ENERGY STATISTICS 2020

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Ministry of Statistics and Programme Implementation
Government of India
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ENERGY STATISTICS 2020

NATIONAL STATISTICAL OFFICE
MINISTRY OF STATISTICS AND PROGRAMME IMPLEMENTATION
GOVERNMENT OF INDIA
NEW DELHI

FOREWORD

Energy is one of the most important building blocks in human development, and as such, acts as a key factor in determining the economic development of all the countries. In an effort to meet the demands of a developing nation, the energy sector has witnessed a rapid growth. It is important to note that non-renewable resources are significantly depleted by human use, whereas renewable resources are produced by ongoing processes that can sustain indefinite human exploitation.

The use of renewable resources of energy is rapidly increasing worldwide. Solar power, one of the potential energy sources, is a fast developing industry in India. The country's solar installed capacity has reached 28.18 GW as on 31.03.2019 as compared to 21.65 GW on 31.03.2018. India has expanded its renewable source of electricity generation capacity by 12.23% over a year which has led to downward trend in the cost and has increased usage. It clearly signifies that proper integration of policy interventions hold the key to achieve the sustainable development goals.

This publication, 27thin the series, is an annual publication of NSO and is a continued effort to provide a comprehensive picture of Energy Sector in India. **Energy Statistics** is an integrated and updated database of reserves, installed capacity, production, consumption, import, export and whole sale prices of different sources viz. coal, crude oil, natural gas and electricity. Energy Balance and Sankey Diagram (Energy flow diagram) adds analytic value and thus increases its utility.

Energy indicators are being brought out by NSO as part of **Energy Statistics** for the use of policy makers as well as for comprehensive reporting. Indicators play a vital role by turning data into information for policy makers and help in decision-making. Keeping in view the importance of Goal no 7 of Sustainable Development Goal, one of the targets of Goal No. 7, "Double the global rate of improvement in energy efficiency", has been accounted for in the form of an indicator i.e. "Energy Intensity measured in terms of primary energy and GDP". Disaggregation of the indicator i.e. Energy Intensity at sectoral level i.e. Industry, agriculture and transport is also available in the publication.

Identification of list of indicators depends on various factors such as transparency, scientific validity, robustness, sensitivity and the extent to which they are linkable to each other. The indicators are selected on the guidelines/approach followed by IAEA in their publication "Energy Indicators for Sustainable Development: Guidelines and Methodologies", which was brought out in collaboration with United Nations Department of Economic and Social Affairs (UNDESA), International Energy Agency (IEA), Eurostat and European Environmental Agency (EEA).

The data in the publication have been sourced from the subject Ministries of the Government of India. I appreciate the co-operation and support extended by these Ministries/Departments in compiling this publication. I also appreciate the efforts of the officers of Economic Statistics Division, National Statistics Office in bringing out this publication in a time bound manner. I hope the publication will prove to be useful to the policy makers, planners and researchers working in field of Energy. It shall be endeavor of NSO to continuously improve the publication both in content and design with the help of user feedback and data source agencies.

April, 2020
New Delhi
NSO

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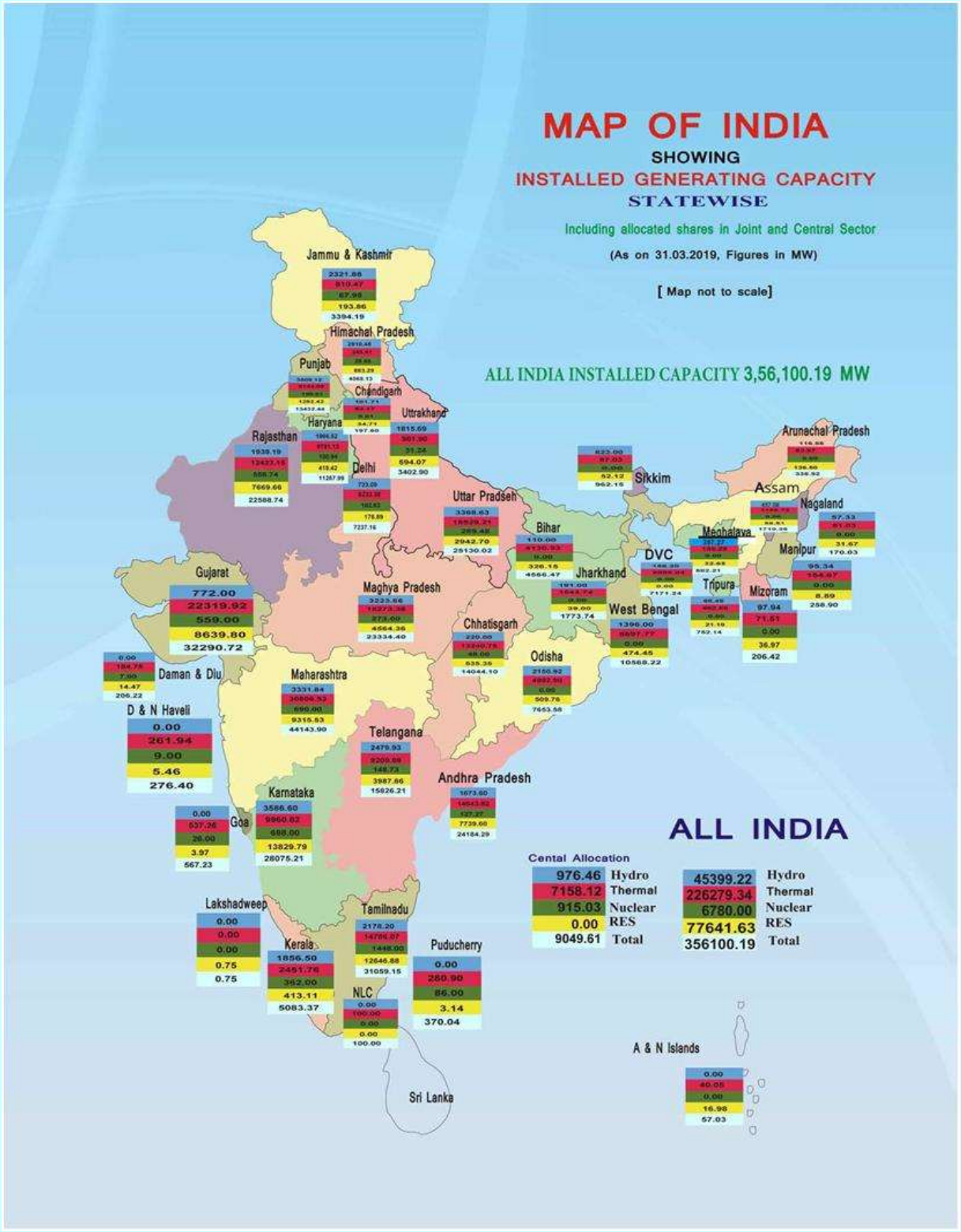
ABBREVIATION

ATF	Aviation Turbine Fuel
CAGR	Compound Annual Growth Rate
CPEs	Centrally Planned Economies
EMEs	Emerging Market Economies (includes countries of South & Central America, Africa, Middle-east, Non-OECD Asia & Non-OECD Europe)
F.O.	Furnace Oil
GW	Giga Watt
HSDO	High Speed Diesel Oil
IAEA	International Atomic Energy Agency,
IEA	International Energy Agency
KW	Kilowatt
KToE	Kilo Tonne of oil Equivalent
LDO	Light Diesel Oil
LNG	Liquefied Natural Gas
LSHS	Low Sulphur Heavy Stock
LPG	Liquefied Petroleum Gas
MS/MOGAS	Motor Spirit/Motor Gasoline
M.T.O.	Mineral Turpentine Oil
MW	Megawatt
N.C.W.	Non-communist World
O.P.E.C.	Organisation of Petroleum Exporting Countries
O.E.C.D.	Organisation for Economic Cooperation & Development
(P)	Provisional
PJ	Petajoules
PET-COKE	Petroleum Coke
SBPS	Special Boiling Point Spirit
SKO	Superior Kerosene Oil
TMT	Thousand Metric Tonne

CONTENTS

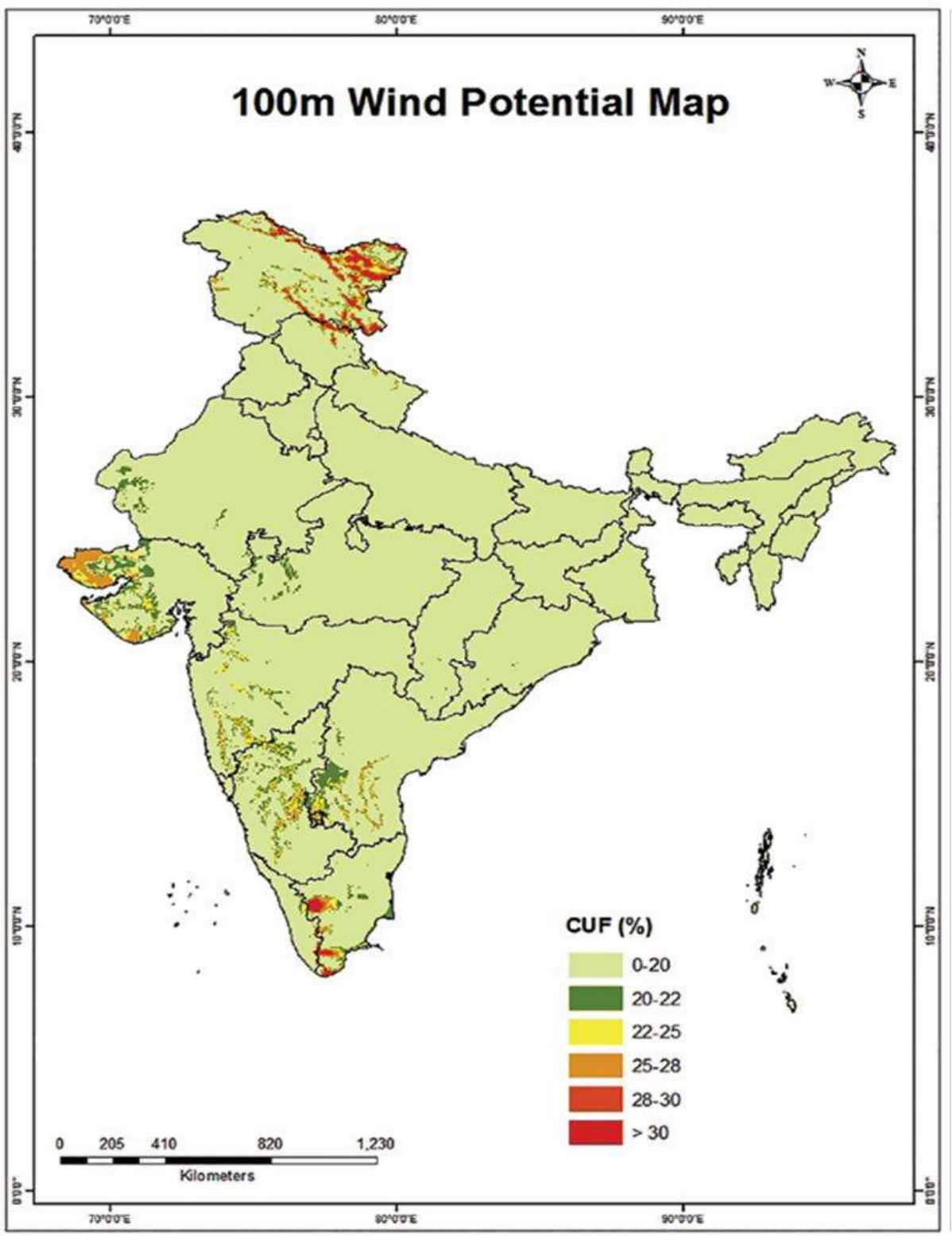
ENERGY MAPS OF INDIA

Map 1: Installed Generating Capacity



Source: Central Electricity authority

Map 2: Wind Power Potential at 100m agl (2018-19)



Source: Ministry of New and Renewable Energy

METADATA-ENERGY STATISTICS

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2. Statistical presentation
2.1 Data sources
The data contained in this publication has been sourced from the Ministry of Petroleum and Natural Gas, Central Electricity Authority, Office of the Coal Controller, Ministry of New and Renewable Energy and Office of the Economic Adviser, Ministry of Commerce and Industry and National Accounts Division, Ministry of Statistics and Programme Implementation.
2.2. Data description
The statistics represent information about the reserves, installed capacity, potential for generation, production, consumption, import, export and wholesale price of different energy commodities and Energy Indicators on Economic Dimension.
2.3. Sector coverage
Coal & Lignite, Petroleum & Natural Gas, Renewable Energy Resources and Electricity. (Data Collection Mechanism is given in Annex: V of this publication). The indicators are based on the guidelines/approach followed by International Atomic Energy Agency in their publication "Energy Indicators for Sustainable Development: Guidelines and Methodologies", which was brought out in collaboration with United Nations Department of Economic and Social Affairs (UNDESA), International Energy Agency (IEA), Eurostat and European Environmental Agency(EEA). Also, the choice of indicators was made as per the availability of data from the subject ministries.
2.4. Data content
The Statistics are given by type of fuel and energy source. The publication includes analytical indicators viz. Growth Rates, Compound Annual Growth Rates (CAGR), Percentage Distributions and Economic Energy Indicators.
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 2009-10 to 2018-19 and is based on statistics compiled by the Ministry of Petroleum and Natural Gas, Central Electricity Authority, Office of Coal Controller, Ministry of New and Renewable Energy. The data for Office of the Economic Advisor, Ministry

of Commerce and Industry and National Accounts Division has been sourced for the year 2011-12 to 2018-19. Energy Indicators on Economic Dimensions have been compiled for the year 2018-19.

2.9. Base period

2011-12 for WPI and GDP data

2.10. Statistical concepts and definitions

The main Concepts and Definitions and certain Conversion Factors are given in Annex: I & Annex: II respectively. Annex III gives categorization of coal in India. Annex IV gives details of Energy Data Collection Mechanism.

3. Unit of measure

Energy quantities data are recorded in physical units relevant to the product in question; Giga Watt hour (GWh) for electricity, Thousand Metric Tonne (TMT) for petroleum products etc. Prices are indicated by Wholesale Price Index. The Energy Balance is given in Kilo Tonne of oil equivalent (KToE). Consumption and Production of the Energy resources is also given in Petajoules(PJ).

4. Reference period

Reference period of the Publication of "Energy Statistics -2020" is the financial year 2018-19 and the previous financial years since 2009-10. For Energy Indicators reference period is Financial Year 2018-19.

5. Institutional mandate

5.1. 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.

5.2. Data sharing

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

6. Confidentiality

6.1. 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 end of March every year.

7.2. User access

MOSPI disseminates Energy 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 data 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 in Chapter 10.

10. Accuracy and reliability
10.1. Overall accuracy
Data on energy is published on the basis of information received from the source agencies. ESD, NSO compiles and analyses data received from the source agencies and then presents in the form of publication.

11. Timeliness and punctuality
11.1. Timeliness
Preliminary data on energy production and consumption and few energy indicators are available 12 months after the reference year. Final data for the year are published 24 months after the end of the reference year.
11.2. Punctuality
Annual publication on Energy Statistics is released 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. The data revision by source Ministries is incorporated in the subsequent edition and hence some of the values may not match with the previous issues of this publication.
12.2. Data revision – practice
Preliminary data on energy production and consumption statistics for the year 2018-19is published in current publication. Final data will be given in the next publication in March 2021.
13. Statistical processing
13.1. Source data
Energy data are collected from the source agencies at national level and presented in the publication. It is published in the ministry's web-site.
13.2. Frequency of data collection
Annual.
13.3. Data collection

Data is collected through e-mail or by publications brought out by the source agencies.
13.4. Data validation
Checks are carried out to the data before publishing it.
13.5. Data compilation
National figures are compiled by aggregating the data received from the source agencies.
13.6. Adjustment
No seasonal adjustment or temperature correction of the energy consumption is applied.

Highlights of Energy Sector 2018-19

1. Production and Consumption

1.1 Compound Annual Growth Rates (CAGR) of Production of Coal & Lignite in 2018-19 over 2009-10 are 3.20% & 2.66% respectively whereas their consumption grew at 5.12% and 2.90% respectively during the same period.

1.2 The estimated total consumption of raw coal by industry has increased from 587.81 MT during 2009-10 to 968.25 MT during 2018-19 with a CAGR of 5.12%. Consumption of Raw Coal recorded annual growth of 7.76% during 2018-19 over 2017-18.

1.3 In case of Crude Oil and Natural Gas, during the period 2009-10 to 2018-19 the production recorded a CAGR of 0.15% and (-) 3.61% whereas consumption increased with a CAGR of 3.3% & 0.2% respectively.

1.4 The estimated consumption of crude oil has steadily increased from 186.55 MMT during 2009-10 to 257.20 MMT during 2018-19 with CAGR of 3.3%

1.5 Industry wise off-take of natural gas shows that natural gas has been used both for Energy (62.17%) and Non-energy (37.83%) purposes.

1.6 During the period 2009-10 to 2018-19 , Gross Generation of Electricity increased by a CAGR of 5.49 %

1.7 The estimated electricity consumption increased from 6,12,645 GWh during 2009-10 to 11,58,310 GWh during 2018-19, showing a CAGR of 6.6%.

1.8 As on 31.03.2019, all the villages (total = 5,97,464 as per 2011 census) were electrified as compared to 5,97,121 electrified villages on 31.03.2018 accounting for 100.0% electrification in the country.

2. Imports and Exports

2.1 Imports of the Coal during 2009-10 to 2018-19 increased at a CAGR of 12.37% whereas the Exports during the corresponding period decreased at(-) 6.06%.

2.2 India is highly dependent on import of crude oil. Imports of crude oil have increased from 159.26MTs during 2009-10 to 226.50 MTs during 2018-19. The import of Crude oil has registered a CAGR of 3.6 % during the said period.

2.3 The import of natural gas has increased from 12.92 BCM in 2009-10 to 28.74 BCM in 2018-19, recording a CAGR of 8.3%.

2.4 The imports of petroleum products, during the period 2009-10 to 2017-18 increased at CAGR of 8.6%

2.5 The CAGR of exports of petroleum products from 2009-10 to 2018-19 is 1.8 %. However, during 2018-19, exports witnessed decline of 8.6% from the previous year 2017-18.

2.6 For electricity, the net imports witnessed significant decline in last three years i.e. from 2016-17 to 2018-19. The exports have shown robust increase at CAGR of 55.2% during 2009-10 to 2018-19 whereas the imports registered a decline with CAGR of 1.4%.

3. Usage of Energy

3.1 The maximum energy intensive sector was industrial sector accounting about 56% of total energy consumption followed by transport (10%) and residential (9.14%).

3.2 The consumption of energy in petajoules from Coal and Lignite was highest which accounted for about 46.8% of the total consumption during 2018-19 followed by Crude Oil (33.2%) and Electricity (12.9%).

3.3 While percapita consumption of energy has consistently increased during the years 2011-12 to 2018-19 with a CAGR of 2.30%, energy consumed for producing one unit of Gross Domestic Product has decreased during the period (CAGR (-) 1.92%).

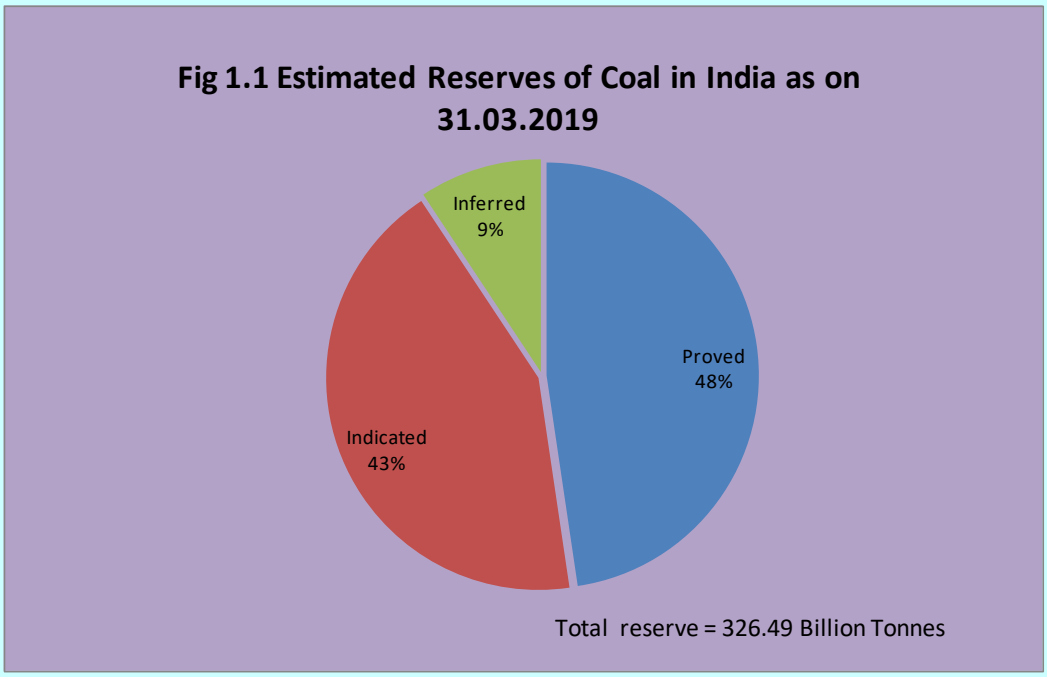
***

CHAPTER 1: RESERVES AND POTENTIAL FOR GENERATION

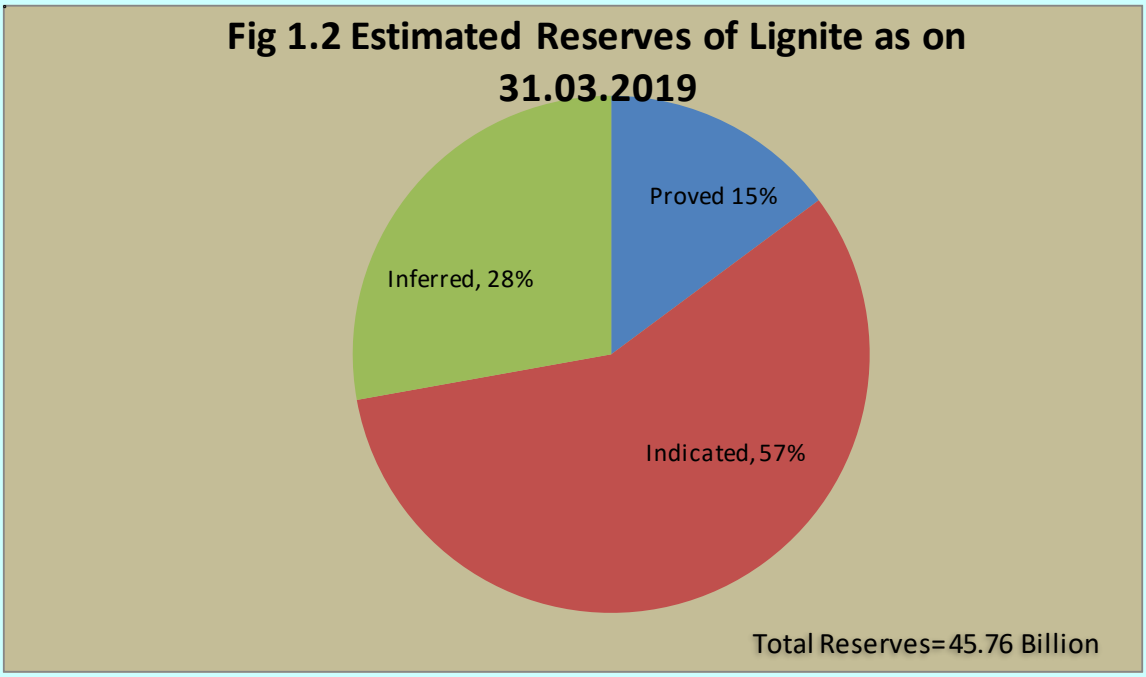
Coal and Lignite

Coal deposits are mainly confined to eastern and south central parts of the country. The states of Jharkhand, Odisha, Chhattisgarh, West Bengal, Madhya Pradesh, Telangana and Maharashtra account for 98.09% of the total coal reserves in the country. The State of Jharkhand had the maximum share (25.88%) in the overall reserves of coal in the country as on 31st March 2019 followed by the State of Odisha (24.76%) (Table 1.1).

As on 31.03.2019, the estimated reserves of coal were 326.49 billion tonnes, an addition of 7.47 billion tones over the last year in corresponding period (Table 1.1).Chhattisgarh accounted for 2.70 billion tonnes increase followed by 1.36 billion tonnes in Jharkhand. In terms of percentage, there has been an increase of 2.34% in the total estimated coal reserves during the year 2018-19 as compared to 2017-18 .

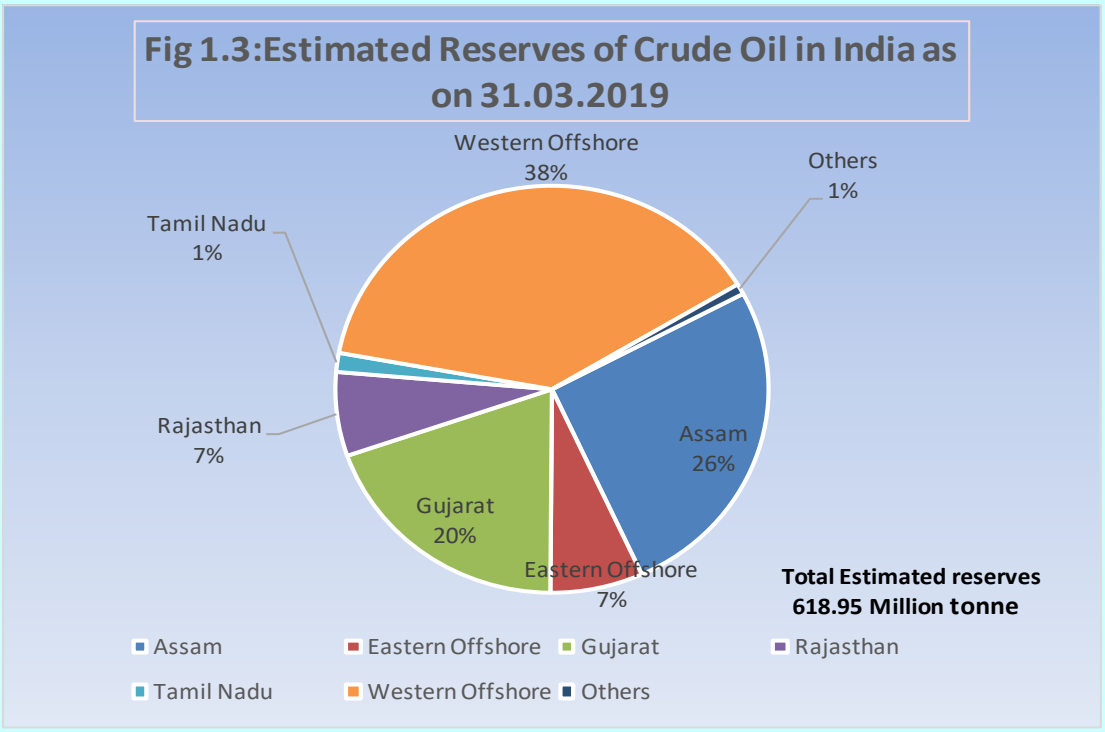


The estimated total reserves of lignite as on 31.03.2019 were 45.76 billion tonnes against 45.66 billion tonnes on 31.03.2018. (Table 1.1(A)).



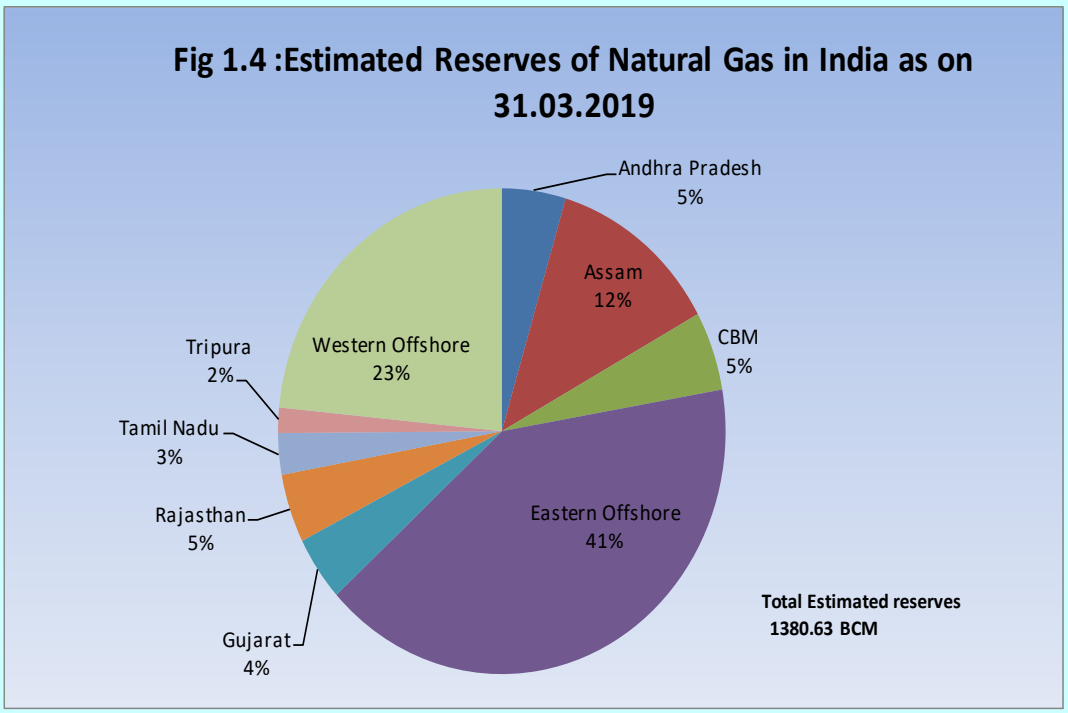
Petroleum and Natural gas

The estimated reserves of crude oil in India as on 31.03.2019 stood at 618.95 million tonnes (MT) against 594.69 million tonnes on 31.03.2018. Geographical distribution of Crude oil indicates that the maximum reserves are in the Western Offshore (38%) followed by Assam (25.6%), whereas the maximum reserves of Natural Gas are in the Eastern Offshore (41%) followed by Western offshore (23.4%) (Table 1.2).



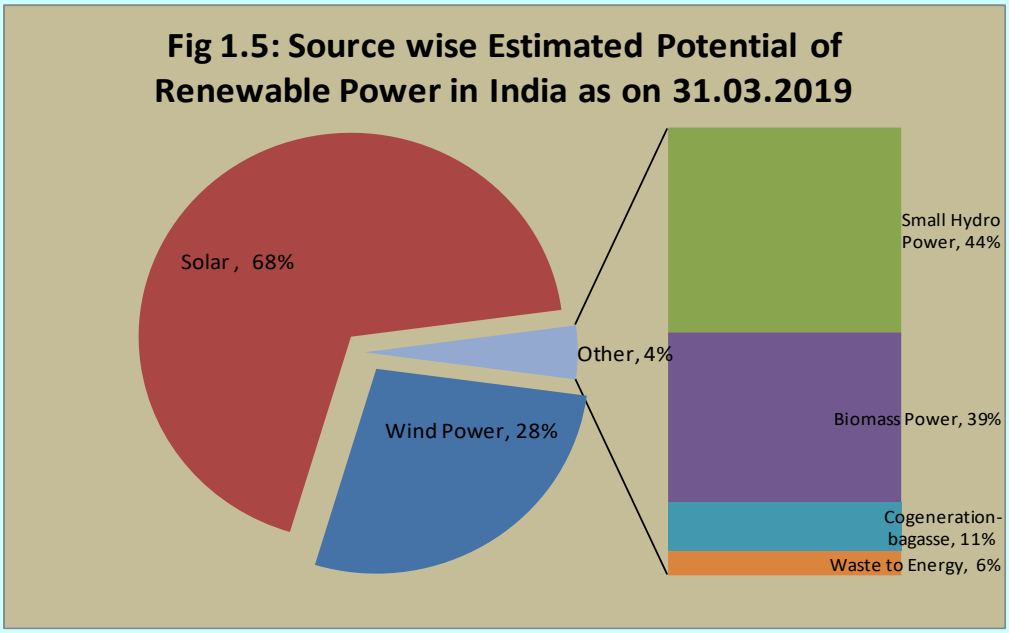
There was an increase of 4.1% in the estimated reserve of crude oil for the country as a whole during 2018-19 as compared to the position a year ago.

The estimated reserves of Natural Gas in India as on 31.03.2019 stood at 1380.63 Billion Cubic Meters (BCM) as against 1339.57 BCM as on 31.03.2018(Table 1.2). The estimated reserves of Natural Gas increased by3.07 % over the last year.



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 31.03.2019 is estimated at 1097465 MW (Table 1.3). This includes solar power potential of 748990 MW (68.25%), wind power potential of 302251 MW (27.54%) at 100m hub height, SHP (small-hydro power) potential of 21134 MW (1.93%), Biomass power of 17,536 MW (1.60%), 5000 MW (0.46%) from bagasse-based cogeneration in sugar mills and 2554 MW (0.23%) from waste to energy



The geographic distribution of the estimated potential of renewable power as on 31.03.2019 reveals that Rajasthan has the highest share of about 15% (162223 MW), followed by Gujarat with 11% share 122086 MW) and Maharashtra& Jammu and Kashmir with 10% share (113925MW and 112800 MW respectively), mainly on account of solar power potential except Gujarat where the share of Wind Power is the highest.

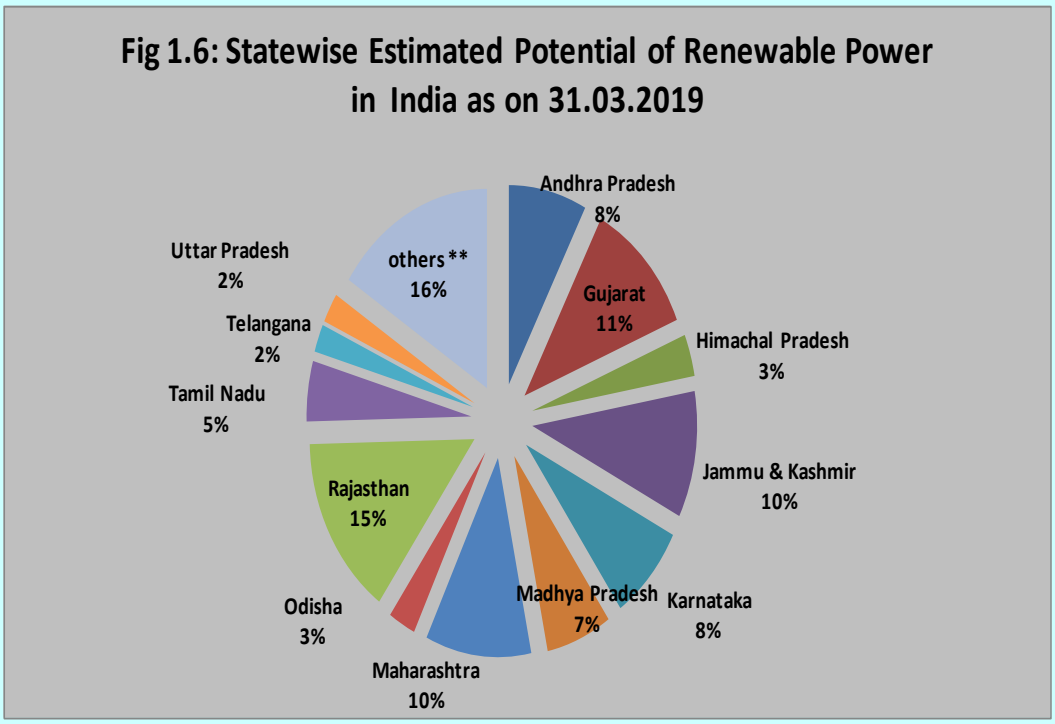


Table 1.1: Statewise Estimated Reserves of Coal in India as on 31.03.2018 and 31.03.2019

(in Billion Tonne)

States/ UTs	Proved		Indicated		Inferred		Total		Distribution (%)	
	31.03.2018	31.03.2019	31.03.2018	31.03.2019	31.03.2018	31.03.2019	31.03.2018	31.03.2019	31.03.2018	31.03.2019
Andhra Pradesh	0.00	0.097	1.15	1.08	0.43	0.43	1.58	1.61	0.50	0.49
Arunachal Pradesh	0.03	0.03	0.04	0.04	0.02	0.02	0.09	0.09	0.03	0.03
Assam	0.47	0.47	0.04	0.04	0.00	0.00	0.51	0.51	0.16	0.16
Bihar	0.16	0.31	0.81	1.51	0.39	0.01	1.37	1.83	0.43	0.56
Chhattisgarh	20.43	21.45	34.58	36.26	2.20	2.20	57.21	59.91	17.93	18.35
Jharkhand	45.56	48.03	31.44	30.40	6.15	6.08	83.15	84.51	26.06	25.88
Madhya Pradesh	11.96	12.18	12.15	12.74	3.88	3.88	27.99	28.80	8.77	8.82
Maharashtra	7.18	7.57	3.07	3.26	2.05	1.85	12.30	12.68	3.86	3.88
Meghalaya	0.09	0.09	0.02	0.02	0.47	0.47	0.58	0.58	0.18	0.18
Nagaland	0.01	0.01	0.00	0.02	0.40	0.42	0.41	0.45	0.13	0.14
Odisha	37.39	39.65	34.17	33.47	7.74	7.71	79.30	80.83	24.86	24.76
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	0.33	0.32
West Bengal	14.16	14.22	12.87	12.85	4.64	4.62	31.67	31.69	9.93	9.71
Telangana	10.47	10.62	8.58	8.57	2.65	2.65	21.70	21.84	6.80	6.69
All India Total	**148.79**	**155.61**	**139.16**	**140.50**	**31.06**	**30.38**	**319.02**	**326.49**	**100.00**	**100.00**
Distribution (%)	**46.64**	**47.66**	**43.62**	**43.03**	**9.74**	**9.31**	**100.00**	**100.00**		

Source: Office of Coal Controller, Ministry of Coal

NOTE: Figure as on 31.03.2018 has been revised.

Table 1.1(A) :Statewise Estimated Reserves of Lignite in India as on 31.03.2018 and 31.03.2019

(in Billion Tonne)

States/ UTs	Proved		Indicated		Inferred		Total		Distribution (%)	
	31.03.2018	31.03.2019	31.03.2018	31.03.2019	31.03.2018	31.03.2019	31.03.2018	31.03.2019	31.03.2018	31.03.2019
Gujarat	1.28	1.28	0.28	0.28	1.16	1.16	2.72	2.72	5.96	5.94
Jammu & Kashmir	0.00	0.00	0.02	0.02	0.01	0.01	0.03	0.03	0.07	0.07
Kerala	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.02	0.02
Puducherry	0.00	0.00	0.41	0.41	0.01	0.01	0.42	0.42	0.92	0.92
Rajasthan	1.17	1.17	3.03	3.03	2.15	2.15	6.35	6.35	13.91	13.88
TamilNadu	4.09	4.34	22.65	22.50	9.39	9.39	36.13	36.23	79.12	79.17
West Bengal	-	-	-	-	-	-	-	-	-	-
All India	**6.54**	**6.79**	**26.39**	**26.24**	**12.73**	**12.73**	**45.66**	**45.76**	**100.00**	100.00
Distribution (%)	**14.32**	**14.84**	**57.80**	**57.34**	**27.88**	**27.82**	**100.00**	**100.00**		

Source:Office of Coal Controller, Ministry of Coal - Negligible

Download Table 1.1 and Table 1.1(A)

Table 1.2 :Statewise Estimated Reserves of Crude Oil and Natural Gas in India as on 31.03.2018 and 31.03.2019

States/ UTs/ Region	Crude Petroleum (million tonnes)				Natural Gas (billion cubic metres)			
	01.04.2018		01.04.2019		01.04.2018		01.04.2019	
	Estimated Reserves	Distribution (%)	Estimated Reserves	Distribution (%)	Estimated Reserves	Distribution (%)	Estimated Reserves	Distribution (%)
Arunachal Pradesh	1.74	0.29	2.67	0.43	1.26	0.09	1.64	0.12
Andhra Pradesh	7.94	1.34	8.05	1.30	59.89	4.47	63.57	4.60
Assam	160.34	26.97	158.62	25.63	161.65	12.07	170.71	12.36
Cold Bed Methane (CBM)	-	-	-	-	105.94	7.91	72.56	5.26
Eastern Offshore	40.42	6.80	42.34	6.84	510.83	38.13	565.15	40.93
Gujarat	118.20	19.88	119.63	19.33	58.23	4.35	59.45	4.31
Nagaland	2.38	0.40	2.38	0.38	0.09	0.01	0.09	0.01
Rajasthan	17.99	3.03	40.71	6.58	54.85	4.09	63.03	4.57
Tamil Nadu	9.16	1.54	9.21	1.49	39.11	2.92	38.00	2.75
Tripura	0.07	0.01	0.07	0.01	35.20	2.63	23.24	1.68
Western Offshore	236.25	39.74	235.27	38.01	312.52	23.33	323.19	23.41
Total	**594.49**	**100.00**	**618.95**	**100.00**	**1339.57**	**100.00**	**1380.63**	**100.00**

* CBM : Cold Bed Methane (Jharkhand, West Bengal and M.P.) - Neg.

Notes:

1. Proved and indicated Balance Recoverable Reserves as on 1st April.
2. Western offshore includes Gujarat offshore
3. Total may not tally due to rounding off

Source: M/o Petroleum & Natural Gas

Download Table 1.2

Table 1.3 :Sourcewise and Statewise Estimated Potential of Renewable Power in India as on 31.03.2019

(in MW)

Sl. No.	States/ UTs	Wind Power @ 100m	Small Hydro Power	Biomass Power	Cogeneration-bagasse	Waste to Energy*	Solar Energy	Total	Distribution (%)
1	Andhra Pradesh	44229	409	578	300	123	38440	84079	7.66
2	Arunachal Pradesh	-	2065	8	-	-	8650	10723	0.98
3	Assam	-	202	212	-	8	13760	14182	1.29
4	Bihar	-	527	619	300	73	11200	12719	1.16
5	Chhattisgarh	77	1098	236	-	24	18270	19705	1.80
6	Goa	1	5	26	-	-	880	911	0.08
7	Gujarat	84431	202	1221	350	112	35770	122086	11.12
8	Haryana	-	107	1333	350	24	4560	6374	0.58
9	Himachal Pradesh	-	3460	142	-	2	33840	37444	3.41
10	Jammu & Kashmir	-	1707	43	-	-	111050	112800	10.28
11	Jharkhand	-	228	90	-	10	18180	18508	1.69
12	Karnataka	55857	3726	1131	450	-	24700	85864	7.82
13	Kerala	1700	647	1044	-	36	6110	9538	0.87
14	Madhya Pradesh	10484	820	1364	-	78	61660	74406	6.78
15	Maharashtra	45394	786	1887	1250	287	64320	113925	10.38
16	Manipur	-	100	13	-	2	10630	10745	0.98
17	Meghalaya	-	230	11	-	2	5860	6103	0.56
18	Mizoram	-	169	1	-	2	9090	9261	0.84
19	Nagaland	-	182	10	-	-	7290	7482	0.68
20	Odisha	3093	286	246	-	22	25780	29428	2.68
21	Punjab	-	578	3172	300	45	2810	6905	0.63
22	Rajasthan	18770	52	1039	-	62	142310	162233	14.78
23	Sikkim	-	267	2	-	-	4940	5209	0.47
24	Tamil Nadu	33800	604	1070	450	151	17670	53745	4.90
25	Telangana	4244	102		-	-	20410	24756	2.26
26	Tripura	-	47	3	-	2	2080	2131	0.19
27	Uttar Pradesh	-	461	1617	1250	176	22830	26333	2.40
28	Uttarakhand	-	1664	24	-	5	16800	18493	1.69
29	West Bengal	2	392	396	-	148	6260	7198	0.66
30	Andaman & Nicobar	8	7		-	-	-	15	0.00
31	Chandigarh	-	-	-	-	6	-	6	0.00
32	Dadar & Nagar Haveli	-	-	-	-	-	-	-	-
33	Daman & Diu	-	-	-	-	-	-	-	-
34	Delhi	-	-	-	-	131	2050	2181	0.20
35	Lakshadweep	8	-	-	-	-	-	8	0.00
36	Puducherry	153	-	-	-	3	-	156	0.01
37	Others*	-	-	-	-	1022	790	1812	0.17
All India Total		**302251**	**21134**	**17536**	**5000**	**2554**	**748990**	**1097465**	**100.00**
Distribution (%)		**27.54**	**1.93**	**1.60**	**0.46**	**0.23**	**68.25**	**100.00**	

* Industrial waste

Source: Ministry of New and Renewable Energy

Download Table 1.3

CHAPTER 2: INSTALLED CAPACITY AND CAPACITY UTILIZATION

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 washer does not form part of a coal mine in India. Total installed capacity of washeries in the country is around 146.53 million tonne per year (MTY) as on 31.3.2019. As on 31.03.2019, out of a total of 60washeriesin the country comprising both Coking (29.84 MTY) and Non-Coking Coal (116.69 MTY), inclusive of both PSUs and Private, 19 were closed and 3 did not report any production,(Table 2.1).

Refineries of crude oil

As on 31.03.2019, there were a total of 23 refineries in the country, 18 in the Public Sector, 3 in the Private sector and 2 in Joint Venture (Table 2.2).

The refining capacity of the country was 249366 TMTPA on 31.03.2019 which is 1800 TMTPA higher than the country's refining capacity (247566TMTPA) on 31.03.2018 and the entire increase is on account of refineries in Joint Venture sector.

The Refinery production (crude throughput) achievement was 257205TMT during 2018-19 which marks net increase of 2.09 % over 2017-18 (251935 TMT).

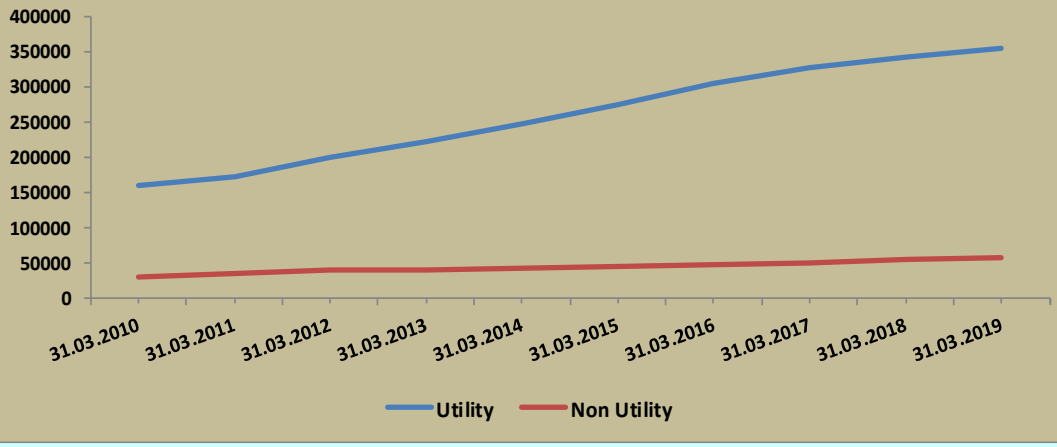
Capacity utilization of the refineries was 103.9% during 2018-19 as compared to 107.7% during 2017-18. In the Public Sector Indian Oil Corporation (IOC) enhanced its capacity utilization from 99.71 in 2017-18 to 103.71 in 2018-19. All units of IOC together processed 71.816 MMT during 2018-19 as compared to 69.001 MMT during 2017-18. In the Private Sector during 2018-19 overall decline in all the three refineries have been noticed with the maximum decrease in capacity utilization recorded by RIL-SEZ Jamnagar, Gujarat.

All the private refineries taken together processed 88.041 MMT during 2018-19 which is lower than 91.163 MMT processed in 2017-18. The capacity utilization of these refineries during 2018-19 was 99.8% which is 14.1% lower than its capacity utilization (113.9%) in 2017-18.

Installed generating capacity of electricity

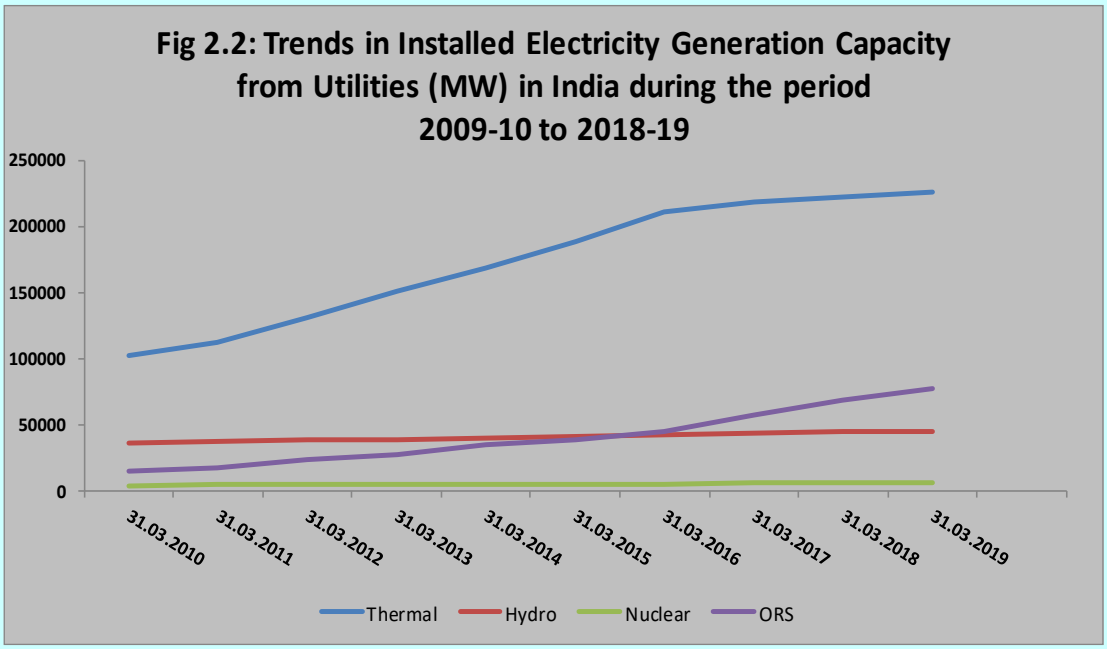
The total installed capacity for electricity generation in the country has increased from 190915 MW as on 31.03.2010 to 414100 MW as on 31.03.2019, registering a compound annual growth rate (CAGR) of 8.05% (Table 2.3). Electricity generation capacity increased by 3.8% to 414100 MW in 2018-19 over 398935 MW in 2017-18.

Fig 2.1:Trends in Installed Electricity Generation Capacity (MW) in India during the period 2009-10 to 2018-19

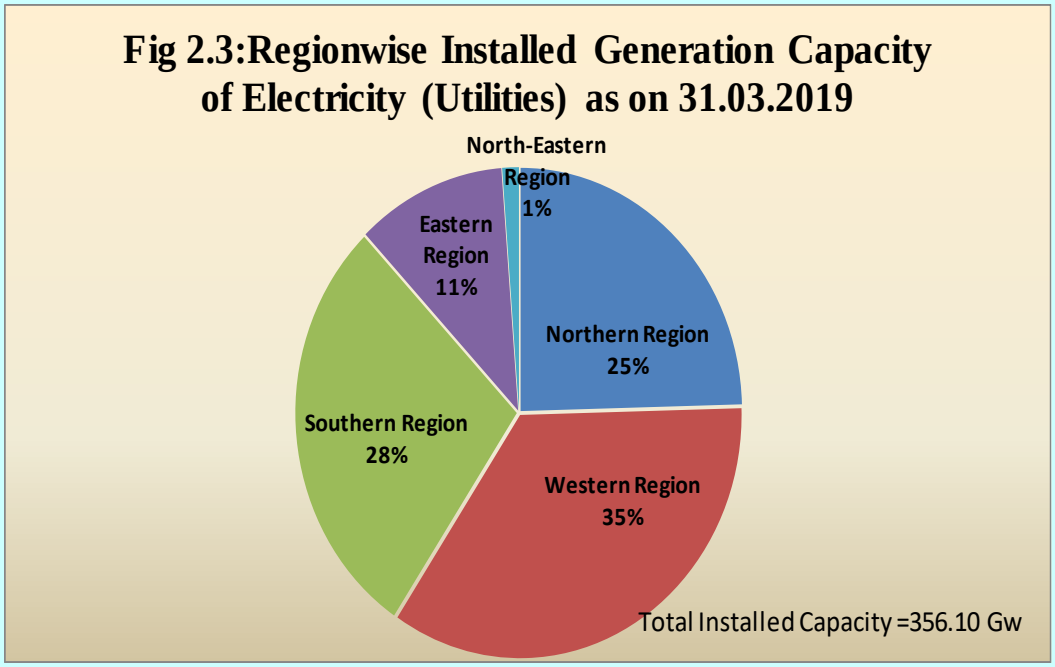


The highest rate of annual growth from 2017-18 to 2018-19 in installed capacity in utilities is from Other Renewable Sources (ORS- 12.5%) followed by Thermal Power (1.5%). Within thermal sources in utility, installed capacity for diesel has fallen by 24 %.

The total installed capacity of power utilities in the country increased from 159398 MW in 31.3.2010 to 356100 MW as on 31.3.2019, with a CAGR of 8.37% over the period. At the end of March 2019, thermal power plants accounted for an overwhelming 68.2% of the total installed capacity in the country, with an installed capacity of 282350MW as compared to share of 69.2% as on March 2018.Other Renewable Sources (excluding hydro) come next with an installed capacity of 79522 MW, accounting for 19.2% of the total installed capacity up from share of 17.7% as on end of March 2018. The share of Hydro and Nuclear energy was only 10.97% and1.64% respectively of total installed capacity as on March 2019. Non-utilities accounted for 14.01% (58000MW) of the total installed electricity generation capacity.



The geographical distribution of installed generating capacity of electricity as on 31.03.2019 indicates that Western Region accounted for the highest share (35%) followed by Southern Region (28%) and Northern Region (25%), Northern Region accounted for the highest share of hydro energy, Western Region of thermal energy and Southern Region of nuclear & other sources of R.E. (Table 2.4).



Region wise growth in the installed capacity during 2018-19 reveals that North Eastern Region (NER)registered highest annual growth of about 10.69%, followed by Western Region (5.42%), Southern Region (4.54%), Eastern Region (1.33%), whereas Northern Region meagre growth

(0.44%). Amongst all the major states Jharkhand registered highest annual growth (77.9%)in the installed capacity.

Grid Interactive Renewable Power

The total installed capacity of grid interactive renewable power, which was 69784.20 MW as on 31.03.2018, had gone up to 78316.44 MW as on 31.03.2019 indicating growth of 12.23% during the period (Table 2.5). Out of the total installed generation capacity of renewable power as on 31.10.2019, Wind power accounted for about 45.5%, followed by Solar power including roof tops(36.0%) and Biomass power (12.5%).

Karnataka had the highest installed capacity of grid connected renewable power (13844.99 MW) followed by Tamil Nadu (12671.13 MW) and Maharashtra (9331.93 MW), mainly on account of wind and solar power.

As on 31.12.2019, out of total number of Biogas plants installed (49.57 lakh), maximum number of plants installed were in Maharashtra (8.99lakh) followed by Andhra Pradesh (5.49 lakh), Karnataka (4.90 lakh), Uttar Pradesh (4.41lakh) and Gujarat (4.33 lakh) (Table 2.6)

As on 31.03.2019, all the villages (total = 5,97,464 as per 2011 census) were electrified (Table 2.7) as compared to 5,97,121 electrified villages on 31.03.2018 accounting for 100.0% electrification in the country.

Table 2.1: Installed Capacity of Coal Washeries in India as on 31.03.2019

Sl. No.	Washery & Operator	State of Location	Capacity (MTY) 31.03.2019*
	COKING COAL :		
1	Dudga-II, CIL	Jharkhand	2.00
2	Bhojudih, CIL	West Bengal	1.70
3	Patherdih, CIL	Jharkhand	Closed
4	Moonidih, CIL	Jharkhand	1.60
5	Sudamdih, CIL	Jharkhand	1.60
6	Mahuda, CIL	Jharkhand	0.63
7	Madhuban,CIL	Jharkhand	2.50
8	Kathara, CIL	Jharkhand	3.00
9	Swang, CIL	Jharkhand	0.75
10	Rajrappa, CIL	Jharkhand	3.00
11	Kedla, CIL	Jharkhand	2.60
12	Nandan, CIL	Madhya Pradesh	1.20
	(A) CIL		**20.58**
13	Durgapur, SAIL	West Bengal	na
14	DCOP, DPL	West Bengal	na
15	Chasnala, IISCO	Jharkhand	1.4
16	Jamadoba, TISCO	Jharkhand	1.3
17	West Bokaro-II, TISCO	Jharkhand	2.5
18	West Boakaro-III,TISCO	Jharkhand	2.56
19	Bhelatand	Jharkhand	1.5
	(B) PSU & Private		**9.26**
	TOTAL COKING (A + B)		**29.84**
	NON-COKING COAL		
1	Dugda-I,CIL	Jharkhand	Closed
2	Gidi,CIL	Jharkhand	2.50
3	Piparwar,CIL	Jharkhand	6.50
4	Kargali,CIL	Jharkhand	2.72
5	Bina,CIL	Uttar Pradesh	4.50
	(A) CIL		**16.22**
6	Dipka, Aryan coal beneficiation pvt. Ltd.	Chattisgarh	14.00
7	Gevra, Aryan coal beneficiation pvt. Ltd.	Chattisgarh	6.25
8	Panderpauni, Aryan coal beneficiation pvt. Ltd.	Maharashtra	2.62
9	Chakabuwa, Aryan Energy private ltd.	Chattisgarh	7.50
10	Himgir, Aryan Energy private ltd.	Odisha	5.00
11	Binjhari, Aryan Energy private ltd.	Chattisgarh	4.80
12	Indaram, Aryan Coal Benefication Pvt.Ltd.	Andhra Pradesh	Closed
13	Talcher, Aryan Energy Pvt. Ltd.	Odisha	2.34

* Provisional

Contd….

NA: Not Available.

Source: Office of Coal Controller, Ministry of Coal

Table 2.1(Contd.): Installed Capacity of Coal Washeries in India as on 31.03.2019

Sl. No.	Washery & Operator	State of Location	Capacity (MTY) 31.03.2019*
14	Wani, Kartikay Coal washeries pvt. ltd.(Aryan)	Maharashtra	2.50
15	Korba, ST-CLI Coal washeries ltd.	Chattisgarh	NA
16	Ramagundam, Gupta coalfield & washeries ltd.	Andhra Pradesh	2.40
17	Sasti, Gupta coalfield & washeries ltd.	Maharashtra	closed
18	Wani, Gupta coalfield & washeries ltd.	Maharashtra	closed
19	Umrer, Gupta coalfield & washeries ltd.	Maharashtra	closed
20	Bhandara, Gupta coalfield & washeries ltd.	Maharashtra	closed
21	Gondegaon, Gupta coalfield & washeries ltd.	Maharashtra	closed
22	Majri, Gupta coalfield & washeries ltd.	Maharashtra	closed
23	Bilaspur, Gupta coalfield & washeries ltd.	Chattisgarh	closed
24	Ghugus, Gupta coalfield & washeries ltd.	Maharashtra	closed
25	Talcher, Global coal Mining (P) Ltd.	Odisha	4.00
26	Ib Valley, Global coal Mining (P) Ltd.	Odisha	3.50
27	Ramagundam, Global coal Mining (P) Ltd.	Andhra Pradesh	1.00
28	Manuguru, Global coal Mining (P) Ltd.	Telengana	0.96
29	Wani, Bhatia International Ltd.	Maharashtra	closed
30	Ghugus, Bhatia International Ltd.	Maharashtra	closed
31	Jharsuguda, Bhatia International Ltd.	Odisha	closed
32	Tamnar, Jindal Steel & Power Ltd.	Chattisgarh	closed
33	Wani, Indo Unique Flame Ltd.	Maharashtra	closed
34	Nagpur, Indo Unique Flame Ltd.	Maharashtra	closed
35	Punwat, Indo Unique Flame Ltd.	Maharashtra	closed
36	Dharamsthal, BLA Industries	Madhya Pradesh	closed
37	Talcher, Spectrum Coal & Power Ltd.	Odisha	9.52
38	Ratija, Spectrum Coal & Power Ltd.	Chattisgarh	11.00
39	Maruti Clean Coal	Chattisgarh	3.33
40	Adani Enterprises Limited	Chattisgarh	15.00
41	Jindal Power Limited	Chattisgarh	4.75
	(B) Private		**100.47**
	TOTAL NON-COKING (A+B)		**116.69**
	Gross Total (Coking + Non-Coking)		**146.53**

* Provisional

Source: Office of Coal Controller, Ministry of Coal

Download Table 2.1

Table 2.2: Installed Capacity and Capacity Utilization of Refineries of Crude Oil during 2017-18 and 2018-19

Sl. No.	Refinery	Refinery Capacity (TMTPA)		Crude Oil Processed (TMT)		Capacity Utilisation (%)		
		31.03.2018	31.03.2019	2017-18	2018-19(P)	2017-18	2018-19	Change in Utilisation
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*
(a)	**PUBLIC SECTOR**	**142066**	**142066**	**145234**	**150976**	**104.51**	**106.27**	**1.76**
	IOCL, Guwahati, Assam	1000	1000	1024	863	102.37	86.32	-16.05
	IOCL, Barauni, Bihar	6000	6000	5819	6661	96.98	111.02	14.04
	IOCL, Koyali, Gujarat	13700	13700	13811	13505	100.81	98.58	-2.24
	IOCL, Haldia, West Bengal	7500	7500	7655	7965	102.07	106.20	4.12
	IOCL, Mathura, Uttar Pradesh	8000	8000	9240	9737	115.50	121.71	6.20
	IOCL, Digboi, Assam	650	650	666	676	102.40	103.93	1.52
	IOCL, Panipat, Haryana	15000	15000	15654	15281	104.36	101.87	-2.49
	IOCL, Bongaigaon, Assam	2350	2350	2402	2513	102.20	106.93	4.73
	IOCL, Paradip, Odisha	15000	15000	12730	14616	84.87	97.44	12.57
	Total IOC	**69200**	**69200**	**69001**	**71816**	**99.71**	**103.78**	**4.07**
	BPCL, Mumbai, Maharashtra	12000	12000	14054	14773	117.12	123.11	5.99
	BPCL, Kochi, Kerala	15500	15500	14095	16051	113.67	103.55	-10.11
	Total BPCL	**27500**	**27500**	**28149**	**30823**	**115.36**	**112.09**	**-3.28**
	HPCL, Mumbai, Maharashtra	7500	7500	8641	8671	115.22	115.61	0.40
	HPCL, Visakh, Andhra Pradesh	8300	8300	9635	9773	116.08	117.75	1.66
	Total HPCL	**15800**	**15800**	**18276**	**18444**	**115.67**	**116.73**	**1.06**
	CPCL, Manali, Tamil Nadu	10500	10500	10289	10271	97.99	97.82	-0.17
	CPCL, Narimanam, Tamil Nadu	1000	1000	500	423	50.02	42.34	-7.68
	Total CPCL	**11500**	**11500**	**10789**	**10695**	**93.82**	**93.00**	**-0.82**
	NRL, Numaligarh, Assam	3000	3000	2809	2900	93.65	96.68	3.03
	ONGC, Tatipaka, Andhra Pradesh	66	66	80	66	120.58	100.24	-20.34
	MRPL, Mangalore, Karnataka	15000	15000	16130	16231	107.53	108.21	0.68
(b)	**PRIVATE SECTOR**	**88200**	**88200**	**91163**	**88041**	**113.95**	**99.82**	**-14.13**
	RIL, Jamnagar, Gujarat	33000	33000	33153	31752	100.46	96.22	-4.24
	RIL, SEZ-Jamnagar, Gujarat	35200	35200	37317	37393	138.21	106.23	-31.98
	ESSAR Oil Ltd. Vadinar	20000	20000	20693	18896	103.46	94.48	-8.99
(c)	**JOINT VENTURE**	**17300**	**19100**	**15538**	**18189**	**103.59**	**105.14**	**1.55**
	BORL, Bina, M.P.	6000	7800	6708	5716	111.80	95.26	-16.53
	HMEL, GGS, Bathinda, Punjab	11300	11300	8830	12473	98.11	110.38	12.27
	Total (a+b+c)	**247566**	**249366**	**251935**	**257205**	**107.68**	**103.89**	**-3.79**

Note: 1.Total may not tally due to rounding off P:Provisional

2. Crude throughput in terms of crude oil processed.

3. Capacity utilisation is equal to crude oil processsed in current year divided by refineing capacity at the end of previous year*100

Source: M/o Petroleum & Natural Gas

Download Table 2.2

Table 2.3 (A) : Installed Electicity Generation Capacity in Utilities and Non-utilities in India from 2009-10 to 2018-19

(in Mega Watt = 10^3 Kilo Watt)

As on	Utilities							
	Thermal				Hydro	Nuclear	ORS*	Total
	Steam	Diesel	Gas	Total				
1	2	3	4	5	6	7	8	9
31.03.2010	84,198	1,200	17,056	102,454	36,863	4,560	15,521	159,398
31.03.2011	93,918	1,200	17,706	112,824	37,567	4,780	18,455	173,626
31.03.2012	112,022	1,200	18,381	131,603	38,990	4,780	24,503	199,877
31.03.2013	130,221	1,200	20,110	151,530	39,491	4,780	27,542	223,344
31.03.2014	145,273	1,200	21,782	168,255	40,531	4,780	34,988	248,554
31.03.2015	164,636	1,200	23,062	188,898	41,267	5,780	38,959	274,904
31.03.2016	185,173	994	24,509	210,675	42,783	5,780	45,924	305,162
31.03.2017	192,163	838	25,329	218,330	44,478	6,780	57,244	326,833
31.03.2018	197,172	838	24,897	222,907	45,293	6,780	69,022	344,002
31.03.2019(P)	200,705	638	24,937	226,279	45,399	6,780	77,642	356,100
Growth rate of 2018-19 over 2017-18(%)	**1.79**	**-23.88**	**0.16**	**1.51**	**0.23**	**0.00**	**12.49**	**3.52**
CAGR 2009-10 to 2018-19(%)**	**9.08**	**-6.13**	**3.87**	**8.25**	**2.10**	**4.05**	**17.47**	**8.37**

Note: Data for RES has been revised with respect to year 2014, 2015 along with 2016 as per the data supplied by CEA

* RES= Renewable Energy Sources excluding Hydro

** 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 2.3 (B) : Installed Electricity Generation Capacity in Utilities and Non-utilities in India from 2009-10 to 2018-19

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

As on	Non-Utilities							Grand Total (Utility + Non-Utility)
	Thermal				Hydro	RES*	Total	
	Steam	Diesel	Gas	Total				
	10	11	12	13	14	15	16	17= 9+16
31.03.2010	17,183	9,457	4,368	31,008	55	454	31,517	190,915
31.03.2011	19,112	9,655	5,054	33,821	57	567	34,444	208,071
31.03.2012	22,615	9,955	5,885	38,456	48	872	39,375	239,252
31.03.2013	23,890	11,148	4,498	39,535	67	1,124	40,726	264,070
31.03.2014	24,752	11,432	4,751	40,935	64	1,259	42,258	290,812
31.03.2015	26,089	12,009	5,193	43,291	65	1,301	44,657	319,561
31.03.2016	28,688	12,347	5,819	46,853	59	1,368	48,279	353,442
31.03.2017	30,572	13,350	6,109	50,031	65	1,433	51,529	378,362
31.03.2018	32,854	13,145	7,156	53,155	51	1,726	54,933	398,935
31.03.2019	34,833	13,485	7,753	56,071	48	1,881	58,000	414,100
Growth rate of 2018-19 over 2017-18(%)	**6.02**	**2.59**	**8.34**	**5.48**	**-5.30**	**8.96**	**5.58**	**3.80**
CAGR 2009-10 to 2018-19(%)**	**7.32**	**3.61**	**5.91**	**6.10**	**-1.30**	**15.28**	**6.29**	**8.05**

* RES= Renewable Energy Sources excluding Hydro

** 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.

Download Table 2.3

Table 2.4 : Regionwise and Statewise Installed Generating Capacity of Electricity (Utilities) in India as on 31.03.2018 and 31.03.2019

(in Gw)

States/UTs	Hydro		Thermal		Nuclear		RES*		Total		Growth Rate (2018-19 to 2017-18) (%)
	31.03.18	31.03.19	31.03.18	31.03.19	31.03.18	31.03.19	31.03.18	31.03.19	31.03.18	31.03.19	
Chandigarh	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.03	**37.74**
Delhi	0.00	0.00	2.49	2.49	0.00	0.00	0.12	0.18	2.61	2.67	**2.19**
Haryana	1.08	1.10	5.03	5.03	0.00	0.00	0.41	0.41	6.53	6.55	**0.40**
Himachal Pradesh	2.48	2.48	0.00	0.00	0.00	0.00	0.85	0.88	3.33	3.36	**0.88**
Jammu & Kashmir	1.23	1.23	0.18	0.18	0.00	0.00	0.18	0.19	1.59	1.60	**0.85**
Punjab	2.57	2.60	7.78	6.92	0.00	0.00	1.28	1.28	11.64	10.80	**-7.15**
Rajasthan	1.09	1.10	9.65	10.31	0.00	0.00	6.48	7.33	17.22	18.73	**8.79**
Uttar Pradesh	0.72	0.72	12.87	12.77	0.00	0.00	2.65	2.91	16.24	16.41	**1.06**
Uttarakhand	1.98	1.98	0.55	0.55	0.00	0.00	0.55	0.59	3.08	3.13	**1.52**
Central Sector NR	8.60	8.60	14.27	13.56	1.62	1.62	0.33	0.38	24.81	24.16	**-2.64**
Sub-Total (NR)	19.75	19.81	52.82	51.82	1.62	1.62	12.87	14.20	87.07	87.45	**0.44**
Chhattisgarh	0.12	0.12	16.09	16.45	0.00	0.00	0.54	0.54	16.74	17.10	**2.15**
Gujarat	0.77	0.77	19.63	19.63	0.00	0.00	7.06	8.40	27.46	28.80	**4.88**
Madhya Pradesh	1.70	1.70	9.83	11.75	0.00	0.00	3.72	4.26	15.25	17.72	**16.16**
Maharashtra	3.33	3.33	24.29	24.29	0.00	0.00	8.46	9.19	36.07	36.81	**2.04**
Daman & Diu	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	**36.38**
D. & N. Haveli	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	**-**
Goa	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.05	0.05	**6.15**
Central Sector WR	1.52	1.52	17.90	19.36	1.84	1.84	0.66	0.67	21.92	23.39	**6.68**
Sub-Total (WR)	7.45	7.45	87.78	91.52	1.84	1.84	20.45	23.08	117.52	123.89	**5.42**
Andhra Pradesh	1.67	1.67	12.72	12.84	0.00	0.00	6.48	7.49	20.87	22.00	**5.43**
Telangana	2.45	2.48	5.87	6.25	0.00	0.00	3.65	3.98	11.97	12.71	**6.17**
Karnataka	3.60	3.59	7.23	7.23	0.00	0.00	12.44	13.83	23.27	24.65	**5.92**
Kerala	1.88	1.86	0.33	0.33	0.00	0.00	0.33	0.36	2.54	2.55	**0.34**
Tamil Nadu	2.20	2.18	8.71	8.51	0.00	0.00	10.98	12.41	21.90	23.10	**5.51**
Puducherry	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.03	0.04	**9.12**
Lakshadweep	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Central Sector SR #	0.00	0.00	12.85	12.75	3.32	3.32	0.49	0.54	16.66	16.61	**-0.30**
Sub-Total (SR)	11.81	11.77	47.75	47.95	3.32	3.32	34.37	38.62	97.25	101.66	**4.54**
Bihar	0.00	0.00	0.71	0.00	0.00	0.00	0.33	0.33	1.04	0.33	**-68.52**
Jharkhand	0.13	0.13	1.20	2.25	0.00	0.00	0.03	0.04	1.36	2.42	**77.90**
Odisha	2.06	2.06	4.22	4.22	0.00	0.00	0.18	0.50	6.47	6.78	**4.87**
West Bengal	0.99	0.99	7.65	7.54	0.00	0.00	0.44	0.47	9.07	9.00	**-0.77**
Sikkim	0.76	0.76	0.00	0.00	0.00	0.00	0.05	0.05	0.81	0.81	**0.00**
A. & N. Islands	0.00	0.00	0.04	0.04	0.00	0.00	0.01	0.01	0.05	0.05	**11.06**
Central Sector ER $	1.01	1.01	18.47	18.38	0.00	0.00	0.02	0.02	19.49	19.40	**-0.46**
Sub-Total (ER)	4.94	4.94	32.29	32.43	0.00	0.00	1.05	1.42	38.28	38.79	**1.33**
Arunachal Pradesh	0.00	0.00	0.00	0.00	0.00	0.00	0.11	0.14	0.11	0.14	**24.09**
Assam	0.10	0.10	0.31	0.35	0.00	0.00	0.05	0.03	0.46	0.48	**5.38**
Manipur	0.00	0.00	0.04	0.04	0.00	0.00	0.01	0.01	0.04	0.04	**8.14**
Meghalaya	0.32	0.32	0.00	0.00	0.00	0.00	0.03	0.03	0.35	0.35	**0.45**
Mizoram	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.04	0.04	0.04	**0.82**
Nagaland	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.03	**0.00**
Tripura	0.00	0.00	0.17	0.17	0.00	0.00	0.02	0.02	0.19	0.19	**0.00**
Central Sector NER	0.92	1.01	1.75	2.00	0.00	0.00	0.01	0.03	2.68	3.04	**13.44**
Sub-Total (NER)	1.34	1.43	2.27	2.56	0.00	0.00	0.28	0.32	3.90	4.31	**10.69**
Total States	**33.25**	**33.27**	**157.66**	**160.22**	**0.00**	**0.00**	**67.52**	**76.01**	**258.44**	**269.50**	**4.28**
Total Central	**12.04**	**12.13**	**65.24**	**66.06**	**6.78**	**6.78**	**1.50**	**1.63**	**85.57**	**86.60**	**1.20**
Total All India	**45.29**	**45.40**	**222.91**	**226.28**	**6.78**	**6.78**	**69.02**	**77.64**	**344.00**	**356.10**	**3.52**

$ Damodar Valley Corporation (DVC) installed capacity is considered under central sector(ER)

* RES: Renewable Energy Sources excluding hydro

Includes NLC-Central capacity also

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

Source : Central Electricity Authority.

Download Table 2.4

Table 2.5: State-wise cumulative installed capacity of Grid Interactive Renewable Power as on 31.03.2018 and 31.03.2019

S. No.	STATES / UTs	Small Hydro Power (MW)		Wind Power (MW)		Power/Cogen (MW)		Waste to Energy (MW)		Solar Power (MW)		Total Capacity (MW)		Growth* Rate(2017-18 to 2018-19)
		2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018	2019	
1	Andhra Pradesh	162.11	162.11	3966.95	4090.45	477.18	477.18	23.16	23.16	2195.46	3085.68	6824.86	7838.58	**14.85**
2	Arunachal Pradesh	104.61	131.11	-	-	-	-	-	-	5.39	5.39	110.00	136.50	**24.09**
3	Assam	34.11	34.11	-	-	-	-	-	-	12.45	22.40	46.56	56.51	**21.37**
4	Bihar	70.70	70.70	-	-	121.20	121.20	-	-	142.45	142.45	334.35	334.35	**0.00**
5	Chhatisgarh	76.00	76.00	-	-	230.50	230.50	-	-	231.35	231.35	537.85	537.85	**0.00**
6	Goa	0.05	0.05	-	-	-	-	-	-	0.91	3.92	0.96	3.97	**313.54**
7	Gujarat	28.60	61.30	5613.42	6073.07	65.30	77.30	-	-	1588.00	2440.13	7295.32	8651.80	**18.59**
8	Haryana	73.50	73.50	-	-	205.66	205.66	-	-	216.85	224.52	496.01	503.68	**1.55**
9	Himachal Pradesh	853.11	860.61	-	-	7.20	7.20	-	-	0.73	22.68	861.04	890.49	**3.42**
10	Jammu & Kashmir	179.03	179.03	-	-	-	-	-	-	1.36	14.83	180.39	193.86	**7.47**
11	Jharkhand	4.05	4.05	-	-	4.30	4.30	-	-	25.67	34.95	34.02	43.30	**27.28**
12	Karnataka	1230.73	1254.73	4608.40	4694.90	1768.80	1798.80	1.00	1.00	4944.12	6095.56	12553.05	13844.99	**10.29**
13	Kerala	219.02	222.02	52.50	52.50	0.72	0.72	-	-	107.94	138.59	380.18	413.83	**8.85**
14	Madhya Pradesh	86.16	95.91	2519.89	2519.89	105.35	105.35	15.40	15.40	1305.35	1840.16	4032.15	4576.71	**13.51**
15	Maharashtra	373.18	375.57	4783.93	4794.13	2186.40	2516.10	12.59	12.59	1239.18	1633.54	8595.28	9331.93	**8.57**
16	Manipur	5.45	5.45	-	-	-	-	-	-	0.06	3.44	5.51	8.89	**61.34**
17	Meghalaya	31.03	32.53	-	-	13.80	13.80	-	-	0.02	0.12	44.85	46.45	**3.57**
18	Mizoram	36.47	36.47	-	-	-	-	-	-	0.20	0.50	36.67	36.97	**0.82**
19	Nagaland	30.67	30.67	-	-	-	-	-	-	1.00	1.00	31.67	31.67	**0.00**
20	Odisha	64.63	64.63	-	-	59.22	59.22	-	-	79.57	394.73	203.42	518.58	**154.93**
21	Punjab	173.55	173.55	-	-	317.10	317.10	9.25	9.25	905.62	905.62	1405.52	1405.52	**0.00**
22	Rajasthan	23.85	23.85	4297.72	4299.72	121.30	121.30	-	-	2332.77	3226.79	6775.64	7671.66	**13.22**
23	Sikkim	52.11	52.11	-	-	-	-	-	-	0.00	0.01	52.11	52.12	**0.02**
24	Tamil Nadu	123.05	123.05	8197.09	8968.91	954.55	997.55	6.40	6.40	1908.57	2575.22	11189.66	12671.13	**13.24**
25	Telangana	90.87	90.87	100.80	128.10	159.10	159.10	18.50	18.50	3291.25	3592.09	3660.52	3988.66	**8.96**
26	Tripura	16.01	16.01	-	-	-	-	-	-	5.09	5.09	21.10	21.10	**0.00**
27	Uttar Pradesh	25.10	25.10	-	-	2115.51	2115.51	-	-	694.41	960.10	2835.02	3100.71	**9.37**
28	Uttarakhand	214.32	214.32	-	-	130.50	130.50	-	-	260.08	306.75	604.90	651.57	**7.72**
29	West Bengal	98.50	98.50	-	-	319.92	319.92	-	-	37.32	75.95	455.74	494.37	**8.48**
30	Andaman & Nicobar	5.25	5.25	-	-	-	-	-	-	6.56	11.73	11.81	16.98	**43.78**
31	Chandigarh	-	-	-	-	-	-	-	-	25.20	34.71	25.20	34.71	**37.74**
32	Dadar & Nagar Haveli	-	-	-	-	-	-	-	-	5.46	5.46	5.46	5.46	**0.00**
33	Daman & Diu	-	-	-	-	-	-	-	-	10.61	14.47	10.61	14.47	**36.38**
34	Delhi	-	-	-	-	-	-	52.00	52.00	69.57	126.89	121.57	178.89	**47.15**
35	Lakshwadeep	-	-	-	-	-	-	-	-	0.75	0.75	0.75	0.75	**0.00**
36	Puducherry	-	-	-	-	-	-	-	-	0.16	3.14	0.16	3.14	**1862.50**
37	Others	-	-	4.30	4.30	-	-	-	-	-	-	4.30	4.30	**0.00**
Total (MW)		**4485.81**	**4593.15**	**34145.00**	**35625.97**	**9363.61**	**9778.31**	**138.30**	**138.30**	**21651.48**	**28180.71**	**69784.20**	**78316.44**	**12.23**

Source: Ministry of New and Renewable Eneergy

Download Table 2.5

Table 2.6 : Installation of Off-grid / Decentralised Renewable Energy Systems/ Devices as on 31.12.2019

Sl. No.	State/UT	Biogas Plants (Nos in Lakh.)	SPV Pumps (Nos.)	Solar Photovoltaic (SPV) Systems				Aerogen/Aerogen/systems (KW.)	Waste to Energy (MW)
				SLS (Nos.)	HLS (Nos.)	SL (Nos.)	PP (KWP)		
1	2	3	4	5	6	7	8	9	10
1	Andhra Pradesh	5.49	34,045	8,992	22,972	77,803	3,816	272.5	25.21
2	Arunachal Pradesh	0.03	22	5,008	35,065	18,551	963	6.8	-
3	Assam	1.28	45	9,554	46,879	642,996	1,605	6.0	-
4	Bihar	1.30	2,813	34,468	12,303	1,725,478	6,770	-	1.00
5	Chhattisgarh	0.54	61,970	2,042	42,232	3,311	31,250	-	0.33
6	Goa	0.04	15	707	393	1,093	33	193.8	0.00
7	Gujarat	4.33	11,522	3,267	9,253	31,603	13,577	20.0	19.25
8	Haryana	0.62	1,293	34,625	56,727	93,853	2,321	10.0	4.89
9	Himachal Pradesh	0.48	6	78,000	22,592	33,909	1,906	-	1.00
10	Jammu & Kashmir	0.03	39	14,156	144,316	51,224	8,130	95.6	-
11	Jharkhand	0.07	4,670	12,286	9,450	790,515	3,770	-	-
12	Karnataka	4.90	7,420	2,694	52,638	7,781	7,754	39.2	13.62
13	Kerala	1.49	818	1,735	41,912	54,367	15,825	8.0	0.23
14	Madhya Pradesh	3.64	17,813	11,496	7,920	529,101	3,654	24.0	2.50
15	Maharashtra	8.99	9,337	10,420	3,497	239,297	3,858	1,779.5	31.04
16	Manipur	0.02	40	11,205	24,583	9,058	1,581	140.0	-
17	Meghalaya	0.10	19	5,800	14,874	40,750	2,004	201.5	-
18	Mizoram	0.05	37	5,325	12,060	10,512	2,956	21.2	-
19	Nagaland	0.08	3	6,235	1,045	6,766	1,506	20.0	-
20	Odisha	2.70	9,551	17,111	5,274	99,843	568	13.1	-
21	Punjab	1.77	4,413	42,758	8,626	17,495	2,066	50.0	7.46
22	Rajasthan	0.71	48,175	7,114	187,968	225,851	30,349	14.0	3.83
23	Sikkim	0.09	-	504	15,059	23,300	850	15.5	-
24	Tamil Nadu	2.23	5,459	39,419	296,505	16,818	12,753	256.7	16.57
25	Telangana	0.24	424	1,958	-	-	7,450	-	4.09
26	Tripura	0.04	151	1,199	32,723	64,282	867	2.0	-
27	Uttar Pradesh	4.41	20,546	264,179	235,909	2,284,425	10,638	-	50.24
28	Uttarakhand	0.21	26	25,168	91,595	163,386	3,145	24.0	8.72
29	West Bengal	3.67	653	8,726	145,332	17,662	1,730	74.0	1.17
30	Andaman & Nicobar	-	5	390	468	6,296	167	-	-
31	Chandigarh	-	12	898	275	1,675	730	-	-
32	Dadar & Nagar Haveli	-	-	-	-	-	0	-	-
33	Daman & Diu	-	-	-	-	-	0	-	-
34	Delhi	0.01	90	301	-	4,807	1,269	-	-
35	Lakshadweep	-	-	2,465	600	5,289	2,190	-	-
36	Puducherry	0.01	21	417	25	1,637	121	5.0	-
37	Others*	0.02	4,621	9,150	140,273	125,797	23,885	-	-
	Total	**49.57**	**246,074**	**679,772**	**1,721,343**	**7,426,531**	**212,057**	**3,292**	**191**

* 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

Source : Ministry of New and Renewable Energy

Download Table 2.6

Table: 2.7: State-wise Number of Villages Electrified

Sl. No.	States/ UTs	No. of villages as per 2011 Census	No. of villages Electrified as on 31.3.2018	No. of villages Electrified as on 31.03.2019	Percentage
1	Andhra Pradesh	16158	16158	16158	100.0
2	Arunachal Pradesh	5258	5035	5258	100.0
3	Assam	25372	25372	25372	100.0
4	Bihar	39073	39073	39073	100.0
5	Chhatisgarh	19567	19534	19567	100.0
6	Goa	320	320	320	100.0
7	Gujarat	17843	17843	17843	100.0
8	Haryana	6642	6642	6642	100.0
9	Himachal Pradesh	17882	17882	17882	100.0
10	Jammu & Kashmir	6337	6271	6337	100.0
11	Jharkhand	29492	29492	29492	100.0
12	Karnataka	27397	27397	27397	100.0
13	Kerala	1017	1017	1017	100.0
14	Madhya Pradesh	51929	51924	51929	100.0
15	Maharashtra	40956	40956	40956	100.0
16	Manipur	2379	2379	2379	100.0
17	Meghalaya	6459	6459	6459	100.0
18	Mizoram	704	704	704	100.0
19	Nagaland	1400	1400	1400	100.0
20	Odisha	47677	47674	47677	100.0
21	Punjab	12168	12168	12168	100.0
22	Rajasthan	43264	43264	43264	100.0
23	Sikkim	425	425	425	100.0
24	Tamil Nadu	15049	15049	15049	100.0
25	Telangana	10128	10128	10128	100.0
26	Tripura	863	863	863	100.0
27	Uttar Pradesh	97813	97813	97813	100.0
28	Uttarakhand	15745	15732	15745	100.0
29	West Bengal	37463	37463	37463	100.0
30	Andaman & Nicobar	396	396	396	100.0
31	Chandigarh	5	5	5	100.0
32	Dadar & Nagar Haveli	65	65	65	100.0
33	Daman & Diu	19	19	19	100.0
34	Delhi	103	103	103	100.0
35	Lakshwadeep	6	6	6	100.0
36	Puducherry	90	90	90	100.0
Total		**597464**	**597121**	**597464**	100.0

Source: Central Electricity Authority

Download Table 2.7

CHAPTER 3: PRODUCTION OF COMMERCIAL SOURCES OF ENERGY

Production of Coal, Lignite, Crude Oil, Natural Gas& Electricity

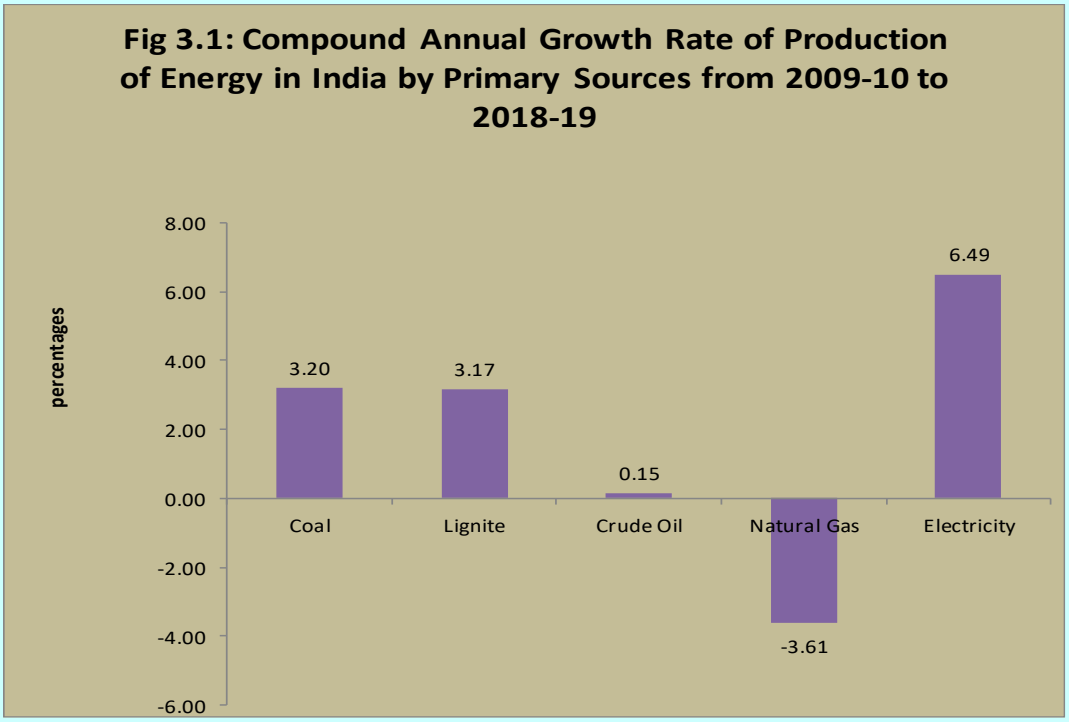
Coal production in the country during the year 2018-19 was 728.72 million tonne(MTs) as compared to 675.40 MTs during 2017-18, registering a growth of 7.89%(Table 3.1). Considering the trend of production from 2009-10 to 2018-19, it is observed that coal production in India was about 532.04 MTs during 2009-10, which increased to 728.72 MTs during 2018-19 with a CAGR of 3.2%.

The Lignite production during 2018-19 was 44.28 million tonnes which is 5.06% lower than the production during 2017-18 (46.64 million tonnes). During the same period, the CAGR of Lignite was about 2.66% with production increasing from 34.07 MTs in 2009-10 to 44.28 MTs in 2018-19.

Production of crude oil for 2018-19 was 34.2 MT as compared to 35.7 in 2017-18 which is a fall of 4.2%.

The CAGRs for natural gas and electricity were (-) 3.61% and 6.49% respectively for the period 2009-10 to 2018-19. Electricity has experienced the highest CAGR among all the commercial sources of energy since 2009-10 to 2018-19.

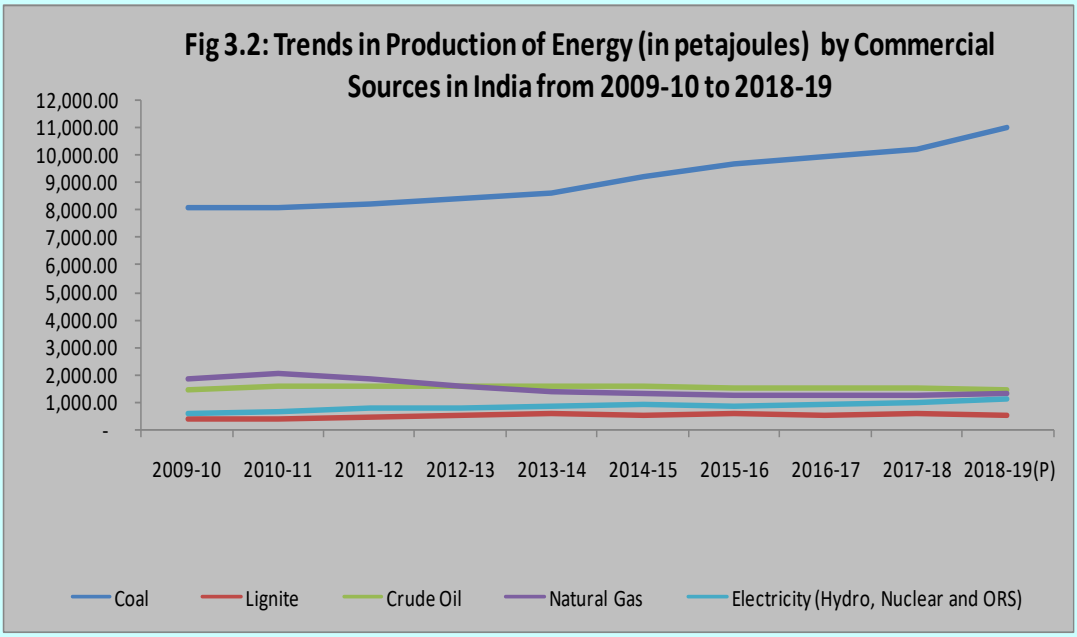
Fig 3.1: Compound Annual Growth Rate of Production of Energy in India by Primary Sources from 2009-10 to 2018-19



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

The total production of energy from commercial sources increased from 14459.45 petajoules during 2017-18 to 15305.18 petajoules during 2018-19, showing an increase of 5.85%(Table 3.2).

The production of energy in petajoules by commercial sources shows that Coal was the major source of energy, accounting for about 72.04% of the total production during 2018-19. Crude Oil was the second (9.36%), while Natural Gas (8.27%) was the third major source. Electricity (from hydro, nuclear & other Renewable Sources (ORS)) and lignite contributed 7.04% and 3.29% respectively.



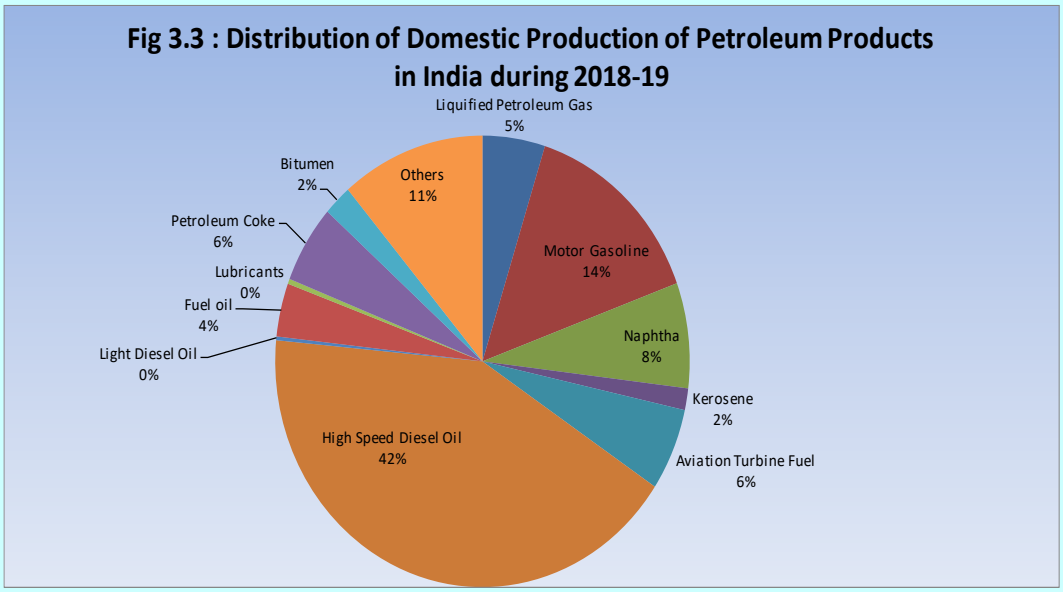
While production of coal increased by 7.9% in 2018-19 over 2017-18, production of lignite experienced a fall of 5% during that period. Non-coking coal accounts for 89% of coal and lignite (Table 3.3)

Out of the total coking coal production of 41.13 MT in the country, 84.5% is produced by public sector, whereas for the private sector, the share of production is 15.5%. A similar pattern is observed for the production of non-coking coal in the country, where the public sector contributes a significant 95.7% (607.85 MTs) of the total production (635.25MT) and the private sector producing only 4.3% of non-coking coal in the country (27.4 MTs) (Table 3.3A & B).

Production of Petroleum Products and Natural Gas

In the year 2018-19, the production of Petroleum Products in the country was 262.36 MT as against 254.4MT during 2017-18, an increase of 3.13%. In the total production of Petroleum products during 2018-19, High speed diesel oil accounted for the maximum share (42.13%), followed by Motor Gasoline (14.50%). (Table 3.4).

Net production of Natural Gas for consumption increased from 31.58 Billion Cubic Meters(BCM) in 2017-18 to 31.96 BCM in 2018-19 registering a growth of 1.18% (Table 3.5).



Generation of electricity

The All India gross electricity generation from utilities, excluding that from the captive generating plants, was 7,99,851 Giga Watt-Hours(GWh) during 2009-10. It rose to 13,71,779 GWh during 2018-19(Table 3.6). The production of electricity from utilities has increased from 13, 03,493 GWh during 2017-18 to 13,71,779 GWh during 2018-19, registering an annual growth of about 5.24%.

Total Electricity generation in the country, from utilities and non-utilities taken together during 2018-19 was 15,46,779 GWh. Out of the total electricity generated through utilities, 10,72,314 GWh was generated from thermal and 1,34,894 GWh was from hydro, 37,813 GWh was generated from nuclear and 1,26,759 Gwh was from other renewable sources. Total output from non-utilities was 1,75,000 GWh.

Table 3.1 : Production of Energy in India by Commercial Sources

Year	Coal (million tonnes	Lignite (million tonnes)	Crude Oil (million tonnes)	Natural Gas (Billion Cubic Metres)	Electricity* (GWh)
1	2	3	4	5	6
2009-10	532.04	34.07	33.69	47.50	159,642.84
2010-11	532.69	37.73	37.68	52.22	179,926.46
2011-12	539.95	42.33	38.09	47.56	214,024.08
2012-13	556.40	46.45	37.86	40.68	204,035.31
2013-14	565.77	44.27	37.79	35.41	234,595.01
2014-15	612.44	48.27	37.46	33.66	238,908.43
2015-16	639.23	43.84	36.94	32.25	224,571.11
2016-17	657.87	45.23	36.01	31.90	241,841.64
2017-18	675.40	46.64	35.68	32.65	266,308.30
2018-19(P)	728.72	44.28	34.20	32.87	299,465.00
Growth rate of 2018-19 over 2017-18(%)	**7.89**	**-5.06**	**-4.15**	**0.67**	**12.45**
CAGR 2009-10 to 2018-19 (%)	**3.20**	**2.66**	**0.15**	**-3.61**	**6.49**

(p): provisional

* Electricity from Hydro, Nuclear and other Renewable energy sources.

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

Download Table 3.1

Table 3.2 : Production of Energy in India by Commercial Sources

(in Petajoules) @

Year	Coal	Lignite	Crude Oil	Natural Gas	Electricity *	Total
1	2	3	4	5	6	7= 2 to 6
2009-10	8,049.80	387.39	1,410.60	1,829.70	574.71	12,252.20
2010-11	8,059.66	429.02	1,577.66	2,011.51	647.74	12,725.60
2011-12	8,169.44	481.31	1,594.83	1,832.01	770.49	12,848.08
2012-13	8,418.33	528.17	1,585.20	1,566.99	734.53	12,833.22
2013-14	8,560.10	503.36	1,582.27	1,363.99	844.54	12,854.26
2014-15	9,266.22	548.83	1,568.45	1,296.58	860.07	13,540.15
2015-16	9,671.55	498.48	1,546.68	1,242.27	808.46	13,767.44
2016-17	9,953.54	514.27	1,507.74	1,228.79	870.63	14,090.50
2017-18	10,218.80	530.34	1,493.92	1,257.68	958.71	14,459.45
2018-19(P)	11,025.50	503.50	1,431.95	1,266.15	1,078.07	15,305.18
Growth rate of 2018-19 over 2017-18(%)	**7.89**	**-5.06**	**-4.15**	**0.67**	**12.45**	**5.85**
CAGR 2009-10 to 2018-19 (%)	**3.20**	**2.66**	**0.15**	**-3.61**	**6.49**	**2.25**

(P): provisional

* Electricity from hydro, Nuclear and other Renwable energy sources.

@ Conversion factors have been applied to convert production of primary sources of energy into petajoules

Sources:

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

Download Table 3.2

Table 3.3 :Production of Coal and Lignite in India.

(Million Tonnes)

Year	Coal			Lignite	Grand Total
	Coking	Non-coking	Total		
1	2	3	4=(2)+(3)	5	6=(4)+(5)
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	51.66	488.29	539.95	42.33	582.28
2012-13	51.58	504.82	556.40	46.45	602.86
2013-14	56.82	508.95	565.77	44.27	610.04
2014-15	57.45	551.73	609.18	48.27	657.45
2015-16	60.89	578.34	639.23	43.84	683.07
2016-17	61.66	596.21	657.87	45.23	703.10
2017-18	40.15	635.25	675.40	46.64	722.04
2018-19(P)	41.13	687.59	728.72	44.28	773.00
Growth rate of 2018-19 over 2017-18(%)	**2.45**	**8.24**	**7.89**	**-5.06**	**7.06**
CAGR 2009-10 to 2018-19 (%)	**-0.76**	**3.50**	**3.20**	**2.66**	**3.16**

(P): Provisional

Source : Office of Coal Controller of India

Download Table 3.3

Table 3.3 A: Grade Wise Production of Coking Coal by Companies in 2017-18 & 2018-19

(Million Tonnes)

Grade of Coaking Coal	Public		Private		All India		Percentage Change
	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	
Steel-I	0.16	0.04	-	-	0.16	0.04	-77.42
Steel-II	0.05	-	-	-	0.05	-	-
SC-1	0.18	0.25	-	-	0.18	0.25	35.71
Wash-I	0.18	0.06	-	-	0.18	0.06	-67.05
Wash-II	4.36	3.89	0.20	0.45	4.55	4.34	-4.70
Wash-III	3.60	5.94	0.40	0.64	3.99	6.58	64.80
Wash-IV	25.41	24.42	5.63	5.46	31.04	29.88	-3.76
Wash-V	-	-	-	0.00	-	0.00	-
SLV1	0.00	-	0.00	0.00	0.00	0.00	-
All India Total	**33.92**	**34.58**	**6.22**	**6.55**	**40.15**	**41.13**	**2.45**
Met.Coal	**8.94**	**6.75**	**6.32**	**6.22**	**15.25**	**12.98**	**-14.92**
Non Met	**46.41**	**27.17**	-	-	**46.41**	**27.17**	**-41.45**
All India Total	**55.35**	**33.92**	**6.32**	**6.22**	**61.66**	**40.15**	**-34.89**

Table 3.3 B: Grade Wise Production of Non-Coking Coal by Companies in 2017-18 & 2018-19

(Million Tonnes)

Grade of Non-Coaking Coal	Public		Private		All India		Percentage Change
	2017-18	2018-19	2017-18	2018-19	2017-18	2018-19	
1	0.18	0.09	1.53	-	1.71	0.09	-94.91
2	0.26	0.48	-	-	0.26	0.48	81.82
3	3.51	3.31	-	-	3.51	3.31	-5.66
4	14.54	15.17	-	-	14.54	15.17	4.39
5	14.73	12.80	-	-	14.73	12.80	-13.12
6	10.87	7.13	-	0.80	10.87	7.93	-27.02
7	35.48	41.11	1.34	0.40	36.82	41.51	12.74
8	40.65	52.76	0.33	1.66	40.98	54.42	32.80
9	27.55	35.37	0.00	0.22	27.55	35.59	29.20
10	82.38	75.44	9.10	8.62	91.48	84.07	-8.10
11	165.84	184.99	14.14	14.71	179.98	199.70	10.96
12	52.72	65.53	0.70	0.77	53.42	66.30	24.11
13	101.74	111.21	-	-	101.74	111.21	9.30
14	44.37	41.04	0.27	-	44.64	41.04	-8.06
15	7.89	6.89	-	-	7.89	6.89	-12.78
16	3.54	3.85	-	-	3.54	3.85	8.55
17	1.47	3.10	-	-	1.47	3.10	111.04
UNG	0.13	0.14	-	-	0.13	0.14	4.55
Total Non-Coaking Coal	**569.851**	**607.851**	**26.356**	**27.402**	**596.207**	**635.253**	**6.55**

Source: Office of Coal Controller of India

Download Table 3.3(A&B)

Table 3.4: Domestic Production of Petroleum Products in India

(Million Tonnes)

Year	Light distillates			Middle distillates			
	LPG	MG	Naphtha	Kerosene	ATF	HSD	LDO
1	2	3	4	5	6	7	8
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	19.02	7.97	10.09	91.10	0.40
2013-14	10.03	30.28	18.51	7.42	11.22	93.76	0.42
2014-15	9.84	32.33	17.39	7.56	11.10	94.43	0.36
2015-16	10.57	35.32	17.86	7.50	11.79	98.59	0.43
2016-17	11.33	36.59	19.95	6.04	13.83	102.48	0.63
2017-18	12.38	37.78	20.01	4.41	14.59	107.90	0.56
2018-19(P)	12.79	38.04	19.79	4.07	15.48	110.53	0.70
Growth rate of 2018-19 over 2017-18(%)	**3.31**	**0.69**	**-1.10**	**-7.71**	**6.10**	**2.44**	**25.00**
CAGR 2009-10 to 2018-19 (%)	**2.16**	**5.37**	**0.52**	**-7.32**	**5.23**	**4.19**	**4.06**

(p) : Provisional LPG=Liquified Petroleum Gas, MG= Motor Gasoline, ATF= Aviation Turbine Fuel
HSD= High Speed Diesel Oil, LDO= Light Diesel Oil

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

(Million Tonnes)

Year	Heavy ends				Others*	Total
	Fuel oil	Lubes	Pet. Coke	Bitumen		
1	9	10	11	12	13	14 (sum of 2
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	17.65	217.74
2013-14	13.41	0.94	12.07	4.79	17.93	220.76
2014-15	11.92	0.95	12.45	4.63	18.19	221.14
2015-16	9.73	1.04	13.32	5.16	20.62	231.92
2016-17	9.96	1.03	13.94	5.19	22.59	243.55
2017-18	9.49	1.04	14.75	5.28	26.21	254.40
2018-19(P)	10.03	0.95	14.68	5.80	29.50	262.36
Growth rate of 2018-19 over 2017-18(%)	**5.75**	**-8.39**	**-0.52**	**9.97**	**12.54**	**3.13**
CAGR 2009-10 to 2018-19 (%)	**-5.86**	**-0.01**	**14.75**	**1.73**	**8.31**	**3.58**

(P): Provisional Lubes= Lubricant, Pet.Coke= Petroleum Coke
$: Includes other Light distillates from 2006-07
* Others include VGO, Benzene, MTO, CBFS, Sulphur, Waxes, MTBE & Reformate, etc.
Source : Ministry of Petroleum & Natural Gas.

Download Table 3.4

Table 3.5 :Gross and Net Production of Natural Gas

(in Billion Cubic Metres)

Year	Gross Production	Internal Consumption	Flared	Losses	Net Production (For Sales)	Net Production (For Consumption)
1	2	3	4	5	6=2-3-4-5	7=2-4-5
2009-10	47.50	5.66	1.10	**	40.74	46.40
2010-11	52.22	5.21	0.97	**	46.04	51.25
2011-12	47.56	5.28	0.97	0.03	41.31	46.56
2012-13	40.68	5.40	1.08	0.03	34.20	39.57
2013-14	35.41	5.59	0.90	0.07	28.92	34.44
2014-15	33.66	5.91	0.77	0.10	26.98	32.79
2015-16	32.25	5.83	0.87	0.12	25.55	31.26
2016-17	31.90	5.86	1.01	0.07	25.03	30.82
2017-18	32.65	5.81	0.98	0.09	25.86	31.58
2018-19(P)	32.87	6.04	0.82	0.09	26.01	31.96
Growth rate of 2018-19 over 2017-18(%)	**0.67**	**3.96**	**-15.60**	**0.00**	**0.55**	**1.18**
CAGR 2009-10 to 2018-19 (%)	**-3.61**	**0.65**	**-2.84**	**-**	**-4.39**	**-3.6609**

Note:

P : Provisional **:Included in Internal consumption

Total may not tally due to rounding off.

Source : Ministry of Petroleum & Natural Gas.

Download Table 3.5

Table 3.6 (A): Gross Generation of Electricity from utilities and non-utilities in India

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

Year	Utilities							
	Thermal				Hydro	Nuclear	RES*	Total
	Steam	Diesel	Gas	Total				
1	2	3	4	5	6	7	8	9
2009-10	539,586	4,248	96,373	640,208	104,059	18,636	36,947	799,851
2010-11	561,298	3,181	100,342	664,822	114,416	26,266	39,245	844,748
2011-12	612,497	2,649	93,281	708,427	130,511	32,287	51,226	922,451
2012-13	691,341	2,448	66,664	760,454	113,720	32,866	57,449	964,489
2013-14	745,533	1,998	44,522	792,054	134,848	34,228	65,520	1,026,649
2014-15	835,291	1,576	41,075	877,941	129,244	36,102	73,563	1,116,850
2015-16	895,340	551	47,122	943,013	121,377	37,414	65,781	1,167,584
2016-17	944,022	401	49,094	993,516	122,378	37,916	81,548	1,235,358
2017-18	986,591	348	50,208	1,037,184	126,123	38,346	101,839	1,303,493
2018-19(P)	1,022,265	215	49,834	1,072,314	134,894	37,813	126,759	1,371,779
Growth rate of 2018-19 over 2017-18(%)	**3.62**	**-38.19**	**-0.74**	**3.39**	**6.95**	**-1.39**	**24.47**	**5.24**
CAGR 2009-10 to 2018-19 (%)	**6.60**	**-25.79**	**-6.38**	**5.29**	**2.63**	**7.33**	**13.12**	**5.54**

Table 3.6 (B) : Gross Generation of Electricity from utilities and non-utilities in India

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

Year	Non-Utilities							Grand Total
	Thermal				Hydro	RES*	Total	
	Steam	Diesel	Gas	Total				
1	10	11	12	13	14	15	16	
2009-10	77,416	8,217	19,739	105,372	152	609	106,133	905,984
2010-11	96,657	7,754	15,435	119,846	149	922	120,917	965,665
2011-12	104,863	6,244	21,972	133,079	131	1,178	134,388	1,056,839
2012-13	113,167	8,205	20,769	142,141	118	1,750	144,010	1,108,499
2013-14	118,178	8,866	19,912	146,957	129	1,903	148,988	1,175,637
2014-15	128,401	9,720	21,135	159,256	145	2,656	162,057	1,278,907
2015-16	136,721	8,412	21,083	166,216	110	2,046	168,372	1,335,956
2016-17	137,588	9,182	22,855	169,625	144	2,277	172,046	1,407,404
2017-18	143,868	8,107	25,362	177,337	112	2,328	179,777	1,483,270
2018-19(P)	141,137	7,723	23,785	172,645	97	2,258	175,000	1,546,779
Growth rate of 2018-19 over 2017-18(%)	**-1.90**	**-4.74**	**-6.22**	**-2.65**	**-13.76**	**-3.01**	**-2.66**	**4.28**
CAGR 2009-10 to 2018-19 (%)	**6.19**	**-0.62**	**1.88**	**5.06**	**-4.38**	**14.00**	**5.13**	**5.49**

(P)-Provisional * RES: Renewable Energy Sources excluding hydro

Source : Central Electricity Authority.

Download Table 3.6

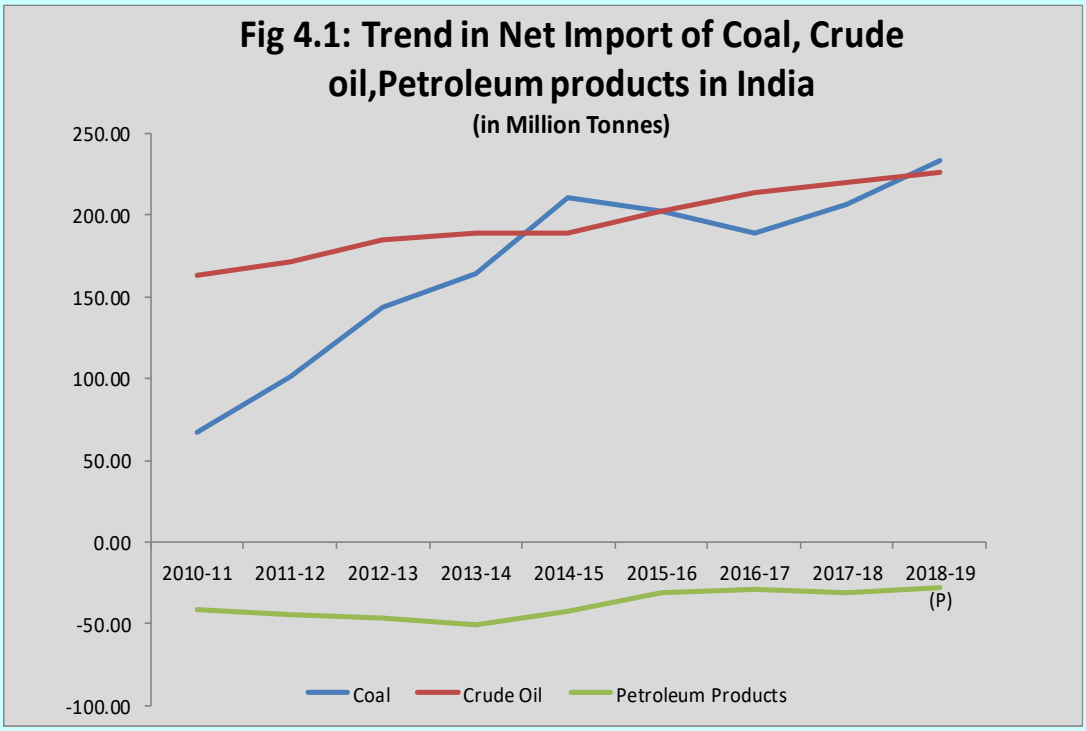
CHAPTER 4: FOREIGN TRADE IN COMMERCIAL SOURCES OF ENERGY

Import and export of coal

The average quality of the Indian coal is not very high and this necessitates the import of high quality coal to meet the requirements of steel plants. There has been an increasing trend in the import of coal. Import of coal has steadily increased from 73.26 MTs during 2009-10 to 235.24 MTs during 2018-19. During this period, the quantum of coal exported decreased from 2.45 MTs during 2008-09 to1.31 MT during 2018-19. The gross import of coal increased at12.95% whereas the export has decreased by 12.64% in 2018-19 as compared to year 2017-18. Net Import of coal increased by 13.13% in 2018-19 over the previous year. (Table 4.1)

Crude oil and petroleum products

India is highly dependent on import of crude oil. Imports of crude oil have increased from 159.26MTs during 2009-10 to 226.50 MTs during 2018-19. There has been an increase of 2.75% in the imports of crude oil during 2018-19 over 2017-18, as the import increased from 220.43 MTs to 226.50 MTs (Table 4.1). The CAGR of import of crude oil from 2009-10 to 2018-19 is 3.6%



The export of petroleum product has increased from 51.15 MT during 2009-10 to 61.10 MT during 2018-19. The CAGR of exports of petroleum products from 2009-10 to 2018-19 is 1.8 %. However, during 2018-19, exports witnessed decrease of (-) 8.58% from the previous year 2017-18 (Table 4.1).

The import of petroleum products has declined in 2018-19 by (-) 5.96 % over the previous year. However, in the long term Import of Petroleum Products has increased from 14.67 MT in 2009-10 to 33.35 MT during 2018-19, recording a CAGR of 8.6% from 2009-10 to 2018-19.

Natural Gas

The import of Natural Gas stood at 28.74 BCM for the year 2018-19 as compared to 27.44 BCM in the previous year recording an annual growth of 4.7%.The import of natural gas has increased from 12.92 BCM in 2009-10 to 28.69 BCM in 2018-19, recording a CAGR of 8.3%.

Electricity

The export of electricity has increased from 105 GWh in 2009-10 to 8494 GWh in 2018-19. As compared to the previous year, 2017-18, export of electricity has improved by 17.9%.

The gross import of electricity has decreased at CAGR of 1.39% during the period 2009-10 (5359 GWh) to 2018-19 (4657GWh).There is decline in net import of electricity during 2009-10 to 2018-19. For the third consecutive year net import in electricity has gone negative and percentage decrease in 2018-19 with respect to 2017-18 is 80.08%.

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

(Million Tonnes)

Year	Coal			Crude Oil			Petroleum Products		
	Gross Imports	Exports	Net Imports	Gross Imports	Exports	Net Imports	Gross Imports	Exports	Net Imports
1	2	3	4=(2)-(3)	5	6	7=(5)-(6)	8	9	10=(8)-(9)
2009-10	73.26	2.45	70.80	159.26	0.00	159.26	14.67	51.15	-36.49
2010-11	68.92	1.88	67.04	163.60	0.00	163.60	17.38	59.08	-41.70
2011-12	102.85	2.02	100.83	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	16.35	63.41	-47.05
2013-14	166.86	2.19	164.67	189.24	0.00	189.24	16.70	67.86	-51.17
2014-15	212.10	1.24	210.87	189.43	0.00	189.43	21.30	63.93	-42.63
2015-16	203.95	1.58	202.37	202.85	0.00	202.85	29.46	60.54	-31.08
2016-17	190.95	1.77	189.18	213.93	0.00	213.93	36.29	65.51	-29.23
2017-18	208.27	1.50	206.77	220.43	0.00	220.43	35.46	66.83	-31.37
2018-19 (P)	235.24	1.31	233.93	226.50	0.00	226.50	33.35	61.10	-27.75
Growth rate of 2018-19 over 2017-18(%)	**12.95**	**-12.64**	**13.13**	**2.75**	**-**	**2.75**	**-5.96**	**-8.58**	**-11.55**
CAGR 2009-10 to 2018-19 (%)	**12.37**	**-6.06**	**12.69**	**3.58**	**-**	**3.58**	**8.56**	**1.79**	**-2.70**

Table 4.1 (Contd): Trends of Foreign Trade in Coal, Crude Oil, Petroleum Products, Natural Gas and Electricity in India

Year	Natural Gas (BCM)			Electricity(Gwh)		
	Gross Imports	Exports	Net Imports	Gross Imports	Exports	Net Imports
1	11	12	13	14	15	16
2009-10	12.92	0.00	12.92	5359	105	5254
2010-11	12.93	0.00	12.93	5611	128	5482
2011-12	18.00	0.00	18.00	5253	135	5118
2012-13	17.61	0.00	17.61	4795	154	4641
2013-14	17.80	0.00	17.80	5598	1651	3947
2014-15	18.61	0.00	18.61	5008	4433	575
2015-16	21.39	0.00	21.39	5244	5150	94
2016-17	24.85	0.00	24.85	5617	6710	-1093
2017-18	27.44	0.00	27.44	5072	7203	-2131
2018-19 (P)	28.74	0.00	28.69	4657	8494	-3837
Growth rate of 2018-19 over 2017-18(%)	**4.74**	**-**	**4.56**	**-8.18**	**17.93**	**80.08**
CAGR 2009-10 to 2018-19 (%)	**8.32**		**8.30**	**-1.39**	**55.17**	

(P): Provisional.

Sources:

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

Download Table 4.1

CHAPTER 5: AVAILABILITY OF ENERGY SOURCES

Availability of Coal and Lignite

The total availability of raw coal in India in 2018-19 stood at 958.25 MT and that of lignite at 42.72MT (Table 5.1).The availability of coal in the year 2018-19 increased by 6.94% compared to 2017-18. However, the availability of lignite decreased by 9.05% during the same period. The availability of coal has increased at a CAGR of about 4.44% during the period from 2009-10 to 2018-19. This increased availability (620.39 MT during 2009-10 to 958.24 MT during 2018-19) can be attributed to the increase in the coal production supplemented by imports (Table 5.2).

The availability of lignite has increased at a CAGR of about 2.39% during the period from 2009-10 to 2018-19(Table 5.1).

Availability of Natural Gas

The availability of natural gas has not increased steadily, a mere 0.22 CAGR has been observed from 59.41 BCM in 2009-10 to 60.75 BCM in 2018-19, (Table 5.1). However, an annual growth of 2.7% has been observed in its production in 2018-19 (60.75 BCM) over the year 2017-18 (59.17 BCM).

Availability of Crude Oil and Petroleum Products

The availability of crude oil in the country increased from 192.95 MT in 2009-10 to 260.70 MT during 2018-19 (Table 5.3). During this period, crude oil production increased from 33.69 MT to 34.20 MT and the net import increased from 159.26 MT to 226.50 MT between 2009-10 and 2018-19. There was increase of 1.79% in the net availability of crude oil during 2018-19 over 2017-18. Crude oil production for year 2018-19 has declined by -4.15% over year 2017-18.

Production of Petroleum Products during 2018-19 increased to 262.36 MT from 254.40 MT in 2017-18. The availability of Petroleum Products is 234.61 MT in 2018-19 up from 148.12 MT in 2009-10.

Availability of Electricity

Electricity available for supply increased from 7,63,519 Gwh in 2009-10 to 12,96,235 Gwh in 2018-19, thus recording a CAGR of 5.44% during this period. The availability of electricity increased at 5.17% in 2018-19 over its value in 2017-18.

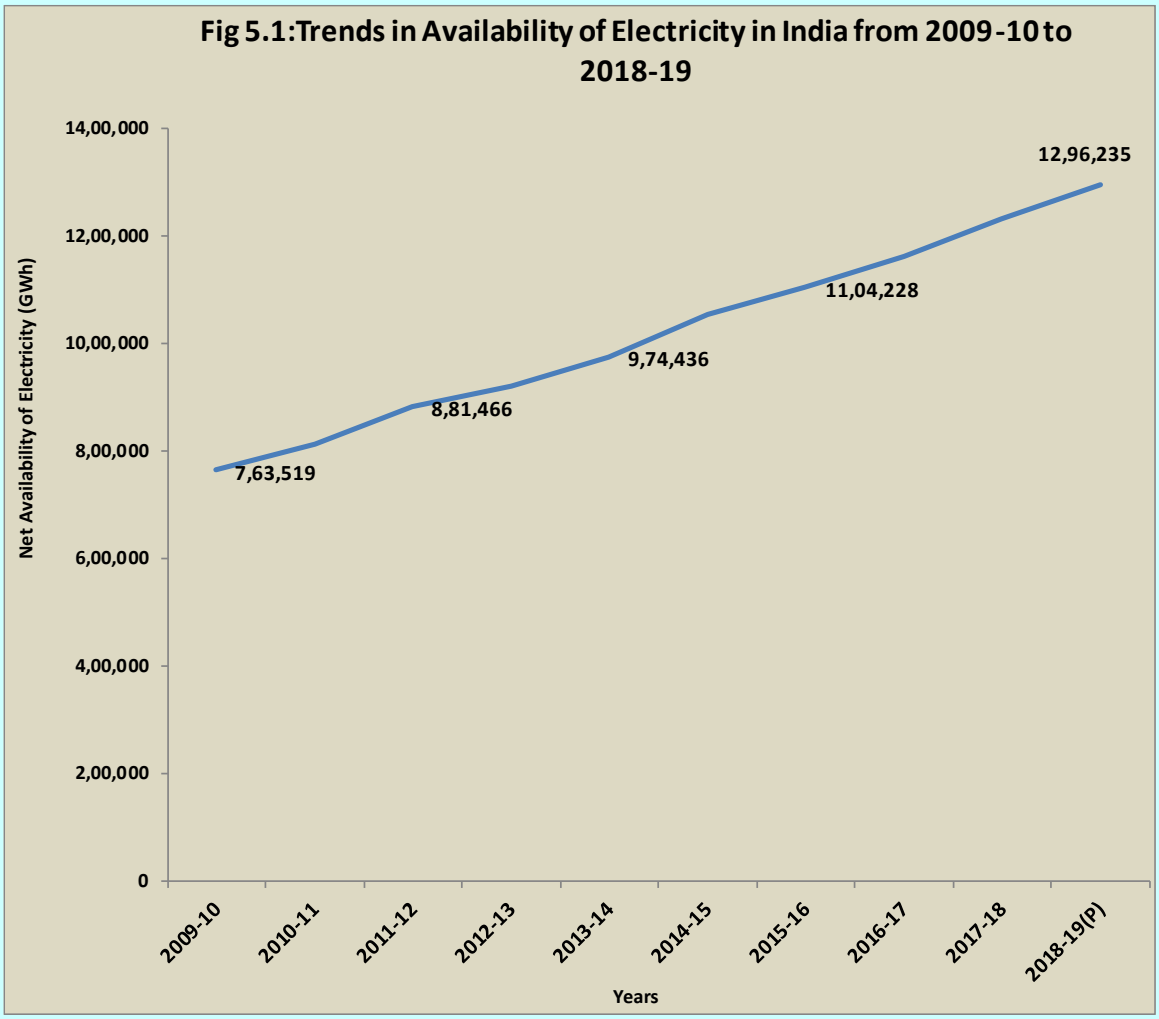


Fig 5.1:Trends in Availability of Electricity in India from 2009-10 to 2018-19
Net Availability of Electricity (GWh)
14,00,000
12,00,000
10,00,000
8,00,000
6,00,000
4,00,000
2,00,000
0
7,63,519
8,81,466
9,74,436
11,04,228
12,96,235
2009-10
2010-11
2011-12
2012-13
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19(P)
Years

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

Year	Coal (Million Tonnes)	Lignite (Million Tonnes)	Crude Oil (Million Tonnes)	Natural Gas (Billion Cubic Metres)*
2009-10	620.39	33.73	192.95	59.41
2010-11	607.06	37.78	201.28	64.16
2011-12	642.63	42.77	209.82	64.45
2012-13	688.75	46.83	222.66	57.36
2013-14	722.57	44.64	227.03	52.37
2014-15	827.52	49.58	226.90	51.30
2015-16	847.58	45.48	239.79	52.51
2016-17	858.58	47.32	249.94	55.70
2017-18	896.09	46.98	256.12	59.17
2018-19 (P)	958.25	42.72	260.70	60.75
Growth rate of 2018-19 over 2017-18(%)	**6.94**	**-9.05**	**1.79**	**2.67**
CAGR 2009-10 to 2018-19 (%)	**4.44**	**2.39**	**3.06**	**0.22**

(P) - Provisional

* : Availability of natural gas is equal to indigenous net production (Gross production-Flared & Losses) + net imports

Sources:

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

Download Table 5.1

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

(Million Tonnes)

Year	Coal					Lignite				
	Production (Coking + Non-coking)	Change of Vendible Stock (closing stock-Opening stock)	Imports	Exports	Availability for Consumption	Production	Imports	Exports	Change of Vendible Stock (closing stock-Opening stock)	Availability for Consumption
1	2	3	4	5	6=2+3+4-5	7	8	9	10	11=7+8-9+10
2009-10	532.04	17.55	73.26	2.45	620.39	34.07	0.00	0.00	-0.34	33.73
2010-11	532.69	7.33	68.92	1.88	607.06	37.73	0.00	0.00	0.05	37.78
2011-12	539.95	1.85	102.85	2.02	642.63	42.33	0.00	0.00	0.44	42.77
2012-13	556.40	-10.99	145.79	2.44	688.75	46.45	0.00	0.07	0.44	46.83
2013-14	565.77	-7.87	166.86	2.19	722.57	44.27	0.00	0.00	0.37	44.64
2014-15	612.44	4.21	212.10	1.24	827.52	48.27	0.00	0.00	1.32	49.58
2015-16	639.23	5.97	203.95	1.58	847.58	43.84	0.00	0.00	1.63	45.48
2016-17	657.87	11.53	190.95	1.77	858.58	45.23	0.02	0.01	2.07	47.32
2017-18	675.40	13.92	208.27	1.50	896.09	46.64	0.01	0.00	0.33	46.98
2018-19(P)	728.72	-4.40	235.24	1.31	958.25	44.28	0.02	0.04	-1.54	42.72
Growth rate of 2018-19 over 2017-18(%)	**7.89**	**-131.58**	**12.95**	**-12.64**	**6.94**	**-5.06**				**-9.05**

(P): Provisional

Source : Office of the Coal Controller, Ministry of Coal

Download Table 5.2

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

Year	Crude Oil (Million Tonne)			Petroleum Products (Million Tonne)			Natural Gas (Billion Cubic Meter)*		
	Production	Net Imports	Availability	Production	Net Imports	Availability	Production	Net Imports	Availability
1	2	3	4=2+3	5	6	7=5+6	8	9	10 = 8+9
2009-10	33.69	159.26	192.95	184.61	-36.49	148.12	46.49	12.92	59.41
2010-11	37.68	163.60	201.28	194.82	-41.70	153.12	51.23	12.93	64.16
2011-12	38.09	171.73	209.82	203.20	-44.99	158.21	46.45	18.00	64.45
2012-13	37.86	184.80	222.66	217.74	-47.05	170.68	39.75	17.61	57.36
2013-14	37.79	189.24	227.03	220.76	-51.17	169.59	34.57	17.80	52.37
2014-15	37.46	189.43	226.89	221.14	-42.63	178.50	32.69	18.61	51.30
2015-16	36.94	202.85	239.79	231.92	-31.08	200.84	31.12	21.39	52.51
2016-17	36.01	213.93	249.94	243.55	-29.23	214.32	30.85	24.85	55.70
2017-18	35.68	220.43	256.11	254.40	-31.37	223.03	31.73	27.44	59.17
2018-19 (P)	34.20	226.50	260.70	262.36	-27.75	234.61	32.05	28.69	60.75
Growth rate of 2018-19 over 2017-18(%)	**-4.15**	**2.75**	**1.79**	**3.13**	**-11.55**	**5.19**	**1.02**	**4.57**	**2.66**

* : Availability of natural gas is equal to indigenous net production (Gross production-Flared/Losses) + net imports

(P): Provisional; Total may not tally due to rounding off.

Source : Ministry of Petroleum & Natural Gas.

Download Table 5.3

Table 5.4 : Trends in Availability of Electricity in India from 2009-10 to 2018-19

(in Giga Watt hour = 10^6 Kilo Watt hour)

Year	Gross Electricity Generated from Utilities	Consumption in Power Station Auxiliaries	Net Electricity Generated from Utilities	Purchases from Non-Utilities + Net Import from Other Countries	Net Electricity Available for Supply
1	2	3	4=2-3	5	6=4+5
2009-10	799,851	50,723	749,128	14,391	763,519
2010-11	844,748	52,952	791,796	19,839	811,635
2011-12	922,451	56,499	865,952	15,514	881,466
2012-13	964,489	64,109	900,380	20,849	921,229
2013-14	1,026,649	70,161	956,488	17,948	974,436
2014-15	1,116,850	76,268	1,040,582	13,773	1,054,355
2015-16	1,167,584	79,302	1,088,282	15,947	1,104,228
2016-17	1,235,358	81,044	1,154,314	8,977	1,163,290
2017-18	1,303,455	82,148	1,221,307	11,198	1,232,505
2018-19(P)	1,371,779	85,802	1,285,977	10,258	1,296,235
Growth rate of 2018-19 over 2017-18(%)	**5.24**	**4.45**	**5.30**	**-8.40**	**5.17**
CAGR 2009-10 to 2018-19 (%)	**5.54**	**5.40**	**5.55**	**-3.33**	**5.44**

(P): Provisional

Source:Central Electricity Authority.

Download Table 5.4

CHAPTER 6: CONSUMPTION OF ENERGY RESOURCES

Consumption of Coal and Lignite

The estimated total consumption of raw coal by industry has increased from 587.81 MT during 2009-10 to 968.25 MT during 2018-19 with a CAGR of 5.12%. Consumption of Raw Coal recorded an annual growth of 7.76% during 2018-19 over 2017-18 (Table 6.1).

Consumption of Lignite increased from 34.41 MT in 2009-10 to 45.81 MT in 2018-19 registering a compound growth of 2.90% (Table 6.1). Consumption of Lignite in Electricity Generation sector is the highest accounting for about 82.23%of the total lignite consumption (Table 6.5).

The maximum consumption of raw coal is in Electricity generation, followed by steel industry. Industry-wise estimates of consumption of coal shows that during 2018-19, electricity generating units consumed 637.95 MT of coal, followed by steel &washery industries (69.50 MT), sponge iron industries (12.23 MT) and cement industries (8.82 MT) (Table 6.4).

Consumption of Crude Oil and Natural Gas

The estimated consumption of crude oil has steadily increased from 186.55 MMT during 2009-10 to 257.20 MMT during 2018-19 with CAGR of 3.26%. It increased from 251.93 MMT in 2017-18 to 257.20 MMT in 2018-19 registering a growth of 2.09% (Table 6.1).

The maximum use of Natural Gas is in fertilizers industry (27.84%) followed by power generation (22.30%) and 17.10% natural gas was used for transport distribution network. Industry wise off-take of natural gas shows that natural gas has been used both for Energy (62.17%) and Non-energy (37.83%) purposes (Table 6.8).

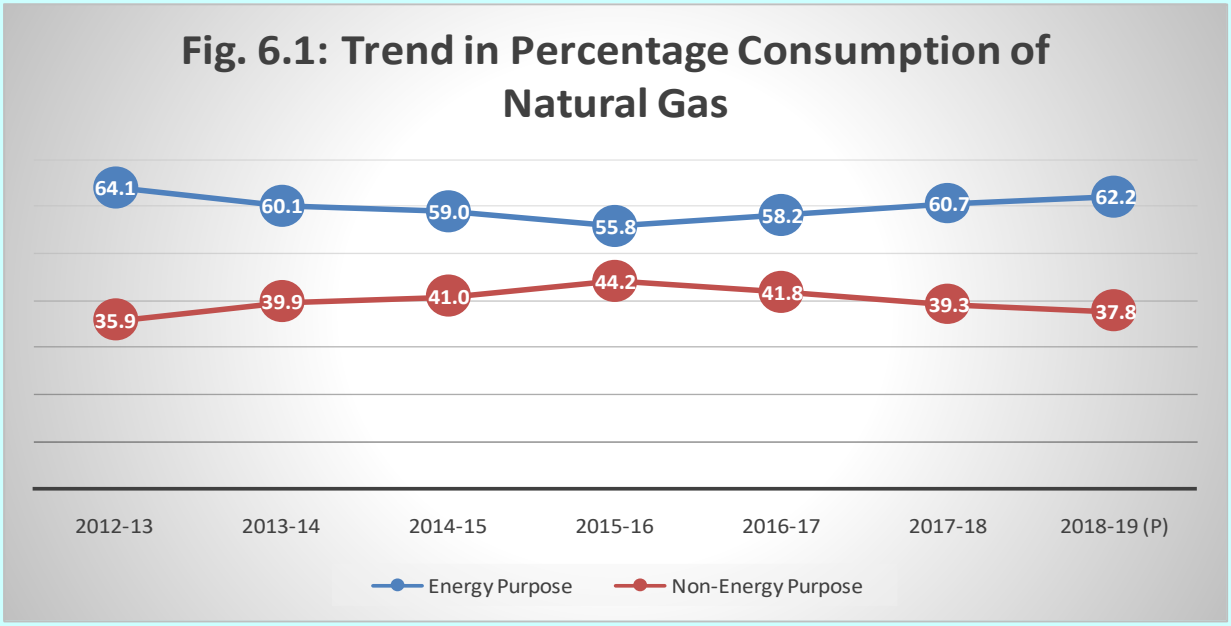


Fig. 6.1: Trend in Percentage Consumption of Natural Gas
64.1
60.1
59.0
55.8
58.2
60.7
62.2
35.9
39.9
41.0
44.2
41.8
39.3
37.8
2012-13
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19 (P)
Energy Purpose
Non-Energy Purpose

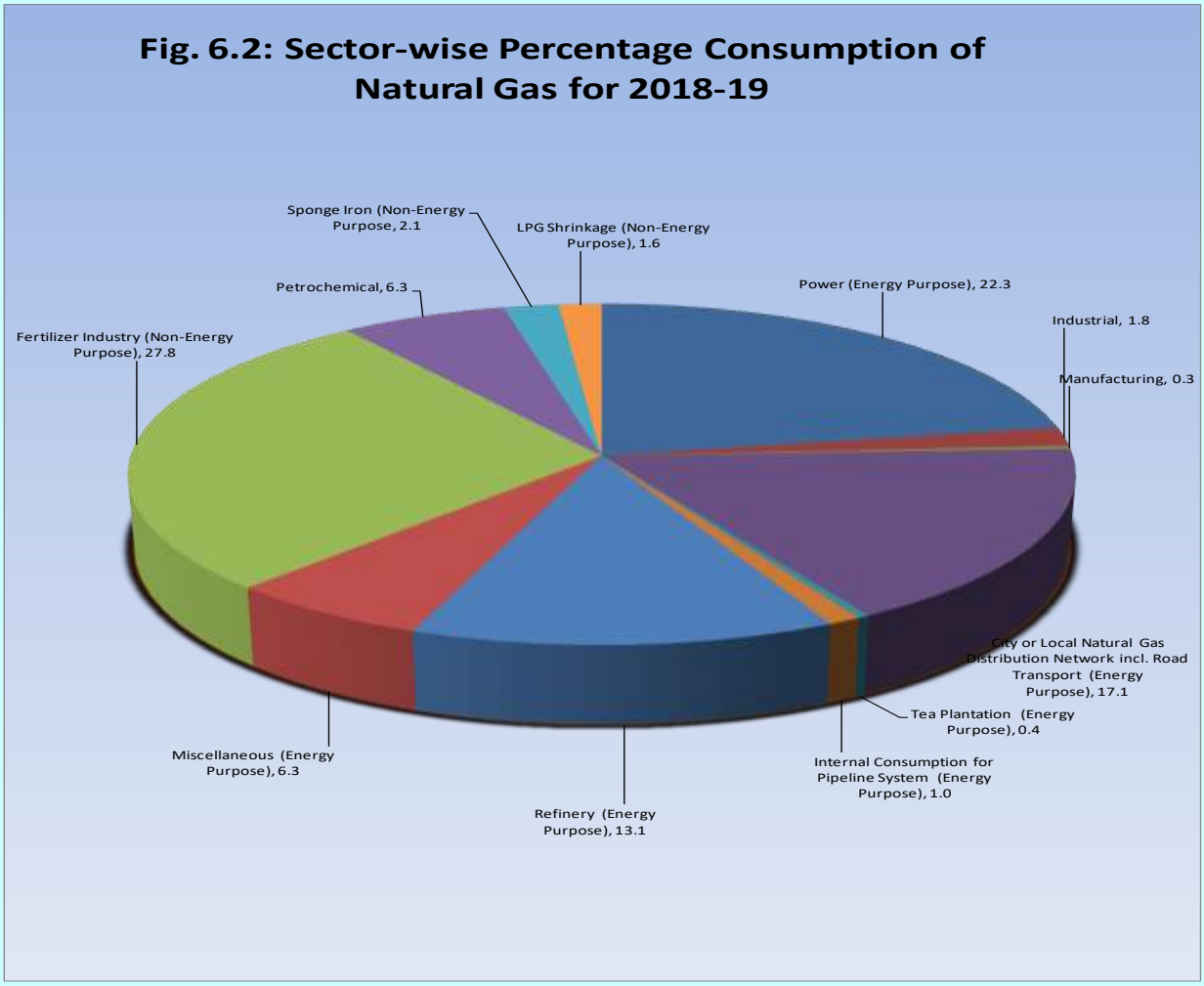


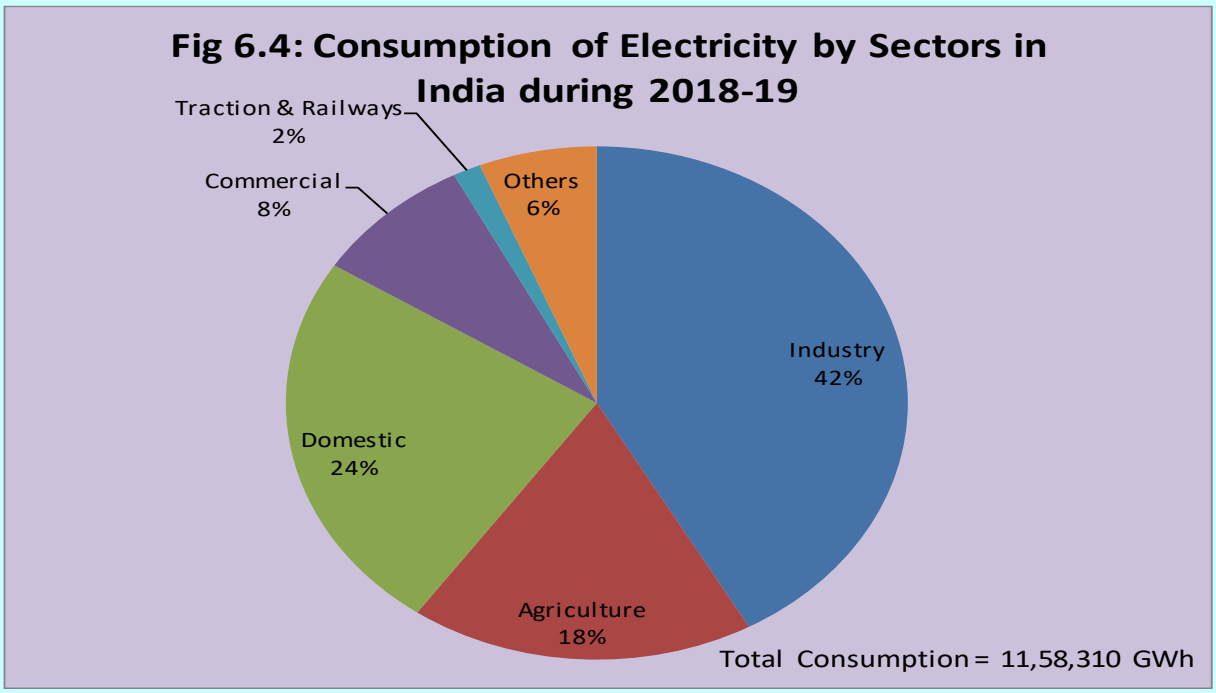
Fig. 6.2: Sector-wise Percentage Consumption of Natural Gas for 2018-19
Sponge Iron (Non-Energy Purpose, 2.1
LPG Shrinkage (Non-Energy Purpose), 1.6
Petrochemical, 6.3
Power (Energy Purpose), 22.3
Industrial, 1.8
Fertilizer Industry (Non-Energy Purpose), 27.8
Manufacturing, 0.3
City or Local Natural Gas Distribution Network incl. Road Transport (Energy Purpose), 17.1
Tea Plantation (Energy Purpose), 0.4
Internal Consumption for Pipeline System (Energy Purpose), 1.0
Miscellaneous (Energy Purpose), 6.3
Refinery (Energy Purpose), 13.1

Consumption of Petroleum Products

High speed diesel oil accounted for 39.18% of total consumption (Excluding refinery fuel and losses) of all types of petroleum products in 2018-19. This was followed by Petrol (13.27%), LPG (11.68%), Pet Coke (10.01%), Naphtha (6.63%) (Tables 6.6).

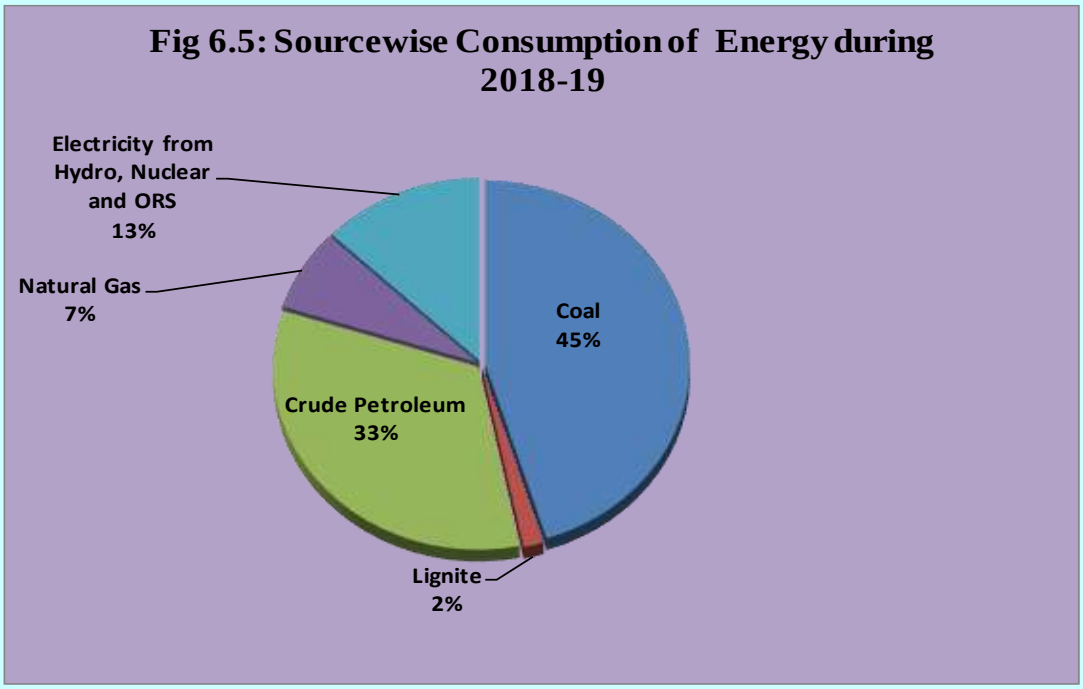
Consumption of Electricity

The estimated electricity consumption increased from 6,12,645 GWh during 2009-10 to 11,58,310 GWh during 2018-19, showing a CAGR of 6.58%. The percentage increase in electricity consumption is 3.11% from 2017-18 (11, 23,427 GWh) to 2018-19 (11, 58,310 GWh) (Table 6.9).



Of the total consumption of electricity in 2017-18, industry sector accounted for the largest share (42.0%), followed by domestic (24.0%), agriculture (18.0%) and commercial sectors (8.4%). The electricity consumption in industry sector and domestic sector has increased at a much faster pace compared to other sectors during 2009-10 to 2018-19 with CAGRs of 7.4% and 6.7% respectively (Table 6.9).

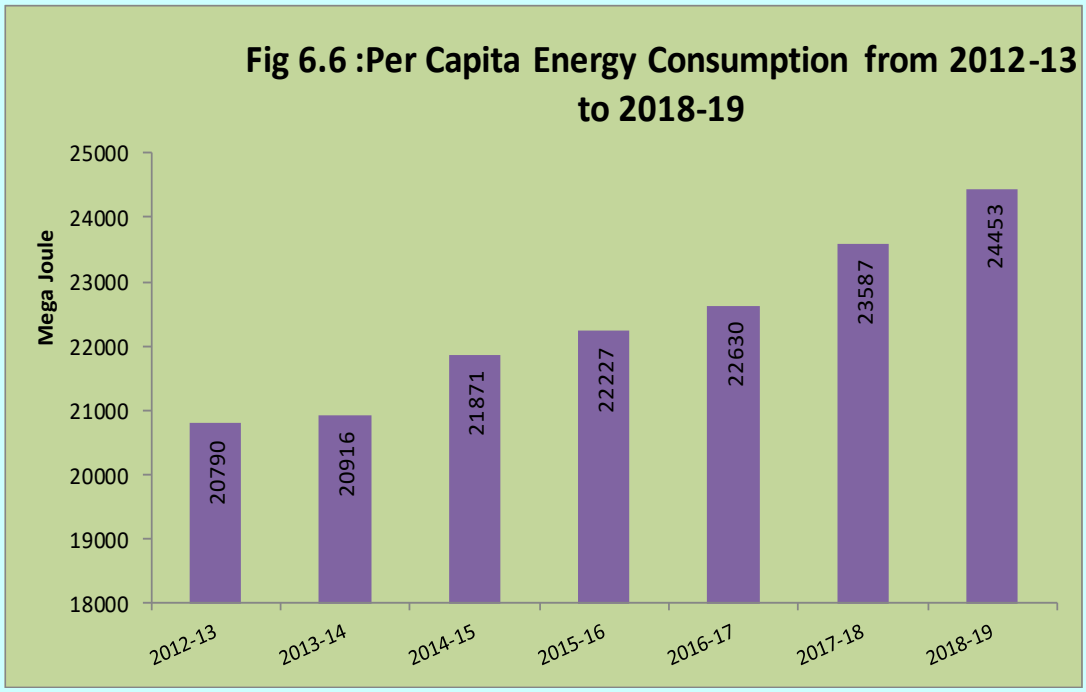
Electricity losses in transmission and distribution have reduced from 25.4% in 2009-10 to 20.8% during 2018-19 (Table 6.10).



Per-Capita Energy Consumption & Energy Intensity

The consumption of energy in petajoules from of Coal and Lignite was highest which accounted for about 46.75% of the total consumption during 2018-19 followed by Crude Oil (33.19%) and Electricity (12.85%). The total consumption of energy sources increased from 21,590 petajoules during 2009-10 to 32,450 petajoules during 2018-19, showing a CAGR of 4.2% (Table 6.2).

Per-capita Energy Consumption (PEC) during a year is computed as the ratio of the estimate of total energy consumption during the year to the mid-year population of that year. Per-capita Energy Consumption (PEC) increased from 19,669Megajoules in 2011-12 to 24,453Megajoules in 2018-19, the annual increase in PEC for 2018-19 over 2017-18 was 3.67% (Table 6.3).



Energy Intensity is defined as the amount of energy consumed for generating one unit of Gross Domestic Product (at constant prices). PEC and Energy intensity are the most used policy indicators, both at national and international levels. In the absence of data on consumption of non-conventional energy from various sources, particularly in rural areas these two indicators are generally computed on the basis of consumption of conventional energy. The Energy Intensity (at 2011-12 prices) decreased from0.2747Megajoules per rupee in 2011-12 to0.2321 Mega Joules in 2018-19 (Table 6.3).

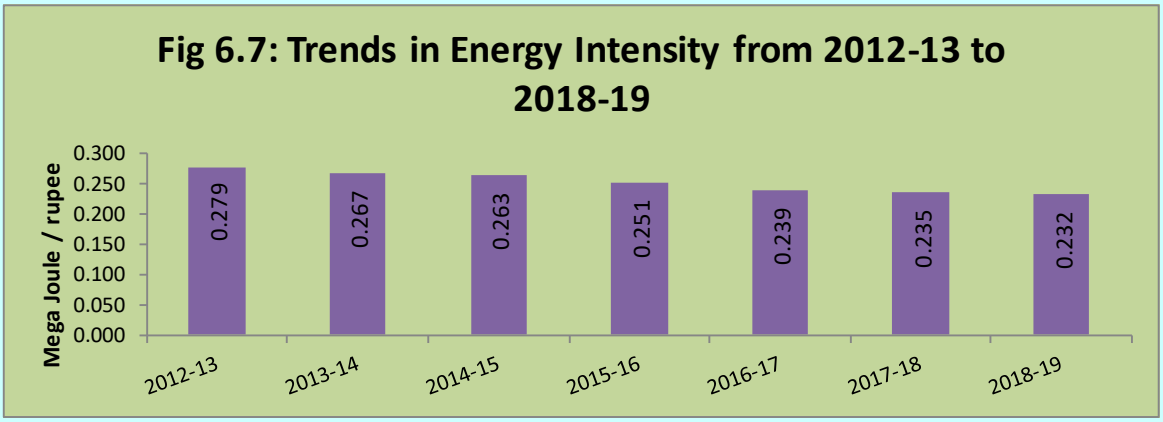


Table 6.1: Trends in Consumption of Energy Sources in India

Year	Coal #	Lignite	Crude Oil** MMT	Natural Gas (Billion Cubic Metres)	Electricity (GWh)
	(Million Tonnes)				
1	2	3	4	5	6
2009-10	587.81	34.41	186.55	59.41	612,644.99
2010-11	593.00	37.69	196.99	64.16	694,392.00
2011-12	638.73	41.88	204.12	64.45	785,194.00
2012-13	713.39	46.31	219.21	57.37	824,300.99
2013-14	739.34	43.90	222.50	52.37	874,208.57
2014-15	822.13	46.95	223.24	51.30	948,521.82
2015-16	836.73	42.21	232.86	52.52	1,001,190.68
2016-17	837.22	43.16	245.36	55.70	1,061,182.64
2017-18	898.52	46.32	251.93	59.17	1,123,426.86
2018-19 (P)	968.25	45.81	257.20	60.75	1,158,310.06
Growth rate of 2018-19 over 2017-18(%)	**7.76**	**-1.09**	**2.09**	**2.67**	**3.11**
CAGR 2009-10 to 2018-19 (%)	**5.12**	**2.90**	**3.26**	**0.22**	**6.58**

(P): Provisional

Data on electricity has been revised as per the inputs from CEA and hence may not match with the previous year data.

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

**Crude oil in terms of refinery crude throughput.

Does not include Lignite

Sources:

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

Download Table 6.1

Table 6.2 Consumption of Energy Sources

(In Petajoules)

Year	Coal	Lignite	Crude Oil *	Natural Gas	Electricity #	Total
1	2	3	4	5	6	7
2009-10	8894	391	7811	2288	2206	21590
2010-11	8972	428	8248	2471	2500	22620
2011-12	9664	476	8547	2483	2827	23996
2012-13	10794	527	9178	2210	2967	25676
2013-14	11186	499	9316	2017	3147	26166
2014-15	12439	534	9347	1976	3415	27711
2015-16	12660	480	9750	2023	3604	28517
2016-17	12667	491	10273	2145	3820	29397
2017-18	13595	527	10549	2279	4044	30993
2018-19(P)	14650	521	10769	2340	4170	32450
% Share in total consumption for 2018-19	45.1	1.6	33.2	7.2	12.9	100.0
CAGR 2008-09 to 2017-18(%)	**5.12**	**2.90**	**3.26**	**0.22**	**6.58**	**4.16**

*: Crude oil in terms of refinery crude processed. (P): Provisional.

#: Include Hydro, Nuclear and other renewable sources electricity from utilities

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

Sources:

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

Download Table 6.2

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

Year	Energy Consumption in petajoules *	Mid year population (in Million) **	GDP at 2011-12 prices (Rs. crore) **	Per Capita Energy Consumption (in Megajoules)	Energy Intensity (Megajoules per rupee)
2011-12	23996	1220	8736329	19669	0.2747
2012-13	25676	1235	9213017	20790	0.2787
2013-14	26166	1251	9801370	20916	0.2670
2014-15	27711	1267	10527674	21871	0.2632
2015-16	28517	1283	11369493	22227	0.2508
2016-17	29397	1299	12,308,193	22630	0.2388
2017-18	30993	1314	13,175,160	23587	0.2352
2018-19 (P)	32450	1327	13,981,426	24453	0.2321
Growth rate of 2018-19 over 2017-18 (%)	**4.70**	**0.99**	**6.12**	**3.67**	**-1.34**
CAGR 2011-12 to 2018-19(%)	**3.25**	**0.93**	**5.27**	**2.30**	**-1.92**

(P): Provisional

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

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

** GDP estimates are at base 2011-12 price as per the National Accounts Divisions's, NSO, MoSPI First Revised Estimates released on 31.01.2020

Mid year Polpulation has been taken from Statement 2 of Press Relaese dated 31.01.2020 of National Accounts Division, NSO, MoSPI.

Download Table 6.3

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

(Million tonnes)

Year	Electricity	Steel & Washery + Import Coking	Cement	Paper	Textile	Sponge Iron	Fertilizers &chemicals	Bricks	Others plus import non-coking *	Total
1	2	3	4	5	6	7	8	9	10	11 = 2 to 10
2009-10	390.58	43.26	14.66	2.34	0.27	23.10	3.20	0.49	109.91	587.81
2010-11	395.84	38.11	15.08	2.43	0.28	22.79	3.45	0.27	114.75	593.00
2011-12	410.37	47.86	13.18	2.03	0.26	21.69	3.19	0.13	140.04	638.73
2012-13	446.76	51.70	31.11	2.12	0.30	20.90	2.86	2.01	173.62	731.39
2013-14	448.95	53.05	11.94	1.91	0.36	18.49	2.64	4.01	198.00	739.34
2014-15	497.70	56.24	11.36	1.65	0.42	17.77	2.70	0.09	234.22	822.13
2015-16	517.77	57.08	8.99	1.21	0.27	7.76	2.62	0.07	240.95	836.73
2016-17	535.04	51.98	6.36	1.18	0.24	5.56	2.45	0.10	234.31	837.22
2017-18	585.49	58.45	7.71	1.51	0.24	8.53	2.16	0.12	234.32	898.52
2018-19(P)	637.95	69.50	8.82	1.64	0.20	12.23	2.04	0.09	235.78	968.25
Distribution (%)	**65.89**	**7.18**	**0.91**	**0.17**	**0.02**	**1.26**	**0.21**	**0.01**	**24.35**	**100.00**
Growth rate of 2018-19 over 2017-18(%)	**8.96**	**18.90**	**14.39**	**8.41**	**-14.29**	**43.42**	**-5.56**	**-19.13**	**0.62**	**7.76**
CAGR 2009-10 to 2018-19(%)	**5.03**	**4.85**	**-4.96**	**-3.49**	**-2.84**	**-6.16**	**-4.41**	**-15.38**	**7.93**	**5.12**

(P): Provisional

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

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

Source : Office of the Coal Controller, Ministry of Coal

Download Table 6.4

Table 6.5 : Trends in Industrywise Consumption of Lignite in India

(Million tonnes)

Year	Electricity	Steel & Washery	Cement	Paper	Textile	Others *	Total
1	2	3	4	5	6	7	8=2 to 7
2009-10	28.14	-	0.38	0.82	-	4.09	33.43
2010-11	29.90	-	0.36	0.84	1.18	6.25	38.53
2011-12	32.06	0.03	1.01	0.63	3.67	4.48	41.88
2012-13	37.20	0.05	1.10	0.69	0.30	3.81	43.15
2013-14	36.34	0.03	1.49	1.29	0.73	4.02	43.90
2014-15	39.47	0.02	1.27	0.65	2.89	2.65	46.95
2015-16	37.56	0.01	0.23	0.43	1.73	2.26	42.21
2016-17	38.82	0.04	0.29	0.53	1.29	2.19	43.16
2017-18	38.84	0.12	1.09	0.76	2.46	3.05	46.32
2018-19(P)	37.67	0.09	1.50	0.60	2.56	3.39	45.81
Distribution (%)	**82.23**	**0.21**	**3.27**	**1.32**	**5.58**	**7.40**	**100.00**
Growth rate of 2018-19 over 2017-18(%)	**-3.01**	**-21.67**	**37.31**	**-20.45**	**4.11**	**11.04**	**-1.10**
CAGR 2009-10 to 2018-19(%)	**2.96**		**14.70**	**-3.00**		**-1.86**	**3.20**

(P): Provisional

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

From 2009-10 onwards cotton is also included in others.

Source : Office of the Coal Controller, Ministry of Coal

Download Table 6.5

Table 6.6 : Trends in Consumption of Petroleum Products in India

(Million Tonnes)

Year	Light Distillates			Middle Distillates			
	LPG	Petrol	Naphtha	Kerosene	ATF	HSDO	LDO
1	2	3	4	5	6	7	8
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	0.41
2012-13	15.60	15.74	12.29	7.50	5.27	69.08	0.40
2013-14	16.29	17.13	11.31	7.16	5.50	68.36	0.39
2014-15	18.00	19.08	11.08	7.09	5.72	69.42	0.37
2015-16	19.62	21.85	13.27	6.83	6.26	74.65	0.41
2016-17	21.61	23.76	13.24	5.40	7.00	76.03	0.45
2017-18	23.34	26.17	12.89	3.85	7.63	81.07	0.52
2018-19 (P)	24.91	28.28	14.13	3.46	8.30	83.53	0.60
% Distribution in 2018-19(P)	**11.68**	**13.27**	**6.63**	**1.62**	**3.89**	**39.18**	**0.28**
Growth rate of 2018-19 over 2017-18 (%)	**6.70**	**8.06**	**9.64**	**-10.03**	**8.74**	**3.03**	**14.19**
CAGR 2009-10 to 2018-19 (%)	**6.61**	**8.24**	**3.38**	**-9.42**	**6.02**	**4.03**	**2.72**

(P) : Provisional

Note 1 Consumption includes sales by oil companies, own consumption and direct private imports

Total may not tally due to rounding off.

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

(Million Tonnes)

Year	Heavy Ends				Others*	Total Consumption	Refinery Fuel and Losses	Total including Refinery Fuel and losses
	Fuel Oil	Lubricants	Bitumen	Petcoke				
	9	10	11	13	14	15=2 to 14	16	17
2009-10	11.63	2.54	4.93	6.59	5.40	137.81	15.12	152.92
2010-11	10.79	2.43	4.54	4.98	4.57	141.04	16.38	157.42
2011-12	9.31	2.63	4.64	6.14	4.92	148.13	17.29	165.42
2012-13	7.66	3.20	4.68	10.13	5.51	157.06	18.35	175.40
2013-14	6.24	3.31	5.01	11.76	5.96	158.41	17.87	176.28
2014-15	5.96	3.31	5.07	14.56	5.87	165.52	17.67	183.19
2015-16	6.63	3.57	5.94	19.30	6.35	184.67	18.77	203.44
2016-17	7.15	3.47	5.94	23.96	6.59	194.60	20.07	214.66
2017-18	6.72	3.88	6.09	25.66	8.34	206.17	21.16	227.33
2018-19 (P)	6.56	3.67	6.71	21.35	11.72	213.22	21.45	234.67
% Distribution in 2018-19(P)	3.08	1.72	3.15	10.01	5.50	100.00	-	-
Growth rate of 2018-19 over 2017-18(%)	**-2.34**	**-5.56**	**10.22**	**-16.80**	**40.53**	**3.42**	**1.37**	**3.23**
CAGR 2009-10 to 2018-19 (%)	**-5.56**	**3.75**	**3.12**	**12.48**	**8.06**	**4.46**	**3.56**	**4.38**

(P) : Provisional; Consumption includes sales by oil companies, own consumption and direct private imports

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

Total may not tally due to rounding off.

Source: Ministry of Petroleum & Natural Gas.

Download Table 6.6

Table 6.7 (A) : Sectorwise (end use) Consumption of Selected Petroleum Products in India

('000 tonnes)

Petroleum Product	Year	Transport	Plantation/ Agriculture	Power Generation	Industry	Mining & Quarrying	Resellers/ Retail	Misc. Services	Pvt Imports	Total
1	2	3	4	5	6	7	8	9	10	11 =3 to10
High Speed Diesel Oil	2009-10	5365	594	303	1502	1248	**	47137	94	56242
	2010-11	5417	616	166	1440	1366	48704	2170	193	60071
	2011-12	5529	684	168	1649	1181	53208	2262	70	64750
	2012-13	5160	617	214	1628	1073	58021	2320	47	69080
	2013-14	3203	429	204	687	873	61465	1426	77	68364
	2014-15	4617	575	197	794	998	60403	1748	83	69416
	2015-16	5765	630	224	1096	1184	63772	1922	55	74647
	2016-17	5658	607	208	1033	1224	65089	2161	46	76027
	2017-18	5999	618	223	1155	1255	69846	1887	90	81073
	2018-19(P)	6210	639	222	1264	1465	71697	1938	93	83528
Growth rate of 2018-19 over 2017-18(%)		3.51	3.34	-0.17	9.43	16.72	2.65	2.71	3.58	3.03
CAGR 2009-10 to 2018-19 (%)		1.47	0.73	-3.05	-1.71	1.62	-	-27.32	-0.11	4.03

Note: ** denotes that the data of Resellers / Retail are included in Miscellaneous services

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

('000 tonnes)

Petroleum Product	Year	Transport	Plantation/ Agriculture	Power Generation	Industry	Mining & Quarrying	resellers/Retail	Misc. Services	Pvt Imports	Total
1	2	3	4	5	6	7	8	9	10	11 =3 to10
Light Diesel Oil	2009-10	6	3	152	143	2	**	152	0	457
	2010-11	5	2	137	127	3	**	182	0	455
	2011-12	3	1	127	102	2	**	180	0	415
	2012-13	3	1	142	74	2	1	175	0	399
	2013-14	4	1	132	64	3	1	182	0	386
	2014-15	5	1	132	55	4	4	165	0	365
	2015-16	4	1	154	61	2	1	184	0	407
	2016-17	7	2	174	60	2	1	203	0	449
	2017-18	7	9	143	149	6	3	207	0	524
	2018-19(P)	10	16	277	175	22	33	65	0	598
Growth rate of 2018-19 over 2017-18(%)		39.33	68.41	93.45	17.44	266.48	1199.18	-68.43	-	14.16
CAGR 2009-10 to 2018-19 (%)		4.76	18.93	6.17	2.03	28.50	-	-8.07	-	2.72

Note: ** denotes that the data of Resellers / Retail are included in Miscellaneous services

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

('000 tonnes)

Petroleum Product	Year	Transport	Plantation/ Agriculture	Power Generation	Industry	Mining & Quarrying	resellers/Retail	Misc. Services	Pvt Imports	Total
1	2	3	4	5	6	7	8	9	10	11 =3 to10
Furnace Oil	2009-10	560	68	688	3135	22	**	4133	538	9145
	2010-11	780	70	823	2773	7	**	3979	374	8807
	2011-12	371	70	647	2408	45	**	3300	706	7547
	2012-13	277	79	587	2019	12	351	2357	608	6291
	2013-14	315	75	536	1833	38	309	1985	696	5787
	2014-15	346	56	446	1748	45	197	2175	570	5584
	2015-16	380	57	430	2136	53	270	2564	592	6482
	2016-17	444	51	361	2492	71	357	2485	784	7046
	2017-18	601	50	314	2346	68	321	2234	672	6605
	2018-19 (P)	786	78	339	2577	54	298	1449	611	6195
Growth rate of 2018-19 over 2017-18(%)		**30.87**	**57.44**	**7.97**	**9.87**	**-4.96**	**-10.09**	**-35.10**	**-8.98**	**-6.21**
CAGR 2009-10 to 2018-19 (%)		**3.45**	**1.51**	**-6.84**	**-1.94**	**9.21**	**-**	**-9.95**	**1.28**	**-3.82**

Note: ** denotes that the data of Resellers / Retail are included in Miscellaneous services

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

('000 tonnes)

Petroleum Product	Year	Plantation/ Agriculture	Power Generation	Industry	Mining & Quarrying	resellers/Retail	Misc. Services	Pvt Imports	Total
1	2	3	4	5	6	7	8	9	10 =3 to 9
Low Sulphur Heavy Stock	2009-10	2.14	936.45	1224.96	0.00	0.00	320.45	0.00	2484.00
	2010-11	0.29	468.57	1031.16	0.22	0.00	481.75	0.00	1982.00
	2011-12	0.17	399.19	1066.99	0.92	0.00	291.87	0.00	1759.14
	2012-13	0.00	438.98	778.01	0.00	0.00	149.00	0.00	1365.99
	2013-14	0.00	328.14	76.32	0.00	0.00	44.25	0.00	448.71
	2014-15	0.00	226.18	103.59	0.00	0.00	47.50	0.00	377.26
	2015-16	0.00	50.70	70.45	0.00	0.00	29.23	0.00	150.38
	2016-17	0.00	16.43	50.88	0.00	0.00	36.91	0.00	104.23
	2017-18	1.18	0.00	53.78	0.00	14.67	46.33	0.00	116.27
	2018-19 (P)	7.90	9.31	175.13	0.31	48.04	128.67	0.00	369.04
Growth rate of 2018-19 over 2017-18(%)		**-**	**-**	**225.62**	**-**	**-**	**177.70**	**-**	**217.39**
CAGR 2009-10 to 2018-19 (%)		**13.95**	**-**	**-17.68**	**-**	**-**	**-8.72**	**-**	**-17.36**

Table 6.7 (E) : Sectorwise (end use) Consumption of Selected Petroleum Products in India

('000 tonnes)

Petroleum Product	Year	Transport	Plantation/ Agriculture	Power Generation	manufacturing/Non domestic	Domestic Distribution	Non- Domestic /Industry/Commercial	Reseller/ Retail	Other/ Misc. Services	Private import	Total
1	2	3	4	5	6	7	8	9	10	11	12=3 to 11
Liquefied Petroleum Gas	2009-10	225	4	0	1014	11,364	N A	**	133	395	13,135
	2010-11	224	2	0	1150	12,369	N A	**	156	430	14,331
	2011-12	224	5	0	1255	13,296	N A	**	150	421	15,350
	2012-13	215	4	0	145	13,568	1,168	59	45	398	15,601
	2013-14	195	4	3	135	14,412	1,074	58	46	369	16,294
	2014-15	165	6	3	208	16,040	1,051	45	53	429	18,000
	2015-16	172	7	3	202	17,182	1,464	45	60	489	19,623
	2016-17	168	8	2	220	18,871	1,776	67	67	429	21,608
	2017-18	185	7	1	205	20,352	2,086	73	67	365	23,342
	2018-19(P)	181	22	2	204	21,728	2,365	0	89	316	24,907
Growth rate of 2018-19 over 2017-18 (%)		**-2.13**	**195.06**	**59.80**	**-0.49**	**6.76**	**13.37**	**-100.00**	**32.38**	**-13.42**	**6.70**
CAGR 2009-10 to 2018-19(%)		**-2.16**	**19.94**	**-**	**-14.82**	**6.70**	**-**	**-**	**-3.93**	**-2.21**	**6.61**

Note: ** denotes that the data of Resellers / Retail are included in Miscellaneous services

Table 6.7 (F) : Sectorwise (end use) Consumption of Selected Petroleum Products in India

('000 tonnes)

Petroleum Product	Year	Fertiliser Sector	Petro chemicals	Power Sector	Steel Plants	Others	Private import	Total
1	2	3	4	5	6	7	8	9 =3 to 8
Naptha	2009-10	844.40	6,967.60	639.25	2.51	559.99	1,120.50	10,134.25
	2010-11	892.22	7,500.00	419.33	0.01	154.74	1,710.00	10,676.30
	2011-12	962.25	8,140.82	187.36	0.19	163.22	1,767.66	11,221.50
	2012-13	897.96	9,412.21	342.01	0.00	203.07	1,434.16	12,289.40
	2013-14	515.90	9,463.94	215.11	0.00	240.27	869.98	11,305.20
	2014-15	301.49	9,530.06	199.24	0.00	207.53	843.71	11,082.03
	2015-16	315.89	10,350.23	50.30	0.00	37.07	2,517.36	13,270.84
	2016-17	349.35	10,350.89	60.20	0.00	57.59	2,422.75	13,240.78
	2017-18	367.74	10,010.95	66.53	0.00	404.90	2,038.49	12,888.61
	2018-19(P)	351.61	10,601.63	5.26	0.00	1,445.26	1,727.48	14,131.23
Growth rate of 2018-19 over 2017-18(%)		**-4.39**	**5.90**	**-92.10**	**-**	**256.94**	**-15.26**	**9.64**
CAGR 2009-10 to 2018-19 (%)		**-8.39**	**4.29**	**-38.12**	**-**	**9.95**	**4.42**	**3.38**

Table 6.7 (G) : Sectorwise (end use) Consumption of Selected Petroleum Products in India

('000 tonnes)

Petroleum Product	Year	Domestic	Commercial / Industry	Others	Total
1	2	3	4	5	6=3 to 5
SKO(Kerosene)	2009-10	9101.00	69.00	134.00	9304.00
	2010-11	8722.00	67.00	139.00	8928.00
	2011-12	8045.00	61.00	123.00	8229.00
	2012-13	7349.04	37.18	115.28	7501.50
	2013-14	7008.86	107.30	48.61	7164.77
	2014-15	6917.34	60.11	109.26	7086.72
	2015-16	6648.94	63.94	113.43	6826.31
	2016-17	5204.12	77.11	115.58	5396.81
	2017-18	3633.59	96.99	114.54	3845.12
	2018-19(P)	3231.21	97.30	130.95	3459.46
Growth rate of 2018-19 over 2017-18(%)		**-11.07**	**0.31**	**14.33**	**-10.03**
CAGR 2009-10 to 2018-19 (%)		**-9.84**	**3.50**	**-0.23**	**-9.42**

Download Table 6.7

Table 6.8: Sector-wise Sales/Consumption of Natural Gas

(Figures in MMSCM)

Sector	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19 (P)	% Share of Total
1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
(a) Energy Purpose									
Power	22,628.46	16,077.71	11,283.62	10,719.80	10,889.20	11,616.26	12,028.29	12,004.70	22.30
Industrial	283.75	269.40	155.89	394.51	401.11	688.15	873.01	944.26	1.75
Manufacturing	29.61	0.00	104.84	138.30	144.22	105.50	126.26	141.81	0.26
City or Local Natural Gas Distribution Network incl. Road Transport	5,598.79	5,779.84	5,904.09	5,415.51	5,463.90	7,350.00	8,585.37	9,206.00	17.10
Tea Plantation	175.28	182.10	195.72	180.48	187.06	183.33	188.56	192.26	0.36
Internal Consumption for Pipeline System	385.14	386.82	372.13	350.57	409.60	471.18	495.62	540.71	1.00
Refinery	4,256.87	3,890.54	3,968.48	4,575.20	5,076.54	5,374.37	6,533.13	7,047.31	13.09
Miscellaneous	9,063.73	7,975.90	7,479.30	5,941.23	4,111.65	3,745.96	3,226.49	3,392.60	6.30
Total (a)	**42,421.62**	**34,562.30**	**29,464.05**	**27,715.60**	**26,683.28**	**29,534.74**	**32,056.71**	**33,469.65**	**62.17**
(b) Non-Energy Purpose									
Fertilizer Industry	14,003.32	14,733.29	15,869.37	15,190.30	16,134.61	15,428.57	14,675.67	14,986.91	27.84
Petrochemical	1,857.69	2,485.96	2,404.66	2,889.67	3,733.28	4,170.06	4,024.13	3,386.09	6.29
Sponge Iron	1,333.26	1,105.74	274.12	153.59	544.32	885.05	1,278.00	1,123.71	2.09
LPG Shrinkage	1,068.37	1,027.29	981.85	1,005.48	754.19	759.45	797.87	873.52	1.62
Total (b)	**18,262.64**	**19,352.29**	**19,530.01**	**19,239.04**	**21,166.40**	**21,243.12**	**20,775.68**	**20,370.22**	**37.83**
Total Sectorial Sales (a+b)	**60,684.26**	**53,914.59**	**48,994.06**	**46,954.64**	**47,849.68**	**50,777.87**	**52,832.40**	**53,839.87**	**100.00**
Total Consumption **	**64,450.67**	**57,367.34**	**52,374.86**	**51,299.75**	**52,517.44**	**55,696.90**	**59,170.16**	**60,798.37**	**-**
Total Consumption in MMSCMD	**165.80**	**157.17**	**143.49**	**140.55**	**143.49**	**152.59**	**162.11**	**166.57**	**-**

Note: **: Availability Basis (Net Production+LNG Imports) P: Provisional

1. Re-classification among the sectors of consumption of natural gas under energy and non-energy sectors, has been done depending on usage. Sectors where natural gas

2. Sectorial Sales/consumption of natural gas includes RLNG.

3. Total may not tally due to rounding off.

4. The reasons for the variation between the consolidated availability and the consumption can be attributed to stock changes, conversion factor (volume/energy) and the

Source: PPAC

Download Table 6.8

Table 6.9: Consumption of Electricity by Sectors in India

(in Giga Watt Hour = 10^6 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
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	384,418	152,744	199,842	74,247	15,540	47,418	874,209
2014-15	418,346	168,913	217,405	78,391	16,177	49,289	948,522
2015-16	423,523	173,185	238,876	86,037	16,594	62,976	1,001,191
2016-17	440,206	191,151	255,826	89,825	15,683	68,493	1,061,183
2017-18	468,613	199,247	273,545	93,755	17,433	70,834	1,123,427
2018-19(P)	484,843	207,791	280,454	97,251	16,823	71,149	1,158,310
Distribution in 2018-19 (%)	**41.86**	**17.94**	**24.21**	**8.40**	**1.45**	**6.14**	**100.00**
Growth rate of 2018-19 over	**3.46**	**4.29**	**2.53**	**3.73**	**-3.50**	**0.44**	**3.11**
CAGR 2009-10 to 2018-19 (%)	**7.43**	**5.63**	**6.74**	**4.84**	**3.09**	**6.87**	**6.58**

(P): Provisional

Source : Central Electricity Authority.

Download Table 6.9

Table 6.10 : Electricity Generated(from Utilities), Distributed, Sold and Transmission Losses in India

in Giga Watt hour =10^6 Kilo Watt hour

Year	Net Electricity Generated from Utilities	Purchases from Non-Utilities + Net Import from Other Countries	Net Electricity Available for Supply	Sold to Ultimate Consumers & Other Countries	Loss in transmission & distribution	Loss in transmission & distribution (%)
1	**2**	**3**	**4=2+3**	**5**	**6=4-5**	**7**
2009-10	749,128	14,391	763,519	569,723	193,796	25.38
2010-11	791,796	19,839	811,635	617,098	194,537	23.97
2011-12	865,952	15,514	881,466	673,068	208,398	23.64
2012-13	900,380	20,849	921,229	708,997	212,232	23.04
2013-14	956,488	17,948	974,436	751,908	222,528	22.84
2014-15	1,040,582	13,773	1,054,355	814,250	240,105	22.77
2015-16	1,088,282	15,947	1,104,228	863,364	240,864	21.81
2016-17	1,154,314	8,977	1,163,290	914,093	249,197	21.42
2017-18	1,221,307	11,198	1,232,505	973,131	259,375	21.04
2018-19(P)	1,285,977	10,258	1,296,235	1,027,070	269,165	20.77
Growth rate of 2018-19 over 2017-18(%)	**5.30**	**-8.40**	**5.17**	**5.54**	**3.77**	**-1.33**
CAGR 2009-10 to 2018-19 (%)	**5.55**	**-3.33**	**5.44**	**6.07**	**3.34**	**-1.99**

(P): Provisional

Source : Central Electricity Authority.

Download Table 6.10

CHAPTER 7: ENERGY BALANCE

Definitions

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

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

Coal is also used as a final product or intermediate for power generation. Similarly, natural gas is also used directly or as an intermediate in power generation. Many petroleum products, such as HSDO, Naphtha etc. are used as a final product by the non-energy producing sectors and also used for power generation. This indicates that the same energy source can be used in various forms at various stages of consumption. This creates a possibility of over-estimation or under-estimation of energy consumption in totality as well as for different sources.

Energy Balance: An energy balance is a framework to complete data on all energy products entering, existing and used within a given country during a reference period (e.g. a year). It expresses all data in common energy units, which makes it possible to define a "total" product.

The purpose of compiling an energy balance starting from the various commodity balances are numerous; they are to:

- Provide a comprehensive overview of the energy profile of a country, to monitor energy security, energy markets, relevant policy goals and to formulate adequate energy policies;
- Provide the basis for aggregate socio-economic indicators, as well as for estimates of CO_2 emissions;
- Compare data of 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(TPES) and Total Final Consumption (TFC) 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 available, 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.

Methodology used for Energy Balance

Energy (in KToe) = Quantity of Commodity * Conversion factor

1Toe = 41868 MJ

Conversion factor = [Net Calorific Value (NCV)]/Mega joules per ton of oil equivalent
where NCV is in kj per kg

Net Calorific Value(NCV) = Gross calorific value (GCV) – (% Moisture Content) [1NCV = 0.9 GCV]
The difference between net and gross calorific values are typically about 5% to 6% of the gross value of solid and liquid fuels and about 10% for Natural gas.
Net Calorific Values are, as recommended by IEA for all commodities.

Highlights of Energy Balance:

In 2018-19, Primary Energy Supply added up to 9,06,089 Kilo Tonne of Oil equivalent (ktoe). The share of Coal accounted for 64.13% and the contribution of Crude Oil was 29.40%. (Table 7.2).

In 2018-19, National Energy Consumption was 5,69,537 ktoe. The industrial sector used 55.90 % 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 17.68% of the industrial energy use followed by Chemicals and petrochemicals 4.41 % and construction 2.38 % (Table 7.2).

The consumption of the residential, agriculture, commercial & public sectors and others represented 30.82% whereas, transport sector accounted for 9.99% of Total Final Consumption. (Table 7.2).

Efforts are being made to reduce the statistical difference, by incorporating more data.

Sankey Diagram (2018-19):

The concept of data visualization in the digital age has revived interest in a style of chart called a Sankey diagram. This style of diagram makes it easy to see the dominant flows within a system and highlights where losses occur. The Sankey diagram is very useful tool to represent an entire input and

output energy flow in energy system after carrying out energy balance calculation. The thicker the line, the greater the amount of energy involved.

The data of Energy Balance (Table 7.2) is used to construct the Sankey diagram, in which flows of energy are traced from energy sources to end-use consumption. The resulting diagram provides a convenient and clear snapshot of existing energy transformations in India which can usefully be compared with a similar global analysis. It gives a basis for examining and communicating future energy scenarios.

Table 7.1 : Energy Commodity Balance for the year 2018-19(P)

Supply	Coal	Lignite	LPG	Naphtha	Kerosene	Diesel (HDO+ LDO)	Fuel Oil	Lubricants	Bitumin	Petrol/ Motor Spirit	Other Petroleum Produc	Natural Gas	Electricity
	(000 tonnes)											MMSCM	(GWh)
Production	728720	44283	12786	19786	4072	111236	10032	949	5803	38039	59658	32873	1371779
From Other Sources													175000
Imports	235240	19	13235	2082		555	1419	2457	877	670	12053	28740	4657
Exports	-1313	-40	-417	-6963	-19	-27931	-2197	-8	-23	-12885	-10653		-8494
Stock changes	-4401	-1538											
Domestic Supply	**958246**	**42724**	**25604**	**14905**	**4053**	**83860**	**9254**	**3398**	**6657**	**25824**	**61058**	**61613**	**1542942**
Transfer													
Statistical difference	10007	3087	-695	-774	-594	266	-2692	270	51	2460	-19689	-815	-29662
Transformation	**637949**	**37669**	**2**	**5**		**499**	**348**					**12005**	**85802**
Electricity plants	637949	37669	2	5		499	348					12005	85802
Energy industry own use												**16479**	
Oil and Gas extraction												6039	
Petroleum refineries												7047	
Other energy sector												3393	
Distribution losses												**82**	**269165**
Final Consumption	**330304**	**8142**	**24907**	**14126**	**3459**	**83627**	**6214**	**3668**	**6708**	**28284**	**41369**	**32232**	**1158313**
Industry Sector	**330304**	**8142**	**2571**	**14126**		**2926**	**2806**				**33073**	**1086**	**484843**
Iron and steel	81731	142				216	1017						
Chemical and petroleum	2040	1		10953		137	770						
Non-ferrous metals						44	386						
Machinery						157	31						
Mining & Quarrying						1487	54						
Paper, pulp and print	1637	603											
Construction	8910	2132				791	275						
Textile and leather	204	2558				28	52						
Non-specified	235782	2706	2571	3173		66	221				33073	1086	484843
Transport Sector			**181**			**6220**	**786**			**28284**	**8300**	**9747**	**16823**
Road			181			2733	110			28284		9206	
Domestic Aviation						3							
Rail						2716							16823
Pipeline transport												541	
Domestic navigation						768	676				8300		
Non-specified													
Other Sectors			**22155**		**3459**	**74481**	**2622**	**3668**	**6708**			**1029**	**656645**
Residential			21728		3231								280454
Comm. And public services					97								97251
Agriculture/forestry			22			654	86					192	207791
Non-specified			405		131	73827	2536	3668	6708			837	71149
Non-Energy Use												**20370**	

(P): Provisional

Statistical Difference is defined as final consumption + use for transformation processes and consumption by energy industry own use + losses - domestic

Final consumption = Total Consumption in Transport + Total Industrial Consumption+Consumption by Other sectors+Non energy Use

* Incluse ATF, Pet Coke, Paraffin waxes, petroleum jelly, LSWR, MTBE and reformate, BGO, Benzene, MTO, CBFS and Sulfur etc.

Download Table 7.1

Table 7.2:Energy Balance of India for 2018-19 (P)

All figures in KToe

	Coal	Crude Oil	Oil Products	Natural Gas	Nuclear	Hydro	Solar, Wind, Others	Electricity	Total
Production	432,746.57	34,955.39		30,238.48	9,854.30	11,609.23	11,095.46		530,499.42
Imports	152,206.88	231,480.44	33,154.13	26,437.12				400.50	443,679.07
Exports	-893.49		-63,562.18					-730.48	-65,186.15
Stock changes	-2,903.20								-2,903.20
Total primary energy supply	**581,156.76**	**266,435.82**	**-30,408.05**	**56,675.60**	**9,854.30**	**11,609.23**	**11,095.46**	**-329.98**	**906,089.14**
Statistical differences	81,450.63	18,353.03	-20,388.21	-750.11				-2,551.10	76,114.24
Main activity producer electricity plants	-438,276.25		-857.84	-11,042.90	-9,854.30	-11,600.88	-10,901.27	117,972.99	-364,560.45
Autoproducer electricity plants						-8.34	-194.19	15,050.00	14,847.47
Oil refineries		-262,862.92	267,596.83	-6,482.23					-1,748.31
Energy industry own use				-8,676.09				-7,378.97	-16,055.06
Losses		-21,925.94		-75.44				-23,148.19	-45,149.57
Final consumption *	**224,331.14**		**215,942.73**	**29,648.83**				**99,614.75**	**569,537.46**
Industry	**224,331.14**		**51,320.17**	**998.97**				**41,696.50**	**318,346.78**
Iron and steel	55,081.92		1,199.87						56,281.79
Chemical and petrochemical	1,374.26		12,653.37						14,027.63
Non-ferrous metals			416.13						416.12
Machinery			192.13						192.13
Mining and quarrying			1,589.71						1,589.71
Paper, pulp and print	1,240.08								1,240.08
Construction	6,487.39		1,082.10						7,569.48
Textile and leather	720.63		78.89						799.52
Non-specified (industry)	159,426.86		34,107.98	998.97				41,696.50	236,230.31
Transport			**46,498.23**	**8,965.84**				**1,446.78**	**56,910.85**
Road			33,401.30	8,468.21					41,869.51
Domestic aviation			8,844.70						8,844.70
Rail			2,808.89					1,446.78	4,255.67
Pipeline transport				497.64					497.64
Domestic navigation			1,443.34						1,443.34
Non-specified (transport)									
Other			**118,124.34**	**946.53**				**56,471.47**	**175,542.34**
Residential			27,927.10					24,119.04	52,046.15
Commercial and public services			101.48					8,363.59	8,465.06
Agriculture/forestry			783.80	176.62				17,870.03	18,830.44
Non-specified (other)			89,311.96	769.92				6,118.81	96,200.69
Non-energy use				**18,737.49**					**18,737.49**
Non-energy use industry/transformation/energy				**1,033.91**					1,033.91
Non-energy use in transport				**803.04**					803.04
Non-energy use in other				16,900.54					16,900.54
Elect. output in GWh					**37,813.00**	**134,991.00**	**129,017.00**		**301,821.00**
Elec output-main activity producer ele plants					37,813.00	134,894.00	126,759.00		299,466.00
Elec output-autoproducer electricity plants						97.00	2,258.00		2,355.00

*** Final consumption refers to End Use Consumption**

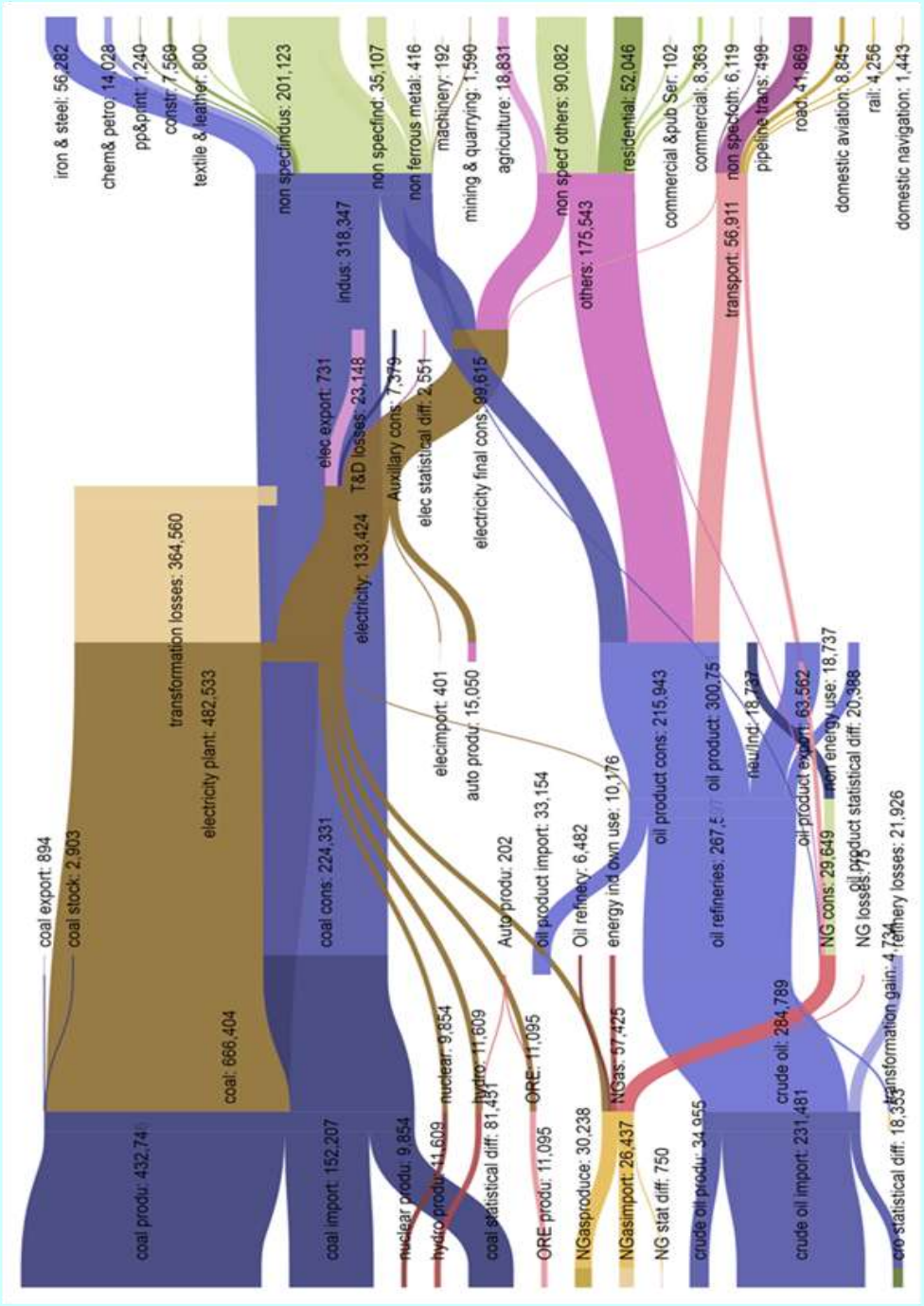
P: Provisional

Download Table 7.2

SANKEY DIAGRAM (INDIA)
ENERGY BALANCE (2018-19)

Total Energy Supply =906089

Total Final Consumption =569537 UNIT: KILO TONNE OF OIL EQUIVALENT (Ktoe)

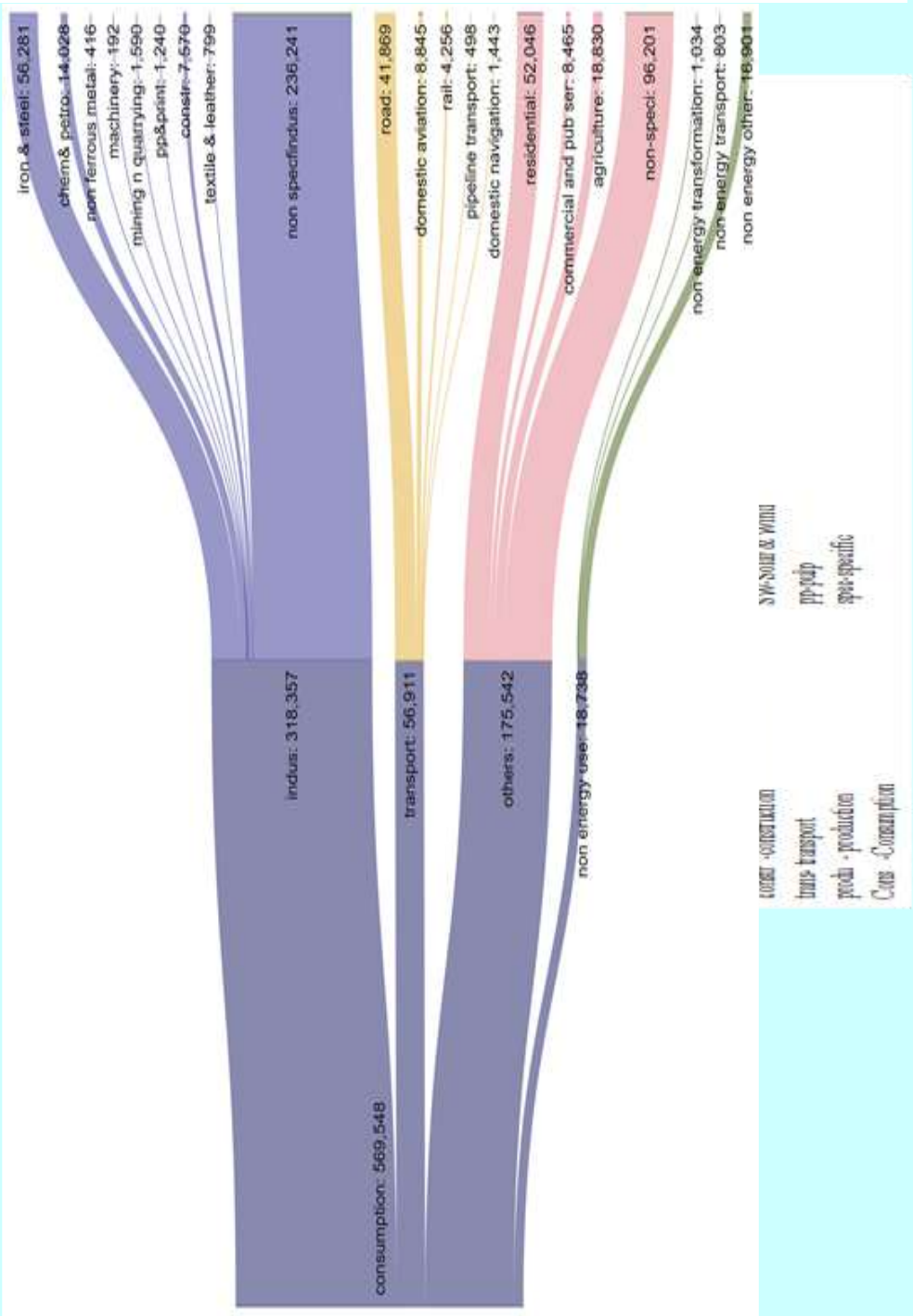


Coal cons -Coal Final Consumption
NGas -Natural Gas
St diff -Statistical Difference
produ - production
Cons -Consumption

Indus -Industries
SW-Solar & Wind
pp-pulp

Source programe for diagram: Sankey MATIC

SANKEY DIAGRAM (INDIA)
FINAL CONUMPTION (2018-19)
Total Consumption =564548 UNIT: KILO TONNE OF OIL EQUIVALENT
Consumption by Subsectors: Industry (318357) Transport (56911) Others (175542) & Non-energy use (18738)

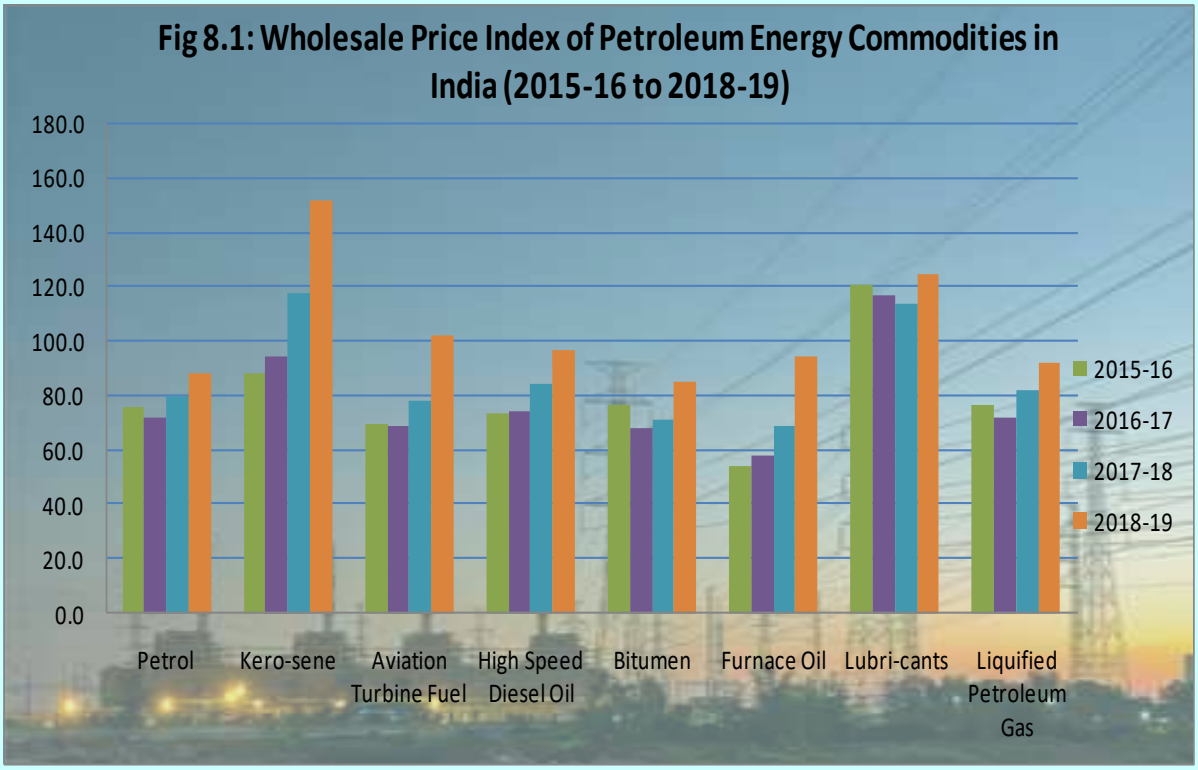


Source programme for diagram: Sankey MATIC

CHAPTER 8: WHOLESALE PRICE INDEX OF ENERGY COMMODITIES

Wholesale Price Index of Petroleum Products

Inflation (2018-19 over 2017-18) in terms of Wholesale Price Index (WPI) of Petroleum Products varied for different products ranging from 37.65% (Furnace Oil), 30.62% (Aviation Turbine Fuel). Index was highest for kerosene (152.4), Index of ATF exceeded 100 in 2018-19 (Table 8.1).



Wholesale Price Index of Non-Petroleum Products

The Wholesale Price Index (WPI) for Petroleum Coke was 149.7 for 2018-19 which registered an inflation of 27.73% in comparison with its value in 2017-18 followed by 15.45% (Lignite) and 5.69% (Electricity) among other non-petroleum products. WPI of coking coal recorded a decrease of 0.89% during 2018-19 over 2017-18.

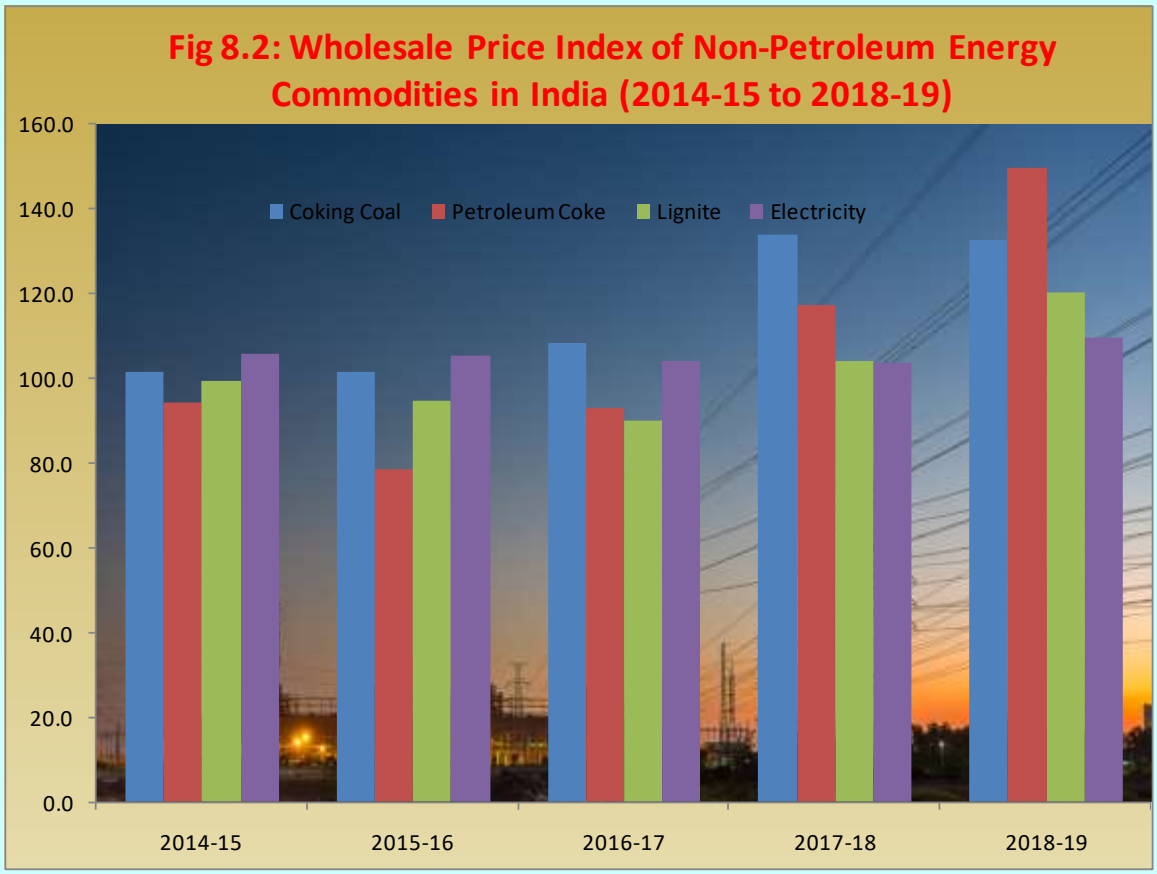


Table 8.1 : Wholesale Price Indices of Energy Commodities in India

(2011-12=100)

	Petroleum Products								Non-Petroleum Products			
Year	Petrol	Kero-sene	Aviation Turbine Fuel	High Speed Diesel Oil	Bitumen	Furnace Oil	Lubri-cants	LPG	Coking Coal	Petroleum Coke	Lignite	Electricity
1	2	3	4	5	6	7	8	9	10	11	12	13
2012-13	114.9	107.1	112.6	111.6	101.3	107.7	109.6	107.8	100.0	99.4	98.9	100.5
2013-14	124.6	109.3	119.7	126.3	112.1	111.5	114.2	118.6	101.2	92.8	99.2	103.6
2014-15	108.6	103.5	105.1	114.8	106.1	93.6	118.8	103.5	101.4	94.3	99.2	105.7
2015-16	75.7	88.4	69.5	73.4	77.1	54.3	120.8	76.7	101.4	78.3	94.7	105.3
2016-17	72.4	94.3	69.3	74.4	68.0	58.1	116.8	72.0	108.2	93.0	90.2	104.2
2017-18	80.3	117.8	78.7	84.4	71.3	68.8	114.0	82.2	134.1	117.2	104.2	103.7
2018-19	88.4	152.4	102.8	97.1	85.6	94.7	124.8	92.1	132.9	149.7	120.3	109.6
Increase in 2018-19 over 2017-18 (%)	**10.09**	**29.37**	**30.62**	**15.05**	**20.06**	**37.65**	**9.47**	**12.04**	**-0.89**	**27.73**	**15.45**	**5.69**

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

Download Table 8.1

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

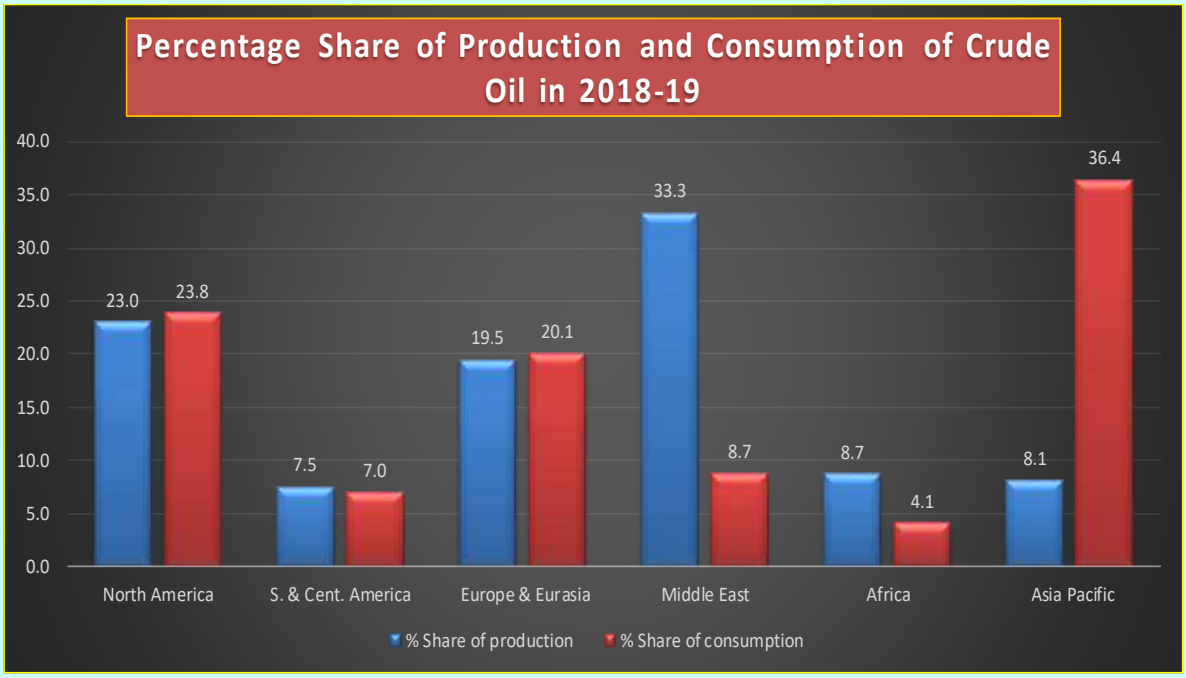
Production and consumption of crude oil

The total estimated production of crude oil in the world has increased from 4120.3 MT in 2012-13 to about 4474.4 MT during 2018-19, The production increased by2.2% from 2017-18 to 2018-19. Geographical distribution of total world production during 2018-19 across major regions reveals that Middle East accounted for the highest share (33.29%), followed by North America (22.96%), Europe & Eurasia (19.49%), Africa (8.69%) Asia Pacific (8.08%)and South & Central America (7.49%). (Table 9.1)

Distribution of total world production according to countries shows that USA, Saudi Arabia and Russian Federation were the highest producers with shares of 14.96%, 12.93% and 12.59% respectively. They were followed by Canada (5.71%), Iraq (5.05%), Iran (4.93%), China (4.23%), UAE (3.97%), Brazil (3.14%), Kuwait (3.28%), Mexico (2.29%), Nigeria (2.20%), and Kazakhstan (2.04%)). India has accounted for only 0.88% of the world production.

Region-wise consumption (Table 9.2) shows that Asia Pacific accounted for the highest share (36.39%) of total world consumption, followed by North America (23.77%), and Europe & Eurasia (20.06%). African countries accounted for the lowest share in the world consumption (4.07%).

Country-wise distribution of consumption reveals that the United States was the largest consumer of crude oil, consuming 19.71% of the world consumption during 2018-19. China was the second largest consumer (13.87%), followed by **India (5.22%)**, Japan (3.88%), Saudi Arabia (3.45%), Russian federation (3.23%) and Brazil (3.12%). India was the third largest consumer of crude oil in the world and the second largest crude oil consumer in the Asia-Pacific region after China.



Production and Consumption of Natural Gas

The total world production of Natural Gas increased from2858.0Million Tonne oil equivalent (Mtoe) in 2012-13 to 3325.8 Mtoe in 2018-19. The production has increased by 5.2% from 2017-18 to 2018-19 (Table 9.3).

Distribution of production of natural gas over major regions shows that Europe & Eurasia (27.97%) and North America (27.25%) are the highest and the second highest producers, together accounting for 55.22% of the total world production.

Country-wise, USA was the largest producer of natural gas (21.50%) in the world during 2018-19, followed by the Russian Federation (17.31%), Iran (6.19%) and Canada (4.78%). India's share in the total world production of natural gas during 2018-19 was only 0.71% (23.6 Mtoe)(Table 9.3).

The growth in production of natural gas from 2017-18to 2018-19 was the highest in North America (9.6%) followed by Middle East (5.7%), Africa (4.8%), Asia pacific (4.0%) and Europe and Eurasia (2.8%) whereas it has declined in South & Central America (-2.0%) in the year 2018-19 as compared to 2017-18 (Table 9.3).

The total world consumption of natural gas has increased by 5.3% from 2852.6 Mtoe in 2012-13 to 3309.4 Mtoe in 2018-19. Country-wise distribution of consumption of natural gas indicates that USA was the largest consumer (21.23%), followed by Russian federation (11.81%), China (7.35%) and Iran (5.86%) respectively. India with a consumption of 49.9 Mtoe accounted for only 1.51% of total world consumption (Table 9.4).

Consumption of natural gas over major regions shows that North America (26.6%) and Asia Pacific (21.44%) accounted for over 48.0% of consumption. They were followed by Commonwealth Independent States (CIS) (15.88%), Middle East (14.37%) and Europe & Eurasia (13.47%) (Table 9.4).

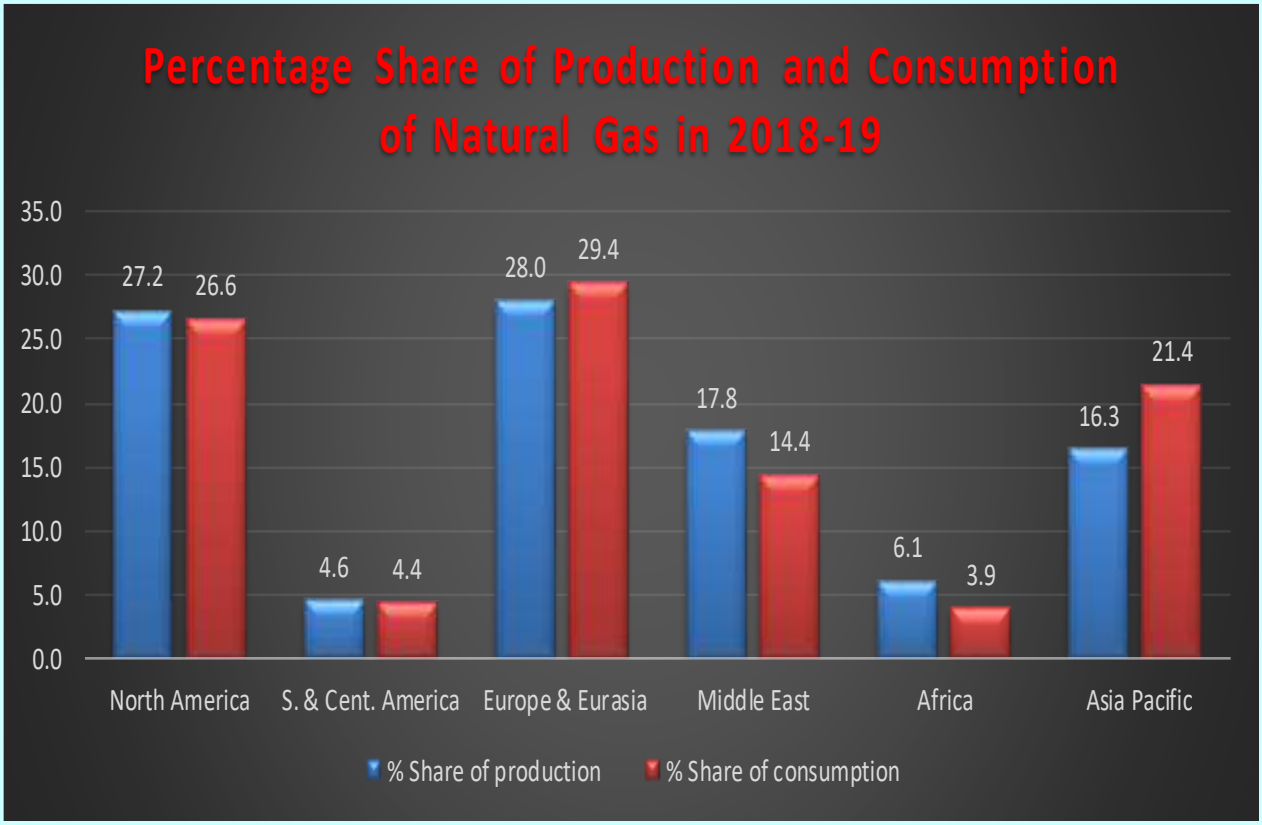

Percentage Share of Production and Consumption of Natural Gas in 2018-19
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
27.2
26.6
4.6
4.4
28.0
29.4
17.8
14.4
6.1
3.9
16.3
21.4
North America
S. & Cent. America
Europe & Eurasia
Middle East
Africa
Asia Pacific
% Share of production
% Share of consumption

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

(Million tonnes)

Country/ Region	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19 (P)	% Change 2018-19 over 2017-18	2018-19 % Share of World's Total Production
North America									
US	394.2	447.2	523.0	566.6	541.9	573.9	669.4	16.6	14.96
Canada	182.6	195.1	209.4	215.6	218.0	235.4	255.5	8.5	5.71
Mexico	143.9	141.8	137.1	127.5	121.4	109.5	102.3	-6.6	2.29
North America	**720.6**	**784.1**	**869.5**	**909.7**	**881.3**	**918.7**	**1027.1**	**11.8**	**22.96**
South and Central America									
Argentina	30.8	30.2	29.8	30.1	28.7	27.3	27.6	1.1	0.62
Brazil	111.9	109.7	122.5	132.2	136.2	142.3	140.3	-1.4	3.14
Colombia	49.9	53.2	52.2	53.0	46.8	45.0	45.6	1.4	1.02
Ecuador	27.1	28.2	29.8	29.1	29.5	28.5	27.7	-2.7	0.62
Peru	6.9	7.3	7.5	6.5	5.8	5.7	6.4	12.2	0.14
Trinidad & Tobago	5.2	5.1	5.1	4.8	4.3	4.4	3.9	-10.9	0.09
Venezuela	139.3	137.8	138.5	135.4	121.0	107.6	77.3	-28.1	1.73
Other S. & Cent. America	7.4	7.6	7.8	7.3	6.8	6.6	6.2	-5.5	0.14
S. & Cent. America	**378.6**	**379.2**	**393.1**	**398.4**	**379.2**	**367.3**	**335.1**	**-8.8**	**7.49**
Europe and Eurasia									
Azerbaijan	43.7	43.8	42.5	42.0	41.4	39.1	39.2	0.3	0.88
Denmark	10.0	8.7	8.1	7.7	6.9	6.7	5.7	-15.9	0.13
Italy	5.4	5.5	5.8	5.5	3.8	4.1	4.7	12.9	0.10
Kazakhstan	79.3	82.3	81.1	80.2	78.6	87.0	91.2	4.9	2.04
Norway	86.9	82.8	84.8	87.5	90.2	88.6	83.1	-6.2	1.86
Romania	4.0	4.1	4.1	4.0	3.8	3.6	3.6	-2.0	0.08
Russian Federation	526.7	532.2	535.1	541.8	555.9	554.3	563.3	1.6	12.59
Turkmenistan	11.5	12.4	12.5	12.8	11.9	11.2	10.6	-5.3	0.24
United Kingdom	44.7	40.7	40.0	45.4	47.5	46.6	50.8	9.0	1.13
Uzbekistan	3.2	2.9	2.8	2.7	2.6	2.8	2.9	4.5	0.06
Other Europe & Eurasia	18.5	18.9	18.7	18.2	17.4	16.8	17.1	1.8	0.38
Europe & Eurasia	**833.8**	**834.4**	**835.5**	**847.7**	**860.0**	**860.8**	**872.1**	**1.3**	**19.49**
Middle East									
Iran	180.5	169.7	174.0	180.2	216.3	235.6	220.4	-6.5	4.93
Iraq	151.3	152.0	158.8	195.6	217.6	222.2	226.1	1.8	5.05
Kuwait	153.8	151.2	150.0	148.1	152.5	144.8	146.8	1.4	3.28
Oman	45.0	46.1	46.2	48.0	49.3	47.6	47.8	0.5	1.07
Qatar	82.2	84.2	83.5	81.2	81.6	78.5	78.5	0.0	1.75
Saudi Arabia	549.2	538.4	543.8	568.0	586.7	559.3	578.3	3.4	12.93
Syria	8.1	2.7	1.5	1.2	1.1	1.1	1.1	-2.5	0.02
United Arab Emirates	156.9	163.3	163.4	176.1	182.4	176.2	177.7	0.8	3.97
Yemen	8.1	9.0	6.9	2.6	1.6	2.4	2.8	14.7	0.06
Other Middle East	9.0	10.3	10.5	10.5	10.6	10.3	10.2	-1.0	0.23
Middle East	**1344.2**	**1326.9**	**1338.7**	**1411.6**	**1499.8**	**1477.9**	**1489.7**	**0.8**	**33.29**

Contd….

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

(Million tonnes)

Country/ Region	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19 (P)	% Change 2018-19 over 2017-18	2018-19 % Share of World's Total Production
Africa									
Algeria	67.2	64.8	68.8	67.2	68.4	66.6	65.3	-2.0	1.46
Angola	85.3	85.2	83.3	88.2	85.8	81.9	74.6	-8.8	1.67
Chad	5.3	4.8	4.7	5.8	5.4	5.4	5.3	-3.1	0.12
Rep. of Congo	14.2	12.3	12.9	11.9	11.8	13.8	17.0	23.9	0.38
Egypt	34.7	34.4	35.1	35.4	33.8	32.2	32.7	1.6	0.73
Equatorial Guinea	15.2	13.2	13.3	12.1	10.4	9.0	8.7	-3.1	0.19
Gabon	11.1	10.7	10.5	10.7	11.0	10.5	9.7	-7.6	0.22
Libya	72.6	49.4	24.4	20.5	19.3	43.8	47.5	8.7	1.06
Nigeria	116.4	109.5	109.3	105.7	91.3	95.5	98.4	3.0	2.20
South Sudan	1.5	4.9	7.7	7.3	5.8	5.5	6.4	17.5	0.14
Sudan	5.1	5.8	5.9	5.4	5.1	4.7	4.9	5.7	0.11
Tunisia	3.8	3.5	3.3	2.9	2.8	2.2	2.3	3.4	0.05
Other Africa	9.8	11.2	11.6	13.7	12.9	15.0	15.7	5.1	0.35
Africa	**442.2**	**409.5**	**390.6**	**386.8**	**363.9**	**386.0**	**388.7**	**0.7**	**8.69**
Asia Pacific									
Australia	21.4	17.8	19.1	17.0	15.6	14.9	15.2	1.5	0.34
Brunei	7.8	6.6	6.2	6.2	5.9	5.5	5.4	-1.4	0.12
China	207.5	210.0	211.4	214.6	199.7	191.5	189.1	-1.3	4.23
India	**42.5**	**42.5**	**41.6**	**41.2**	**40.2**	**40.4**	**39.5**	-2.2	**0.88**
Indonesia	44.6	42.7	41.0	40.6	42.8	41.0	39.5	-3.5	0.88
Malaysia	30.1	28.7	29.8	32.2	32.6	31.5	31.5	-0.2	0.70
Thailand	17.2	17.0	16.8	17.5	18.0	17.5	17.3	-1.0	0.39
Vietnam	17.4	17.3	16.2	17.6	16.0	14.3	13.0	-9.1	0.29
Other Asia Pacific	12.6	12.0	13.7	13.8	13.1	12.5	11.1	-11.1	0.25
Asia Pacific	**401.0**	**394.6**	**395.8**	**400.6**	**383.9**	**369.1**	**361.6**	**-2.0**	**8.08**
TOTAL WORLD	**4120.3**	**4128.5**	**4223.2**	**4354.8**	**4367.9**	**4379.8**	**4474.4**	**2.2**	**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.

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

Source : Ministry of Petroleum & Natural Gas.

Download Table 9.1

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

(in Million tonnes)

Country/ Region	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19(P)	% Change 2018-19 over 2017-18	2018-19 % Share of World's Total Consumption
North America									
US	819.9	835.2	841.2	859.7	868.5	876.6	892.8	1.86	19.71
Canada	103.2	103.4	105.1	102.2	103.8	103.8	105.2	1.34	2.32
Mexico	92.9	90.3	85.9	84.9	85.3	81.8	78.8	-3.70	1.74
North America	**1016.1**	**1028.9**	**1032.2**	**1046.8**	**1057.6**	**1062.1**	**1076.8**	**1.38**	**23.77**
South and Central America									
Argentina	29.7	31.9	31.6	32.6	32.0	31.8	29.8	-6.26	0.66
Brazil	133.3	143.5	149.5	145.6	136.8	140.2	141.3	0.82	3.12
Chile	17.5	16.8	16.3	16.5	17.5	17.0	17.4	2.67	0.38
Colombia	13.8	13.9	14.7	15.5	16.1	15.8	15.9	0.75	0.35
Ecuador	10.9	11.6	12.2	11.8	11.1	10.8	11.7	8.38	0.26
Peru	9.7	10.2	10.0	11.1	11.6	11.4	11.8	3.19	0.26
Trinidad & Tobago	2.0	2.2	2.0	2.2	2.4	2.1	2.1	-0.76	0.05
Venezuela	37.2	36.8	33.6	29.6	24.9	21.2	18.7	-11.85	0.41
Cent. America	18.2	18.2	18.8	20.4	21.0	21.0	21.3	1.43	0.47
Other Caribbean	34.4	32.6	32.6	33.5	34.5	34.8	35.0	0.74	0.77
Other South America	9.2	9.1	9.2	9.6	10.1	10.1	10.5	3.96	0.23
S. & Cent. America	**315.9**	**326.9**	**330.5**	**328.4**	**317.9**	**316.2**	**315.6**	**-0.18**	**6.97**
Europe and Eurasia									
Austria	12.5	12.7	12.4	12.4	12.7	12.9	13.2	2.03	0.29
Belgium	30.7	31.4	31.0	31.9	32.7	32.8	33.1	0.93	0.73
Bulgaria	4.2	3.9	4.2	4.7	4.8	5.0	5.0	0.87	0.11
Croatia	3.2	3.1	3.2	3.3	3.3	3.6	3.6	1.59	0.08
Cyprus	2.6	2.3	2.3	2.4	2.6	2.7	2.6	-1.49	0.06
Czech Republic	9.3	8.9	9.4	9.3	8.6	10.1	10.3	2.46	0.23
Denmark	7.8	7.7	7.8	7.8	7.7	7.7	7.7	0.26	0.17
Estonia	1.6	1.6	1.5	1.4	1.4	1.5	1.5	-0.88	0.03
Finland	9.7	10.1	9.8	9.7	10.2	10.0	10.6	5.48	0.23
France	80.1	79.1	76.7	76.7	76.3	76.6	76.4	-0.20	1.69
Germany	111.4	113.4	110.4	110.0	112.3	114.7	109.2	-4.78	2.41
Greece	15.7	14.9	14.8	15.3	15.3	15.8	15.7	-0.46	0.35
Hungary	6.6	6.5	7.3	7.6	7.6	8.1	8.6	7.10	0.19
Iceland	0.7	0.7	0.8	0.8	0.9	1.0	1.0	0.92	0.02
Ireland	6.7	6.7	6.7	7.0	7.3	7.4	7.6	3.65	0.17
Italy	66.2	60.2	56.8	59.4	59.8	60.2	59.0	-1.88	1.30
Latvia	1.6	1.6	1.6	1.7	1.8	1.8	1.6	-10.66	0.04
Lithuania	2.7	2.6	2.6	2.8	3.0	3.1	3.2	1.12	0.07
Luxembourg	2.8	2.8	2.7	2.7	2.7	2.8	3.0	5.68	0.07
North Macedonia	0.9	0.9	0.9	1.0	1.1	1.0	1.0	-1.87	0.02
Netherlands	43.7	41.4	39.6	38.7	39.9	38.5	39.8	3.17	0.88
Norway	10.2	10.3	9.7	9.9	9.6	9.8	10.1	3.29	0.22
Poland	26.6	24.7	24.8	25.8	28.1	30.6	31.7	3.53	0.70
Portugal	11.1	11.5	11.3	11.6	11.4	11.7	11.3	-3.32	0.25
Romania	9.2	8.4	9.0	9.2	9.7	10.2	10.1	-0.52	0.22
Slovakia	3.6	3.6	3.4	3.7	3.8	4.2	4.1	-3.28	0.09
Slovenia	2.6	2.5	2.4	2.4	2.5	2.5	2.6	4.07	0.06
Spain	65.4	59.8	59.5	61.6	63.7	64.1	65.7	2.53	1.45
Sweden	14.7	14.4	14.3	14.3	15.1	15.2	14.6	-3.78	0.32
Switzerland	11.2	11.8	10.6	10.7	10.2	10.5	10.1	-3.18	0.22
Turkey	33.1	36.0	36.6	43.5	47.1	48.8	48.2	-1.22	1.06
United Kingdom	72.0	71.0	71.0	72.5	74.9	75.1	74.2	-1.15	1.64
Other Europe	15.2	14.9	14.9	15.4	16.5	17.0	16.6	-2.35	0.37
Azerbaijan	4.2	4.5	4.4	4.5	4.5	4.6	4.5	-2.28	0.10
Belarus	10.5	7.1	8.1	6.9	6.8	6.6	6.7	1.13	0.15
Kazakhstan	11.5	12.1	12.1	13.5	13.9	14.4	15.7	9.15	0.35
Russian Federation	144.6	144.3	152.3	144.3	147.8	146.0	146.3	0.18	3.23
Turkmenistan	6.0	6.2	6.5	6.5	6.5	6.6	6.8	2.72	0.15
Ukraine	12.5	11.9	10.2	9.0	9.6	9.5	9.2	-3.72	0.20
Uzbekistan	3.0	2.9	2.7	2.5	2.3	2.7	2.6	-3.76	0.06
Other CIS	3.4	3.5	3.4	3.5	3.8	3.4	3.5	3.19	0.08
Europe & Eurasia	**891.4**	**873.8**	**869.6**	**878.1**	**900.0**	**910.6**	**908.4**	**1.18**	**20.06**

contd...

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

(Million tonnes)

Country/ Region	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19(P)	% Change 2018-19 over 2017-18	2018-19 % Share of World's Total
Middle East									
Iran	87.4	96.5	90.5	82.2	78.3	80.6	82.1	1.91	1.81
Iraq	32.0	34.4	32.8	33.2	37.0	35.4	38.0	7.08	0.84
Israel	13.9	10.3	9.7	10.4	10.6	11.3	11.1	-1.66	0.24
Kuwait	21.6	22.5	19.1	20.1	19.8	19.8	19.3	-2.31	0.43
Oman	7.2	8.4	8.6	8.6	8.9	8.9	8.8	-0.26	0.20
Qatar	8.2	9.3	9.8	10.7	11.8	10.8	11.2	3.69	0.25
Saudi Arabia	146.1	146.5	161.1	167.5	165.1	162.3	156.1	-3.80	3.45
United Arab Emirates	35.2	39.0	39.3	42.2	44.8	42.1	43.3	2.92	0.96
Other Middle East	31.2	29.9	29.9	27.5	26.2	25.8	26.0	0.78	0.57
Middle East	**382.9**	**396.6**	**400.9**	**402.2**	**402.5**	**396.9**	**396.0**	**-0.24**	**8.74**
Africa									
Algeria	16.8	17.6	18.3	19.5	18.9	18.6	18.8	1.22	0.41
Egypt	35.3	35.7	38.3	39.8	40.8	37.9	35.4	-6.58	0.78
Morocco	13.2	13.4	12.7	12.3	12.6	13.3	13.0	-2.61	0.29
South Africa	26.3	26.7	26.5	27.5	26.5	26.5	25.3	-4.63	0.56
Eastern Africa	21.8	23.0	24.1	26.6	27.2	28.7	29.5	2.82	0.65
Middle Africa	10.7	11.7	12.5	12.0	11.9	11.9	12.2	2.51	0.27
Western Africa	26.3	27.1	25.6	25.8	27.7	30.9	32.1	3.92	0.71
Other Northern Africa	15.8	16.7	17.1	15.2	13.8	14.5	15.1	3.85	0.33
Other Southern Africa	2.4	2.5	2.6	2.7	2.8	2.8	2.9	1.60	0.06
Africa	**168.7**	**174.4**	**177.5**	**181.5**	**182.2**	**185.1**	**184.2**	**-0.50**	**4.07**
Asia Pacific									
Australia	47.5	47.8	48.5	46.4	48.0	48.9	51.1	4.51	1.13
Bangladesh	5.4	5.3	6.0	6.3	6.9	7.7	8.8	14.53	0.19
China	487.6	508.9	529.5	561.8	574.0	597.5	628.0	5.10	13.87
China Hong Kong SAR	17.2	17.6	16.6	18.3	18.9	21.4	21.6	1.14	0.48
India	**174.9**	**176.7**	**182.3**	**197.6**	**218.6**	**226.2**	**236.6**	**4.59**	**5.22**
Indonesia	75.5	76.4	77.6	70.7	73.4	76.0	80.1	5.40	1.77
Japan	217.7	207.4	197.0	189.5	183.9	180.7	175.5	-2.86	3.88
Malaysia	32.8	34.9	34.7	34.4	34.3	33.9	34.8	2.56	0.77
New Zealand	7.0	7.1	7.2	7.5	7.6	8.2	8.1	-1.54	0.18
Pakistan	20.0	21.9	22.6	24.6	27.5	28.3	23.4	-17.18	0.52
Philippines	14.4	15.1	16.1	18.3	19.6	21.0	21.2	0.88	0.47
Singapore	63.4	64.2	65.8	69.5	72.4	74.3	75.2	1.17	1.66
South Korea	109.2	108.7	108.4	114.3	123.0	123.3	122.3	-0.84	2.70
Sri Lanka	4.6	3.9	3.4	4.1	4.9	5.2	5.1	-1.69	0.11
Taiwan	42.7	43.5	45.0	45.3	46.6	48.2	48.1	-0.20	1.06
Thailand	52.3	54.6	54.9	57.6	59.8	61.6	63.1	2.35	1.39
Vietnam	16.8	18.2	18.7	20.4	21.6	22.7	23.9	5.26	0.53
Other Asia Pacific	15.6	17.1	18.3	19.2	20.5	21.0	21.6	2.72	0.48
Asia Pacific	**1404.7**	**1429.2**	**1452.6**	**1505.7**	**1561.5**	**1606.1**	**1648.4**	**2.63**	**36.39**
TOTAL WORLD	**4179.6**	**4229.8**	**4263.4**	**4342.7**	**4421.7**	**4477.0**	**4529.3**	**1.17**	**100.00**

Notes: *: Less than 0.05 P: Provisional

Note: Inland demand plus international aviation and marine bunkers and refinery fuel and loss. Consumption of biogasoline (such as ethanol), biodiesel and derivatives of coal and natural gas are also included.

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

Download Table 9.2

Table 9.3: Countrywise Estimates of Production of Natural Gas

(Million tonnes oil equivalent)

Country/ Region	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19 (P)	% Change 2018-19 over 2017-18	2018-19 % Share of World's Total Production
North America									
USA	558.1	563.8	606.0	636.5	625.4	641.2	715.2	11.5	21.50
Canada	129.2	130.6	136.7	138.2	147.7	152.7	158.8	4.0	4.78
Mexico	43.7	45.1	44.1	41.2	37.5	32.9	32.1	-2.4	0.97
North America	**731.1**	**739.6**	**786.8**	**816.0**	**810.7**	**826.8**	**906.2**	**9.6**	**27.25**
South and Central America									
Argentina	31.5	29.7	29.7	30.5	32.1	31.9	33.9	6.1	1.02
Bolivia	14.7	16.8	17.4	16.8	15.1	14.7	13.7	-6.6	0.41
Brazil	17.1	18.9	20.1	20.5	20.7	23.4	21.6	-7.4	0.65
Colombia	9.9	11.4	10.6	10.0	10.3	10.6	11.1	4.6	0.33
Peru	10.3	10.7	11.3	10.9	12.1	11.2	11.0	-1.7	0.33
Trinidad & Tobago	33.1	33.3	32.7	30.9	26.9	27.4	29.2	6.6	0.88
Venezuela	27.4	26.3	27.3	31.0	32.0	33.2	28.6	-13.9	0.86
Other S. & Cent. America	2.6	2.3	2.3	2.5	2.7	2.7	2.8	6.8	0.09
S. & Cent. America	**146.7**	**149.4**	**151.4**	**153.1**	**151.9**	**155.0**	**151.9**	**-2.0**	**4.57**
Europe and Eurasia									
Azerbaijan	14.5	15.0	15.8	16.2	15.7	15.3	16.1	5.6	0.48
Denmark	5.2	4.3	4.1	4.1	4.0	4.3	3.7	-15.0	0.11
Germany	8.1	7.4	6.9	6.5	6.0	5.5	4.8	-13.1	0.14
Italy	7.0	6.3	5.9	5.5	4.7	4.5	4.5	-1.6	0.13
Kazakhstan	17.1	18.4	18.6	18.9	19.7	20.1	21.0	4.1	0.63
Netherlands	58.8	62.3	51.9	39.4	38.1	33.2	27.7	-16.3	0.83
Norway	97.9	92.8	92.9	99.9	99.6	105.9	103.7	-2.1	3.12
Poland	3.9	3.8	3.7	3.7	3.6	3.5	3.4	-1.5	0.10
Romania	8.7	8.6	8.8	8.8	7.8	8.5	8.2	-3.7	0.25
Russian Federation	517.5	528.4	508.3	502.5	506.7	546.5	575.6	5.3	17.31
Turkmenistan	50.7	50.7	54.6	56.6	54.4	50.5	52.9	4.8	1.59
Ukraine	16.7	17.3	17.4	16.2	16.4	16.7	17.1	2.4	0.51
United Kingdom	33.7	31.8	32.2	35.0	35.9	36.0	34.9	-3.1	1.05
Uzbekistan	48.6	48.1	48.4	46.1	45.7	45.9	48.7	6.1	1.46
Other Europe & Eurasia	8.0	7.00	6.5	6.2	8.2	8.5	7.8	-8.2	0.23
Europe & Eurasia	**896.3**	**902.1**	**876.0**	**865.7**	**866.4**	**904.9**	**930.1**	**2.8**	**27.97**
Middle East									
Bahrain	11.2	12.0	12.6	12.7	12.4	12.4	12.8	2.6	0.38
Iran	134.9	135.4	150.9	157.8	171.4	189.3	205.9	8.8	6.19
Iraq	5.5	6.1	6.5	6.3	8.5	8.7	11.2	28.4	0.34
Kuwait	12.7	13.3	12.3	13.8	14.1	14.0	15.0	7.6	0.45
Oman	24.4	26.5	25.2	26.4	27.1	27.7	30.9	11.4	0.93
Qatar	139.8	144.6	145.8	150.5	149.4	148.2	150.9	1.8	4.54
Saudi Arabia	81.1	81.7	83.6	85.3	90.6	93.9	96.4	2.6	2.90
Syria	5.2	4.3	4.0	3.5	3.0	2.9	3.1	4.0	0.09
United Arab Emirates	45.5	45.8	45.5	50.5	51.9	53.3	55.6	4.4	1.67
Yemen	6.5	8.9	8.4	2.5	0.4	0.5	0.5	1.9	0.01
Other Middle East	2.2	5.4	6.3	6.9	7.8	8.2	8.7	6.4	0.26
Middle East	**469.0**	**484.0**	**501.1**	**516.1**	**536.6**	**559.2**	**590.9**	**5.7**	**17.77**

w Less than 0.05%

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

(Million Tonnes Oil Equivalent)

Country/ Region	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19 (P)	% Change 2018-19 over 2017-18	2018-19 % Share of World's Total Production
Africa									
Algeria	67.4	68.2	68.9	70.0	78.6	79.9	79.4	-0.7	2.39
Egypt	50.4	46.4	40.4	36.6	34.6	42.0	50.4	20.0	1.51
Libya	10.0	10.5	10.2	9.5	8.1	8.2	8.4	2.2	0.25
Nigeria	33.7	28.5	34.4	41.3	39.7	41.4	42.3	2.4	1.27
Other Africa	16.3	17.0	16.9	17.7	18.6	22.5	22.9	1.9	0.69
Africa	**177.8**	**170.5**	**170.8**	**175.0**	**179.6**	**194.0**	**203.4**	**4.8**	**6.12**
Asia Pacific									
Australia	51.2	53.1	57.3	65.4	82.9	97.0	111.9	15.3	3.36
Bangladesh	18.3	18.9	19.8	22.2	22.7	22.9	23.7	3.2	0.71
Brunei	10.5	10.2	10.9	11.4	11.1	11.1	10.8	-2.3	0.32
China	95.9	104.7	112.8	116.7	118.6	128.3	138.9	8.3	4.18
India	**32.0**	**26.7**	**25.2**	**24.2**	**22.9**	**23.8**	**23.6**	**-0.7**	**0.71**
Indonesia	67.3	66.7	65.7	65.5	64.6	62.7	62.9	0.4	1.89
Malaysia	59.5	62.7	61.9	63.5	62.2	64.0	62.3	-2.6	1.87
Myanmar	10.8	11.1	14.2	16.5	15.7	15.3	15.3	0.0	0.46
Pakistan	31.5	30.6	30.1	30.1	29.8	29.8	29.4	-1.3	0.88
Thailand	36.9	37.2	37.5	35.4	34.7	33.3	32.4	-2.6	0.98
Vietnam	7.8	8.1	8.5	8.8	8.8	8.2	8.3	1.3	0.25
Other Asia Pacific	15.5	16.1	20.3	25.3	26.0	26.0	23.6	-9.2	0.71
Asia Pacific	**437.1**	**446.2**	**464.2**	**485.1**	**500.1**	**522.4**	**543.2**	**4.0**	**16.33**
TOTAL WORLD	**2858.0**	**2891.8**	**2950.2**	**3011.0**	**3045.3**	**3162.4**	**3325.8**	**5.2**	**100.0**

* Excluding gas flared or recyled

Source : Ministry of Petroleum & Natural Gas

Download Table 9.3

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

(in Million Tonnes Oil Equivalent)

Country/ Region	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19 (P)	% Change 2018-19 over 2017-18	% Share of World's Total Consumption for 2018-19
North America									
USA	591.7	607.9	621.0	639.4	644.1	635.8	702.6	10.5	21.23
Canada	83.6	89.7	94.2	94.4	91.0	94.3	99.5	5.5	3.01
Mexico	63.3	66.9	67.8	69.5	71.4	74.3	77.0	3.6	2.33
North America	**738.6**	**764.5**	**783.1**	**803.2**	**806.5**	**804.4**	**879.1**	**9.3**	**26.6**
South and Central America									
Argentina	39.3	39.6	39.7	40.1	41.5	41.5	41.9	0.8	1.27
Brazil	28.0	33.0	35.0	36.9	31.9	32.4	30.9	-4.6	0.93
Chile	4.6	4.6	3.8	4.1	5.1	4.8	5.5	14.2	0.17
Colombia	8.1	9.0	9.8	9.6	10.1	10.5	11.2	7.1	0.34
Ecuador	0.6	0.7	0.8	0.7	0.8	0.7	0.6	-14.1	0.02
Peru	5.2	5.1	5.8	6.1	6.5	5.8	6.1	4.4	0.18
Trinidad & Tobago	14.7	14.9	14.7	14.6	13.0	13.1	13.2	0.3	0.40
Venezuela	29.8	27.8	29.3	31.8	32.3	33.4	28.7	-13.9	0.87
Central America	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.00
Other Caribbean	2.8	3.1	3.2	3.2	3.3	3.0	3.5	16.0	0.10
Other South America	2.7	2.8	3.0	2.9	3.1	3.3	3.3	1.5	0.10
S. & Cent. America	**135.6**	**140.6**	**144.8**	**150.2**	**147.5**	**148.4**	**144.8**	**-2.5**	**4.37**
Europe and Eurasia									
Austria	7.4	7.1	6.5	6.9	7.2	7.8	7.5	-4.2	0.23
Belgium	14.4	14.2	12.4	13.6	13.9	14.1	14.5	2.8	0.44
Bulgaria	2.5	2.4	2.4	2.6	2.7	2.8	2.6	-5.9	0.08
Croatia	2.4	2.3	2.0	2.1	2.2	2.5	2.4	-2.8	0.07
Czech Republic	6.9	6.9	6.2	6.5	7.0	7.2	6.9	-4.7	0.21
Denmark	3.5	3.3	2.8	2.8	2.9	2.8	2.7	-2.9	0.08
Estonia	0.5	0.5	0.4	0.4	0.4	0.4	0.4	2.4	0.01
Finland	2.7	2.6	2.3	2.0	1.7	1.6	1.8	11.5	0.05
France	38.2	38.8	32.6	35.0	38.3	38.5	36.7	-4.6	1.11
Germany	69.7	73.1	63.5	66.2	73.0	77.2	75.9	-1.6	2.29
Greece	3.6	3.2	2.4	2.6	3.4	4.1	4.1	-1.8	0.12
Hungary	8.4	7.8	7.0	7.5	8.0	8.5	8.3	-3.3	0.25
Ireland	4.0	3.8	3.7	3.8	4.2	4.3	4.5	3.8	0.14
Italy	61.4	57.4	50.7	55.3	58.1	61.5	59.5	-3.3	1.80
Latvia	1.2	1.2	1.1	1.1	1.1	1.0	1.2	14.6	0.04
Lithuania	2.7	2.2	2.1	2.1	1.8	1.9	1.9	0.4	0.06
Luxembourg	1.1	0.9	0.8	0.8	0.7	0.7	0.7	-1.4	0.02
Macedonia	0.1	0.1	0.1	0.1	0.2	0.2	0.2	-7.5	0.01
Netherlands	33.8	33.6	29.6	29.3	30.2	31.0	30.7	-1.1	0.93
Norway	3.4	3.4	3.7	3.9	3.8	3.9	3.9	-2.2	0.12
Poland	15.0	15.0	14.6	14.7	15.7	16.5	17.0	2.9	0.51
Portugal	3.9	3.7	3.5	4.1	4.4	5.5	5.0	-7.6	0.15
Romania	10.8	9.8	9.5	8.9	9.0	9.6	9.3	-2.8	0.28
Slovakia	4.4	4.8	3.8	3.9	3.9	4.1	4.0	-3.3	0.12
Slovenia	0.7	0.7	0.6	0.7	0.7	0.7	0.7	-1.1	0.02
Spain	28.6	26.1	23.7	24.5	25.0	27.3	27.1	-0.8	0.82
Sweden	0.9	0.9	0.8	0.8	0.8	0.7	0.7	2.4	0.02
Switzerland	2.6	2.8	2.4	2.6	2.7	2.7	2.6	-5.0	0.08
Turkey	37.2	37.8	40.1	39.5	38.3	44.3	40.7	-8.3	1.23
United Kingdom	66.1	65.6	60.2	61.9	69.8	67.8	67.8	0.1	2.05
Other Europe	3.4	3.6	3.5	3.9	4.0	4.6	4.6	-0.1	0.14
Europe & Eurasia	**441.6**	**435.7**	**395.2**	**410.0**	**435.2**	**455.9**	**445.7**	**-2.2**	**13.47**
Commonwealth Independent States (CIS)									
Azerbaijan	8.0	8.1	8.5	9.6	9.4	9.1	9.3	1.9	0.28
Belarus	16.7	16.6	16.4	15.4	15.3	15.7	16.6	6.1	0.50
Kazakhstan	11.1	11.7	12.9	13.2	13.6	13.7	16.7	22.4	0.50
Russian Federation	368.6	365.3	363.0	351.4	361.7	370.7	390.8	5.4	11.81
Turkmenistan	19.7	16.6	17.2	21.8	20.7	21.8	24.4	12.0	0.74
Ukraine	44.6	41.0	34.7	27.5	27.0	26.0	26.3	1.3	0.79
Uzbekistan	39.8	39.7	41.7	39.8	37.3	37.1	36.6	-1.2	1.11
Other CIS	4.9	4.1	4.5	4.5	4.4	4.3	4.9	13.2	0.15
CIS	**513.4**	**503.0**	**498.9**	**483.2**	**489.4**	**498.3**	**525.7**	**5.5**	**15.88**

Contd….

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

(in Million Tonnes Oil Equivalent)

Country/ Region	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19 (P)	% Change 2018-19 over 2017-18	% Share of World's Total Consumption for 2018-19
Middle East									
Iran	131.2	132.3	149.1	158.2	168.8	180.5	193.9	7.4	5.86
Iraq	5.5	6.1	6.5	6.3	8.5	11.0	14.7	33.9	0.44
Israel	2.1	5.7	6.2	6.9	8.0	8.5	9.0	6.4	0.27
Kuwait	15.1	15.3	15.4	17.5	18.2	18.1	18.7	3.6	0.57
Oman	16.9	18.6	18.3	19.8	19.6	20.0	21.4	6.9	0.65
Qatar	28.9	30.6	33.2	36.5	34.7	37.0	36.0	-2.8	1.09
Saudi Arabia	81.1	81.7	83.6	85.3	90.6	93.9	96.4	2.6	2.91
United Arab Emirates	55.0	55.7	54.5	61.5	62.5	64.0	65.8	2.9	1.99
Other Middle East	17.5	18.0	18.0	19.3	19.8	20.1	19.5	-2.9	0.59
Middle East	**353.2**	**364.0**	**384.8**	**411.3**	**430.7**	**453.2**	**475.6**	**4.9**	**14.37**
Africa									
Algeria	25.7	27.6	31.0	32.6	33.2	33.4	36.7	9.9	1.11
Egypt	43.5	42.6	39.7	39.6	42.4	48.1	51.2	6.5	1.55
Morocco	1.0	1.0	1.0	1.0	1.0	1.0	0.9	-9.6	0.03
South Africa	3.7	3.5	3.7	3.7	3.9	3.8	3.7	-2.2	0.11
Eastern Africa	0.9	1.0	1.1	1.4	1.7	1.7	1.9	7.5	0.06
Middle Africa	3.5	3.1	3.1	3.0	3.8	3.9	3.8	-1.6	0.11
Western Africa	11.2	10.9	13.7	20.6	21.2	19.8	21.0	6.2	0.63
Other Northern Africa	9.4	10.6	9.7	8.3	8.8	9.4	9.8	4.3	0.30
Other Southern Africa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	-	0.00
Africa	**99.0**	**100.3**	**103.1**	**110.1**	**116.1**	**121.0**	**129.0**	**6.6**	**3.90**
Asia Pacific									
Australia	30.4	32.0	34.5	36.2	35.9	35.5	35.6	0.4	1.08
Bangladesh	18.3	18.9	19.8	22.2	22.7	22.9	24.4	6.4	0.74
China	129.7	147.8	162.0	167.4	180.1	206.7	243.3	17.7	7.35
China Hong Kong SAR	2.3	2.1	2.1	2.6	2.7	2.7	2.6	-3.2	0.08
India	**47.9**	**42.1**	**41.7**	**41.1**	**43.7**	**46.2**	**49.9**	**8.1**	**1.51**
Indonesia	36.9	35.6	35.7	35.3	33.6	33.1	33.5	1.1	1.01
Japan	105.9	106.2	107.3	102.1	100.1	100.6	99.5	-1.1	3.01
Malaysia	36.1	38.3	38.4	37.8	36.4	35.9	35.5	-1.2	1.07
New Zealand	3.8	4.0	4.5	4.1	4.1	4.3	3.7	-12.9	0.11
Pakistan	31.5	30.6	30.1	31.4	33.2	35.0	37.5	7.0	1.13
Philippines	3.1	2.9	3.0	2.9	3.3	3.2	3.5	8.3	0.11
Singapore	7.7	8.6	8.9	10.0	10.2	10.6	10.6	0.0	0.32
South Korea	45.2	47.3	43.0	39.3	41.0	42.8	48.1	12.4	1.45
Taiwan	15.4	15.4	16.2	17.4	18.0	20.0	20.3	1.8	0.61
Thailand	41.8	42.0	42.9	43.8	43.5	43.1	42.9	-0.3	1.30
Vietnam	7.8	8.1	8.5	8.8	8.8	8.2	8.3	1.3	0.25
Other Asia Pacific	7.3	7.4	8.7	10.3	9.8	9.8	10.3	5.3	0.31
Asia Pacific	**571.2**	**589.5**	**607.2**	**612.7**	**627.1**	**660.6**	**709.6**	**7.4**	**21.44**
TOTAL WORLD	**2852.6**	**2897.5**	**2917.1**	**2980.6**	**3052.6**	**3141.9**	**3309.4**	**5.3**	**100.0**

Notes: *:Less than 0.05

1.The difference between these world consumption figures and the world production

2. Inland demand plus international aviation and marine bunkers and refinery fuel and

3. Total may not add up due to rounding off.

Source : Ministry of Petroleum & Natural Gas.

Download Table 9.4

CHAPTER 10: ENERGY INDICATORS

The availability of resources and the reliability of their supply are essential for a sustainable economic growth. All sectors of the economy including residential, commercial, transportation, service and agricultural sectors depend on secure, sufficient and efficient energy services. Job availability, industrial productivity, urban and rural development and all major economic activities are strongly affected by energy input. The most important form of energy, viz. electricity is an important and sometimes irreplaceable input to modem productive activities, communication, dissemination of information and other service industries.

Energy Indicators

Energy indicators are the medium to provide a snap shot of the energy scenario of the country. They help to understand the various aspects of energy and are capable of detecting the grey areas in the complete chain of energy flow. Energy and energy efficiency indicators are indispensable tools for identifying and understanding the key drivers of trends, and for prioritizing interventions to control energy consumption growth. Indicators are also effective in quantifying the potential impact and benefits of interventions. While defining and constructing energy indicators is rather flexible, their accuracy strongly depends on the quality and detail of available energy end-use data.

As per "Energy Indicators for Sustainable Development: Guidelines and Methodology" the list of indicators includes indicators on Social, Economic and Environment. While the importance of these various indicators is recognized and since Social and Environmental indicators require additional levels of detail than that are presented in Energy Statistics this report is restricted to the economic dimension only

Yet, choosing and developing appropriate indicators to support the development of policies is not straightforward. This publication should enable energy analysts and policy makers to: Identify priority areas for the development of energy sector and develop a strategy to advance policy development through the improved use of indicators to track progress of energy policies. No set of energy indicators can be final and definitive. To be useful, indicators must evolve over time to fit country-specific conditions, priorities and capabilities. The information inherent in these indicators is not only meaningful for internal management, but also of interest for external users.

Economic Dimension and Energy Indicators

Modem Economies are highly dependent on reliable and adequate energy supply owing to the fact that it's the prerequisite for industrialization. All sectors of the economy - residential, commercial, transport, services and agriculture, demand energy in different forms. In tum, these sectors foster growth on economic and social front. Energy supply affects employment, productivity and development. Owing to the economic importance of energy it is important to develop the economic energy indicators and provide a profound basis for strategic changes and policy making.

The economic indicators have two themes: Use & production patterns and Security. The first has the sub theme of Overall Use, Overall Productivity, Supply Efficiency, Production, End Use, Diversification (Fuel Mix) and Prices. The second has the sub themes of Imports and strategic Fuel stocks.

Table: 10.1 List of Energy Indicators

Theme	Sub-theme	
Use and Production Pattern	Overall Use	Energy use per capita
	Overall Productivity	Energy use per unit of GDP
	Supply Efficiency	Efficiency of energy conversion and distribution
	Production	Reserves-to-production ratio
		Resources-to-production ratio
	End Use	Industrial energy intensities
		Agricultural energy intensities
		Transport energy intensities
	Diversification (Fuel Mix)	Fuel shares in energy and electricity
		Non-carbon energy share in energy and electricity
		Renewable energy share in energy and electricity
	Prices	WPI of energy sources
Security	Imports	Net Energy Import Dependency
	Strategic fuel stocks	Stocks of critical fuels per corresponding fuel consumption

The indicators as indicated in the earlier chapter have been classified under two themes Use and Production Pattern and Security. Indian scenario for each of these indicatorshas been presented in the current chapter. The indicators have been numbered irrespective of their theme and sub-theme

Theme: Use and Production Pattern

This theme is further sub classified into sub themes as Overall Use, Overall Productivity, Supply Efficiency, Production, End Use, Diversification (Fuel Mix) and Prices.

SUB THEME: OVERALL USE

Energy Indicator: Energy Use per Capita-

Purpose and Measurement method**:** This indicator measures the level of energy use on per capita basis and reflects the energy-use pattems and aggregate energy intensity of a society. It is calculated as the ratio of the total annual use of energy to the mid-year population. It may be further classified as follows:

a) Total Primary energy supply per capita
b) Total Final consumption of energy per capita
c) Electricity use per capita

SUB THEME: OVERALL PRODUCTIVITY

Energy Indicator: Energy Use Per Unit of GDP

Purpose and Measurement method: This indicator reflects the trends in overall energy use relative to GDP, indicating the general relationship of energy use to economic development. This indicator is calculated as the ratio of energy use to economic output. Here Energy Use indicates Total Primary Energy Supply (TPES), Total Final Consumption (TFC) and final electricity consumption and Output is taken as GDP measured in thousand INR. It may be further classified as follows:

a) Total Primary energy supply per 000' rupees
b) Total Final consumption of energy per 000'rupees
c) Electricity Use per 000' rupees

SUB THEME: PRODUCTION

Energy Indicator:

I. Reserve-to-Production Ratio

Purpose and Measurement method: – The purpose of this indicator is to measure the availability of national energy reserves with respect to corresponding fuel production. Reserves are generally defined as identified (demonstrated and inferred) resources that are economically recoverable at the time of assessment. The indicator provides a basis for estimating future energy supplies in years with respect to current availability of energy reserves and levels of production.

It is computed by dividing the proven energy reserves of a commodity at the end of a year by the total production of that commodity in that year.

II. Resources to Production Ratio

Purpose and Measurement method: – The purpose of this indicator is to measure the availability of national energy resources with respect to corresponding fuel production. Total resources include reserves, and hypothetical and speculative undiscovered resources. It provides a relative measure of the length of time that resources would last if production were to continue at current levels.

The lifetime of fuel resources in terms of years by using resources-to-production ratio is computed by dividing the total energy resources of a commodity at the end of a year by the total production of that commodity in that year.

SUB THEME: END USE

Energy Indicator: End Use Energy Intensities

I. Industrial Energy Intensities-

Purpose and Measurement method: – This set of indicators measures the aggregate energy use of the industrial sector and selected energy intensive industries per corresponding value

added. Intensities provide information about the relative energy use per thousand units of output. The set is used to analyze trends in energy efficiency and evaluating trends in technological improvements. It is measured as Energy Use per thousand units of value added by industrial sector and by selected energy intensive industries.

II. Agricultural Energy Intensities

Purpose and Measurement method: – This indicator is a measure of aggregate energy intensity in the agricultural sector that can be used for analyzing trends, particularly in renewable and non-commercial energy use. It is measured as Energy Use per thousand units of value added by Agriculture sector.

III. Transport Energy Intensities

Purpose and Measurement method: – This indicator is used to monitor trends in energy use in the Transport sector. It is measured as Energy Use per thousand units of value added by Transport sector. The transport indicators measure how much energy is used for moving both goods and people. Transport is a major user of energy, mostly in the form of oil products, which makes transport the most important driver behind growth in global oil demand.

It is evident from the value of the indicator that industrial sector and transport sector are energy intensive. It must be noted that changes in the aggregate indicator can also be due to change in relative output of the sector. Hence we can say that the difference seen across the time development do not necessarily reflect differences in energy efficiency.

SUB THEME: DIVERSIFICATION

Energy Indicator: Fuel share in energy and electricity

I. Fuel Share in Energy
II. FuelShare in Electricity

Purpose and Measurement method: – This indicator provides the share of fuels in TPES, TFC and electricity generation. This indicator is computed by calculating the ratio of consumption or production of the specific energy fuels identified above to total energy use or production with respect to:

i. TPES,
ii. TFC and
iii. Electricity generation

Energy Indicator: Non carbon energy share in energy and electricity

I. Non Carbon Energy Share in Energy
II. Non Carbon Energy Share in Electricity

Purpose and Measurement method: – This indicator measures the share of non-carbon energy sources in TPES and electricity generation. Share of non- carbon energy in TPES is computed by calculating the ratio of primary supply of non-carbon energy to TPES. The share of non-carbon in electricity generation is the total electricity generated from non-carbon energy sources divided by total electricity generated.

Energy Indicator: Renewable energy share in energy and electricity

I. Renewable Energy Share in TPES
II. Renewable Energy Share in TFC
III. Renewable Energy Share in Electricity

Purpose and Measurement method: – This indicator measures the share of Renewable energy in TPES, TFC and electricity generation. This indicator is computed by calculating the ratio of the consumption and production of renewables to total final energy supply and production. The share of renewables in electricity is the electricity generated from renewables divided by total electricity generated.

SUB THEME: PRICES

Energy Indicator: WPI of Energy Sources

Purpose and Measurement method: – This is a price indicator of energy sources and reflects the price change with respect to base year 2011-12. It is to be noted that energy prices are driving forces for incentive or conservation, or efficiency improvements. Also, it shows affordability and therefore is one of the factors responsible for fuel diversification.

SUB THEME: SUPPLY EFFICIENCY

Energy Indicator: **Efficiency of energy conversion and distribution**

Purpose and Measurement method: – This indicator measures the efficiency of energy conversion and distribution systems in various energy supply chains including losses occurring during electricity transmission and distribution, and gas transportation and distribution. Due to constraint of data availability only the losses in transmission of electricity are used. The indicator is calculated as ratio of losses in transmission of electricity to electricity generated.

Theme: Security

SUB THEME: STRATEGIC FUEL STOCKS

Energy Indicator: Stock of Critical Fuels per Corresponding Fuel consumption

Purpose and Measurement method: – The purpose of this indicator is to measure the availability of national stocks of critical fuels, such as oil, with respect to corresponding fuel consumption. Many countries maintain stocks of oil in anticipation of disruptions in oil supply. For some countries, the critical fuel might be natural gas or other types of fuel. In Indian context we have taken coal as critical fuel. The indicator provides a relative measure of the length of time that stocks would last if supply were disrupted and fuel use were to continue at current levels. This indicator is defined by dividing the stocks of the critical fuels maintained by countries by the corresponding annual fuel consumption.

SUB THEME: IMPORTS

Energy Indicator: Net energy import dependency

Purpose and Measurement method: – This indicator measures the extent to which a country relies on imports to meet its energy requirements. This indicator is computed by calculating the ratio of net imports to consumption. Petroleum products are excluded as India is net exporter of them and have taken into account only the import value of different energy sources to calculate the indicator.

Table 10.2 ENERGY INDICATORS 2018-19 AT A GLANCE

Theme	Sub-theme	Indicator	category	Unit	Value
Use and Production Pattern	Overall Use	Energy use per capita	TPES	toe/person	0.6828
			TFC	toe/person	0.4292
			Electricity	Kwh/person	872.8787
	Overall Productivity	Energy use per unit of GDP	TPES	toe/000'rupees	0.0065
			TFC	toe/000'rupees	0.0041
			Electricity	Kwh/000'rupees	8.2846
	Supply Efficiency	Efficiency of energy conversion and distribution	All	%	19.62
	Production	Reserves-to-production ratio	All	years	176
			coal	years	214
			lignite	years	153
		Resources-to-production ratio	All	years	389
			Crude oil	years	18
			Natural Gas	years	42
			Coal	years	448
			Lignite	years	1033
	End Use	Sectoral Energy Intensities	Industry	toe/000'rupees	0.00865
			Agriculture	toe/000'rupees	0.00101
			Transport	toe/000'rupees	0.00916
		Sectoral Electricity Intensities	Industry	Kwh/000'rupees	12.190
			Agriculture	Kwh/000'rupees	11.098
			Transport	Kwh/000'rupees	2.707
	Diversification (Fuel Mix)	Fuel shares in TPES	Crude Oil	%	29.41
			Natural Gas	%	6.25
			Coal	%	64.14
			RE &Others	%	3.59
		Fuel share in TFC	Oil Products	%	37.92
			Natural Gas	%	5.21
			Coal	%	39.39
			Electricity	%	17.49
		Fuel share in electricity	Thermal	%	80.49
			Nuclear	%	2.44
			Hydro	%	8.73
			RE (other than Hydro)	%	8.34
Security	Imports	Net energy import dependency	Overall	%	40.01
			Crude Oil	%	86.88
			Natural gas	%	46.65
			Coal	%	26.19
			Electricity	%	0.34
	Strategic Fuel Stocks	Stocks of critical fuels per corresponding fuel consumption	Coal	%	5.95

ANNEX- I

Definitions of Energy Products

1. Solid fuels

i. **Hard Coal**: Coals with a gross calorific value (moist, ash-free basis) which is not less than 24 MJ/kg or which is less than 24 MJ/kg provided that the coal has a vitrinite mean random reflectance greater than or equal to 0.6 per cent. Hard coal comprises anthracite and bituminous coals.

ii. **Lignite**: Brown coal with a gross calorific value (moist, ash-free basis) less than 20 MJ/kg.

iii. **Coke**: Products derived directly or indirectly from the various classes of coal by carbonisation or pyrolysis processes, or by the aggregation of finely divided coal or by chemical reactions with oxidising agents, including water.

iv. **Proved Reserves**: A 'Proven Mineral Reserve' is the economically mineable part of a Measured Mineral Resource demonstrated by at least a Preliminary Feasibility Study. This Study must include adequate information on mining, processing, metallurgical, economic, and other relevant factors that demonstrate, at the time of reporting, that economic extraction is justified.

v. **Indicated Reserves:** An 'Indicated Mineral Resource' is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics can be estimated with a level of confidence sufficient to allow the appropriate application of technical and economic parameters, to support mine planning and evaluation of the economic viability of the deposit. The estimate is based on detailed and reliable exploration and testing information gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes that are spaced closely enough for geological and grade continuity to be reasonably assumed.

vi. **Inferred Reserves**: An 'Inferred Mineral Resource' is that part of a Mineral Resource for which quantity and grade or quality can be estimated on the basis of geological evidence and limited sampling and reasonably assumed, but not verified, geological and grade continuity. The estimate is based on limited information and sampling gathered through appropriate techniques from locations such as outcrops, trenches, pits, workings and drill holes. Due to the uncertainty that may be attached to Inferred Mineral Resources, it cannot be assumed that all or any part of an Inferred Mineral Resource will be upgraded to an Indicated or Measured Mineral Resource as a result of continued exploration. Confidence in the estimate is insufficient to allow the meaningful application of technical and economic parameters or to enable an evaluation of economic viability worthy of public disclosure. Inferred Mineral

Resources must be excluded from estimates forming the basis of feasibility or other economic studies

2. Liquid fuels

i. **Crude petroleum/Oil** 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 Gas (LPG)** refers to liquefied propane (C_3H_8) and butane (C_4H_{10}) 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** 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 refineryprocesses.

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 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 percent 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 gas liquids (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) orwith back-pressure turbines, and plants using internal combustionengines 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.

5. Production of Energy Products 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.

6. 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.

7. 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.

8. 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.

9. 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.

10. Non-commercial Energy Sources

i. **Fuelwood, wood residues and by-products:** Fuelwood 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.

11. Other important definitions:

i. **GrossDomesticProduct** (GDP) is the broadest quantitative measure of a nation's total economic activity. More specifically, GDP represents the monetary value of all goods and services produced within a nation's geographic borders over a specified period of time.

ii. **EnergyUse** indicates Total Primary Energy Supply (TPES), Total Final Consumption (TFC) and final electricity consumption.

iii. **Transformation/Conversion Losses:** When one form of energy is converted into another form, the amount of losses are referred as transformation/conversion losses.

ANNEX- II

Conversion Factors

1 kilogram	=	2.2046 pounds
1 Pound	=	454 gm.
1 Cubic metres	=	35.3 cubic feet (gas)
1 Metric ton	=	1 Tonne =1000 kilogram
1 Joule	=	0.23884 calories
1 Mega Joule	=	10^6 joules = 238.84 x 10^3 calories
1 Giga Joule	=	10^9 joules = 238.84 x 10^6 calories
1 Tera Joule	=	10^12 joules = 238.84 x 10^9 calories
1 Peta Joule	=	10^15 joules = 238.84 x 10^12 calories
One million tonnes of coal	=	15.13 petajoules of energy
One million tonnes of oil equivalent (MTOE)	=	15.13 petajoules of energy
One billion cubic meter of natural gas	=	38.52 petajoules of energy
One million cubic meter of natural gas	=	38.52 terajoules of energy
	=	0.03852 petajoules of energy
One billion kilowatt hour of electricity	=	3.60 petajoules of energy

NSANNEX- III

Categorisation of Coal in India

Grading of Coking Coal based on ash content

Grade	Ash Content
Steel Gr I	Ash content < 15%
Steel Gr II	15%<=Ash content<18%
WasheryGr.I	18%<=Ash content<21%
WasheryGr.II	21%<=Ash content<24%
WasheryGr.III	24%<=Ash content<28%
WasheryGr.IV	28%<=Ash content<35%

Grading of Non Coking Coal based on Gross Calorific Value(GCV)

Grade	GCV Range (Kcal/Kg)
G1	GCV exceeding 7000
G2	GCV between 6701 and 7000
G3	GCV between 6401 and 6701
G4	GCV between 6101 and 6400
G5	GCV between 5801 and 6100
G6	GCV between 5501 and 5800
G7	GCV between 5201 and 5500
G8	GCV between 4901 and 5200
G9	GCV between 4601 and 4900
G10	GCV between 4301 and 4600
G11	GCV between 4001 and 4300
G12	GCV between 3700 and 4000
G13	GCV between 3400 and3700
G14	GCV between3101 and 3400
G15	GCV between 2801 and 3100
G16	GCV between 2501 and2800
G17	GCV between 2201 and 2500

Source: Office of the Coal Controller

ANNEX- IV

Energy Data Collection Mechanisms

I. Coal and Coal Derivatives

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

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

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

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

I.4. Details of data flows/ items:

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

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

Data sources and Act/ Order/ Rule etc.

The data are collected from different coal/ lignite companies under the statutory power vested with the Coal Controller under the provisions of Collection of Statistics Act, 1953, the

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

Methodology of Data Collection

Monthly Data- Data are collected from coal companies (Pvt. and Pub) on monthly basis on some major parameters.

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

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

Details of data items being compiled and 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, Middling, 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 entrusted with the responsibility of exploration and production of oil and natural gas, their refining, distribution and marketing, import, export and conservation of petroleum products and liquefied natural gas.

II.1. Organizational set up and activities

Ministry of Petroleum and Natural Gas has an Economic and Statistics Division headed by Senior Adviser. The Division provides economic and statistics related inputs to all the Divisions of the Ministry as well as other Ministries / Departments. An exhaustive data base is maintained on important parameters of oil and gas sector. This Division is involved in the plan formulation exercise of the Central public sector enterprises (CPSEs) associated with petroleum exploration, production, refining, distribution & marketing, import, export and conservation of Petroleum products. This Division also handles matters related to foreign direct investment (FDI) policy in the Oil and Gas sector and issues related to Double Taxation, Action plan under Swachh Bharat Abhiyaan / SwachhtaPakhwada by CPSEs as well as MoPNG. The Division is also involved in monitoring projects of Oil & Gas CPSEs and facilitating pending issues of projects under Oil and Gas Sector with Centre & States at various fora like PRAGATI, e-Samiksha, Project Monitoring Group (PMG) of PMO and in meetings chaired by the Hon'ble Prime Minister.

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

Weekly &Monthly Reports on Petroleum Statistics: Collection, compilation and submission of Reports on:

(i) Weekly Production Report: Weekly report on Crude Oil and Natural Gas production in the country and by ONGC Videsh Ltd. abroad.
(ii) Monthly Production Report: Monthly report on production of Crude Oil, Natural Gas, refinery production, refinery capacity utilization prepared by the 25th day of the following month and circulated to Ministries / Departments.
(iii) Monthly data on Imports / Exports: Monthly data on import of Crude Oil, Petroleum products and export of Petroleum products compiled and circulated to relevant Ministries / Departments.
(iv) Joint Organization Data Initiative (JODI): JODI data on Oil and Gas summited monthly to United Nations Statistics Division.

Annual Publication: Indian Petroleum & Natural Gas Statistics

II.2. Details of the data flows and items

Data Collected: Production of Crude Oil, Natural Gas, Petroleum Products, Imports of Crude Oil, Petroleum products & LNG, export of Petroleum products and Consumption of Petroleum Products and Natural Gas are collected on monthly basis. Data published in Indian Petroleum and Natural Gas Statistics are collected annually.

Periodicity & Data Sources: Data are collected from all Public Sector Undertakings and Private Oil Companies and Joint Venture companies of Oil and Gas Sector on weekly, monthly, quarterly and yearly basis as applicable for a given dataset.

Methods of Data Collection: Data collected through e-mail, FAX as well as hard copies by post.

Data Dissemination Methods: Monthly, Quarterly and Annual Reports circulated to all concerned and also uploaded on Ministry's website.

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

(i) For Returns on Crude Oil and Natural Gas

(a) Principal Legislation:

The Oilfields (Regulation and Development) Act, 1948 (53 of 1948) (8th September, 1948)

XXXXXX

5. Power to make rules as respects mining leases

XXXXXX

6. Power to make rules as respects development of mineral oil

XXXXXX

(b) Subordinate Legislation:

The Petroleum and Natural Gas Rules, 1959 (As amended from time to time)

G.S.R.1288. In exercise of the powers conferred by sections 5 and 6 of the Oilfields (Regulation and Development) Act, 1948 (53 of 1948) andin supersession of the Petroleum Concession Rules, 1949, the Central Government hereby makes the following rules, regulating the grant of exploration licenses and mining leases in respect of petroleum and natural gas which belongs to Government, and for conservation and development thereof, namely: -

THE PETROLEUM AND NATURAL GAS RULES, 1959

XXXXXX

II.4. Royalty on petroleum and furnishing of returns and particulars:

XXXXXX

(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 quality 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 returns 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

(a) Principal Legislation:

(b)

The Industries (Development and Regulation) Act, 1951, (Act No. 65 of 1951)

30. Power to make rules:

(1) The Central Government may, subjectto the condition of previous publication, make rules for carrying out the purposes of this Act.

(2) In particular, and without prejudice to the generality of the foregoing power, such rules may provide for all or any of the following matters, namely: -

XXXXXX

(g) the collection of any information or statistics in respect of any scheduled industry;

XXXXXX

XXXXXX

2. Fuels:

XXXXXX

(2) Mineral oil (crude oil), motor and aviation spirit, diesel oil, kerosene oil, fuel oil, diverse hydrocarbon oils and their blends including synthetic fuels, lubricating oils and the like.
(3) Fuel gases-(coal gas, natural gas and the like)

(b) Subordinate Legislation:

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

8. (1) 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".

8. (2) "Every marketing 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 refinery, stocking, movements (onshore or offshore), transfers, imports, exports and sales of crude and or all products, refined there from, at such period, in such manner and from such of the sources, as may 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.

i. Delay in furnishing data.
ii. Furnishing incomplete/ incorrect data.
iii. 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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