# ENERGY STATISTICS 2015

CENTRAL STATISTICS OFFICE
NATIONAL STATISTICAL ORGANISATION
MINISTRY OF STATISTICS AND PROGRAMME IMPLEMENTATION
GOVERNMENT OF INDIA
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# ENERGY STATISTICS 2015

## (Twenty Second Issue)

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

# FOREWORD

Energy is one of the most fundamental parts of our universe. Energy has come to be known as a `strategic commodity' and any uncertainty about its supply can threaten the functioning of the entire economy, particularly in developing economies. India's substantial and sustained economic growth is placing enormous demand on its energy resources. The demand and supply imbalance in energy sources is pervasive requiring serious efforts by Government of India to augment energy supplies as India faces possible severe energy supply constraints. Energy requirement in our country is increasing at a very rapid rate. Achieving energy security in this strategic sense is of fundamental importance not only to India's economic growth but also for the human development objectives that aim at alleviation of poverty, unemployment and meeting the Millennium Development Goals (MDGs). Holistic planning for achieving these objectives requires quality energy statistics that is able to address the issues related to energy demand, energy poverty and environmental effects of energy growth.

This publication titled "Energy Statistics" is brought out every year by Central Statistics Office (CSO) and the present one is the 22nd in the series. The latest data on reserves, installed capacity, potential for generation, production, consumption, import, export and wholesale price of different energy commodities are included in the publication. The publication also includes analytical indicators viz. Growth Rates, Compound Annual Growth Rates (CAGR) & Percentage Distributions, in relevant tables to increase the utility of the publication. The data has been sourced from the concerned subject matter Ministries of the Government of India, in respect of different energy sources as per their mandate. The Energy Balance in the chapter 7 is provisional and efforts are being made to reduce the statistical difference.

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

I would like to put on record my appreciation to the team of officers in the Economic Statistics Division for their dedicated services in bringing out this publication in time.

This publication is an attempt to cater to the needs of the planners, policy makers and researchers by making available the entire energy data at a single place. I hope that "Energy Statistics 2015" will fulfill the expectations of all.

(Ashish Kumar)
DIRECTOR GENERAL (In-charge)
Central Statistics Office

New Delhi
March 2015.

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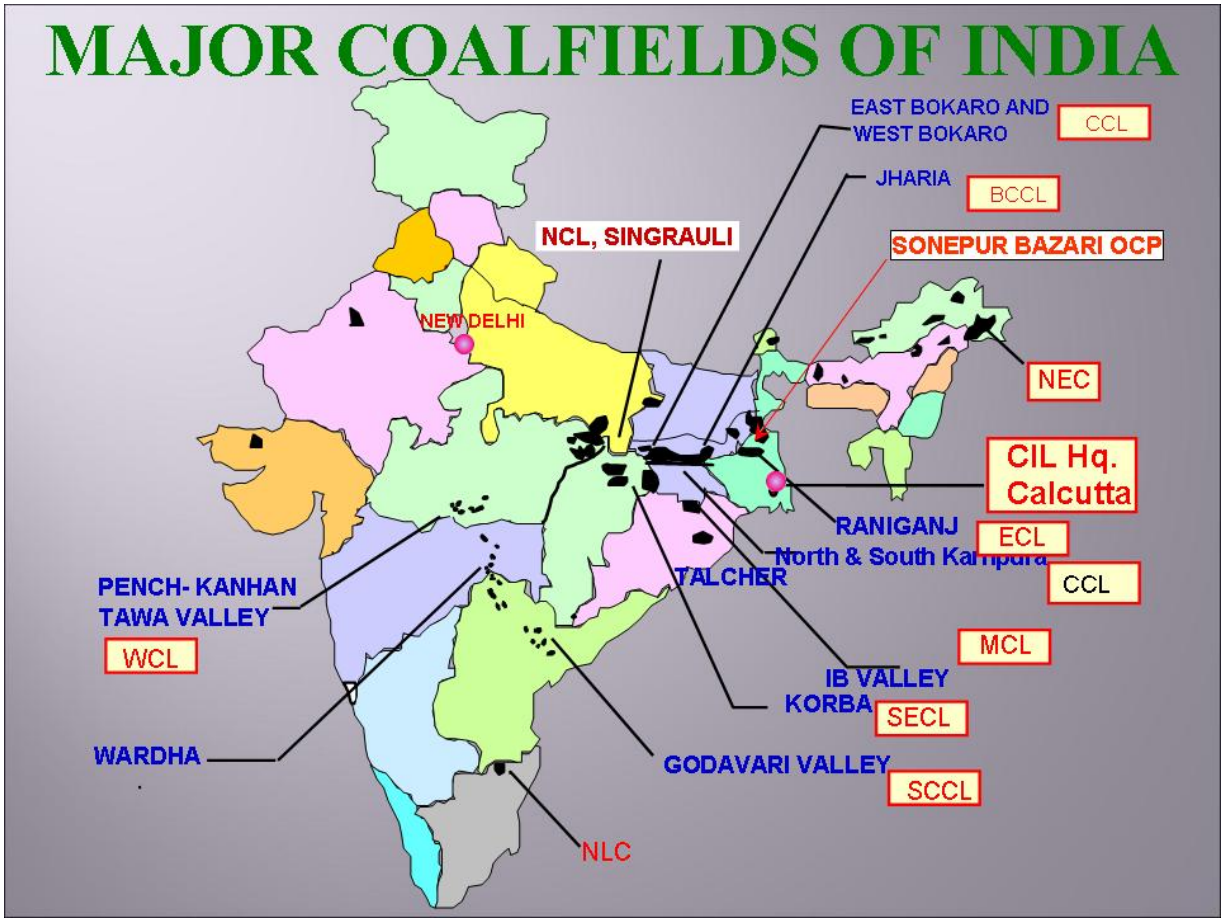
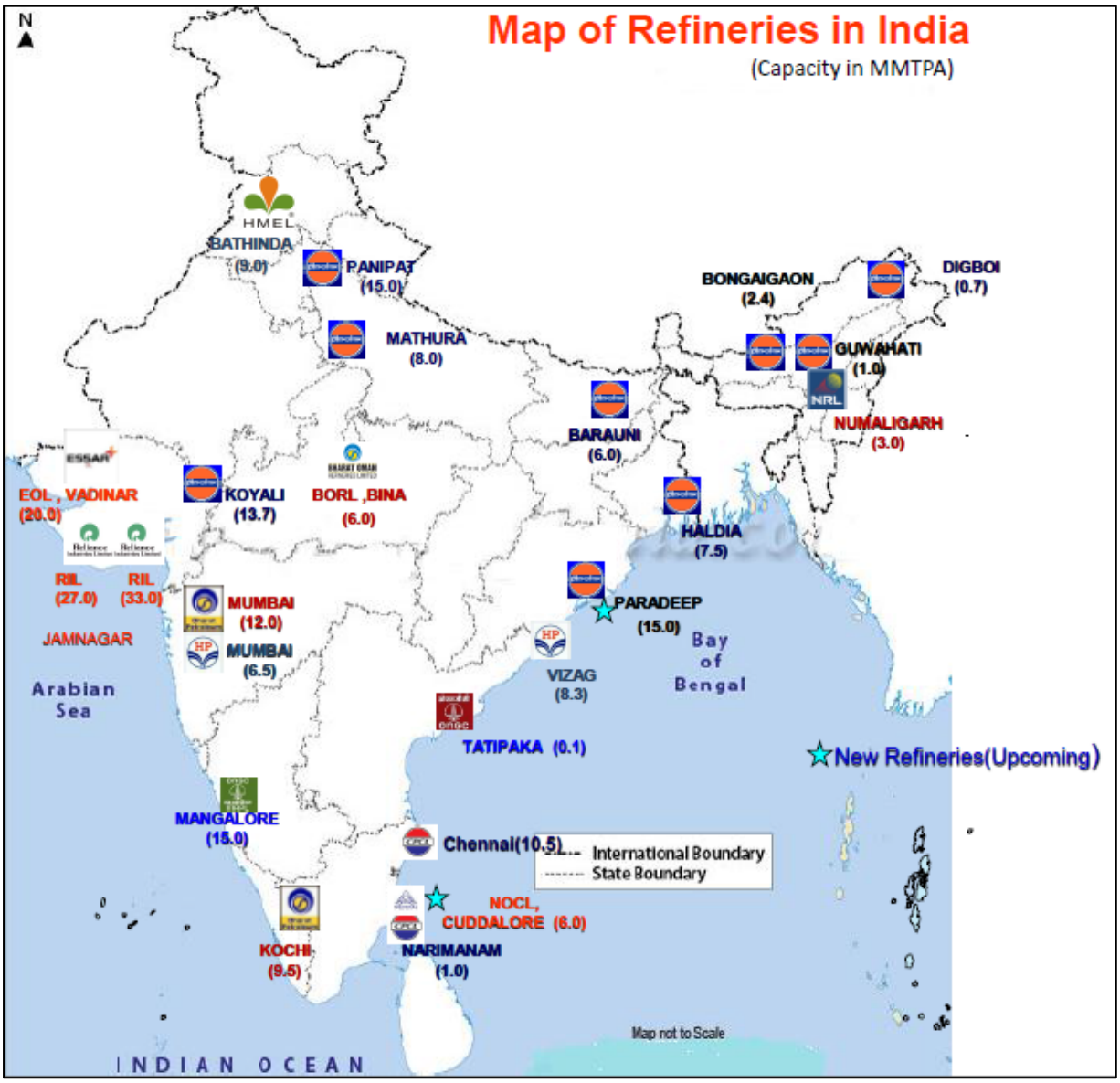
# ENERGY MAP OF INDIA




Courtesy: Eastern Coalfields Limited
(As on 31.03.2014)




Source: http://ppac.org.in/WriteReadData/userfiles/file/IndiaRefineryMap.pdf
(As on 31.03.2014)

# Nuclear Facilities in India

***http://www.npcil.nic.in/images/maps_24feb2015.jpg***

# METADATA-ENERGY STATISTICS

| 1. Contact | |
|---|---|
| **1.1. Contact organisation** | Central Statistics Office (CSO), M/o Statistics & Programme Implementation (MOSPI) |
| **1.2. Contact organisation unit** | Economic Statistics Division, CSO |
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| **1.5. Homepage** | http:// www.mospi.gov.in |

| 2. Statistical presentation |
|---|
| **2.1 Data sources** |
| The data has been sourced from the concerned subject matter Ministries of the Government of India in respect of different energy sources as per their mandate. These Ministries are Ministry of Petroleum and Natural Gas, Central Electricity Authority, Office of Coal Controller, Ministry of New and Renewable Energy and Office of the Economic Advisor, Ministry of Commerce and Industry. |
| **2.2. Data description** |
| The statistics present information about the reserves, installed capacity, potential for generation, production, consumption, import, export and wholesale price 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) and 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 2013-14. |
| **2.9. Base period** |
| 2004-05 |
| **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 Tons for petroleum products etc.). Prices are indicated by Wholesale Price Index. The Energy Balance is given in ktoe. Consumption and Production of the Energy resources is also given in petajoules.

## 4. Reference period

Reference period of the Publication of "Energy Statistics -2015" is the financial year 2013-14 and the previous financial years since 2005-06.

## 5. Institutional mandate

### 6.1. Legal acts and other agreements

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

### 6.2. Data sharing

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

## 6. Confidentiality

### 7.1. Confidentiality – policy and data treatment

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

## 7. Release policy

### 7.1. Release calendar

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

### 7.2. User access

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

## 8. Dissemination format

### 8.1. News release

Publication on Energy Statistics is released annually.

### 8.2. Publications

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

## 9. Accessibility of documentation

### 9.1. Documentation on methodology

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

## 10. Accuracy and reliability

### 10.1. Overall accuracy

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

| 11. Timeliness and punctuality |
|---|
| **11.1. Timeliness** |
| Preliminary data on energy production, consumption statistics and few energy indicators are available 12 months after the reference year. Preliminary data on energy consumption and supply are complete and published before the end of the next financial year. Final data for the year are published 24 months after the end of the statistical reference year. |
| **11.2. Punctuality** |
| Annual publication on Energy Statistics is released by the end of March every year. |

| 12. Data revision |
|---|
| **12.1. Data revision – policy** |
| The annual publication 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 2016. |

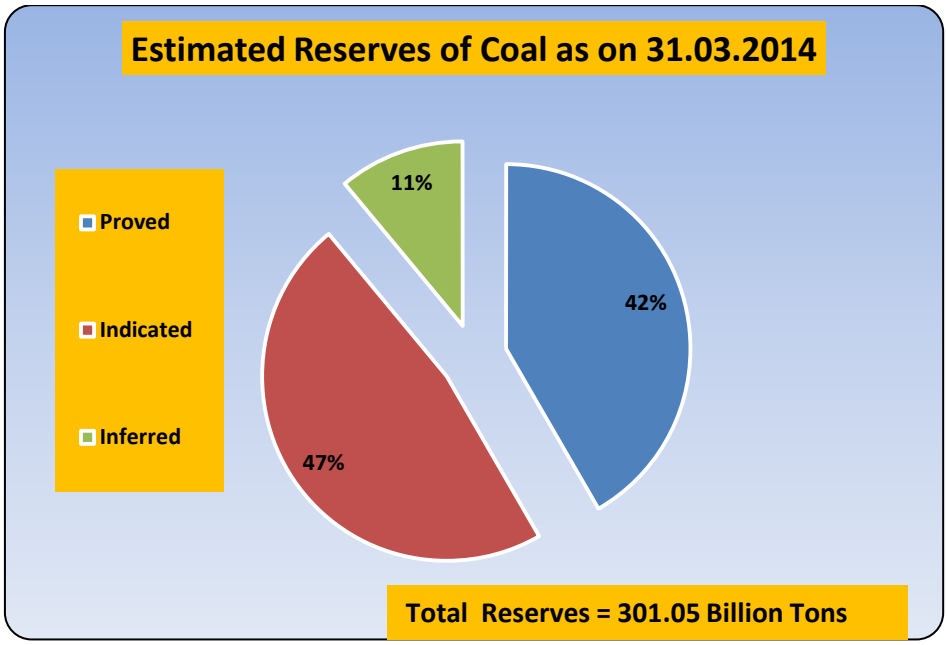
| 13. Statistical processing |
|---|
| **13.1. Source data** |
| Energy data are collected from the source agencies at national level and presented in publication. It is published in the ministry's web-site. |
| **13.2. Frequency of data collection** |
| Annual. |
| **13.3. Data collection** |
| Data is collected through e-mail or by post from the source ministries. |
| **13.4. Data validation** |
| Checks are carried out to the data before publishing it. |
| **13.5.5. Data compilation** |
| Data is calculated by summing up the national figures. |
| **13.6. Adjustment** |
| No seasonal adjustment or temperature correction of the energy consumption is applied. |

# CHAPTER 1: RESERVES AND POTENTIAL FOR GENERATION

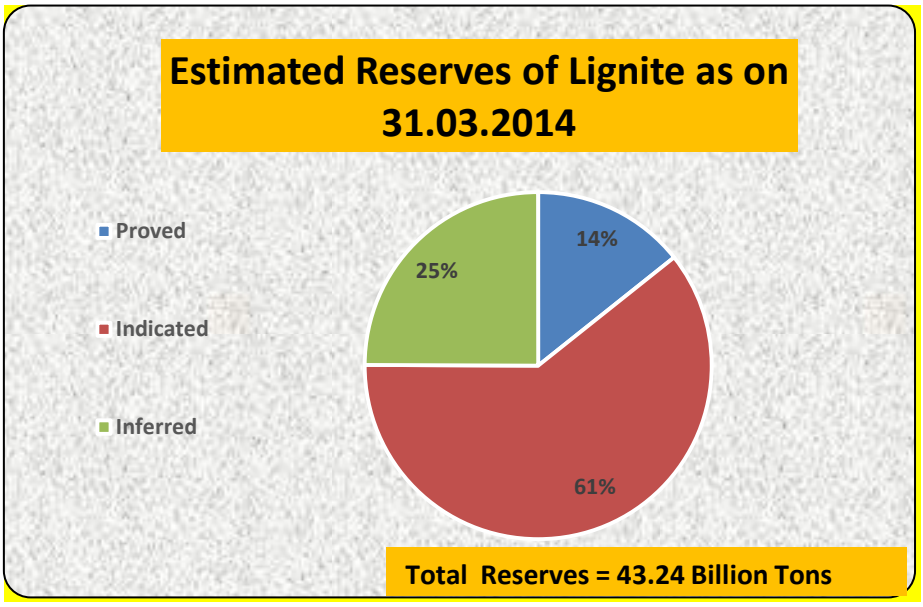
## *1.1 Coal and Lignite*

- Coal deposits are mainly confined to eastern and south central parts of the country. The states of Jharkhand, Odisha, Chhattisgarh, West Bengal, Madhya Pradesh, Andhra Pradesh and Maharashtra account for more than 99% of the total coal reserves in the country. The State of Jharkhand had the maximum share (26.81%) in the overall reserves of coal in the country as on 31st March 2014 followed by the State of Odisha(24.94%)(Table 1.1).

- As on 31.03.14 the estimated reserves of coal was 301.05 billion tons, an addition of 2.11 billion over the last year (Table 1.1). There has been an increase of 0.7% in the estimated coal reserves during the year 2013-14 with Odisha accounting for the maximum increase of 1.85%



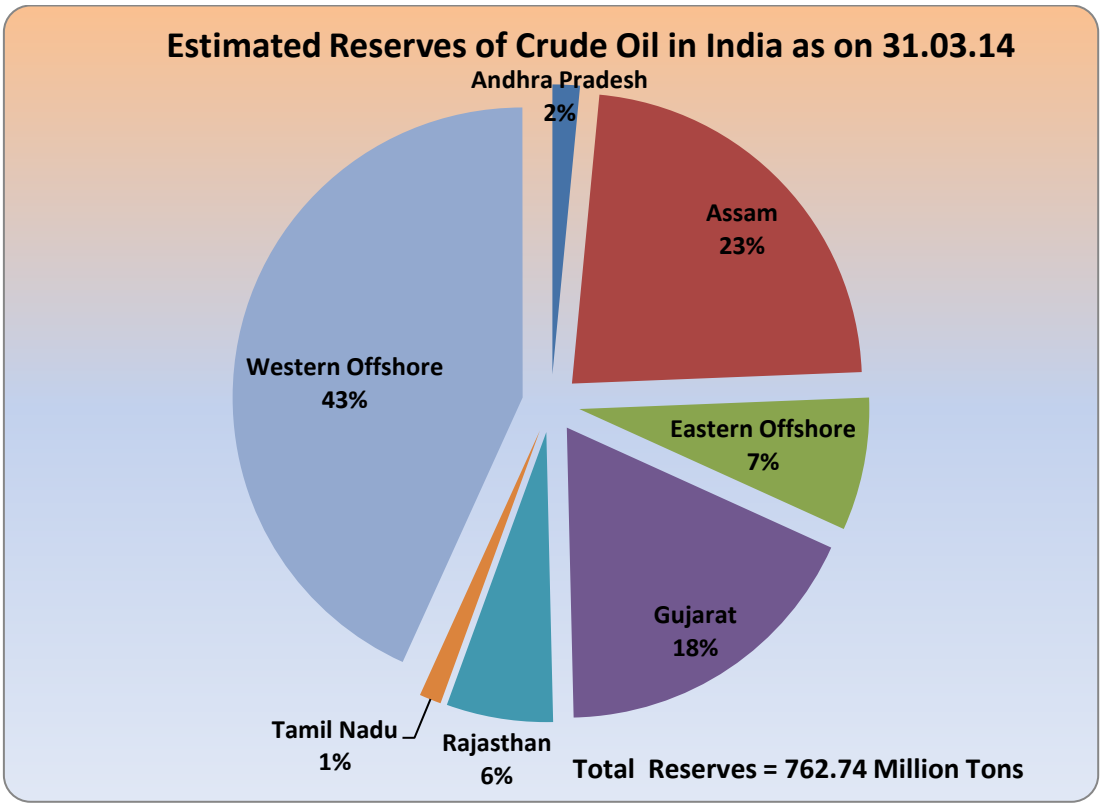

- The estimated total reserves of lignite as on 31.03.14 was 43.24 billion tons against 43.22 billion tons as on 31.03.13. (Table 1.1(A)).




## *1.2 Petroleum and Natural gas*

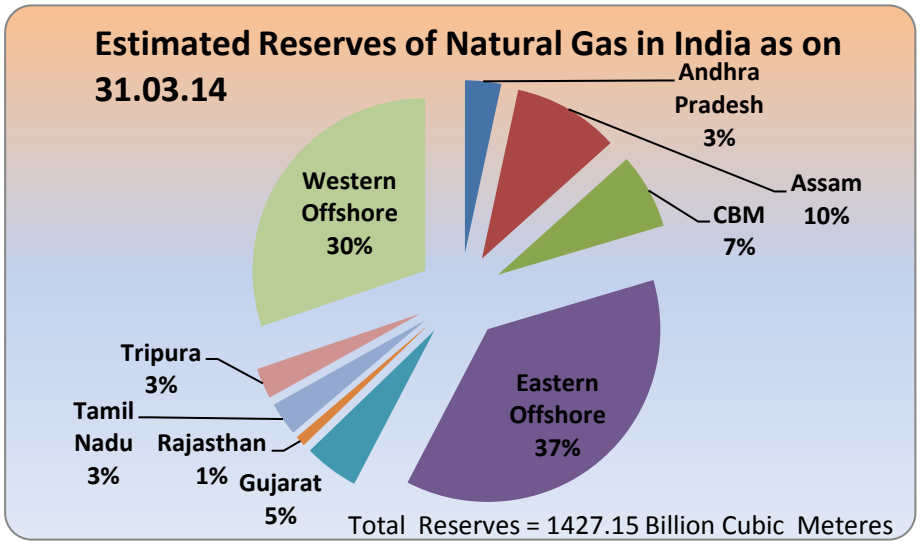
- The estimated reserves of crude oil in India as on 31.03.2014 stood at 762.74 million tons (MT) (Table 1.2).

- Geographical distribution of Crude oil indicates that the maximum reserves are in the Western Offshore (42.91%) followed by Assam (22.69%), whereas the maximum reserves of Natural Gas are in the Eastern Offshore (37.24%) followed by Western offshore (30.17%). (Table 1.2).




- There was increase of 0.57% in the estimated reserve of crude oil for the country as a whole by 31st March, 2014 as compared to the position a year ago. During the same period, estimated reserves of crude oil in Rajasthan, Western offshore and Gujarat decreased by 24.24%, 2.66% and 1.26.% respectively, while the same in Eastern Offshore and Assam increased by 84.69% and 0.56% respectively.

- The estimated reserves of natural gas in India as on 31.03.2014 stood at 1427.15 billion cubic meters (BCM) (Table 1.2).

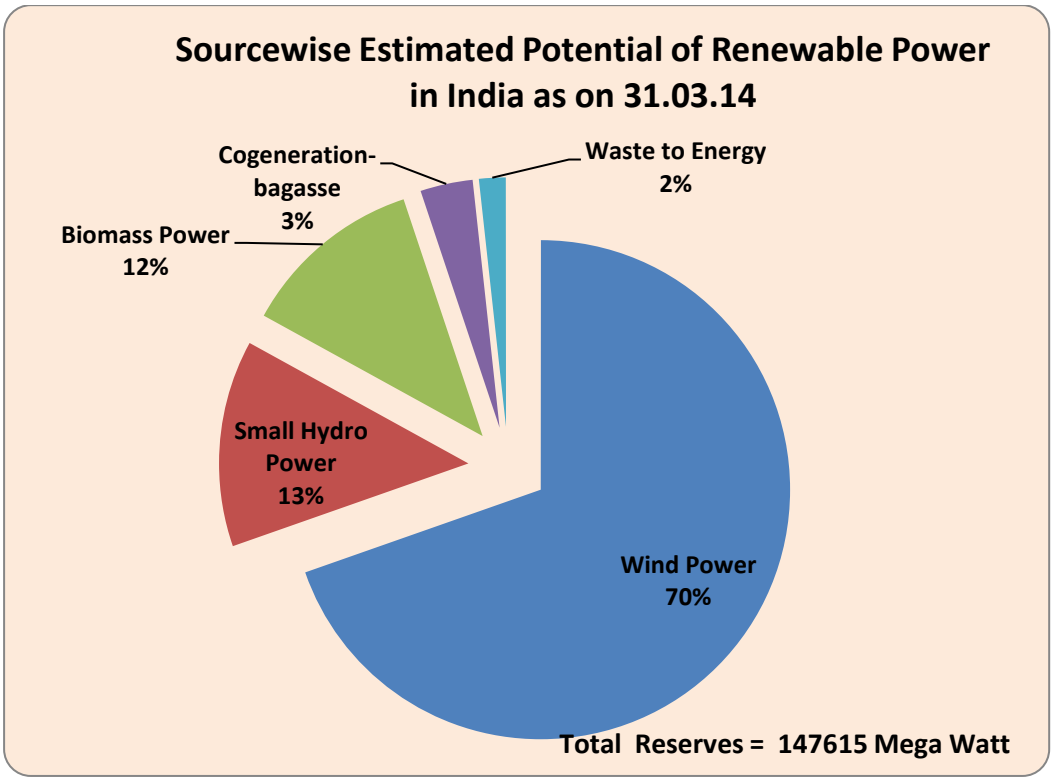


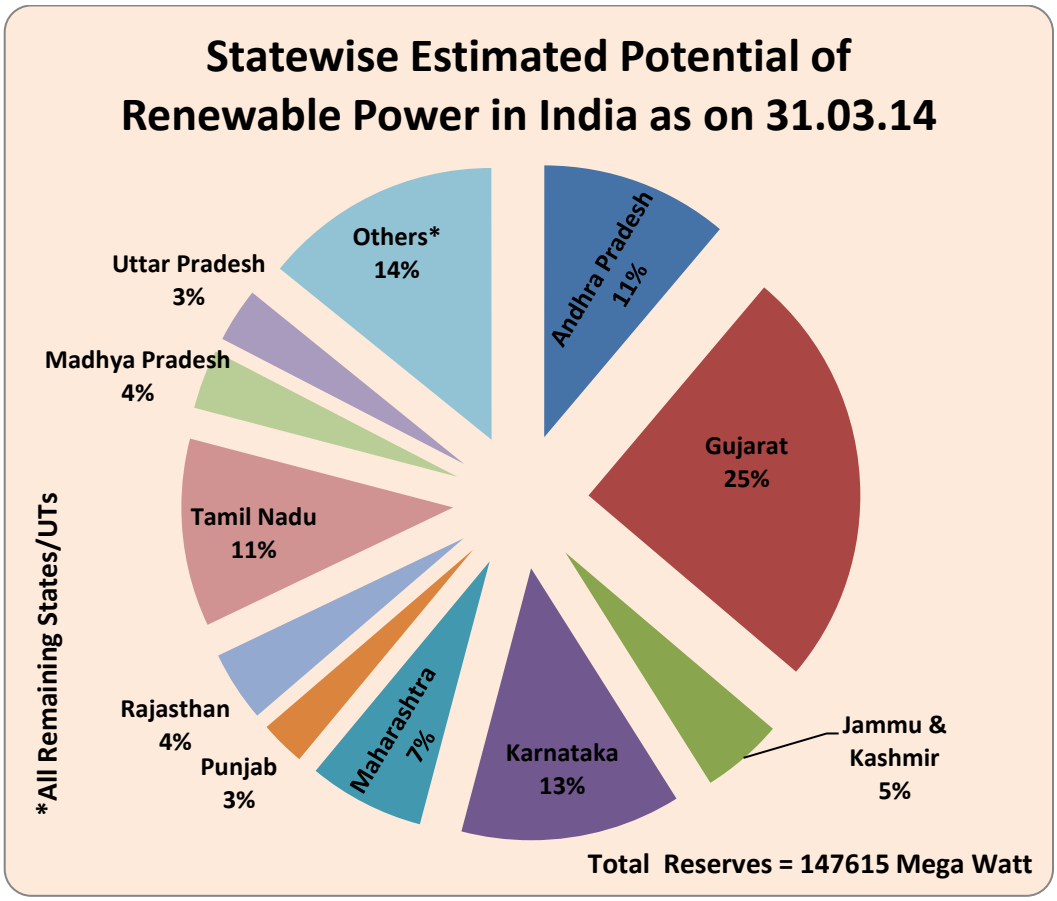
- In case of Natural Gas, the increase in the estimated reserves over the same period was 5.34%. The maximum contribution to this increase has been from Eastern Offshore (12.26%), followed by Western Offshore (3.6%).

### *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 31.03.14 is estimated at 147615 MW (Table 1.3). This includes wind power potential of 102772 MW (69.6%), SHP (small-hydro power) potential of 19749 MW (13.38%), Biomass power potential of 17,538 MW (11.88%) and 5000 MW (3.39%) from bagasse-based cogeneration in sugar mills.






❖ The geographic distribution of the estimated potential of renewable power as on 31.03.2014 reveals that Gujarat has the highest share of about 25.04% (36,956 MW), followed by Karnataka with 13.08% share (19,315 MW) and Tamil Nadu with 11.17% share (16,483 MW), mainly on account of wind power potential.

# Table 1.1 :Statewise Estimated Reserves of Coal in India as on 31.03.2013 and 31.03.2014

(in Billion Tons)

| States/ UTs | Proved | | Indicated | | Inferred | | Total | | Distribution (%) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 31.03.13 | 31.03.14 | 31.03.13 | 31.03.14 | 31.03. 13 | 31.03. 14 | 31.03. 13 | 31.03. 14 | 31.03. 13 | 31.03. 14 |
| Andhra Pradesh | 9.60 | 9.73 | 9.55 | 9.67 | 3.05 | 3.07 | 22.20 | 22.47 | **7.43** | **7.46** |
| Arunachal Pradesh | 0.03 | 0.03 | 0.04 | 0.04 | 0.02 | 0.02 | 0.09 | 0.09 | **0.03** | **0.03** |
| Assam | 0.47 | 0.00 | 0.05 | 0.00 | 0.00 | 0.00 | 0.52 | 0.00 | **0.17** | **0.00** |
| Bihar | 0.00 | 0.00 | 0.00 | 0.00 | 0.16 | 0.16 | 0.16 | 0.16 | **0.05** | **0.05** |
| Chhattisgarh | 14.78 | 16.05 | 34.11 | 33.25 | 3.28 | 3.23 | 52.17 | 52.53 | **17.45** | **17.45** |
| Jharkhand | 41.16 | 41.38 | 32.99 | 32.78 | 6.56 | 6.56 | 80.71 | 80.72 | **27.00** | **26.81** |
| Madhya Pradesh | 9.82 | 10.41 | 12.36 | 12.38 | 2.88 | 2.88 | 25.06 | 25.67 | **8.38** | **8.53** |
| Maharashtra | 5.67 | 5.67 | 3.19 | 3.19 | 2.11 | 2.11 | 10.97 | 10.96 | **3.67** | **3.64** |
| 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 | **0.11** | **0.10** |
| Odisha | 27.28 | 27.79 | 37.11 | 37.87 | 9.32 | 9.41 | 73.71 | 75.07 | **24.66** | **24.94** |
| 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 | 13.40 | 13.00 | 13.02 | 4.89 | 4.89 | 31.29 | 31.32 | **10.47** | **10.40** |
| **All India Total** | **123.19** | **125.44** | **142.66** | **142.46** | **33.09** | **33.15** | **298.94** | **301.05** | **100.00** | **100.00** |
| **Distribution (%)** | **41.21** | **41.67** | **47.72** | **47.32** | **11.07** | **11.01** | **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 31.03.2013 and 31.03.2014

(in Billion Tons)

| States/ UTs | Proved | | Indicated | | Inferred | | Total | | Distribution (%) | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 31.03.13 | 31.03.14 | 31.03.13 | 31.03.14 | 31.03. 13 | 31.03. 14 | 31.03. 13 | 31.03. 14 | 31.03. 13 | 31.03. 14 |
| Gujarat | 1.28 | 1.28 | 0.28 | 0.28 | 1.16 | 1.16 | 2.72 | 2.72 | **6.29** | **6.29** |
| Jammu & Kashmir | 0.00 | 0.00 | 0.02 | 0.02 | 0.01 | 0.01 | 0.03 | 0.03 | **0.07** | **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 | **0.97** | **0.96** |
| Rajasthan | 1.17 | 1.17 | 2.67 | 2.67 | 1.85 | 1.88 | 5.69 | 5.72 | **13.17** | **13.23** |
| TamilNadu | 3.74 | 3.74 | 22.90 | 22.90 | 7.71 | 7.71 | 34.35 | 34.35 | **79.48** | **79.43** |
| **India** | **6.19** | **6.18** | **26.28** | **26.28** | **10.75** | **10.78** | **43.22** | **43.24** | **100.00** | **100.00** |
| **Distribution (%)** | **14.32** | **14.29** | **60.81** | **60.78** | **24.87** | **24.93** | **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 31.03.2013 and 31.03.2014

| States/ UTs/ Region | Crude Petroleum (Million Tons) | | | | Natural Gas (Billion Cubic Metres) | | | |
|---|---|---|---|---|---|---|---|---|
| | 31.03.2013 | | 31.03.2014 | | 31.03.2013 | | 31.03.2014 | |
| | Estimated Reserves | Distribution (%) | Estimated Reserves | Distribution (%) | Estimated Reserves | Distribution (%) | Estimated Reserves | Distribution (%) |
| Andhra Pradesh | 7.42 | **0.98** | 11.45 | **1.50** | 48.21 | **3.56** | 48.20 | **3.38** |
| Arunachal Pradesh | 3.37 | **0.44** | 2.95 | **0.39** | 1.96 | **0.14** | 0.72 | **0.05** |
| Assam | 172.11 | **22.69** | 173.08 | **22.69** | 142.77 | **10.54** | 142.19 | **9.96** |
| CBM | 0.00 | **0.00** | 0.00 | **0.00** | 100.76 | **7.44** | 100.59 | **7.05** |
| Eastern Offshore[1] | 30.43 | **4.01** | 56.09 | **7.35** | 473.51 | **34.95** | 531.54 | **37.24** |
| Gujarat | 136.73 | **18.03** | 135.01 | **17.70** | 77.53 | **5.72** | 72.96 | **5.11** |
| Nagaland | 2.69 | **0.35** | 2.69 | **0.35** | 0.12 | **0.01** | 0.12 | **0.01** |
| Rajasthan | 60.19 | **7.94** | 45.00 | **5.90** | 11.50 | **0.85** | 14.02 | **0.98** |
| Tamil Nadu | 9.21 | **1.21** | 9.12 | **1.20** | 45.83 | **3.38** | 44.92 | **3.15** |
| Tripura | 0.07 | **0.01** | 0.07 | **0.01** | 36.92 | **2.73** | 41.28 | **2.89** |
| Western Offshore[2] | 336.22 | **44.33** | 327.28 | **42.91** | 415.65 | **30.68** | 430.61 | **30.17** |
| Total | **758.44** | **100.00** | **762.74** | **100.00** | **1354.76** | **100.00** | **1427.15** | **100.00** |

CBM : Cold Bed Methane

@ Proved and indicated Balance Recoverable Reserves.

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

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

Source: Ministry of Petroleum & Natural Gas

# Table 1.3 :Sourcewise and Statewise Estimated Potential of Renewable Power in India as on 31.03.2014

(in MW)

| States/ UTs | Wind Power | Small Hydro Power | Biomass Power | Cogeneration -bagasse | Waste to Energy | Total | |
|---|---|---|---|---|---|---|---|
| | | | | | | Estimated Potential | Distribution (%) |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| Andhra Pradesh | 14497 | 978 | 578 | 300 | 123 | 16476 | 11.16 |
| Arunachal Pradesh | 236 | 1341 | 8 | 0 | 0 | 1585 | 1.07 |
| Assam | 112 | 239 | 212 | 0 | 8 | 571 | 0.39 |
| Bihar | 144 | 223 | 619 | 300 | 73 | 1359 | 0.92 |
| Chhattisgarh | 314 | 1107 | 236 | 0 | 24 | 1681 | 1.14 |
| Goa | 0 | 7 | 26 | 0 | 0 | 33 | 0.02 |
| Gujarat | 35071 | 202 | 1221 | 350 | 112 | 36956 | 25.04 |
| Haryana | 93 | 110 | 1333 | 350 | 24 | 1910 | 1.29 |
| Himachal Pradesh | 64 | 2398 | 142 | 0 | 2 | 2606 | 1.77 |
| Jammu & Kashmir | 5685 | 1431 | 43 | 0 | 0 | 7159 | 4.85 |
| Jharkhand | 91 | 209 | 90 | 0 | 10 | 400 | 0.27 |
| Karnataka | 13593 | 4141 | 1131 | 450 | 0 | 19315 | 13.08 |
| Kerala | 837 | 704 | 1044 | 0 | 36 | 2621 | 1.78 |
| Madhya Pradesh | 2931 | 820 | 1364 | 0 | 78 | 5193 | 3.52 |
| Maharashtra | 5961 | 794 | 1887 | 1250 | 287 | 10179 | 6.90 |
| Manipur | 56 | 109 | 13 | 0 | 2 | 180 | 0.12 |
| Meghalaya | 82 | 230 | 11 | 0 | 2 | 325 | 0.22 |
| Mizoram | 0 | 169 | 1 | 0 | 2 | 172 | 0.12 |
| Nagaland | 16 | 197 | 10 | 0 | 0 | 223 | 0.15 |
| Odisha | 1384 | 295 | 246 | 0 | 22 | 1947 | 1.32 |
| Punjab | 0 | 441 | 3172 | 300 | 45 | 3958 | 2.68 |
| Rajasthan | 5050 | 57 | 1039 | 0 | 62 | 6208 | 4.21 |
| Sikkim | 98 | 267 | 2 | 0 | 0 | 367 | 0.25 |
| Tamil Nadu | 14152 | 660 | 1070 | 450 | 151 | 16483 | 11.17 |
| Tripura | 0 | 47 | 3 | 0 | 2 | 52 | 0.04 |
| Uttar Pradesh | 1260 | 461 | 1617 | 1250 | 176 | 4764 | 3.23 |
| Uttarakhand | 534 | 1708 | 24 | 0 | 5 | 2271 | 1.54 |
| West Bengal | 22 | 396 | 396 | 0 | 148 | 962 | 0.65 |
| Andaman & Nicobar | 365 | 8 | 0 | 0 | 0 | 373 | 0.25 |
| Chandigarh | 0 | 0 | 0 | 0 | 6 | 6 | 0.00 |
| Dadar & Nagar Haveli | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| Daman & Diu | 4 | 0 | 0 | 0 | 0 | 4 | 0.00 |
| Delhi | 0 | 0 | 0 | 0 | 131 | 131 | 0.09 |
| Lakshadweep | 0 | 0 | 0 | 0 | 0 | 0 | 0.00 |
| Puducherry | 120 | 0 | 0 | 0 | 3 | 123 | 0.08 |
| Others* | 0 | 0 | 0 | 0 | 1022 | 1022 | 0.69 |
| **All India Total** | **102772** | **19749** | **17538** | **5000** | **2556** | **147615** | **100.00** |
| **Distribution (%)** | **69.62** | **13.38** | **11.88** | **3.39** | **1.73** | **100.00** | |

* Industrial waste
Source: Ministry of New and Renewable Energy

# 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.

- As per the provisional estimates, total installed capacity of washeries in the country is around 131.24 Million ton per year (MTY) as on 31.3.2014 (Table 2.1). As on 31.03.14, 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 31.03.14 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 MMTPA) over the period of one year (Table 2.2).

- The Refinery production (crude throughput) achievement was 222.497 MMT during 2013-14 which marks net increase of 1.5% over 2012-13 (219.212 MMT)

- Capacity utilization of the refineries was 101.9% during 2012-13 which increased to 103.5% during 2013-14. In the Public Sector the maximum increase in capacity utilization (12.9%) was at ONGC, Tatipaka, Andhra Pradesh.

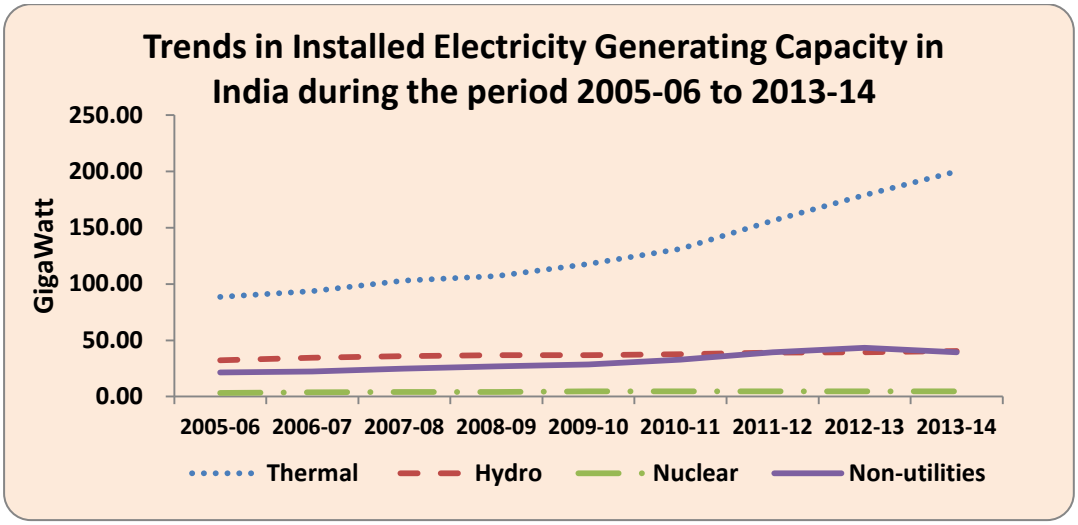
- In the Private Sector the highest increase (6.8%) in capacity utilization was at RIL(SEZ), Jamnagar, Gujarat.

- Indian Oil Corporation, the state owned corporation had highest refining capacity of 53,126 TMTY. All units of IOC together processed 53,126 TMT during 2013-14 as compared to 54,649 TMT during 2012-13. The capacity utilization of these refineries was 98% during 2013-14 as against 100.8% during 2012-13.

- All the private refineries taken together processed 88,229 TMT during 2013-14 as compared to 88,273 TMT during 2012-13. The capacity utilization of these refineries during 2012-13 and 2013-14 was constant 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 284,634 MW as on 31.03.2014, registering a compound annual growth rate (CAGR) of 7.72% (Table 2.3).




- There has been an increase in generating capacity of 17990 MW over the last one year, the annual increase being 6.75%.

- The highest rate of annual growth (11.66%) from 2012-13 to 2013-14 in installed capacity was for Thermal power followed by Hydro Power (2.63%).

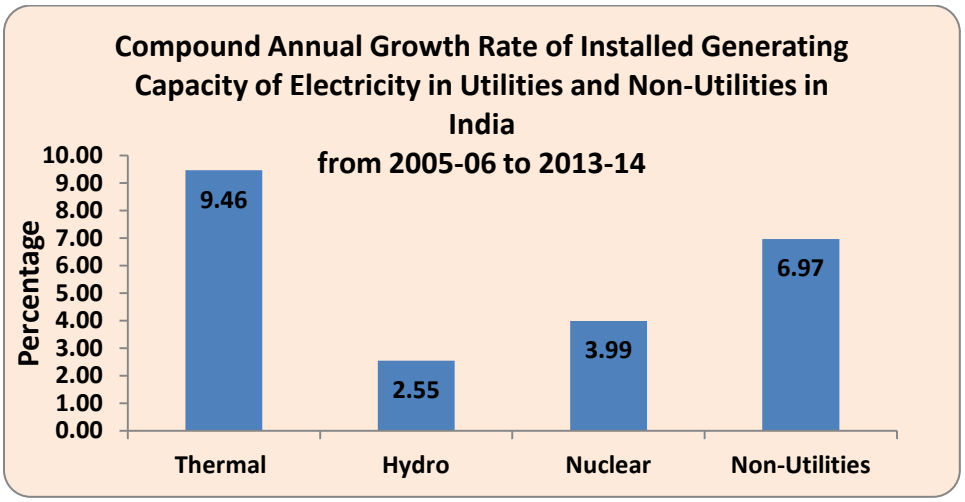
- The total Installed capacity of power utilities in the country increased from 124,287 MW in 31.3.2006 to 245,259 MW as on 31.3.2014, with a CAGR of 7.84 % over the period.

- At the end of March 2014, thermal power plants accounted for an overwhelming 70.25% of the total installed capacity in the country, with an installed capacity of 199,947 MW. The share of Nuclear energy was only 1.68% (4.78 GW).

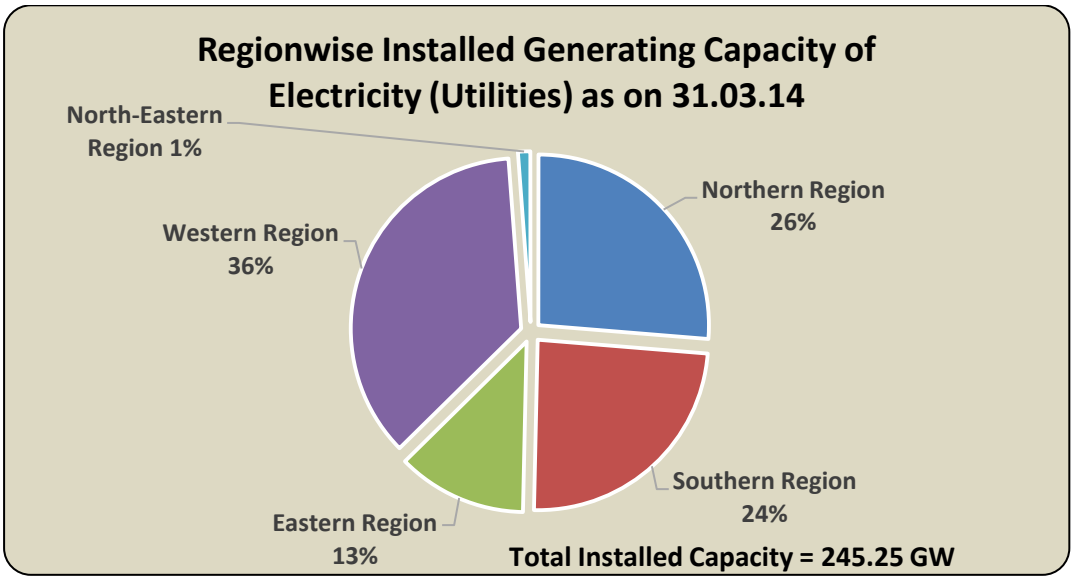
- Hydro power plants come next with an installed capacity of 40,531 MW, accounting for 14.24% of the total installed Capacity.

- Non-utilities accounted for 13.83% (39,375MW) of the total installed generation capacity.

- The highest CAGR (9.46%) was in case of Thermal utilities followed by Nuclear (3.99%) and Hydro (2.55%).




- The geographical distribution of Installed generating capacity of electricity as on 31.03.14 (Table 2.4) indicates that Western Region (both central and state sector) accounted for the highest share (36.18%) followed by Northern Region (26.28%), Southern Region (24.06%), Eastern Region (12.29%) and North Eastern Region (1.19%).




- Region wise growth in the installed capacity during 2013-14 reveals that Western Region registered the highest annual growth of about 15.94%, followed by Northern Region (7.65%) and Eastern Region (7.03%).

- Among the States in the Western Region that accounted for the highest growth of 15.94%, Chhattisgarh registered the highest (66.24%) followed by Madhya Pradesh (50.17%).

- Among all the states Sikkim registered highest annual growth (164.59%) growth in the installed capacity followed by Chhattisgarh (66.24%) and Madhya Pradesh (50.17%).

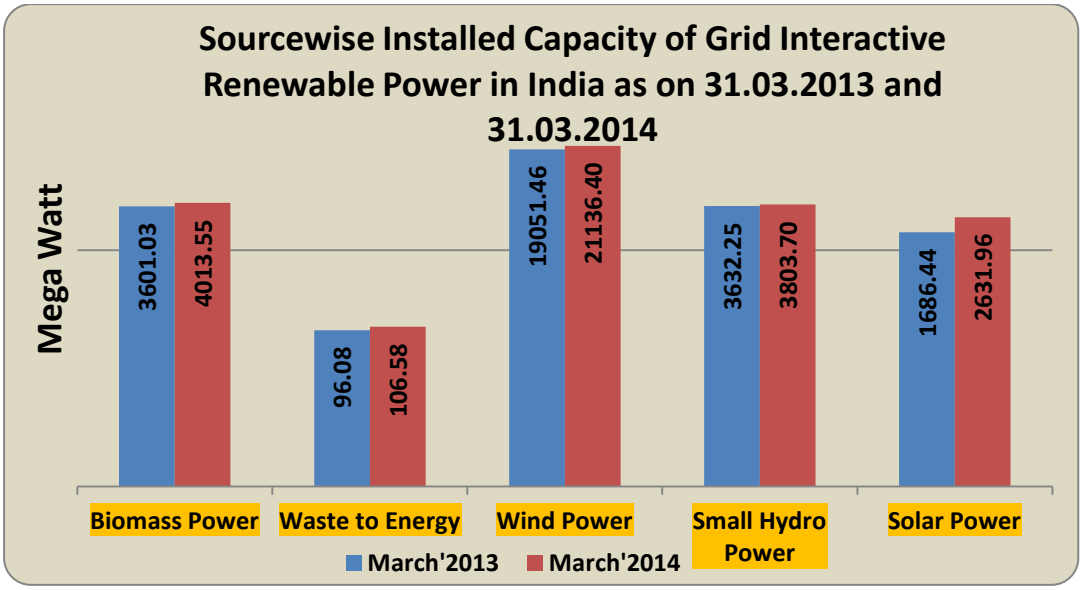
## *2.4 Grid Interactive Renewable Power*

- The total installed capacity of grid interactive renewable power, which was 28067.26 MW as on 31.03.2013 had gone up to 31692.18 MW as on 31.03.2014 indicating growth of 12.92% during the period (Table 2.5).

- Out of the total installed generation capacity of renewable power as on 31-03-2014, Wind power accounted for about 66.69%, followed by Biomass power (12.66%) and Small hydro power (12%).

- Tamil Nadu had the highest installed capacity of grid connected renewable power (8070.26 MW) followed by Maharashtra (5630.20 MW) and Gujarat (4430.20 MW), mainly on account of wind power.

- As on 31.03.2014 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.




- Out of 1221.26 MW Solar Cookers installed as on 31.03.2014, 824.09 MW were installed in Gujarat and 222.9 MW in Rajasthan.

- As on 31.03.2013 there were 1,418 Water pumping Wind mills systems installed and 7971 remote villages and 2183 hamlets were electrified.

# Table 2.1: Installed Capacity of Coal Washeries in India as on 31.03.14

| Sl. No. | Washery & Operator | State of Location | Capacity (MTY) 31.03.2014* |
|---|---|---|---|
| | **COKING COAL :** | | |
| 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** |
| | **NON-COKING COAL** | | |
| 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, -do- | Chattisgarh | 5.00 |
| 9 | Panderpauni, -do- | Maharashtra | 3.00 |
| 10 | Chakabuwa, Aryan Energy private ltd. | Chattisgarh | 4.00 |
| 11 | Indaram, Aryan Coal Benefication Pvt.Ltd. | Andhra Pradesh | - |
| 12 | Talcher, Aryan Energy Pvt. Ltd. | Odisha | 2.00 |

# Table 2.1(Contd.): Installed Capacity of Coal Washeries in India as on 31.03.14

| Sl. No. | Washery & Operator | State of Location | Capacity (MTY) 31.03.2014* |
|---|---|---|---|
| 13 | Wani, Kartikay Coal washeries pvt. ltd.(Aryan) | Maharashtra | 2.50 |
| 14 | Korba, ST-CLI Coal washeries ltd. | Chhattisgarh | 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. | Chhattisgarh | 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 2012-13 and 2013-14

| Sl. No. | Refinery | Installed Capacity (TMTPA) | | Crude Oil Processed (TMT) | | Capacity Utilisation (%) | | |
|---|---|---|---|---|---|---|---|---|
| | | 01.04.13 | 01.04.14 | 2012-13 | 2013-14* | 2012-13 | 2013-14 | Change in Utilisation |
| **A** | **Public Sector Refineries** | **120066** | **120066** | **120303** | **119547** | **100.2** | **99.6** | **-0.6** |
| **I** | **IOC RFINERIES** | **54200** | **54200** | **54649** | **53126** | **100.8** | **98.0** | **-2.8** |
| | IOC, Guwahati, Assam | 1000 | 1000 | 956 | 1019 | 95.6 | 101.9 | **6.3** |
| | IOC,Barauni, Bihar | 6000 | 6000 | 6344 | 6478 | 105.7 | 108.0 | **2.2** |
| | IOC,Koyali, Gujarat | 13700 | 13700 | 13155 | 12960 | 96.0 | 94.6 | **-1.4** |
| | IOC, Haldia, West Bengal | 7500 | 7500 | 7490 | 7952 | 99.9 | 106.0 | **6.2** |
| | IOC, Mathura, Uttar Pradesh | 8000 | 8000 | 8561 | 6641 | 107.0 | 83.0 | **-24.0** |
| | IOC, Digboi, Assam | 650 | 650 | 660 | 651 | 101.6 | 100.2 | **-1.4** |
| | IOC, Panipat, Haryana | 15000 | 15000 | 15126 | 15098 | 100.8 | 100.7 | **-0.2** |
| | IOC, Bongaigaon, Assam | 2350 | 2350 | 2356 | 2328 | 100.3 | 99.1 | **-1.2** |
| **III** | **BPCL RFINERIES** | **21500** | **21500** | **23183** | **22969** | **107.8** | **106.8** | **-1.0** |
| | BPCL, Mumbai, Maharastra | 12000 | 12000 | 13077 | 12684 | **109.0** | **105.7** | **-3.3** |
| | BPCL, Kochi, Kerala | 9500 | 9500 | 10105 | 10285 | **106.4** | **108.3** | **1.9** |
| **III** | **HPCL RFINERIES** | **14800** | **14800** | **15777** | **15561** | **106.6** | **105.1** | **-1.5** |
| | HPCL, Mumbai, Maharastra | 6500 | 6500 | 7748 | 7785 | 119.2 | 119.8 | **0.6** |
| | HPCL, Visakh, Andhra Pradesh | 8300 | 8300 | 8028 | 7776 | 96.7 | 93.7 | **-3.0** |
| **IV** | **CPCL RFINERIES** | **11500** | **11500** | **9745** | **10624** | **84.7** | **92.4** | **7.6** |
| | CPCL, Manali, Tamil Nadu | 10500 | 10500 | 9105 | 10065 | 86.7 | 95.9 | **9.1** |
| | CPCL, Narimanam, Tamil Nadu | 1000 | 1000 | 640 | 559 | 64.0 | 55.9 | **-8.1** |
| **V** | **NRL, Numaligarh, Assam** | **3000** | **3000** | **2478** | **2613** | **82.6** | **87.1** | **4.5** |
| **VI** | **MRPL, Mangalore, Karanataka** | **15000** | **15000** | **14415** | **14589** | **96.1** | **97.3** | **1.2** |
| **VII** | **ONGC, Tatipaka, Andhra Pradesh** | **66** | **66** | **57** | **65** | **85.6** | **98.5** | **12.9** |
| **B** | **Private Sector Refineries** | **80000** | **80000** | **88273** | **88229** | **110.3** | **110.3** | **-0.1** |
| **I** | **RIL RFINERIES** | **60000** | **60000** | **68504** | **68027** | **114.2** | **113.4** | **-0.8** |
| | RIL, DTA,Jamnagar, Gujarat | 33000 | 33000 | 32613 | 30307 | 98.8 | 91.8 | **-7.0** |
| | RIL(SEZ), Jamnagar, Gujarat | 27000 | 27000 | 35892 | 37720 | 132.9 | 139.7 | **6.8** |
| **II** | Essar Oil Ltd.(EOL), Vadinar | 20000 | 20000 | 19769 | 20202 | 98.8 | 101.0 | **2.2** |
| **C** | **JOINT VENTURE** | **15000** | **15000** | **10636** | **14721** | **70.9** | **98.1** | **27.2** |
| **I** | **BORL,Bina*** ** | **6000** | **6000** | **5732** | **5450** | **95.5** | **90.8** | **-4.7** |
| **II** | **HMEL,Bathinda** ** | **9000** | **9000** | **4904** | **9271** | **54.5** | **103.0** | **48.5** |
| | **Total (A+B+C)** | **215066** | **215066** | **219212** | **222497** | **101.9** | **103.5** | **1.5** |

***** Provisional TMT: Thousand Metric Tons TMTPA: Thousand Metric Tons Per Annum

****:** 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 2013-14

**(in Mega Watt ) = ($10^3$ x Kilo Watt )**

| As on | Utilities | | | | Non-utilities | Grand Total |
|---|---|---|---|---|---|---|
| | Thermal * | Hydro | Nuclear | Total | Total | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 31.03.2006 | 88,601 | 32,326 | 3,360 | 124,287 | 21,468 | 145,755 |
| 31.03.2007 | 93,775 | 34,654 | 3,900 | 132,329 | 22,335 | 154,664 |
| 31.03.2008 | 103,032 | 35,909 | 4,120 | 143,061 | 24,986 | 168,047 |
| 31.03.2009 | 106,968 | 36,878 | 4,120 | 147,966 | 26,980 | 174,946 |
| 31.03.2010 | 117,975 | 36,863 | 4,560 | 159,398 | 28,474 | 187,872 |
| 31.03.2011 | 131,279 | 37,567 | 4,780 | 173,626 | 32,900 | 206,526 |
| 31.03.2012 | 156,107 | 38,990 | 4,780 | 199,877 | 39,375 | 239,252 |
| 31.03.2013 | 179,072 | 39,491 | 4,780 | 223,344 | 43,300 | 266,644 |
| 31.03.2014(P) | 199,947 | 40,531 | 4,780 | 245,259 | 39,375 | 284,634 |
| **Growth rate of 2013-14 over 2012-13(%)** | **11.66** | **2.63** | **0.00** | **9.81** | **-9.06** | **6.75** |
| **CAGR 2005-06 to 2013-14(%)** | **9.46** | **2.55** | **3.99** | **7.84** | **6.97** | **7.72** |

* 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.

# Table 2.4 : Regionwise and Statewise Installed Generating Capacity of Electricity (Utilities) in India as on 31.03.2013 and 31.03.2014

**(in Giga Watt=$10^6$ KW)**

| States/UTs | Hydro | | Thermal | | Nuclear | | New & Renewable Energy** | | Total | | Growth * |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 31.03.13 | 31.03.14 | 31.03.13 | 31.03.14 | 31.03.13 | 31.03.14 | 31.03.13 | 31.03.14 | 31.03.13 | 31.03.14 | Rate(2012-13 to 2013-14) |
| Delhi | 0.00 | 0.00 | 1.79 | 2.29 | 0.00 | 0.00 | 0.02 | 0.02 | 1.81 | 2.42 | **33.51** |
| Haryana | 0.88 | 0.88 | 4.81 | 4.91 | 0.00 | 0.00 | 0.12 | 0.13 | 5.82 | 5.92 | **1.76** |
| Himachal Prd. | 2.14 | 2.14 | 0.00 | 0.00 | 0.00 | 0.00 | 0.59 | 0.64 | 2.73 | 2.78 | **1.87** |
| Jammu & Kashmir | 0.78 | 0.78 | 0.18 | 0.18 | 0.00 | 0.00 | 0.13 | 0.15 | 1.09 | 1.11 | **1.55** |
| Punjab | 2.23 | 2.23 | 3.02 | 3.86 | 0.00 | 0.00 | 0.39 | 0.32 | 5.63 | 6.41 | **13.76** |
| Rajasthan | 0.99 | 0.99 | 5.55 | 7.22 | 0.00 | 0.00 | 3.33 | 3.64 | 9.86 | 11.85 | **20.10** |
| Uttar Pradesh | 0.52 | 0.52 | 8.01 | 7.77 | 0.00 | 0.00 | 0.82 | 0.83 | 9.36 | 9.12 | **-2.52** |
| Uttrakhand | 1.65 | 1.65 | 0.00 | 0.00 | 0.00 | 0.00 | 0.19 | 0.21 | 1.84 | 1.86 | **1.09** |
| Chandigarh | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | - | 0.00 | **-** |
| Central Sector NR | 6.27 | 7.13 | 13.84 | 14.34 | 1.62 | 1.62 | 0.00 | 0.00 | 21.73 | 23.09 | **6.27** |
| Sub-Total (NR) | 15.47 | 16.33 | 37.21 | 40.58 | 1.62 | 1.62 | 5.59 | 5.94 | 59.88 | 64.46 | **7.65** |
| Chhatisgarh | 0.12 | 0.12 | 4.57 | 7.86 | 0.00 | 0.00 | 0.31 | 0.32 | 4.99 | 8.30 | **66.24** |
| D & N Haveli | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 5.63 | **-** |
| Daman & Diu | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | **-** |
| Goa | 0.00 | 0.00 | 0.05 | 0.05 | 0.00 | 0.00 | 0.03 | 0.00 | 0.08 | 0.05 | **-38.44** |
| Gujarat | 0.77 | 0.77 | 18.04 | 18.81 | 0.00 | 0.00 | 3.97 | 4.43 | 22.78 | 24.02 | **5.41** |
| Madhya Pradesh | 1.70 | 1.70 | 4.10 | 6.91 | 0.00 | 0.00 | 0.53 | 0.89 | 6.32 | 9.50 | **50.17** |
| Maharashtra | 3.33 | 3.33 | 16.24 | 19.28 | 0.00 | 0.00 | 4.16 | 5.63 | 23.73 | 28.24 | **19.02** |
| Central Sector WR | 1.52 | 1.52 | 15.27 | 15.27 | 1.84 | 1.84 | 0.00 | 0.00 | 18.63 | 18.63 | **0.00** |
| Sub-Total (WR) | 7.45 | 7.45 | 58.26 | 68.18 | 1.84 | 1.84 | 8.99 | 11.27 | 76.54 | 88.73 | **15.94** |
| Andhra Pradesh | 3.73 | 3.73 | 8.95 | 9.25 | 0.00 | 0.00 | 1.11 | 1.53 | 13.79 | 14.51 | **5.24** |
| Karnataka | 3.60 | 3.60 | 5.01 | 5.01 | 0.00 | 0.00 | 3.51 | 3.99 | 12.13 | 12.60 | **3.90** |
| Kerala | 1.88 | 1.88 | 0.43 | 0.43 | 0.00 | 0.00 | 0.17 | 0.19 | 2.49 | 2.51 | **0.76** |
| Lakshadweep | 0.00 | 0.00 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.01 | **7.52** |
| 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 | 2.14 | 2.18 | 6.01 | 6.76 | 0.00 | 0.00 | 7.46 | 8.08 | 15.60 | 17.02 | **9.06** |
| Central Sector SR # | 0.00 | 0.00 | 10.50 | 11.00 | 1.32 | 1.32 | 0.00 | 0.00 | 11.82 | 12.32 | **4.23** |
| Sub-Total (SR) | 11.35 | 11.40 | 30.94 | 32.49 | 1.32 | 1.32 | 12.25 | 13.79 | 55.87 | 59.00 | **5.60** |
| A & N Island | 0.00 | 0.00 | 0.06 | 0.06 | 0.00 | 0.00 | 0.01 | 0.01 | 0.07 | 0.07 | **7.65** |
| Bihar | 0.00 | 0.00 | 0.43 | 0.21 | 0.00 | 0.00 | 0.11 | 0.11 | 0.54 | 0.32 | **-40.42** |
| Jharkhand | 0.13 | 0.13 | 1.82 | 2.09 | 0.00 | 0.00 | 0.02 | 0.02 | 1.97 | 2.24 | **13.71** |
| Odisha | 2.06 | 2.06 | 3.17 | 3.87 | 0.00 | 0.00 | 0.10 | 0.12 | 5.33 | 6.05 | **13.47** |
| Sikkim | 0.00 | 0.10 | 0.01 | 0.00 | 0.00 | 0.00 | 0.05 | 0.05 | 0.06 | 0.15 | **164.59** |
| West Bengal | 0.98 | 0.98 | 6.42 | 6.67 | 0.00 | 0.00 | 0.17 | 0.13 | 7.57 | 7.78 | **2.77** |
| DVC | 0.00 | 0.00 | 1.05 | 1.05 | 0.00 | 0.00 | 0.00 | 0.00 | - | 1.05 | **-** |
| Central Sector ER | 0.81 | 0.85 | 10.77 | 11.64 | 0.00 | 0.00 | 0.00 | 0.00 | 11.58 | 12.48 | **7.80** |
| Sub-Total (ER) | 3.98 | 4.11 | 23.73 | 25.59 | 0.00 | 0.00 | 0.46 | 0.44 | 28.17 | 30.15 | **7.03** |
| Arunachal Prd. | 0.00 | 0.00 | 0.02 | 0.02 | 0.00 | 0.00 | 0.10 | 0.10 | 0.12 | 0.12 | **-0.01** |
| Assam | 0.10 | 0.10 | 0.38 | 0.38 | 0.00 | 0.00 | 0.03 | 0.03 | 0.51 | 0.52 | **0.59** |
| 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 | 0.09 | 0.08 | **-7.71** |
| Nagaland | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.03 | 0.03 | 0.02 | **-41.28** |
| Tripura | 0.00 | 0.00 | 0.15 | 0.17 | 0.00 | 0.00 | 0.02 | 0.02 | 0.17 | 0.17 | **2.95** |
| Central Sector NER | 0.86 | 0.86 | 0.74 | 0.74 | 0.00 | 0.00 | 0.00 | 0.00 | 1.60 | 1.60 | **0.00** |
| Sub-Total (NER) | 1.24 | 1.24 | 1.39 | 1.41 | 0.00 | 0.00 | 0.25 | 0.26 | 2.88 | 2.91 | **0.87** |
| **Total States** | **30.03** | **30.18** | **100.41** | **115.26** | **0.00** | **0.00** | **27.54** | **31.69** | **157.98** | **177.13** | **12.12** |
| **Total Central** | **9.46** | **10.36** | **51.12** | **52.99** | **4.78** | **4.78** | **0.00** | **0.00** | **65.36** | **68.13** | **4.23** |
| **Total All India** | **39.49** | **40.53** | **151.53** | **168.25** | **4.78** | **4.78** | **27.54** | **31.69** | **223.34** | **245.25** | **9.81** |

**:- 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 31.03.2013 and 30.03.2014

(in MW)

| States/ UTs | Biomass Power | | Waste to Energy | | Wind Power | |
|---|---|---|---|---|---|---|
| | 31.03.13 | 31.03.14 | 31.03.13 | 31.03.14 | 31.03.13 | 31.03.14 |
| Andhra Pradesh | 380.75 | 380.75 | 43.16 | 50.66 | 447.65 | 746.20 |
| Arunachal Pradesh | - | - | - | - | - | - |
| Assam | - | - | - | - | - | - |
| Bihar | 43.30 | 43.42 | - | - | - | - |
| Chhattisgarh | 249.90 | 264.90 | - | - | - | - |
| Goa | - | - | - | - | - | - |
| Gujarat | 30.50 | 43.90 | - | - | 3174.58 | 3454.30 |
| Haryana | 45.30 | 45.30 | - | - | - | - |
| Himachal Pradesh | - | - | - | - | - | - |
| Jammu & Kashmir | - | - | - | - | - | - |
| Jharkhand | - | - | - | - | - | - |
| Karnataka | 491.38 | 603.28 | 1.00 | 1.00 | 2135.15 | 2318.20 |
| Kerala | - | - | - | - | 35.10 | 35.20 |
| Madhya Pradesh | 16.00 | 26.00 | 3.90 | 3.90 | 386.00 | 423.40 |
| Maharashtra | 756.90 | 940.40 | 9.72 | 12.72 | 3021.85 | 4100.40 |
| Manipur | - | - | - | - | - | - |
| Meghalaya | - | - | - | - | - | - |
| Mizoram | - | - | - | - | - | - |
| Nagaland | - | - | - | - | - | - |
| Odisha | 20.00 | 20.00 | - | - | - | - |
| Punjab | 124.50 | 140.50 | 9.25 | 9.25 | - | - |
| Rajasthan | 91.30 | 101.30 | - | - | 2684.65 | 2784.90 |
| Sikkim | - | - | - | - | - | - |
| Tamil Nadu | 538.70 | 571.30 | 8.05 | 8.05 | 7162.18 | 7269.50 |
| Tripura | - | - | | - | - | - |
| Uttar Pradesh | 776.50 | 776.50 | 5.00 | 5.00 | - | - |
| Uttarakhand | 10.00 | 30.00 | - | - | - | - |
| West Bengal | 26.00 | 26.00 | - | - | - | - |
| Andaman & Nicobar | - | - | - | - | - | - |
| Chandigarh | - | - | - | - | - | - |
| Dadar & Nagar Haveli | - | - | - | - | - | - |
| Daman & Diu | - | - | - | - | - | - |
| Delhi | - | - | 16.00 | 16.00 | - | - |
| Lakshadweep | - | - | - | - | - | - |
| Puducherry | - | - | - | - | - | - |
| Others | - | - | - | - | 4.30 | 4.30 |
| **All India Total** | **3601.03** | **4013.55** | **96.08** | **106.58** | **19051.46** | **21136.40** |
| **Distribution (%)** | **12.83** | **12.66** | **0.34** | **0.34** | **67.88** | **66.69** |

Source: Ministry of New and Renewable Energy

## Table 2.5 (contd):Statewise and Sourcewise Installed Capacity of Grid Interactive Renewable Power as on 31.03.2013 and 30.03.2014

(in MW)

| States/ UTs | Small Hydro Power | | Solar Power | | Total | | Growth* Rate(2012-13 to 2013-14) |
|---|---|---|---|---|---|---|---|
| | 31.03.13 | 31.03.14 | 31.03.13 | 31.03.14 | 31.03.13 | 31.03.14 | |
| Andhra Pradesh | 219.03 | 221.03 | 23.35 | 131.84 | 1113.94 | 1530.48 | **37.39** |
| Arunachal Pradesh | 103.91 | 103.91 | 0.03 | 0.03 | 103.93 | 103.93 | **0.00** |
| Assam | 31.11 | 34.11 | - | - | 31.11 | 34.11 | **9.64** |
| Bihar | 70.70 | 70.70 | - | - | 114.00 | 114.12 | **0.11** |
| Chhattisgarh | 52.00 | 52.00 | 4.00 | 7.10 | 305.90 | 324.00 | **5.92** |
| Goa | 0.05 | 0.05 | - | - | 0.05 | 0.05 | **0.00** |
| Gujarat | 15.60 | 15.60 | 857.90 | 916.40 | 4078.58 | 4430.20 | **8.62** |
| Haryana | 70.10 | 70.10 | 7.80 | 10.30 | 123.20 | 125.70 | **2.03** |
| Himachal Pradesh | 587.91 | 638.91 | - | - | 587.91 | 638.91 | **8.68** |
| Jammu & Kashmir | 130.53 | 147.53 | - | - | 130.53 | 147.53 | **13.02** |
| Jharkhand | 4.05 | 4.05 | 16.00 | 16.00 | 20.05 | 20.05 | **0.00** |
| Karnataka | 963.76 | 1031.66 | 14.00 | 31.00 | 3605.29 | 3985.14 | **10.54** |
| Kerala | 158.42 | 158.42 | 0.03 | 0.03 | 193.55 | 193.65 | **0.05** |
| Madhya Pradesh | 86.16 | 86.16 | 37.32 | 347.17 | 529.38 | 886.63 | **67.49** |
| Maharashtra | 299.93 | 327.43 | 100.00 | 249.25 | 4188.40 | 5630.20 | **34.42** |
| Manipur | 5.45 | 5.45 | - | - | 5.45 | 5.45 | **0.00** |
| Meghalaya | 31.03 | 31.03 | - | - | 31.03 | 31.03 | **0.00** |
| Mizoram | 36.47 | 36.47 | - | - | 36.47 | 36.47 | **0.00** |
| Nagaland | 28.67 | 29.67 | - | - | 28.67 | 29.67 | **3.49** |
| Odisha | 64.30 | 64.63 | 13.00 | 30.50 | 97.30 | 115.13 | **18.32** |
| Punjab | 154.50 | 156.20 | 9.33 | 16.85 | 297.58 | 322.80 | **8.48** |
| Rajasthan | 23.85 | 23.85 | 552.90 | 730.10 | 3352.70 | 3640.15 | **8.57** |
| Sikkim | 52.11 | 52.11 | - | - | 52.11 | 52.11 | **0.00** |
| Tamil Nadu | 123.05 | 123.05 | 17.11 | 98.36 | 7849.09 | 8070.26 | **2.82** |
| Tripura | 16.01 | 16.01 | - | - | 16.01 | 16.01 | **0.00** |
| Uttar Pradesh | 25.10 | 25.10 | 17.38 | 21.08 | 823.98 | 827.68 | **0.45** |
| Uttaranchal | 174.82 | 174.82 | 5.05 | 5.05 | 189.87 | 209.87 | **10.53** |
| West Bengal | 98.40 | 98.40 | 2.05 | 7.05 | 126.45 | 131.45 | **3.95** |
| Andaman & Nicobar | 5.25 | 5.25 | 5.10 | 5.10 | 10.35 | 10.35 | **0.00** |
| Chandigarh | - | - | - | 2.00 | - | 2.00 | **-** |
| Dadar & Nagar Haveli | - | - | - | - | - | - | **-** |
| Daman & Diu | - | - | - | - | - | - | **-** |
| Delhi | - | - | 2.56 | 5.15 | 18.56 | 21.15 | **13.98** |
| Lakshadweep | - | - | 0.75 | 0.75 | 0.75 | 0.75 | **0.00** |
| Puducherry | - | - | 0.03 | 0.03 | 0.03 | 0.03 | **20.00** |
| Others | - | - | 0.79 | 0.82 | 5.09 | 5.12 | **-** |
| **All India Total** | **3632.25** | **3803.70** | **1686.44** | **2631.96** | **28067.26** | **31692.18** | **12.92** |
| **Distribution (%)** | **12.94** | **12.00** | **6.01** | **8.30** | **100.00** | **100.00** | |

Source: Ministry of New and Renewable Energy

# Table 2.6 : Installation of Off-grid / Decentralised Renewable Energy Systems/ Devices as on 31.03.2014

| Sl. No. | State/UT | Biogas Plants (Nos. in Lakh) | Biomass Gasifiers (Rural+ Industrial) (KW) | Biomass (non-bagasse) (MW) | Water Pumping/ Wind Mills# (Nos.) | SPV Pumps (Nos.) | Solar Photovoltaic | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | SLS (Nos. in Lakh) | HLS (Nos. in Lakh) | SL (Nos. in Lakh) | PP (KWP) |
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10** | **11** |
| 1 | Andhra Pradesh | 5.2 | 22914 | 75.4 | 6 | 613 | 0.1 | 0.2 | 0.4 | 1263.6 |
| 2 | Arunachal Pradesh | 0.0 | 750 | 0.0 | 0 | 18 | 0.0 | 0.2 | 0.1 | 217.1 |
| 3 | Assam | 1.1 | 2933 | 0.0 | 3 | 45 | 0.0 | 0.1 | 0.0 | 910.0 |
| 4 | Bihar | 1.3 | 10924 | 8.2 | 46 | 139 | 0.0 | 0.1 | 0.5 | 775.6 |
| 5 | Chhattisgarh | 0.5 | 1210 | 2.5 | 1 | 240 | 0.0 | 0.1 | 0.0 | 14616.7 |
| 6 | Goa | 0.0 | 0 | 0.0 | 0 | 15 | 0.0 | 0.0 | 0.0 | 1.7 |
| 7 | Gujarat | 4.3 | 21530 | 0.0 | 945 | 85 | 0.0 | 0.1 | 0.3 | 9452.6 |
| 8 | Haryana | 0.6 | 2503 | 35.9 | 0 | 469 | 0.2 | 0.6 | 0.9 | 864.3 |
| 9 | Himachal Pradesh | 0.5 | 0 | 7.2 | 0 | 6 | 0.1 | 0.2 | 0.2 | 1208.5 |
| 10 | Jammu & Kashmir | 0.0 | 200 | 0.0 | 0 | 39 | 0.1 | 0.7 | 0.4 | 3430.9 |
| 11 | Jharkhand | 0.1 | 500 | 1.2 | 0 | 0 | 0.0 | 0.1 | 0.2 | 480.9 |
| 12 | Karnataka | 4.7 | 7447 | 15.2 | 28 | 551 | 0.0 | 0.5 | 0.1 | 1596.4 |
| 13 | Kerala | 1.4 | 0 | 0.7 | 79 | 810 | 0.0 | 0.3 | 0.5 | 214.4 |
| 14 | Madhya Pradesh | 3.5 | 10258 | 12.4 | 0 | 87 | 0.1 | 0.0 | 0.1 | 1983.0 |
| 15 | Maharashtra | 8.6 | 7150 | 16.4 | 26 | 239 | 0.1 | 0.0 | 0.7 | 913.7 |
| 16 | Manipur | 0.0 | 0 | 0.0 | 0 | 40 | 0.0 | 0.0 | 0.0 | 456.0 |
| 17 | Meghalaya | 0.1 | 250 | 13.8 | 0 | 19 | 0.0 | 0.1 | 0.2 | 173.5 |
| 18 | Mizoram | 0.0 | 250 | 0.0 | 0 | 37 | 0.0 | 0.1 | 0.1 | 241.0 |
| 19 | Nagaland | 0.1 | 2100 | 0.0 | 0 | 3 | 0.0 | 0.0 | 0.1 | 1050.0 |
| 20 | Odisha | 2.6 | 270 | 2.9 | 0 | 56 | 0.1 | 0.1 | 0.1 | 84.5 |
| 21 | Punjab | 1.6 | 0 | 110.7 | 0 | 1857 | 0.1 | 0.1 | 0.2 | 663.0 |
| 22 | Rajasthan | 0.7 | 2464 | 2.0 | 222 | 4501 | 0.1 | 1.4 | 0.0 | 8625.0 |
| 23 | Sikkim | 0.1 | 0 | 0.0 | 0 | 0 | 0.0 | 0.2 | 0.2 | 680.0 |
| 24 | Tamil Nadu | 2.2 | 16262 | 16.6 | 60 | 829 | 0.3 | 0.6 | 0.2 | 4006.6 |
| 25 | Tripura | 0.0 | 1050 | 0.0 | 0 | 151 | 0.0 | 0.3 | 0.6 | 365.0 |
| 26 | Uttar Pradesh | 4.4 | 23702 | 150.9 | 0 | 575 | 1.2 | 2.4 | 0.6 | 3491.5 |
| 27 | Uttarakhand | 0.2 | 2150 | 42.5 | 0 | 26 | 0.1 | 0.9 | 0.8 | 280.0 |
| 28 | West Bengal | 3.7 | 26168 | 17.4 | 0 | 48 | 0.1 | 1.5 | 0.2 | 889.0 |
| 29 | Andaman & Nicobar | 0.0 | 0 | 0.0 | 2 | 5 | 0.0 | 0.0 | 0.1 | 167.0 |
| 30 | Chandigarh | 0.0 | 0 | 0.0 | 0 | 12 | 0.0 | 0.0 | 0.0 | 730.0 |
| 31 | Dadar & Nagar Haveli | 0.0 | 0 | 0.0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 32 | Daman & Diu | 0.0 | 0 | 0.0 | 0 | 0 | 0.0 | 0.0 | 0.0 | 0.0 |
| 33 | Delhi | 0.0 | 0 | 0.0 | 0 | 90 | 0.0 | 0.0 | 0.0 | 332.0 |
| 34 | Lakshadweep | 0.0 | 250 | 0.0 | 0 | 0 | 0.0 | 0.0 | 0.1 | 1090.0 |
| 35 | Puducherry | 0.0 | 0 | 0.0 | 0 | 21 | 0.0 | 0.0 | 0.0 | 0.0 |
| 36 | Others* | 0.1 | 0 | 0.0 | 0 | 0 | 0.1 | 0.2 | 1.3 | 23885.0 |
| | **Total** | **47.5** | **163235** | **531.8** | **1418** | **11626** | **2.7** | **11.0** | **9.6** | **85138.4** |

Source : Ministry of New and Renewable Energy

* Others includes installations through NGOs/IREDA in different states

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

## Table 2.6(contd..) : Installation of Off-grid / Decentralised Renewable Energy Systems/ Devices as on 31.03.2014

| Sl. No. | State/UT | Aerogen. Hybrid System | Solar Cooker # | Waste to Energy | Remote Village Electrification Villages | |
|---|---|---|---|---|---|---|
| | | | | | Villages | Hamlets |
| | | (KW) | (MW) | (MW) | (Nos.) | (Nos.) |
| 1 | 2 | 12 | 13 | 14 | 15 | 16 |
| 1 | Andhra Pradesh | 16.00 | 23.15 | 10.61 | - | 13 |
| 2 | Arunachal Pradesh | 6.80 | 0.03 | - | 297 | - |
| 3 | Assam | 6.00 | - | - | 1,952 | - |
| 4 | Bihar | - | - | 1.00 | - | - |
| 5 | Chhattisgarh | - | 4.00 | 0.33 | 568 | - |
| 6 | Goa | 163.80 | 1.69 | - | - | 19 |
| 7 | Gujarat | 20.00 | 824.09 | 14.64 | 38 | - |
| 8 | Haryana | 10.00 | 7.80 | 4.00 | - | 286 |
| 9 | Himachal Pradesh | - | - | 1.00 | 21 | - |
| 10 | Jammu & Kashmir | 15.80 | - | - | 334 | 15 |
| 11 | Jharkhand | - | 16.00 | - | 493 | - |
| 12 | Karnataka | 39.20 | 14.00 | 9.64 | 16 | 14 |
| 13 | Kerala | 8.00 | 0.03 | - | - | 607 |
| 14 | Madhya Pradesh | 24.00 | 11.75 | 0.48 | 577 | - |
| 15 | Maharashtra | 1422.10 | 34.50 | 20.45 | 340 | - |
| 16 | Manipur | 140.00 | - | - | 237 | 3 |
| 17 | Meghalaya | 191.50 | - | - | 149 | - |
| 18 | Mizoram | - | - | - | 20 | - |
| 19 | Nagaland | - | - | - | 11 | - |
| 20 | Odisha | - | 13.00 | 0.02 | 1,495 | 14 |
| 21 | Punjab | 50.00 | 9.33 | 4.78 | - | - |
| 22 | Rajasthan | 14.00 | 222.90 | 3.00 | 292 | 90 |
| 23 | Sikkim | 15.50 | - | - | - | 13 |
| 24 | Tamil Nadu | 24.50 | 17.06 | 11.42 | - | 131 |
| 25 | Tripura | 2.00 | - | - | 60 | 782 |
| 26 | Uttar Pradesh | - | 12.38 | 46.18 | 113 | 222 |
| 27 | Uttarakhand | 4.00 | 5.05 | 4.02 | 476 | 118 |
| 28 | West Bengal | 74.00 | 2.00 | 1.17 | 1,177 | 2 |
| 29 | Andaman & Nicobar | - | - | - | - | - |
| 30 | Chandigarh | - | - | - | - | - |
| 31 | Dadar & Nagar Haveli | - | - | - | - | - |
| 32 | Daman & Diu | - | - | - | - | - |
| 33 | Delhi | - | 2.53 | - | - | - |
| 34 | Lakshaadweep | - | - | - | - | - |
| 35 | Puducherry | 5.00 | - | - | - | - |
| 36 | Others* | - | - | - | - | - |
| | **Total** | **2252.20** | **1221.26** | **132.74** | **8666.00** | **2329.00** |

# Data repeated for 2012

*Others includes installations through NGOs/IREDA in different states

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

Source : Ministry of New and Renewable Energy

# CHAPTER 3: PRODUCTION OF CONVENTIONAL ENERGY SOURCES

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

- Coal production in the country during the year 2013-14 was 565.77 million tons (MTs) as compared to 556.40 MTs during 2012-13, registering a growth of 1.68% (Table 3.1)

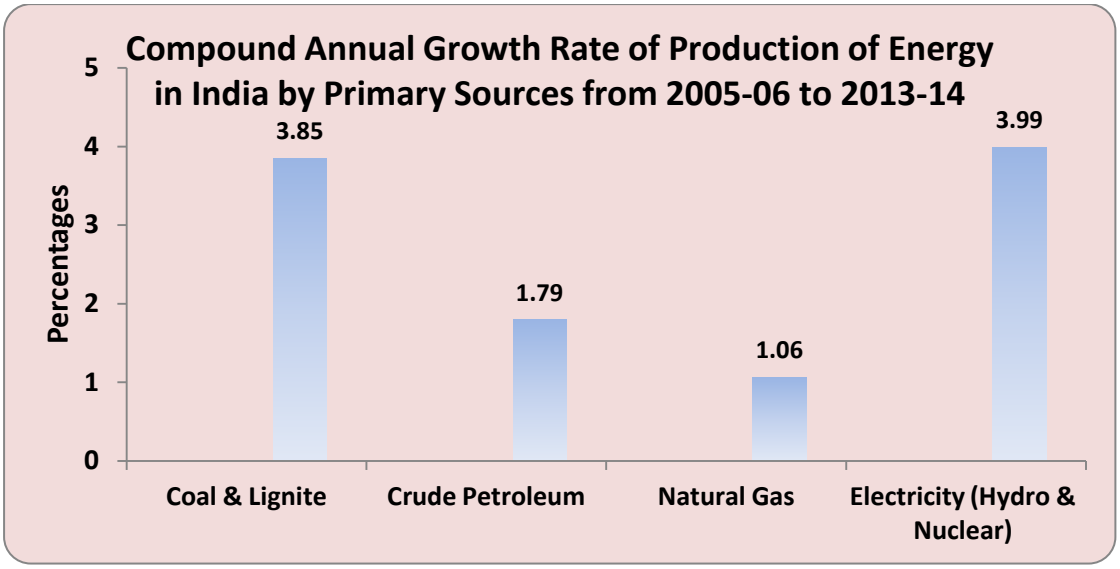
- The Lignite production during the same period decreased by 4.70%.

- Considering the trend of production from 2005-06 to 2013-14, it is observed that coal production in India was about 407.04 MTs during 2005-06, which increased to 565.77 MTs during 2013-14 with a CAGR of 3.73%.

- During the same period the CAGR of Lignite was about 4.33% with production increasing from 30.23 MTs in 2005-06 to 44.27 MTs in 2013-14.

- Production of crude petroleum increased from 32.19 MTs during 2005-06 to 37.79 MTs during 2013-14, a CAGR of about 1.80%.

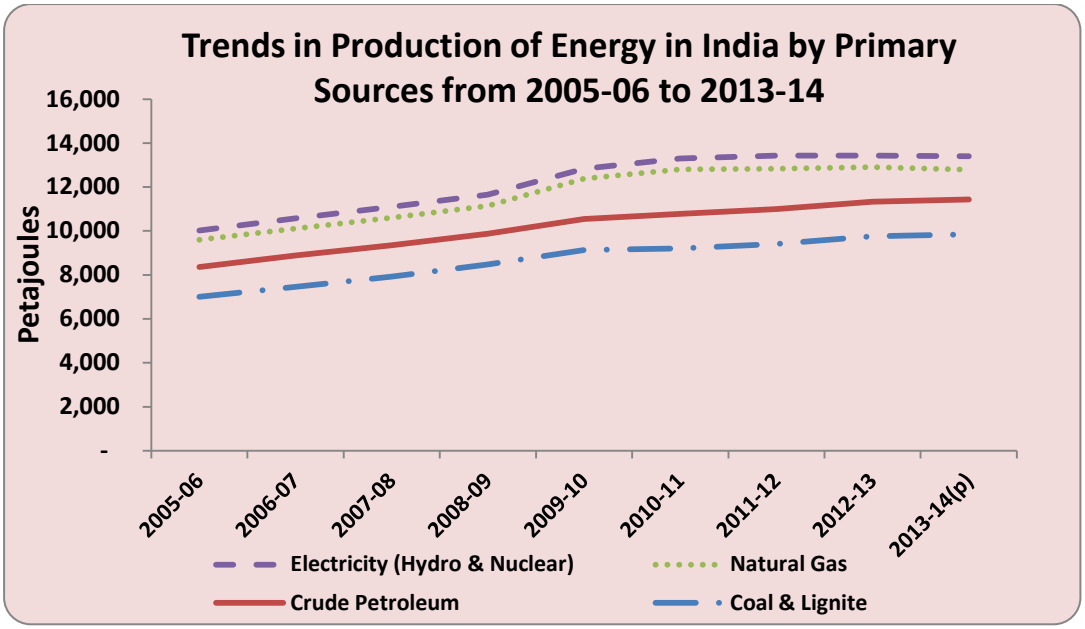
- The CAGRs for natural gas and electricity were 1.06% and 3.99% respectively. Lignite has experienced the highest CAGR i.e. 4.33% among all the conventional sources of energy since 2005.




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

- The total production of energy from conventional sources decreased from 13409.47 Peta joules during 2012-13 to 13400.15 Peta joules during 2013-14, showing a decrease of 0.07%.(Table 3.2).

- The production of energy in Peta joules by primary sources (Table 3.2) shown that Coal and Lignite were the major sources of energy, accounting for about 73.48% of the total production during 2013-14. Crude Petroleum was second (11.81%), while Natural Gas (10.18%) was third.

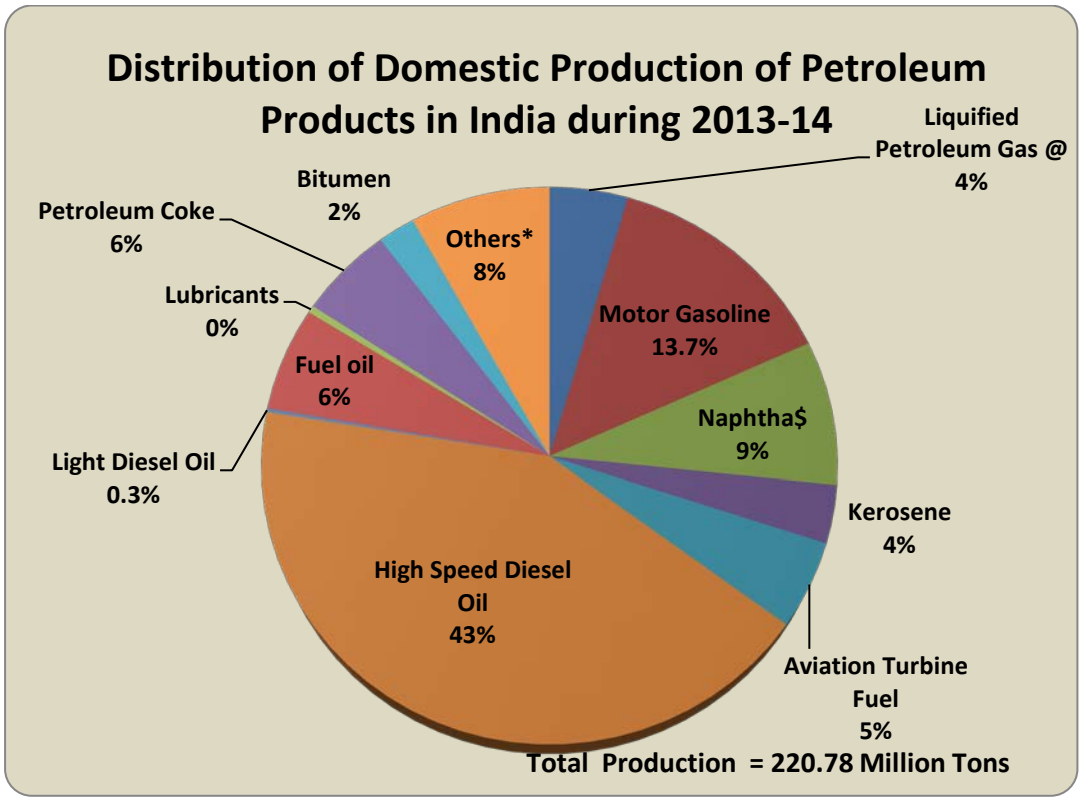



### *3.2 Production of petroleum products and Natural Gas*

- In the year 2013-14, the production of Petroleum Products in the country was 220.78 MTs as against 217.74 during 2012-13, an increase of 1.40% (Table 3.4).

- In the total production of Petroleum products during 2013-14, High speed diesel oil accounted for the maximum share (42.47%), followed by Motor Gasoline(13.72%), Naptha (8.38%), Fuel Oil(6.07%), Petroleum Coke (5.47%) and Aviation Turbine Fuel(5.08%)(Table 3.4).

- Production of Natural Gas decreased from 39.78 billion cubic meters (BCM) in 2012-13 to 34.64 BCM in 2013-14 registering a negative growth of 12.92% and a CAGR of 1.12% from 2005-06 to 2013-14 (Table 3.5).




### *3.3 Generation of electricity*

- The all India gross electricity generation from utilities, excluding that from the captive generating plants, was 6,23,819 Giga Watt-Hours (GWh) during 2005-06 (Table 3.6). It rose to 1,022,614 GWh during 2013-14.

- The production of electricity from utilities has increased from 9,63,811 GWh during 2012-13 to 1,022,614 GWh during 2013-14, registering an annual growth rate of about 6.10%.

- Total Electricity generation in the country, from utilities and non-utilities taken together during 2013-14 was 11,79,256 GWh. Out of this 8,53,683 GWh was generated from thermal and 1,34,731 GWh was from hydro and 34,200 GWh was generated from nuclear sources. Total output from non-utilities was 1,56,642 GWh.

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

| Year | Coal (Million Tons) | Lignite (Million Tons) | Crude Petroleum (Million Tons) | Natural Gas (Billion Cubic Metres) | Electricity* Hydro & Nuclear (GWh) |
|---|---|---|---|---|---|
| 1 | 2 | | 3 | 4 | 5 |
| 2005-06 | 407.04 | 30.23 | 32.19 | 32.20 | 118,818 |
| 2006-07 | 430.83 | 31.29 | 33.99 | 31.75 | 132,304 |
| 2007-08 | 457.08 | 33.98 | 34.12 | 32.42 | 137,344 |
| 2008-09 | 492.76 | 32.42 | 33.51 | 32.85 | 142,576 |
| 2009-10 | 532.04 | 34.07 | 33.69 | 47.50 | 125,316 |
| 2010-11 | 532.69 | 37.73 | 37.68 | 52.22 | 140,524 |
| 2011-12 | 539.95 | 42.33 | 38.09 | 47.56 | 163,796 |
| 2012-13 | 556.40 | 46.45 | 37.86 | 40.68 | 146,497 |
| 2013-14(p) | 565.77 | 44.27 | 37.79 | 35.41 | 168,931 |
| **Growth rate of 2013-14 over 2012-13(%)** | **1.68** | **-4.70** | **-0.18** | **-12.95** | **15.31** |
| **CAGR 2005-06 to 2013-14(%)** | **3.73** | **4.33** | **1.80** | **1.06** | **3.99** |

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

* Thermal electricity is not a primary source of energy

(p) Provisional figure

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 | 7008.97 | 1348.00 | 1240.00 | 427.74 | 10024.72 |
| 2006-07 | 7458.57 | 1423.00 | 1223.00 | 476.29 | 10580.86 |
| 2007-08 | 7925.74 | 1429.00 | 1249.00 | 494.44 | 11098.18 |
| 2008-09 | 8476.37 | 1402.90 | 1265.34 | 513.27 | 11657.89 |
| 2009-10 | 9137.06 | 1410.64 | 1830.09 | 451.14 | 12828.93 |
| 2010-11 | 9206.69 | 1578.00 | 2011.00 | 505.89 | 13301.58 |
| 2011-12 | 9398.03 | 1595.00 | 1832.00 | 589.67 | 13414.70 |
| 2012-13 | 9730.08 | 1585.00 | 1567.00 | 527.39 | 13409.47 |
| 2013-14(p) | 9846.00 | 1582.00 | 1364.00 | 608.15 | 13400.15 |
| **Growth rate of 2013-14 over 2012-13(%)** | **1.19** | **-0.19** | **-12.95** | **15.31** | **-0.07** |
| **CAGR 2005-06 to 2013-14(%)** | **3.85** | **1.79** | **1.06** | **3.99** | **3.28** |

GWh = Giga Watt hour = 10^ 6 KiloWatt hour = 10^ -3 Billion KWh

1 Billion KWh = 3.60 Peta Joules of Energy

* Thermal electricity is not a primary source of energy

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

Sources:

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

# Table 3.3 : Trends in Production of Coal and Lignite in India

(in Million Tons)

| 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 | 51.58 | 504.82 | 556.40 | 46.45 | 602.86 |
| 2013-14(p) | 56.82 | 508.95 | 565.77 | 44.27 | 610 |
| **Growth rate of 2013-14 over 2012-13(%)** | **10.15** | **0.82** | **1.68** | **-4.70** | **1.19** |
| **CAGR 2005-06 to 2013-14(%)** | **6.77** | **3.44** | **3.73** | **4.33** | **3.77** |

Source : Ministry of Coal, .Office of Coal Controller

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

(in Million Tons)

| Year | Light distillates | | | Middle distillates | | | |
|---|---|---|---|---|---|---|---|
| | Liquefied 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(p) | 10.03 | 30.28 | 18.51 | 7.42 | 11.22 | 93.76 | 0.42 |
| **Growth rate of 2013-14 over 2012-13(%)** | **2.09** | **0.54** | **6.66** | **-5.69** | **11.34** | **2.94** | **5.11** |
| **CAGR 2005-06 to 2013-14(%)** | **2.97** | **12.49** | **1.57** | **-2.41** | **6.82** | **7.83** | **-8.38** |

(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

(in Million Tons)

| 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(p) | 13.41 | 0.94 | 12.07 | 4.79 | 17.93 | 220.78 |
| **Growth rate of 2013-14 over 2012-13(%)** | **-10.92** | **4.89** | **10.30** | **2.57** | **-7.80** | **1.40** |
| **CAGR 2005-06 to 2013-14(%)** | **-0.72** | **3.71** | **15.97** | **3.30** | **16.84** | **6.58** |

* : 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 India

(in Billion Cubic Metres)

| Year | Gross Production | Re-injected | Flared | Net Production |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5=2-4 |
| 2005-06 | 32.20 | 4.47 | 0.88 | 31.33 |
| 2006-07 | 31.75 | 4.37 | 0.96 | 30.79 |
| 2007-08 | 32.42 | 4.50 | 0.94 | 31.48 |
| 2008-09 | 32.85 | 4.68 | 1.09 | 31.75 |
| 2009-10 | 47.50 | 5.66 | 0.98 | 46.52 |
| 2010-11 | 52.22 | 5.21 | 0.97 | 51.25 |
| 2011-2012 | 47.56 | 5.31 | 1.08 | 46.48 |
| 2012-13 | 40.68 | 5.43 | 0.90 | 39.78 |
| 2013-14(p) | 35.41 | 5.65 | 0.77 | 34.64 |
| **Growth rate of 2013-14 over 2012-13(%)** | **-12.95** | **4.08** | **-14.44** | **-12.92** |
| **CAGR 2005-06 to 2013-14(%)** | **1.06** | **2.65** | **-1.44** | **1.12** |

(P) : Provisional
Source : Ministry of Petroleum & Natural Gas.

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

(Giga Watt hour) = ($10^6$ x Kilo Watt hour)

| Year | Utilities | | | | Non-Utilities | Grand Total |
|---|---|---|---|---|---|---|
| | Thermal * | Hydro | Nuclear | Total | | |
| 1 | 2 | 3 | 4 | 5 = 2 to 4 | 6 | 7=5+6 |
| 2005-06 | 505,001 | 101,494 | 17,324 | 623,819 | 73,640 | 697,459 |
| 2006-07 | 538,350 | 113,502 | 18,802 | 670,654 | 81,800 | 752,454 |
| 2007-08 | 585,282 | 120,387 | 16,957 | 722,626 | 90,477 | 813,103 |
| 2008-09 | 617,832 | 113,081 | 14,713 | 745,626 | 95,905 | 841,531 |
| 2009-10 | 670,965 | 106,680 | 18,636 | 796,281 | 109,693 | 905,974 |
| 2010-11 | 704,323 | 114,257 | 26,266 | 844,846 | 114,224 | 959,070 |
| 2011-12 | 708,427 | 130,511 | 32,287 | 922,451 | 128,172 | 1,050,623 |
| 2012-13 | 817,225 | 113,720 | 32,866 | 963,811 | 148,000 | 1,111,811 |
| 2013-14(p) | 853,683 | 134,731 | 34,200 | 1,022,614 | 156,642 | 1,179,256 |
| **Growth rate of 2013-14 over 2012-13(%)** | **4.46** | **18.48** | **4.06** | **6.10** | **5.84** | **6.07** |
| **CAGR 2005-06 to 2013-14(%)** | **6.01** | **3.20** | **7.85** | **5.65** | **8.75** | **6.01** |

* From 1995-96 onwards, Thermal includes Renewable Energy Sources also.
Source : Central Electricity Authority.

# CHAPTER 4: FOREIGN TRADE IN ENERGY PRODUCTS

## *4.1 Import and export of coal*

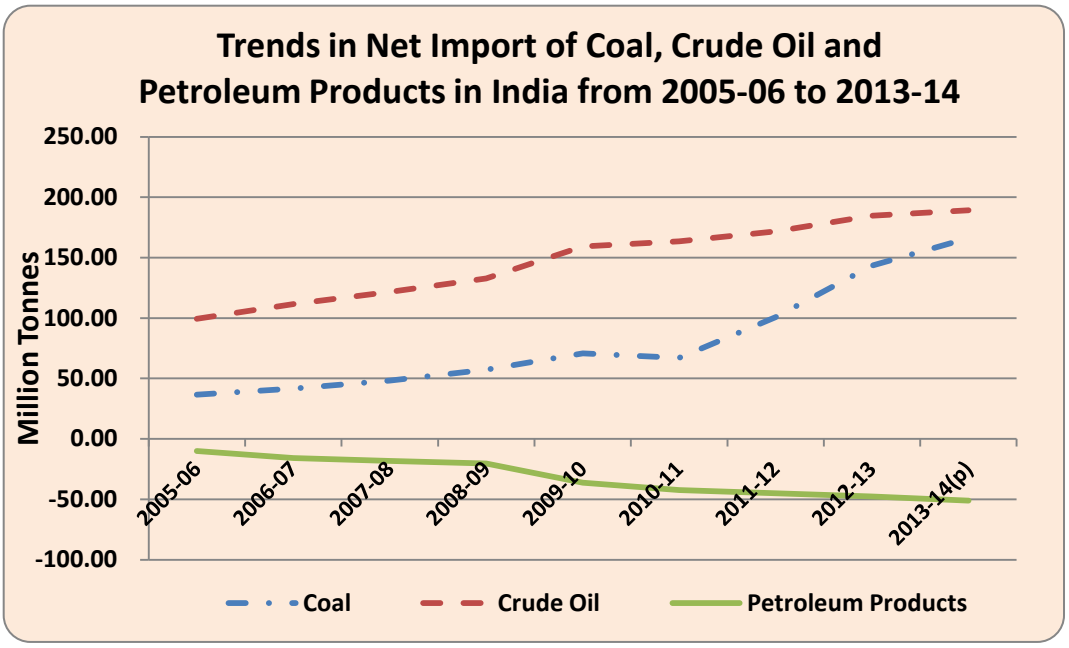
- The average quality of the Indian coal is not very high and this necessitates the import of high quality coal to meet the requirements of steel plants. There has been an increasing trend in the import of coal.

- Net Import of coal has steadily increased from 36.60 MTs during 2005-06 to 166.29 MTs during 2013-14(Table 4.1). During the said period, the quantum of coal exported increased from 1.99 MTs during 2005-06 to 2.15 MTs during 2013-14.

- There is growth rate of 15.54% of gross import and 16.01% in net imports of coal in 2013-14 over the previous year. However there was decrease of 11.87% 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 99.41MTs during 2005-06 to 189.24 MTs during 2013-14.




- There has been an increase of 2.41% in the net imports of crude oil during 2013-14 over 2012-13, as the net import increased from 184.80 MTs to 189.24 MTs (Table 4.1).

- Although more than 70% of its crude oil requirements and part of the petroleum products is met from imports, India has developed sufficient processing capacity over the years to produce different petroleum products so as to become a net exporter of petroleum products.

- The export of petroleum product has increased from 23.46 MT during 2005-06 to 67.86 MTs during 2013-14. During 2013-14 exports recorded an increase of 7.02% from previous year (Table 4.1).

- The import of petroleum products has increased from 13.44 MT in 2005-06 to 16.72 MT during 2013-14, although there are some fluctuations in the trend (Table 4.1). There is an increase of growth rate of 6% in import of petroleum products over the previous year.

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

**(in Million Tons)**

| Year | Coal | | | Crude Oil | | | Petroleum Products | | |
|---|---|---|---|---|---|---|---|---|---|
| | Gross Imports | Exports | Net Imports | Gross Imports | Exports | Net Imports | Gross Imports | Exports | Net Imports |
| 1 | 2 | 3 | 4=(2)-(3) | 5 | 6 | 7=(5)-(6) | 8 | 9 | 10=(8)-(9) |
| 2005-06 | 38.59 | 1.99 | 36.60 | 99.41 | 0.00 | 99.41 | 13.44 | 23.46 | -10.02 |
| 2006-07 | 43.08 | 1.55 | 41.53 | 111.50 | 0.00 | 111.50 | 17.76 | 33.62 | -15.86 |
| 2007-08 | 49.79 | 1.63 | 48.17 | 121.67 | 0.00 | 121.67 | 22.46 | 40.78 | -18.32 |
| 2008-09 | 59.00 | 1.66 | 57.35 | 132.78 | 0.00 | 132.78 | 18.52 | 38.90 | -20.38 |
| 2009-10 | 73.26 | 2.45 | 70.80 | 159.26 | 0.00 | 159.26 | 14.66 | 50.97 | -36.31 |
| 2010-11 | 68.92 | 1.88 | 67.04 | 163.60 | 0.00 | 163.60 | 16.82 | 59.08 | -42.26 |
| 2011-12 | 102.85 | 2.02 | 100.83 | 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(p) | 168.44 | 2.15 | 166.29 | 189.24 | 0.00 | 189.24 | 16.72 | 67.86 | -51.14 |
| **Growth rate of 2013-14 over 2012-13(%)** | **15.54** | **-11.87** | **16.01** | **2.41** | | **2.41** | **6.00** | **7.02** | **7.36** |

(p): Provisional.

Sources:

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

# CHAPTER 5: AVAILABILITY

## *5.1 Availability of Coal and Lignite*

- The total availability of raw coal in India in 2013-14 stood at 739.92 MTs and that of lignite at 43.90 (Table 5.1).

- The availability of coal in the year 2013-14 increased by 4.11% compared to 2012-13. The availability of lignite decreased by 4.59% during the same period.

- The availability of coal has increased at a CAGR of about 6.13% during the period from 2005-06 to 2013-14. This increased availability might be attributed to the secular increase in the coal production (407.04 MTs during 2005-06 to 565.77 MTs during 2013-14) supplemented by imports (Table 5.2).

- The availability of lignite has increased at a CAGR of about 4.23% during the period from 2005-06 to 2013-14(Table 5.1).

## *5.2 Availability of Natural Gas*

- The production of natural gas has steadily increased from a mere 31.33 BCMs during 2005-06 to 34.64 BCMs during 2013-14, registering a CAGR of 1.12%. Most of this increase in the indigenous production is due to discovery of new reserves.(Table 5.1)

## *5.3 Availability of Electricity*

- Since thermal electricity is not a primary source of energy, being produced either from coal or natural gas in India, electricity availability is considered only for that electricity which is generated from Hydro and Nuclear sources.

- Without taking into account the transmission and distribution losses, the total availability is equal to the total generation, and this figure increased from 592194 GWh during 2005-06 to 11,79,256 GWh during 2013-14, registering a CAGR of 7.95% over the period (Table 5.1).

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

- The availability of crude oil in the country increased from 131.60 MTs during 2005-06 to 227.03 MTs during 2013-14 (Table 5.3).

- During this period crude oil production increased from 32.19 MTs to 37.79 MTs and the net import increased from 99.41 MTs to 189.24 MTs during period from 2005-06 to 2013-14. There was 1.96% increase in availability of crude oil during 2013-14 over 2012-13.

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

| Year | Coal | Lignite | Crude Petroleum | Natural Gas | Electricity |
|---|---|---|---|---|---|
| | (Million Tonnes) | (Million Tonnes) | (Million Tonnes) | (Billion Cubic Metres) | (GWh) |
| 1 | 2 | 3 | 4 | 5 | 6 |
| 2005-06 | 433.27 | 30.24 | 130.11 | 31.33 | 592,194 |
| 2006-07 | 462.35 | 30.81 | 146.55 | 30.79 | 639,008 |
| 2007-08 | 502.82 | 34.65 | 156.10 | 31.48 | 689,780 |
| 2008-09 | 549.57 | 31.85 | 160.77 | 31.75 | 712,540 |
| 2009-10 | 585.30 | 34.41 | 192.77 | 46.52 | 761,934 |
| 2010-11 | 589.87 | 37.69 | 196.99 | 51.25 | 809,455 |
| 2011-12 | 638.84 | 41.89 | 204.12 | 46.48 | 811,506 |
| 2012-13 | 710.74 | 46.01 | 219.21 | 39.78 | 908,574 |
| 2013-14(p) | 739.92 | 43.90 | 222.50 | 34.64 | 1,179,256 |
| **Growth rate of 2013-14 over 2012-13(%)** | **4.11** | **-4.58** | **1.50** | **-12.91** | **29.79** |
| **CAGR 2005-06 to 2013-14(%)** | **6.13** | **4.23** | **6.14** | **1.12** | **7.95** |

(p) - Provisional

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

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

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

**(in Million Tons)**

| 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 | 638.94 | 42.33 | 0.44 | 41.89 |
| 2012-13 | 556.40 | -10.99 | 145.79 | 2.44 | 710.74 | 46.45 | 0.44 | 46.01 |
| 2013-14(p) | 565.77 | -7.87 | 168.44 | 2.15 | 739.92 | 44.27 | 0.37 | 43.90 |
| **Growth rate of 2013-14 over 2012-13(%)** | **1.68** | **-28.39** | **15.54** | **-11.87** | **4.11** | **-4.70** | **-16.74** | **-4.58** |

Note: Figures in brackets are in negative

Source : Office of the Coal Controller, Ministry of Coal

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

| Year | Crude Oil* | | | Petroleum Products* | | | Natural Gas** | | |
|---|---|---|---|---|---|---|---|---|---|
| | Production | Net Imports | Gross Availability | Production @ | Net Imports | Gross Availability | Production | Net Imports | Gross Availability |
| **1** | **2** | **3** | **4=2+3** | **5** | **6** | **7=5+6** | **8** | **9** | **10-8+9** |
| 2005-06 | 32.19 | 99.41 | 131.60 | 124.41 | -10.02 | 114.39 | 31.33 | 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 | 31.75 | 8.06 | 39.81 |
| 2009-10 | 33.69 | 159.26 | 192.95 | 184.61 | -36.31 | 148.30 | 46.52 | 9.15 | 55.67 |
| 2010-11 | 37.68 | 163.60 | 201.28 | 194.82 | -42.26 | 152.56 | 51.25 | 9.93 | 61.18 |
| 2011-12 | 38.09 | 171.73 | 209.82 | 203.20 | -44.99 | 158.21 | 46.48 | 13.21 | 59.69 |
| 2012-13 | 37.86 | 184.80 | 222.66 | 217.74 | -47.63 | 170.10 | 39.78 | 13.14 | 52.92 |
| 2013-14(p) | 37.79 | 189.24 | 227.03 | 220.76 | -51.15 | 169.61 | 34.64 | 13.03 | 47.67 |
| **Growth rate of 2013-14 over 2012-13(%)** | **-0.19** | **2.41** | **1.96** | **1.39** | **7.38** | **-0.29** | **-12.92** | **-0.79** | **-9.91** |

*: Million Tons

**: Billion Cubic Meter

.@ Excludes LPG Production from Natural Gas

Source : Ministry of Petroleum & Natural Gas.

# 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 407.04 MTs during 2005-06 to 571.89 MTs during 2013-14 with a CAGR of 3.85% (Table 6.1). The annual growth rate from 2012-13 to 2013-14 is 0.76%.

- Consumption of Lignite increased from 30.23 MTs in 2005-06 to 43.90 MTs in 2013-14 registering a compound growth of 4.23%. Consumption of Lignite is highest in Electricity Generation sector, accounting for about 83.09% (Table 6.5) of the total lignite consumption.

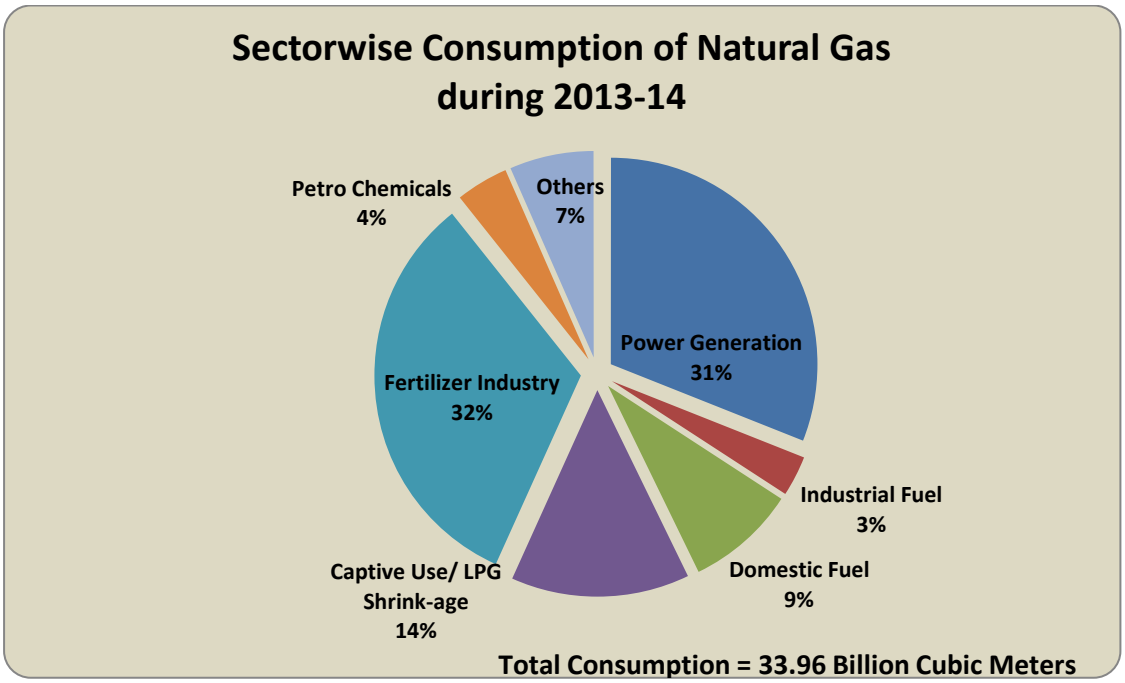
- Electricity generation is the biggest consumer of coal, followed by steel industries. Industry-wise estimates of consumption of coal(Table 6.4) shows that during 2013-14 electricity generating units consumed 427.23 MTs of coal, followed by steel & washery industries (23.13 MTs), cement industries(11.96 MTs) and paper industries (1.67 MTs).

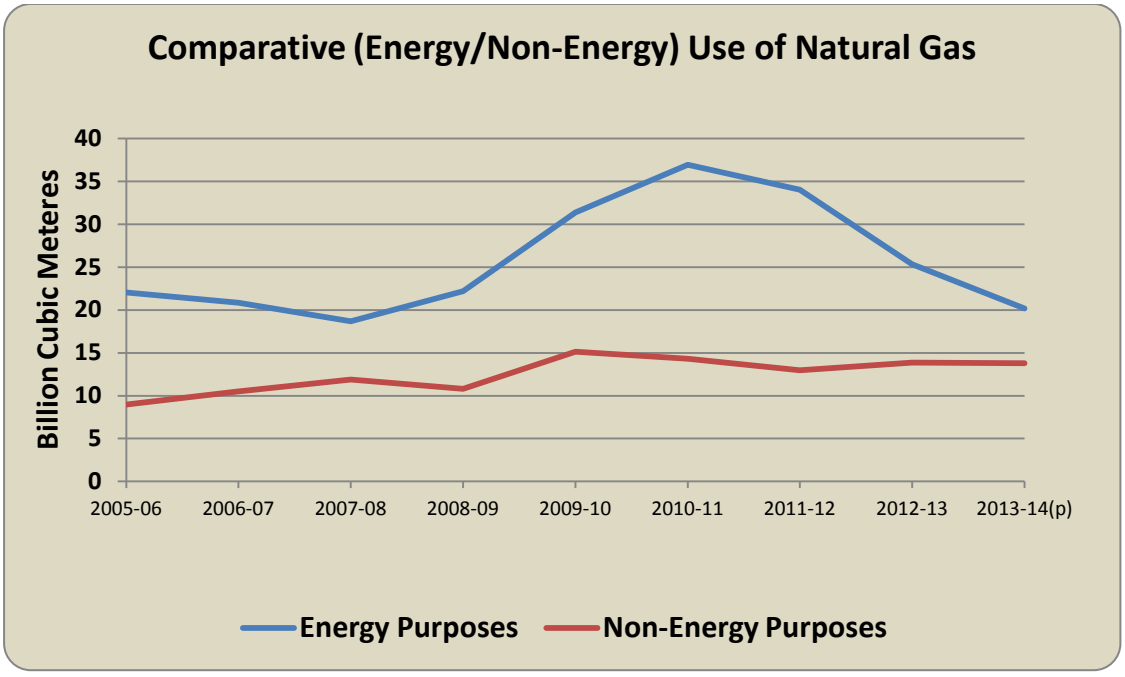
## *6.2 Consumption of Crude Oil and Natural Gas*

- The estimated consumption of crude oil has a steady increase, from 130.11 MMTs during 2005-06 to 222.50 MMTs during 2013-14 with CAGR of 6.14%. It increased from 219.21 MMTs in 2012-13 to 222.50 MMTs in 2013-14 (Table 6.1).

- The maximum use of Natural Gas is in fertilizers industry (32.56%) followed by power generation (31.02%) and 8.60% natural gas was used for domestic fuel (Table 6.8).

- Industry wise off-take of natural gas shows that natural gas has been used both for Energy (59.42%) and Non-energy(40.58%) purposes (Table 6.8).

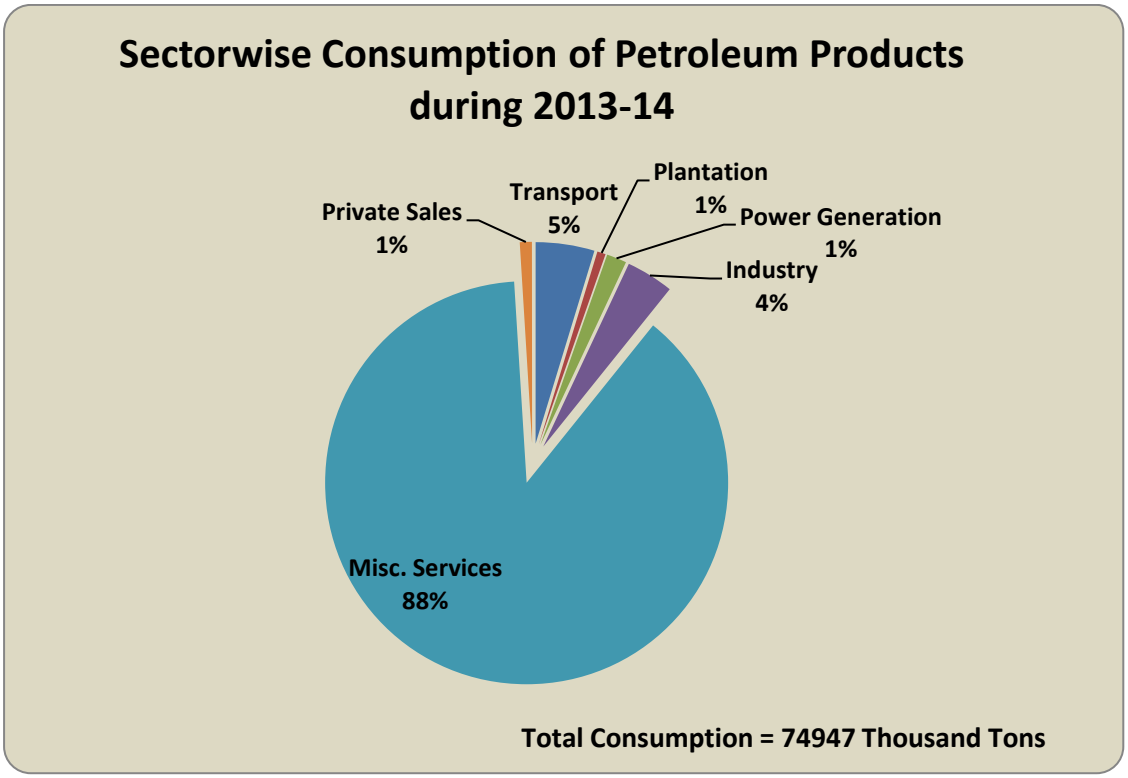



### *6.3 Consumption of Petroleum Products*

- High speed diesel oil accounted for 38.83% of total consumption of all types of petroleum products in 2013-14. This was followed by Refinery (10.15%), Petrol (9.73%), LPG (9.28%) and Naphtha (6.50%). Consumption of Light Diesel oil continuously decreased from 2005-06(0.88 MTs) to 2013-14 (0.39 MTs) (Tables 6.6 & 6.7).

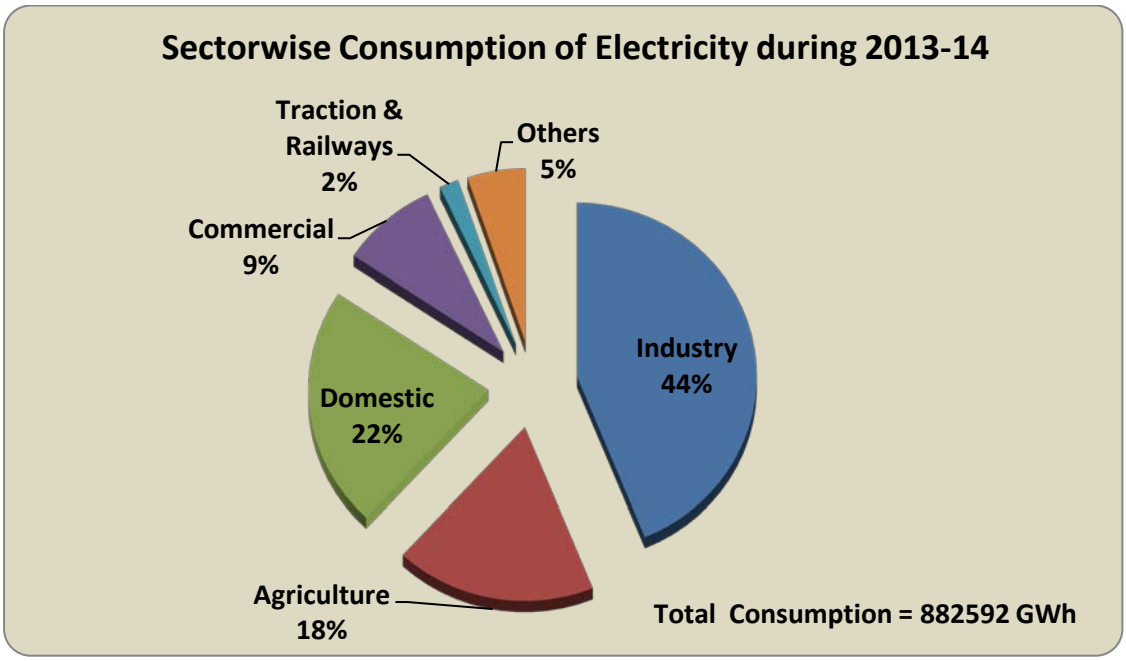
- Sector-wise consumption of different petroleum products reveals that miscellaneous service sector accounts for the lion's share (88.25%) of the total consumption of petroleum products (Table 6.7).




## *6.4 Consumption of Electricity*

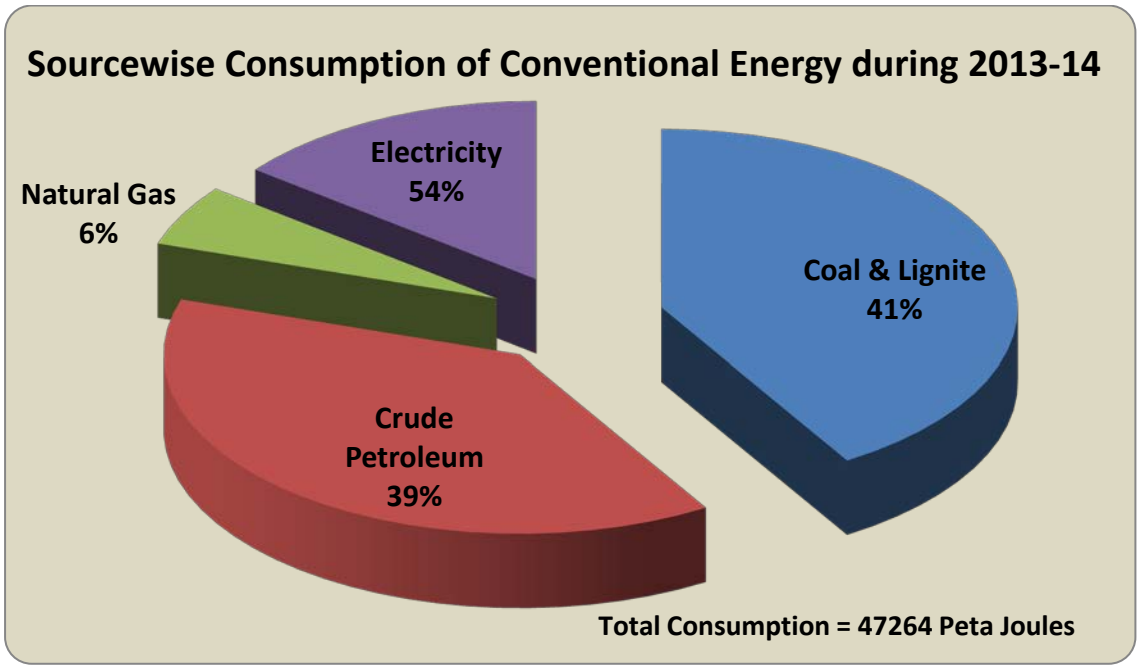
- The estimated electricity consumption increased from 4,11,887 GWh during 2005-06 to 882,592GWh during 2013-14,showing a CAGR of 8.84%(Table 6.9). The increase in electricity consumption is 7.07% from 2012-13 (824,301GWh) to 2013-14 (882,592 GWh).

- Of the total consumption of electricity in 2013-14, industry sector accounted for the largest share (43.83%), followed by domestic (22.46%), agriculture (18.03%) and commercial sectors (8.72%) (Table 6.9).




- The electricity consumption in Industry sector and commercial sector has increased at a much faster pace compared to other sectors during 2005-06 to 2013-14 with CAGRs of 10.97% and 8.82% respectively (Table 6.9).

- Loss of electricity due to transmission has decreased from 30.42% during 2005-06 to 23.04% during 2013-14 (Table 6.10).

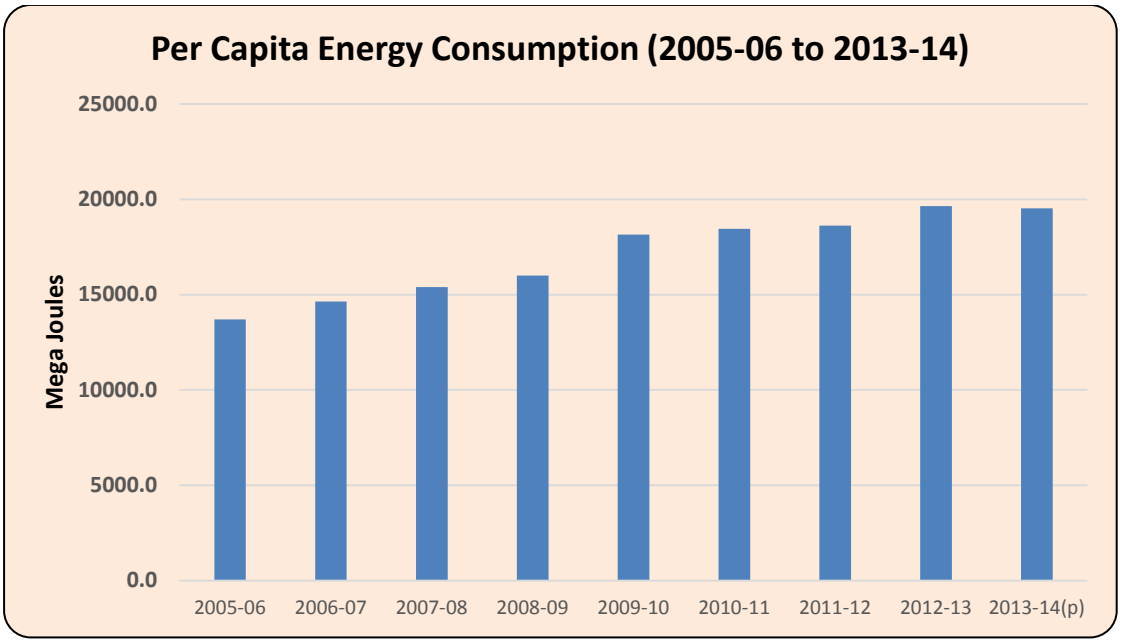


### *6.5 Per-Capita Energy Consumption & Energy Intensity*

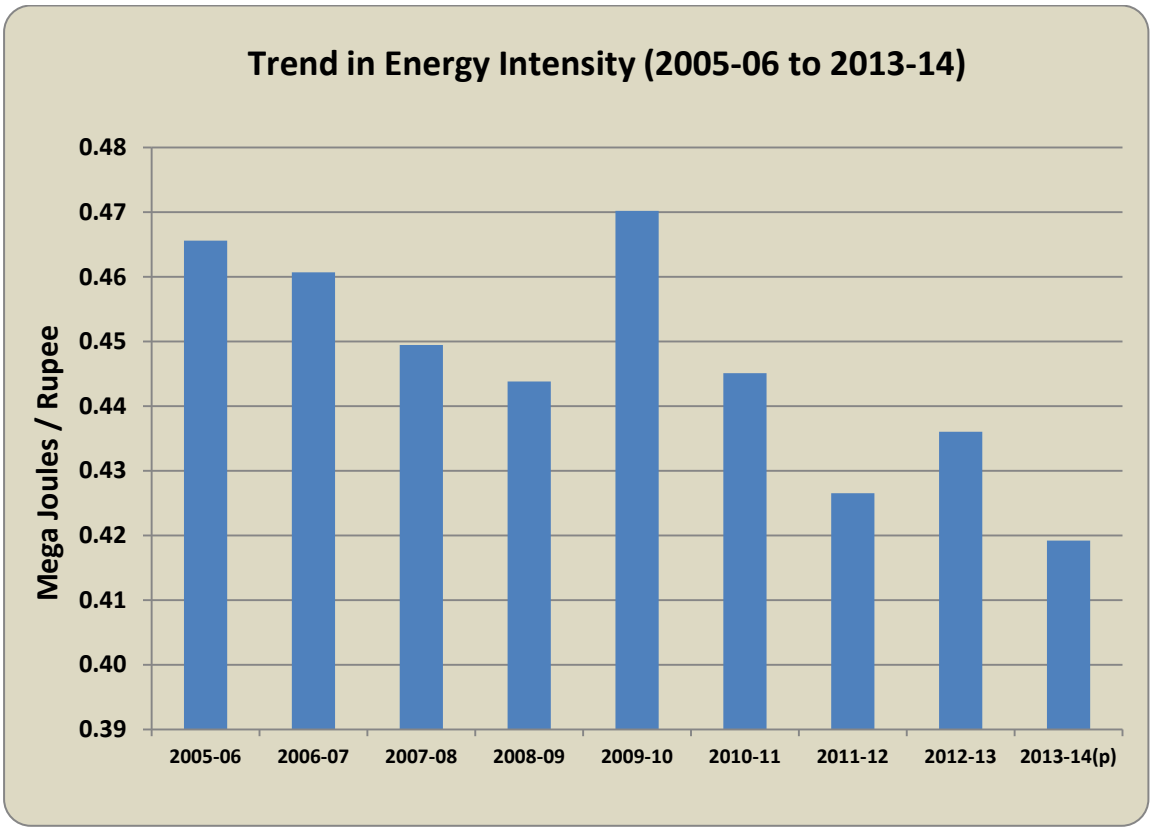
- Per-capita Energy Consumption (PEC) during a year is computed as the ratio of the estimate of total energy consumption during the year to the estimated mid-year population of that year. Energy Intensity is defined as the amount of energy consumed for generating one unit of Gross Domestic Product (at constant prices). PEC and Energy intensity are the most used policy indicators, both at national and international levels. In the absence of data on consumption of non-conventional energy from various sources, particularly in rural areas in the developing countries, including India, these two indicators are generally computed on the basis of consumption of conventional energy. The consumption of energy in Peta joules was in the form of Coal and Lignite which accounted for about 41.29% of the total consumption during 2013-14. Crude Petroleum was second (38.70%), while Electricity (14.47%) was third.(Table 6.2)

- The total consumption of energy from conventional sources increased from 23,903 Peta joules during 2012-13 to 24,071 Peta joules during 2013-14, showing an increase of 0.70% (Table 6.2).

- Per-capita Energy Consumption (PEC) (the ratio of the estimate of total energy consumption during the year to the estimated mid-year population of that year) increased from 13694.83 Mega Joules in 2005-06 to 19522.15 Mega Joules in 2013-14, a CAGR of 4.53% (Table 6.3). The annual decrease in PEC for 2013-14 over 2012-13 is 0.60%.




- The Energy Intensity (amount of energy consumed for generating one unit of Gross Domestic Product) (at 2004-05 prices) increased from 0.4656 Mega Joules in 2005-06 to 0.4192 Mega Joules in 2013-14 (Table 6.3).


Trend in Energy Intensity (2005-06 to 2013-14)
Mega Joules / Rupee
0.48
0.47
0.46
0.45
0.44
0.43
0.42
0.41
0.40
0.39
2005-06
2006-07
2007-08
2008-09
2009-10
2010-11
2011-12
2012-13
2013-14(p)

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

| Year | Coal # | Lignite | Crude Oil** | Natural Gas *** (Billion Cubic Metres) | Electricity* (GWh) |
|---|---|---|---|---|---|
| | (Million Tons) | | (MMT) | | |
| 1 | 2 | 3 | 4 | 5 | 6 |
| 2005-06 | 407.04 | 30.23 | 130.11 | 31.33 | 411,887 |
| 2006-07 | 430.83 | 31.29 | 146.55 | 30.79 | 455,748 |
| 2007-08 | 457.08 | 33.98 | 156.10 | 31.48 | 510,899 |
| 2008-09 | 492.76 | 32.42 | 160.77 | 31.75 | 562,888 |
| 2009-10 | 532.04 | 34.07 | 192.77 | 46.52 | 620,251 |
| 2010-11 | 532.69 | 37.73 | 196.99 | 51.25 | 684,324 |
| 2011-12 | 535.88 | 41.88 | 204.12 | 46.48 | 755,847 |
| 2012-13 | 567.60 | 46.31 | 219.21 | 39.78 | 912,057 |
| 2013-14(p) | 571.89 | 43.90 | 222.50 | 34.64 | 967,150 |
| **Growth rate of 2013-14 over 2012-13(%)** | **0.76** | **-5.22** | **1.50** | **-12.93** | **6.04** |
| **CAGR 2005-06 to 2013-14(%)** | **3.85** | **4.23** | **6.14** | **1.12** | **9.95** |

(p): Provisional

GWh = Giga Watt hour = $10^6$ x Kilo Watt hour
*Includes thermal, hydro & nuclear electricity from utilities.
** Crude oil in terms of refinery crude throughput.
# Does not include Lignite and imports.
Sources:
1. Office of Coal Controller, Ministry of Coal
2. Ministry of Petroleum & Natural Gas.
3. Central Electricity Authority.

# Table 6.2 : Trends in Consumption of Conventional Energy in India ( Peta Joules)

**(in Peta Joules)**

| Year | Coal & Lignite | Crude Petroleum ** | Natural Gas | Electricity * | Total |
|---|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** | **6= 2 to 5** |
| 2005-06 | 7,009 | 5,448 | 1,207 | 1,483 | 15,146 |
| 2006-07 | 7,459 | 6,136 | 1,186 | 1,641 | 16,421 |
| 2007-08 | 7,926 | 6,536 | 1,213 | 1,839 | 17,514 |
| 2008-09 | 8,476 | 6,732 | 1,223 | 2,026 | 18,457 |
| 2009-10 | 9,137 | 8,071 | 1,792 | 2,233 | 21,233 |
| 2010-11 | 9,207 | 8,248 | 1,974 | 2,464 | 21,892 |
| 2011-12 | 9,325 | 8,547 | 1,790 | 2,721 | 22,383 |
| 2012-13 | 9,909 | 9,178 | 1,532 | 3,283 | 23,903 |
| 2013-14(p) | 9,939 | 9,316 | 1,334 | 3,482 | 24,071 |
| **Growth rate of 2013-14 over 2012-13(%)** | **0.31** | **1.50** | **-12.93** | **6.04** | **0.70** |
| **CAGR 2005-06 to 2013-14(%)** | **3.96** | **6.14** | **1.12** | **9.95** | **5.28** |

* Includes thermal, hydro & nuclear electricity from utilities.

** Crude oil in terms of refinery crude throughput.

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

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

| Year | Energy Consumption (in Peta Joules) | Population # (in Million) | GDP # ( Rs. Crore) (2004-05 prices) | Per Capita Energy Consumption (in Mega Joules) | Energy Intensity (Mega Joules per rupee) |
|---|---|---|---|---|---|
| 2005-06 | 15146 | 1106 | 3253073 | 13694.83 | 0.4656 |
| 2006-07 | 16421 | 1122 | 3564364 | 14635.85 | 0.4607 |
| 2007-08 | 17514 | 1138 | 3896636 | 15389.79 | 0.4495 |
| 2008-09 | 18457 | 1154 | 4158676 | 15994.06 | 0.4438 |
| 2009-10 | 21233 | 1170 | 4516071 | 18147.99 | 0.4702 |
| 2010-11 | 21892 | 1186 | 4918533 | 18458.90 | 0.4451 |
| 2011-12 | 22383 | 1202 | 5247530 | 18621.62 | 0.4265 |
| 2012-13 | 23903 | 1217 | 5482111 | 19640.72 | 0.4360 |
| 2013-14(p) | 24071 | 1233 | 5741791 | 19522.15 | 0.4192 |
| **Growth rate of 2013-14 over 2012-13(%)** | **0.70** | **1.31** | **4.74** | **-0.60** | **-3.85** |
| **CAGR 2005-06 to 2013-14(%)** | **5.96** | **1.37** | **7.36** | **4.53** | **-1.30** |

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

# Population and GDP figures from M/o Statistics & P.I. Website

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

# Table 6.4 : Trends in Industry-wise Consumption of Raw Coal in India

**(in Million Tons)**

| Year | Electricity | Steel & Washery | Cement | Paper | Textile | Others * | Total |
|---|---|---|---|---|---|---|---|
| **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8=2 to 7** |
| 2005-06 | 306.04 | 19.66 | 14.97 | 2.77 | 0.29 | 51.85 | 395.59 |
| 2006-07 | 321.91 | 17.30 | 14.71 | 2.50 | 0.30 | 63.08 | 419.80 |
| 2007-08 | 350.58 | 16.99 | 15.27 | 2.64 | 0.37 | 67.72 | 453.57 |
| 2008-09 | 377.27 | 16.58 | 13.12 | 2.16 | 2.53 | 77.52 | 489.17 |
| 2009-10 | 390.58 | 16.45 | 14.66 | 2.34 | 0.27 | 89.50 | 513.79 |
| 2010-11 | 395.84 | 17.26 | 15.08 | 2.43 | 0.28 | 92.58 | 523.47 |
| 2011-12 | 410.37 | 16.05 | 13.18 | 2.03 | 0.26 | 94.00 | 535.88 |
| 2012-13 | 446.76 | 16.15 | 13.11 | 2.12 | 0.30 | 89.16 | 567.60 |
| 2013-14(p) | 427.23 | 23.13 | 11.96 | 1.67 | 0.36 | 107.54 | 571.89 |
| **Distribution (%)** | **74.70** | **4.04** | **2.09** | **0.29** | **0.06** | **18.80** | **100.00** |
| **Growth rate of 2013-14 over 2012-13(%)** | **-4.37** | **43.26** | **-8.77** | **-21.25** | **18.42** | **20.62** | **0.76** |
| **CAGR 2005-06 to 2013-14(%)** | **3.78** | **1.82** | **-2.46** | **-5.49** | **2.51** | **8.44** | **4.18** |

* Includes Sponge Iron, colliery consmn.,jute, bricks, coal for soft coke, colliery, fertilisers & other industries consumption.
@ From 1996-97 and onwards Cotton includes
'Rayon' also.
Source : Office of the Coal Controller,
Ministry of Coal

# Table 6.5 : Trends in Industry-wise Consumption of Lignite in India

(in Million Tons)

| Year | Electricity | Steel & Washery | Cement | Paper | Textile | Others * | Total |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8=2 to 7 |
| 2005-06 | 23.36 | - | 0.79 | 0.23 | 1.11 | 4.86 | 30.34 |
| 2006-07 | 23.92 | - | 0.77 | 0.22 | 0.84 | 5.06 | 30.80 |
| 2007-08 | 26.76 | - | 0.96 | 0.35 | 0.77 | 5.83 | 34.66 |
| 2008-09 | 25.71 | - | 0.34 | 0.36 | - | 6.01 | 32.42 |
| 2009-10 | 28.14 | - | 0.38 | 0.82 | - | 4.09 | 33.43 |
| 2010-11 | 29.90 | - | 0.36 | 0.84 | 1.18 | 6.25 | 38.53 |
| 2011-12 | 32.06 | 0.03 | 1.01 | 0.63 | 3.67 | 4.47 | 41.88 |
| 2012-13 | 37.20 | 0.05 | 1.10 | 0.69 | 3.47 | 3.81 | 46.31 |
| 2013-14(p) | 36.48 | 0.03 | 1.40 | 0.66 | 2.83 | 2.51 | 43.90 |
| **Distribution (%)** | **83.09** | **0.06** | **3.18** | **1.51** | **6.44** | **5.71** | **100.00** |
| **Growth rate of 2013-14 over 2012-13(%)** | **-1.94** | **-46.94** | **27.35** | **-4.61** | **-18.43** | **-34.13** | **-5.22** |
| **CAGR 2005-06 to 2013-14(%)** | **5.08** | | **6.54** | **12.74** | **10.99** | **-7.10** | **4.19** |

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

Source : Office of the Coal Controller, Ministry of Coal

# Table 6.6 : Trends in Consumption of Petroleum Products in India

**(in Million Tons)**

| Year | Light Distillates | | | Middle Distillates | | | |
|---|---|---|---|---|---|---|---|
| | **LPG** | **Petrol** | **Naphtha** | **Kerosene** | **ATF** | **HSDO** | **LDO** |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| 2005-06 | 10.46 | 8.65 | 12.19 | 9.54 | 3.30 | 40.19 | 0.88 |
| 2006-07 | 10.85 | 9.29 | 13.89 | 9.51 | 3.98 | 42.90 | 0.72 |
| 2007-08 | 12.17 | 10.33 | 13.29 | 9.37 | 4.54 | 47.67 | 0.67 |
| 2008-09 | 12.34 | 11.26 | 13.91 | 9.30 | 4.42 | 51.71 | 0.55 |
| 2009-10 | 13.14 | 12.82 | 10.13 | 9.30 | 4.63 | 56.24 | 0.46 |
| 2010-11 | 14.33 | 14.19 | 10.68 | 8.93 | 5.08 | 60.07 | 0.46 |
| 2011-12 | 15.35 | 14.99 | 11.22 | 8.23 | 5.54 | 64.75 | 0.42 |
| 2012-13 | 15.60 | 15.74 | 12.29 | 7.50 | 5.27 | 69.08 | 0.40 |
| 2013-14(p) | 16.34 | 17.13 | 11.45 | 7.17 | 5.51 | 68.37 | 0.39 |
| **Growth rate of 2013-14 over 2012-13(%)** | **4.71** | **8.79** | **-6.79** | **-4.49** | **4.44** | **-1.03** | **-3.26** |
| **CAGR 2005-06 to 2013-14(%)** | **5.08** | **7.89** | **-0.69** | **-3.13** | **5.86** | **6.08** | **-8.78** |

(p) : Provisional

Contd…

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

**(in Million Tons)**

| Year | Heavy Ends | | | | Refinery Fuel | Others* | Total |
|---|---|---|---|---|---|---|---|
| | Fuel Oils | Lubricants | Bitumen | Petroleum Coke | | | |
| | 9 | 10 | 11 | 12 | 13 | 14 | 15=2 to 14 |
| 2005-06 | 12.83 | 2.08 | 3.51 | 4.93 | 9.14 | 4.66 | 122.36 |
| 2006-07 | 12.62 | 1.90 | 3.83 | 5.44 | 10.92 | 5.83 | 131.67 |
| 2007-08 | 12.72 | 2.29 | 4.51 | 5.95 | 11.75 | 5.45 | 140.70 |
| 2008-09 | 12.59 | 2.00 | 4.75 | 6.17 | 11.91 | 4.60 | 145.51 |
| 2009-10 | 11.63 | 2.54 | 4.93 | 6.59 | 14.58 | 5.40 | 152.39 |
| 2010-11 | 10.79 | 2.43 | 4.54 | 4.98 | 16.38 | 4.57 | 157.42 |
| 2011-12 | 9.31 | 2.63 | 4.64 | 6.14 | 17.29 | 4.92 | 165.43 |
| 2012-13 | 7.66 | 3.20 | 4.68 | 10.14 | 18.35 | 5.51 | 175.40 |
| 2013-14(p) | 6.19 | 2.89 | 4.94 | 11.65 | 17.87 | 6.18 | 176.06 |
| **Growth rate of 2013-14 over 2012-13(%)** | **-19.11** | **-9.54** | **5.60** | **14.96** | **-2.61** | **12.22** | **0.38** |
| **CAGR 2005-06 to 2013-14(%)** | **-7.77** | **3.72** | **3.87** | **10.03** | **7.73** | **3.19** | **4.13** |

(p) : Provisional

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

Source: Ministry of Petroleum & Natural Gas.

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

**(Thousand Tons)**

| 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 | 5,293 | 490 | 336 | 1,310 | 44,220 | 62 | 51,711 |
| | 2009-10 | 5,365 | 594 | 303 | 1,502 | 48,385 | 94 | 56,243 |
| | 2010-11 | 5,417 | 616 | 166 | 1,440 | 52,240 | 193 | 60,072 |
| | 2011-12 | 5,529 | 684 | 168 | 1,649 | 56,651 | 70 | 64,751 |
| | 2012-13 | 5,160 | 617 | 214 | 1,628 | 61,415 | 47 | 69,081 |
| | 2013-14(p) | 3,203 | 429 | 204 | 873 | 63,577 | 81 | 68,367 |
| **Growth rate of 2013-14 over 2012-13(%)** | | **-37.93** | **-30.47** | **-4.67** | **-46.38** | **3.52** | **72.34** | **-1.03** |
| **CAGR 2005-06 to 2013-14(%)** | | **-3.13** | **-0.05** | **-9.44** | **-1.10** | **8.64** | **-34.95** | **6.08** |

**(Thousand Tons)**

| 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 | 36 | 3 | 77 | 200 | 351 | 0 | 667 |
| | 2008-09 | 15 | 4 | 175 | 171 | 187 | 0 | 552 |
| | 2009-10 | 6 | 3 | 152 | 143 | 153 | 0 | 457 |
| | 2010-11 | 5 | 2 | 137 | 127 | 184 | 0 | 455 |
| | 2011-12 | 3 | 1 | 127 | 102 | 183 | 0 | 416 |
| | 2012-13 | 3 | 1 | 142 | 74 | 178 | 0 | 399 |
| | 2013-14(p) | 4 | 1 | 132 | 64 | 186 | 0 | 387 |
| **Growth rate of 2013-14 over 2012-13(%)** | | **29** | **-23** | **-7** | **-14** | **5** | | **-3** |
| **CAGR 2005-06 to 2013-14(%)** | | **-25** | **-31** | **8** | **-17** | **-7** | **-100** | **-9** |

Contd…

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

(Thousand Tons)

| 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 | 3,135 | 4,156 | 538 | 9,145 |
| | 2010-11 | 780 | 70 | 823 | 2,773 | 3,986 | 374 | 8,806 |
| | 2011-12 | 371 | 70 | 647 | 2,408 | 3,345 | 706 | 7,547 |
| | 2012-13 | 277 | 79 | 587 | 2,019 | 2,721 | 608 | 6,291 |
| | 2013-14(p) | 315 | 75 | 536 | 1,833 | 2,332 | 654 | 5,745 |
| **Growth rate of 2013-14 over 2012-13(%)** | | **13.72** | **-5.06** | **-8.69** | **-9.21** | **-14.30** | **7.57** | **-8.68** |
| **CAGR 2005-06 to 2013-14(%)** | | **-4.53** | | **6.58** | **0.03** | **-9.30** | **-0.75** | **-4.77** |

(Thousand Tons)

| 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 | 1,294 | 526 | 0 | 3,168 |
| | 2009-10 | 0 | 2 | 936 | 1,225 | 320 | 0 | 2,483 |
| | 2010-11 | 0 | 0 | 469 | 1,031 | 482 | 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(p) | 0 | 0 | 328 | 76 | 44 | 0 | 448 |
| **Growth rate of 2013-14 over 2012-13(%)** | | | | **-25.28** | **-90.23** | **-70.47** | | **-67.20** |
| **CAGR 2005-06 to 2013-14(%)** | | | | **-5.77** | **-27.60** | **-34.40** | | **-21.39** |

(p) : Provisional, @ : LSHS sales through pvt. parties included in FO sales. Break-up not available.
** : Included in Miscellaneous services. Break-up is not available.
Source: Ministry of Petroleum & Natural Gas.

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

(in Billion Cubic Metres)

| Year | Energy Purposes | | | | | | | Non-Energy Purposes | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Power Generation | Industrial Fuel | Tea Plantation | Domestic Fuel | Captive Use/ LPG Shrinkage | Others | Total | Fertilizer Industry | Petro Chemicals | Others @ | Total | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8=2 to 7 | 9 | 10 | 11 | 12=9 to11 | 13=8+12 |
| 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 | 15.14 | 46.51 |
| 2010-11 | 25.79 | 0.90 | 0.19 | 2.52 | 6.78 | 0.77 | 36.95 | 11.46 | 1.31 | 1.53 | 14.30 | 51.26 |
| 2011-12 | 20.77 | 1.69 | 0.18 | 3.19 | 6.37 | 1.85 | 34.04 | 11.33 | 1.41 | 0.23 | 12.97 | 47.01 |
| 2012-13 | 14.48 | 1.06 | 0.18 | 2.75 | 6.19 | 0.68 | 25.35 | 11.50 | 1.07 | 1.30 | 13.87 | 39.22 |
| 2013-14(p) | 10.53 | 1.08 | 0.20 | 2.92 | 4.74 | 0.71 | 20.18 | 11.06 | 1.40 | 1.33 | 13.78 | 33.96 |
| **Distribution (%)** | 31.02 | 3.17 | 0.58 | 8.60 | 13.96 | 2.10 | 59.42 | 32.56 | 4.11 | 3.90 | 40.58 | 100.00 |
| **Growth rate of 2013-14 over 2012-13(%)** | -27.24 | 1.70 | 7.69 | 6.14 | -23.44 | 4.39 | -20.38 | -3.79 | 29.89 | 1.77 | -0.66 | -13.40 |
| **CAGR 2005-06 to 2013-14(%)** | -1.33 | -13.02 | 2.94 | 50.22 | -0.69 | -4.89 | -0.98 | 4.01 | 1.93 | 49.29 | 4.88 | 1.01 |

@ : Excludes offtakes of natural gas by ONGC.

$: Sales of City Gas Distribution Companies like IGL, MGL, Bhagyanagar Gas, TNGCL, BMC Green Gas,
CUGL & GGCL. Includes Industrial sale, domestic sale and CNG sale.

**: Sponge iron use.

Source : Ministry of Petroleum & Natural Gas.

# Table 6.9: Consumption of Electricity by Sectors in India

**(in Giga Watt Hour) = ($10^6$ x Kilo Watt Hour)**

| Year | Industry | Agriculture | Domestic | Commercial | Traction & Railways | Others | Total Electricity Consumed |
|---|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8=2 to 7 |
| 2005-06 | 151,557 | 90,292 | 100,090 | 35,965 | 9,944 | 24,039 | 411,887 |
| 2006-07 | 171,293 | 99,023 | 111,002 | 40,220 | 10,800 | 23,411 | 455,749 |
| 2007-08 | 189,424 | 104,182 | 120,918 | 46,685 | 11,108 | 29,660 | 501,977 |
| 2008-09 | 209,474 | 109,610 | 131,720 | 54,189 | 11,425 | 37,577 | 553,995 |
| 2009-10 | 236,752 | 120,209 | 146,080 | 60,600 | 12,408 | 36,595 | 612,645 |
| 2010-11 | 272,589 | 131,967 | 169,326 | 67,289 | 14,003 | 39,218 | 694,392 |
| 2011-12 | 352,291 | 140,960 | 171,104 | 65,381 | 14,206 | 41,252 | 785,194 |
| 2012-13 | 365,989 | 147,462 | 183,700 | 72,794 | 14,100 | 40,256 | 824,301 |
| 2013-14(p) | 386,872 | 159,144 | 198,246 | 76,968 | 15,182 | 46,180 | 882,592 |
| **Distribution (%)** | **43.83** | **18.03** | **22.46** | **8.72** | **1.72** | **5.23** | **100.00** |
| **Growth rate of 2013-14 over 2012-13(%)** | **5.71** | **7.92** | **7.92** | **5.73** | **7.67** | **14.72** | **7.07** |
| **CAGR 2005-06 to 2013-14(%)** | **10.97** | **6.50** | **7.89** | **8.82** | **4.81** | **7.52** | **8.84** |

Source : Central Electricity Authority.

# Table 6.10 : Electricity Generated(from Utilities), Distributed, Sold and Lost in India

**(in Giga Watt hour) = ($10^6$ x Kilo Watt hour)**

| Year | Gross Electricity Generated from Utilities | Consum-ption 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 transm-ission | Loss in transm-ission (%) |
|---|---|---|---|---|---|---|---|---|
| **1** | **2** | **3** | **4=2-3** | **5** | **6=4+5** | **7** | **8=6-7** | **9** |
| 2005-06 | 623,819 | 41,970 | 581,849 | 10,345 | 592,194 | 411,887 | 180,145 | 30.42 |
| 2006-07 | 670,654 | 43,577 | 627,077 | 11,931 | 639,008 | 455,749 | 183,012 | 28.64 |
| 2007-08 | 722,626 | 45,531 | 677,095 | 12,685 | 689,780 | 501,977 | 187,620 | 27.20 |
| 2008-09 | 746,626 | 47,573 | 699,053 | 14,181 | 713,234 | 553,995 | 178,420 | 25.02 |
| 2009-10 | 796,281 | 49,706 | 746,576 | 14,391 | 760,967 | 612,645 | 193,455 | 25.42 |
| 2010-11 | 844,846 | 52,952 | 791,894 | 19,839 | 811,733 | 694,392 | 194,537 | 23.97 |
| 2011-12 | 922,451 | 56,499 | 865,952 | 15,516 | 811,506 | 685,194 | 208,400 | 25.68 |
| 2012-13 | 963,722 | 59,799 | 903,923 | 20,577 | 924,500 | 824,301 | 226,395 | 24.49 |
| 2013-14(p) | 1,022,614 | 62,250 | 960,364 | 20,577 | 980,941 | 882,592 | 226,009 | 23.04 |
| **Growth rate of 2013-14 over 2012-13(%)** | **6.11** | **4.10** | **6.24** | **0.00** | **6.11** | **7.07** | **-0.17** | **-5.91** |
| **CAGR 2005-06 to 2013-14(%)** | **6.37** | **5.05** | **6.46** | **8.98** | **6.51** | **9.99** | **2.88** | **-3.41** |

Source : Central Electricity Authority.

# CHAPTER 7: ENERGY COMMODITY BALANCE

## *7.1 Concept and Definition*

- **Commodity balance**: The purpose of commodity balance is to show the sources of supply and various uses of particular energy product with reference to national territory of the compiling country. The balance is compiled for any energy commodity provided that the commodity remains homogeneous at each point in the balance.

- International Recommendations on Energy Statistics (IRES) recommends that the format of energy balance and all applicable concepts are consistently used in the compilation of a commodity balance to ensure data consistency. The major sources for commercial energy in India are coal, oil products, natural gas and electricity. Non-energy producing sectors derive energy from the resources available in primary form such as coal, crude oil, natural gas, hydro-power and nuclear power. Some of the energy resources are converted into other (final) energy products that are used for purposes other than energy generation.

- Coal is used as a final product as well as intermediate product 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 compile data on all energy products entering, exiting and used within a given country during a reference period (e.g. a year). It expresses all data in a common energy unit, which makes it possible to define a "total" product.
- The purposes 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** = $\frac{\text{Net Calorific Value (NCV)}}{\text{mega joules per tonne of oil equivalent}}$

  where NCV is in kj per kg.
- **Net Calorific Value (NCV)** = Gross calorific value (GCV) - (% Moisture Content)
  - 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, except coal.
  - **NCV for Coal**: As per publication "Provisional Coal Statistics 2013-14" :

    Average GCV of Coal in India = 4600 (Average of range 2200-7000)

    Average Moisture Content in Coal in India = 12 (Ranges from 0 to 24 % )
- The Energy Balance has been calculated using the NCVs:

| Type of Fuel | Average Net Calorific Value (kj/kg) |
|---|---|
| Coal | 19,259 |
| Lignite | 9,546 |
| Crude Oil | 42,789 |
| Liquefied Petroleum Gases | 47,300 |
| Motor Gasoline | 44,800 |
| Kerosene Type Jet Fuel | 44,600 |
| Kerosene | 43,800 |
| Gas/Diesel Oil | 43,300 |
| Naphtha | 45,000 |
| Lubricants | 42,000 |
| Bitumen | 39,000 |
| Paraffin Waxes | 40,000 |
| Petroleum Coke | 32,000 |
| Non-specified Oil Products | 40,000 |

### *7.3 Highlights of Energy Balance:*

- In 2013-14, primary energy production added up to 596,352 Kilo Tons of Oil equivalent (ktoe). The share of Crude oil accounted for 38.91% and the contribution of coal was 64.11%.(Table 7.2)

- In 2013-14, national energy consumption was 424,509 ktoe. The industrial sector used 52.72% 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 18.22% of the industrial energy use, construction (12.39%) and Chemical and petrochemicals (5.5%).(Table 7.2)

- The transport sector accounted for 6.85% of total final consumption. The consumption of the residential, commercial and public sectors represented 11.81%.(Table 7.2).

- Efforts are being made to reduce the Statistical Balance.

# Table 7.1 : Energy Commodity Balance for the year 2013-14(p)

| Supply | Coal | Lignite | LPG | Naphtha | Kerosene | High Speed Diesel | Furnance Oil | Electricity |
|---|---|---|---|---|---|---|---|---|
| | (000 Tons) | | | | | | | (Gwh) |
| Production | 565766 | 44271 | 7890 | 17038 | 7338 | 93742 | 12920 | 1022614 |
| From Other Sources | | | 2140 | 1468 | 80 | 16 | | 156642 |
| Imports | 168439 | | 6607 | 1026 | | 84 | | 5609 |
| Exports | 2153 | | 227 | 8332 | 15 | 26469 | | |
| Intl. marine bunkers | | | | | | | | |
| Stock changes | -7871 | 368 | | | | | | |
| **Domestic Supply** | **739923** | **43903** | **16410** | **11200** | **7403** | **67373** | **12920** | **1184865** |
| Transfer | | | | | | | | |
| Statistical difference | -430 | -4 | 75 | -254 | 239 | -996 | 7175 | 76264 |
| **Transformation** | **488428** | **36476** | **3** | **215** | **0** | **204** | **536** | **62250** |
| Electricity plants | 473312 | 36476 | 3 | 215 | | 204 | 536 | 62250 |
| CHP plants | | | | | | | | |
| Heat plants | | | | | | | | |
| Blast furnaces/ gas works | | | | | | | | |
| Coke/pat.fuel/BKB plants | 15116 | | | | | | | |
| Petroleum refineries | | | | | | | | |
| Petrochemical industry | | | | | | | | |
| Liquefaction plants | | | | | | | | |
| Other Transform. sector | | | | | | | | |
| **Energy Sector** | **643** | | | | | | | |
| Coal mines | 643 | | | | | | | |
| Fuel mining and extraction | | | | | | | | |
| Petroleum refineries | | | | | | | | |
| Elec., CHP and heat plants | | | | | | | | |
| Pumped storage (elec.) | | | | | | | | |
| Other energy sector | | | | | | | | |
| Distribution losses | | | | | | | | 226009 |
| **Final Consumption** | **740353** | **43907** | **16335** | **11454** | **7164** | **68369** | **5745** | **1108601** |
| **Industry Sector** | **251282** | **7431** | **135** | **10155** | **37** | **1559** | **1871** | **401590** |
| Iron and steel | 60320 | 26 | | | | 154 | | |
| Chemical and petroleum | 2817 | 325 | 5 | 9620 | | 103 | 201 | |
| Non-ferrous metals | | | 85 | | | 28 | 253 | |
| Non-metallic minerals | | | 2 | | | 15 | 958 | |
| Transport equipment | | | 7 | | | | | |
| Machinery | | | 15 | | | | | |
| Mining & Quarrying | | | | | | 873 | 39 | |
| Food and tobacco | | | | | | | | |
| Paper, pulp and print | 1688 | 662 | | | | | | |
| Wood and wood products | | | | | | | | |
| Construction | 40194 | 2035 | | | | 199 | 192 | |
| Textile and leather | 360 | 2829 | 2 | | | 46 | 58 | |
| Non-specified | 145903 | 1554 | 19 | 535 | 37 | 141 | 170 | 14718 |
| **Transport Sector** | | | **299** | | | **3202** | **316** | **15182** |
| International aviation | | | | | | | | |
| Domestic aviation | | | | | | 1 | | |
| Road | | | 195 | | | 205 | 6 | |
| Rail | | | | | | 2631 | 3 | 15182 |
| Pipeline transport | | | | | | | | |
| Domestic navigation | | | | | | 365 | 307 | |
| Non-specified | | | 104 | | | | | |
| **Other Sectors** | | | **15901** | **240** | **7127** | **63527** | **2369** | **403570** |
| Residential | | | 14412 | | 7012 | | | 198246 |
| Comm. And public services | | | | | | | | 76968 |
| Agriculture/forestry | | | 4 | | | 429 | 75 | 159144 |
| Fishing | | | | | | | | |
| Non-specified | | | 1485 | 240 | 115 | 63098 | 2294 | 46180 |
| **Non-Energy Use** | | | | **844** | | **81** | **653** | |

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 2013-14(p)

**(in Kilotonne of Oil Equivalent)**

| | Coal | Crude Oil | Oil Products | Natural Gas | Nuclear |
|---|---|---|---|---|---|
| Production | 270,342 | 38,642 | - | 3,144 | 8,913 |
| Imports | 108,982 | 193,401 | 17,360 | 6,752 | - |
| Exports | -1,450 | - | -68,278 | - | - |
| International marine bunkers | - | - | - | - | - |
| International aviation bunkers | - | - | - | - | - |
| Stock changes | 4,481 | - | 1,996 | - | - |
| **Total primary energy supply** | **382,355** | **232,043** | **-48,923** | **9,896** | **8,913** |
| Transfers | - | - | - | - | - |
| Statistical differences | 125,463 | - | -10,322 | 20,500 | - |
| Main activity producer electricity plants | -327,114 | - | -442 | -9,055 | -8,913 |
| Autoproducer electricity plants | - | - | -3 | -4,076 | - |
| Oil refineries | - | -232,043 | 221,013 | - | - |
| Coal transformation | -9,387 | - | - | - | - |
| Liquefaction plants | - | - | - | - | - |
| Non-specified (transformation) | - | - | - | - | - |
| Energy industry own use | -373 | - | - | -926 | - |
| Losses | - | - | - | - | - |
| **Final consumption** | **170,944** | **-** | **161,323** | **16,339** | **-** |
| **Industry** | **170,944** | **-** | **18,664** | **926** | **-** |
| Iron and steel | 40,634 | - | 159 | - | - |
| Chemical and petrochemical | 1,971 | - | 10,452 | - | - |
| Non-ferrous metals | - | - | 125 | - | - |
| Non-metallic minerals | - | - | 18 | - | - |
| Transport equipment | - | - | 8 | - | - |
| Machinery | - | - | 17 | - | - |
| Mining and quarrying | - | - | 903 | - | - |
| Food and tobacco | - | - | - | - | - |
| Paper, pulp and print | 1,288 | - | - | - | - |
| Wood and wood products | - | - | - | - | - |
| Construction | 27,536 | - | 206 | - | - |
| Textile and leather | 887 | - | 50 | - | - |
| Non-specified (industry) | 98,627 | - | 6,727 | 926 | - |
| **Transport** | **-** | **-** | **27,798** | **-** | **-** |
| Road | - | - | 18,760 | - | - |
| Domestic aviation | - | - | 5,823 | - | - |
| Rail | - | - | 2,721 | - | - |
| Pipeline transport | - | - | - | - | - |
| Domestic navigation | - | - | 377 | - | - |
| Non-specified (transport) | - | - | 117 | - | - |
| **Other** | **-** | **-** | **91,883** | **3,292** | **-** |
| Residential | - | - | 23,970 | 2,511 | - |
| Commercial and public services | - | - | - | - | - |
| Agriculture/forestry | - | - | 448 | 168 | - |
| Fishing | - | - | - | - | - |
| Non-specified (other) | - | - | 67,465 | 613 | - |
| **Non-energy use** | **-** | **-** | **22,977** | **12,121** | **-** |
| Non-energy use industry/transformation/energy | - | - | 22,893 | 1,474 | - |
| Non-energy use in transport | - | - | - | - | - |
| Non-energy use in other | - | - | 84 | 10,647 | - |
| Memo: feedstock use in petchemical industry | - | - | - | 1,199 | - |
| **Elect. output in GWh** | **-** | **-** | **-** | **-** | **34,200** |
| Elec output-main activity producer ele plants | - | - | - | - | 34,200 |

# Table 7.2(contd) : Energy Balance of India for 2013-14(p)

(in Kilotonne of Oil Equivalent)

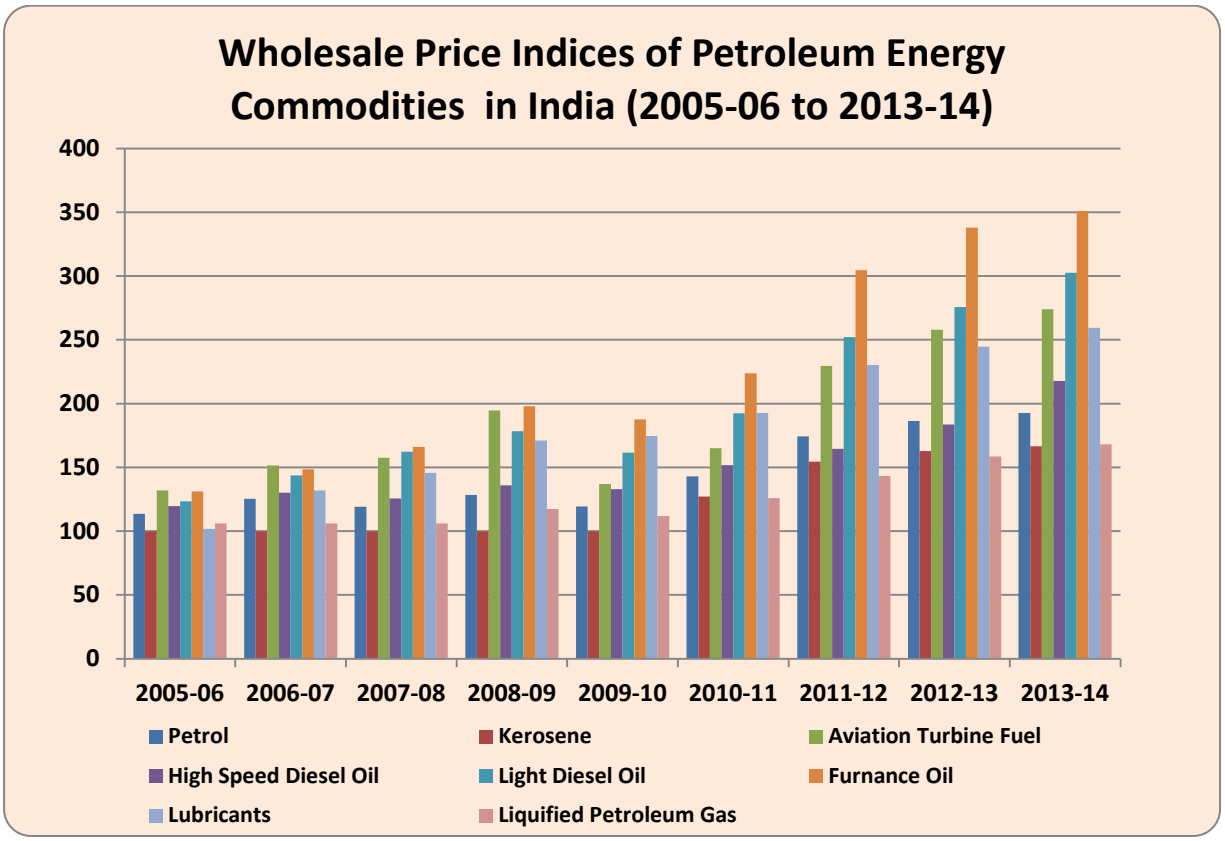
| | Hydro | Geothermal | Electricity | Total |
|---|---|---|---|---|
| Production | 11,587 | - | - | 332,628 |
| Imports | - | - | 482 | 326,976 |
| Exports | - | - | - | -69,728 |
| International marine bunkers | - | - | - | - |
| International aviation bunkers | - | - | - | - |
| Stock changes | - | - | - | 6,477 |
| **Total primary energy supply** | **11,587** | **-** | **482** | **596,352** |
| Transfers | - | - | - | - |
| Statistical differences | - | - | -10,059 | 125,582 |
| Main activity producer electricity plants | -11,587 | - | 87,945 | -269,166 |
| Auto producer electricity plants | - | - | 13,471 | 9,392 |
| Oil refineries | - | - | - | -11,030 |
| Coal transformation | - | - | - | -9,387 |
| Liquefaction plants | - | - | - | - |
| Non-specified (transformation) | - | - | - | - |
| Energy industry own use | - | - | - | -1,299 |
| Losses | - | - | -15,936 | -15,936 |
| **Final consumption** | **-** | **-** | **75,903** | **424,509** |
| **Industry** | **-** | **-** | **33,271** | **223,805** |
| Iron and steel | - | - | - | 40,793 |
| Chemical and petrochemical | - | - | - | 12,423 |
| Non-ferrous metals | - | - | - | 125 |
| Non-metallic minerals | - | - | - | 18 |
| Transport equipment | - | - | - | 8 |
| Machinery | - | - | - | 17 |
| Mining and quarrying | - | - | - | 903 |
| Food and tobacco | - | - | - | - |
| Paper, pulp and print | - | - | - | 1,288 |
| Wood and wood products | - | - | - | - |
| Construction | - | - | - | 27,742 |
| Textile and leather | - | - | - | 937 |
| Non-specified (industry) | - | - | 33,271 | 139,551 |
| **Transport** | **-** | **-** | **1,306** | **29,104** |
| Road | - | - | - | 18,760 |
| Domestic aviation | - | - | - | 5,823 |
| Rail | - | 3,073,258 | 1,306 | 4,027 |
| Pipeline transport | - | 3,073,258 | - | - |
| Domestic navigation | - | - | - | 377 |
| Non-specified (transport) | - | - | - | 117 |
| **Other** | **-** | **-** | **41,326** | **136,501** |
| Residential | - | - | 17,049 | 43,530 |
| Commercial and public services | - | - | 6,619 | 6,619 |
| Agriculture/forestry | - | - | 13,686 | 14,303 |
| Fishing | - | - | - | - |
| Non-specified (other) | - | - | 3,971 | 72,049 |
| **Non-energy use** | **-** | **-** | **-** | **35,098** |
| Non-energy use industry/transformation/energy | - | - | - | 24,367 |
| Non-energy use in transport | - | - | - | - |
| Non-energy use in other | - | - | - | 10,731 |
| Memo: feedstock use in pet chemical industry | - | - | - | 1,199 |
| **Elect. output in GWh** | **134,731** | **3,073,258** | **-** | **3,242,191** |
| Elec output-main activity producer ele plants | 134,731 | 3,073,258 | - | 3,242,191 |

# CHAPTER 8: WHOLE SALE PRICE INDEX OF ENERGY COMMODITIES

## *8.1 The Wholesale Price Index of Petroleum Products*

- Wholesale Price Index of Petroleum Products recorded an increase ranging from 2.22% to 18.68% from 2012-13 to 2013-14 (Table 8.1).

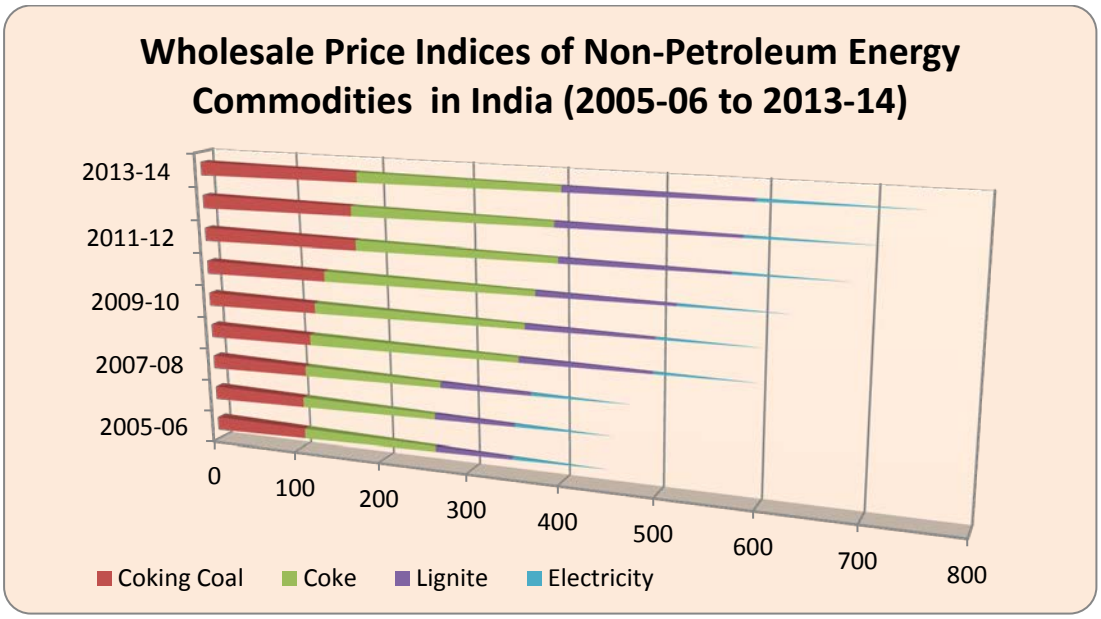
- The maximum increase was observed in High Speed Diesel Oil (18.68%) followed by Light Diesel Oil (9.69%).




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

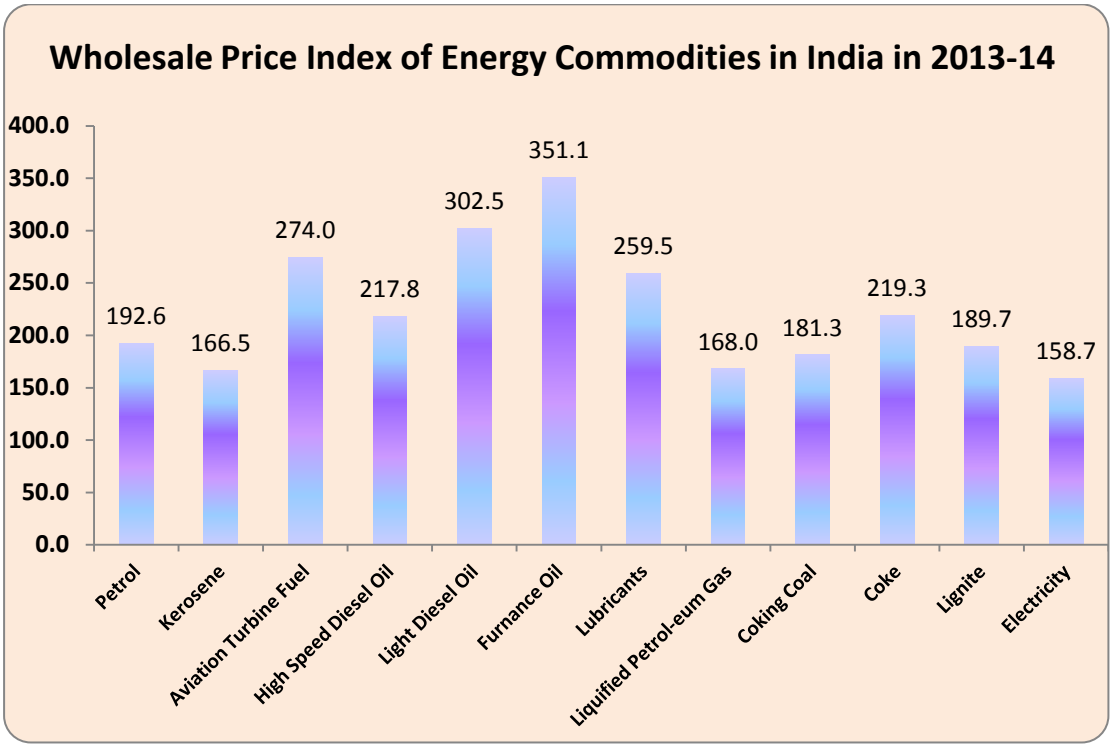
- The wholesale price index remained constant for Coke at 219.3 for the period 2013-14 over 2012-13.

- Wholesale Price Index of Electricity recorded an increase of 22.23% during 2013-14 over 2012-13.




## *8.2 Inter-Year Movement of WPI*

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



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

(2004-05=100)

| | Petroleum Products | | | | | | | | Coking Coal | Coke | Lignite | Electricity |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Year | Petrol | Kero-sene | Aviation Turbine Fuel | High Speed Diesel Oil | Light Diesel Oil | Furnace Oil | Lubri-cants | Liquified Petrol-eum 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 |
| **Increase in 2013-14 over 2012-13 (%)** | **3.39** | **2.22** | **6.26** | **18.68** | **9.69** | **3.92** | **6.10** | **5.96** | **4.56** | **0.00** | **1.42** | **22.23** |

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

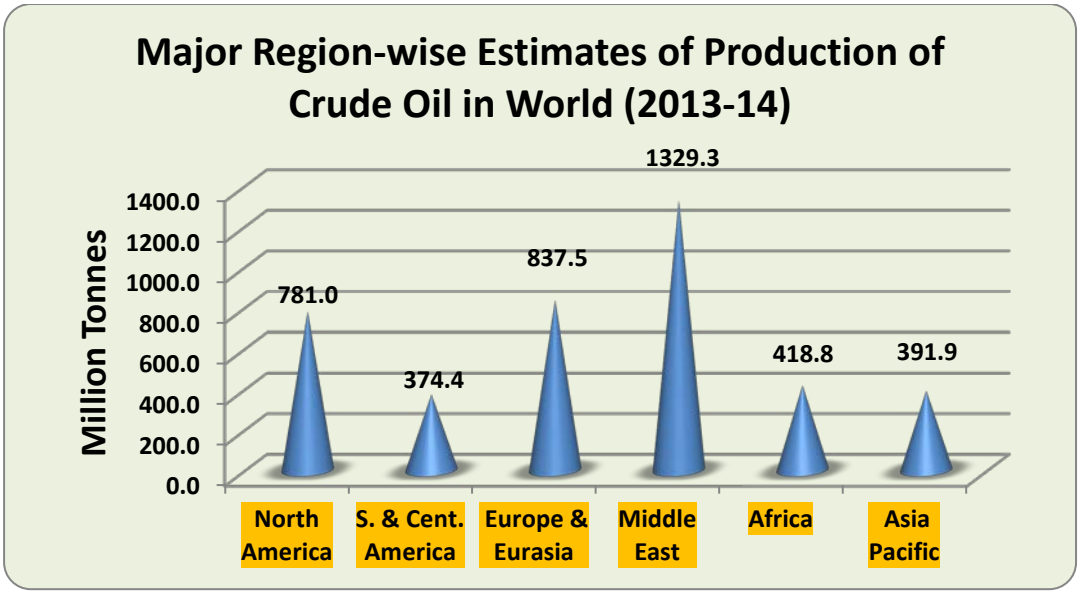
# CHAPTER 9: WORLD PRODUCTION AND CONSUMPTION OF CRUDE OIL & NATURAL GAS

## *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 4132.9 MT during 2013-14 (Table 9.1). The production increased by 0.4% from 2012-13 to 2013-14.

- Geographical distribution of total world production during 2013-14 across major regions reveals that Middle East accounted for the highest share (32.31%), followed by Europe & Eurasia (20.35%), North America (18.98%), Africa (10.18%), Asia Pacific (9.48%) and South & Central America (9.10%). (Table 9.1)

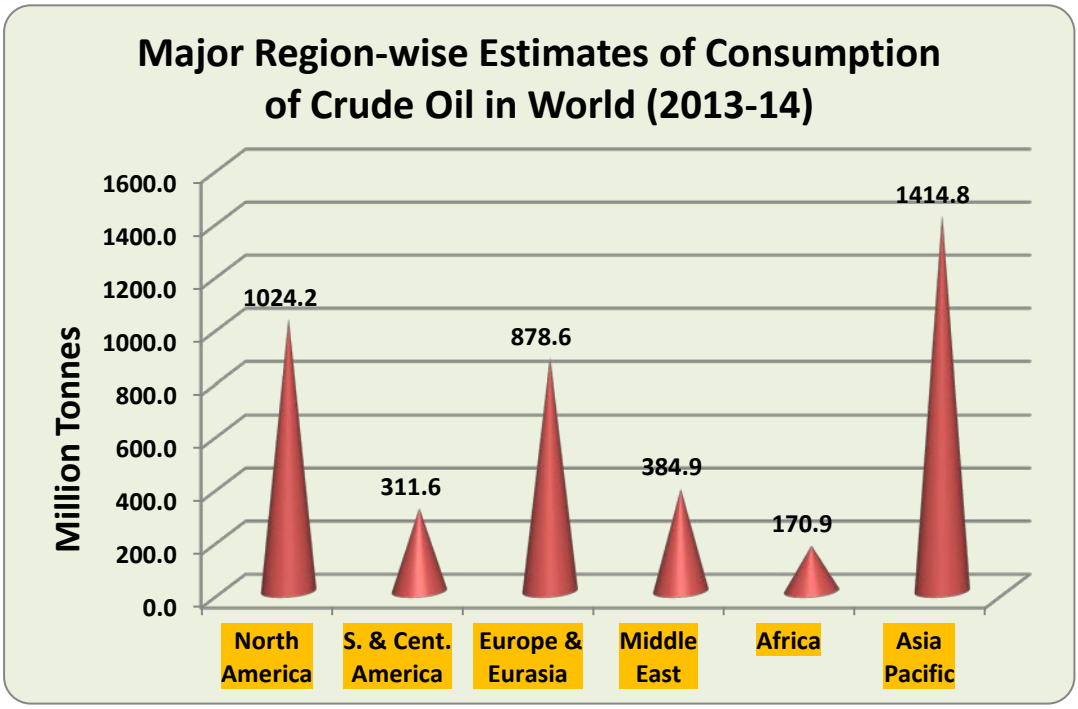
- Distribution of total world production according to countries shows that Saudi Arabia and Russian Federation were the first and second highest producers with 13.12% and 12.86% respectively. They were followed by USA (10.80%), China (5.04%), Canada (4.67%), Iran (4.02%), UAE(4.01), Kuwait(3.66), Mexico (3.43%) and Venezuela (3.27%). India has accounted for only 1.02% of the world production.




- Major region-wise consumption (Table 9.2) shows that Asia Pacific accounted for the highest share (33.8%) of total world consumption, followed by North America (24.47%), and Europe & Eurasia (20.99%). African countries accounted for the lowest share in the world consumption (4.1%).

- Country-wise distribution of consumption reveals that the United States was the largest consumer of crude oil, consuming 19.86% of the world consumption during 2013-14. China was the second largest consumer (12.1%), followed by Japan (5%), India (4.2%) and Russian federation (3.66%).

- 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*

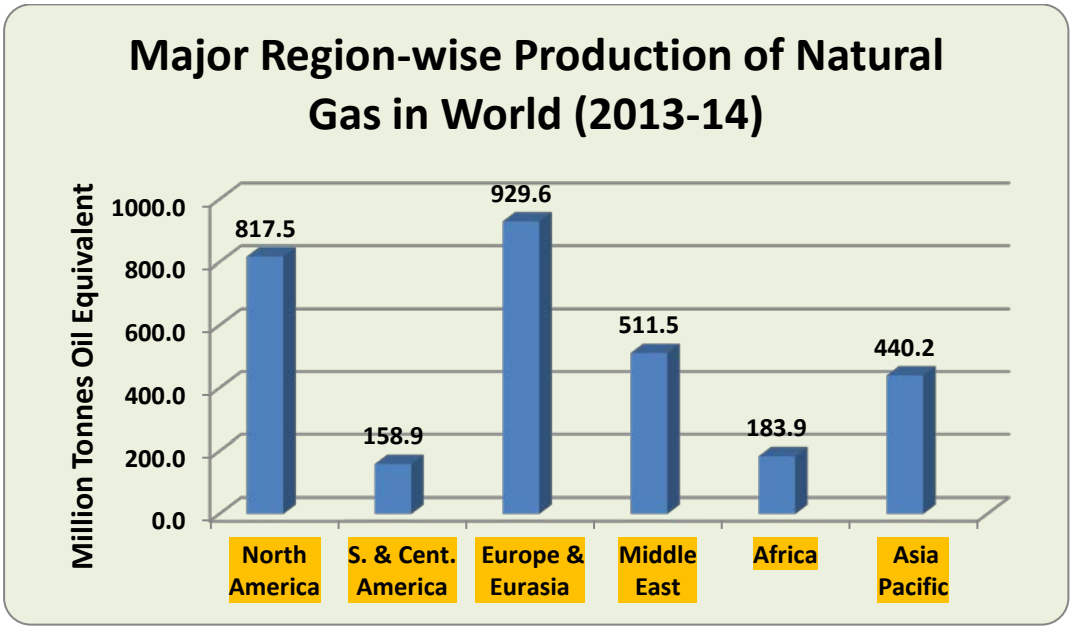
- The total world production of Natural Gas increased from 2674.2 million Tons oil equivalent (Mtoe) in 2007-08 to 3041.6 Mtoe in 2013-14. The production has increased by 0.8% from 2012-13 to 2013-14 (Table 9.3).

- Distribution of production of natural gas over major regions shows that Europe & Eurasia (30.56%) and North America (26.88%) are the highest and the second highest producers, together accounting for 57.44% of the total world production.

- Country-wise, USA was the largest producer of natural gas (20.62%) in the world during 2013-14, followed by the Russian Federation (17.90%) and Iran (4.93%). India's share in the total world production of natural gas during 2013-14 was only 1% (30.3 Mtoe).(Table 9.3)

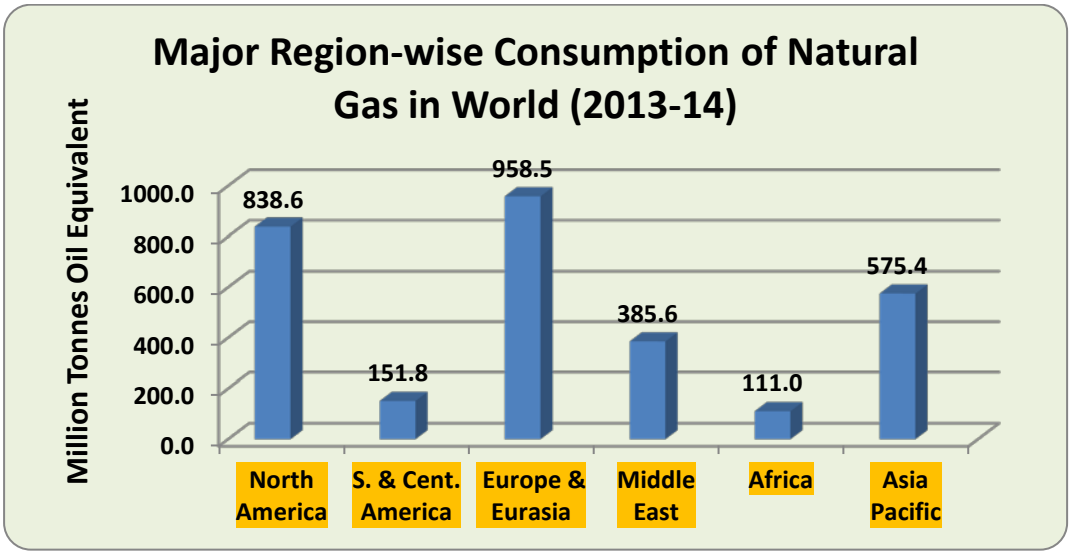
- The growth in production of natural gas from 2012-13 to 2013-14 was highest in Middle East (4.2%), followed by South & Central America (1.3%) and Asia Pacific (0.9%) respectively.(Table 9.3)
- The total world consumption of natural gas has increased from 2666.6 Mtoe in 2005-06 to 3020.9 Mtoe in 2013-14 (Table 9.4).

- United States of America was the largest consumer of natural gas, consuming 22.21% of the world consumption during 2013-14 while Europe & Eurasia accounted for 31.73% of the total world consumption.(Table 9.4)




- Country-wise distribution of consumption of natural gas indicates that USA was the largest consumer (22.21%), followed by Russian federation (12.5%), Iran(4.83%) and China (4.82%) respectively. India with a consumption of 46.3 Mtoe accounted for only 1.53% of total world consumption.(Table 9.4)

- Consumption of natural gas over major regions shows that Europe & Eurasia (31.73%) and North America (27.76%) are the highest and the second highest consumers, together accounting for 59.49% of the total world consumption. (Table 9.4)



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

(in Million tonnes)

| Country/ Region | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | % Change 2013-14 over 2012-13 | 2013-14 % Share of World's Total Production |
|---|---|---|---|---|---|---|---|---|---|
| **North America** | | | | | | | | | |
| USA | 305.2 | 302.3 | 322.4 | 332.9 | 345.7 | 394.1 | 446.2 | 13.2 | 10.80 |
| Canada | 155.3 | 152.9 | 152.8 | 160.3 | 169.8 | 182.6 | 193.0 | 5.7 | 4.67 |
| Mexico | 172.2 | 156.9 | 146.7 | 145.6 | 144.5 | 143.9 | 141.8 | -1.5 | 3.43 |
| **Total North America** | **632.7** | **612.0** | **621.9** | **638.8** | **660.0** | **720.6** | **781.0** | **8.4** | **18.98** |
| **South and Central America** | | | | | | | | | |
| Argentina | 38.0 | 36.5 | 34.9 | 34.0 | 32.2 | 31.0 | 30.5 | -1.8 | 0.74 |
| Brazil | 95.2 | 98.8 | 105.6 | 111.4 | 114.2 | 112.2 | 109.9 | -2.0 | 2.66 |
| Colombia | 28.0 | 31.1 | 35.3 | 41.4 | 48.2 | 49.9 | 52.9 | 6.1 | 1.28 |
| Ecuador | 27.5 | 27.2 | 26.1 | 26.1 | 26.8 | 27.1 | 28.2 | 4.1 | 0.68 |
| Peru | 4.6 | 4.7 | 4.8 | 5.1 | 4.9 | 4.8 | 4.6 | -3.7 | 0.11 |
| Trinidad & Tobago | 8.2 | 8.7 | 7.6 | 7.4 | 6.9 | 6.0 | 5.9 | -1.6 | 0.14 |
| Venezuela | 165.5 | 165.6 | 155.7 | 145.7 | 141.5 | 136.6 | 135.1 | -1.1 | 3.27 |
| Other S. & Cent. America | 7.1 | 7.1 | 6.6 | 6.9 | 7.0 | 7.1 | 7.3 | 2.8 | 0.18 |
| **Total S. & Cent. America** | **374.1** | **379.7** | **376.7** | **377.9** | **381.7** | **374.7** | **374.4** | **-0.1** | **9.10** |
| **Europe and Eurasia** | | | | | | | | | |
| Azerbaijan | 42.6 | 44.5 | 50.4 | 50.8 | 45.6 | 43.4 | 46.2 | 6.5 | 1.12 |
| Denmark | 15.2 | 14.0 | 12.9 | 12.2 | 10.9 | 10.1 | 8.7 | -13.8 | 0.21 |
| Italy | 5.9 | 5.2 | 4.6 | 5.1 | 5.3 | 5.4 | 5.6 | 3.8 | 0.14 |
| Kazakhstan | 68.4 | 72.0 | 78.2 | 81.6 | 82.4 | 81.3 | 83.8 | 3.1 | 2.03 |
| Norway | 118.6 | 114.7 | 108.8 | 98.9 | 93.8 | 87.5 | 83.2 | -4.9 | 2.01 |
| Romania | 4.7 | 4.7 | 4.5 | 4.3 | 4.2 | 4.1 | 4.1 | -0.3 | 0.10 |
| Russian Federation | 496.8 | 493.7 | 500.8 | 511.8 | 518.5 | 526.2 | 531.4 | 1.0 | 12.86 |
| Turkmenistan | 9.8 | 10.3 | 10.4 | 10.7 | 10.7 | 11.0 | 11.4 | 3.6 | 0.28 |
| United Kingdom | 76.7 | 72.0 | 68.2 | 62.8 | 51.9 | 45.0 | 40.6 | -9.9 | 0.98 |
| Uzbekistan | 4.9 | 4.8 | 4.5 | 3.6 | 3.6 | 3.2 | 2.9 | -8.4 | 0.07 |
| Other Europe & Eurasia | 21.6 | 20.6 | 19.9 | 19.2 | 19.2 | 19.2 | 19.6 | 2.3 | 0.47 |
| **Total Europe & Eurasia** | **865.2** | **856.6** | **863.1** | **861.0** | **846.1** | **836.4** | **837.5** | **0.1** | **20.35** |
| **Middle East** | | | | | | | | | |
| Iran | 210.9 | 214.5 | 205.5 | 208.8 | 208.2 | 174.9 | 166.1 | -5.0 | 4.02 |
| Iraq | 105.1 | 119.3 | 119.9 | 121.5 | 136.7 | 152.4 | 153.2 | 0.5 | 3.71 |
| Kuwait | 129.9 | 136.1 | 121.2 | 122.5 | 139.7 | 152.5 | 151.3 | -0.8 | 3.66 |
| Oman | 35.3 | 37.7 | 40.3 | 42.9 | 44.1 | 45.8 | 46.1 | 0.7 | 1.12 |
| Qatar | 57.9 | 65.0 | 62.4 | 72.1 | 78.2 | 83.3 | 84.2 | 1.0 | 2.04 |
| Saudi Arabia | 488.9 | 509.9 | 456.7 | 473.8 | 526.0 | 547.0 | 542.3 | -0.9 | 13.12 |
| Syria | 20.1 | 20.3 | 20.0 | 19.2 | 16.3 | 8.2 | 2.8 | -65.8 | 0.07 |
| United Arab Emirates | 139.6 | 141.4 | 126.2 | 133.3 | 151.3 | 154.1 | 165.7 | 7.5 | 4.01 |
| Yemen | 15.9 | 14.8 | 14.3 | 13.5 | 10.6 | 8.3 | 7.4 | -11.2 | 0.18 |
| Other Middle East | 9.3 | 9.3 | 9.4 | 9.4 | 10.0 | 10.1 | 10.2 | 0.5 | 0.25 |
| **Total Middle East** | **1213.0** | **1268.2** | **1176.1** | **1217.2** | **1321.0** | **1336.8** | **1329.3** | **-0.6** | **32.31** |

Contd….

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

(in Million tonnes)

| Country/ Region | 2007-08 | 2008-09 | 2009-10 | 2010-11 | 2011-12 | 2012-13 | 2013-14 | % Change 2013-14 over 2012-13 | 2013-14 % Share of World's Total |
|---|---|---|---|---|---|---|---|---|---|
| **Africa** | | | | | | | | | |
| Algeria | 86.5 | 85.6 | 77.2 | 74.1 | 73.5 | 73.1 | 68.9 | -5.7 | 1.67 |
| Angola | 82.1 | 93.1 | 87.6 | 90.5 | 83.8 | 86.9 | 87.4 | 0.6 | 2.11 |
| Chad | 7.5 | 6.7 | 6.2 | 6.4 | 6.0 | 5.3 | 5.0 | -5.8 | 0.12 |
| Rep. of Congo (Brazzaville) | 11.4 | 12.1 | 13.9 | 15.1 | 15.1 | 15.3 | 14.5 | -5.2 | 0.35 |
| Egypt | 33.8 | 34.7 | 35.3 | 35.0 | 35.3 | 35.4 | 34.5 | -2.5 | 0.83 |
| Equatorial Guinea | 15.9 | 16.1 | 14.2 | 12.6 | 11.6 | 13.2 | 14.6 | 10.3 | 0.35 |
| Gabon | 12.3 | 12.0 | 12.0 | 12.7 | 12.7 | 12.3 | 11.8 | -3.8 | 0.29 |
| Libya | 85.3 | 85.5 | 77.4 | 77.7 | 22.5 | 71.1 | 46.5 | -34.6 | 1.13 |
| Nigeria | 110.2 | 102.8 | 106.6 | 121.3 | 118.2 | 116.2 | 111.3 | -4.2 | 2.69 |
| South Sudan | - | - | - | - | - | 1.5 | 4.9 | 220.3 | 0.12 |
| Sudan | 23.1 | 23.7 | 23.4 | 22.9 | 22.3 | 4.1 | 6.0 | 48.1 | 0.15 |
| Tunisia | 4.6 | 4.2 | 4.0 | 3.8 | 3.2 | 3.1 | 3.0 | -2.9 | 0.07 |
| Other Africa | 9.7 | 9.5 | 9.2 | 8.3 | 11.5 | 11.6 | 10.4 | -10.5 | 0.25 |
| **Total Africa** | **482.2** | **486.0** | **466.8** | **480.6** | **415.7** | **449.0** | **418.8** | **-6.7** | **10.18** |
| **Asia Pacific** | | | | | | | | | |
| Australia | 24.3 | 24.8 | 24.6 | 25.4 | 21.7 | 19.9 | 17.9 | -10.1 | 0.43 |
| Brunei | 9.5 | 8.6 | 8.3 | 8.5 | 8.1 | 7.8 | 6.6 | -15.3 | 0.16 |
| China | 186.3 | 190.4 | 189.5 | 203.0 | 202.9 | 207.5 | 208.1 | 0.3 | 5.04 |
| **India** | **37.9** | **37.9** | **37.2** | **40.8** | **42.3** | **42.0** | **42.0** | **-0.1** | **1.02** |
| Indonesia | 47.8 | 49.4 | 48.4 | 48.6 | 46.3 | 44.6 | 42.7 | -4.3 | 1.03 |
| Malaysia | 33.8 | 34.0 | 32.2 | 32.0 | 28.9 | 29.7 | 29.6 | -0.5 | 0.72 |
| Thailand | 13.2 | 14.0 | 14.6 | 14.8 | 14.8 | 16.2 | 16.6 | 2.3 | 0.40 |
| Vietnam | 16.3 | 15.2 | 16.7 | 15.3 | 15.5 | 17.0 | 17.0 | -0.2 | 0.41 |
| Other Asia Pacific | 13.9 | 14.8 | 14.4 | 13.8 | 13.1 | 12.5 | 11.4 | -8.9 | 0.28 |
| **Total Asia Pacific** | **383.1** | **389.3** | **385.8** | **402.3** | **393.6** | **397.3** | **391.9** | **-1.4** | **9.48** |
| | | | | | | | | | |
| **TOTAL WORLD** | **3950.2** | **3991.8** | **3890.3** | **3977.8** | **4018.1** | **4114.8** | **4132.9** | **0.4** | **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 : COUNTRY-WISE 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 | % Change 2013-14 over 2012-13 | 2013-14 % Share of World's Total Consumption |
|---|---|---|---|---|---|---|---|---|---|
| **North America** | | | | | | | | | |
| US | 928.8 | 875.4 | 833.0 | 850.1 | 834.9 | 817.0 | 831.0 | 1.7 | **19.86** |
| Canada | 102.3 | 101.2 | 95.2 | 101.3 | 105.0 | 104.3 | 103.5 | -0.8 | **2.47** |
| Mexico | 92.0 | 91.6 | 88.5 | 88.5 | 90.3 | 92.3 | 89.7 | -2.8 | **2.14** |
| **Total North America** | **1123.1** | **1068.2** | **1016.8** | **1039.9** | **1030.2** | **1013.6** | **1024.2** | **1.0** | **24.47** |
| **South and Central America** | | | | | | | | | |
| Argentina | 24.0 | 24.7 | 24.0 | 26.9 | 26.9 | 28.5 | 29.4 | 3.2 | **0.70** |
| Brazil | 101.8 | 108.6 | 109.1 | 118.1 | 121.9 | 125.8 | 132.7 | 5.5 | **3.17** |
| Chile | 17.0 | 17.8 | 17.4 | 15.4 | 16.8 | 17.3 | 17.6 | 1.7 | **0.42** |
| Colombia | 10.7 | 10.8 | 11.1 | 11.6 | 12.4 | 13.4 | 13.9 | 3.7 | **0.33** |
| Ecuador | 8.5 | 8.7 | 8.9 | 10.3 | 10.5 | 10.9 | 11.6 | 6.4 | **0.28** |
| Peru | 7.1 | 8.0 | 8.1 | 8.5 | 9.2 | 9.5 | 10.0 | 5.3 | **0.24** |
| Trinidad & Tobago | 1.7 | 1.8 | 1.7 | 1.9 | 1.7 | 1.7 | 1.8 | 5.9 | **0.04** |
| Venezuela | 29.7 | 34.8 | 35.2 | 32.1 | 31.9 | 33.0 | 36.2 | 9.7 | **0.86** |
| Other S. & Cent. America | 61.6 | 57.8 | 57.0 | 58.4 | 59.0 | 59.1 | 58.4 | -1.2 | **1.40** |
| **Total S. & Cent. Ameri** | **262.1** | **272.9** | **272.5** | **283.2** | **290.3** | **299.2** | **311.6** | **4.1** | **7.45** |
| **Europe and Eurasia** | | | | | | | | | |
| Austria | 13.4 | 13.4 | 12.8 | 13.4 | 12.5 | 12.5 | 12.5 | 0.0 | **0.30** |
| Azerbaijan | 4.5 | 3.6 | 3.3 | 3.2 | 4.0 | 4.2 | 4.6 | 9.2 | **0.11** |
| Belarus | 8.0 | 8.3 | 9.4 | 7.5 | 8.6 | 8.6 | 8.7 | 1.2 | **0.21** |
| Belgium | 33.7 | 36.8 | 32.2 | 33.5 | 32.3 | 30.4 | 31.0 | 2.0 | **0.74** |
| Bulgaria | 4.8 | 4.8 | 4.3 | 3.9 | 3.8 | 3.9 | 4.1 | 5.1 | **0.10** |
| Czech Republic | 9.7 | 9.9 | 9.7 | 9.2 | 9.0 | 8.9 | 8.6 | -3.4 | **0.21** |
| Denmark | 9.4 | 9.5 | 8.3 | 8.4 | 8.3 | 7.8 | 7.8 | 0.0 | **0.19** |
| Finland | 10.6 | 10.5 | 9.9 | 10.4 | 9.7 | 9.0 | 8.9 | -1.1 | **0.21** |
| France | 91.4 | 90.8 | 87.5 | 84.5 | 83.7 | 81.0 | 80.3 | -0.9 | **1.92** |
| Germany | 112.5 | 118.9 | 113.9 | 115.4 | 112.0 | 111.4 | 112.1 | 0.6 | **2.68** |
| Greece | 21.7 | 21.3 | 20.1 | 17.9 | 17.0 | 15.1 | 14.0 | -7.3 | **0.33** |
| Hungary | 7.7 | 7.5 | 7.1 | 6.7 | 6.4 | 5.9 | 6.0 | 1.7 | **0.14** |
| Republic of Ireland | 9.4 | 9.0 | 8.0 | 7.6 | 6.7 | 6.5 | 6.7 | 3.1 | **0.16** |
| Italy | 84.0 | 80.4 | 75.1 | 73.1 | 70.5 | 64.2 | 61.8 | -3.7 | **1.48** |
| Kazakhstan | 11.3 | 11.0 | 8.9 | 9.3 | 12.3 | 13.1 | 13.8 | 5.3 | **0.33** |
| Lithuania | 2.8 | 3.1 | 2.6 | 2.7 | 2.6 | 2.7 | 2.7 | 0.0 | **0.06** |
| Netherlands | 50.7 | 47.3 | 45.9 | 45.9 | 46.1 | 43.7 | 41.4 | -5.3 | **0.99** |
| Norway | 10.7 | 10.4 | 10.6 | 10.8 | 10.6 | 10.5 | 10.6 | 1.0 | **0.25** |
| Poland | 24.2 | 25.3 | 25.3 | 26.7 | 26.6 | 25.7 | 24.0 | -6.6 | **0.57** |
| Portugal | 14.4 | 13.6 | 12.8 | 12.5 | 11.6 | 10.9 | 10.8 | -0.9 | **0.26** |
| Romania | 10.3 | 10.4 | 9.2 | 8.8 | 9.1 | 9.2 | 9.0 | -2.2 | **0.22** |
| Russian Federation | 130.0 | 133.9 | 128.2 | 134.3 | 143.5 | 148.9 | 153.1 | 2.8 | **3.66** |
| Slovakia | 3.6 | 3.9 | 3.7 | 3.9 | 3.9 | 3.6 | 3.5 | -2.8 | **0.08** |
| Spain | 80.3 | 77.9 | 73.5 | 69.6 | 68.5 | 64.2 | 59.3 | -7.6 | **1.42** |
| Sweden | 16.9 | 15.7 | 15.5 | 16.2 | 14.8 | 14.6 | 14.3 | -2.1 | **0.34** |
| Switzerland | 11.3 | 12.1 | 12.3 | 11.4 | 11.0 | 11.2 | 11.8 | 5.4 | **0.28** |
| Turkey | 33.6 | 31.9 | 32.5 | 31.8 | 31.1 | 31.4 | 33.1 | 5.4 | **0.79** |
| Turkmenistan | 5.2 | 5.4 | 5.2 | 5.7 | 6.0 | 6.1 | 6.3 | 3.3 | **0.15** |
| Ukraine | 14.7 | 14.9 | 13.5 | 12.6 | 13.1 | 12.5 | 12.2 | -2.4 | **0.29** |
| United Kingdom | 79.2 | 77.9 | 74.4 | 73.5 | 71.1 | 71.0 | 69.8 | -1.7 | **1.67** |
| Uzbekistan | 4.6 | 4.5 | 4.3 | 3.7 | 3.5 | 3.3 | 3.3 | 0.0 | **0.08** |
| Other Europe & Eurasia | 32.5 | 33.1 | 32.4 | 32.6 | 32.5 | 32.0 | 32.5 | 1.6 | **0.78** |
| **Total Europe & Eurasia** | **957.4** | **957.0** | **912.5** | **906.5** | **902.4** | **884.0** | **878.6** | **-0.6** | **20.99** |

contd……..

**Table 9.2(Contd.) : COUNTRY-WISE 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 | % Change 2013-14 over 2012-13 | 2013-14 % Share of World's Total Consumption |
|---|---|---|---|---|---|---|---|---|---|
| **Middle East** | | | | | | | | | |
| Iran | 89.4 | 93.3 | 95.5 | 86.7 | 88.2 | 89.5 | 92.9 | 3.8 | **2.2** |
| Israel | 12.4 | 12.2 | 11.4 | 10.9 | 11.5 | 13.6 | 10.6 | -22.1 | **0.3** |
| Kuwait | 17.9 | 19.0 | 20.3 | 21.6 | 20.4 | 21.6 | 21.8 | 0.9 | **0.5** |
| Qatar | 5.3 | 6.1 | 6.0 | 6.5 | 7.8 | 8.0 | 8.5 | 6.0 | **0.2** |
| Saudi Arabia | 98.0 | 106.8 | 115.8 | 124.2 | 125.1 | 131.3 | 135.0 | 2.8 | **3.2** |
| United Arab Emirates | 28.2 | 29.4 | 27.7 | 30.1 | 33.0 | 34.3 | 35.6 | 3.8 | **0.9** |
| Other Middle East | 62.4 | 69.4 | 70.3 | 74.2 | 75.2 | 79.5 | 80.5 | 1.3 | **1.9** |
| **Total Middle East** | **313.6** | **336.1** | **347.0** | **354.2** | **361.2** | **377.8** | **384.9** | **1.9** | **9.2** |
| **Africa** | | | | | | | | | |
| Algeria | 12.9 | 14.0 | 14.9 | 14.8 | 15.5 | 16.7 | 17.5 | 4.8 | **0.4** |
| Egypt | 30.6 | 32.6 | 34.4 | 36.3 | 33.7 | 35.2 | 35.7 | 1.4 | **0.9** |
| South Africa | 26.2 | 25.7 | 24.7 | 26.6 | 27.4 | 27.3 | 27.2 | -0.4 | **0.6** |
| Other Africa | 75.7 | 80.5 | 82.1 | 86.5 | 81.9 | 86.8 | 90.5 | 4.3 | **2.2** |
| **Total Africa** | **145.4** | **152.8** | **156.0** | **164.2** | **158.5** | **166.0** | **170.9** | **3.0** | **4.1** |
| **Asia Pacific** | | | | | | | | | |
| Australia | 42.4 | 43.2 | 42.8 | 43.6 | 45.8 | 47.3 | 47.0 | -0.6 | **1.1** |
| Bangladesh | 4.2 | 4.2 | 3.7 | 4.3 | 5.5 | 5.8 | 5.7 | -1.7 | **0.1** |
| China | 370.6 | 377.6 | 391.0 | 440.4 | 464.1 | 490.1 | 507.4 | 3.5 | **12.1** |
| China Hong Kong SAR | 16.1 | 14.6 | 16.6 | 17.9 | 18.1 | 17.3 | 17.7 | 2.3 | **0.4** |
| India | 138.1 | 144.7 | 152.6 | 155.4 | 163.0 | 173.6 | 175.2 | 0.9 | **4.2** |
| Indonesia | 60.9 | 60.4 | 61.6 | 66.4 | 72.3 | 73.2 | 73.8 | 0.8 | **1.8** |
| Japan | 232.6 | 226.3 | 201.8 | 204.1 | 204.9 | 217.8 | 208.9 | -4.1 | **5.0** |
| Malaysia | 30.8 | 29.5 | 29.2 | 29.3 | 31.1 | 30.7 | 31.2 | 1.6 | **0.7** |
| New Zealand | 7.2 | 7.2 | 6.9 | 7.0 | 7.0 | 7.0 | 7.1 | 1.4 | **0.2** |
| Pakistan | 19.3 | 19.4 | 20.8 | 20.6 | 20.8 | 20.0 | 22.0 | 10.0 | **0.5** |
| Philippines | 14.1 | 12.4 | 13.2 | 13.2 | 12.8 | 13.0 | 13.7 | 5.4 | **0.3** |
| Singapore | 50.4 | 53.7 | 57.0 | 62.9 | 65.5 | 65.4 | 65.9 | 0.8 | **1.6** |
| South Korea | 107.6 | 103.1 | 103.7 | 105.0 | 105.8 | 108.8 | 108.4 | -0.4 | **2.6** |
| Taiwan | 51.2 | 45.8 | 44.0 | 45.3 | 42.5 | 41.9 | 43.4 | 3.6 | **1.0** |
| Thailand | 41.6 | 41.2 | 44.2 | 44.3 | 46.6 | 49.6 | 50.4 | 1.6 | **1.2** |
| Vietnam | 13.3 | 14.1 | 14.6 | 15.6 | 17.0 | 17.2 | 17.4 | 1.2 | **0.4** |
| Other Asia Pacific | 16.5 | 15.6 | 16.4 | 16.8 | 19.3 | 19.5 | 19.6 | 0.5 | **0.5** |
| **Total Asia Pacific** | **1216.9** | **1213.0** | **1220.0** | **1292.1** | **1342.1** | **1398.2** | **1414.8** | **1.2** | **33.8** |
| | | | | | | | | | |
| **TOTAL WORLD** | **4018.5** | **4000.0** | **3924.9** | **4040.0** | **4084.8** | **4138.8** | **4185.0** | **1.1** | **100.0** |

Notes: Growth rates are adjusted for leap years.

* Inland demand plus international aviation and marine bunkers and refinery fuel and loss. Consumption of fuel ethanol and biodiesel is also i

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

Source : Ministry of Petroleum & Natural Gas.

## Table 9.3: Country-wise 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 | % Change 2013-14 over 2012-13 | 2013-14 % Share of World's Total Consumption |
|---|---|---|---|---|---|---|---|---|---|
| **North America** | | | | | | | | | |
| USA | 498.6 | 521.7 | 532.7 | 549.5 | 589.8 | 620.8 | 627.2 | 1.0 | **20.62** |
| Canada | 164.4 | 158.9 | 147.6 | 143.9 | 143.7 | 140.4 | 139.3 | -0.8 | **4.58** |
| Mexico | 48.3 | 48.0 | 53.4 | 51.8 | 52.4 | 51.2 | 51.0 | -0.4 | **1.68** |
| **Total North America** | **711.3** | **728.6** | **733.7** | **745.2** | **786.0** | **812.4** | **817.5** | **0.6** | **26.88** |
| **South and Central America** | | | | | | | | | |
| Argentina | 40.3 | 39.7 | 37.3 | 36.1 | 34.9 | 34.0 | 32.0 | -5.8 | **1.05** |
| Bolivia | 12.4 | 12.9 | 11.1 | 12.8 | 14.4 | 16.5 | 18.8 | 13.9 | **0.62** |
| Brazil | 10.1 | 12.6 | 10.7 | 13.1 | 15.1 | 17.3 | 19.2 | 11.0 | **0.63** |
| Colombia | 6.8 | 8.2 | 9.5 | 10.1 | 9.9 | 10.8 | 11.4 | 5.8 | **0.37** |
| Peru | 2.4 | 3.1 | 3.1 | 6.5 | 10.2 | 10.7 | 11.0 | 2.8 | **0.36** |
| Trinidad & Tobago | 38.0 | 37.8 | 39.3 | 40.3 | 38.6 | 38.5 | 38.6 | 0.3 | **1.27** |
| Venezuela | 32.5 | 29.5 | 27.9 | 24.7 | 24.8 | 26.5 | 25.6 | -3.4 | **0.84** |
| Other S. & Cent. America | 3.5 | 3.3 | 3.8 | 3.2 | 2.8 | 2.6 | 2.3 | -11.5 | **0.08** |
| **Total S. & Cent. America** | **146.0** | **146.9** | **142.6** | **146.9** | **150.6** | **156.8** | **158.9** | **1.3** | **5.22** |
| **Europe and Eurasia** | | | | | | | | | |
| Azerbaijan | 8.8 | 13.3 | 13.3 | 13.6 | 13.3 | 14.0 | 14.5 | 3.3 | **0.48** |
| Denmark | 8.3 | 9.1 | 7.6 | 7.4 | 5.9 | 5.2 | 4.4 | -15.4 | **0.14** |
| Germany | 12.9 | 11.7 | 11.0 | 9.6 | 9.0 | 8.1 | 7.4 | -9.0 | **0.24** |
| Italy | 8.0 | 7.6 | 6.6 | 6.8 | 6.9 | 7.1 | 6.4 | -9.9 | **0.21** |
| Kazakhstan | 13.6 | 15.2 | 14.8 | 14.3 | 15.7 | 16.5 | 16.6 | 0.6 | **0.55** |
| Netherlands | 54.5 | 60.0 | 56.4 | 63.5 | 57.8 | 57.5 | 61.8 | 7.5 | **2.03** |
| Norway | 81.3 | 90.1 | 94.0 | 96.5 | 91.1 | 103.3 | 97.9 | -5.2 | **3.22** |
| Poland | 3.9 | 3.7 | 3.7 | 3.7 | 3.8 | 3.8 | 3.8 | -0.4 | **0.12** |
| Romania | 10.4 | 10.3 | 10.1 | 9.8 | 9.8 | 9.8 | 9.9 | 0.6 | **0.33** |
| Russian Federation | 532.9 | 541.6 | 474.9 | 530.0 | 546.3 | 533.1 | 544.3 | 2.1 | **17.90** |
| Turkmenistan | 58.9 | 59.5 | 32.7 | 38.1 | 53.6 | 56.1 | 56.1 | 0.0 | **1.84** |
| Ukraine | 16.9 | 17.1 | 17.3 | 16.7 | 16.8 | 16.7 | 17.3 | 3.6 | **0.57** |
| United Kingdom | 64.9 | 62.7 | 53.7 | 51.4 | 40.7 | 35.0 | 32.8 | -6.3 | **1.08** |
| Uzbekistan | 53.2 | 56.0 | 54.0 | 53.7 | 51.3 | 51.2 | 49.7 | -3.0 | **1.63** |
| Other Europe & Eurasia | 9.7 | 9.2 | 9.1 | 9.1 | 8.5 | 7.8 | 6.7 | -14.1 | **0.22** |
| **Total Europe & Eurasia** | **938.1** | **967.0** | **859.2** | **924.1** | **930.5** | **925.3** | **929.6** | **0.5** | **30.56** |
| **Middle East** | | | | | | | | | |
| Bahrain | 10.6 | 11.4 | 11.5 | 11.8 | 12.0 | 12.4 | 14.2 | 14.5 | **0.47** |
| Iran | 112.5 | 119.2 | 129.8 | 137.1 | 143.9 | 149.1 | 149.9 | 0.5 | **4.93** |
| Iraq | 1.3 | 1.7 | 1.0 | 1.2 | 0.8 | 0.6 | 0.6 | 0.0 | **0.02** |
| Kuwait | 10.9 | 11.5 | 10.3 | 10.6 | 12.2 | 14.0 | 14.0 | 0.0 | **0.46** |
| Oman | 21.6 | 21.7 | 22.3 | 24.4 | 23.9 | 27.0 | 27.8 | 3.0 | **0.91** |
| Qatar | 56.9 | 69.3 | 80.4 | 105.0 | 130.7 | 135.7 | 142.7 | 5.2 | **4.69** |
| Saudi Arabia | 67.0 | 72.4 | 70.6 | 78.9 | 83.0 | 89.4 | 92.7 | 3.7 | **3.05** |
| Syria | 5.0 | 4.8 | 5.0 | 7.2 | 6.4 | 4.8 | 4.0 | -16.7 | **0.13** |
| United Arab Emirates | 45.3 | 45.2 | 43.9 | 46.2 | 47.1 | 48.9 | 50.4 | 3.1 | **1.66** |
| Yemen | - | - | 0.7 | 5.6 | 8.5 | 6.8 | 9.3 | 36.8 | **0.31** |
| Other Middle East | 2.7 | 3.3 | 2.7 | 3.0 | 4.0 | 2.4 | 5.9 | 145.8 | **0.19** |
| **Total Middle East** | **333.8** | **360.3** | **378.3** | **431.0** | **472.5** | **491.1** | **511.5** | **4.2** | **16.82** |

Contd….

## Table 9.3(Contd.): Country-wise 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 | % Change 2013-14 over 2012-13 | 2013-14 % Share of World's Total Consumption |
|---|---|---|---|---|---|---|---|---|---|
| **Africa** | | | | | | | | | |
| Algeria | 76.3 | 77.2 | 71.6 | 72.4 | 74.4 | 73.4 | 70.7 | -3.6 | **2.32** |
| Egypt | 50.1 | 53.1 | 56.4 | 55.2 | 55.3 | 54.8 | 50.5 | -7.8 | **1.66** |
| Libya | 13.8 | 14.3 | 14.3 | 15.1 | 7.1 | 11.0 | 10.8 | -1.6 | **0.36** |
| Nigeria | 33.2 | 32.6 | 23.4 | 33.6 | 36.5 | 39.0 | 32.5 | -16.7 | **1.07** |
| Other Africa | 11.1 | 14.2 | 14.7 | 16.6 | 16.7 | 16.6 | 19.4 | 16.9 | **0.64** |
| **Total Africa** | **184.5** | **191.4** | **180.4** | **192.8** | **190.0** | **194.7** | **183.9** | **-5.6** | **6.05** |
| **Asia Pacific** | | | | | | | | | |
| Australia | 36.0 | 34.4 | 38.1 | 41.0 | 40.5 | 39.0 | 38.6 | -1.0 | **1.27** |
| Bangladesh | 14.3 | 15.3 | 16.7 | 17.9 | 18.1 | 19.0 | 19.7 | 3.7 | **0.65** |
| Brunei | 11.0 | 10.9 | 10.3 | 11.1 | 11.5 | 11.3 | 11.0 | -2.7 | **0.36** |
| China | 62.3 | 72.3 | 76.7 | 85.4 | 92.4 | 96.4 | 105.3 | 9.2 | **3.46** |
| **India** | **27.1** | **27.5** | **35.3** | **45.8** | **41.5** | **36.3** | **30.3** | -16.5 | **1.00** |
| Indonesia | 60.9 | 62.7 | 64.7 | 73.8 | 68.3 | 64.0 | 63.4 | -0.9 | **2.08** |
| Malaysia | 58.1 | 58.2 | 57.0 | 58.7 | 58.7 | 59.8 | 62.1 | 3.8 | **2.04** |
| Myanmar | 12.2 | 11.2 | 10.4 | 11.2 | 11.5 | 11.5 | 11.8 | 3.0 | **0.39** |
| Pakistan | 33.1 | 33.8 | 34.6 | 35.7 | 35.2 | 37.1 | 34.7 | -6.5 | **1.14** |
| Thailand | 23.4 | 25.9 | 27.8 | 32.7 | 33.3 | 37.3 | 37.6 | 0.9 | **1.24** |
| Vietnam | 6.4 | 6.7 | 7.2 | 8.5 | 7.6 | 8.4 | 8.8 | 4.8 | **0.29** |
| Other Asia Pacific | 15.6 | 16.5 | 16.7 | 16.3 | 16.5 | 16.4 | 16.9 | 3.0 | **0.56** |
| **Total Asia Pacific** | **360.4** | **375.4** | **395.6** | **437.8** | **435.2** | **436.4** | **440.2** | **0.9** | **14.47** |
| | | | | | | | | | |
| **TOTAL WORLD** | **2674.2** | **2769.8** | **2689.9** | **2877.9** | **2964.8** | **3016.8** | **3041.6** | **0.8** | **100.00** |

* Excluding gas flared or recyled.

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 | % Change 2013-14 over 2012-13 | 2013-14 % Share of World's Total Consumption |
|---|---|---|---|---|---|---|---|---|---|
| **North America** | | | | | | | | | |
| USA | 596.3 | 600.8 | 590.1 | 619.3 | 628.8 | 657.3 | 671.0 | 2.1 | **22.21** |
| Canada | 86.6 | 86.5 | 85.4 | 85.5 | 90.8 | 90.2 | 93.1 | 3.2 | **3.08** |
| Mexico | 57.1 | 59.6 | 65.2 | 65.2 | 69.0 | 71.6 | 74.5 | 4.1 | **2.47** |
| **Total North America** | **740.0** | **746.9** | **740.7** | **770.1** | **788.5** | **819.1** | **838.6** | **2.4** | **27.76** |
| **South and Central America** | | | | | | | | | |
| Argentina | 39.5 | 40.0 | 38.9 | 39.0 | 41.1 | 42.6 | 43.2 | 1.4 | **1.43** |
| Brazil | 19.1 | 22.4 | 18.1 | 24.1 | 24.0 | 28.5 | 33.9 | 18.9 | **1.12** |
| Chile | 4.1 | 2.4 | 2.8 | 4.8 | 4.8 | 4.9 | 3.9 | -20.4 | **0.13** |
| Colombia | 6.7 | 6.8 | 7.8 | 8.2 | 8.0 | 8.9 | 9.6 | 7.9 | **0.32** |
| Ecuador | 0.4 | 0.4 | 0.5 | 0.5 | 0.5 | 0.6 | 0.5 | -16.7 | **0.02** |
| Peru | 2.4 | 3.1 | 3.1 | 4.9 | 5.5 | 6.1 | 5.9 | -3.3 | **0.20** |
| Trinidad & Tobago | 19.7 | 19.2 | 19.9 | 20.9 | 20.8 | 20.0 | 20.2 | 1.0 | **0.67** |
| Venezuela | 32.5 | 30.9 | 29.0 | 26.1 | 26.8 | 28.3 | 27.5 | -2.8 | **0.91** |
| Other S. & Cent. America | 4.0 | 4.3 | 4.5 | 4.8 | 5.2 | 6.4 | 7.1 | 10.9 | **0.24** |
| **Total S. & Cent. America** | **128.5** | **129.4** | **124.6** | **133.3** | **136.7** | **146.3** | **151.8** | **3.8** | **5.02** |
| **Europe and Eurasia** | | | | | | | | | |
| Austria | 8.0 | 8.6 | 8.4 | 9.1 | 8.5 | 8.1 | 7.6 | -6.6 | **0.25** |
| Azerbaijan | 7.2 | 8.2 | 7.0 | 6.7 | 7.3 | 7.7 | 7.8 | 1.3 | **0.26** |
| Belarus | 17.0 | 17.3 | 14.5 | 17.7 | 16.5 | 16.5 | 16.5 | 0.0 | **0.55** |
| Belgium | 14.9 | 14.8 | 15.1 | 17.0 | 14.9 | 15.2 | 15.1 | -0.7 | **0.50** |
| Bulgaria | 2.9 | 2.9 | 2.1 | 2.3 | 2.6 | 2.5 | 2.4 | -4.0 | **0.08** |
| Czech Republic | 7.8 | 7.8 | 7.4 | 8.4 | 7.6 | 7.4 | 7.6 | 3.1 | **0.25** |
| Denmark | 4.1 | 4.1 | 4.0 | 4.5 | 3.8 | 3.5 | 3.4 | -3.1 | **0.11** |
| Finland | 3.5 | 3.6 | 3.2 | 3.6 | 3.1 | 2.7 | 2.6 | -3.7 | **0.09** |
| France | 38.3 | 39.4 | 37.6 | 42.2 | 36.4 | 38.0 | 38.6 | 1.6 | **1.28** |
| Germany | 74.6 | 73.1 | 70.2 | 75.0 | 67.1 | 70.5 | 75.3 | 6.8 | **2.49** |
| Greece | 3.3 | 3.5 | 2.9 | 3.2 | 4.0 | 3.7 | 3.2 | -13.5 | **0.11** |
| Hungary | 11.8 | 12.6 | 11.5 | 11.3 | 9.3 | 9.2 | 7.7 | -16.3 | **0.25** |
| Republic of Ireland | 4.3 | 4.5 | 4.3 | 4.7 | 4.1 | 4.0 | 4.0 | 0.0 | **0.13** |
| Italy | 70.0 | 70.0 | 64.4 | 68.6 | 64.3 | 61.8 | 57.8 | -6.5 | **1.91** |
| Kazakhstan | 8.3 | 8.0 | 7.7 | 8.1 | 8.6 | 9.4 | 10.3 | 9.6 | **0.34** |
| Lithuania | 3.3 | 2.9 | 2.5 | 2.8 | 3.1 | 3.0 | 2.4 | -20.0 | **0.08** |
| Netherlands | 33.3 | 34.7 | 35.0 | 39.2 | 34.3 | 32.8 | 33.4 | 1.8 | **1.11** |
| Norway | 3.8 | 3.9 | 3.7 | 3.7 | 3.9 | 3.9 | 4.0 | 2.6 | **0.13** |
| Poland | 12.4 | 13.5 | 13.0 | 14.0 | 14.1 | 14.9 | 15.0 | 0.7 | **0.50** |
| Portugal | 3.9 | 4.3 | 4.2 | 4.6 | 4.7 | 4.0 | 3.7 | -7.5 | **0.12** |
| Romania | 14.5 | 14.3 | 11.9 | 12.2 | 12.5 | 12.2 | 11.2 | -8.2 | **0.37** |
| Russian Federation | 379.8 | 374.4 | 350.7 | 372.8 | 382.1 | 374.6 | 372.1 | -0.7 | **12.32** |
| Slovakia | 5.1 | 5.2 | 4.4 | 5.0 | 4.6 | 4.4 | 4.9 | 11.4 | **0.16** |
| Spain | 31.6 | 34.8 | 31.1 | 31.2 | 29.0 | 28.2 | 26.1 | -7.4 | **0.86** |
| Sweden | 0.9 | 0.8 | 1.0 | 1.4 | 1.1 | 1.0 | 1.0 | 0.0 | **0.03** |
| Switzerland | 2.6 | 2.8 | 2.7 | 3.0 | 2.7 | 2.9 | 3.3 | 13.8 | **0.11** |
| Turkey | 32.5 | 33.8 | 32.1 | 35.1 | 40.2 | 40.7 | 41.1 | 1.0 | **1.36** |
| Turkmenistan | 19.1 | 18.5 | 17.9 | 20.4 | 21.1 | 23.8 | 20.0 | -16.0 | **0.66** |
| Ukraine | 56.9 | 54.0 | 42.1 | 47.0 | 48.4 | 44.6 | 40.5 | -9.2 | **1.34** |
| United Kingdom | 81.9 | 84.1 | 78.3 | 84.8 | 70.3 | 66.3 | 65.8 | -0.8 | **2.18** |
| Uzbekistan | 41.3 | 43.8 | 39.2 | 41.0 | 44.2 | 42.2 | 40.7 | -3.6 | **1.35** |
| Other Europe & Eurasia | 16.4 | 15.8 | 13.3 | 14.4 | 14.9 | 14.5 | 13.4 | -7.4 | **0.44** |
| **Total Europe & Eurasia** | **1015.4** | **1020.1** | **943.4** | **1014.8** | **989.4** | **974.2** | **958.5** | **-1.6** | **31.73** |

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 | % Change 2013-14 over 2012-13 | 2013-14 % Share of World's Total Consumption |
|---|---|---|---|---|---|---|---|---|---|
| **Middle East** | | | | | | | | | |
| Iran | 113.0 | 121.3 | 128.9 | 137.6 | 146.2 | 145.4 | 146.0 | 0.4 | **4.83** |
| Israel | 2.5 | 3.7 | 4.1 | 4.8 | 4.5 | 2.3 | 6.2 | 165.5 | **0.21** |
| Kuwait | 10.9 | 11.5 | 11.1 | 13.1 | 15.3 | 16.3 | 16.0 | -1.8 | **0.53** |
| Qatar | 17.4 | 17.4 | 18.0 | 18.4 | 20.7 | 21.1 | 23.3 | 10.4 | **0.77** |
| Saudi Arabia | 67.0 | 72.4 | 70.6 | 78.9 | 83.0 | 89.4 | 92.7 | 3.7 | **3.07** |
| United Arab Emirates | 44.3 | 53.5 | 53.2 | 54.7 | 56.2 | 59.0 | 61.5 | 4.2 | **2.04** |
| Other Middle East | 29.1 | 32.9 | 35.0 | 39.8 | 36.6 | 38.0 | 39.9 | 5.0 | **1.32** |
| **Total Middle East** | **284.2** | **312.7** | **320.9** | **347.2** | **362.6** | **371.5** | **385.6** | **3.8** | **12.76** |
| **Africa** | | | | | | | | | |
| Algeria | 21.9 | 22.8 | 24.5 | 23.7 | 25.1 | 27.8 | 29.1 | 4.6 | **0.96** |
| Egypt | 34.5 | 36.8 | 38.3 | 40.6 | 44.7 | 47.3 | 46.3 | -2.2 | **1.53** |
| South Africa | 3.1 | 3.4 | 3.0 | 3.5 | 3.5 | 3.6 | 3.5 | -2.8 | **0.12** |
| Other Africa | 27.1 | 28.2 | 24.3 | 29.2 | 30.1 | 31.8 | 32.1 | 0.9 | **1.06** |
| **Total Africa** | **86.6** | **91.1** | **90.1** | **97.0** | **103.4** | **110.6** | **111.0** | **0.4** | **3.67** |
| **Asia Pacific** | | | | | | | | | |
| Australia | 23.9 | 23.0 | 22.7 | 22.8 | 23.0 | 16.7 | 16.1 | -3.6 | **0.53** |
| Bangladesh | 14.3 | 15.3 | 16.7 | 17.9 | 18.1 | 19.0 | 19.7 | 3.7 | **0.65** |
| China | 63.5 | 73.2 | 80.6 | 96.2 | 117.5 | 131.7 | 145.5 | 10.5 | **4.82** |
| China Hong Kong SAR | 2.5 | 2.9 | 2.8 | 3.4 | 2.7 | 2.5 | 2.4 | -5.1 | **0.08** |
| **India** | **36.1** | **37.2** | **46.7** | **56.7** | **55.0** | **52.9** | **46.3** | **-12.5** | **1.53** |
| Indonesia | 28.2 | 30.0 | 33.6 | 36.3 | 33.5 | 32.2 | 34.6 | 7.4 | **1.15** |
| Japan | 81.2 | 84.4 | 78.7 | 85.1 | 95.0 | 105.3 | 105.2 | -0.1 | **3.48** |
| Malaysia | 30.1 | 30.4 | 29.7 | 31.6 | 28.8 | 31.2 | 30.6 | -1.9 | **1.01** |
| New Zealand | 3.6 | 3.4 | 3.6 | 3.9 | 3.5 | 3.8 | 4.0 | 5.3 | **0.13** |
| Pakistan | 33.1 | 33.8 | 34.6 | 35.7 | 35.2 | 37.1 | 34.7 | -6.5 | **1.15** |
| Philippines | 3.2 | 3.4 | 3.4 | 3.2 | 3.2 | 3.3 | 3.0 | -9.1 | **0.10** |
| Singapore | 7.8 | 7.4 | 7.3 | 7.6 | 7.9 | 8.5 | 9.5 | 11.8 | **0.31** |
| South Korea | 31.2 | 32.1 | 30.5 | 38.7 | 41.7 | 45.2 | 47.3 | 4.6 | **1.57** |
| Taiwan | 9.6 | 10.5 | 10.2 | 12.7 | 14.0 | 14.7 | 14.7 | 0.3 | **0.49** |
| Thailand | 31.8 | 33.6 | 35.3 | 40.6 | 41.9 | 46.1 | 47.0 | 1.9 | **1.56** |
| Vietnam | 6.4 | 6.7 | 7.2 | 8.5 | 7.6 | 8.4 | 8.8 | 4.8 | **0.29** |
| Other Asia Pacific | 5.4 | 5.1 | 4.6 | 5.2 | 5.6 | 5.9 | 6.0 | 1.7 | **0.20** |
| **Total Asia Pacific** | **411.8** | **432.3** | **448.1** | **506.0** | **534.2** | **564.5** | **575.4** | **1.9** | **19.05** |
| | | | | | | | | | |
| **TOTAL WORLD** | **2666.6** | **2732.5** | **2667.8** | **2868.3** | **2914.8** | **2986.2** | **3020.9** | **1.2** | **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**: The coal resource of an area falling within 200 m radius from a borehole. Point (or observation point).

v. **Indicated Reserves:** Those resources occurring in the area falling between radii of 200m and 1 Km from the borehole point.

vi. **Inferred Reserves**: Those resources occurring in the area falling between radii of 1 Km and 2 Km from the borehole point.

### *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 20º 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 25ºC to 220ºC.
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 30ºC and 210ºC 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 145ºC to 300°C, but not usually above 250ºC and with a flash point above 38ºC.

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 100ºC and 250ºC. 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 160ºC 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 350ºC to 650ºC and a kinematic viscosity in the range 6 to 55 cSt at 100ºC. Their flash point is always above 60ºC 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 630ºC. 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 1330ºC.
Calcined coke is a petroleum coke or coal-derived pitch coke obtained by heat treatment of green coke to about 1330ºC. 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 gms | | |
| 1 Cubic Meter | = | 35.3 cubic feet (gas) | | |
| 1 Metric tonne | = | 1 Tonne | | |
| | = | 1000 kilograms | | |
| 1 joule | = | 0.23884 calories | | |
| 1 kilo joules | = | $10^3$joules | = | 238.84 calories |
| 1 mega joule | = | $10^6$ joules | = | $238.84 \times 10^3$ calories |
| 1 giga joule | = | $10^9$ joules | = | $238.84 \times 10^6$ calories |
| 1 tera joule | = | $10^{12}$joules | = | $238.84 \times 10^9$ calories |
| 1 peta joule | = | $10^{15}$ joules | = | $238.84 \times 10^{12}$ calories |

One million tonnes of coal in

| | | |
|---|---|---|
| 1970-81 | = | 20.93 peta joules of energy. |
| 1982-38 | = | 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. |
| 2006-14 | = | 16.14 peta joules of energy |

| | | |
|---|---|---|
| One million tonnes of oil equivalent (MTOE) | = | 41.87 peta joules of energy. |
| | = | $4.1868 \times 10^4$ terajoules (TJ) |
| | = | 42 giga joules |
| | = | 11.6 Mwh |
| One billion cubic metre of natural gas | = | 38.52 peta joules of energy. |
| One million cubic metre of natural gas | = | 38.52 tera joules of energy. |
| | = | .03852 peta joules of energy. |
| One billion kilowatt hour of electricity | = | 3.60 peta joules of energy. |

**ANNEX-III**

## Abbreviations

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

**ANNEX- IV**

# Energy Data Collection Mechanisms

## *I. Coal and Coal Derivatives*

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

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

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

**I.3 Details of data flows/ items:**

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

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

- **Data sources and Act/ Order/ Rule etc.**
  The data are collected from different coal/ lignite companies under the statutory powers vested with the Coal Controller under the provisions of Collection of Statistics Act, 2008, 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 (Private and Public) on monthly basis on some major parameters.

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

  Coverage:- Entire coal and lignite producing sector.
  Response:- 100%

- Details of data items being compiled and periodicity

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

## *II. Petroleum and Natural Gas*

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

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

Ministry of Petroleum has an Economic and Statistics Division headed by an 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 Organisations Data Initiative Statistics - to United Nations Statistics Division.

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

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

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

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

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

**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 to these organizations to furnish the correct, complete data in time, yet the following problems are being faced in collection of data.

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

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

## *IV. New and Renewable Energy*

### IV.1. Nodal ministry

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

### IV.2. Organisational setup

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

### IV.3. Current responsibilities

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

(a) Coordinating and intensifying research and development activities in new and renewable sources of energy;

(b) Ensuring implementing of Government's policies in regard to all matters concerning new and renewable sources of energy.

### IV.4. Data flows

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

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