7	1.2	1.4
Turkmenistan	14.5	16.5	19.1	18.5	17.9	20.4	22.5	20.9	-6.8	0.7
Ukraine	62.1	60.3	56.9	54.0	42.3	46.9	48.3	44.6	-7.6	1.5
United Kingdom	85.5	81.1	81.9	89.4	82.1	89.3	74.5	70.5	-5.4	2.4
Uzbekistan	38.4	37.7	41.3	43.8	39.2	41.0	44.2	43.1	-2.6	1.4
Other Europe & Eurasia	15.0	15.6	16.0	15.3	12.6	13.6	14.2	14.5	2.1	0.5
<b>Total Europe &amp; Eurasia</b>	<b>990.5</b>	<b>1008.2</b>	<b>1013.3</b>	<b>1022.7</b>	<b>944.5</b>	<b>1016.6</b>	<b>995.2</b>	<b>975.0</b>	<b>-2.0</b>	<b>32.6</b>

Contd...

Table 9.4(Contd.) : Country-wise Estimates of Consumption of Natural Gas\*

(Million tonnes oil equivalent)										
Country/ Region	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	% Change 2012-13 over 2011- 12	2012-13 % Share of World's Total Consumption
<b>Middle East</b>										
Iran	94.5	97.8	101.7	107.4	118.2	130.1	138.2	140.5	1.7	4.7
Israel	1.5	2.1	2.5	3.7	4.1	4.8	4.5	2.3	-47.9	0.1
Kuwait	11.0	11.3	10.9	11.5	11.1	13.1	15.3	15.5	1.2	0.5
Qatar	16.8	17.6	17.4	17.4	18.0	17.9	19.7	23.5	19.3	0.8
Saudi Arabia	64.1	66.2	67.0	72.4	70.6	78.9	83.0	92.5	11.4	3.1
United Arab Emirates	37.8	39.0	44.3	53.5	53.2	54.7	56.2	56.6	0.7	1.9
Other Middle East	25.5	28.3	29.1	32.9	35.0	39.6	38.3	39.6	3.4	1.3
<b>Total Middle East</b>	<b>251.3</b>	<b>262.3</b>	<b>272.9</b>	<b>298.8</b>	<b>310.2</b>	<b>339.1</b>	<b>355.3</b>	<b>370.6</b>	<b>4.3</b>	<b>12.4</b>
<b>Africa</b>										
Algeria	20.9	21.4	21.9	22.8	24.5	23.7	25.1	27.8	11.1	0.9
Egypt	28.4	32.9	34.5	36.8	38.3	40.6	44.7	47.3	6.0	1.6
South Africa	2.8	3.1	3.1	3.4	3.0	3.5	3.5	3.4	-4.4	0.1
Other Africa	24.9	23.1	26.3	27.8	24.3	29.2	29.3	32.0	9.1	1.1
<b>Total Africa</b>	<b>77.1</b>	<b>80.5</b>	<b>85.9</b>	<b>90.7</b>	<b>90.1</b>	<b>97.0</b>	<b>102.6</b>	<b>110.5</b>	<b>7.8</b>	<b>3.7</b>
<b>Asia Pacific</b>										
Australia	19.9	22.0	23.9	23.0	22.7	23.1	23.0	22.9	-0.7	0.8
Bangladesh	12.4	13.6	14.3	15.3	16.7	17.9	18.1	19.6	8.5	0.7
China	42.1	50.5	63.5	73.2	80.6	96.2	117.5	129.5	10.2	4.3
China Hong Kong SAR	2.4	2.6	2.5	2.9	2.8	3.4	2.7	2.5	-7.9	0.1
<b>India</b>	<b>32.1</b>	<b>33.5</b>	<b>36.1</b>	<b>37.2</b>	<b>45.9</b>	<b>55.7</b>	<b>55.0</b>	<b>49.1</b>	<b>-10.7</b>	<b>1.6</b>
Indonesia	29.9	29.9	28.2	30.0	33.6	36.3	33.5	32.2	-3.9	1.1
Japan	70.7	75.4	81.2	84.4	78.7	85.1	95.0	105.1	10.6	3.5
Malaysia	28.3	30.4	30.1	30.4	29.7	31.0	28.8	30.0	4.2	1.0
New Zealand	3.2	3.3	3.6	3.4	3.6	3.9	3.5	3.8	9.1	0.1
Pakistan	32.0	32.5	33.1	33.8	34.6	35.7	35.2	37.3	5.9	1.2
Philippines	3.0	2.5	3.0	3.1	3.1	2.9	3.2	3.1	-4.0	0.1
Singapore	6.2	6.3	7.8	7.4	7.3	7.6	7.9	7.5	-5.2	0.3
South Korea	27.3	28.8	31.2	32.1	30.5	38.7	41.7	45.0	8.1	1.5
Taiwan	8.5	9.1	9.6	10.5	10.2	12.7	14.0	14.7	5.0	0.5
Thailand	29.3	30.0	31.8	33.6	35.3	40.6	41.9	46.1	9.9	1.5
Vietnam	5.8	6.3	6.4	6.7	7.2	8.5	7.6	8.5	10.9	0.3
Other Asia Pacific	4.7	4.9	5.4	5.1	4.6	5.1	5.6	5.6	1.3	0.2
<b>Total Asia Pacific</b>	<b>357.7</b>	<b>381.6</b>	<b>411.6</b>	<b>432.0</b>	<b>447.0</b>	<b>504.4</b>	<b>534.2</b>	<b>562.5</b>	<b>5.3</b>	<b>18.8</b>
<b>TOTAL WORLD</b>	<b>2499.5</b>	<b>2562.1</b>	<b>2647.3</b>	<b>2717.7</b>	<b>2655.7</b>	<b>2864.1</b>	<b>2914.2</b>	<b>2987.1</b>	<b>2.5</b>	<b>100.0</b>

^ Less than 0.05.

The difference between these world consumption figures and the world production statistics is due to variations in stocks at storage facilities and liquefaction plants, together with unavoidable disparities in the definition, measurement or conversion of gas supply and demand data.

Source : Ministry of Petroleum & Natural Gas.

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**DEFINITIONS OF ENERGY PRODUCTS.****1. Solid fuels**

- i. **Hard Coal:** Coals with a gross calorific value (moist, ash-free basis) which is not less than 24 MJ/kg or which is less than 24 MJ/kg provided that the coal has a vitrinite mean random reflectance greater than or equal to 0.6 per cent. Hard coal comprises anthracite and bituminous coals.
- ii. **Lignite:** Brown coal with a gross calorific value (moist, ash-free basis) less than 20 MJ/kg.
- iii. **Coke:** Products derived directly or indirectly from the various classes of coal by carbonisation or pyrolysis processes, or by the aggregation of finely divided coal or by chemical reactions with oxidising agents, including water.
- iv. **Proved Reserves :**A ‘Proven Mineral Reserve’ is the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified.
- v. **Indicated Reserves:** An ‘Indicated Mineral Resource’ is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics, can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.
- vi. **Inferred Reserves:** An ‘Inferred Mineral Resource’ is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. Due to the uncertainty that may be attached to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure. Inferred Mineral Resources must be excluded from estimates forming the basis of feasibility or other economic studies

## 2. Liquid fuels

- i. **Crude petroleum** A mineral oil of fossil origin extracted by conventional means from underground reservoirs, and comprises liquid or near-liquid hydrocarbons and associated impurities such as sulphur and metals.

Remark: Conventional crude oil exists in the liquid phase under normal surface temperature and pressure, and usually flows to the surface under the pressure of the reservoir. This is termed “conventional” extraction. Crude oil includes condensate from condensate fields, and “field” or “lease” condensate extracted with the crude oil.

The various crude oils may be classified according to their sulphur content (“sweet” or “sour”) and API gravity (“heavy” or “light”). There are no rigorous specifications for the classifications but a heavy crude oil may be assumed to have an API gravity of less than 20° and a sweet crude oil may be assumed to have less than 0.5% sulphur content.

- ii. **Liquefied petroleum** LPG refers to liquefied propane (C<sub>3</sub>H<sub>8</sub>) and butane (C<sub>4</sub>H<sub>10</sub>) or mixtures of both. Commercial grades are usually mixtures of the gases with small amounts of propylene, butylene, isobutene and isobutylene stored under pressure in containers.

Remark: The mixture of propane and butane used varies according to purpose and season of the year. The gases may be extracted from natural gas at gas separation plants or at plants re-gasifying imported liquefied natural gas. They are also obtained during the refining of crude oil.

LPG may be used for heating and as a vehicle fuel. Certain oil field practices also use the term LPG to describe the high vapour pressure components of natural gas liquids.

- iii. **Motor gasoline** A mixture of some aromatics (e.g., benzene and toluene) and aliphatic hydrocarbons in the C<sub>5</sub> to C<sub>12</sub> range. The distillation range is 25°C to 220°C.

Remark: Additives are blended to improve octane rating, improve combustion performance, reduce oxidation during storage, maintain cleanliness of the engine and improve capture of pollutants by catalytic converters in the exhaust system. Motor gasoline may also contain bio-gasoline products.

- iv. **Naphtha's** Light or medium oils distilling between 30°C and 210°C which do not meet the specification for motor gasoline.

Remark: Different naphthas are distinguished by their density and the content of paraffins, isoparaffins, olefins, naphthenes and aromatics. The main uses for naphthas are as feedstock for high octane gasolines and the manufacture of olefins in the petrochemical industry

- v. **Kerosene** Mixtures of hydrocarbons in the range C<sub>9</sub> to C<sub>16</sub> and distilling over the temperature interval 145°C to 300°C, but not usually above 250°C and with a flash point above 38°C.

Remark: The chemical compositions of kerosenes depend on the nature of the crude oils from which they are derived and the refinery processes that they have undergone. Kerosenes obtained from crude oil by atmospheric distillation are known as straight-run kerosenes. Such streams may be treated by a variety of processes to produce



kerosenes that are acceptable for blending as jet fuels. Kerosenes are primarily used as jet fuels. They are also used as domestic heating and cooking fuels, and as solvents. Kerosenes may include components or additives derived from biomass.

- vi. **Gasoline-type Jet fuels** Light hydrocarbons for use in aviation turbine power units, distilling between 100°C and 250°C. They are obtained by blending kerosene and gasoline or naphtha in such a way that the aromatic content does not exceed 25 per cent in volume, and the vapour pressure is between 13.7 kPa and 20.6 kPa.

Remark: Gasoline-type jet fuel is also known as “aviation turbine fuel”.

- vii. **Gas oil / Diesel oil** Gas oils are middle distillates, predominantly of carbon number range C11 to C25 and with a distillation range of 160°C to 420°C.

Remark: The principal marketed products are fuels for diesel engines (diesel oil), heating oils and marine fuel. Gas oils are also used as middle distillate feedstock for the petrochemical industry and as solvents.

- viii. **Fuel oil** Comprises residual fuel oil and heavy fuel oil. Residual fuel oils have a distillation range of 350°C to 650°C and a kinematic viscosity in the range 6 to 55 cSt at 100°C. Their flash point is always above 60°C and their specific gravity is above 0.95. Heavy fuel oil is a general term describing a blended product based on the residues from various refinery processes.

Remark: Other names commonly used to describe fuel oil include: bunker fuel, bunker C, fuel oil No. 6, industrial fuel oil, marine fuel oil and black oil. Residual and heavy fuel oil are used in medium to large industrial plants, marine applications and power stations in combustion equipment such as boilers, furnaces and diesel engines. Residual fuel oil is also used as fuel within the refinery.

- ix. **Lubricants** Oils, produced from crude oil, for which the principal use is to reduce friction between sliding surfaces and during metal cutting operations.

Remark: Lubricant base stocks are obtained from vacuum distillates which result from further distillation of the residue from atmospheric distillation of crude oil. The lubricant base stocks are then further processed to produce lubricants with the desired properties.

- x. **Petroleum coke** Petroleum coke is a black solid obtained mainly by cracking and carbonizing heavy hydrocarbon oils, tars and pitches. It consists mainly of carbon (90 to 95 per cent) and has a low ash content.

The two most important categories are "green coke" and "calcined coke".

- xi. Green coke (raw coke) is the primary solid carbonization product from high boiling hydrocarbon fractions obtained at temperatures below 630°C. It contains 4-15 per cent by weight of matter that can be released as volatiles during subsequent heat treatment at temperatures up to approximately 1330°C.

Calcined coke is a petroleum coke or coal-derived pitch coke obtained by heat treatment of green coke to about 1330°C. It will normally have a hydrogen content of less than 0.1 per cent by weight.

Remark: In many catalytic operations (e.g., catalytic cracking) carbon or catalytic coke is deposited on the catalyst, thus deactivating it. The catalyst is reactivated by burning off the coke which is used as a fuel in the refining process. The coke is not recoverable in a concentrated form

- xii. **Bitumen (Asphalt)** A solid, semi-solid or viscous hydrocarbon with a colloidal structure, being brown to black in color.

Remark: It is obtained as a residue in the distillation of crude oil and by vacuum distillation of oil residues from atmospheric distillation. It should not be confused with the nonconventional primary extra heavy oils which may also be referred to as bitumen. In addition to its major use for road pavements, bitumen is also used as an adhesive, a waterproofing agent for roof coverings and as a binder in the manufacture of patent fuel. It may also be used for electricity generation in specially designed power plants. Bitumen is also known in some countries as asphalt but in others asphalt describes the mixture of bitumen and stone aggregate used for road pavements.

- xiii. **Refinery gas** is a non-condensable gas collected in petroleum refineries (it is also known as still gas).

### 3. Gaseous fuels

- i. **Natural Gas:** A mixture of gaseous hydrocarbons, primarily methane, but generally also including ethane, propane and higher hydrocarbons in much smaller amounts and some noncombustible gases such as nitrogen and carbon dioxide.

Remark: The majority of natural gas is separated from both "non-associated" gas originating from fields producing hydrocarbons only in gaseous form, and "associated" gas produced in association with crude oil. The separation process produces natural gas by removing or reducing the hydrocarbons other than methane to levels which are acceptable in the marketable gas. The natural gas The natural gasliquids (NGL) removed in the process are distributed separately.

- ii. **Coke-oven gas :** A gas produced from coke ovens during the manufacture of coke oven coke.
- iii. **Biogases:** Gases arising from the anaerobic fermentation of biomass and the gasification of solid biomass (including biomass in wastes).

Remark: The biogases from anaerobic fermentation are composed principally of methane and carbon dioxide and comprise landfill gas, sewage sludge gas and other biogases from anaerobic fermentation.

Biogases can also be produced from thermal processes (by gasification or pyrolysis) of biomass and are mixtures containing hydrogen and carbon monoxide (usually known as syngas) along with other components. These gases may be further processed to modify their composition and can be further processed to produce substitute natural gas.

The gases are divided into two groups according to their production: biogases from anaerobic fermentation and biogases from thermal processes. They are used mainly as a fuel but can be used as a chemical feedstock.

#### 4. Electricity

- i. **Installed capacity:** The net capacity measured at the terminals of the stations, i.e., after deduction of the power absorbed by the auxiliary installations and the losses in the station transformers.
- ii. **Utilities:** undertakings of which the essential purpose is the production, transmission and distribution of electric energy. These may be private companies, cooperative organisations, local or regional authorities, nationalised undertakings or governmental organisations.
- iii. **Non-Utilities:** An Independent Power Producer which is not a public utility, but which owns facilities to generate electric power for sale to utilities and end users. They may be privately held facilities, corporations, cooperatives such as rural solar or wind energy producers, and non-energy industrial concerns capable of feeding excess energy into the system
- iv. **Hydro Electricity:** refers to electricity produced from devices driven by fresh, flowing or falling water.
- v. **Thermal Electricity** comprises conventional thermal plants of all types, whether or not equipped for the combined generation of heat and electric energy. Accordingly, they include steam-operated generating plants, with condensation (with or without extraction) or with back-pressure turbines, and plants using internal combustion engines or gas turbines whether or not these are equipped for heat recovery.
- vi. **Nuclear Electricity** is defined as the heat released by the reactors during the accounting period and is obtained by dividing the generation of nuclear electricity by average efficiency of all nuclear power stations.
- vii. **Production** is defined as the capture, extraction or manufacture of fuels or energy in forms which are ready for general use. In energy statistics, two types of production are distinguished, primary and secondary. Primary production is the capture or extraction of fuels or energy from natural energy flows, the biosphere and natural reserves of fossil fuels within the national territory in a form suitable for use. Inert matter removed from the extracted fuels and quantities reinjected flared or vented are not included. The resulting products are referred to as “primary” products. Secondary production is the manufacture of energy products through the process of transformation of primary fuels or energy. The quantities of secondary fuels reported as production include quantities lost through venting and flaring during and after production. In this manner, the mass, energy and carbon within the primary source(s) from which the fuels are manufactured may be balanced against the secondary fuels produced. Fuels, electricity and heat produced are usually sold but may be partly or entirely consumed by the producer. comprises gross production, i.e. the amount of electric energy produced, including that consumed by station auxiliaries and any

losses in the transformers that are considered integral parts of the station. Included is the total production of electric energy produced by pump storage installations.

- viii. **Imports of energy products** comprise all fuel and other energy products entering the national territory. Goods simply being transported through a country (goods in transit) and goods temporarily admitted are excluded but re-imports, which are domestic goods exported but subsequently readmitted, are included. The bunkering of fuel outside the reference territory by national merchant ships and civil aircraft engaged in international travel is excluded from imports. Fuels delivered to national merchant ships and civil aircraft which are outside of the national territory and are engaged in international travel should be classified as “International Marine” or “Aviation Bunkers”, respectively, in the country where such bunkering is carried out (see paragraph 5.12). Note that the “country of origin” of energy products should be recorded as a country from which goods were imported.
- ix. **Exports of energy products** comprise all fuel and other energy products leaving the national territory with the exception that exports exclude quantities of fuels delivered for use by merchant (including passenger) ships and civil aircraft, of all nationalities, during international transport of goods and passengers. Goods simply being transported through a country (goods in transit) and goods temporarily withdrawn are excluded but re-exports, foreign goods exported in the same state as previously imported, are included. Fuels delivered to foreign merchant ships and civil aircraft engaged in international travel are classified as “International Marine” or “Aviation Bunkers”, respectively. Note that “country of destination” of energy products (that is country of the last known destination as it is known at the time of exportation) should be recorded as a country to which these products are exported to.
- x. **Losses** refer to losses during the transmission, distribution and transport of fuels, heat and electricity. Losses also include venting and flaring of manufactured gases, losses of geothermal heat after production and pilferage of fuels or electricity. Production of secondary gases includes quantities subsequently vented or flared. This ensures that a balance can be constructed between the use of the primary fuels from which the gases are derived and the production of the gases.
- xi. **Energy Industries Own Use** refers to consumption of fuels and energy for the direct support of the production, and preparation for use of fuels and energy. Quantities of fuels which are transformed into other fuels or energy are not included here but within the transformation use. Neither are quantities which are used within parts of the energy industry not directly involved in the activities listed in the definition. These quantities are reported within final consumption.

### *5. Non-commercial Energy Sources*

- i. **Fuelwood, wood residues and by-products:** Fuel wood or firewood (in log, brushwood, pellet or chip form) obtained from natural or managed forests or isolated trees. Also included are wood residues used as fuel and in which the original composition of wood is retained.  
Remark: Charcoal and black liquor are excluded.

- ii. **Charcoal** The solid residue from the carbonisation of wood or other vegetal matter through slow pyrolysis.
- iii. **Bagasse** The fuel obtained from the fiber which remains after juice extraction in sugar cane processing.

## ANNEX -II

## Conversion Factors

1 kilogram	=	2.2046 pounds
1 Pound	=	454 gm.
1 Cubic metres		35.3 cubic feet (gas)
1 Metric ton	=	1 Tonne
	=	1000 kilogram
1 joule	=	0.23884 calories
1 mega joule	=	$10^6$ joules = $238.84 \times 10^3$ calories
1 giga joule	=	$10^9$ joules = $238.84 \times 10^6$ calories
1 tera joule	=	$10^{12}$ joules = $238.84 \times 10^9$ calories
1 peta joule	=	$10^{15}$ joules = $238.84 \times 10^{12}$ calories
One million tonnes of coal in		
	1970-81	= 20.93 peta joules of energy.
	1982-83	= 19.98 peta joules of energy.
	1984-89	= 19.62 peta joules of energy.
	1990-96	= 17.81 peta joules of energy.
	1997-99	= 17.08 peta joules of energy.
	1999-00	= 16.93 peta joules of energy.
	2000-01	= 16.88 peta joules of energy.
	2001-02	= 16.87 peta joules of energy.
	2002-03	= 16.68 peta joules of energy.
	2003-04	= 16.69 peta joules of energy.
	2004-05	= 16.60 peta joules of energy.
	2005-06	= 16.03 peta joules of energy.
	2006-12	= 16.14 peta joules of energy
One million tonnes of oil equivalent (MTOE)	=	41.87 peta joules of energy.
	=	$4.1868 \times 10^4$ terajoule (TJ)
One billion cubic metre of natural gas	=	38.52 peta joules of energy.
One million cubic metre of natural gas	=	38.52 tera joules of energy.
	=	.03852 peta joules of energy.
One billion kilowatt hour of electricity	=	3.60 peta joules of energy.

## ANNEX-III

**Abbreviations**

ATF	:	Aviation Turbine Fuel
HSDO	:	High Speed Diesel Oil
LDO	:	Light Diesel Oil
LSHS	:	Low Sulphur Heavy Stock
LPG	:	Liquefied Petroleum Gas
MS/MOGAS	:	Motor Spirit/Motor Gasoline
F.O.	:	Furnace Oil
M.T.O.	:	Mineral Turpentine Oil
PET-COKE	:	Petroleum Coke
SBPS	:	Special Boiling Point Spirit
SKO	:	Superior Kerosene Oil
CPEs	:	Centrally Planned Economies
N.C.W.	:	Non-communist World
O.P.E.C.	:	Organisation of Petroleum Exporting Countries
O.E.C.D.	:	Organisation for Economic Cooperation & Development
EMEs	:	Emerging Market Economies (includes countries of South & Central America, Africa, Middle-east, Non-OECD Asia & Non-OECD Europe)
MW	:	Megawatt
KW	:	Kilowatt
(P)	:	Provisional

## ANNEX- IV

## Energy Data Collection Mechanisms

### I. Coal and Coal Derivatives

**I.1 Organisational set up:** The Coal controller's Office is a subordinate office of M/o Coal having headquarter in Kolkata and five field offices at Dhanbad, Ranchi, Bilaspur and Nagpur. The Statistical Division of coal controller's Office, working under overall guidance of Coal Controller located at Kolkata is having a Deputy Director General and Deputy Director from Indian Statistical Service.

**I.2. Current Activities:** Statistics division of Coal Controller's Office (CCO) is looking after all work related to coal and lignite statistics. Major role of this division are as under:-

- Collection, compilation, analysis and dissemination of Coal Statistics
- Undertake Annual Survey of Coal and Lignite Industry to assess production, dispatch, stock at pithead etc.
- To monitor the progress of captive coal and lignite blocks
- To maintain a database of washeries in India

**I.3 Future initiatives:-** To develop a more robust database, Coal Controller's Office needs to conduct own survey on various aspect of coal statistics like reserve, production, dispatch, stock at pithead etc.

#### I.4. Details of data flows/ items:

- **Data items-** The organization is collecting data on the following items on regular basis:-

ITEMS	PERIODICITY
1.Reserve (from GSI)	Annual
2.Production (from coal/ lignite company)	Monthly
3.Despatches (from coal/ lignite company)	-do-
4. Pit head closing stock ( ” )	-do-
5. Price (for non-captive coal mines)	-do-
6. Wagon Loading (Rail)(from CIL/ SCCL)	-do-
7. Import & Export (DGC&S)	-do-
8. Coal consumption in steel (from SAIL/RINL/TSL)	Monthly
9. Coal consumption in power & cement sector (from CEA etc.)	Annual
10. Captive coal & lignite mining	Monthly
11. Washery in India	Monthly
12. World Coal Statistics (from IEA)	Annual
13.Colliery-wise production data	Annual

- **Data sources and Act/ Order/ Rule etc.**

The data are collected from different coal/ lignite companies under the statutory power vested with the Coal Controller under the provisions of Collection of Statistics Act,



1953, the Colliery Control Rule, 2004 and Coal Mines (Conservation & Development) Act, 1974 and publications of CIL, SAIL and DGCIS.

- **Methodology of Data Collection**

**Monthly Data-** Data are collected from coal companies (pvt. And pub) on monthly basis on some major parameters.

**Annual survey-** Complete enumeration (through mailed questionnaire) and sample check by physical inspection in Annual Survey of Coal and Lignite Industries.

Coverage:- Entire coal and lignite producing sector.

Response:- 100%

- Details of data items being compiled and periodicity

ITEMS	PERIODICITY
1. Coal production data for PMO	Monthly
2. Data for Infrastructure Bulletin of MOSPI through MOC	Monthly
3. Data for IIP(Covering Washed Coal, Middlings, Hard Coke)	Monthly
4. Data for IIP of Mineral Sector (Coal & Lignite – state-wise)	Monthly
5. Provisional Coal Statistics	Annual
6. Coal Directory of India- Vol I & II	Annual
7. U. N. Annual energy Report- through CSO	Annual
8. IEA( for energy balance in case of non-OECD country: India)	Annual
9. Ad-hoc Reports	As and when required

## II. *Petroleum and Natural Gas*

The Ministry of Petroleum and Natural Gas is mandated to take measures for exploration and exploitation of petroleum resources including natural gas and coal bed methane, and also distribution, marketing and pricing of petroleum products.

### II.1. **Organizational set up and activities**

Ministry of Petroleum has an Economic and Statistics Division headed by Economic Adviser. The Division provides economic inputs to the Divisions of the Ministry after detailed analysis of the plan and programmes. An exhaustive data base is maintained on production and trade of crude oil, natural gas, petroleum products and stages of capacity creation by the petroleum industry. The Economic and Statistics Division is involved in the plan formulation exercise of the public sector enterprises associated with petroleum exploration, production, refining and marketing. Also, all issues pertaining to foreign investment policy in the petroleum sector and issues relating to Double Taxation Avoidance Agreement (DTAA) on Income & Capital etc. are handled in the Division.

The Division brings out the following reports for monitoring the performance of Petroleum & Natural gas products:

❑ **Monthly & Quarterly Reports on Petroleum Statistics:** Collection, compilation and submission of Reports on:

- (i) Production of Crude Oil, Natural Gas and Petroleum Products- to Ministries/Department/Committees etc. on monthly basis.
- (ii) Quarterly report on Production Performance- to Ministry of Statistics & Programme Implementation;
- (iii) Import/Export of Crude Oil and Petroleum Products- to the designated Ministries/Departments.
- (iv) Joint Oil Data Initiative Statistics - to United Nations Statistics Division.

❑ **Publication of Annual Basic Statistics on Petroleum & Natural Gas Products and Annual Indian Petroleum & Natural Gas Statistics**

### II.2. **Details of the data flows and items**

**Data Collected:** Production of Crude Oil, all Petroleum Products, Natural Gas, LNG, Imports/Exports of Oil & Petroleum products, Consumption of Petroleum Products and Refinery intake etc. on monthly basis and apart from these data other related data for publication of “Basic Statistics on Indian Petroleum & Natural Gas Products” and “Indian Petroleum & Natural Gas Statistics” being collected annually.

**Periodicity & Data Sources:** The data being collected on monthly, quarterly, annual basis from all Public Sector Undertakings and Private Oil Companies including oil refineries.

**Methods of Data Collection:** Data collected through electronic mail, FAX as well as hard copy by post.

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**Data Dissemination Methods:** Monthly, Quarterly and Annual Progress Reports circulated to all concerned and also uploaded on Ministry's web site for the public user.

### **II.3. Provisions under which statutory returns are collected for the petroleum sector:**

#### **(i) For returns on crude oil and natural gas**

##### **- Principal Legislation:**

THE OILFIELDS (REGULATION AND DEVELOPMENT) ACT, 1948  
(53 of 1948) (8TH SEPTEMBER, 1948)

##### **- Subordinate Legislation:**

THE PETROLEUM AND NATURAL GAS RULES, 1959  
(As amended from time to time)

#### **Section 14:** Royalty on petroleum and furnishing of returns and particulars:

(2) The lessee shall, within the first seven days of every month or within such further time as the Central Government or the State Government, as the case may be, may allow, furnish or cause to be furnished to the Central Government or the State Government as the case may be a full and proper return showing the quantity of all crude oil, casing head condensate and natural gas obtained during the preceding month from mining operations conducted pursuant to the lease. The monthly return required to be furnished shall be, as nearly as may be, in the form specified in the schedule annexed to these rules.

#### **(ii) For returns on refinery output (petrol, diesel etc)**

##### **-Principal Legislation:**

THE INDUSTRIES (DEVELOPMENT AND REGULATION) ACT, 1951, (ACT NO. 65 OF 1951)

##### **-Subordinate Legislation:**

Scheduled Industries (Submission of Production Returns) Rules, 1979.

**Section 6:** However, collection of data is also governed by the Gazette of India (Extraordinary) Part II-Section 3-Sub Section (i) order No.G.S.R.272(E) dated 16.04.1999 wherein clause 8 states that "Every oil refining company shall furnish to the Central Government or an agency nominated by Central Government any and every information that may be asked for in regard to the procurement, stocking, movements (onshore or offshore), transfers, imports, exports and sales of crude oil and or all products at such period, in such manner and from such of the sources, as may be specified from time to time".

### **III. Electricity**

#### **III.1 Organisational Setup**

The Central Electricity Authority (CEA) is the nodal authority for supply of electricity data. It is a statutory organization under M/o Power, constituted under Section 3 of the repealed Electricity (Supply) Act, 1948. It was established as a part-time body in the year 1951 and made a full-time body in the year 1975.

With the objective of reforming the Power Sector, the Electricity Act, 2003 (No. 36 of 2003) has been enacted and the provisions of this Act have been brought into force with effect from 10<sup>th</sup> June, 2003.

#### **III.2 Functions**

As per section 73 of the Electricity Act, 2003, the Central Electricity Authority shall perform such functions and duties as the Central Government may prescribe or direct, and in particular to -

- a) advise the Central Government on the matters relating to the national electricity policy, formulate short-term and perspective plans for development of the electricity system and coordinate the activities of the planning agencies for the optimal utilization of resources to sub serve the interests of the national economy and to provide reliable and affordable electricity to all consumers;
- b) specify the technical standards for construction of electrical plants, electric lines and connectivity to the grid;
- c) specify the safety requirements for construction, operation and maintenance of electrical plants and electric lines;
- d) specify the Grid Standards for operation and maintenance of transmission lines;
- e) specify the conditions for installation of meters for transmission and supply of electricity;
- f) promote and assist in the timely completion of schemes and projects for improving and augmenting the electricity system;
- g) promote measures for advancing the skills of persons engaged in electricity industry;
- h) advise Central Government on any matter on which its advice is sought or make recommendation to that Government on any matter if, in the opinion of the Authority, the recommendation would help in improving the generation, transmission, trading, distribution and utilization of electricity;
- i) collect and record the data concerning the generation, transmission, trading, distribution and utilization of electricity and carry out studies relating to cost, efficiency, competitiveness and such like matters;
- j) make public from time to time the information secured under this Act, and provide for the publication of reports and investigations;
- k) promote research in matters affecting the generation, transmission, distribution and trading of electricity;
- l) carry out, or cause to be carried out, any investigation for the purpose of generating or transmitting or distributing electricity;
- m) advise any State Government, licensees or the generating companies on such matters which shall enable them to operate and maintain the electricity system under their ownership or control in an improved manner and where necessary, in coordination with any other Government, licensee or the generating company owning or having the control of another electricity system;

- n) advise the Appropriate Government and the Appropriate Commission on all technical matters relating to generation, transmission and distribution of electricity; and
- o) discharge such other functions as may be provided under this Act.

### **III.3. Details of the data Flows/ Items**

In exercise of the powers conferred by section 177, read with section 74 and clause (i) of section 73 of the Electricity Act, 2003, the Central Electricity Authority published the regulations vide Extra Ordinary Gazette notification dated 19<sup>th</sup> April 2007, namely:- **Central Electricity Authority (Furnishing of Statistics, Returns and Information) Regulations, 2007**

#### **(a) Sources of Statistics, Returns and Information**

All licensees, generating companies and person(s) mentioned below, but not limited to, shall furnish to the Authority such statistics, returns or other information relating to generation, transmission, distribution, trading and utilization of electricity at such times and in such form and manner as specified under these regulations-

#### **□ Licensees**

- (i) Transmission Licensees;
- (ii) Distribution Licensees;
- (iii) Trading Licensees;
- (iv) Central Transmission Utility;
- (v) State Transmission Utilities;
- (vi) Appropriate Governments who are responsible for transmitting, distributing or trading of electricity;
- (vii) Damodar Valley Corporation established under sub-section (1) of section 3 of the Damodar Valley Corporation Act, 1948 (14 of 1948);
- (viii) Any person engaged in the business of transmission or supply of electricity under the provisions of the repealed laws or any act specified in the Schedule;
- (ix) Any person who intends to generate and distribute electricity in a rural area as notified by the State Government;
- (x) State Electricity Boards;
- (xi) Local authorities including Cantonment Boards;
- (xii) Deemed licensees and entities exempted from license.
- (xiii) Bhakra Beas Management Board.

#### **□ Generating companies**

- (i) Generating companies established by appropriate Governments;
- (ii) Independent Power Producers;
- (iii) Appropriate Governments responsible for generating electricity;
- (iv) Bhakra Beas Management Board;
- (v) Any person engaged in the business of generating electricity under the provisions of the repealed laws or any act specified in the Schedule;
- (vi) Damodar Valley Corporation.

❑ **Person(s) generating electricity for own use:**

- (i) All captive power producers;
- (ii) Any other person including Co-operative Society, Association of persons, body of individuals, etc. engaged in generating electricity for its or his own use.

❑ **Other entities**

- (i) National Load Despatch Centre;
- (ii) Regional Load Despatch Centre(s);
- (iii) State Load Despatch Centre(s);
- (iv) Regional Power Committee(s);
- (v) High voltage or extra high voltage consumers of electricity.

**(b) Formats for furnishing of statistics, returns or information –**

The entities shall furnish the statistics, returns and information as per the formats annexed to these regulations titled “List of formats, frequency(ies) and target date(s)”. These formats can also be obtained from the website of the Central Electricity Authority. (website [www.cea.nic.in](http://www.cea.nic.in))

**(c) Time schedule for furnishing of statistics, returns or information –**

The time schedule or targets for furnishing of statistics, returns or information is specified by the Authority on its prescribed formats.

**(d) Frequency of submission of statistics, returns or information –**

The frequency of submission i.e. daily, weekly, monthly, quarterly or annually is specified by the Authority in its prescribed formats.

**(e) Manner of furnishing the statistics, returns or information –**

The statistics, returns or information in the prescribed formats shall be furnished to the Authority preferably electronically or by post or courier or fax.

### III.4 Data collection problems

The Central Electricity Authority is receiving data from various Public and Private Entities/ Utilities / Organizations/Industries. Though, it is mandatory to these organizations to furnish the correct, complete data in time, yet the following problems are being faced in collection of data.

1. Delay in furnishing data.
2. Furnishing incomplete/ incorrect data.
3. Non submission of data.

For smooth collection of the electricity data, CEA is installing electronic data collection system titled as Information Management System (IMS), where all the returns of electricity data can be directly furnished by concerned party (licensees, generating companies, entities etc.)

## **IV. New and Renewable Energy**

### **IV.1. Nodal ministry**

Ministry of New and Renewable Energy (MNRE) is the nodal Ministry of the Government of India at the National level for all matters relating to new and renewable energy. The Ministry has been facilitating the implementation of broad spectrum programmes including harnessing renewable power, renewable energy to rural areas for lighting, cooking and motive power, use of renewable energy in urban, industrial and commercial applications and development of alternate fuels and applications. In addition, it supports research, design and development of new and renewable energy technologies, products and services.

### **IV.2. Organisational setup**

It is broadly organized into eight Groups dealing with 'Bio-Energy, Research & Development and TIFAD(Technology Information Forecasting, Assessment and Databank ), Solar Energy', and Remote Village Electrification', Biomass and Wind Power', 'Energy for Urban, Industrial & Commercial Applications', 'Small Hydro and Information & Public Awareness', 'Hydrogen Energy' and 'Administration and Coordination'. In addition, the Ministry has an Integrated Finance Division, which is functioning under the Special Secretary and Financial Adviser. The Ministry is classified as a Scientific Ministry.

### **IV.3. Current responsibilities**

Formulating policies and programmes for the development of new and renewable sources of energy;

- (a) Coordinating and intensifying research and development activities in new and renewable sources of energy;
- (b) Ensuring implementing of Government's policies in regard to all matters concerning new and renewable sources of energy.

### **IV.4. Data flows**

The basic data being compiled includes year wise and month wise no. of systems installed, their capacities, locations, etc. and is obtained from various stakeholders i.e. State Government Departments/Nodal Agencies, NGOs, Private Entrepreneurs, etc. Annual statistical information regarding achievements under different programmes/schemes is being included in the yearly Annual Report of the Ministry.