



सत्यमेव जयते

ENERGY STATISTICS 2016



CENTRAL STATISTICS OFFICE

MINISTRY OF STATISTICS AND PROGRAMME IMPLEMENTATION

GOVERNMENT OF INDIA

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ENERGY STATISTICS

2016
(Twenty Third Issue)

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

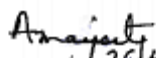
FOREWORD

Energy sector is one of the basic infrastructure sectors. Energy demand in agriculture, industrial, commercial and household sectors has increased tremendously and placed enormous pressure on its resources. The depleting resources and increasing pollution of environment due to energy use has necessitated optimum use of its resources; which in turn requires proper energy planning to achieve energy security. For proper planning to optimize its use, an integrated and updated database of production and consumption of different sources viz. coal, crude petroleum, natural gas and electricity is needed. Good energy statistics will allow monitoring of energy generation from various sources, its use in different sectors, losses and damages done to environment by various processes.

India's substantial and sustained economic growth is placing enormous demand on its energy resources. A long-term energy policy perspective is provided by the Integrated Energy Policy Report 2006 which provided policy guidance on energy sector growth. India's crude oil and natural gas production has been stagnating in recent years. The widening of the demand supply gap has increased the dependency on imports. Presently, almost 83% of India's crude oil availability is through imports. To reduce dependency on imports, India's strategy is the encouragement of the development of renewable sources of energy by the use of incentives by the Federal and State governments including the use of nuclear energy, promoting windfarms and solar energy.

For proper planning of energy resources and monitor its usage, energy statistics are published in India in the annual publication "Energy Statistics". The publication aims to provide an analytical overview of the current trends of the energy sector, which is divided into sub segments viz. reserves, installed capacity, potential for generation, production, consumption, import, export and wholesale price of various energy commodities etc. It provides information on renewable energy resources like solar, wind, small hydro, biomass/bio-fuels, waste to energy etc. It includes analytical indicators viz. growth rates, compound annual growth rates (CAGR), percentage distribution etc. to increase the utility of the publication.

The data in the publication has been sourced from various Ministries of the Government of India. The co-operation and support provided by these Ministries/Departments in compiling this publication is appreciated. I also appreciate the efforts of the officers of Economic Statistics Division, Central Statistics Office in bringing out this publication in a time bound manner. Any suggestion to improve the presentation of statistics in this publication is welcome.


(Smt. Amarjeet Kaur)

DIRECTOR GENERAL (CSO)

New Delhi
April 2016.

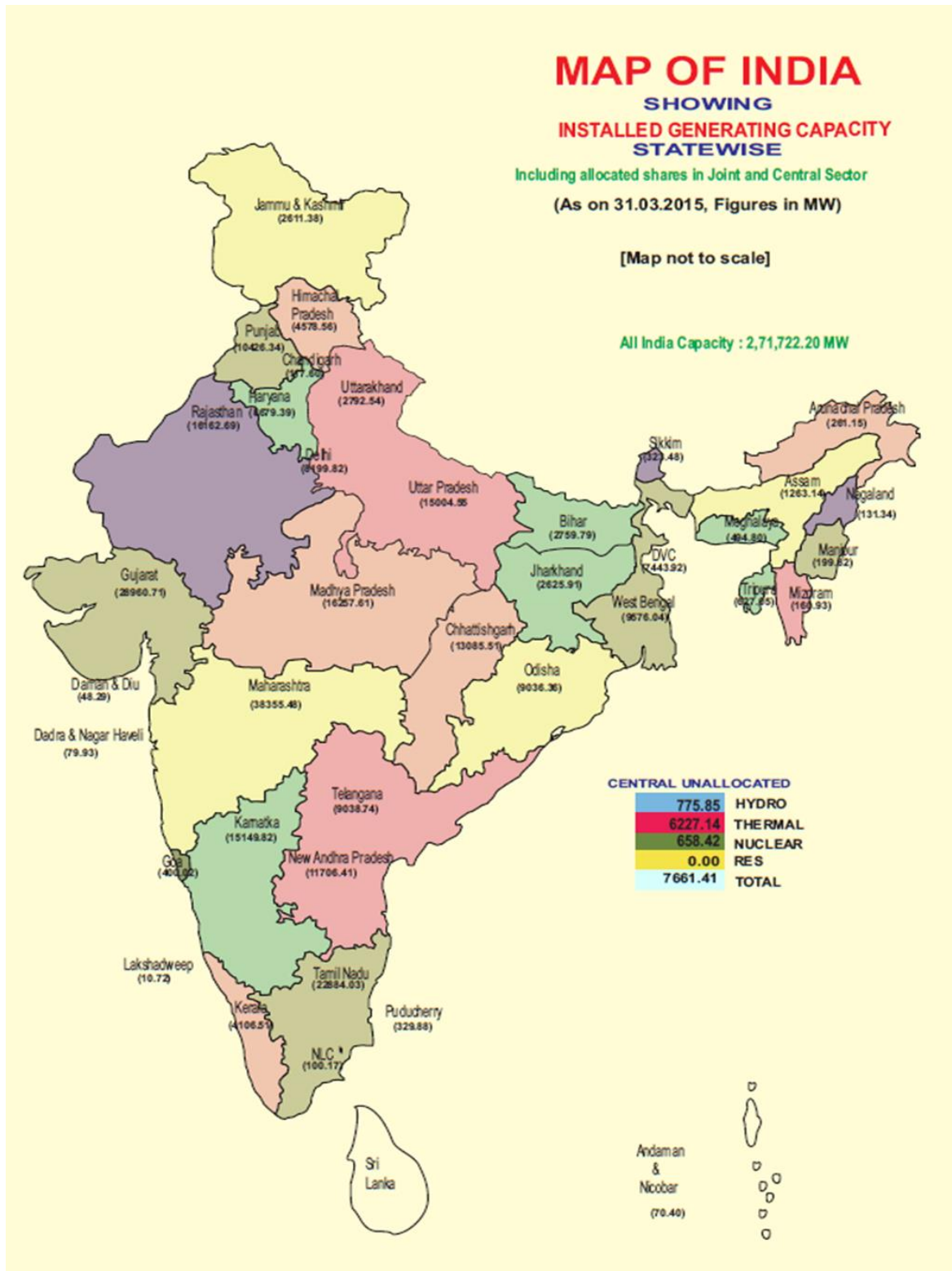
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ENERGY MAPS OF INDIA



Source: Growth of Electricity Sector
in India from 1947-2015, CEA

Nuclear Facilities in India



Source : Nuclear Power Corporation of India Ltd.

METADATA-ENERGY STATISTICS

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2. Statistical presentation	
2.1 Data sources	
The data contained in this publication has been sourced from the Ministry of Petroleum and Natural Gas, Central Electricity Authority, Office of Coal Controller, Ministry of New and Renewable Energy, Office of the Economic Advisor and Ministry of Commerce and Industry.	
2.2. Data description	
The statistics present information about the reserves, installed capacity, potential for generation, production, consumption, import, export and wholesale prices of different energy commodities.	
2.3. Sector coverage	
Coal & Lignite, Petroleum & Natural Gas, Renewable Energy Resources and Electricity (Data collection Mechanism is given in Annex:IV)	
2.4. Data content	
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.	
2.5. Statistical unit	
Data are aggregated appropriately at national and state level.	
2.6. Statistical population	
Data covers all the energy commodity sources.	
2.7. Reference area	
The energy industries of the entire country are covered.	
2.8. Time coverage	
In the current publication, the data given is for the period 2005-06 to 2014-15 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.	
2.9. Base period	
2004-05 for WPI and 2011-12 for GDP data pertaining to 2014-15	
2.10. Statistical concepts and definitions	
The main Concepts and Definitions are given in Annex: I. (Annex: II & Annex: III 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 Tonne for petroleum products etc.). Prices are indicated by Wholesale Price Index. The Energy Balance is given in Kilo Tonne of oil equivalent. Consumption and Production of the Energy resources is also given in petajoules.

4. Reference period

Reference period of the Publication of "Energy Statistics -2016" is the financial year 2014-15 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 website 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 equally. 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 is available 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. CSO 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 and few energy indicators are available 12 months after the reference year. Final data for the year are published 24 months after the end of the reference year.

11.2. Punctuality

Annual publication on Energy Statistics is released in time every year.

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

The annual publication provides 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 2017.

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

Energy data are collected from the source agencies at national level and presented in the publication. It is published in the Ministry's website.

13.2. Frequency of data collection

Annual.

13.3. Data collection

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

13.4. Data validation

Checks are carried out on the data before publishing it.

13.5. Data compilation

National figures are compiled by aggregating the data received from the source agencies.

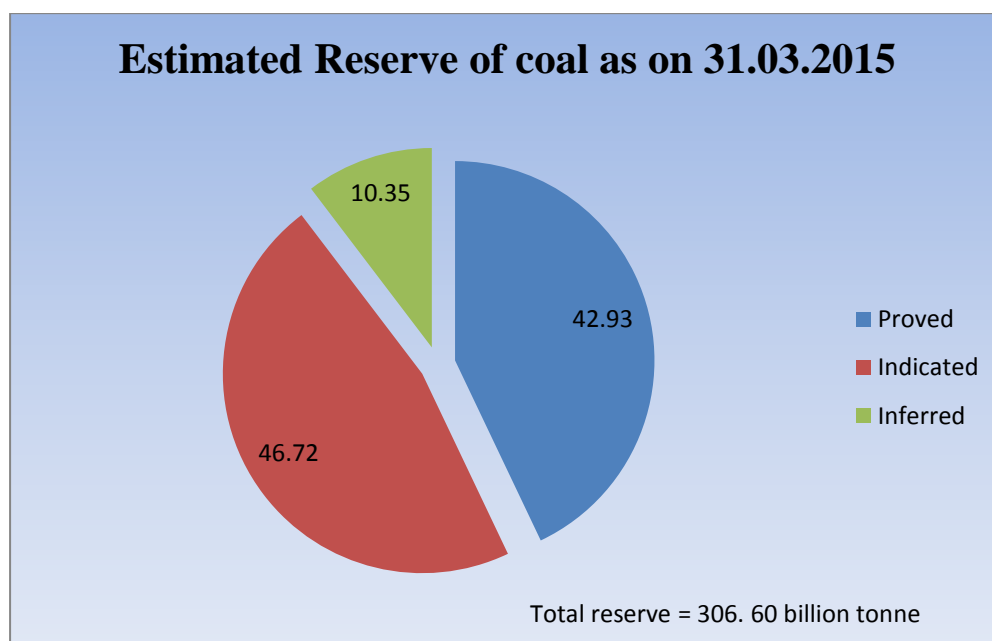
13.6. Adjustment

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

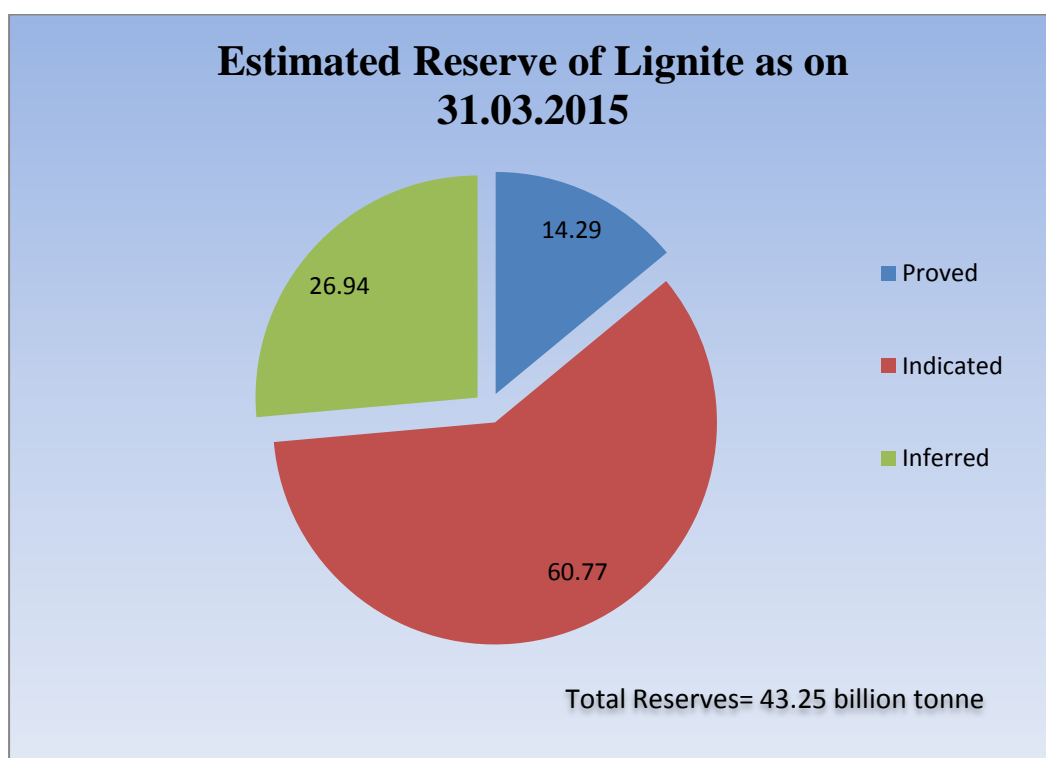
CHAPTER 1: RESERVES AND POTENTIAL FOR GENERATION

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, Madhya Pradesh, Telangana and Maharashtra account for 99.08% of the total coal reserves in the country. The State of Jharkhand had the maximum share (26.44%) in the overall reserves of coal in the country as on 31st March 2015 followed by the State of Odisha (24.72%) (Table 1.1).
- ❖ As on 31.03.15, the estimated reserve of coal was 306.60 billion tonnes, an addition of 5.04 billion over the last year (Table 1.1). There has been an increase of 1.67% in the estimated coal reserves during the year 2014-15 with Chattisgarh accounting for maximum increase of 4.53%.

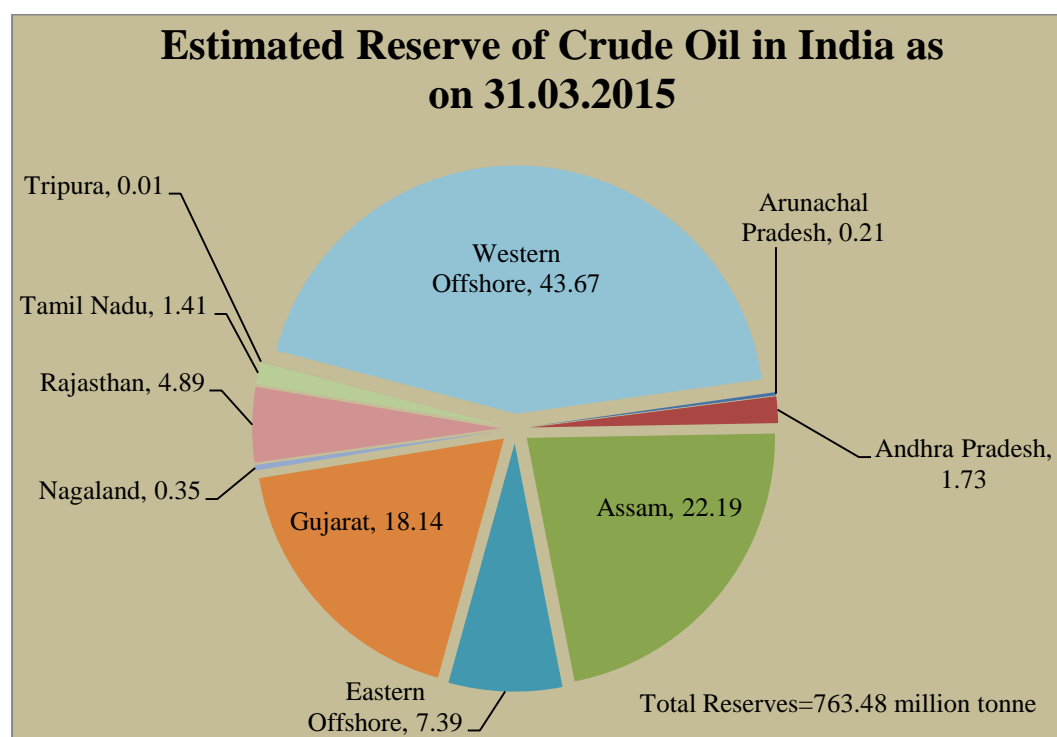


- ❖ The estimated total reserve of lignite as on 31.03.15 was 43.25 billion Tonne which is equivalent to the total reserve as on 31.03.14. (Table 1.1(A)).

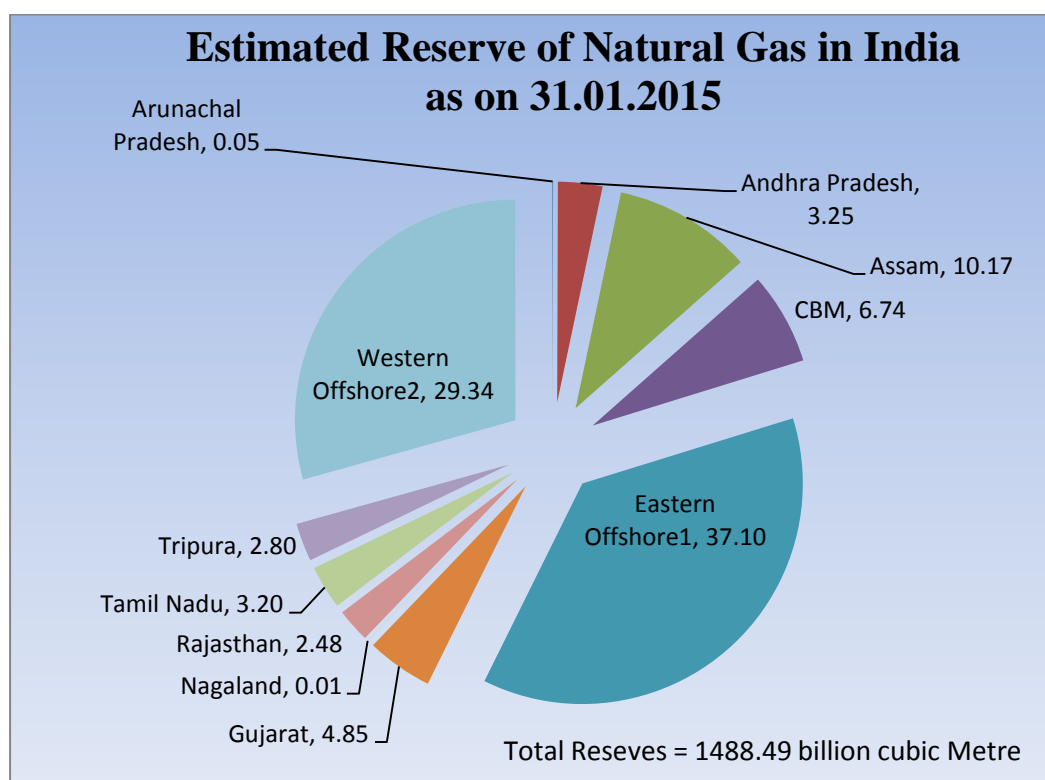


1.2 Petroleum and Natural gas

- ❖ The estimated reserve of crude oil in India as on 31.03.2015 stood at 763.48 million tonne (MT) (Table 1.2).
- ❖ Geographical distribution of Crude oil indicates that the maximum reserves are in the Western Offshore (43.67%) followed by Assam (22.19%), whereas the maximum reserves of Natural Gas are in the Eastern Offshore (37.10%) followed by Western offshore (29.34%). (Table 1.2).



- ❖ There was increase of 0.10% in the estimated reserve of crude oil for the country as a whole during 2014-15 as compared to the position an year ago. During the same period, estimated reserves of crude oil in Arunachal Pradesh, Rajasthan and Assam decreased by 44.75%, 17.04% and 2.11% respectively, while the same in Tamil Nadu, Andhra Pradesh, Gujarat, Western Offshore and Eastern Offshore increased by 18.42 %, 15.30% , 2.58%, 1.88% and 0.59% respectively.
- ❖ The estimated reserves of natural gas in India as on 31.03.2015 stood at 1488.49 billion cubic meters (BCM) (Table 1.2).

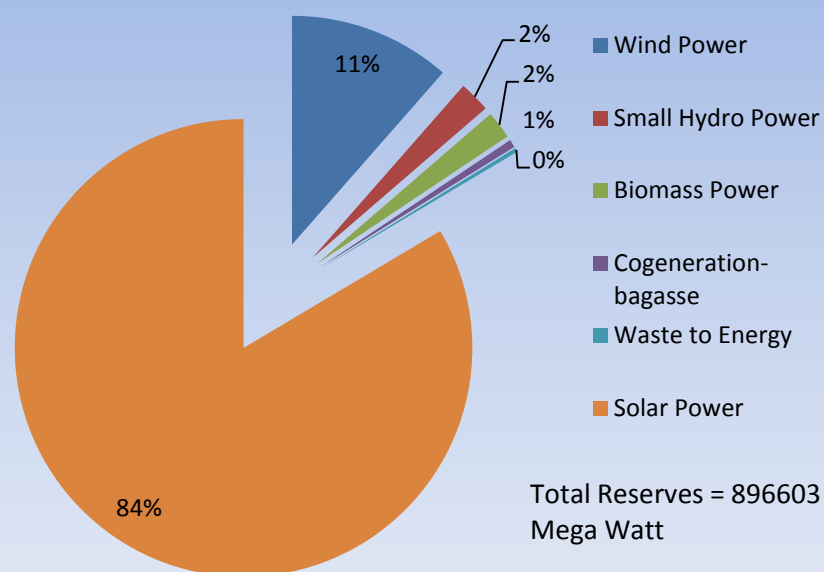


- ❖ In case of Natural Gas, the increase in the estimated reserve over the last year was 1.40%. The maximum contribution to this increase has been from Eastern Offshore (37.10%), followed by Western Offshore (29.34%).

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 31.03.15 is estimated at 896603 MW (Table 1.3). This includes wind power potential of 102772 MW (11.46%), SHP (small-hydro power) potential of 19749 MW (2.20%), Biomass power potential of 17,538 MW (1.96%), 5000 MW (0.56%) from bagasse-based cogeneration in sugar mills and solar power potential of 748990 MW (83.54%).
- ❖ The geographic distribution of the estimated potential of renewable power as on 31.03.2015 reveals that Rajasthan has the highest share of about 17% (148518MW), followed by Jammu and Kashmir with 13% share (118208) and Gujarat with 8% share (72726MW), mainly on account of solar power potential.

Sourcewise Estimated Potential of Renewable Power in India as on 31.03.15



Statewise Estimated Potential of Renewable Power in India as on 31.03.15

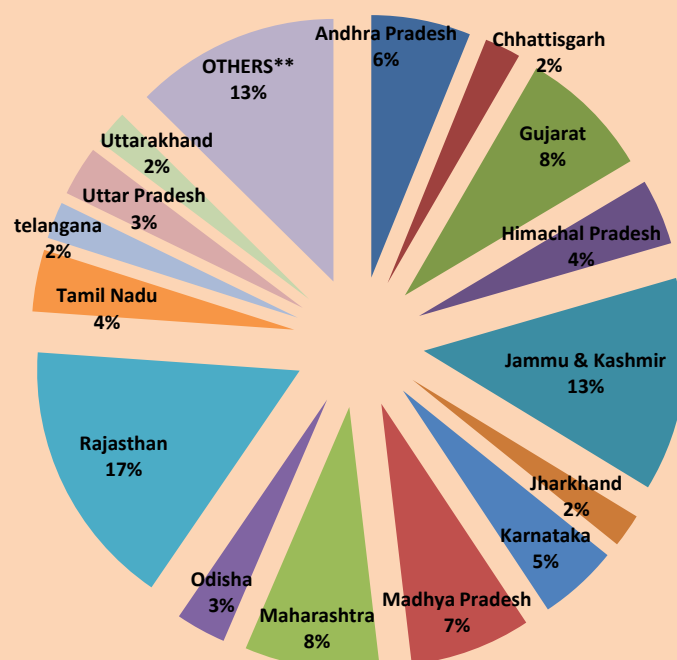


Table 1.1: Statewise Estimated Reserves of Coal in India as on 31.03.2014 and 31.03.2015

(in Billion Tonne)

States/ UTs	Proved		Indicated		Inferred		Total		Distribution (%)	
	31.03.2014	31.03.2015	31.03.2014	31.03.2015	31.03.2014	31.03.2015	31.03.2014	31.03.2015	31.03.2014	31.03.2015
Arunachal Pradesh	0.47	0.47	0.05	0.05	0.00	0.00	0.52	0.52	0.17	0.17
Assam	0.03	0.03	0.04	0.04	0.02	0.02	0.09	0.09	0.03	0.03
Bihar	0.00	0.00	0.00	0.00	0.16	0.16	0.16	0.16	0.05	0.05
Chhattisgarh	16.05	18.24	33.25	34.39	3.23	2.29	52.53	54.91	17.42	17.91
Jharkhand	41.38	41.46	32.78	33.03	6.56	6.56	80.72	81.05	26.77	26.44
Madhya Pradesh	10.41	10.41	12.38	12.78	2.88	3.34	25.67	26.54	8.51	8.66
Maharashtra	5.67	5.95	3.19	3.19	2.11	2.11	10.96	11.25	3.64	3.67
Meghalaya	0.09	0.09	0.02	0.02	0.47	0.47	0.58	0.58	0.19	0.19
Nagaland	0.01	0.01	0.00	0.00	0.31	0.31	0.32	0.32	0.10	0.10
Odisha	27.79	30.75	37.87	36.55	9.41	8.51	75.07	75.80	24.89	24.72
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	0.35	0.35
West Bengal	13.40	13.52	13.02	13.01	4.89	4.91	31.32	31.44	10.39	10.25
Telangana	9.73	9.81	9.67	9.96	3.07	3.03	22.47	22.79	7.45	7.43
All India Total	125.91	131.61	142.50	143.24	33.15	31.74	301.56	306.60	100.00	100.00
Distribution (%)	41.07	42.93	46.48	46.72	10.81	10.35	100.00	100.00		

Source: Office of Coal Controller, Ministry of Coal

Table 1.1(A) :Statewise Estimated Reserves of Lignite in India as on 31.03.2014 and 31.03.2015

(in Billion Tonne)

States/ UTs	Proved		Indicated		Inferred		Total		Distribution (%)	
	31.03.2014	31.03.2015	31.03.2014	31.03.2015	31.03.2014	31.03.2015	31.03.2014	31.03.2015	31.03.2014	31.03.2015
Gujarat	1.28	1.28	0.28	0.28	1.16	1.16	2.72	2.72	6.29	6.29
Jammu & Kashmi	0.00	0.00	0.02	0.02	0.01	0.01	0.03	0.03	0.06	0.06
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	0.96	0.96
Rajasthan	1.17	1.17	2.67	2.67	1.88	1.89	5.72	5.72	13.23	13.23
TamilNadu	3.74	3.74	22.90	22.90	7.71	8.57	34.35	34.35	79.42	79.42
West Bengal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01
All India	6.18	6.18	26.28	26.28	10.78	11.65	43.25	43.25	100.00	100.00
Distribution (%)	14.29	14.29	60.77	60.77	24.93	26.94	100.00	100.00		

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 31.03.2014 and 31.03.2015**

States/ UTs/ Region	Crude Petroleum (million tonnes)				Natural Gas (billion cubic metres)			
	31.03.2014		31.03.2015		31.03.2014		31.03.2015	
		Distribution (%)	Estimated Reserves	Distribution (%)	Estimated Reserves	Distribution (%)	Estimated Reserves	Distribution (%)
Arunachal Pradesh	2.95	0.39	1.63	0.21	0.72	0.05	0.78	0.05
Andhra Pradesh	11.44	1.50	13.19	1.73	48.20	3.38	48.44	3.25
Assam	173.08	22.69	169.42	22.19	142.19	9.96	151.40	10.17
CBM	0.00	0.00	0.00	0.00	100.59	7.05	100.37	6.74
Eastern Offshore ¹	56.09	7.35	56.42	7.39	531.54	37.24	552.24	37.10
Gujarat	135.01	17.70	138.49	18.14	72.96	5.11	72.20	4.85
Nagaland	2.69	0.35	2.69	0.35	0.12	0.01	0.12	0.01
Rajasthan	45.00	5.90	37.33	4.89	14.02	0.98	36.95	2.48
Tamil Nadu	9.12	1.20	10.80	1.41	44.92	3.15	47.59	3.20
Tripura	0.07	0.01	0.07	0.01	41.28	2.89	41.75	2.80
Western Offshore ²	327.28	42.91	333.44	43.67	430.61	30.17	436.65	29.34
Total	762.73	100.00	763.48	100.00	1427.15	100.00	1488.49	100.00

CBM : Cold Bed Methane

Note: 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

Source: Ministry of Petroleum & Natural Gas

Table 1.3 :Sourcewise and Statewise Estimated Potential of Renewable Power in India as on 31.03.2015

(in MW)

States/ UTs	Wind Power	Small Hydro Power	Biomass Power	Cogeneration-bagasse	Waste to Energy	Solar Energy	Total	
							Estimated Reserves	Distribution (%)
1	2	3	4	5	6	7	8	9
Andhra Pradesh	14497	978	578	300	123	38440	54916	6.12
Arunachal Pradesh	236	1341	8	-	-	8650	10236	1.14
Assam	112	239	212	-	8	13760	14330	1.60
Bihar	144	223	619	300	73	11200	12559	1.40
Chhattisgarh	314	1107	236	-	24	18270	19951	2.23
Goa	-	7	26	-	-	880	912	0.10
Gujarat	35071	202	1221	350	112	35770	72726	8.11
Haryana	93	110	1333	350	24	4560	6470	0.72
Himachal Pradesh	64	2398	142	-	2	33840	36446	4.06
Jammu & Kashmir	5685	1431	43	-	-	111050	118208	13.18
Jharkhand	91	209	90	-	10	18180	18580	2.07
Karnataka	13593	4141	1131	450	-	24700	44015	4.91
Kerala	837	704	1044	-	36	6110	8732	0.97
Madhya Pradesh	2931	820	1364	-	78	61660	66853	7.46
Maharashtra	5961	794	1887	1250	287	64320	74500	8.31
Manipur	56	109	13	-	2	10630	10811	1.21
Meghalaya	82	230	11	-	2	5860	6185	0.69
Mizoram	-	169	1	-	2	9090	9261	1.03
Nagaland	16	197	10	-	-	7290	7513	0.84
Odisha	1384	295	246	-	22	25780	27728	3.09
Punjab	-	441	3172	300	45	2810	6768	0.75
Rajasthan	5050	57	1039	-	62	142310	148518	16.56
Sikkim	98	267	2	-	-	4940	5307	0.59
Tamil Nadu	14152	660	1070	450	151	17670	34152	3.81
telangana	-	-	-	-	-	20410	20410	2.28
Tripura	-	47	3	-	2	2080	2131	0.24
Uttar Pradesh	1260	461	1617	1250	176	22830	27593	3.08
Uttarakhand	534	1708	24	-	5	16800	19071	2.13
West Bengal	22	396	396	-	148	6260	7222	0.81
Andaman & Nicobar	365	8	-	-	-	-	373	0.04
Chandigarh	-	-	-	-	6	-	6	0.00
Dadar & Nagar Haveli	-	-	-	-	-	-	-	0.00
Daman & Diu	4	-	-	-	-	-	4	0.00
Delhi	-	-	-	-	131	2050	2181	0.24
Lakshadweep	-	-	-	-	-	-	-	0.00
Puducherry	120	-	-	-	3	-	123	0.01
Others*	-	-	-	-	1022	790	1812	0.20
All India Total	102772	19749	17538	5000	2556	748990	896603	100.00
Distribution (%)	11.46	2.20	1.96	0.56	0.29	83.54	100.00	

* Industrial waste

Source: Ministry of New and Renewable Energy

[GO TO CONTENTS](#)

CHAPTER 2: INSTALLED CAPACITY AND CAPACITY UTILIZATION

2.1 Coal Washeries

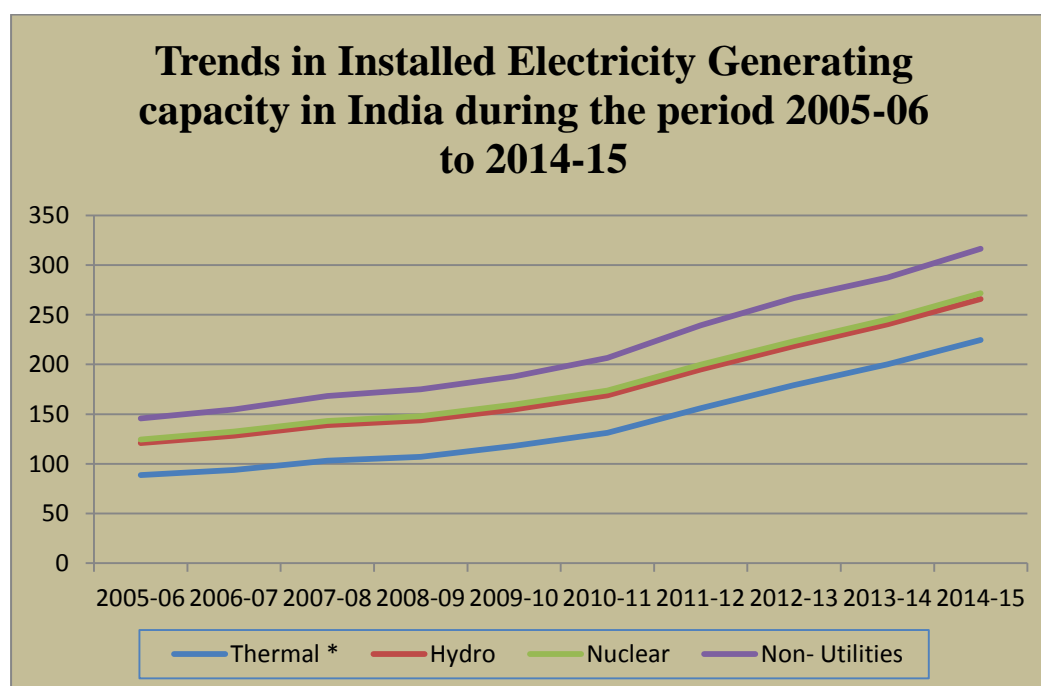
- ❖ Coal washing is an integral part of coal production. Raw coal coming from mines is washed to remove the ash contents to make them fit for feeding into boilers, particularly those of steel plants. Barring a few instances, a coal washery does not form part of a coal mine in India.
- ❖ Total installed capacity of washeries in the country is around 131.24 Million tonne per year (MTY) as on 31.3.2015 (Table 2.1). As on 31.03.15, 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

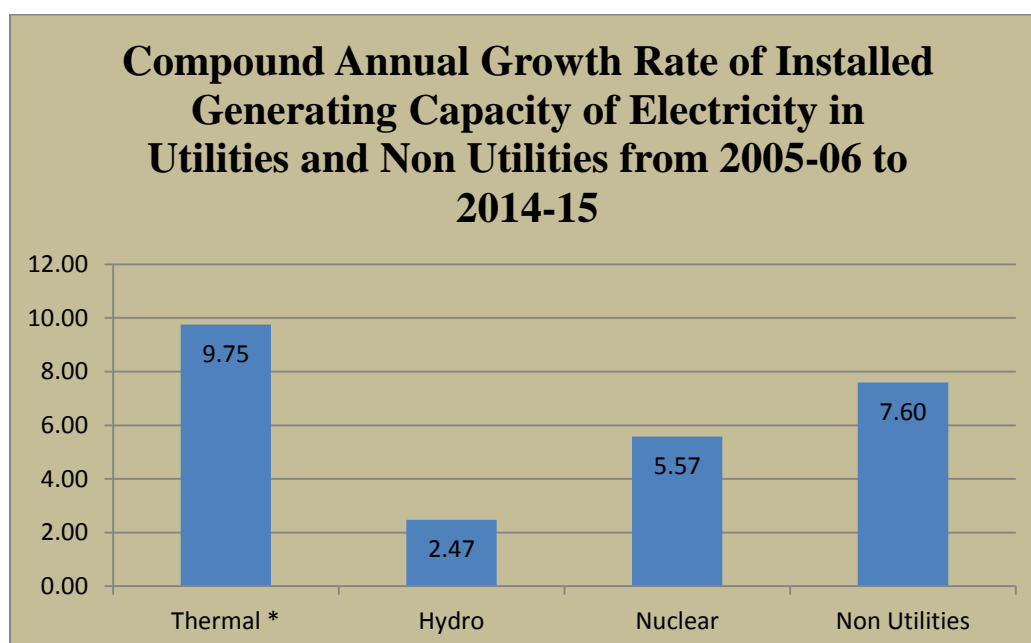
- ❖ As on 31.03.15 there were a total of 22 refineries in the country (Table 2.2), 17 in the Public Sector, 3 in the Private sector and 2 in Joint Venture.
- ❖ There is no change in refining capacity in the country (215 MMT) over the period of one year.
- ❖ The Refinery production (crude throughput) achievement was 222.938 MMT during 2014-15 which marks net increase of 0.20% over 2013-14 (222.497 MMT).
- ❖ Capacity utilization of the refineries was 103.5% during 2013-14 which increased to 103.7% during 2014-15. In the Public Sector the maximum increase in capacity utilization (23.4%) was at IOC, Mathura, Uttar Pradesh.
- ❖ In the Private Sector,
- ❖ the highest increase (1.9%) in capacity utilization was at RIL (SEZ), Jamnagar, Gujarat.
- ❖ Indian Oil Corporation, the state owned corporation had highest refining capacity of 54,200 TMTY. All units of IOC together processed 53,585 TMT during 2014-15 as compared to 53,127 TMT during 2013-14. The capacity utilization of these refineries was 98.9% during 2014-15 as against 98% during 2013-14.
- ❖ All the private refineries taken together processed 88,229 TMT during 2014-15 which is equivalent to the amount processed in 2013-14. The capacity utilization of these refineries during 2012-13 and 2013-14 was same i.e. 110.3%.

2.3 Installed generating capacity of electricity

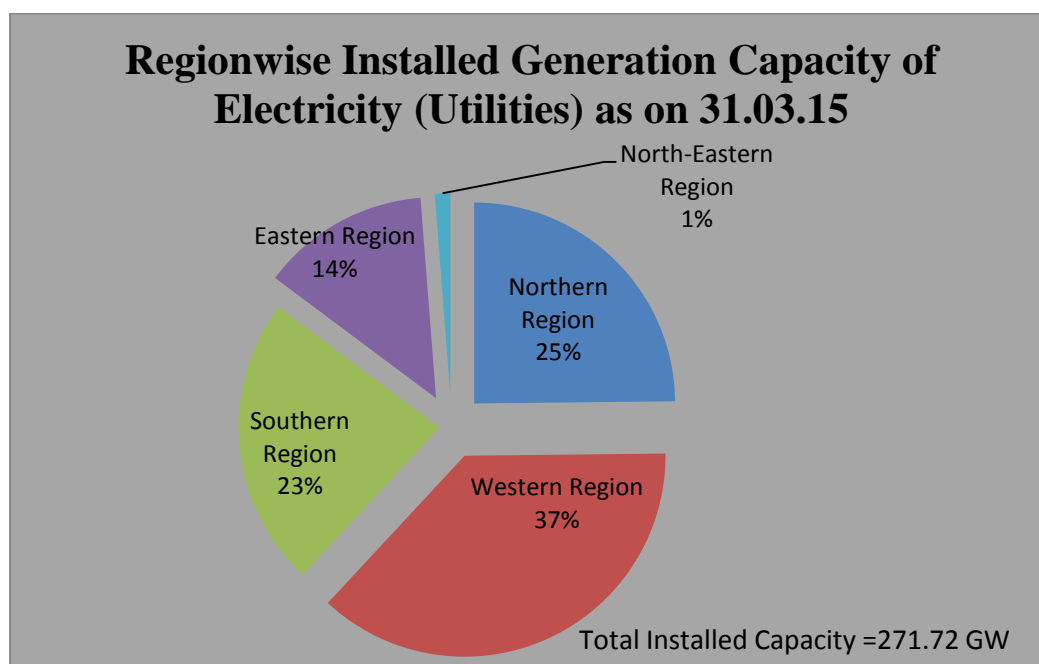
- ❖ The total installed capacity for electricity generation in the country has increased from 145755 MW as on 31.03.2006 to 316379 MW as on 31.03.2015, registering a compound annual growth rate (CAGR) of 8.06% (Table 2.3).



- ❖ There has been an increase in generating capacity of 28863 MW over the last one year, the annual increase being 10.04%.
- ❖ The highest rate of annual growth from 2013-14 to 2014-15 in installed capacity was for Nuclear power (20.92%) followed by Thermal Power (12.37%).
- ❖ The total Installed capacity of power utilities in the country increased from 124287 MW in 31.3.2006 to 271722 MW as on 31.3.2015, with a CAGR of 8.14% over the period.
- ❖ At the end of March 2015, thermal power plants accounted for an overwhelming 71.01% of the total installed capacity in the country, with an installed capacity of 224674 MW. Hydro power plants come next with an installed capacity of 41268 MW, accounting for 13.04% of the total installed Capacity. The share of Nuclear energy was only 1.82% (5.78 GW).
- ❖ Non-utilities accounted for 14.11% (44657 MW) of the total installed generation capacity.
- ❖ The highest CAGR (9.75%) was in case of Thermal utilities followed by Nuclear (5.57%) and Hydro (2.47%).



- ❖ The geographical distribution of Installed generating capacity of electricity as on 31.03.15 (Table 2.4) indicates that Western Region (both central and state sector) accounted for the highest share (37%) followed by Northern Region (25%), Southern Region (23%), Eastern Region (14%) and North Eastern Region (1%).

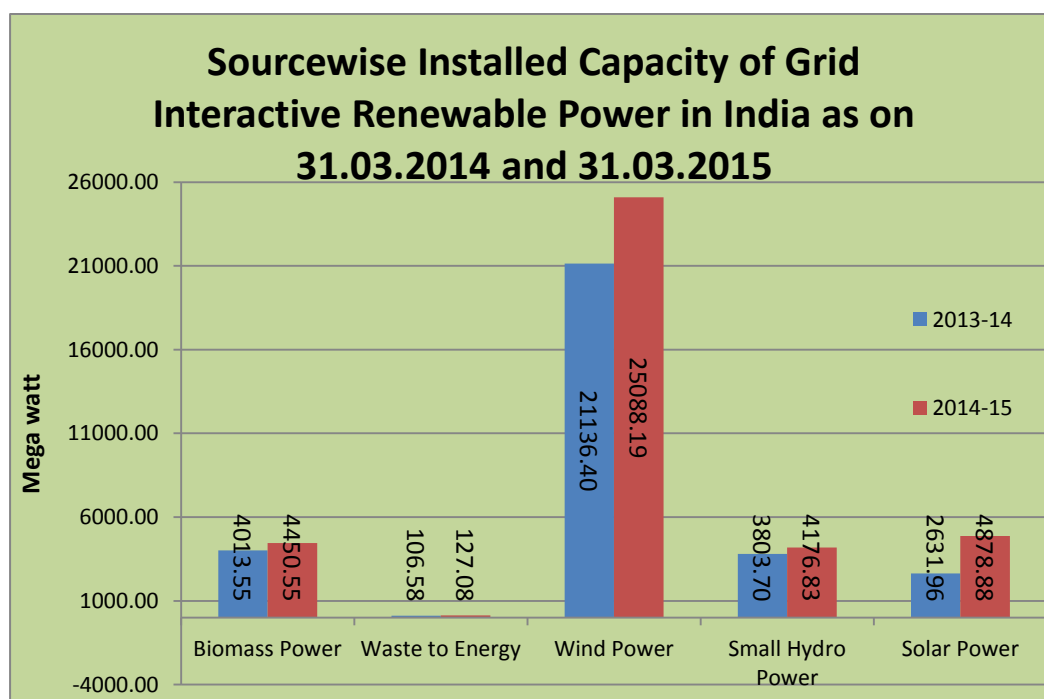


- ❖ Region wise growth in the installed capacity during 2014-15 reveals that North Eastern Region registered the highest annual growth of about 15.52%, followed by Western Region (14.08%), Southern Region (10.67%) and Eastern Region (9.70%).

- ❖ Among all the states, Madhya Pradesh registered highest annual growth (46.18%) in the installed capacity followed by Chhattisgarh (39.05%) and Punjab (23.91%).

2.4 Grid Interactive Renewable Power

- ❖ The total installed capacity of grid interactive renewable power, which was 31692.18 MW as on 31.03.2014, had gone up to 38821.53MW as on 31.03.2015 indicating growth of 22.50% during the period (Table 2.5).
- ❖ Out of the total installed generation capacity of renewable power as on 31-03-2015, Wind power accounted for about 64.62%, followed by Solar power (12.57%) and Biomass power (11.46%).
- ❖ Tamil Nadu had the highest installed capacity of grid connected renewable power (8727.11 MW) followed by Maharashtra (6400.04 MW) and Rajasthan (5265.84 MW), mainly on account of wind power.
- ❖ As on 31.03.2015, out of total number of Biogas plants installed (47.52 lakh) (Table 2.6), maximum number of plants installed were in Maharashtra (8.56 lakh) followed by Andhra Pradesh, Karnataka, Uttar Pradesh and Gujarat each with more than 4 lakh biogas plants.



- ❖ As on 31.03.2015, 8666 remote villages and 2329 hamlets were electrified (Table 2.6).

Table 2.1: Installed Capacity of Coal Washeries in India as on 31.03.15

Sl. No.	Washery & Operator	State of Location	Capacity (MTY)
			31.03.2014
<u>COKING COAL :</u>			
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
	(A) CIL		19.68
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) PSU & Private		10.01
	TOTAL (A + B)		29.69
<u>NON-COKING COAL</u>			
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
	(A) CIL		21.22
7	Dipka, Aryan coal beneficiation pvt. Ltd.	Chattisgarh	12.00
8	Gevra, Aryan coal beneficiation pvt. Ltd.	Chattisgarh	5.00
9	Panderpauni, Aryan coal beneficiation pvt. Ltd.	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 31.03.15

Sl. No.	Washery & Operator	State of Location	Capacity (MTY)
			31.03.2015*
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) Private			80.33
TOTAL (A+B)			101.55
Gross Total (Coking+Non-Coking)			131.24

* Provisional

Source: Office of Coal Controller, Ministry of Coal

Table 2.2: Installed Capacity and Capacity Utilization of Refineries of Crude Oil during 2013-14 and 2014-15

Sl. No.	Refinery	Installed Capacity (TMTPA)		Crude Oil Processed (TMT)		Capacity Utilisation (%)		
		01.04.2014	01.04.2015	2013-14	2014-15*	2013-14	2014-15	Change in Utilisation
A	Public Sector Refineries	120066	120066	119547	121183	99.6	100.9	1.4
I	IOC RFINERIES	54200	54200	53127	53585	98.0	98.9	0.8
	IOC, Guwahati, Assam	1000	1000	1019	1006	101.9	100.6	-1.3
	IOC, Barauni, Bihar	6000	6000	6478	5944	108.0	99.1	-8.9
	IOC, Koyali, Gujarat	13700	13700	12960	13285	94.6	97.0	2.4
	IOC, Haldia, West Bengal	7500	7500	7952	7650	106.0	102.0	-4.0
	IOC, Mathura, Uttar Pradesh	8000	8000	6641	8515	83.0	106.4	23.4
	IOC, Digboi, Assam	650	650	651	591	100.2	90.9	-9.2
	IOC, Panipat, Haryana	15000	15000	15098	14191	100.7	94.6	-6.0
	IOC, Bongaigaon, Assam	2350	2350	2328	2403	99.1	102.3	3.2
III	BPCL RFINERIES	21500	21500	22969	23177	106.8	107.8	1.0
	BPCL, Mumbai, Maharashtra	12000	12000	12684	12821	105.7	106.8	1.1
	BPCL, Kochi, Kerala	9500	9500	10285	10356	108.3	109.0	0.7
III	HPCL RFINERIES	14800	14800	15561	16178	105.1	109.3	4.2
	HPCL, Mumbai, Maharashtra	6500	6500	7785	7408	119.8	114.0	-5.8
	HPCL, Visakh, Andhra Pradesh	8300	8300	7776	8770	93.7	105.7	12.0
IV	CPCL RFINERIES	11500	11500	10624	10782	92.4	93.8	1.4
	CPCL, Manali, Tamil Nadu	10500	10500	10065	10251	95.9	97.6	1.8
	CPCL, Narimanam, Tamil Nadu	1000	1000	559	531	55.9	53.1	-2.8
V	NRL, Numaligarh, Assam	3000	3000	2613	2777	87.1	92.6	5.5
VI	MRPL, Mangalore, Karnataka	15000	15000	14589	14632	97.3	97.5	0.3
VII	ONGC, Tatipaka, Andhra Pradesh	66	66	65	51	98.5	77.3	-21.2
B	Private Sector Refineries	80000	80000	88229	88229	110.3	110.3	0.0
I	RIL RFINERIES	60000	60000	68027	68041	113.4	113.4	0.0
	RIL, DTA, Jamnagar, Gujarat	30000	30000	30307	30867	101.0	102.9	1.9
	RIL (SEZ), Jamnagar, Gujarat	27000	27000	37720	37174	139.7	137.7	-2.0
II	Essar Oil Ltd. (EOL), Vadinar	20000	20000	20202	20491	101.0	102.5	1.4
C	JOINT VENTURE	15000	15000	14721	13526	98.1	90.2	-8.0
I	BORL, Bina***	6000	6000	5450	6209	90.8	103.5	12.7
II	HMEL, Bathinda**	9000	9000	9271	7318	103.0	81.3	-21.7
	Total (A+B+C)	215066	215066	222497	222938	103.5	103.7	0.2

* Provisional TMT:Thousand metric Tonnes TMTPA:Thousand metric Tonnes/Year/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

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 2014-15

(in Mega Watt) = (10³ x Kilo Watt)

As on	Utilities				Non-utilities	Grand
	Thermal *	Hydro	Nuclear	Total	Total	Total
1	2	3	4	5	6	7
31.03.2006	88,601	32,326	3,360	1,24,287	21,468	1,45,755
31.03.2007	93,775	34,654	3,900	1,32,329	22,335	1,54,664
31.03.2008	1,03,032	35,909	4,120	1,43,061	24,986	1,68,047
31.03.2009	1,06,968	36,878	4,120	1,47,966	26,980	1,74,946
31.03.2010	1,17,975	36,863	4,560	1,59,398	28,474	1,87,872
31.03.2011	1,31,279	37,567	4,780	1,73,626	32,900	2,06,526
31.03.2012	1,56,107	38,990	4,780	1,99,877	39,375	2,39,252
31.03.2013	1,79,072	39,491	4,780	2,23,344	43,300	2,66,644
31.03.2014	1,99,947	40,531	4,780	2,45,259	42,257	2,87,516
31.03.2015(P)	2,24,674	41,268	5,780	2,71,722	44,657	3,16,379
Growth rate of 2014-15 over 2013-14(%)	12.37	1.82	20.92	10.79	5.68	10.04
CAGR 2005-06 to 2014-15(%)	9.75	2.47	5.57	8.14	7.60	8.06

* 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 = ((Current Value/Base Value)^(1/nos. of years)-1)*100

Source : Central Electricity Authority

(P) Provisional

Table 2.4 : Regionwise and Statewise Installed Generating Capacity of Electricity (Utilities) in India as on 31.03.2014 and 31.03.2015

States/UTs	Hydro		Thermal		Nuclear		New & Renewable		Total		Growth* Rate(2013-14 to 2014-15)
	31.03.14	31.03.15	31.03.14	31.03.15	31.03.14	31.03.15	31.03.14	31.03.15	31.03.14	31.03.15	
Delhi	0.00	0.00	2.29	2.29	0.00	0.00	0.02	0.02	2.31	2.31	0.00
Haryana	0.88	0.88	4.91	4.91	0.00	0.00	0.13	0.14	5.92	5.93	0.24
Himachal Prd.	2.14	2.14	0.00	0.00	0.00	0.00	0.64	0.72	2.78	2.86	2.92
Jammu & Kashmir	0.78	0.78	0.18	0.18	0.00	0.00	0.15	0.16	1.11	1.12	1.12
Punjab	2.23	2.23	3.86	5.22	0.00	0.00	0.32	0.49	6.41	7.94	23.91
Rajasthan	0.99	0.99	7.22	8.12	0.00	0.00	3.64	4.39	11.85	13.50	13.94
Uttar Pradesh	0.52	0.52	7.77	7.77	0.00	0.00	0.83	0.99	9.12	9.29	1.78
Uttarakhand	1.65	1.65	0.00	0.00	0.00	0.00	0.21	0.24	1.86	1.89	1.62
Chandigarh	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Central Sector NR	7.13	7.87	13.11	13.11	1.62	1.62	0.00	0.00	21.86	22.60	3.38
Sub-Total (NR)	16.33	17.07	39.34	41.61	1.62	1.62	5.94	7.15	63.23	67.45	6.68
Chhatisgarh	0.12	0.12	7.86	11.10	0.00	0.00	0.32	0.32	8.30	11.54	39.05
D & N Haveli	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.63	6.19	9.94
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	0.00	0.00	0.05	0.05	0.00
Gujarat	0.77	0.77	18.81	19.84	0.00	0.00	4.43	4.72	24.02	25.33	5.48
Madhya Pradesh	1.70	1.70	6.91	10.62	0.00	0.00	0.89	1.56	9.50	13.88	46.18
Maharashtra	3.33	3.33	19.28	22.21	0.00	0.00	5.63	6.19	28.24	31.73	12.36
Central Sector WR	1.52	1.52	14.87	14.87	1.84	1.84	0.00	0.00	18.23	18.23	0.00
Sub-Total (WR)	7.45	7.45	67.77	78.69	1.84	1.84	11.27	12.79	88.33	100.77	14.08
Andhra Pradesh	3.73	1.24	9.25	9.38	0.00	0.00	1.53	1.95	14.51	12.57	-13.40
Telangana	-	2.50	-	2.28	-	-	-	0.06	0.00	4.84	-
Karnataka	3.60	3.60	5.01	5.01	0.00	0.00	3.99	4.51	12.60	13.12	4.17
Kerala	1.88	1.88	0.43	0.43	0.00	0.00	0.19	0.20	2.51	2.51	0.25
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	0.00
Tamil Nadu	2.18	2.18	6.76	7.36	0.00	0.00	8.08	8.40	17.02	17.94	5.45
Central Sector SR #	0.00	0.00	9.20	9.95	1.32	2.32	0.00	0.00	10.52	12.27	16.63
Sub-Total (SR)	11.40	11.40	30.69	34.46	1.32	2.32	13.79	15.12	57.20	63.30	10.67
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	0.21	0.21	0.00	0.00	0.11	0.11	0.32	0.32	0.00
Jharkhand	0.13	0.13	2.09	2.09	0.00	0.00	0.02	0.02	2.24	2.24	0.00
Odisha	2.06	2.06	3.87	5.07	0.00	0.00	0.12	0.12	6.05	7.25	19.84
Sikkim	0.10	0.10	0.00	0.00	0.00	0.00	0.05	0.05	0.15	0.15	0.00
West Bengal	0.98	0.98	6.67	7.27	0.00	0.00	0.13	0.13	7.78	8.38	7.66
DVC	0.14	0.14	7.34	7.34	0.00	0.00	0.00	0.00	7.48	7.48	0.00
Central Sector ER	0.70	0.70	8.78	10.24	0.00	0.00	0.00	0.00	9.48	10.94	15.40
Sub-Total (ER)	4.11	4.11	29.02	32.28	0.00	0.00	0.44	0.44	33.57	36.83	9.70
Arunachal Prd.	0.00	0.00	0.02	0.02	0.00	0.00	0.10	0.10	0.12	0.12	0.00
Assam	0.10	0.10	0.38	0.38	0.00	0.00	0.03	0.03	0.52	0.52	0.00
Manipur	0.00	0.00	0.05	0.05	0.00	0.00	0.01	0.01	0.05	0.05	0.00
Meghalaya	0.28	0.28	0.00	0.00	0.00	0.00	0.03	0.03	0.32	0.32	0.00
Mizoram	0.00	0.00	0.05	0.05	0.00	0.00	0.04	0.04	0.08	0.09	10.40
Nagaland	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.02	0.02	0.00
Tripura	0.00	0.00	0.17	0.17	0.00	0.00	0.02	0.02	0.19	0.19	0.00
Central Sector NER	0.86	0.86	0.74	1.19	0.00	0.00	0.00	0.00	1.60	2.05	28.26
Sub-Total (NER)	1.24	1.24	1.41	1.86	0.00	0.00	0.26	0.26	2.91	3.36	15.52
Total States	30.32	30.32	121.55	139.54	0.00	0.00	31.69	35.77	183.56	205.63	12.02
Total Central	10.21	10.95	46.70	49.36	4.78	5.78	0.00	0.00	61.69	66.09	7.14
Total All India	40.53	41.27	168.25	188.90	4.78	5.78	31.69	35.77	245.25	271.72	10.79

**- 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 31.03.2014 and 31.03.2015

(In MW)

States/ UTs	Biomass Power		Waste to Energy		Wind Power	
	31.03.14	31.03.15	31.03.14	31.03.15	31.03.14	31.03.15
Andhra Pradesh	380.75	389.75	50.66	58.16	746.20	1155.12
Arunachal Pradesh	-	-	-	-	-	-
Assam	-	-	-	-	-	-
Bihar	-	43.42	-	-	-	-
Chhattisgarh	264.90	264.90	-	-	-	-
Goa	-	-	-	-	-	-
Gujarat	43.90	55.90	-	-	3454.30	3876.50
Haryana	45.30	52.30	-	-	-	-
Himachal Pradesh	-	-	-	-	-	-
Jammu & Kashmir	-	-	-	-	-	-
Jharkhand	-	-	-	-	-	-
Karnataka	603.28	664.28	1.00	1.00	2318.20	2871.53
Kerala	-	-	-	-	35.20	35.10
Madhya Pradesh	26.00	36.00	3.90	3.90	423.40	1126.19
Maharashtra	940.40	1033.40	12.72	12.72	4100.40	4638.35
Manipur	-	-	-	-	-	-
Meghalaya	-	-	-	-	-	-
Mizoram	-	-	-	-	-	-
Nagaland	-	-	-	-	-	-
Odisha	20.00	20.00	-	-	-	-
Punjab	140.50	140.50	9.25	10.25	-	-
Rajasthan	101.30	11.30	-	-	2784.90	3866.34
Sikkim	-	-	-	-	-	-
Tamil Nadu	571.30	662.30	8.05	8.05	7269.50	7514.76
Telangana	-	-	-	-	-	-
Tripura	-	-	-	-	-	-
Uttar Pradesh	776.50	888.50	5.00	5.00	-	-
Uttarakhand	30.00	30.00	-	-	-	-
West Bengal	26.00	26.00	-	-	-	-
Andaman & Nicobar	-	-	-	-	-	-
Chandigarh	-	-	-	-	-	-
Dadar & Nagar Haveli	-	-	-	-	-	-
Daman & Diu	-	-	-	-	-	-
Delhi	-	-	16.00	28.00	-	-
Lakshadweep	-	-	-	-	-	-
Puducherry	-	-	-	-	-	-
Others	-	132.00	-	-	4.30	4.30
All India Total	4013.55	4450.55	106.58	127.08	21136.40	25088.19
Distribution (%)	12.66	11.46	0.33	0.32	66.69	64.62

- Denotes non availability or indeterminant value

Source: Ministry of New and Renewable Energy

Table 2.5 (contd): Statewise and Sourcewise Installed Capacity of Grid Interactive Renewable Power as on 31.03.2014 and 31.03.2015

(In MW)

States/ UTs	Small Hydro Power		Solar Power		Total		Growth* Rate(2013-14 to 2014-15)
	31.03.14	31.03.15	31.03.14	31.03.15	31.03.14	31.03.15	
Andhra Pradesh	221.03	232.23	131.84	357.34	1530.48	2192.60	43.26
Arunachal Pradesh	103.91	104.61	0.03	0.27	103.93	104.87	0.90
Assam	34.11	34.11	-	-	34.11	34.11	0.00
Bihar	70.70	70.70	-	-	114.12	114.12	0.00
Chhattisgarh	52.00	52.00	7.10	73.18	324.00	390.08	20.40
Goa	0.05	0.05	-	-	0.05	0.05	0.00
Gujarat	15.60	16.60	916.40	1024.15	4430.20	4973.15	12.26
Haryana	70.10	73.50	10.30	12.80	125.70	138.60	10.26
Himachal Pradesh	638.91	754.80	-	-	638.91	754.80	18.14
Jammu & Kashmir	147.53	156.53	-	-	147.53	156.53	6.10
Jharkhand	4.05	4.05	16.00	16.00	20.05	20.05	0.00
Karnataka	1031.66	1177.85	31.00	104.22	3985.14	4818.88	20.92
Kerala	158.42	198.92	0.03	12.03	193.65	246.05	27.06
Madhya Pradesh	86.16	86.16	347.17	678.58	886.63	1930.83	117.77
Maharashtra	327.43	336.87	249.25	378.70	5630.20	6400.04	13.67
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	29.67	29.67	-	-	29.67	29.67	0.00
Odisha	64.63	64.63	30.50	66.92	115.13	151.55	31.63
Punjab	156.20	157.40	16.85	200.32	322.80	508.47	57.52
Rajasthan	23.85	23.85	730.10	1264.35	3640.15	5265.84	44.66
Sikkim	52.11	52.11	-	-	52.11	52.11	0.00
Tamil Nadu	123.05	123.05	98.36	418.95	8070.26	8727.11	8.14
Telangana	-	-	-	91.45	-	91.45	-
Tripura	16.01	16.01	-	5.00	16.01	21.01	31.23
Uttar Pradesh	25.10	25.10	21.08	140.00	827.68	1058.60	27.90
Uttaranchal	174.82	209.33	5.05	5.00	209.87	244.33	16.42
West Bengal	98.40	98.50	7.05	7.21	131.45	131.71	0.20
Andaman & Nicobar	5.25	5.25	5.10	5.10	10.35	10.35	0.00
Chandigarh	-	-	2.00	5.04	2.00	5.04	-
Dadar & Nagar Haveli	-	-	-	-	-	-	-
Daman & Diu	-	-	-	4.00	-	4.00	-
Delhi	-	-	5.15	6.71	21.15	34.71	64.11
Lakshadweep	-	-	0.75	0.75	0.75	0.75	0.00
Puducherry	-	-	0.03	0.03	0.03	0.03	0.00
Others	-	-	0.82	0.79	5.12	137.09	-
All India Total	3803.70	4176.83	2631.96	4878.88	31692.18	38821.53	22.50
Distribution (%)	12.00	10.76	8.30	12.57	100.00	100.00	

- Denotes non availability or indeterminant value

Source: Ministry of New and Renewable Energy

Table 2.6 : Installation of Off-grid / Decentralised Renewable Energy Systems/ Devices as on 31.03.2015

(Nos. in lakhs)

Sl. No.	State/UT	Biogas Plants (Nos.)	Water Pumping/ Wind Mills # (Nos.)	SPV Pumps (Nos.)	Solar Photovoltaic (SPV) Systems			
					SLS	HLS	SL	PP
					(Nos.)	(Nos.)	(Nos.)	(KWP)
1	2	3	4	5	6	7	8	9
1	Andhra Pradesh	5.22	6.0	613	0.1	0.2	0.4	1263.6
2	Arunachal Pradesh	0.04	0.0	18	0.0	0.2	0.1	217.1
3	Assam	1.08	3.0	45	0.0	0.1	0.0	910.0
4	Bihar	1.30	46.0	139	0.0	0.1	0.5	775.6
5	Chhattisgarh	0.49	1.0	240	0.0	0.1	0.0	14616.7
6	Goa	0.04	0.0	15	0.0	0.0	0.0	1.7
7	Gujarat	4.29	945.0	85	0.0	0.1	0.3	9452.6
8	Haryana	0.60	0.0	469	0.2	0.6	0.9	864.3
9	Himachal Pradesh	0.47	0.0	6	0.1	0.2	0.2	1208.5
10	Jammu & Kashmir	0.03	0.0	39	0.1	0.7	0.4	3430.9
11	Jharkhand	0.07	0.0	-	0.0	0.1	0.2	480.9
12	Karnataka	4.69	28.0	551	0.0	0.5	0.1	1596.4
13	Kerala	1.41	79.0	810	0.0	0.3	0.5	214.4
14	Madhya Pradesh	3.45	0.0	87	0.1	0.0	0.1	1983.0
15	Maharashtra	8.56	26.0	239	0.1	0.0	0.7	913.7
16	Manipur	0.02	-	40	0.0	0.0	0.0	456.0
17	Meghalaya	0.10	-	19	0.0	0.1	0.2	173.5
18	Mizoram	0.05	-	37	0.0	0.1	0.1	241.0
19	Nagaland	0.08	-	3	0.0	0.0	0.1	1050.0
20	Odisha	2.62	-	56	0.1	0.1	0.1	84.5
21	Punjab	1.64	-	1,857	0.1	0.1	0.2	663.0
22	Rajasthan	0.69	222.0	4,501	0.1	1.4	0.0	8625.0
23	Sikkim	0.09	-	-	0.0	0.2	0.2	680.0
24	Tamil Nadu	2.21	60.0	829	0.3	0.6	0.2	4006.6
25	Tripura	0.03	-	151	0.0	0.3	0.6	365.0
26	Uttar Pradesh	4.37	-	575	1.2	2.4	0.6	3491.5
27	Uttarakhand	0.17	-	26	0.1	0.9	0.8	280.0
28	West Bengal	3.66	-	48	0.1	1.5	0.2	889.0
29	Andaman & Nicobar	0.00	2.0	5	0.0	0.0	0.1	167.0
30	Chandigarh	0.00	-	12	0.0	0.0	0.0	730.0
31	Dadar & Nagar Haveli	0.00	-	-	-	-	-	0.0
32	Daman & Diu	-	-	-	-	-	-	0.0
33	Delhi	0.01	-	90	0.0	-	0.0	332.0
34	Lakshadweep	-	-	-	0.0	-	0.1	1090.0
35	Puducherry	0.01	-	21	0.0	-	0.0	0.0
36	Others*	0.05	-	-	0.1	0.2	1.3	23885.0
Total		47.52	1,418.08	11,626.00	2.75	10.97	9.60	85,138.44

Data reported for the year 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; SHP = Small Hydro Power; MW = Mega Watt; KWP = Kilowatt peak; BOV = Battery Operated Vehicles

Source : Ministry of New and Renewable Energy

Table 2.6(contd.) : Installation of Off-grid / Decentralised Renewable Energy Systems/ Devices as on 31.03.2015

Sl. No.	State/UT	Aerogen. Hybrid System	Solar Cooker #	Biomass Gasifiers (Rural+ Industrial)	Biomass (non bagasse)	Waste to Energy	Remote Village Electrification Villages	
							Villages	Hamlets
		(KW)	(MW)	(Nos.)	(MW)	(MW)	(Nos.)	(Nos.)
1	2	3	4	5		6	7	8
1	Andhra Pradesh	16.00	23.15	22914	75.4	10.61	-	13
2	Arunachal Pradesh	6.80	0.03	750	-	-	297	-
3	Assam	6.00	-	2,933	-	-	1,952	-
4	Bihar	-	-	10924	8.2	1.00	-	-
5	Chhattisgarh	-	4.00	1210	2.5	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	2503	35.9	4.00	-	286
9	Himachal Pradesh	-	-	-	7.2	1.00	21	-
10	Jammu & Kashmir	15.80	-	200	-	-	334	15
11	Jharkhand	-	16.00	500	1.2	-	493	-
12	Karnataka	39.20	14.00	7447	15.2	9.64	16	14
13	Kerala	8.00	0.03	-	0.7	-	-	607
14	Madhya Pradesh	24.00	11.75	10258	12.4	0.48	577	-
15	Maharashtra	1422.10	34.50	7,150	16.4	20.45	340	-
16	Manipur	140.00	-	-	13.8	-	237	3
17	Meghalaya	191.50	-	250	-	-	149	-
18	Mizoram	-	-	250	-	-	20	-
19	Nagaland	-	-	2,100	2.9	-	11	-
20	Odisha	-	13.00	270	110.7	0.02	1,495	14
21	Punjab	50.00	9.33	-	2.0	4.78	-	-
22	Rajasthan	14.00	222.90	2464	-	3.00	292	90
23	Sikkim	15.50	-	-	16.6	-	-	13
24	Tamil Nadu	24.50	17.06	16262	-	11.42	-	131
25	Tripura	2.00	-	1050	150.9	-	60	782
26	Uttar Pradesh	-	12.38	23702	42.5	46.18	113	222
27	Uttarakhand	4.00	5.05	2,150	17.4	4.02	476	118
28	West Bengal	74.00	2.00	26168	-	1.17	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*	-	-	-	-	-	-	-
Total		2252.20	1221.26	163235	531.8	132.74	8666	2329

Data reported for the year 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; SHP = Small Hydro Power; MW = Mega Watt; KWP = Kilowatt peak; BOV = Battery Operated Vehicles

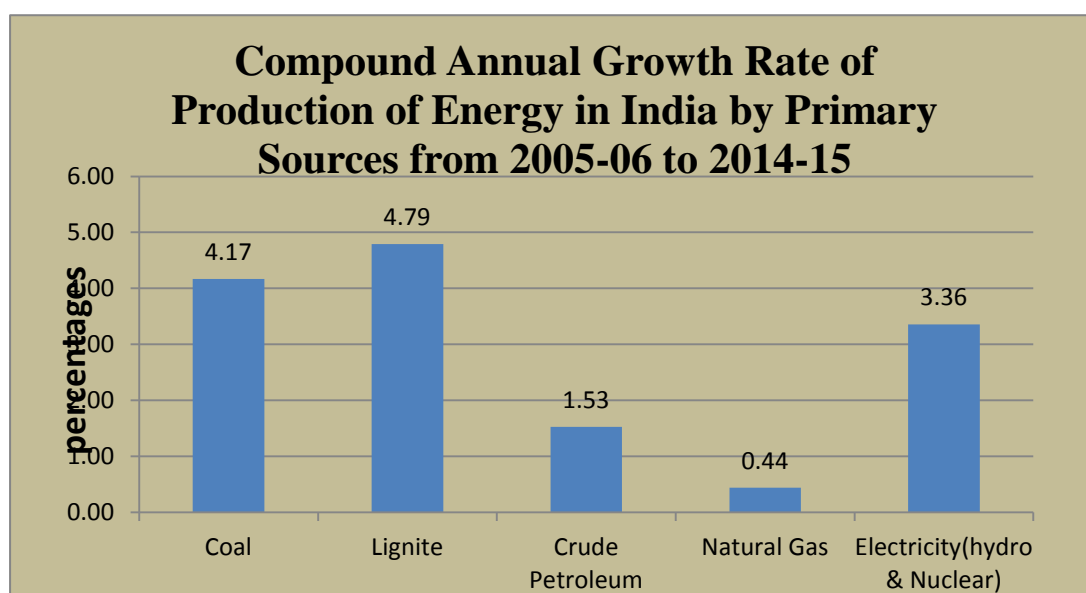
Source : Ministry of New and Renewable Energy

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CHAPTER 3: PRODUCTION OF PRIMARY SOURCES OF ENERGY

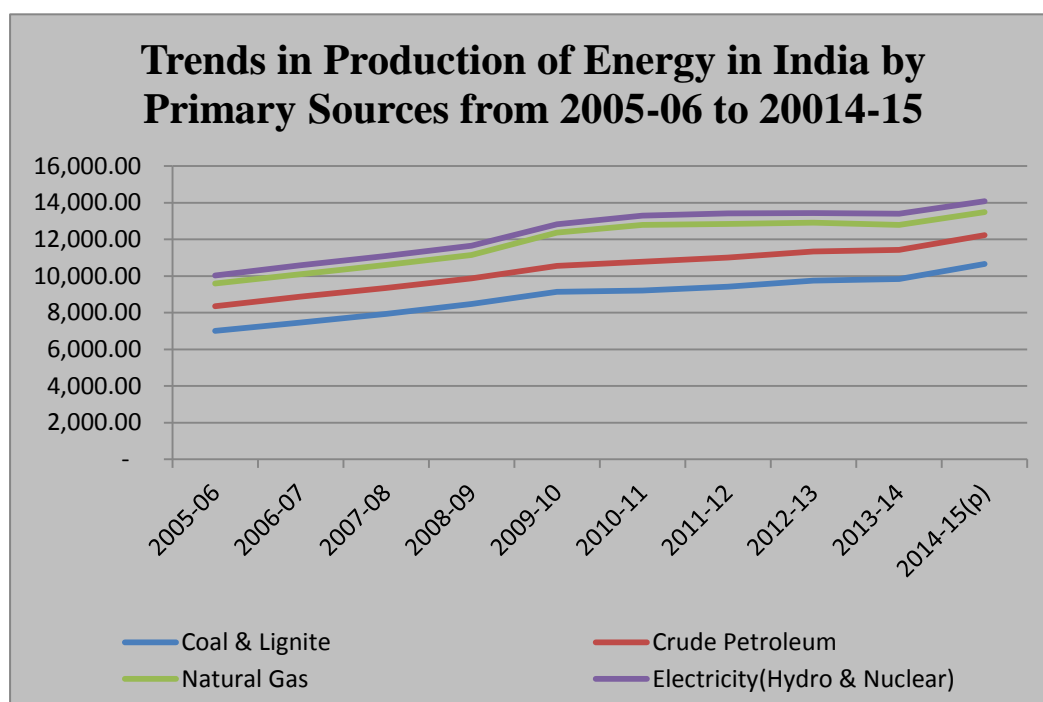
3.1 Production of Coal, lignite, crude petroleum, natural gas & electricity

- ❖ Coal production in the country during the year 2014-15 was **612.44** million tonne (MTs) as compared to 556.77 MTs during 2013-14, registering a growth of 8.25% (Table 3.1).
- ❖ The Lignite production during 2014-15 was 48.26 MTs, which is 9% higher than the production during 2013-14 (44.27 MTs).
- ❖ Considering the trend of production from 2005-06 to 2014-15, it is observed that coal production in India was about 407.04 MTs during 2005-06, which increased to 612.44 MTs during 2014-15 with a CAGR of 4.17%.
- ❖ During the same period, the CAGR of Lignite was about 4.79% with production increasing from 30.23 MTs in 2005-06 to 48.26 MTs in 2014-15.
- ❖ Production of crude petroleum increased from 32.19 MTs during 2005-06 to 37.46 MTs during 2014-15, a CAGR of about 1.53%.
- ❖ The CAGRs for natural gas and electricity were 0.44% and 3.36% respectively for the period 2005-06 to 2014-15. Lignite has experienced the highest CAGR i.e. 4.79% among all the conventional sources of energy since 2005-06 to 2014-15.



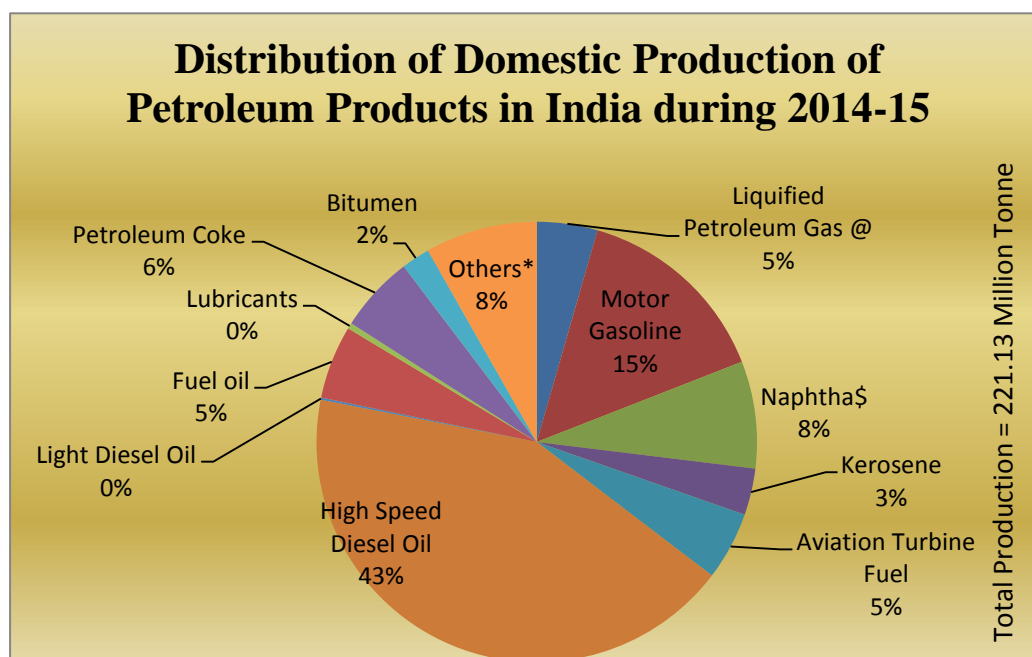
- ❖ For more meaningful comparison in the trends and patterns of growth of different energy resources, it is desirable to convey all the resources to their energy equivalents by applying appropriate convert factors and express them in energy units (Joules/Peta Joules/Terra Joules).

- ❖ The total production of energy from conventional sources increased from 13400.67 peta joules during 2013-14 to 14090.50 peta joules during 2014-15, showing an increase of 5.15%.(Table 3.2).
- ❖ The production of energy in peta joules by primary sources (Table 3.2) shows that Coal and Lignite were the major sources of energy, accounting for about 75% of the total production during 2014-15. Crude Petroleum was the second (11.13%), while Natural Gas (8.96%) was the third major source.



3.2 Production of Petroleum Products and Natural Gas

- ❖ In the year 2014-15, the production of Petroleum Products in the country was 221.13 MTs as against 220.78 during 2013-14, an increase of 0.16% (Table 3.4).
- ❖ In the total production of Petroleum products during 2014-15, High speed diesel oil accounted for the maximum share (43%), followed by Motor Gasoline (15%), Naptha (8%), Petroleum Coke (6%), Fuel Oil(5%) and Aviation Turbine Fuel (5%) (Table 3.4).
- ❖ Production of Natural Gas decreased from 34.64 billion cubic meters (BCM) in 2013-14 to 32.78 BCM in 2014-15 registering a negative growth of 5.35% and a CAGR of 0.46 from 2005-06 to 2014-15 (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 increase to 1116850 GWh during 2014-15.
- ❖ The production of electricity from utilities has increased from 1026650 GWh during 2013-14 to 1116850 GWh during 2014-15, registering an annual growth rate of about 8.79%.
- ❖ Total Electricity generation in the country, from utilities and non-utilities taken together during 2014-15 was 1278907 GWh. Out of this 951504 GWh was generated from thermal and 129244 GWh from hydro and 36102 GWh from nuclear sources. Total output from non-utilities was 162057 GWh.

Table 3.1 : Trends in Production of Primary Sources of 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	1,18,818
2006-07	430.83	31.29	33.99	31.75	1,32,304
2007-08	457.08	33.98	34.12	32.42	1,37,344
2008-09	492.76	32.42	33.51	32.85	142576
2009-10	532.04	34.07	33.69	47.50	1,25,316
2010-11	532.69	37.73	37.68	52.22	1,40,524
2011-12	539.95	42.33	38.09	47.56	1,63,000
2012-13	556.40	46.45	37.86	39.83	1,46,497
2013-14	565.77	44.27	37.79	35.41	1,69,076
2014-15(P)	612.44	48.26	37.46	33.66	1,65,346
Growth rate of 2014-15 over 2013-14(%)	8.25	9.00	-0.87	-4.94	-2.21
CAGR 2005-06 to 2014-15(%)	4.17	4.79	1.53	0.44	3.36

(p): provisional

* 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	7,008.97	1,348.00	1,240.00	427.74	10,024.72
2006-07	7,458.57	1,423.00	1,223.00	476.29	10,580.86
2007-08	7,925.74	1,429.00	1,248.00	494.44	11,097.18
2008-09	8,476.34	1,402.90	1,265.34	513.27	11,657.85
2009-10	9,137.39	1,410.64	1,830.09	451.14	12,829.25
2010-11	9,206.69	1,579.00	2,012.00	505.90	13,303.59
2011-12	9,410.00	1,595.00	1,832.00	586.80	13,423.80
2012-13	9,753.48	1,585.00	1,567.00	527.39	13,432.87
2013-14	9,846.00	1,582.00	1,364.00	608.67	13,400.67
2014-15(p)	10,664.00	1,568.45	1,262.80	595.25	14,090.50
Growth rate of 2014-15 over 2013-14(%)	8.31	-0.86	-7.42	-2.20	5.15
CAGR 2005-06 to 2014-15(%)	4.29	1.53	0.18	3.36	3.46

(P): provisional

* Thermal electricity is not a primary source of energy

@ Conversion factors have been applied to convert production of primary sources of 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
2013-14	56.82	508.95	565.77	44.27	610.00
2014-15(p)	57.45	554.98	612.44	48.25	660.69
Growth rate of 2014-15 over 2013-14(%)	1.11	9.04	8.25	8.99	8.31
CAGR 2005-06 to 2014-15(%)	6.19	3.98	4.17	4.79	4.21

(P): Provisional

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	9.82	30.12	17.35	7.87	10.08	91.08	0.40
2013-14	10.03	30.28	18.51	7.42	11.22	93.76	0.42
2014-15(p)	9.84	32.33	17.39	7.56	11.10	94.43	0.36
Growth rate of 2014-15 over 2013-14(%)	-1.89	6.75	-6.05	1.87	-1.07	0.71	-14.76
CAGR 2005-06 to 2014-15(%)	2.47	15.09	0.98	-2.48	7.56	8.94	-11.16

(p) : Provisional

\$: includes other Light distillates from 2005-06

@: Excludes LPG production from natural gas.

*: Estimated from calendar year figures.

Source : Ministry of Petroleum & 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	15.05	0.90	10.94	4.67	19.45	217.74
2013-14	13.41	0.94	12.07	4.79	17.93	220.78
2014-15(p)	11.92	0.95	12.44	4.63	18.19	221.13
Growth rate of 2014-15 over 2013-14(%)	-11.12	0.64	3.07	-3.34	1.45	0.16
CAGR 2005-06 to 2014-15(%)	-1.81	3.40	14.61	2.62	15.20	5.92

(P): Provisional

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

Source : Ministry of Petroleum & Natural Gas.

Table 3.5 :Trends in Gross and Net Production of Natural Gas**(in Billion Cubic Metres)**

Year	Gross Production	Reinjected	Flared	Net Production ^
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	32.84	4.68	1.10	31.75
2009-10	47.50	5.66	0.97	46.52
2010-11	52.22	5.21	0.97	51.25
2011-12	47.56	5.31	1.08	46.48
2012-13	40.68	5.43	0.90	39.78
2013-14	35.41	5.59	0.77	34.64
2014-15(p)	33.66	5.90	0.87	32.78
2014-15 over 2013-14	-4.95	5.61	13.51	-5.35
CAGR 2005-06 to 2014-15(%)	0.44	2.83	-0.05	0.46

(P) : Provisional

^: Denotes Natural gas available for consumption which is derived by deducting gas flared from gross production by producing companies.

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

(Giga Watt hour) = (10⁶ x Kilo Watt hour)

Year	Thermal *	Hydro	Nuclear	Total	Non-Utilities	Grand
						Total
1	2	3	4	5 = 2 to 4	7	9=5+8
2005-06	5,05,001	1,01,494	17,324	6,23,819	73,640	6,97,459
2006-07	5,38,350	1,13,502	18,802	6,70,654	81,800	7,52,454
2007-08	5,85,282	1,20,387	16,957	7,22,626	90,477	8,13,103
2008-09	6,16,142	1,10,099	14,927	7,41,168	99,721	8,40,889
2009-10	6,77,155	1,04,060	18,636	7,99,851	1,06,133	9,05,984
2010-11	7,04,067	1,14,416	26,266	8,44,749	1,20,917	9,65,666
2011-12	7,59,653	1,30,511	32,287	9,22,451	1,34,388	10,56,839
2012-13	8,17,903	1,13,720	32,866	9,64,489	1,44,010	11,08,499
2013-14	8,57,574	1,34,848	34,228	10,26,650	1,48,988	11,75,638
2014-15(P)	9,51,504	1,29,244	36,102	11,16,850	1,62,057	12,78,907
Growth rate of 2014-15 over 2013-14(%)	10.95	-4.16	5.48	8.79	8.77	8.78
CAGR 2005-06 to 2014-15(%)	6.54	2.45	7.62	6.00	8.21	6.25

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

Source : Central Electricity Authority.

(P)-Provisional

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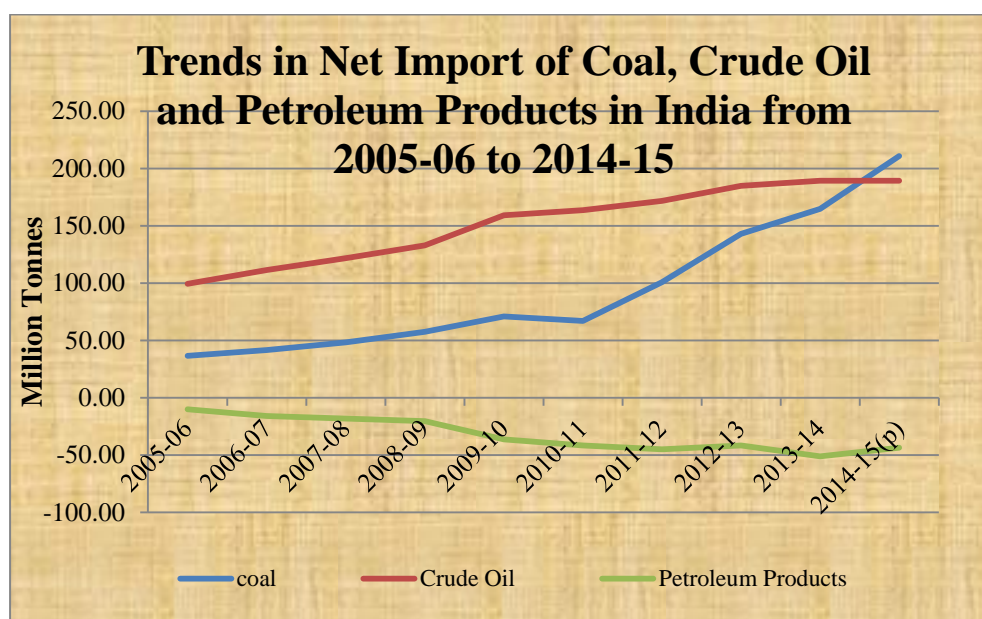
CHAPTER 4: FOREIGN TRADE IN CONVENTIONAL SOURCES OF ENERGY

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 requirement of steel plants. There has been an increasing trend in the import of coal.
- ❖ Import of coal has steadily increased from 38.59 MTs during 2005-06 to 212.10 MTs during 2014-15 (Table 4.1). During this period, the quantum of coal exported increased from 1.99 MTs during 2005-06 to 2.44 MT during 2012-13 and then decreased to 1.24 MTs during 2014-15.
- ❖ There is growth rate of 27.12% of gross import and 28.05% in net imports of coal in 2014-15 over the previous year. However, there was decrease of 43.42% 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 189.43 MTs during 2014-15.



- ❖ There has been an increase of 0.10% in the net imports of crude oil during 2014-15 over 2013-14, as the net import increased from 189.24 MTs to 189.43 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 products has increased from a 23.46 MT during 2005-06 to 63.93 MTs during 2014-15. During 2014-15, exports recorded a decrease of 5.80% from previous year (Table 4.1).
- ❖ The import of petroleum products has increased from 13.44 MT in 2005-06 to 20.42 MT during 2014-15, although there are some fluctuations in the trend (Table 4.1). There is growth rate of 22.16% in the import of petroleum products over the previous year.

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

('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	40.75	-18.32
2008-09	59.00	1.66	57.35	132.78	0.00	132.78	18.59	38.94	-20.36
2009-10	73.26	2.45	70.81	159.26	0.00	159.26	14.67	51.16	-36.49
2010-11	68.92	1.88	67.04	163.60	0.00	163.60	17.38	59.08	-41.70
2011-12	102.85	2.02	100.84	171.73	0.00	171.73	15.85	60.84	-44.99
2012-13	145.79	2.44	143.34	184.80	0.00	184.80	15.77	63.41	-47.63
2013-14	166.86	2.19	164.67	189.24	0.00	189.24	16.72	67.86	-51.15
2014-15(p)	212.10	1.24	210.87	189.43	0.00	189.43	20.42	63.93	-43.51
Growth rate of 2014-15 over 2013-14(%)	27.12	-43.42	28.05	0.10	0.00	0.10	22.16	-5.80	-14.94

(p): Provisional.

Sources:

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

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CHAPTER 5: AVAILABILITY

5.1 Availability of Coal and Lignite

- ❖ The total availability of raw coal in India in 2014-15 stood at 827.57 MTs and that of lignite at 49.57 MTs (Table 5.1).
- ❖ The availability of coal in the year 2014-15 increased by 14.28% compared to 2013-14. The availability of lignite increased by 11.05% during the same period.
- ❖ The availability of coal has increased at a CAGR of about 6.69% during the period from 2005-06 to 2014-15. This increased availability might be attributed to the secular increase in the coal production (407.04 MTs during 2005-06 to 612.44 MTs during 2014-15) supplemented by imports (Table 5.2).
- ❖ The availability of lignite has increased at a CAGR of about 5.07% during the period from 2005-06 to 2014-15 (Table 5.1).

5.2 Availability of Natural Gas

- ❖ The production of natural gas has steadily increased from a mere 36.39 BCM during 2005-06 to 48.25 BCMs during 2014-15, registering a CAGR of 1.22%. Most of this increase in the indigenous production is due to discovery of new reserves (Table 5.1).

5.3 Availability of Crude Oil and Petroleum Products

- ❖ The availability of crude oil in the country increased from 131.60 MTs during 2005-06 to 226.89 MTs during 2014-15 (Table 5.3).
- ❖ During this period crude oil production increased from 32.19 MTs to 37.46 MTs and the net import increased from 99.41 MTs to 189.43 MTs. There was fall of 0.06% in availability of crude oil during 2014-15 over 2013-14.

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

Year	Coal	Lignite	Crude Petroleum	Natural Gas
	(Million Tonnes)	(Million Tonnes)	(Million Tonnes)	(Billion Cubic Metres)
1	2		3	4
2005-06	433.27	30.24	130.11	36.39
2006-07	462.35	30.81	146.55	37.60
2007-08	502.82	34.65	156.10	39.80
2008-09	549.57	31.85	160.77	39.81
2009-10	585.30	34.41	186.55	55.67
2010-11	589.87	37.69	196.99	61.18
2011-12	642.64	42.77	204.12	59.69
2012-13	688.75	46.83	219.21	52.92
2013-14	724.18	44.64	222.50	47.67
2014-15(p)	827.57	49.57	223.24	48.25
Growth rate of 2014-15 over 2013-14(%)	14.28	11.05	0.33	1.22
CAGR 2005-06 to 2014-15(%)	6.69	5.07	5.55	2.86

(p) - Provisional

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

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	4	5	6=2-3+4-5	7	8	9=7-8
2005-06	407.04	10.37	38.59	1.99	433.27	30.23	-0.01	30.24
2006-07	430.83	10.01	43.08	1.55	462.35	31.29	0.48	30.81
2007-08	457.08	2.43	49.79	1.63	502.82	33.98	-0.67	34.65
2008-09	492.76	0.54	59.00	1.66	549.57	32.42	0.58	31.85
2009-10	532.04	17.55	73.26	2.45	585.30	34.07	-0.34	34.41
2010-11	532.69	7.33	68.92	4.41	589.87	37.73	0.05	37.69
2011-12	539.95	1.85	102.85	2.02	642.64	42.33	0.44	42.77
2012-13	556.40	-10.99	137.56	2.83	688.75	46.45	0.44	46.83
2013-14	565.77	-7.87	166.86	2.19	724.18	44.27	0.37	44.64
2014-15(p)	612.44	4.27	212.10	1.24	827.57	48.26	1.32	49.57
Growth rate of 2014-15 over 2013-14(%)	8.25	-154.24	27.12	-43.42	14.28	9.00	258.58	11.05

(P): Provisional

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	5.06	36.39
2006-07	33.99	111.50	145.49	139.75	-15.96	123.78	30.79	6.81	37.60
2007-08	34.12	121.67	155.79	149.47	-18.38	131.10	31.48	8.32	39.80
2008-09	33.51	132.78	166.28	155.15	-20.38	134.77	32.84	8.06	40.90
2009-10	33.69	159.26	192.95	184.61	-36.31	148.30	47.50	9.15	56.65
2010-11	37.68	163.60	201.28	194.82	-42.26	152.56	52.21	9.93	62.75
2011-12	38.09	171.73	209.82	203.20	-44.99	158.21	47.56	13.21	60.77
2012-13	37.86	184.80	222.66	217.74	-47.63	170.10	40.68	13.14	53.82
2013-14	37.79	189.24	227.03	220.76	-51.15	169.61	35.41	13.03	48.44
2014-15(p)	37.46	189.43	226.89	221.14	-43.51	177.63	33.66	15.47	49.13
Growth rate of 2014-15 over 2013-14(%)	-0.87	0.10	-0.06	0.17	-14.95	4.73	-4.93	18.73	1.42

(P): Provisional

*: Million Tonne

**: Billion Cubic Metre

.@ Excludes LPG Production from Natural Gas

Source : Ministry of Petroleum & Natural Gas

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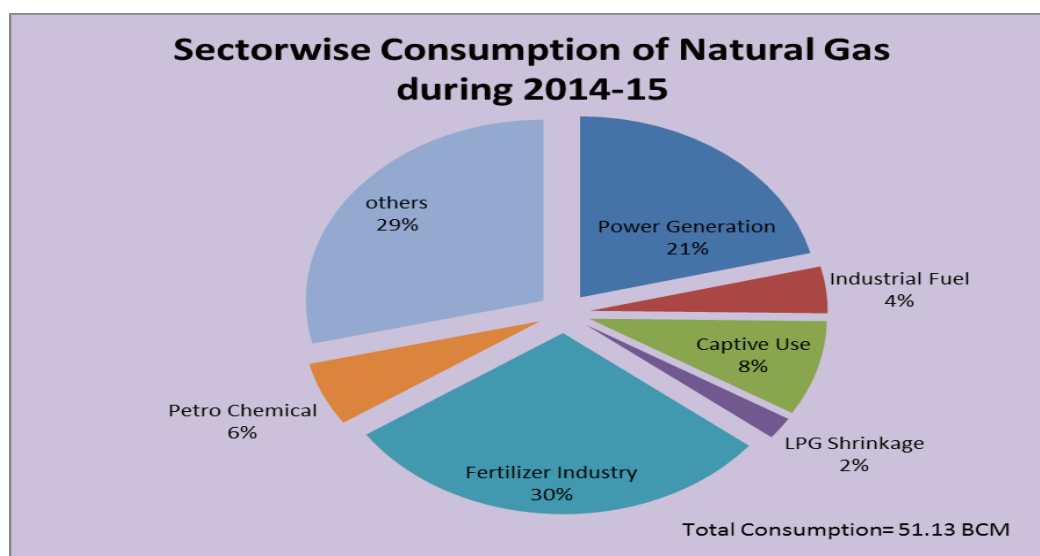
CHAPTER 6: CONSUMPTION OF ENERGY RESOURCES

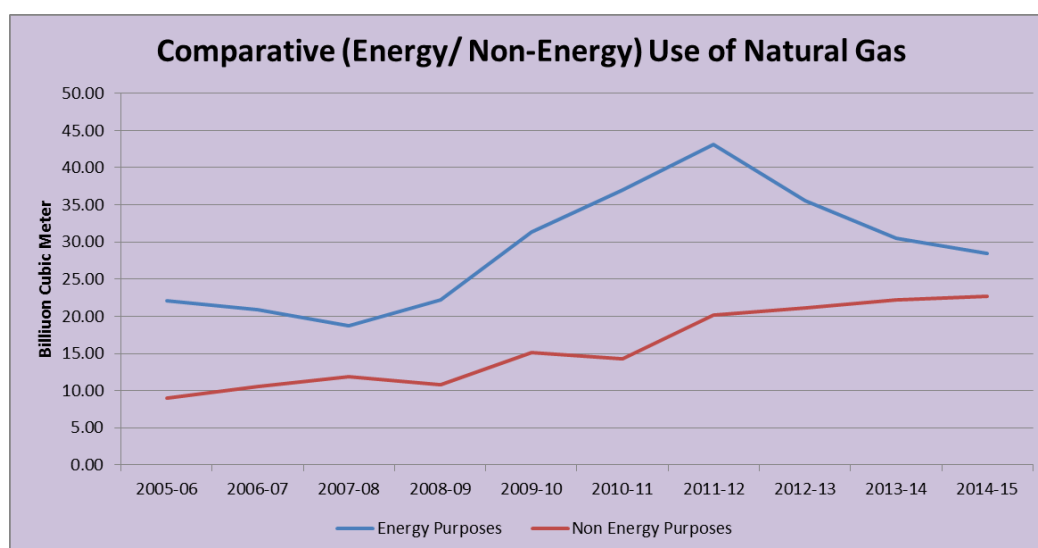
6.1 Consumption of Coal and Lignite

- ❖ The estimated total consumption of raw coal by industry has increased from 433.27 MT during 2005-06 to 827.57 MT during 2014-15 with a CAGR of 6.69% (Table 6.1). The annual growth rate from 2013-14 to 2014-15 is 14.28%.
- ❖ Consumption of Lignite increased from 30.24 MT in 2005-06 to 49.57 MT in 2014-15 registering a compound growth of 5.07%. Consumption of Lignite is highest in Electricity Generation sector, accounting for about 84.09% (Table 6.5) of the total lignite consumption.
- ❖ Electricity generation is the biggest consumer of coal, followed by steel industries. Industrywise estimates of consumption of coal (Table 6.4) show that during 2014-15 electricity generating units consumed 527.10 MT of coal, followed by steel & washery industries (66.37 MT), cement industries (37.95 MT) and paper industries (1.54 MT).

6.2 Consumption of Crude Oil and Natural Gas

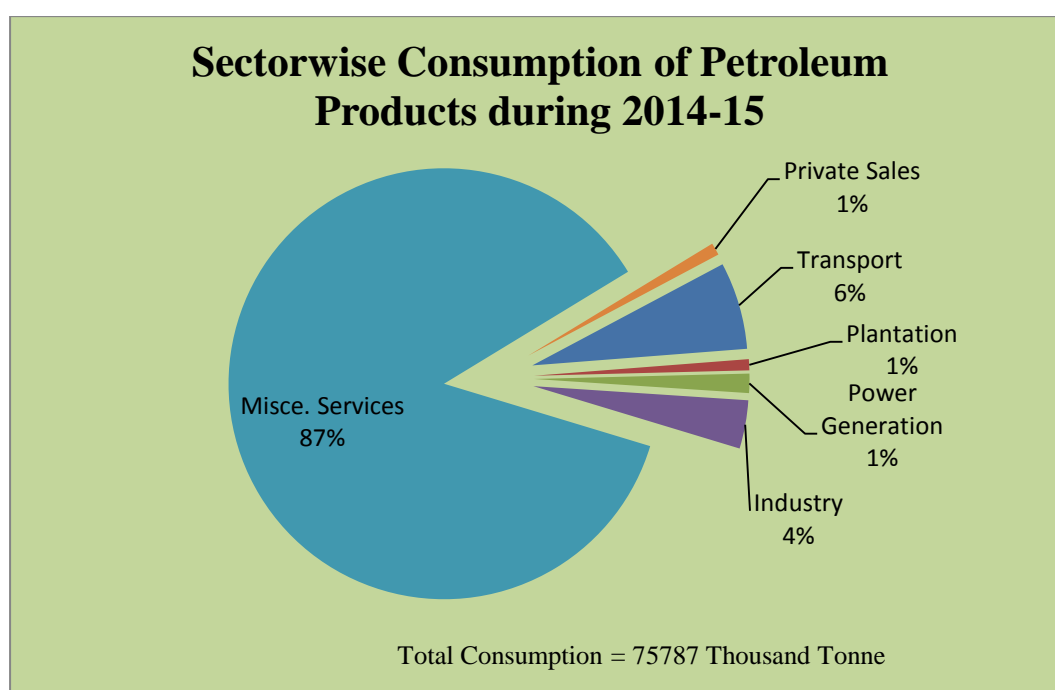
- ❖ The estimated consumption of crude oil has a steady increase, from 130.11 MMT during 2005-06 to 223.24 MMT during 2014-15 with CAGR of 5.55%. It increased from 222.50 MMT in 2013-14 to 223.24 MMT in 2014-15 (Table 6.1).
- ❖ The maximum use of Natural Gas is in fertilizers industry (29.71%) followed by power generation (20.97%) and 0.07% natural gas was used for domestic fuel (Table 6.8).
- ❖ Industrywise off-take of natural gas shows that natural gas has been used both for Energy (55.69%) and Non-energy (44.31%) purposes (Table 6.8).





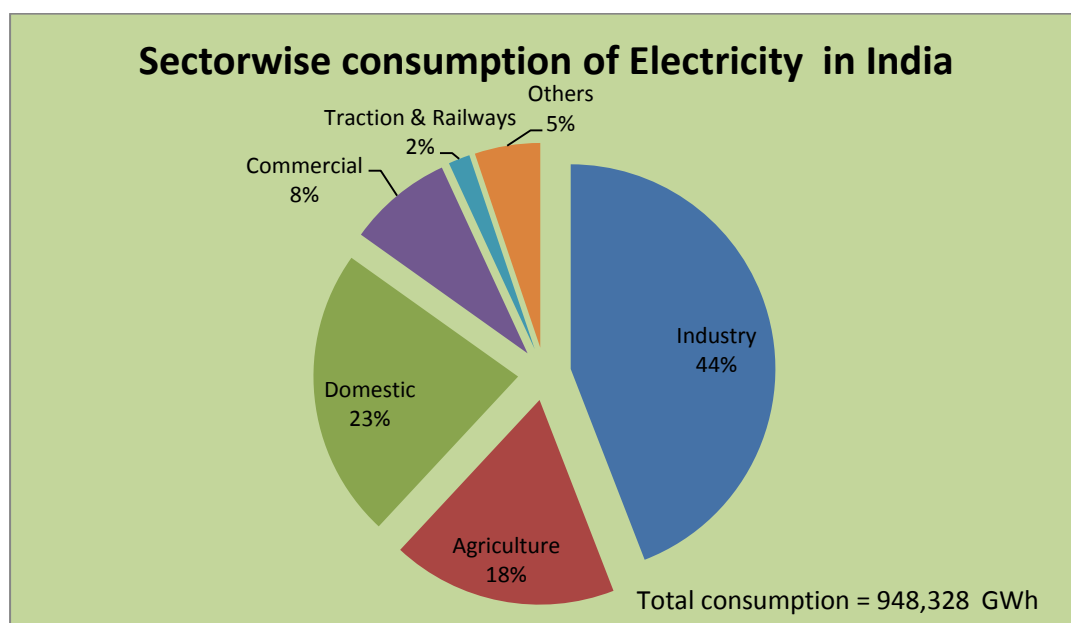
6.3 Consumption of Petroleum Products

- ❖ High speed diesel oil accounted for 37.99% of total consumption of all types of petroleum products in 2014-15. This was followed by Petrol (10.44%), LPG (9.86%), Refinery (9.67), Petroleum Coke (7.88%) and Naphtha (5.98%). Consumption of Light Diesel oil continuously declined from 2005-06 (0.88 MT) to 2014-15 (0.37 MT) (Tables 6.6 & 6.7).
- ❖ Sectorwise consumption of different petroleum products reveals that miscellaneous service sector accounts for the lion's share (87%) of the total consumption of petroleum products (Table 6.7).

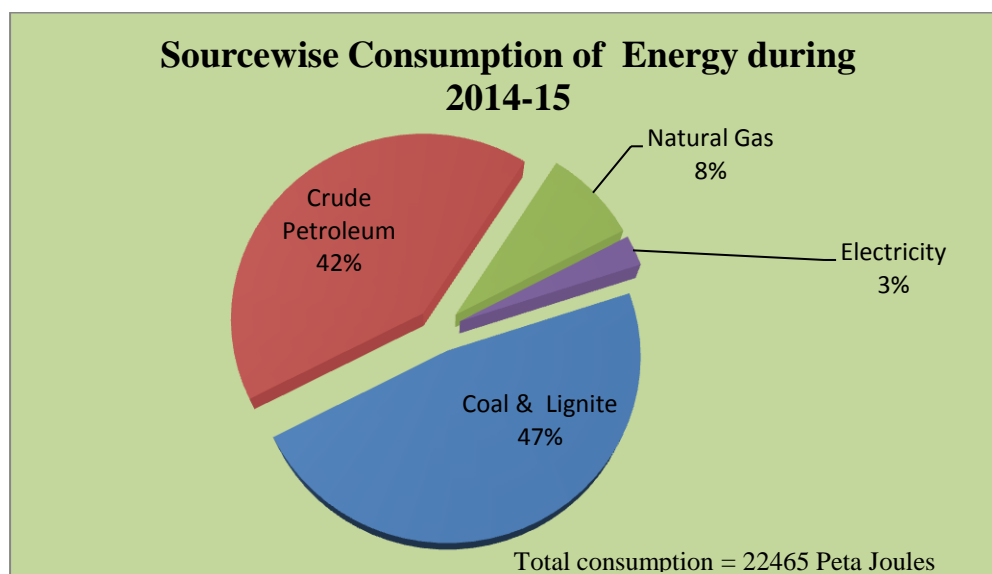


6.4 Consumption of Electricity

- ❖ The estimated electricity consumption increased from 411887 GWh during 2005-06 to 948328 GWh during 2014-15, showing a CAGR of 8.72% (Table 6.9). The increase in electricity consumption is 8.48% from 2013-14 (874209 GWh) to 2014-15 (948328 GWh).
- ❖ Of the total consumption of electricity in 2014-15, industry sector accounted for the largest share (44.11%), followed by domestic (22.93%), agriculture (17.81%) and commercial sectors (8.27%) (Table 6.9).

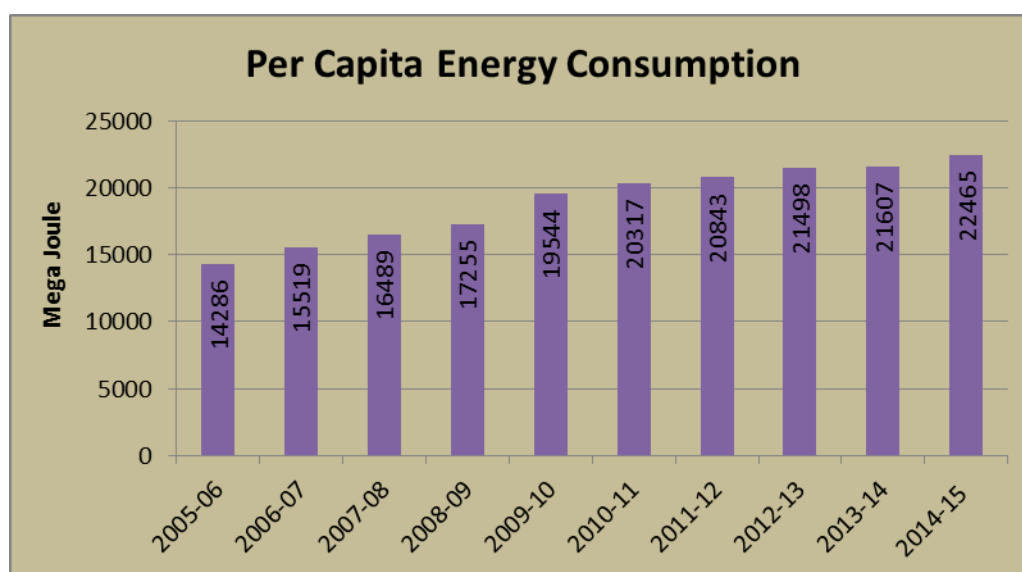


- ❖ The electricity consumption in Industry sector and commercial sector has increased at a much faster pace as compared to other sectors during 2005-06 to 2014-15 with CAGRs of 10.69% and 8.10% respectively (Table 6.9).
- ❖ Loss of electricity due to transmission has decreased from 30.42% during 2005-06 to 22.79% during 2014-15 (Table 6.10).



6.5 Per-Capita Energy Consumption & Energy Intensity

- ❖ The consumption of energy in petajoules in the form of Coal and Lignite accounted for about 47.47% of the total consumption during 2014-15. Crude Petroleum was second (41.60%), while Natural Gas (8.27%) was third (Table 6.2).
- ❖ The total consumption of energy from conventional sources increased from 21607 petajoules during 2013-14 to 22465 petajoules during 2014-15, showing an increase of 3.97% (Table 6.2).
- ❖ 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, these two indicators are generally computed on the basis of consumption of conventional energy.
- ❖ Per-capita Energy Consumption (PEC) increased from 12781 Mega Joules in 2005-06 to 17731 Mega Joules in 2014-15, a CAGR of 3.3% (Table 6.3). The annual increase in PEC for 2014-15 over 2013-14 is 1.89%.



- ❖ The Energy Intensity (at 2004-05 prices) decreased from 0.4392 Mega Joules per rupee in 2005-06 to 0.2129 Mega Joules per rupee in 2014-15 (Table 6.3).
- ❖ Energy intensity has decreased over the last decade. This decline may be attributed to faster growth of GDP than energy demand, the services sector having a growing share of the economy, energy efficiency programmes, etc.

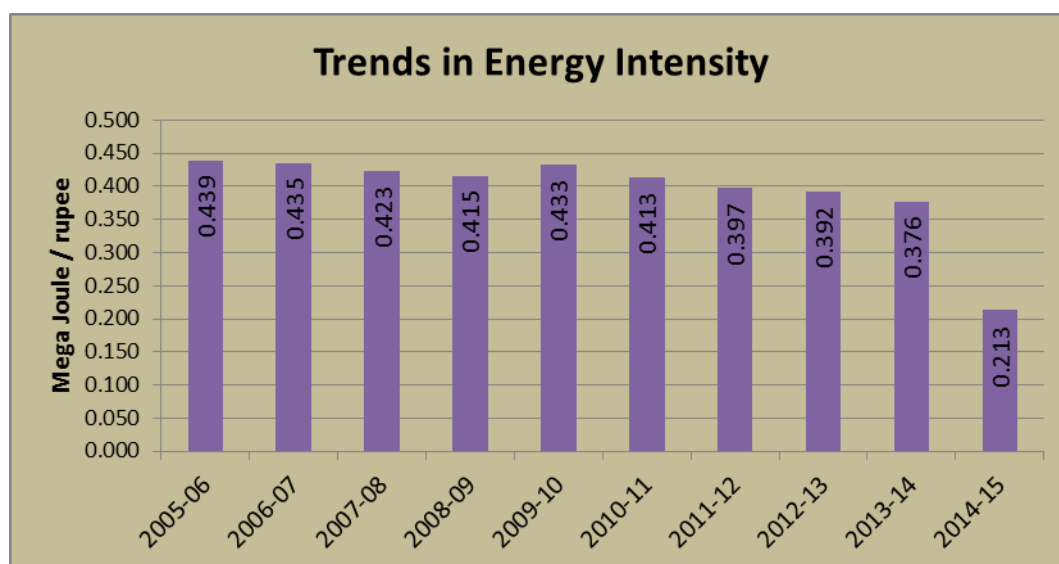


Table 6.1: Trends in Consumption of Energy Sources in India

Year	Coal #	Lignite	Crude Oil**	Natural Gas (Billion Cubic Metres)	Electricity*\$ (GWh)
	(Million Tonnes)		(MMT)		
1	2	3	4	5	6
2005-06	433.27	30.24	130.11	36.39	118,818.00
2006-07	462.35	30.81	146.55	37.60	132,304.00
2007-08	502.82	34.65	156.10	39.80	137,344.00
2008-09	549.57	31.85	160.77	39.81	142,576.00
2009-10	585.30	34.41	192.77	55.67	125,316.00
2010-11	589.87	37.69	196.99	61.18	140,524.00
2011-12	642.64	42.77	204.12	59.69	163,000.00
2012-13	688.75	46.83	219.21	52.92	146,497.00
2013-14	724.18	44.64	222.50	47.67	169,076.00
2014-15(p)	827.57	49.57	223.24	48.25	165,346.00
Growth rate of 2014-15 over 2013-14(%)	14.28	11.05	0.33	1.22	-2.21
CAGR 2005-06 to 2014-15(%)	6.69	5.07	5.55	2.86	3.36

(p): Provisional

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

*Includes hydro & nuclear electricity from utilities.

**Crude oil in terms of refinery crude throughput.

\$ Due to non-availability of the Consumption data it has been assumed that Consumption is equal to the Production

Does not include Lignite

Sources:

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

Table 6.2 Trends in Consumption of Energy Sources

(In Peta Joules)

Year	Coal &Lignite	Crude Petroleum *	Natural Gas	Electricity #	Total
1	2	3	4	5	6
2005-06	7009	5448	1402	428	14286
2006-07	7459	6136	1448	476	15519
2007-08	7926	6536	1533	494	16489
2008-09	8476	6732	1533	513	17255
2009-10	9137	7811	2144	451	19544
2010-11	9207	8248	2357	506	20317
2011-12	9410	8547	2299	587	20843
2012-13	9753	9178	2038	527	21498
2013-14	9846	9316	1836	609	21607
2014-15(P)	10664	9347	1859	595	22465
Growth rate of 2014-15 over 2013- 14(%)	8.3	0.3	1.2	-2.2	4.0
CAGR 2005-06 to 2014-15(%)	4.3	5.5	2.9	3.4	4.6

*: Crude oil in terms of refinery crude throughput.

(p): Provisional.

#: Include Hydro and Nuclear electricity from utilities

Note: Here the value of energy in peta joules relates to the production value from Hydro and Nuclear only. Due to non availability of the data the consumption value is taken equivalent to production value

Sources:

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

Table 6.3 : Trends in Per-Capita Energy Consumption (PEC) and Energy intensity in India

Year	Energy Consumption in peta joules	Mid year population (in Million)	GDP (Rs. crore)	Per Capita Energy Consumption (in Mega Joules)	Energy Intensity (Mega Joules per rupee)
2005-06	14286	1118	3253073	12781	0.4392
2006-07	15519	1134	3564364	13685	0.4354
2007-08	16489	1148	3896636	14368	0.4232
2008-09	17255	1161	4158676	14856	0.4149
2009-10	19544	1175	4516071	16626	0.4328
2010-11	20317	1182	4918533	17187	0.4131
2011-12	20843	1220	5247530	17084	0.3972
2012-13	21498	1235	5482111	17407	0.3921
2013-14	21607	1251	5741791	17272	0.3763
2014-15(P)**	22465	1267	10552151	17731	0.2129
Growth rate of 2012-13 over 2011-12(%)	3.14	1.23	4.47	1.89	-1.27
CAGR 2005-06 to 2014-15(%)	4.63	1.26	12.49	3.33	-6.98

(P): Provisional

* Estimated value based on sourcewise availability of Coal, Crude Petroleum, Natural Gas
 Energy Intensity=Amount of energy consumed for producing one unit of Gross Domestic Product.

** from 2005-06 to 2013-14 GDP estimates are at base 2004-05 price where as 2014-15 GDP estimates are at base 2011-12 price

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

(Million tonnes)

Year	Electricity	Steel & Washery	Cement	Paper	Textile	Sponge Iron	Fertilizers & chemicals	Brick	Others *	Total
1	2	3	4	5	6	7	8		9	10 = 2 to 9
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	437.67	47.86	26.36	2.03	0.26	21.69	2.82	0.13	69.36	608.17
2012-13	485.47	51.70	31.79	2.12	0.30	20.90	2.86	2.01	116.24	713.39
2013-14	493.25	53.05	32.46	1.91	0.36	18.49	2.64	4.01	133.19	739.34
2014-15(p)	527.10	66.37	37.95	1.54	0.42	14.68	2.69	0.11	169.46	820.31
Distribution (%)	64.26	8.09	4.63	0.19	0.05	1.79	0.33	0.01	20.66	100.00
Growth rate of 2014-15 over 2013-14(%)	6.86	25.11	16.91	-19.15	16.39	-20.64	2.05	-97.18	27.23	10.95
CAGR 2005-06 to 2014-15(%)	5.59	12.94	9.75	-5.71	3.82	-9.30	-1.17	-3.26	12.57	7.57

(P): Provisional

* Includes Sponge Iron, colliery consumption, jute, bricks, coal for soft coke, 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	4.48	41.88
2012-13	37.20	0.05	1.10	0.69	0.30	3.81	43.15
2013-14	36.34	0.03	1.49	1.29	0.73	4.02	43.90
2014-15(p)	39.47	0.02	1.27	0.69	2.89	2.60	46.94
Distribution (%)	84.09	0.05	2.70	1.47	6.15	5.54	100.00
Growth rate of 2014-15 over 2013-14(%)	8.63	-23.33	-14.78	-46.51	293.86	-35.33	6.93

(P): Provisional

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

From 2008-09 onwards cotton is also 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 India

(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	12.19	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	15.60	15.74	12.29	7.50	5.27	69.08	0.40
2013-14	16.29	17.13	11.45	7.17	5.51	68.37	0.39
2014-15(p)	18.02	19.08	10.94	7.09	5.58	69.40	0.37
Growth rate of 2014-15 over 2013-14(%)	10.62	11.38	-4.45	-1.12	1.23	1.51	-5.13
CAGR 2005-06 to 2014-15(%)	5.59	8.24	-1.08	-2.93	5.40	5.61	-8.33

(p) : Provisional

Contd...

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

(Million Tonnes)

Year	Heavy Ends				Refinery Fuel and Losses	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	7.66	3.20	4.68	10.14	18.35	5.51	175.40
2013-14	6.24	3.31	5.01	11.76	17.87	5.96	176.46
2014-15(p)	6.02	2.96	4.98	14.41	17.67	6.15	182.67
Growth rate of 2014-15 over 2013-14(%)	-3.53	-10.57	-0.60	22.53	-1.12	3.19	3.52
CAGR 2005-06 to 2014-15(%)	-7.29	3.59	3.57	11.33	6.81	2.81	4.09

(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 : Sectorwise (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
High Speed Diesel Oil	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	5,159	617	214	1,628	61,414	141	69,173
	2013-14	3,203	429	204	687	63,764	77	68,364
	2014-15(p)	4,617	575	197	794	63,149	72	69,404
Growth rate of 2014-15 over 2013-14(%)		44.15	34.03	-3.43	15.59	-0.96	-6.49	1.52
CAGR 2005-06 to 2014-15(%)		0.80	2.92	-8.86	-1.92	7.67	-32.89	5.61

('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
Light Diesel Oil	2005-06	52	28	65	325	362	49	881
	2006-07	53	13	67	244	343	0	720
	2007-08	35	3	77	200	351	0	666
	2008-09	15	4	175	155	203	0	552
	2009-10	6	3	152	143	154	0	458
	2010-11	5	2	137	127	184	0	455
	2011-12	3	1	127	102	182	0	415
	2012-13	3	1	142	74	178	0	399
	2013-14	4	1	132	64	186	0	387
	2014-15(p)	5	1	132	55	172	0	365
Growth rate of 2014-15 over 2013-14(%)		25.00	0.00	0.31	-14.06	-7.53	0.00	-5.58
CAGR 2005-06 to 2014-15(%)		-20.88	-28.34	7.36	-16.28	-7.17	0.00	-8.43

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
Furnace Oil	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	4,390	913	9,419
	2009-10	560	68	688	3,134	4,196	538	9,184
	2010-11	780	70	823	2,774	3,986	374	8,807
	2011-12	371	70	647	2,409	3,420	706	7,623
	2012-13	277	79	587	2,019	2,721	608	6,291
	2013-14	315	75	536	1,833	2,332	696	5,787
	2014-15(p)	346	56	446	1,748	2,417	627	5,640
Growth rate of 2014-15 over 2013-14(%)		9.84	-25.33	-16.79	-4.64	3.64	-9.91	-2.54
CAGR 2005-06 to 2014-15(%)		-3.18	-	3.98	-0.45	-8.08	-1.10	-4.48

('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
Low Sulphur Heavy Stock	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	0	2	936	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	0	0	439	778	149	0	1,366
	2013-14	0	0	328	76	44	0	448
	2014-15(p)	0	0	226	104	48	0	378
Growth rate of 2014-15 over 2013-14(%)		0.00	0.00	-48.52	-86.63	-67.79	0.00	-72.33
CAGR 2005-06 to 2014-15(%)		0.00	0.00	-8.67	-27.68	-37.09	-	-25.32

Contd...

Table 6.7 (Contd.) : Sectorwise (End Use) Consumption of Selected Petroleum Products in India

		('000 tonnes)							
Petroleum	Year	Transport	Plantation	Power	Industry	Domestic	Misc.	Private	Total
1	2	3	4	5	6		7	8	9=3 to 8
Liquified Petroleum Gas	2005-06 (NA)	-	-	-	-	-	-	-	-
	2006-07(NA)	-	-	-	-	-	-	-	-
	2007-08	202	0	0	687	10299	146	676	12010
	2008-09	182	1	0	825	10637	136	409	12191
	2009-10	225	4	0	1014	11364	133	395	13135
	2010-11	224	2	0	1150	12369	157	430	14332
	2011-12	224	5	0	1255	13296	150	421	15350
	2012-13	215	4	0	1312	13568	103	398	15601
	2013-14	195	4	3	1208	14412	104	369	16294
	2014-15(p)	165	6	3	1259	16040	98	448	18019
Growth rate of 2014-15 over 2013-14(%)		-15.60	54.18	19.84	4.18	11.30	-5.66	21.47	10.59
CAGR 2007-08 to 2014-15(%)		-2.52	-	-	7.87	5.69	-4.85	-5.02	5.20

(p) : Provisional, @ : LSHS sales through private 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 INDUSTRYWISE OFF-TAKE OF NATURAL GAS IN INDIA

(Billion Cubic Metres)

Year	Energy Purpose								Non-Energy Purposes				Grand Total
	Power Generation	Industrial Fuel	Tea Plantation	Domestic Fuel/Transport	Captive Use	LPG Shrinkage \$	Others **	Total	Fertilizer Industry	Petro-Chemicals	Others ***	Total	
1	2	3	4	5	6	7	8	9=2 to 8	10	11	12	13=10 to 12	14
2005-06	11.88	3.78	0.15	0.08	5.05	-	1.12	22.05	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	15.13	46.51
2010-11	25.79	2.32	0.19	0.04	6.78	-	1.84	36.96	11.46	1.31	1.53	14.30	51.26
2011-12	22.63	2.40	0.18	0.03	3.82	1.07	12.93	43.06	14.00	1.86	4.26	20.12	63.17
2012-13	16.08	2.51	0.18	0.04	3.86	1.03	11.86	35.56	14.73	2.49	3.89	21.11	56.67
2013-14	11.28	2.33	0.20	0.04	4.04	0.98	11.65	30.51	15.87	2.40	3.97	22.24	52.76
2014-15(P)	10.72	2.12	0.19	0.03	4.33	1.01	10.08	28.47	15.19	2.89	4.58	22.66	51.13
Distribution (%)	20.97	4.14	0.37	0.07	8.46	1.97	19.71	55.69	29.71	5.65	8.95	44.31	100.00
Growth rate of 2014-15 over 2013-14	-5.00	-9.15	-4.04	-1.46	7.23	2.34	-13.48	-6.69	-4.28	20.17	15.29	1.86	-3.09
CAGR 2005-2006 to 2014-15	-1.02	-5.62	2.23	-7.40	-1.53	-1.51	24.57	2.59	6.94	9.42	62.33	9.70	5.12

Note: Includes of Consumption of LNG in 2011-12 & onwards.

(P): Provisional

** Includes off-take by CGD entities for Domestic (PNG), Industrial & Manufacture, Internal Consumption for pipeline system and other Miscellaneous sector

***: Includes use for Sponge iron sector, Refinery and Water Plant.

\$ Data from 2005-06 to 2010-11 is included in Captive Use

Source: Ministry of Petroleum & Natural Gas

Table 6.9: Consumption of Electricity by Sectors in India(in Giga Watt Hour) = (10⁶ 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	1,51,557	90,292	1,00,090	35,965	9,944	24,039	4,11,887
2006-07	1,71,293	99,023	1,11,002	40,220	10,800	23,411	4,55,749
2007-08	1,89,424	1,04,182	1,20,918	46,685	11,108	29,660	5,01,977
2008-09	2,09,474	1,09,610	1,31,720	54,189	11,425	37,577	5,53,995
2009-10	2,36,752	1,20,209	1,46,080	60,600	12,408	36,595	6,12,645
2010-11	2,72,589	1,31,967	1,69,326	67,289	14,003	39,218	6,94,392
2011-12	3,52,291	1,40,960	1,71,104	65,381	14,206	41,252	7,85,194
2012-13	3,65,989	1,47,462	1,83,700	72,794	14,100	40,256	8,24,301
2013-14	3,84,418	1,52,744	1,99,842	74,247	15,540	47,418	8,74,209
2014-15(p)	4,18,346	1,68,913	2,17,405	78,391	16,177	49,095	9,48,328
Distribution (%)	44.11	17.81	22.93	8.27	1.71	5.18	100.00
Growth rate of 2013-14 over 2014-15(%)	8.83	10.59	8.79	5.58	4.10	3.54	8.48
CAGR 2005-06 to 2013-14(%)	10.69	6.46	8.07	8.10	4.99	7.40	8.72

(P): Provisional

Source : Central Electricity Authority.

Table 6.10 : Electricity Generated(from Utilities), Distributed, Sold and Lost in India(in Giga Watt hour) = (10⁶ 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	6,23,819	41,970	5,81,849	10,345	5,92,194	4,12,096	1,80,098	30.41
2006-07	6,70,654	43,577	6,27,077	11,931	6,39,008	4,55,965	1,83,043	28.64
2007-08	7,22,626	45,531	6,77,095	12,685	6,89,780	5,02,267	1,87,513	27.18
2008-09	7,41,168	47,404	6,93,764	14,181	7,07,945	5,27,623	1,80,322	25.47
2009-10	7,99,851	50,723	7,49,128	14,391	7,63,519	5,69,723	1,93,796	25.38
2010-11	8,44,748	52,952	7,91,796	19,839	8,11,635	6,17,098	1,94,537	23.97
2011-12	9,22,451	56,499	8,65,952	15,514	8,81,466	6,73,068	2,08,398	23.64
2012-13	9,64,489	64,109	9,00,380	20,849	9,21,229	7,08,997	2,12,232	23.04
2013-14	10,26,649	70,161	9,56,488	17,948	9,74,436	7,51,908	2,22,528	22.84
2014-15(p)	11,16,850	76,268	10,40,582	13,773	10,54,355	8,14,056	2,40,299	22.79
Growth rate of 2014-15 over 2013-14(%)	8.79	8.70	8.79	-23.26	8.20	8.27	7.99	-0.20
CAGR 2005-06 to 2014-15(%)	6.00	6.15	5.99	2.90	5.94	7.04	2.93	-2.84

(P): Provisional

Source : Central Electricity Authority.

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CHAPTER 7: 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) recommend 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.
- ❖ **Energy Balance:** An energy balance is a framework to complete data on all energy products entering, existing and used within a given country during a reference period (e.g. a year). It expresses all data in common energy units, which makes it possible to define a “total” product.
- ❖ The purpose of compiling an energy balance starting from the various commodity balances are numerous; they are to:
 - provide a comprehensive overview of the energy profile of a country, to monitor energy security, energy markets, relevant policy goals and to formulate adequate energy policies;
 - provide the basis for aggregate socio-economic indicators, as well as for estimates of CO₂ emissions;
 - compare different reference periods and different countries;
 - provide a tool to ensure completeness, consistency and comparability of basic statistics;
 - calculate efficiencies of transformation processes, as well as relative shares of different sectors or products in the country’s total supply or consumption

- ❖ An energy balance generally takes the form of a matrix of products and flows, with varying levels of disaggregation, although graphical formats also exist (e.g. sankey diagram).
- ❖ Two major components of the energy balance statistics are Total Primary Energy Supply and Total Final Consumption of energy commodity.
- ❖ Within a balance, the total final consumption is disaggregated into sectors, like industry, transport, residential, services and others. However, the level of disaggregation of such energy data is not enough to monitor energy efficiency, as no information is given for example on the residential or services end uses, nor on the transport vehicle types or segments. The energy balance will therefore be useful to assess the largest consuming sectors within a country where the energy saving potential will have more impact, before starting more detailed collection programmes on data for energy efficiency indicators.

7.2 Methodology used for Energy Balance

- ❖ **Energy Balance (in ktoe) = Quantity of Commodity * Conversion factor**
- ❖ **1 toe = 41868 MJ**
- ❖ **Conversion factor = $\frac{\text{Net Calorific Value (NCV)}}{\text{Mega joules per ton of oil equivalent}}$**
Where NCV is in kj per kg
- ❖ **Net Calorific Value(NCV) = Gross calorific value (GCV) – (% Moisture Content) [1NCV = 0.9 GCV]**
 - The difference between net and gross calorific values are typically about 5% to 6% of the gross value of solid and liquid fuels and about 10% for Natural gas.
 - Net Calorific Values are, as recommended by IEA for all commodities.

7.3 Highlights of Energy Balance:

- ❖ In 2014-15, Primary Energy Supply added up to 7,69,313 Kilo Tonne of Oil equivalent (ktoe). The share of Crude Oil accounted for 30.14% and the contribution of coal was 65.69%. (Table 7.2).
- ❖ In 2014-15, National Energy Consumption was 483951 ktoe. The industrial sector used 55.92 % of the total final energy consumption (Table 7.2).

- ❖ Within the industry sector the most energy intensive industries were iron and steel, which accounted for 11.31% of the industrial energy use, construction 5.41 % and Chemical and petrochemical 2.60% (Table 7.2).
- ❖ The transport sector accounted for 23.58% of Total Final Consumption. The consumption of the residential, commercial and public sectors represented 10.50%. (Table 7.2).
- ❖ Efforts are being made to reduce the Statistical Difference, by incorporating more data.

7.3 Sankey Diagram (2014-15):

- ❖ The rise of data visualization in the digital age has revived interest in a style of chart called a Sankey diagram. This style of diagram makes it easy to see the dominant flows within a system and highlights where losses occur.
- ❖ The Sankey diagram is very useful tool to represent an entire input and output energy flow in energy system after carrying out energy balance calculation. The thicker the line, the greater the amount of energy involved.
- ❖ This publication for the first time presents a map of the transformation of energy in India as a Sankey diagram. The data of Energy Balance (Table 7.2) is used to construct the Sankey diagram, in which flows of energy are traced from energy sources to end-use consumption. The resulting diagram provides a convenient and clear snapshot of existing energy transformation in India which can be compared with a similar global analysis. It gives a basis for examining and communicating future energy scenarios.

Table 7.1 : Energy Commodity Balance for the year 2014-15(P)

Supply	Coal	Lignite	LPG	Naphta	Kerosene	Diesel	Fuel Oil	Natural Gas	Electricity
	(000 tonnes)							(MMSCM)	(Gwh)
Production	612435	48257	9840	17391	7559	94428	11919	33656	1116850
From Other Sources			1887	1358	74	1486			162057
Imports	212103	1	8318	1571	30	191	945	15470	4998
Exports	1238	3	254	7008	15	25559	4762		
Intl. marine bunkers									
Stock changes	-4269	-1316							
Domestic Supply	827569	49571	19791	13312	7648	70546	8102	49126	1283905
Transfer									
Statistical difference	7260	2630	2220	3087	543	1212	2085	3176	19010
Transformation	527099	39473	3	199		197		10720	76268
Electricity plants	527099	39473	3	199		197		10720	76268
CHP plants									
Heat plants									
Blast furnaces/ gas works									
Coke/pat.fuel/BKB plants									
Petroleum refineries									
Petrochemical industry									
Liquefaction plants									
Other Transform. sector									
Energy Sector	576					998		5934	
Coal mines	576					998			
Fuel mining and extraction									
Petroleum refineries									
Elec., CHP and heat plants									
Pumped storage (elec.)									
Other energy sector								5934	
Distribution losses									240299
Final Consumption	820309	46941	17571	10225	7105	69334	6017	45950	1264895
Industry Sector	292634	7468	1259	10026	70	795	6017	533	418346
Iron and steel	81041	23				162			
Chemical and petroleum	2693	333	35	9818		109			
Non-ferrous metals						19			
Non-metallic minerals									
Transport equipment									
Machinery			21			232			
Mining & Quarrying			125						
Food and tobacco									
Paper, pulp and print	1541	690							
Wood and wood products									
Construction	38058	1882				149			
Textile and leather	419	2887	2			59			
Non-specified	168882	1653	1076	208	70	65	6017	533	
Transport Sector			165			65021		5766	16177
International aviation									
Domestic aviation						1			
Road			164			1580			
Rail			1			2693			16177
Pipeline transport								5766	
Domestic navigation						344			
Non-specified						60403			
Other Sectors			16144		7035	2323		188	513805
Residential			16040		6917				217405
Comm. And public services									78391
Agriculture/forestry			6			575		188	168913
Fishing									
Non-specified			98		118	1748			49095
Non-Energy Use								22809	

(P): Provisional

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 2014-15(P)

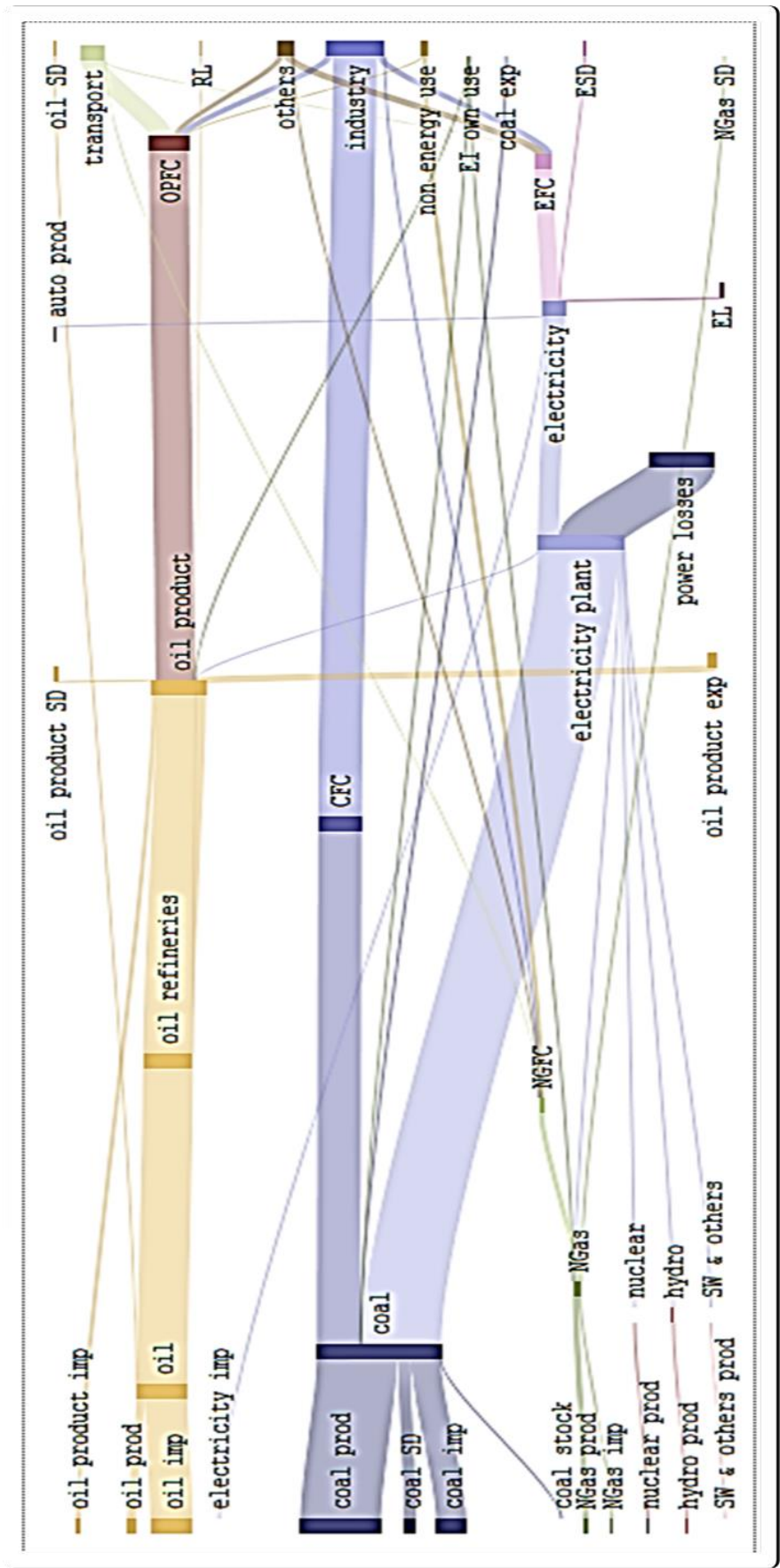
in Kilotonne of Oil Equivalent

	Coal	Crude Oil	Oil Products	Natural Gas	Nuclear	Hydro	Solar, Wind, Others	Electricity	Total
Production	3,66,209	38,283	-	27,860	9,408	11,115	5	-	4,52,883
Imports	1,37,233	1,93,597	19,718	12,806	-	-	-	430	3,63,784
Exports	-835	-	-49,295	-	-	-	-	-	-50,130
International marine bunkers	-	-	-	-	-	-	-	-	-
International aviation bunkers	-	-	-	-	-	-	-	-	-
Stock changes	2,776	-	-	-	-	-	-	-	2,776
Total primary energy supply	5,05,383	2,31,882	-29,577	40,666	9,408	11,115	5	430	7,69,313
Transfers	-	-	-	-	-	-	-	-	-
Statistical differences	57,781	-3,729	-15,021	-2,629	-	-	-	-8,194	28,207
Main activity producer electricity plants	-3,64,025	-	-421	-8,874	-9,408	-11,115	-5	96,049	-2,97,800
Autoproducer electricity plants	-	-	-	-	-	-	-	13,937	13,937
Oil refineries	-	-2,28,153	2,25,391	-	-	-	-	-	-2,762
Coal transformation	-	-	-	-	-	-	-	-	-
Liquefaction plants	-	-	-	-	-	-	-	-	-
Non-specified (transformation)	-	-	-	-	-	-	-	-	-
Energy industry own use	-334	-	-1,032	-4,912	-	-	-	-	-6,278
Losses	-	-	-	-	-	-	-	-20,666	-20,666
Final consumption	1,98,805	-	1,79,339	24,251	-	-	-	81,556	4,83,951
Industry	1,98,805	-	35,417	441	-	-	-	35,978	2,70,641
Iron and steel	54,590	-	168	-	-	-	-	-	54,758
Chemical and petrochemical	1,890	-	10,705	-	-	-	-	-	12,595
Non-ferrous metals	-	-	20	-	-	-	-	-	20
Non-metallic minerals	-	-	-	-	-	-	-	-	-
Transport equipment	-	-	-	-	-	-	-	-	-
Machinery	-	-	264	-	-	-	-	-	264
Mining and quarrying	-	-	141	-	-	-	-	-	141
Food and tobacco	-	-	-	-	-	-	-	-	-
Paper, pulp and print	1,195	-	-	-	-	-	-	-	1,195
Wood and wood products	-	-	-	-	-	-	-	-	-
Construction	26,063	-	154	-	-	-	-	-	26,217
Textile and leather	940	-	63	-	-	-	-	-	1,004
Non-specified (industry)	1,14,127	-	23,902	441	-	-	-	35,978	1,74,448
Transport	-	-	1,07,962	4,773	-	-	-	1,391	1,14,126
Road	-	-	36,408	-	-	-	-	-	36,408
Domestic aviation	-	-	5,943	-	-	-	-	-	5,943
Rail	-	-	2,786	-	-	-	-	1,391	4,177
Pipeline transport	-	-	-	4,773	-	-	-	-	4,773
Domestic navigation	-	-	356	-	-	-	-	-	356
Non-specified (transport)	-	-	62,469	-	-	-	-	-	62,469
Other	-	-	28,001	156	-	-	-	44,187	72,343
Residential	-	-	25,357	-	-	-	-	18,697	44,054
Commercial and public services	-	-	-	-	-	-	-	6,742	6,742
Agriculture/forestry	-	-	601	156	-	-	-	14,527	15,284
Fishing	-	-	-	-	-	-	-	-	-
Non-specified (other)	-	-	2,042	-	-	-	-	4,222	6,264
Non-energy use	-	-	7,960	18,881	-	-	-	-	26,841
Non-energy use industry/transformation/energy	-	-	7,960	18,881	-	-	-	-	26,841
Non-energy use in transport	-	-	-	-	-	-	-	-	-
Non-energy use in other	-	-	-	-	-	-	-	-	-
Memo: feedstock use in petchemical industry	-	-	-	-	-	-	-	-	-
Elect. output in GWh	-	-	-	-	36,102	1,29,244	61	-	1,65,407
Elect. output-main activity producer elect. plants	-	-	-	-	36,102	1,29,244	61	-	1,65,407

SANKEY DIADRAM (INDIA)
BALANCE (2014-15)
MILLION TONNE OF OIL EQUIVALENT

Total Supply = 769313

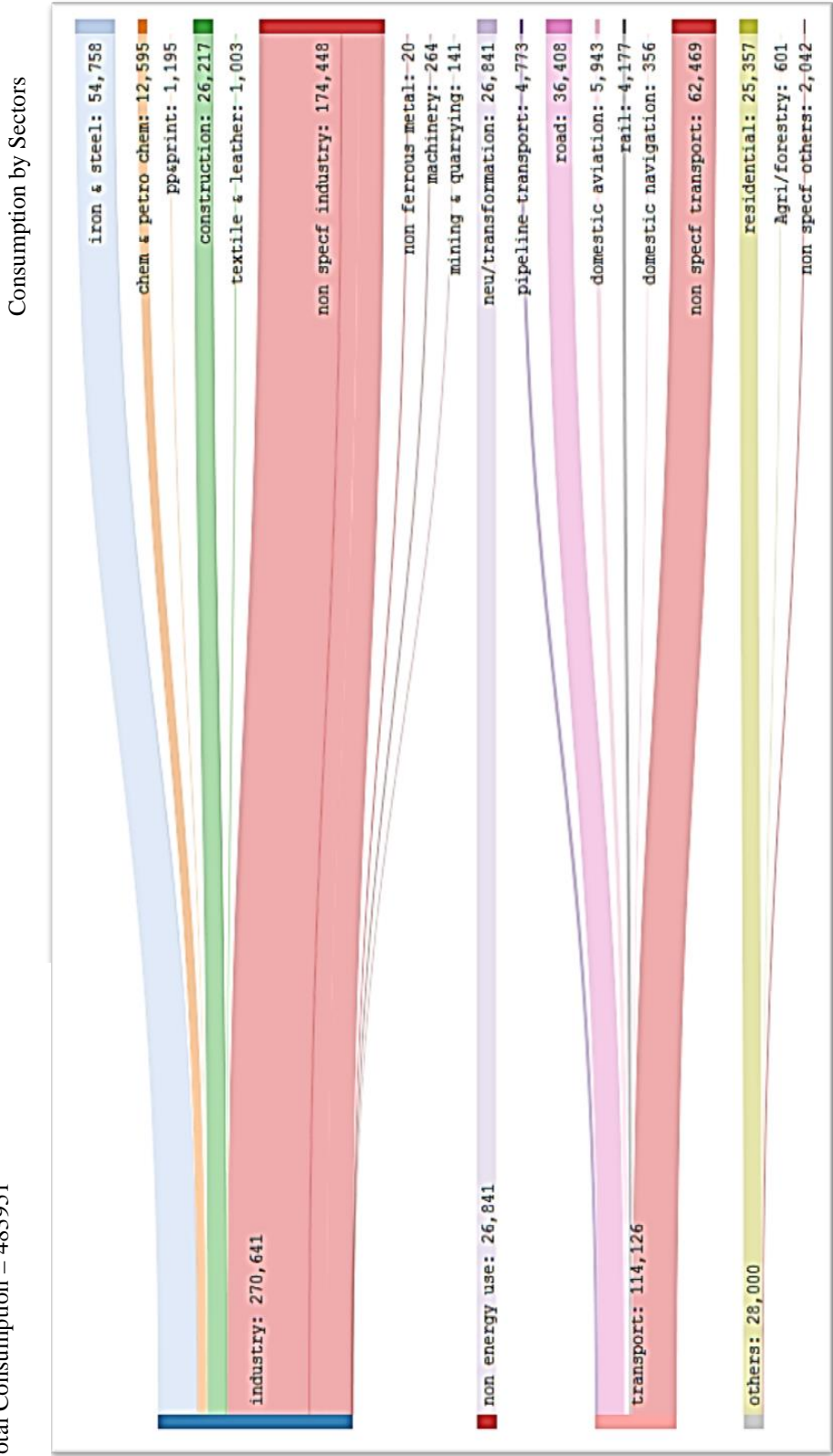
Total Final Consumption = 483951



Source Program for diagram: SankeyMATIC

SANKEY DIADRAM (INDIA)
FINAL CONSUMPTION (2014-15)
MILLION TONNE OF OIL EQUIVALENT

Total Consumption = 483951



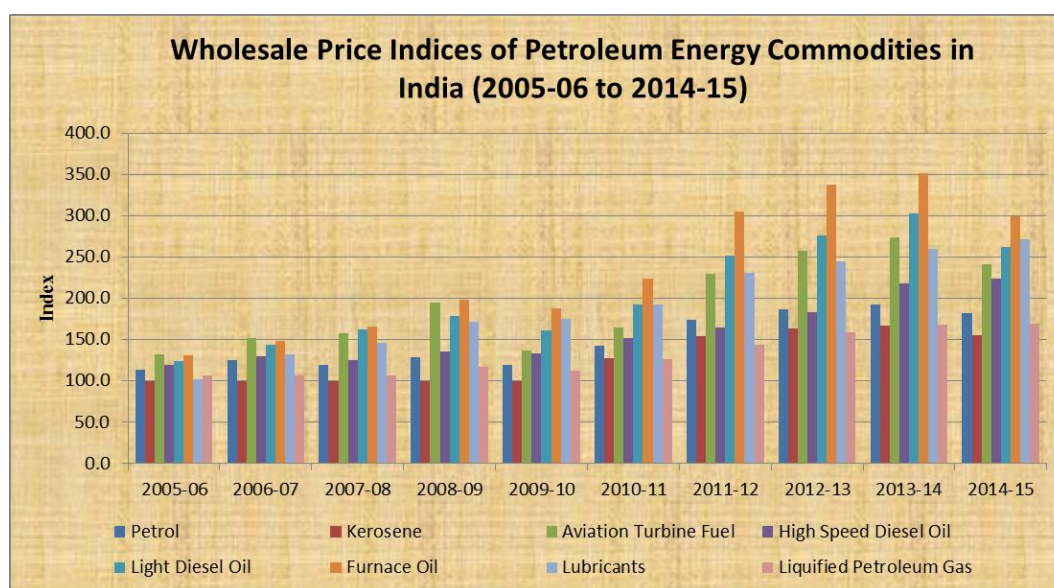
Source Program for diagram: SankeyMATIC

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CHAPTER 8: WHOLE SALE PRICE INDEX OF ENERGY COMMODITIES

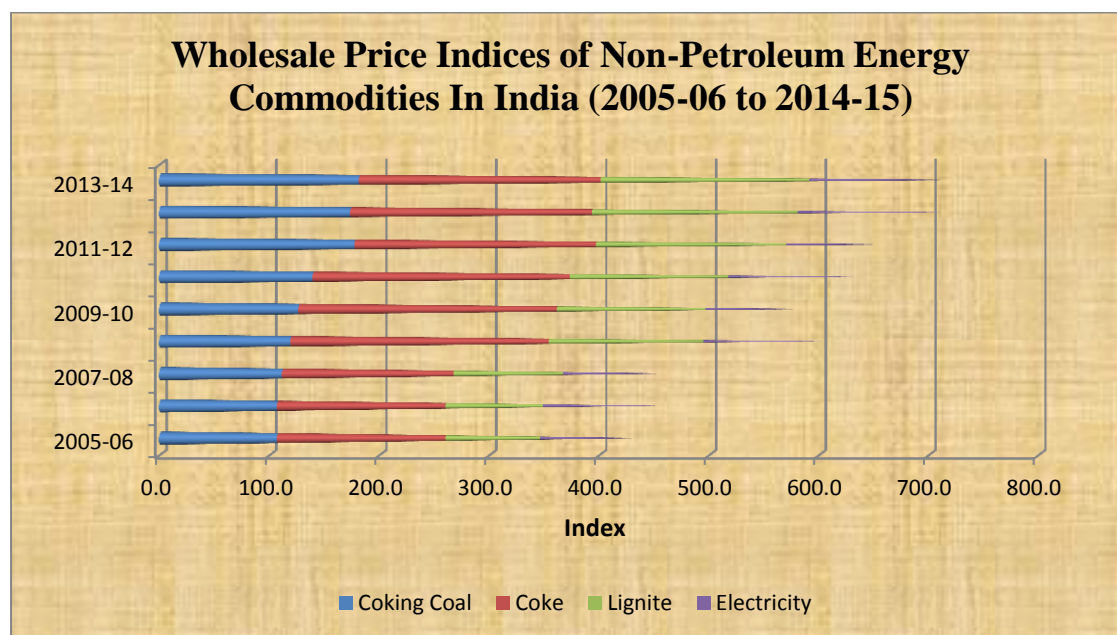
8.1 The Wholesale Price Index of Petroleum Products

- ❖ Annual increase (2014-15 over 2013-14) in wholesale Price Index of Petroleum Products varied for different products ranging from -14.81% (Furnace Oil) to 4.74% (Lubricants).
- ❖ The maximum decrease was observed in case of Furnace Oil (14.81%), followed by Light Speed Diesel Oil (13.48%).



8.2 The Wholesale Price Index of Non-Petroleum Products

- ❖ The Wholesale Price Index remained constant for Coke at 219.3 for the period 2014-15 over 2013-14.
- ❖ Wholesale Price Index of Electricity recorded an increase of 5.88% during 2014-15 over 2013-14.



8.2 Inter-Year Movement of WPI

- ❖ The yearly movement of index shows that from 2005-06 to 2014-15, 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.

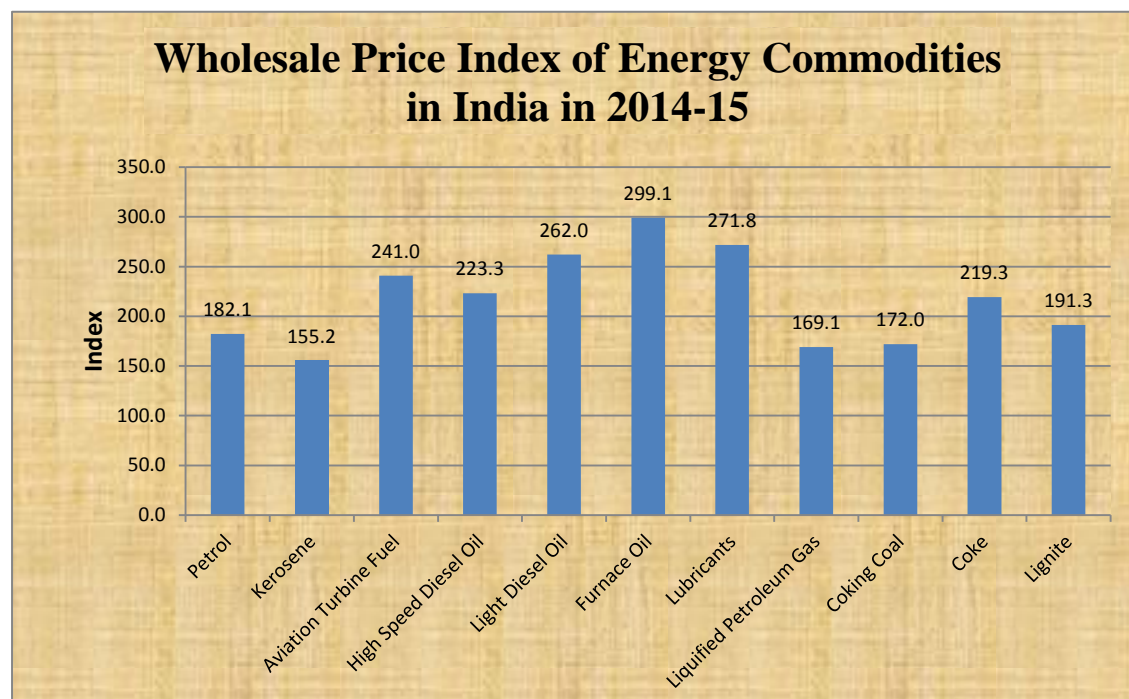


Table 8.1 : Wholesale Price Indices of Energy Commodities in India

(2004-05=100)

Year	Petroleum Products								Coking Coal	Coke	Lignite	Electricity
	Petrol	Kero-sene	Aviation Turbine Fuel	High Speed Diesel Oil	Light Diesel Oil	Furnace Oil	Lubri-cants	Liquified Petroleum Gas				
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
2013-14	192.6	166.5	274.0	217.8	302.5	351.1	259.5	168.0	181.3	219.3	189.7	158.7
2014-15	182.1	155.2	241.0	223.3	262.0	299.1	271.8	169.1	172.0	219.3	191.3	168.0
Increase in 2014-15 over 2013-14 (%)	-5.44	-6.79	-12.05	2.49	-13.38	-14.81	4.74	0.65	-5.13	0.00	0.84	5.88

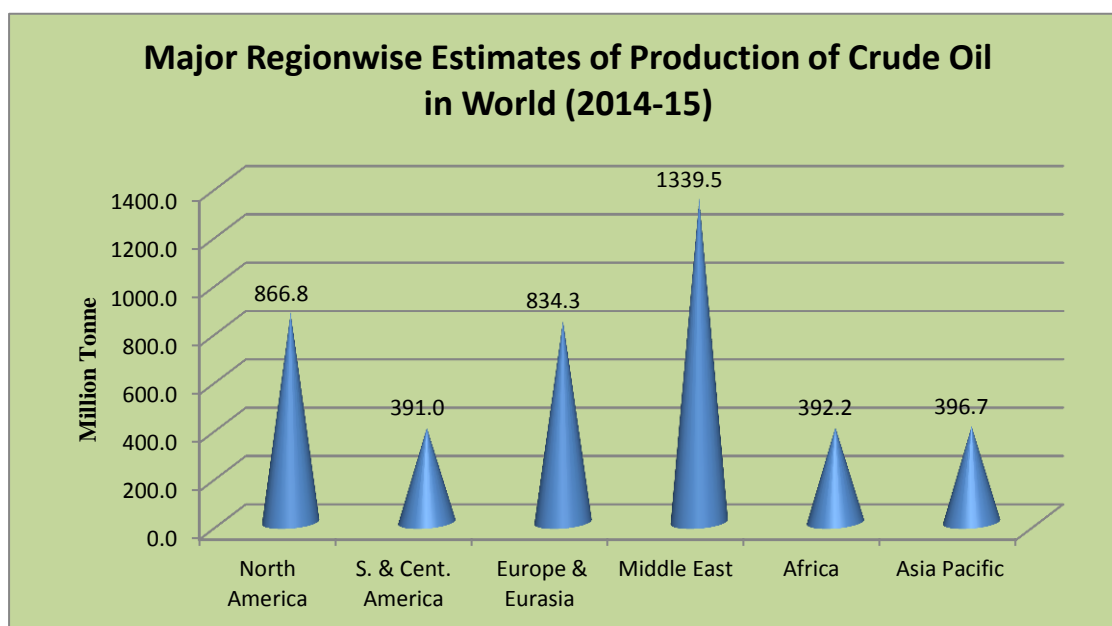
Source :Office of the Economic Advisor, Ministry of Commerce & Industry.

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CHAPTER 9: WORLD PRODUCTION AND CONSUMPTION OF CRUDE OIL & NATURAL GAS

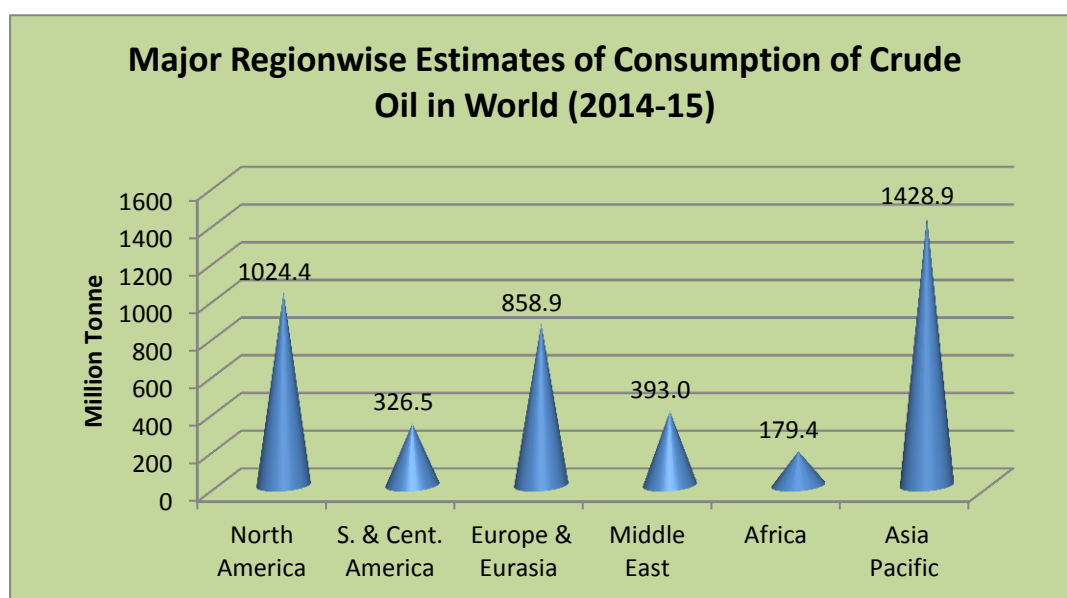
9.1 Production and consumption of crude oil

- ❖ The total estimated production of crude oil in the world has increased from about 3950 MT in 2007-08 to about 4114.8 MT during 2012-13, and further increased to 4220 MT during 2014-15 (Table 9.1). The production increased by 2.3% from 2013-14 to 2014-15.
- ❖ Geographical distribution of total world production during 2014-15 across major regions reveals that Middle East accounted for the highest share (31.74%), followed by North America (20.54%), Europe & Eurasia (19.77%), Asia Pacific (9.40%), Africa (9.29%) and South & Central America (9.26%). (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 12.88% and 12.65% respectively. They were followed by USA (12.32%), China (5.01%), Canada (4.97%), Iran (4.01%), UAE(3.96%), Iraq (3.08%) Kuwait (3.57%), Mexico (3.25%) and Venezuela (3.30%). India has accounted for only 0.99% of the world production.



- ❖ Major regionwise consumption (Table 9.2) shows that Asia Pacific accounted for the highest share (33.93%) of total world consumption, followed by North America (24.32%), and Europe & Eurasia (20.4%). African countries accounted for the lowest share in the world consumption (4.26%).

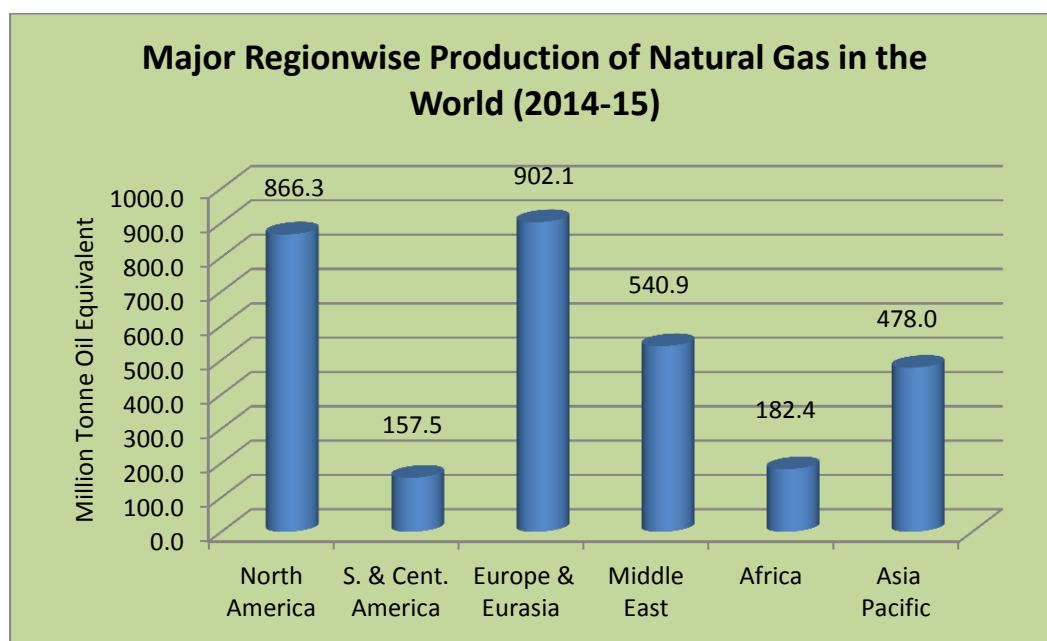
- ❖ Countrywise distribution of consumption reveals that the United States was the largest consumer of crude oil, consuming 19.85% of the world consumption during 2014-15. China was the second largest consumer (12.35%), followed by Japan (4.6%), **India (4.29%)** and Russian Federation (3.52%).
- ❖ India 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 2678.9 million Tonne oil equivalent (Mtoe) in 2007-08 to 3127.3 Mtoe in 2014-15. The production has increased by 1.6% from 2013-14 to 2014-15 (Table 9.3).
- ❖ Distribution of production of natural gas over major regions shows that Europe & Eurasia (28.9%) and North America (27.7%) are the highest and the second highest producers, together accounting for 56.6% of the total world production.
- ❖ Countrywise, USA was the largest producer of natural gas (21.4%) in the world during 2014-15, followed by the Russian Federation (16.7%), Qatar (5.1%) and Iran (4.9%). India's share in the total world production of natural gas during 2014-15 was only 0.9% (28.5 Mtoe).(Table 9.3)
- ❖ The growth in production of natural gas from 2013-14 to 2014-15 was highest in Asia Pacific (3.7) followed by Middle East (3.5%), North America (1.3%) and South & Central America (0.9%) respectively.(Table 9.3)

- ❖ The total world consumption of natural gas has increased from 2675.5 Mtoe in 2007-08 to 3065.7 Mtoe in 2014-15 (Table 9.4).
- ❖ United States of America was the largest consumer of natural gas, consuming 22.7% of the world consumption during 2014-15 while Europe & Eurasia accounted for 29.6% of the total world consumption.(Table 9.4)



- ❖ Countrywise distribution of consumption of natural gas indicates that USA was the largest consumer (22.7%), followed by Russian federation (12%), China (5.5%) and Iran (5%) respectively. India with a consumption of 45.6 Mtoe accounted for only 1.49% of total world consumption (Table 9.4).
- ❖ Consumption of natural gas over major regions shows that Europe & Eurasia (29.6%) and North America (28.3%) are the highest and the second highest consumers, together accounting for 57.9% of the total world consumption. (Table 9.4)

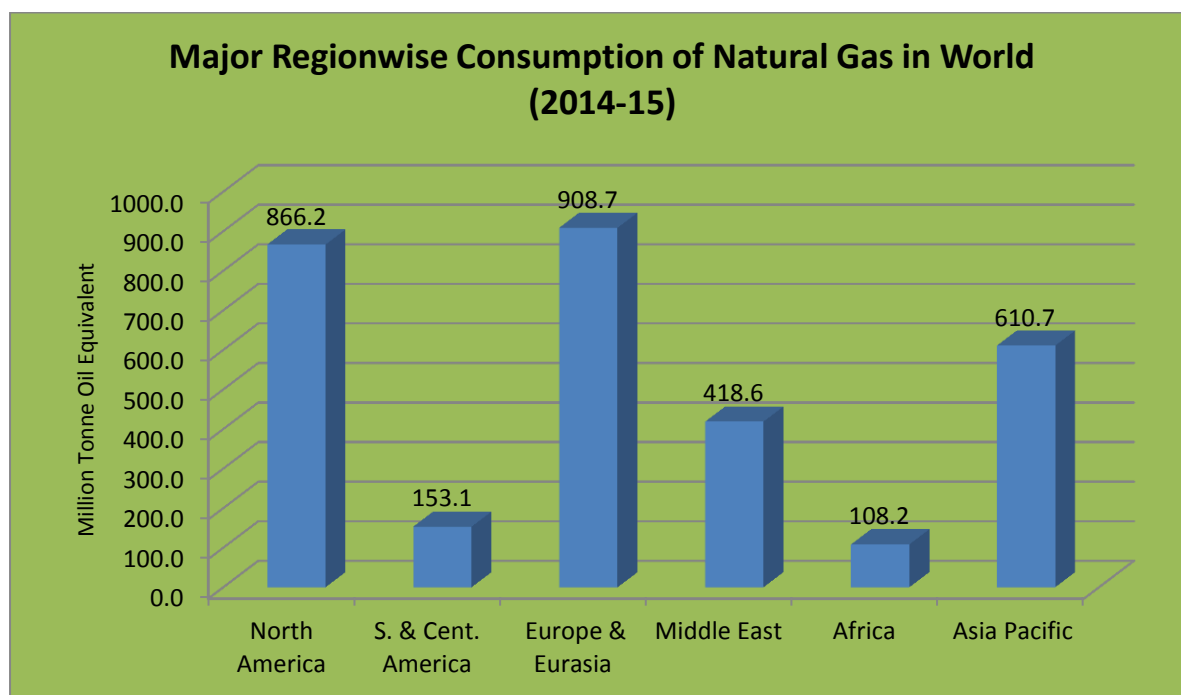


Table 9.1: Countrywise Estimates of Production of Crude Oil*

(Million tonnes)

Country/ Region	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	% Change 2014-15 over 2013- 14	2014-15 % Share of World's Total
North America										
USA	305.2	302.3	322.3	333.1	345.4	394.7	448.5	519.9	15.9	12.32
Canada	166.3	152.9	152.8	160.3	169.8	182.6	194.4	209.8	7.9	4.97
Mexico	172.2	156.9	146.7	145.6	144.5	143.9	141.9	137.1	-3.3	3.25
Total North America	632.7	612.0	621.9	639.0	659.7	721.2	784.7	866.8	10.5	20.54
South and Central America										
Argentina	38.0	36.5	33.6	33.0	30.6	30.4	29.9	29.5	-1.2	0.70
Brazil	95.2	98.9	105.8	111.4	114.1	112.1	109.8	122.1	11.2	2.89
Colombia	28.0	31.1	35.3	41.4	48.2	49.9	52.9	52.2	-1.4	1.24
Ecuador	27.5	27.2	26.1	26.1	26.8	27.1	28.2	29.8	5.6	0.71
Peru	4.6	4.7	4.8	5.1	4.9	4.8	4.6	4.9	7.4	0.12
Trinidad & Tobago	8.2	8.7	7.6	7.4	6.9	6.0	5.7	5.6	-3.3	0.13
Venezuela	165.5	165.6	155.7	145.7	141.5	139.7	137.9	139.5	1.1	3.30
Other S. & Cent. America	7.1	7.1	6.6	6.9	7.0	7.3	7.4	7.5	0.4	0.18
Total S. & Cent. America	374.1	379.7	375.4	376.9	379.0	376.7	376.5	391.0	3.9	9.26
Europe and Eurasia										
Azerbaijan	42.6	44.5	50.4	50.8	45.6	43.4	43.5	42.0	-3.3	1.00
Denmark	15.2	14.0	12.9	12.2	10.9	10.0	8.7	8.1	-6.3	0.19
Italy	5.9	5.2	4.6	5.1	5.3	5.4	5.6	5.8	4.7	0.14
Kazakhstan	67.1	70.7	76.5	79.5	80.0	79.2	81.8	80.9	-1.1	1.92
Norway	118.6	114.7	108.8	98.9	93.8	87.3	83.2	85.6	2.9	2.03
Romania	4.7	4.7	4.5	4.3	4.2	4.0	4.1	4.0	-2.2	0.10
Russian Federation	496.8	493.7	500.8	511.8	518.8	526.1	531.0	534.1	0.6	12.65
Turkmenistan	9.8	10.3	10.4	10.7	10.7	11.0	11.4	11.8	3.9	0.28
United Kingdom	76.6	71.7	68.2	63.0	52.0	44.6	40.7	39.7	-2.3	0.94
Uzbekistan	4.9	4.8	4.5	3.6	3.6	3.2	3.2	3.1	-1.9	0.07
Other Europe & Eurasia	21.6	20.6	19.9	19.2	19.2	19.2	19.6	19.1	-2.3	0.45
Total Europe & Eurasia	863.8	855.0	861.3	859.0	844.2	833.2	832.6	834.3	0.2	19.77
Middle East										
Iran	210.9	214.5	205.5	208.8	208.8	177.3	165.8	169.2	2.0	4.01
Iraq	105.1	119.3	119.9	121.5	136.7	152.5	153.2	160.3	4.6	3.80
Kuwait	129.9	136.1	121.2	123.4	140.8	154.0	151.5	150.9	-0.5	3.57
Oman	35.2	37.6	40.2	42.8	43.8	45.0	46.1	46.2	0.3	1.10
Qatar	57.9	65.0	62.4	71.7	78.5	83.4	84.3	83.5	-0.9	1.98
Saudi Arabia	488.9	509.9	456.7	473.8	526.0	549.8	538.4	543.4	0.9	12.88
Syria	20.1	20.3	20.0	19.2	17.6	8.5	3.0	1.6	-44.6	0.04
United Arab Emirates	139.6	141.4	126.2	133.3	151.3	154.9	165.7	167.3	0.9	3.96
Yemen	15.9	14.8	14.4	14.3	11.2	8.8	6.9	6.6	-3.6	0.16
Other Middle East	9.5	9.5	9.4	9.4	10.0	9.0	10.2	10.5	2.3	0.25
Total Middle East	1213.0	1268.4	1176.0	1218.1	1324.6	1343.2	1325.2	1339.5	1.1	31.74

Contd....

Table 9.1(Contd.):Countrywise Estimates of Production of Crude Oil*

(Million tonnes)										
Country/ Region	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	% Change 2014-15 over 2013- 14	2014-15 % Share of World's Total Production
Africa										
Algeria	86.5	85.6	77.2	73.8	71.7	67.2	64.8	66.0	1.8	1.56
Angola	82.1	93.1	87.6	90.5	83.8	86.9	87.3	83.0	-4.9	1.97
Chad	7.5	6.7	6.2	6.4	6.0	5.3	4.4	4.1	-5.5	0.10
Rep. of Congo (Brazzaville)	11.4	12.1	13.9	15.1	15.6	15.0	14.5	14.5	0.3	0.34
Egypt	33.8	34.7	35.3	35.0	34.6	34.7	34.5	34.7	0.5	0.82
Equatorial Guinea	15.9	16.1	14.2	12.6	11.6	12.7	12.4	13.1	5.6	0.31
Gabon	12.3	12.0	12.0	12.7	12.7	12.3	11.8	11.8	0.0	0.28
Libya	85.3	85.5	77.4	77.6	22.5	71.1	46.4	23.3	-49.8	0.55
Nigeria	110.2	102.8	106.6	120.9	117.8	115.5	110.7	113.5	2.5	2.69
South Sudan	-	-	-	-	-	1.5	4.9	7.8	60.5	0.19
Sudan	23.8	22.6	23.4	22.8	14.3	5.1	5.7	5.4	-5.1	0.13
Tunisia	4.6	4.2	4.0	3.8	3.3	3.1	2.9	2.5	-13.5	0.06
Other Africa	9.7	9.5	9.2	8.3	11.5	11.2	12.6	12.5	-0.6	0.30
Total Africa	483.0	484.9	466.8	479.6	405.3	441.7	412.8	392.2	-5.0	9.29
Asia Pacific										
Australia	24.7	24.3	22.6	24.9	22.0	21.6	18.2	19.4	6.5	0.46
Brunei	9.5	8.6	8.3	8.5	8.1	7.8	6.6	6.2	-6.5	0.15
China	186.3	190.4	189.5	203.0	202.9	207.5	210.0	211.4	0.7	5.01
India	36.4	37.8	38.0	41.3	42.9	42.6	42.5	41.9	-1.3	0.99
Indonesia	47.8	49.4	48.4	48.6	46.3	44.6	42.7	41.2	-3.5	0.98
Malaysia	33.8	34.0	32.2	32.6	29.5	30.3	29.3	30.3	3.6	0.72
Thailand	13.2	14.0	14.6	14.8	15.2	16.4	16.6	16.3	-2.0	0.39
Vietnam	16.3	15.2	16.7	15.3	15.5	17.0	17.1	17.8	4.3	0.42
Other Asia Pacific	13.9	14.8	14.4	13.7	13.0	12.6	11.9	12.2	1.8	0.29
Total Asia Pacific	382.0	388.7	384.5	402.7	395.3	400.4	394.9	396.7	0.5	9.40
TOTAL WORLD	3948.6	3988.7	3885.8	3975.4	4008.1	4116.4	4126.6	4220.6	2.3	100.00

* 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 : COUNTRYWISE ESTIMATES OF CONSUMPTION OF CRUDE OIL*

(in Million tonnes)										
Country/ Region	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	% Change 2014-15 over 2013-14	2014-15 % Share of World's Total Consumption
North America										
US	928.8	875.4	83.2	850.1	834.9	817	832.1	836.1	0.48	19.85
Canada	102.3	101.2	95	101.3	105	103.3	103.5	103	-0.48	2.45
Mexico	92	91.6	88.5	88.6	90.3	92.3	89.7	85.2	-5.02	2.02
Total North America	1123.1	1068.2	1016.7	1040	1030.2	1012.6	1025.3	1024.4	-0.09	24.33
South and Central America										
Argentina	24	24.7	24.2	27.9	28.3	29.4	31.2	30.9	-0.96	0.73
Brazil	102.2	109.1	109.9	119.4	125	127.5	135.2	142.5	5.40	3.38
Chile	17	17.8	17.4	15.4	16.8	16.7	16.8	16.7	-0.60	0.40
Colombia	10.7	11.7	10.7	11.9	12.8	13.9	13.9	14.5	4.32	0.34
Ecuador	8.5	8.7	8.9	10.3	10.5	10.9	11.6	12.1	4.31	0.29
Peru	7.1	8	8.2	8.6	9.5	9.6	10.2	10.4	1.96	0.25
Trinidad & Tobago	1.6	1.8	1.7	1.9	1.7	1.6	1.6	1.6	0.00	0.04
Venezuela	29.7	33.8	34.2	32.1	33	35.4	38.6	38.5	-0.26	0.91
Other S. & Cent. America	61.6	58.0	58.0	58.7	59.6	59.3	58.6	59.3	1.19	1.41
Total S. & Cent. America	262.6	274.3	273.2	286.3	297.2	304.3	317.8	326.5	2.74	7.75
Europe and Eurasia										
Austria	13.4	13.4	12.8	13.4	12.7	12.5	12.7	12.6	-0.79	0.30
Azerbaijan	4.5	3.6	3.3	3.2	4	4.2	4.5	4.6	2.22	0.11
Belarus	8	7.9	9.3	7.5	8.6	10.4	10.7	11	2.80	0.26
Belgium	33.7	36	32.6	34.4	31.5	29.5	30.1	30	-0.33	0.71
Bulgaria	4.8	4.8	4.3	3.9	3.8	3.9	3.6	3.8	5.56	0.09
Czech Republic	9.7	9.9	9.7	9.2	9	8.9	8.5	9.2	8.24	0.22
Denmark	9.4	9.3	8.3	8.4	8.3	7.8	7.7	7.7	0.00	0.18
Finland	10.6	10.5	9.9	10.4	9.6	9.1	8.9	8.6	-3.37	0.20
France	91.4	90.8	87.5	84.5	83	80.3	79.3	76.9	-3.03	1.83
Germany	112.5	118.9	113.9	115.4	112	11.4	113.4	11.5	-89.86	0.27
Greece	21.7	21.3	20.1	17.9	17	15.3	14.5	14.2	-2.07	0.34
Hungary	7.7	7.5	7.1	6.7	6.4	5.9	5.8	6	3.45	0.14
Republic of Ireland	9.4	9	8	7.6	6.8	6.5	6.5	6.6	1.54	0.16
Italy	84	80.4	75.1	73.1	70.5	64.2	60.8	56.6	-6.91	1.34
Kazakhstan	11.3	11	8.9	9.3	12.3	13	12.9	13	0.78	0.31
Lithuania	2.8	3.1	2.6	2.7	2.6	2.7	2.6	2.5	-3.85	0.06
Netherlands	50.7	47.3	45.9	45.9	46.1	43.7	41.4	39.6	-4.35	0.94
Norway	10.7	10.4	10.6	10.8	10.6	10.5	10.8	10.3	-4.63	0.24
Poland	24.2	25.3	25.3	26.7	26.6	25.7	23.8	23.8	0.00	0.57
Portugal	14.7	14.1	13.2	13	12.1	11	11.5	11.4	-0.87	0.27
Romania	10.3	10.4	9.2	8.8	9.1	9.2	8.4	9	7.14	0.21
Russian Federation	130	133.9	128.2	134.3	143.5	145.7	146.8	148.1	0.89	3.52
Slovakia	3.6	3.9	3.7	3.9	3.9	3.6	3.6	3.5	-2.78	0.08
Spain	80.3	77.9	73.5	69.6	68.5	64.2	59	59.5	0.85	1.41
Sweden	16.9	16.7	15.5	16.2	14.8	14.6	14.4	14.4	0.00	0.34
Switzerland	11.3	12.1	12.3	11.4	11	11.2	11.8	10.6	-10.17	0.25
Turkey	33.6	32.1	32.5	31.8	31.1	31.6	33.6	33.8	0.60	0.8
Turkmenistan	5.2	5.4	5.2	5.7	6	6.2	6.2	6.4	3.23	0.15
Ukraine	14.7	14.3	13.5	12.6	13.1	12.4	11.9	10.2	-14.29	0.24
United Kingdom	79.2	77.9	74.4	73.5	71.1	71	69.3	69.3	0.00	1.65
Uzbekistan	4.7	4.6	4.3	3.6	3.4	3	3	3.1	3.33	0.07
Other Europe & Eurasia	32.5	33.2	32.7	32.5	32.5	31.1	31.1	31.3	0.64	0.74
Total Europe & Eurasia	957.7	956.7	913.3	907.7	901.6	880.4	869.3	858.9	-1.20	20.4

contd...

Table 9.2(Contd.) : COUNTRYWISE ESTIMATES OF CONSUMPTION OF CRUDE OIL

(Million tonnes)

Country/ Region	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	% Change 2014-15 over 2013-14	2014-15 % Share of World's Total Consumption
Middle East										
Iran	89.4	93.3	95.6	86.8	88.3	89.6	95.1	93.2	-2.00	2.21
Israel	12.1	11.8	11.0	10.8	11.4	13.5	10.3	10.1	-1.94	0.24
Kuwait	17.9	19.0	20.4	21.6	20.4	21.5	22.3	22.2	-0.45	0.53
Qatar	5.3	6.1	6.0	6.5	7.8	8.1	9.3	10.1	8.60	0.24
Saudi Arabia	98.1	106.8	115.9	123.7	124.6	131.3	132.4	142.0	7.25	3.37
United Arab Emirates	28.9	30.1	28.9	30.8	33.4	34.6	36.2	39.3	8.56	0.93
Other Middle East	62.4	69.1	70.3	73.9	74.3	76.2	76.8	76.0	-1.04	1.80
Total Middle East	314.1	336.3	348.1	354.2	360.2	374.8	382.5	393.0	2.75	9.33
Africa										
Algeria	12.9	14.0	14.9	14.8	15.8	16.9	17.7	18.0	1.69	0.43
Egypt	30.6	32.6	34.4	36.3	33.7	35.2	35.7	38.7	8.40	0.92
South Africa	26.6	25.7	24.2	26.6	27.7	28.0	27.8	29.1	4.68	0.69
Other Africa	75.0	80.7	82.4	86.6	82.1	88.2	91.0	93.6	2.86	2.22
Total Africa	145.0	153.1	155.9	164.3	159.3	168.3	172.2	179.4	4.18	4.26
Asia Pacific										
Australia	42.5	43.3	42.9	43.6	45.8	47.4	46.9	45.5	-2.99	1.08
Bangladesh	3.7	3.8	3.5	3.9	5.1	5.4	5.3	5.7	7.55	0.14
China	369.3	376.0	388.2	437.7	460.0	482.7	503.5	520.3	3.34	12.36
China Hong Kong SAR	16.4	14.8	16.9	18.3	18.4	17.6	18.0	17.0	-5.56	0.40
India	138.1	144.7	152.6	155.4	163.0	173.6	175.3	180.7	3.08	4.29
Indonesia	60.9	60.4	61.6	66.9	72.0	73.2	73.1	73.9	1.09	1.75
Japan	230.9	224.8	200.4	202.7	203.6	217.0	207.5	196.8	-5.16	4.67
Malaysia	30.8	29.5	29.2	29.3	31.1	32.7	34.5	35.2	2.03	0.84
New Zealand	7.1	7.2	6.9	7.0	7.0	7.0	7.0	7.2	2.86	0.17
Pakistan	19.2	19.9	21.7	21.2	21.5	20.4	21.8	22.6	3.67	0.54
Philippines	14.1	12.4	12.5	12.8	12.8	13.1	13.6	14.3	5.15	0.34
Singapore	48.3	51.4	55.5	61.0	64.1	63.5	64.7	66.2	2.32	1.57
South Korea	107.6	103.1	103.7	105.0	105.8	108.8	108.3	108.0	-0.28	2.56
Taiwan	51.2	45.9	44.0	45.3	42.6	42.5	43.4	43.9	1.15	1.04
Thailand	45.1	43.8	45.7	47.5	49.0	52.1	52.2	53.0	1.53	1.26
Vietnam	13.3	14.1	14.6	15.6	17.0	17.1	17.7	18.7	5.65	0.44
Other Asia Pacific	16.4	15.4	16.0	16.2	18.2	18.9	19.0	19.7	3.68	0.47
Total Asia Pacific	1214.8	1210.5	1215.8	1289.5	1336.9	1392.9	1412.1	1428.9	1.19	33.93
TOTAL WORLD	4017.3	3999.0	3922.9	4041.8	4085.4	4133.2	4179.1	4211.1	0.77	100.00

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 biodieses ^ 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: Countrywise Estimates of Production of Natural Gas*

(Million tonnes oil equivalent)

Country/ Region	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	% Change 2014-15 over 2013-14	2014-15 % Share of World's Total Consumption
North America										
USA	498.6	521.7	532.7	549.5	589.8	620.2	629.8	668.2	6.1	21.37
Canada	164.4	158.9	147.6	143.9	143.7	140.4	140.5	145.8	0.0	4.66
Mexico	48.2	48.0	53.4	51.8	52.4	51.5	52.4	52.3	1.7	1.67
Total North America	711.2	728.7	733.6	745.2	786.0	812.1	822.6	866.3	1.3	27.70
South and Central America										
Argentina	40.3	39.7	37.2	36.1	34.9	34.0	32.0	31.9	-0.3	1.02
Bolivia	12.4	12.9	11.1	12.8	14.0	16.8	18.3	19.3	5.6	0.62
Brazil	10.1	12.6	10.7	13.1	15.1	15.7	16.9	18.0	6.9	0.58
Colombia	6.8	8.2	9.5	10.1	9.9	10.8	11.4	10.7	-6.3	0.34
Peru	2.4	3.1	3.1	6.5	10.2	11.6	11.0	11.6	6.0	0.37
Trinidad & Tobago	38.0	37.8	39.3	40.3	38.8	38.5	38.6	37.9	-1.8	1.21
Venezuela	32.5	29.5	27.9	24.7	24.8	26.5	25.6	25.7	0.5	0.82
Other S. & Cent. America	3.5	3.3	3.8	3.3	2.8	2.7	2.4	2.4	0.0	0.08
Total S. & Cent. America	146.1	146.9	142.7	146.9	150.5	156.4	156.0	157.5	0.9	5.04
Europe and Eurasia										
Azerbaijan	8.8	13.3	13.3	13.6	13.3	14.0	14.6	15.3	4.6	0.49
Denmark	8.3	9.1	7.6	7.4	5.9	5.2	4.4	4.2	-4.8	0.13
Germany	12.9	11.7	11.0	9.6	9.0	8.1	7.4	7.0	-6.1	0.22
Italy	8.0	7.6	6.6	6.9	7.0	7.1	6.4	5.9	-7.5	0.19
Kazakhstan	13.6	15.2	14.8	14.3	15.7	16.5	16.8	17.3	3.5	0.55
Netherlands	54.5	60.0	56.4	63.5	57.8	57.5	61.8	50.2	-18.7	1.61
Norway	81.3	90.1	94.0	96.5	91.1	103.3	97.9	97.9	0.1	3.13
Poland	3.9	3.7	3.7	3.7	3.9	3.9	3.8	3.8	-1.8	0.12
Romania	10.4	10.3	10.1	9.8	9.8	9.8	9.8	10.3	5.4	0.33
Russian Federation	532.8	541.6	474.9	530.0	546.3	533.1	544.2	520.9	-4.3	16.66
Turkmenistan	58.9	59.5	32.7	38.1	53.6	56.1	56.1	62.3	11.1	1.99
Ukraine	16.9	17.1	17.4	16.7	16.8	16.7	17.4	16.7	-3.7	0.53
United Kingdom	64.9	62.7	53.7	51.4	40.7	35.0	32.8	32.9	0.3	1.05
Uzbekistan	52.4	52.0	50.0	49.0	51.3	51.2	51.2	51.6	0.7	1.65
Other Europe & Eurasia	9.6	9.2	9.1	9.1	8.5	7.9	6.8	6.0	-11.5	0.19
Total Europe & Eurasia	937.0	963.0	855.2	919.5	930.8	925.4	931.2	902.1	-3.1	28.85
Middle East										
Bahrain	10.6	11.4	11.5	11.8	12.0	12.4	14.2	15.2	7.2	0.49
Iran	112.5	119.2	129.8	137.1	143.9	149.1	147.6	155.3	5.2	4.97
Iraq	1.3	1.7	1.0	1.2	0.8	0.6	1.1	1.1	6.6	0.04
Kuwait	10.9	11.5	10.3	10.6	12.2	14.0	14.7	14.8	0.5	0.47
Oman	21.6	21.7	22.3	24.4	23.9	27.0	27.5	26.1	-5.0	0.83
Qatar	56.9	69.3	84.8	113.7	145.0	153.4	158.8	159.5	0.4	5.10
Saudi Arabia	67.0	72.4	70.6	78.9	83.0	89.4	90.0	97.4	8.2	3.12
Syria	5.0	4.8	5.0	7.2	6.4	4.7	4.3	3.9	-7.8	0.13
United Arab Emirates	45.3	45.2	43.9	46.2	47.1	48.9	49.1	52.0	5.8	1.66
Yemen	-	-	0.7	5.6	8.5	6.8	9.2	8.1	-12.8	0.26
Other Middle East	2.7	3.3	2.6	3.1	4.0	2.4	5.9	6.9	17.2	0.22
Total Middle East	333.7	360.3	382.6	439.7	486.6	508.6	522.4	540.9	3.5	17.3

* Less than 0.05%

Contd....

Table 9.3 (contd.): Countrywise Estimates of Production of Natural Gas*

(Million tonnes oil equivalent)

Country/ Region	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	% Change 2014-15 over 2013-14	2014-15 % Share of World's Total Consumption
Africa										
Algeria	76.3	77.2	71.6	72.4	74.4	73.4	73.4	75.0	2.2	2.40
Egypt	50.1	53.1	56.4	55.2	55.3	54.8	50.5	43.8	-13.3	1.40
Libya	13.8	14.3	14.3	15.1	7.1	11.0	9.9	11.0	11.1	0.35
Nigeria	33.2	32.6	23.4	33.6	36.5	39.0	32.6	34.7	6.4	1.11
Other Africa	10.9	13.9	14.2	15.7	15.9	15.8	17.9	17.8	-0.6	0.57
Total Africa	184.3	191.1	180.0	192.0	189.2	193.8	184.2	182.4	-1.0	5.83
Asia Pacific										
Australia	36.0	34.4	38.1	41.3	41.9	46.4	48.0	49.8	3.7	1.59
Bangladesh	14.3	15.3	16.7	17.9	18.1	19.0	20.4	21.2	3.9	0.68
Brunei	11.0	10.9	10.3	11.1	11.5	11.3	11.0	10.7	-2.7	0.34
China	64.4	74.7	79.3	89.1	98.0	102.9	112.4	121.0	7.7	3.87
India	27.1	27.5	35.3	45.8	41.5	36.3	30.3	28.5	-5.9	0.91
Indonesia	64.4	66.4	69.2	77.1	73.3	69.4	64.9	66.1	1.8	2.11
Malaysia	55.4	57.4	55.0	56.3	56.0	55.4	60.5	59.8	-1.2	1.91
Myanmar	12.2	11.2	10.4	11.2	11.5	11.5	11.8	15.2	28.8	0.49
Pakistan	36.5	37.3	37.4	38.1	38.1	39.4	38.4	37.8	-1.6	1.21
Thailand	23.4	25.9	27.8	32.6	33.3	37.3	37.6	37.9	0.8	1.21
Vietnam	6.4	6.7	7.2	8.5	7.6	8.4	8.8	9.2	4.5	0.29
Other Asia Pacific	15.6	16.5	16.7	16.4	16.6	16.4	16.9	21.0	24.3	0.67
Total Asia Pacific	366.6	384.2	403.4	445.3	447.2	453.6	461.1	478.0	3.7	15.28
TOTAL WORLD	2678.9	2774.0	2697.5	2888.6	2990.3	3049.9	3077.6	3127.3	1.6	100.0

* Excluding gas flared or recycled

Source : Ministry of Petroleum & Natural Gas

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

(in Million Tonnes Oil Equivalent)

Country/ Region	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	% Change 2014-15 over 2013-	2014-15 % Share of World's
North America										
USA	596.3	600.8	590.1	619.3	628.8	657.4	675.8	695.3	2.9	22.68
Canada	86.6	86.5	85.4	85.5	90.8	90.2	93.5	93.8	0.3	3.06
Mexico	57.1	59.7	65.0	65.2	68.9	71.9	76.2	77.2	1.3	2.52
Total North America	739.9	747.0	740.5	770.0	788.6	819.6	845.5	866.2	2.4	28.25
South and Central America										
Argentina	39.5	40.0	38.9	39.0	41.1	42.3	42.9	42.4	-1.2	1.38
Brazil	19.1	22.4	18.1	24.1	24.0	28.5	33.6	35.7	6.3	1.16
Chile	4.1	2.4	2.8	4.8	4.8	4.4	4.4	4.3	-2.3	0.14
Colombia	6.7	6.8	7.8	8.2	8.0	8.9	9.0	9.8	8.9	0.32
Ecuador	0.4	0.4	0.5	0.5	0.5	0.6	0.5	0.6	20.0	0.02
Peru	2.4	3.1	3.1	4.9	5.5	6.1	5.9	6.5	10.2	0.21
Trinidad & Tobago	19.7	19.2	19.9	20.9	21.0	20.0	20.2	19.8	-2.0	0.65
Venezuela	32.5	30.9	29.5	26.7	26.7	28.5	27.9	26.8	-3.9	0.87
Other S. & Cent. America	3.9	4.3	4.5	4.8	5.2	6.3	7.1	7.1	0.0	0.23
Total S. & Cent. America	128.5	129.3	125.2	133.8	136.9	145.5	151.6	153.1	1.0	4.99
Europe and Eurasia										
Austria	8.0	8.6	8.4	9.1	8.5	8.1	7.6	7.0	-7.9	0.23
Azerbaijan	7.2	8.2	7.0	6.7	7.3	7.7	7.7	8.3	7.8	0.27
Belarus	16.9	17.4	14.5	17.8	16.5	16.7	16.7	16.5	-1.2	0.54
Belgium	14.9	14.8	15.1	17.0	14.9	15.2	15.1	13.3	-11.9	0.43
Bulgaria	2.9	2.9	2.1	2.3	2.6	2.5	2.4	2.4	0.0	0.08
Czech Republic	7.8	7.8	7.4	8.4	7.6	7.5	7.6	6.8	-10.5	0.22
Denmark	4.1	4.1	4.0	4.5	3.8	3.5	3.4	2.8	-17.6	0.09
Finland	3.5	3.6	3.2	3.6	3.1	2.7	2.6	2.2	-15.4	0.07
France	38.2	39.4	37.6	42.2	36.4	38.0	38.6	32.3	-16.3	1.05
Germany	74.6	73.1	70.2	75.0	67.1	70.5	74.2	63.8	-14.0	2.08
Greece	3.3	3.5	2.9	3.2	4.0	3.7	3.2	2.5	-21.9	0.08
Hungary	12.2	12.1	10.5	11.3	10.0	9.1	8.3	7.5	-9.6	0.24
Republic of Ireland	4.3	4.5	4.3	4.7	4.1	4.0	3.9	3.7	-5.1	0.12
Italy	70.0	70.0	64.4	68.6	64.3	61.8	57.8	51.1	-11.6	1.67
Kazakhstan	7.3	9.4	5.3	6.3	7.6	6.1	4.1	5.1	24.4	0.17
Lithuania	3.3	2.9	2.5	2.8	3.1	3.0	2.4	2.3	-4.2	0.08
Netherlands	33.3	34.7	35.0	39.2	34.3	32.8	33.3	28.9	-13.2	0.94
Norway	3.8	3.9	3.7	3.7	4.0	3.9	4.0	4.2	5.0	0.14
Poland	12.4	13.5	13.0	14.0	14.1	15.0	15.0	14.7	-2.0	0.48
Portugal	3.9	4.3	4.2	4.6	4.7	4.0	3.8	3.4	-10.5	0.11
Romania	14.5	14.3	11.9	12.2	12.5	12.2	11.3	10.6	-6.2	0.35
Russian Federation	379.8	374.4	350.7	372.7	382.1	374.6	372.1	368.3	-1.0	12.01
Slovakia	5.1	5.2	4.4	5.0	4.6	4.4	4.8	3.3	-31.3	0.11
Spain	31.8	34.9	31.2	31.1	28.9	28.6	26.1	23.7	-9.2	0.77
Sweden	0.9	0.8	1.0	1.4	1.1	1.0	1.0	0.8	-20.0	0.03
Switzerland	2.6	2.8	2.7	3.0	2.7	2.9	3.1	2.7	-12.9	0.09
Turkey	32.5	33.8	32.1	35.1	40.2	40.7	41.1	43.7	6.3	1.43
Turkmenistan	19.1	19.3	17.7	20.4	21.2	23.7	20.6	24.9	20.9	0.81
Ukraine	56.9	54.0	42.1	47.0	48.3	44.6	41.0	34.6	-15.6	1.13
United Kingdom	81.9	84.4	78.4	84.8	70.4	66.5	66.1	60.0	-9.2	1.96
Uzbekistan	41.3	43.8	35.9	36.8	42.9	42.5	42.2	43.9	4.0	1.43
Other Europe & Eurasia	16.2	15.7	13.9	15.0	15.2	15.1	13.7	13.4	-2.2	0.44
Total Europe & Eurasia	1014.5	1022.2	937.4	1009.2	988.0	972.8	954.7	908.7	-4.8	29.64

Contd...

Table 9.4(Contd.) : Country-wise Estimates of Consumption of Natural Gas***(in Million Tonnes Oil Equivalent)**

Country/ Region	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	% Change 2014-15 over 2013- 14	2014-15 % Share of World's Total Consumption
Middle East										
Iran	113.0	121.3	128.9	137.6	146.2	145.4	143.4	153.2	6.8	5.00
Israel	2.5	3.4	3.8	4.8	4.5	2.3	6.3	6.8	7.9	0.22
Kuwait	10.9	11.5	11.1	13.1	15.3	16.6	16.7	18.1	8.4	0.59
Qatar	17.4	17.4	22.4	27.0	34.4	36.9	36.9	40.3	9.2	1.31
Saudi Arabia	67.0	72.4	70.6	78.9	83.0	89.4	90.0	97.4	8.2	3.18
United Arab Emirates	44.3	53.5	53.2	54.7	56.9	59.0	60.1	62.4	3.8	2.04
Other Middle East	29.1	32.9	35.0	39.8	36.6	37.9	40.5	40.4	-0.2	1.32
Total Middle East	284.1	312.3	325.0	355.9	376.8	387.5	393.9	418.6	6.3	13.66
Africa										
Algeria	21.9	22.8	24.5	23.7	25.1	27.9	30.0	30.0	0.0	0.98
Egypt	34.5	36.8	38.3	40.6	44.7	47.3	46.3	46.3	0.0	1.51
South Africa	3.1	3.4	3.0	3.5	3.5	3.6	3.5	3.5	0.0	0.11
Other Africa	26.9	27.9	23.8	28.7	29.2	30.8	28.5	28.5	0.0	0.93
Total Africa	86.4	90.9	89.6	96.5	102.5	109.7	108.2	108.2	0.0	3.53
Asia Pacific										
Australia	23.9	23.0	22.7	23.4	23.9	25.1	26.3	26.3	0.0	0.86
Bangladesh	14.3	15.3	16.7	17.9	18.1	19.0	20.4	21.2	3.9	0.69
China	65.6	75.6	83.2	99.4	121.4	136.0	153.7	166.9	8.6	5.44
China Hong Kong SAR	2.5	2.9	2.8	3.4	2.7	2.5	2.4	2.3	-4.2	0.08
India	36.3	37.4	47.1	56.4	57.2	53.2	46.3	45.6	-1.5	1.49
Indonesia	30.7	35.2	37.3	39.1	37.9	38.0	32.8	34.5	5.2	1.13
Japan	81.2	84.4	78.7	85.1	94.9	102.2	102.2	101.2	-1.0	3.30
Malaysia	31.9	35.3	31.8	31.0	31.3	31.9	36.3	36.9	1.7	1.20
New Zealand	3.6	3.4	3.6	3.9	3.5	3.8	4.0	4.3	7.5	0.14
Pakistan	36.5	37.3	37.4	38.1	38.1	39.4	38.4	37.8	-1.6	1.23
Philippines	3.2	3.4	3.4	3.2	3.5	3.3	3.0	3.2	6.7	0.10
Singapore	7.7	8.3	8.7	7.9	7.9	8.5	9.5	9.7	2.1	0.32
South Korea	31.2	32.1	30.5	38.7	41.7	45.2	47.3	43.0	-9.1	1.40
Taiwan	9.6	10.5	10.2	12.7	14.0	14.7	14.7	15.5	5.4	0.51
Thailand	31.8	33.6	35.3	40.5	41.9	46.1	47.0	47.4	0.9	1.55
Vietnam	6.4	6.7	7.2	8.5	7.6	8.4	8.8	9.2	4.5	0.30
Other Asia Pacific	5.4	5.1	4.6	5.2	5.0	5.6	5.7	5.6	-1.8	0.18
Total Asia Pacific	422.0	449.4	461.4	514.4	551.0	582.8	598.8	610.7	2.0	19.92
TOTAL WORLD	2675.5	2751.0	2679.1	2879.7	2943.8	3017.8	3052.8	3065.7	0.4	100.0

^ 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.

ANNEX- I

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 (C₃H₈) and butane (C₄H₁₀) 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 C₅ to C₁₂ 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 C₉ to C₁₆ 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 = 238.84×10^3 calories
1 giga joule	=	10^9 joules = 238.84×10^6 calories
1 tera joule	=	10^{12} joules = 238.84×10^9 calories
1 peta joule	=	10^{15} joules = 238.84×10^{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
	=	4.1868×10^4 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

ANNEX- IV

Energy Data Collection Mechanisms

I. Coal and Coal Derivatives

I.1 Organsational set up: The Coal Controller's Office is a subordinate office of the Ministry of Coal having headquarter in Kolkata and various field offices at Dhanbad, Ranchi, Bilaspur, Nagpur, Kothagudem and Sambalpur. The Statistical Division of Coal Controller's Office, working under overall guidance of Coal Controller located at Kolkata has a Deputy Director General and Deputy Director from Indian Statistical Service.

I.2. Current Activities: Statistics Division of Coal Controller's Office (CCO) look's after the work related to coal and lignite statistics. Major role of this division is 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 survey on various aspects 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)	Monthly
4. Pit head closing stock (from coal/ lignite company)	Monthly
5. Price (for non-captive coal mines)	Monthly
6. Wagon Loading (Rail)(from CIL/ SCCL)	Monthly
7. Import & Export (DGC&S)	Monthly
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 their 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. **Organisational set up and activities**

Ministry of Petroleum & Natural Gas 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 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.

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 10th 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 19th 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)

(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 for 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 all the stakeholders 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 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 yearwise and monthwise 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.

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