

COAL & LIGNITE



# Indian Minerals Yearbook 2019

(Part- III : MINERAL REVIEWS)

58<sup>th</sup> Edition

**COAL & LIGNITE**

**(ADVANCE RELEASE)**

**GOVERNMENT OF INDIA  
MINISTRY OF MINES  
INDIAN BUREAU OF MINES**

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**C**oal is a fossil fuel. It is a combustible, sedimentary, organic rock, which is composed mainly of carbon, hydrogen and oxygen. It is formed from vegetation, which has been consolidated between rock strata and altered by the combined effects of pressure and heat over millions of years to form coal seams.

The build-up of silt and other sediments, together with movements in the earth's crust (known as tectonic movements) buried these swamps and peat bogs, often to great depths causing the plant material to be subjected to high temperatures and pressures. Millions of year of deep burial engendered such physical and chemical changes which transformed the vegetation into peat and then into coal.

The quality of each coal deposit is determined by temperature and pressure and by the length of time in formation, which is referred to as its 'organic maturity'. Initially the peat is converted into lignite or 'brown coal' – these are coal types with low organic maturity. In comparison to other coals, lignite is quite soft and its colour can range from dark black to various shades of brown.

Many more millions of years of continuous effects of temperature and pressure produced further transformation of lignite, progressively increasing its organic maturity into the range known as 'sub-bituminous' coals.

Further chemical and physical changes have caused these coals to become harder and blacker, forming the 'bituminous' or 'hard coals'. Under the right conditions and progressive contrivance of organic maturity, finally results in the formation of anthracite.

Coal is vital for sustainable development. It is the most widely used energy source for electricity generation and an essential input for steel production. Coal is an essential resource for meeting the challenges facing the modern world. India has a long history of commercial coal mining since 1774 and nationalisation of coal mines was put to effect on 01.05.1973. As per Integrated Energy Policy Committee of erstwhile Planning Commission, coal will remain India's most important energy source till 2031-32 and possibly beyond. In India, during the year 2018-19, 87% coal got despatched to the Power Sector. In addition, other industries like cement, fertilizer, chemical, paper and thousands of medium and small-scale industries are dependent on coal for their process and energy requirements. The production of coal at about 675.40 million tonnes in 2017-18 increased by about 7.9% to

728.72 million tonnes in 2018-19. The production of lignite at 44.28 million tonnes in 2018-19 decreased by about 5.1% from 46.64 million tonnes in the previous year. India, in 2018 ranked 2<sup>nd</sup> in the world coal production.

## GEOLOGICAL RESOURCES

### Coal

The coal deposits in India primarily are concentrated in the Gondwana sediments occurring mainly in the eastern and central parts of Peninsular India, although Gondwana coal deposits also are found to occur in the north-eastern part of the country mainly in Assam and Sikkim. The Tertiary coal-bearing sediments are found in Assam, Arunachal Pradesh, Nagaland and Meghalaya. As a result of exploration carried out by GSI, CMPDI and other agencies, about 326.496 billion tonnes (including that estimated in Sikkim) of geological coal resources up to 1,200 m depth have been established in the country as on 01.04.2019. Out of these resources, 155.614 billion tonnes are Proved resources, 140.501 billion tonnes are Indicated resources and the remaining about 30.381 billion tonnes are in the Inferred category. Of the total resources, the share of prime-coking coal is 5.313 billion tonnes, medium-coking & blendable/semi-coking is 29.691 billion tonnes and non-coking coal, including high sulphur (tertiary) is 291.492 billion tonnes. State-wise/Coalfield-wise and State-wise/Type-wise Geological resources of coal as on 01.04.2019 are furnished in Tables-1 & 2, respectively.

### Lignite

Indian lignite deposits occur in the Tertiary sediments in the southern and western parts of peninsular shield particularly in Tamil Nadu, Puducherry, Kerala, Gujarat & Rajasthan and also in Jammu & Kashmir. The total known geological resources of lignite as on 01.04.2019 is about 45.759 billion tonnes, of which 79% resources are located in Tamil Nadu with about 36.230 billion tonnes. Other States where lignite deposits have been located are Gujarat, Jammu & Kashmir, Kerala, Rajasthan, West Bengal and the Union Territory of Puducherry. State-wise/District-wise Geological resources of lignite as on 01.04.2019 are detailed in Table - 3.

## EXPLORATION & DEVELOPMENT

Exploration and development details, if any, are covered in the Review on "Exploration & Development" under "General Reviews" i.e, Vol.I of the title.

## COAL &amp; LIGNITE

**Table – 1 : Geological Resources of Coal as on 01.04.2019  
(By States/Coalfields)**

State/Coalfield	Proved	Indicated	Inferred	Total
<b>All India : Total</b>	<b>155614.41</b>	<b>140500.53</b>	<b>30380.69</b>	<b>326495.63</b>
<b>Gondwana Coalfields*</b>	<b>155020.60</b>	<b>140379.36</b>	<b>29472.02</b>	<b>324871.98</b>
<b>Andhra Pradesh/</b> Godavari Valley	<b>97.12</b>	<b>1078.44</b>	<b>431.65</b>	<b>1607.21</b>
<b>Assam/Singrimari</b>	–	<b>14.49</b>	–	<b>14.49</b>
<b>Bihar/Rajmahal</b>	<b>309.53</b>	<b>1513.01</b>	<b>11.30</b>	<b>1833.84</b>
<b>Chhattisgarh</b>	<b>21446.29</b>	<b>36259.57</b>	<b>2201.90</b>	<b>59907.76</b>
Sohagpur	94.30	10.08	–	104.38
Sonhat	364.83	2303.81	1.89	2670.53
Jhilimili	228.20	38.90	–	267.10
Chirimiri	320.33	10.83	31.00	362.16
Bisrampur	1549.71	613.02	5.15	2167.88
East Bisrampur	–	164.82	–	164.82
Lakhanpur	455.88	3.35	–	459.23
Panchbahini	–	11.00	–	11.00
Hasdeo-Arand	2032.28	3273.42	223.12	5528.82
Sendurgarh	152.89	126.32	–	279.21
Korba	5877.26	5783.70	168.02	11828.98
Mand-Raigarh	10003.78	20803.93	1563.04	32370.75
Tatapani-Ramkola	366.83	3116.39	209.68	3692.90
<b>Jharkhand</b>	<b>48031.93</b>	<b>30400.13</b>	<b>6073.90</b>	<b>84505.96</b>
Raniganj	1538.19	466.56	31.55	2036.30
Jharia	16282.19	3248.44	–	19530.63
East Bokaro	3497.43	3922.80	863.32	8283.55
West Bokaro	3922.75	1278.59	17.05	5218.39
Ramgarh	936.65	911.77	58.05	1906.47
North Karanpura	10577.40	6173.27	1864.96	18615.63
South Karanpura	5176.08	1312.28	1143.28	7631.64
Auranga	352.05	2141.65	503.41	2997.11
Hutar	190.79	26.55	32.48	249.82
Daltonganj	83.86	60.10	–	143.96
Deogarh	326.24	73.60	–	399.84
Rajmahal	5148.30	10784.52	1559.80	17492.62
<b>Madhya Pradesh</b>	<b>12182.45</b>	<b>12735.98</b>	<b>3874.67</b>	<b>28793.10</b>
Johilla	185.08	104.09	32.83	322.00
Umaria	177.70	3.59	–	181.29
Pench-Kanhan	1515.71	991.93	982.21	3489.85
Pathakhera	290.80	88.13	68.00	446.93
Gurgunda	–	84.92	53.39	138.31
Mohpani	7.83	–	–	7.83
Sohagpur	2129.18	5659.25	293.47	8081.90
Singrauli	7876.15	5804.07	2444.77	16124.99

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(Table-1, Concl'd)

(In million tonnes)

State/Coalfield	Proved	Indicated	Inferred	Total
<b>Maharashtra</b>	<b>7573.20</b>	<b>3257.37</b>	<b>1846.59</b>	<b>12677.16</b>
Wardha Valley	4517.11	1723.27	1440.98	7681.36
Kamthi	2046.24	937.91	107.21	3091.36
Umrer Makardhokra	308.41	–	160.70	469.11
Nand Bander	691.44	596.19	117.70	1405.33
Bokhara	10.00	–	20.00	30.00
<b>Odisha</b>	<b>39654.47</b>	<b>33472.75</b>	<b>7713.12</b>	<b>80840.34</b>
Ib-River	15196.72	10812.42	3610.53	29619.67
Talcher	24457.75	22660.33	4102.59	51220.67
<b>Telangana</b>	<b>10622.32</b>	<b>8564.74</b>	<b>2651.88</b>	<b>21838.94</b>
Godavari Valley	10622.32	8564.74	2651.88	21838.94
<b>Sikkim/Rangit Valley</b>	<b>–</b>	<b>58.25</b>	<b>42.98</b>	<b>101.23</b>
<b>Uttar Pradesh/Singrauli</b>	<b>884.04</b>	<b>177.76</b>	<b>–</b>	<b>1061.80</b>
<b>West Bengal</b>	<b>14219.25</b>	<b>12846.87</b>	<b>4624.03</b>	<b>31690.15</b>
Raniganj	14018.46	7103.37	3707.69	24829.52
Barjora	200.79	–	–	200.79
Birbhum	–	5743.50	901.34	6644.84
Darjeeling	–	–	15.00	15.00
<b>Tertiary Coalfields</b>	<b>593.81</b>	<b>121.17</b>	<b>908.67</b>	<b>1623.65</b>
<b>Assam</b>	<b>464.78</b>	<b>42.72</b>	<b>3.02</b>	<b>510.52</b>
Makum	432.09	20.70	–	452.79
Dilli-Jeypore	32.00	22.02	–	54.02
Mikir Hills	0.69	–	3.02	3.71
<b>Arunachal Pradesh</b>	<b>31.23</b>	<b>40.11</b>	<b>18.89</b>	<b>90.23</b>
Namchik-Namphuk	31.23	40.11	12.89	84.23
Miao Bum	–	–	6.00	6.00
<b>Meghalaya</b>	<b>89.04</b>	<b>16.51</b>	<b>470.93</b>	<b>576.48</b>
West Darangiri	65.40	–	59.60	125.00
East Darangiri	–	–	34.19	34.19
Balphakram-Pendenguru	–	–	107.03	107.03
Siju	–	–	125.00	125.00
Langrin	10.46	16.51	106.19	133.16
Mawlong Shelia	2.17	–	3.83	6.00
Khasi Hills	–	–	10.10	10.10
Bapung	11.01	–	22.65	33.66
Jayanti Hills	–	–	2.34	2.34
<b>Nagaland</b>	<b>8.76</b>	<b>21.83</b>	<b>415.83</b>	<b>446.42</b>
Borjan	5.50	–	4.50	10.00
Jhanzi-Disai	2.00	21.83	109.26	133.09
Tiensang	1.26	–	2.00	3.26
Tiru Valley	–	–	6.60	6.60
DGM	–	–	293.47	293.47

**Source:** Indian Coal & Lignite Resources-2019, Natural Energy Resources, Mission-IIB, 2019 (GSI).

\* Including Sikkim.

## COAL &amp; LIGNITE

**Table – 2 : Geological Resources of Coal as on 01.04.2019  
(By States/Types)**

(In million tonnes)

State/Type of coal	Proved	Indicated	Inferred	Total
<b>All India : Total</b>	<b>155614.41</b>	<b>140500.53</b>	<b>30380.69</b>	<b>326495.63</b>
Prime-coking	4667.75	645.31	–	5313.06
Medium-coking	14875.55	11245.13	1862.86	27983.54
Blendable/Semi-coking	519.44	994.87	193.21	1707.52
Non-coking (Incl. high sulphur)	135551.67	127615.22	28324.62	291491.51
<b>Andhra Pradesh/Non-coking</b>	<b>97.12</b>	<b>1078.44</b>	<b>431.65</b>	<b>1607.21</b>
<b>Arunachal Pradesh/ High sulphur</b>	<b>31.23</b>	<b>40.11</b>	<b>18.89</b>	<b>90.23</b>
<b>Assam</b>	<b>464.78</b>	<b>57.21</b>	<b>3.02</b>	<b>525.01</b>
Non-coking	–	14.49	–	14.49
High sulphur	464.78	42.72	3.02	510.52
<b>Bihar/Non-coking</b>	<b>309.53</b>	<b>1513.01</b>	<b>11.30</b>	<b>1833.84</b>
<b>Chhattisgarh</b>	<b>21446.29</b>	<b>36259.57</b>	<b>2201.90</b>	<b>59907.76</b>
Semi-coking	70.77	99.25	–	170.02
Non-coking	21375.52	36160.32	2201.90	59737.74
<b>Jharkhand</b>	<b>48031.93</b>	<b>30400.13</b>	<b>6073.90</b>	<b>84505.96</b>
Prime-coking	4667.75	645.31	–	5313.06
Medium-coking	13970.64	9685.02	1590.03	25245.69
Semi-coking	223.34	471.55	53.45	748.34
Non-coking	29170.20	19598.25	4430.42	53198.87
<b>Madhya Pradesh</b>	<b>12182.45</b>	<b>12735.98</b>	<b>3874.67</b>	<b>28793.10</b>
Medium-coking	354.49	1560.11	272.83	2187.43
Non-coking	11827.96	11175.87	3601.84	26605.67
<b>Maharashtra/Non-coking</b>	<b>7573.20</b>	<b>3257.37</b>	<b>1846.59</b>	<b>12677.16</b>
<b>Meghalaya/High sulphur</b>	<b>89.04</b>	<b>16.51</b>	<b>470.93</b>	<b>576.48</b>
<b>Nagaland/High sulphur</b>	<b>8.76</b>	<b>21.83</b>	<b>415.83</b>	<b>446.42</b>
<b>Odisha/Non-coking</b>	<b>39654.47</b>	<b>33472.75</b>	<b>7713.12</b>	<b>80840.34</b>
<b>Sikkim/Non-coking</b>	<b>–</b>	<b>58.25</b>	<b>42.98</b>	<b>101.23</b>
<b>Telangana/Non-coking</b>	<b>10622.32</b>	<b>8564.74</b>	<b>2651.88</b>	<b>21838.94</b>
<b>Uttar Pradesh/Non-coking</b>	<b>884.04</b>	<b>177.76</b>	<b>–</b>	<b>1061.80</b>
<b>West Bengal</b>	<b>14219.25</b>	<b>12846.87</b>	<b>4624.03</b>	<b>31690.15</b>
Medium-coking	550.42	–	–	550.42
Semi-coking	225.33	423.68	139.76	788.77
Non-coking	13443.50	12423.19	4484.27	30350.96

**Source:** Indian Coal & Lignite Resources-2019, Natural Energy Resources, Mission-IIB, 2019 (GSI).

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**Table – 3 : Geological Resources of Lignite as on 01.04.2019  
(By States/Districts)**

		(In million tonnes)			
State/District	Area/Lignite field	Proved	Indicated	Inferred	Total
<b>All India : Total</b>		<b>6787.53</b>	<b>26237.10</b>	<b>12734.07</b>	<b>45758.70</b>
<b>Gujarat</b>		<b>1278.65</b>	<b>283.70</b>	<b>1159.70</b>	<b>2722.05</b>
Kachchh	Panandhro & Panandhro Extn., Barkhan Dam, Kaiyari Block-A & B, Mata-No-Madh, Umarsar, Lakhpat-Dhedadi (Punahrajpur), Akrimota, Jhularai-Waghpadar, Hamla-Ratadia & Pranpur.	335.61	56.40	33.09	425.10
Bharuch	Bhuri, Valia, Bhaga, Luna, Pansoli, Nani Pardi, Bhimpur, Rajpardi (GMDC leasehold) by MECL and Rajpardi (CGM) by MECL.	724.76	118.59	491.23	1334.58
Bhavnagar	Kharsalia, Rampur, Hoidad, Bhuteshwar, Surka, etc.	–	–	299.17	299.17
Surat	Tadkeswar, Dungra, East of Kamraj-Vesma, Nani Naroli, Tadkeswar block-Mongrol, Mandvi, Vastan, Ghala, etc.	218.28	108.71	336.21	663.20
<b>Jammu &amp; Kashmir</b>		–	<b>20.25</b>	<b>7.30</b>	<b>27.55</b>
Kupwara	Nichahom, Nichahom-Budhasung	–	20.25	7.30	27.55
<b>Kerala</b>		–	–	<b>9.65</b>	<b>9.65</b>
Kannur	Madayi, Kadamkottumala, Kayyur and Nileswaram	–	–	9.65	9.65
<b>Rajasthan</b>		<b>1168.53</b>	<b>3029.78</b>	<b>2150.77</b>	<b>6349.08</b>
Bikaner	Palana, Barsingsar, Gurha East & West, Bholasar, Bithnok Main & East (Extn.), Gadiyala, Girirajsar, Raneri, Mandal Chaman, Hadda, Hadda north & west, Hadla, Badhnu, Hira-ki-Dhani, Chak-Vijaisinghpura, Kuchore (Napasar), Riri, Lalamdesar, Lalamdesar Bada, East of Riri, Bania, Kuchaur-Athuni, Sarupdesar-Palana west, Palana East, Gigasar-Kesardesar, Khar Charan, Ambasar-Gigasar, Girirajsar Extn., Bapeau, Bigga-Abhaysinghpura. Diyatara, Pyau, Deshnok-Ramsar-Sinthal, Borana, Bangarsar-Jaimalsar and Kenya-Ki-Basti & South of Bhane-Ka-Gao, etc.	560.30	230.33	309.19	1099.82
Barmer	Kapurdi, Jalipa, Bothia (Jalipa N Ext.), Giral, Jogeswartala, Sonari, Sachcha-Sauda, Bharka, Bothia-Bhakra-Dunga, Sindhari East & West, Kurla, Kurla East, Chokla North, Mahabar-Shivkar, Mithra, Hodu, Nimbalkot, Nimbalkot North, Nagurda, Nagurda (East), Munabao, Kawas Gravity Block, South of Nimbla and Magne-Ki-Dhani.	495.23	2509.46	1496.77	4501.46
Jaisalmer & Bikaner	Panna & Charanwala	–	–	11.47	11.47
Jaisalmer	Bhanda, Ramgarh & Khuiyala	–	–	70.44	70.44
Jaisalmer & Barmer	Khuri	–	–	13.80	13.80
Jalore	Sewara	–	–	76.08	76.08
Nagaur	Deswal, Gangardi, Indawar, Kaprion-Ki-Dhani, Kasnau-Igiar, Kuchera, Lunsara, Matasukh, Merta Road & Meeranagar, Mokala, Nimbri-Chadawatan and Ucharada,	113.00	289.49	154.33	556.82
Nagaur & Pali	Phalki, Phalki North and Phalodi	-	0.50	18.69	19.19

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Table - 3 (Concl.d.)

State/District	Area/Lignite field	Proved	Indicated	Inferred	Total
<b>Tamil Nadu</b>		<b>4340.35</b>	<b>22496.63</b>	<b>9392.85</b>	<b>36229.83</b>
Cuddalore	Neyveli Lignite Corporation (NLC) Leasehold areas, (Mine-I & expansion, Mine-IA, II & expansion, Mine-III, Block B, Mine-I, II & III and river), Devandgudi & areas, South of Vellar (Srimushnam), Veeranam (Lalpettai), Eastern part of NLC leasehold area, Kullanchavadi, Kudikadu, Bhuvanagiri-Kullanchavadi, Eastern part of Neyveli, Bahur*, West of Bahur* of Neyveli Lignite Field.	3436.12	2111.86	1302.23	6850.21
Ariyalur	Meensuruti, Jayamkondamcholapuram, Michaelpatti, & Michaelpatti Extn. of Neyveli Lignite Field	904.23	302.50	512.37	1719.10
Thanjavur & Thiruvarur	Mannargudi-Central, Mannargudi-NE Mannargudi-NE Extn., Mannargudi SE, Melnattam-Araharam of Mannargudi Lignite Field	–	17248.06	3123.46	20371.52
Thanjavur	Cholapuram, Mannargudi-NW & SW, Maharajapuram Orattanadu-Pattukottai, Vadaseri (Orattanadu-Pattukottai), Madukkur-Anaikkadu, Veppanagulam-Kasangadu of Mannargudi Lignite Field	–	2306.17	156.33	2462.50
Thanjavur & Nagapattinam	Alangudi, Pandanallur, Kadalangudi, Tirumangaicheri, and Thirumangalam of Mannargudi Lignite Field	–	359.21	926.62	1285.83
Thiruvarur & Nagapattinam	Nachiyarkudi of Mannargudi Lignite Field	–	–	574.05	574.05
Ramanathapuram	Misal, Bogalur, Bogalur (East), Uttarakosamangai & Tiyanur of Ramanathapuram Lignite Field	–	168.83	1812.58	1981.41
Ramanathapuram & Sivaganga	Rajasing Mangalam & Settanur of Ramanathapuram Lignite Field	–	–	985.21	985.21
<b>Puducherry</b>	Bahur & West of Bahur of Neyveli Lignite Field	–	<b>405.61</b>	<b>11.00</b>	<b>416.61</b>
<b>West Bengal</b>		–	<b>1.13</b>	<b>2.80</b>	<b>3.93</b>
Bardhaman	Rakshitpur, Gaurangapur-Bankati	–	0.29	1.82	2.11
Birbhum	Mahalla, Dhobbanpur & Djara	–	0.84	0.98	1.82

*Source: Indian Coal & Lignite Resources-2019, Natural Energy Resources, Mission-IIB, 2019 (GSI).*

*\* Both blocks cover parts of Tamil Nadu and Puducherry.*

## PRODUCTION AND STOCKS

### COAL

#### Production

The provisional total of the reported production of coal in 2018-19 was 728.72 million tonnes which was higher by 7.9% in comparison to that of the previous year. Chhattisgarh is the largest coal producing State with a share of about 22.2% followed by Odisha with contribution of 19.8% to the national output. Next in order of share in the total production were Jharkhand (18.5%), Madhya Pradesh (16.3%), Telangana (8.9%), Maharashtra (6.8%), West Bengal (4.6%) and Uttar Pradesh (2.8%). The remaining 0.1% of coal production was accounted for from Assam and Jammu & Kashmir. Coal mining was confined mainly to the Public Sector which contributed 95% to the national production (Table-4).

**Table – 4 : Production of Coal, 2016-17 to 2018-19  
(By Sectors/States)**

State	(Quantity in '000 tonnes)		
	2016-17	2017-18 <sup>1</sup>	2018-19 (P) <sup>2</sup>
<b>India</b>	<b>657868</b>	<b>675400</b>	<b>728718</b>
<b>Public Sector</b>	<b>625196</b>	<b>641774</b>	<b>694983</b>
<b>Private Sector</b>	<b>32672</b>	<b>33626</b>	<b>33735</b>
Assam	600	781	784
Chhattisgarh	138525	142546	161893
Jammu & Kashmir	10	14	13
Jharkhand	126435	123297	134666
Madhya Pradesh	105013	112127	118661
Maharashtra	40559	42219	49818
Meghalaya	2308	1529	-
Odisha	139359	143328	144312
Telangana	61336	62010	65160
Uttar Pradesh	16056	18309	20275
West Bengal	27667	29240	33136

*Source:* 1-Coal Directory of India 2017-18.  
2- Provisional Coal Statistics, 2018-19.

A total of 455 coal mines (as on 31.03.2018) in India reported production in 2017-18. Out of these, Jharkhand accounted for 120 mines while West Bengal 72 mines, Madhya Pradesh 61, Maharashtra 58, Chhattisgarh 55, Telangana 49 and Odisha 26. The remaining 14 mines were from Arunachal Pradesh, Assam, Jammu & Kashmir, Meghalaya and Uttar Pradesh (Table - 5).

**Table – 5 : Number of Coal Mines, 2017-18 & 2018-19 (P)  
(By States)**

State	No. of Mines	
	2017-18 <sup>#</sup>	2018-19 (P) <sup>2</sup>
<b>India</b>	<b>455</b>	<b>NA</b>
Arunachal Pradesh	1	NA
Assam	4	NA
Chhattisgarh	55	NA
Jammu & Kashmir	2	NA
Jharkhand	120	NA
Madhya Pradesh	61	NA
Maharashtra	58	NA
Meghalaya	3	NA
Odisha	26	NA
Telangana	49	NA
Uttar Pradesh	4	NA
West Bengal	72	NA

*Source:* 1.Coal Directory of India 2017-18.

2.Provisional Coal Statistics, 2018-19

*Note:* Coal Mines in the State of Meghalaya operate under the Private Sector.

*#:* Relates to number of mines as last day of financial year 2017-18.

During the year 2018-19, out of the total production of coal, 5.6% was coking coal and the rest 94.4% was non-coking coal. As in the earlier years, bulk of the coking coal production, i.e., about 84.1% was reported from the Public Sector. Grade-wise analysis of total coking coal in 2018-19 revealed that Washery Grade IV had the maximum share at 72.6%, followed by Washery Grade III (16%) and Washery Grade II (10.5%). The remaining 0.9% production of coking coal was of Semi-coking Grade I, Washery Grade I, Steel Grade I and Washery Grade V. Out of the total production of coking coal in India, bulk quantity, i.e., 96.4% was produced in Jharkhand followed by West Bengal with 2.6 per cent. The remaining 1% was contributed by Chhattisgarh and Madhya Pradesh (Tables-6 & 7).

During 2018-19, except for a nominal quantity (4%), the balance production of non-coking coal (96%) came from the Public Sector. Out of the total production of non-coking coal grades, G11 grade accounted for 29% followed by G13 (16.2%), G10 (12.2%), G12 (9.6%), G8 (7.9%), G7 & G14 (6% each), G9 (5.2%), G4 (2.2%), G5 (1.9%), G6 (1.2%) and G15

(1%). The remaining 1.6% production was accounted for G1, G2, G3, G16, G17 and UNG grades of non-coking coal. Chhattisgarh was the largest producing State of non-coking coal in 2018-19 which alone accounted for 23.5% of the national output. Next in order were Odisha with a contribution of (21%), Madhya Pradesh (17.2%), Jharkhand (13.8%), Telangana (9.5%), Maharashtra (7.2%), West Bengal (4.7%) and Uttar Pradesh (2.9%). The remaining 0.1% production came from Assam and Jammu & Kashmir (Tables-8 to 10).

### **Despatches**

The provisional despatches of coal at 732.79 million tonnes in 2018-19 were higher by around 6.2% as compared to that in the previous year. Chhattisgarh was the leading State in the despatches in 2018-19 and accounted for 21.8% of the total despatches. The States next in order were Odisha (19.5%), Jharkhand (18.6%), Madhya Pradesh (14.1%), Telangana (9.3%), Maharashtra (7.1%), Uttar Pradesh (5%) and West Bengal (4.5%). The remaining 0.1% despatches were from the States of Assam and Jammu & Kashmir.

During the year 2018-19, statewide analysis revealed that there was increase in the despatches of coal from the States of Chhattisgarh, Jharkhand, Maharashtra, Odisha, Telangana, Uttar Pradesh and West Bengal while the States of Assam, Jammu & Kashmir, Madhya Pradesh and Meghalaya showed fall in despatches as against that of the previous year.

Of the total provisional despatches of raw coal effected in 2018-19, a sizeable share of 87.1% was made to the Electricity Sector. As much as 2.4% was made to the Steel Industry, 1.7% to the Sponge iron Industry, 1.2% to the Cement Industry, 0.2 % each to the Fertilizer Industry and Pulp & Paper Industry and 0.1% to the other basic metals. The remaining 7.1% was made for other priority sectors including Chemical, Steel (boilers), Textile & Rayons, Bricks and Others (Tables-11 & 12).

### **Stocks**

The mine-head stocks of coal at the end of the year 2018-19 were 57.64 million tonnes which decreased by about 7.1% from that of the stocks that were available at the beginning of the year. Out of the total mine-head stocks of coal during the year 2018-19, 98.5% was confined mainly to the Public Sector and remaining 1.5 % to the Private Sector.

Similarly, the mine-head stocks of coal at the end of the year 2017-18 were 62.036 million tonnes which decreased by 19.3 % from that of the stocks that were available at the beginning of the year. Bulk of the coal stocks (about 99.9%) at the end of the year was accounted for by the mines located in the states of Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Telangana, Uttar Pradesh and West Bengal (Tables-13 & 14).

### **LIGNITE**

#### **Production**

During the year 2018-19, the provisional production of lignite at 44.28 million tonnes decreased by about 5.1% in comparison to that of the previous year. The production from Tamil Nadu alone accounted for 52%. The share of Gujarat in lignite production was 28.4% and that of Rajasthan was 19.6 % (Table-15).

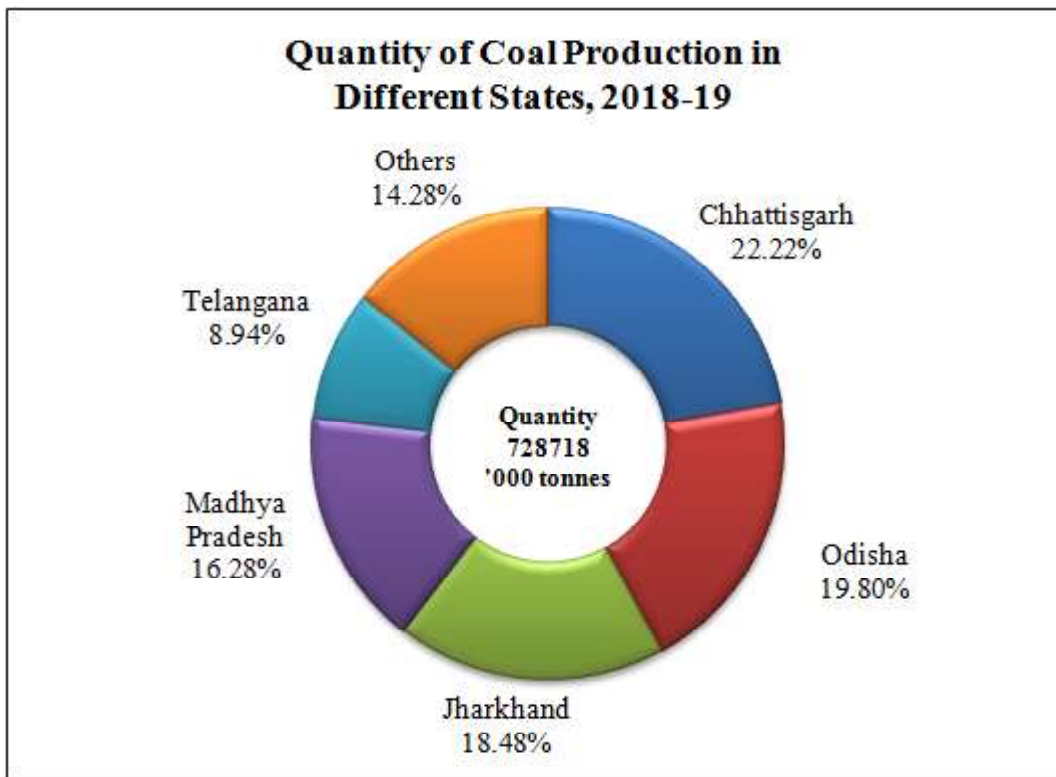
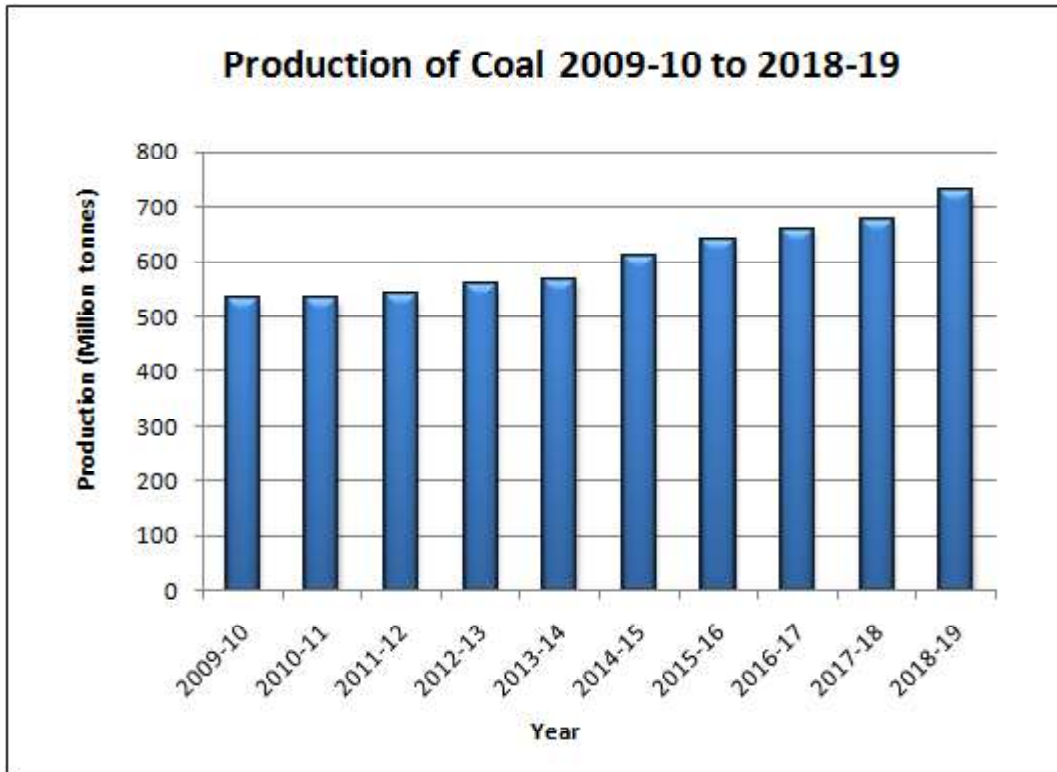
Out of the total 18 mines that reported lignite production in 2017-18, nine mines are located in Gujarat, six in Rajasthan and the remaining three in Tamil Nadu (Table - 16).

#### **Despatches**

The provisionall quantum of despatches of lignite was about 45.81 million tonnes during the year 2018-19, which decreased by about 1.1% as compared to that in the previous year (Table-17).

#### **Stocks**

The mine-head stocks of lignite at the end of 2018-19 were 5,672 thousand tonnes which decreased by 21.3% from that of the stocks that were available at the beginning of the year (Table- 18).



COAL & LIGNITE

**Table –6: Production of Coking Coal, 2017-18  
(By States and Grades)**

(In '000 tonnes)									
State	All-Grades	ST-I	ST-II	W-I	W-II	W-III	W-IV	SLV1	SC
<b>India</b>	<b>40148</b>	<b>155</b>	<b>51</b>	<b>176</b>	<b>4552</b>	<b>3991</b>	<b>31041</b>	-	<b>182</b>
Chhattisgarh	182	-	-	-	-	-	-	-	182
Jharkhand	38768	155	51	176	3966	3559	30861	-	-
Madhya Pradesh	180	-	-	-	-	-	180	-	-
West Bengal	1018	-	-	-	586	432	-	-	-

Source: Coal Directory of India 2017-18.

**Table –7: Production of Coking Coal, 2018-19 (P)  
(By States and Grades)**

(In '000 tonnes)										
State	All-Grades	ST-I	ST-II	W-I	W-II	W-III	W-IV	W-V	SLV1	SC
<b>India</b>	<b>41132</b>	<b>35</b>	-	<b>58</b>	<b>4338</b>	<b>6577</b>	<b>29875</b>	<b>2</b>	-	<b>247</b>
Chhattisgarh	247	-	-	-	-	-	-	-	-	-
Jharkhand	39641	-	-	-	-	-	-	-	-	-
Madhya Pradesh	188	-	-	-	-	-	-	-	-	-
West Bengal	1056	-	-	-	-	-	-	-	-	-

Source: Provisional Coal Statistics, 2018-19,

Note: Grade-wise figures vis-a-vis States not available.

**Table – 8: Production of Coal, 2017-18 & 2018-19  
(By Grades and Sectors)**

(In '000 tonnes)						
Grade	2017-18 (R) <sup>1</sup>			2018-19 (P) <sup>2</sup>		
	Total	Pub. Sec.	Pvt. Sec.	Total	Pub. Sec.	Pvt. Sec.
<b>All Grades</b>	<b>675400</b>	<b>641774</b>	<b>33626</b>	<b>728718</b>	<b>694983</b>	<b>33735</b>
<b>Coking</b>	<b>40148</b>	<b>33924</b>	<b>6224</b>	<b>41132</b>	<b>34586</b>	<b>6546</b>
ST-I	155	155	-	35	35	-
ST-II	51	51	-	-	-	-
W-I	176	176	-	58	58	-
W-II	4552	4357	195	4338	3889	449
W-III	3991	3595	396	6577	5940	637
W-IV	31041	25408	5633	29875	24415	5460
W-V	-	-	-	2	2	-
SC-I	182	182	-	247	247	-
<b>Non-coking</b>	<b>635252</b>	<b>607850</b>	<b>27402</b>	<b>687586</b>	<b>660397</b>	<b>27189</b>
G1	1710	181	1529	87	87	-
G2	264	264	-	480	480	-
G3	3513	3513	-	3314	3314	-
G4	14535	14535	-	15173	15173	-
G5	14730	14730	-	12797	12797	-
G6	10868	10868	-	7931	7133	798
G7	36817	35481	1336	41509	41106	403
G8	40980	40647	333	54422	52764	1658
G9	27547	27547	-	35592	35369	223
G10	91478	82383	9095	84067	75443	8624
G11	179975	165838	14137	199704	184993	14711
G12	53418	52716	702	66298	65526	772
G13	101743	101740	3	111208	111208	-
G14	44637	44370	267	41038	41038	-
G15	7894	7894	-	6885	6885	-
G16	3544	3544	-	3847	3847	-
G17	1467	1467	-	3096	3096	-
UNG	132	132	-	138	138	-

Source: 1. Coal Directory of India, 2017-18, Coal Controller's Organisation, Kolkata.

2. Provisional Coal Statistics, 2018-19, Coal Controller's Organisation, Kolkata.

Note: Meghalaya Coal has not been graded by Coal Controller. For statistical purpose, grade may be treated as 'A'/B' non-coking coal.

**Table – 9 : Production of Non-coking Coal, 2017-18**  
(By States and Grades)

State	Grades																			
	All-Grades	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17 UNG		
<b>India</b>	<b>635252</b>	<b>1710</b>	<b>264</b>	<b>3513</b>	<b>14535</b>	<b>14730</b>	<b>10868</b>	<b>36817</b>	<b>40980</b>	<b>27547</b>	<b>91478</b>	<b>179975</b>	<b>53418</b>	<b>101743</b>	<b>44637</b>	<b>7894</b>	<b>3544</b>	<b>1467</b>	<b>132</b>	
Assam	781	181	264	217	118	1	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chhattisgarh	142364	-	-	1762	717	2701	1691	4176	1492	440	9898	101873	2193	3140	3991	4455	2652	1183	-	
Jammu & Kashmir	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-
Jharkhand	84529	-	-	387	666	358	1861	2381	9159	11174	15002	14752	7721	20018	1049	-	-	-	-	1
Madhya Pradesh	111947	-	-	2	274	1213	6741	24863	11371	2168	34832	27983	2142	216	-	142	-	-	-	
Maharashtra	42219	-	-	-	-	-	176	9	1632	5422	15443	17504	2027	6	-	-	-	-	-	
Meghalaya	1529	1529	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Odisha	143328	-	-	-	-	-	-	40	131	128	418	505	38947	66410	36749	-	-	-	-	
Telangana	62010	-	-	-	-	1094	-	3227	5227	8215	8988	15480	388	11953	2848	3297	892	270	131	
Uttar Pradesh	18309	-	-	-	-	36	-	-	11376	-	6897	-	-	-	-	-	-	-	-	
West Bengal	28222	-	-	1145	12760	9327	399	2121	592	-	-	1878	-	-	-	-	-	-	-	

**Source:** Coal Directory of India, 2017-18, Coal Controllors' Organisation, Kolkata.

**Note:** Meghalaya coal has not been graded. For statistical purpose grade may be treated as "A"/"B" non-coking coal.

COAL & LIGNITE

**Table-10: Production of Non-coking Coal, 2018-19 (P)**  
(By States and Grades)

State	All-Grades	Grades																	
		G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17 UNG	
<b>India</b>	<b>687586</b>	<b>87</b>	<b>480</b>	<b>3314</b>	<b>15173</b>	<b>12797</b>	<b>7931</b>	<b>41509</b>	<b>54422</b>	<b>35592</b>	<b>84067</b>	<b>199704</b>	<b>66298</b>	<b>111208</b>	<b>41038</b>	<b>6885</b>	<b>3847</b>	<b>3096</b>	<b>138</b>
Assam	784	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Chhattisgarh	161646	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jammu & Kashmir	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Jharkhand	95025	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Madhya Pradesh	118473	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Maharashtra	49818	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Meghalaya	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Odisha	144312	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Telangana	65160	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uttar Pradesh	20275	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
West Bengal	32080	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

**Source:** Provisional Coal Statistics, 2018-19, Coal Controller's Organisation, Kolkata.

**Note:** Meghalaya coal has not been graded. For Statistical purpose grade may be treated as "A"/"B" non-coking coal; Gradewise figures vis-a-vis states not available.

## COAL &amp; LIGNITE

**Table – 11: Despatches of Raw Coal, 2017-18 & 2018-19  
(By States)**

(In '000 tonnes)

States	2017-18 (R) <sup>1</sup>	2018-19 (P) <sup>2</sup>
<b>India</b>	<b>690003</b>	<b>732794</b>
Assam	895	754
Chhattisgarh	146656	159984
Jammu & Kashmir	21	16
Jharkhand	126564	136061
Madhya Pradesh	119930	103404
Maharashtra	44070	51793
Meghalaya	1529	-
Odisha	138538	142464
Telangana	64623	68426
Uttar Pradesh	17227	36654
West Bengal	29950	33238

*Source: 1. Coal Directory of India, 2017-18; 2. Provisional Coal Statistics, 2018-19.*

**Table –12 : Despatches of Raw Coal, 2017-18 & 2018-19  
(By Priorities)**

(In '000 tonnes)

Priority	2017-18(R) <sup>1</sup>	2018-19 (P) <sup>2</sup>
<b>Total</b>	<b>690003</b>	<b>732794</b>
Power (Utility)	519582	546170
Power (Captive)	65906	91779
Steel	11074	17365
Cement	7708	8817
Sponge Iron	8528	12231
Fertilizer	1883	1789
Paper & Pulp	1510	1637
Other Basic metal	806	1097
Steel (Boilers)	373	297
Chemical	277	251
Textiles & Rayons	238	204
Bricks	115	93
Others	72003	51064

*Source: 1. Coal Directory of India, 2017-18*

*2. Provisional Coal Statistics, 2018-19.*

*Note: Steel includes direct feed & coking washery for metallurgical use and steel (boilers); Others include non-coking washery and Bricks.*

## COAL &amp; LIGNITE

**Table – 13: Mine-head Stocks of Coal, 2017-18  
(By States)**

(In '000 tonnes)

State	At the beginning of the year	At the end of the year
<b>India</b>	<b>76889</b>	<b>62036</b>
Assam	183	69
Chhattisgarh	12147	7359
Jammu & Kashmir	12	5
Jharkhand	24002	20645
Madhya Pradesh	8609	2846
Maharashtra	12771	10917
Odisha	6393	11178
Telangana	7481	4921
Uttar Pradesh	2684	2389
West Bengal	2607	1707

*Source: Coal Directory of India, 2017-18, Coal Controllers Organisation, Kolkata.*

**Table – 14: Mine-head Stocks of Coal, 2018-19 (P)  
(By States)**

(In '000 tonnes)

State	At the beginning of the year	At the end of the year
<b>India</b>	<b>62036</b>	<b>57640</b>
Assam	69	NA
Chhattisgarh	7359	NA
Jammu & Kashmir	5	NA
Jharkhand	20645	NA
Madhya Pradesh	2846	NA
Maharashtra	10917	NA
Odisha	11178	NA
Telangana	4921	NA
Uttar Pradesh	2389	NA
West Bengal	1707	NA

*Source : Coal Directory of India 2017-18; Provisional Coal Statistics, 2018-19.*

COAL & LIGNITE

**Table – 4 : Production of Lignite, 2016-17 to 2018-19  
(By Sectors/States)**

(Quantity in '000 tonnes)

State	2016-17	2017-18 <sup>1</sup>	2018-19 (P) <sup>2</sup>
<b>India</b>	<b>45230</b>	<b>46644</b>	<b>44283</b>
<b>Public Sector</b>	<b>44644</b>	<b>46161</b>	<b>43885</b>
<b>Private Sector</b>	<b>586</b>	<b>483</b>	<b>398</b>
Gujarat	10546	13781	12565
Rajasthan	8480	9294	8677
Tamil Nadu	26204	23569	23041

*Source: 1. Coal Directory of India, 2017-18, Coal Controller's Organisation, Kolkata.*

*2. Provisional Coal Statistics, 2018-19, Coal Controller's Organisation, Kolkata.*

**Table – 16 : Number of Lignite Mines  
2017-18 & 2018-19  
(By States)**

State	No. of Mines <sup>#</sup>	
	2016-17 <sup>1</sup>	2017-18 <sup>2</sup>
<b>India</b>	<b>18</b>	<b>NA</b>
Gujarat	9	NA
Rajasthan	6	NA
Tamil Nadu	3	NA

*Source: 1. Coal Directory of India, 2017-18*

*2. Provisional Coal Statistics, 2018-19*

*#Relates to no. of mines on the last day of financial year*

**Table – 17 : Despatches of Lignite  
2017-18 & 2018-19  
(By States)**

State	(In '000 tonnes)	
	2017-18	2018-19(P)
<b>India</b>	<b>46317</b>	<b>45811</b>
Gujarat	13779	12554
Rajasthan	9140	8747
Tamil Nadu	23398	24510

*Source: Provisional Coal Statistics, 2018-19*

**Table – 18 : Mine-head Stocks of Lignite, 2018-19  
(By States)**

(In '000 tonnes)

State	At the beginning of the year <sup>1</sup>	At the end of the year <sup>2</sup>
<b>India</b>	<b>7210</b>	<b>5672</b>
Gujarat	14	NA
Rajasthan	412	NA
Tamil Nadu	6784	NA

*Source: 1. Coal Directory of India, 2017-18*

*2. Provisional Coal Statistics, 2018-19*

## MINING & MARKETING

### Coal

Coal mining in the country is carried out by both opencast and underground methods. Opencast mining contributed 94.2% of the total provisional production, whereas the rest of the production (5.8%) came from underground mining during 2018-19. Most of the mines are either semi-mechanised or mechanised. The machinery commonly deployed are drill machines, load-haul-dumper (LHD), ventilation fans, pumps for dewatering, haulage for transport, etc. In order to arrest the decline in production from a few underground mines, "mass production technology" by introducing 'continuous miner' is being practised. Modern roof-bolting technology with "flexibolts" up to 5 m length; 'smart bolting' for cost reduction of roof support; and introduction of mechanised roof bolting using hydraulic bolts for difficult roof are new technology absorptions in Indian Underground Coal Mining. Mechanised Long wall mining (long wall powered support) has also been introduced in a limited scale which yields higher output with high percentage recovery (70-80%). In opencast mines, machinery like draglines, dozers, shovels, dumpers and graders are deployed for various operations.

The latest policy pursued by CIL is to encourage technology upgradation through Global Tender. Global tender approach has been used towards introduction of high productivity with the use of Continuous Miners at SECL and WCL.

There are eight coal producing companies in the Public Sector. Out of these, Eastern Coalfields Limited (ECL), Bharat Coking Coal Limited (BCCL), Central Coalfields Limited (CCL), Western Coalfields Limited (WCL), South-Eastern Coalfields Limited (SECL), Mahanadi Coalfields Limited (MCL), Northern Coalfields Limited (NCL) and NEC (North Eastern Coalfield are subsidiary companies of Coal India Ltd (CIL), a Government of India Undertaking. The coal mines in Assam and its neighbouring areas are controlled directly by CIL under the unit North Eastern Coalfields Ltd (NEC). CMPDIL is a subsidiary of CIL which is engaged in surveying, planning and designing

work with a view to optimise coal production. The Singareni Collieries Company Limited (SCCL) is a joint venture between Government of India and Government of Telangana.

BCCL is the major producer of prime-coking coal (raw and washed). Medium-coking coal is also produced in Mohuda and Barakar areas. In addition to production of hard coke and soft coke, BCCL operates a number of sand gathering plants, a network of aerial ropeways for transport of sand and nine coal washeries, namely, Dugda-I, Dugda-II, Bhojudih, Patherdih, Mahuda, Sudamdih, Barora, Moonidih and Madhuband.

CCL operates mines in Bokaro, Ramgarh, Giridih and North & South Karanpura Coalfields in Jharkhand and four coal washeries, namely, Kathara, Swang, Rajrappa and Kedla. Its products included medium-coking coal (raw and washed), non-coking coal, soft coke and hard coke.

WCL operates coal mines located in Pench, Kanhan and Patharkheda Coalfields in Madhya Pradesh and Wardha Valley & Kamthi Coalfields in Maharashtra. This Company largely meets the requirements of thermal power plant and industries in the western region of the country.

ECL covers Raniganj Coalfields in West Bengal and Mugma & Rajmahal Coalfields in Bihar. It produces and supplies coal to the local and other industries which require relatively higher grades of coal.

The coalfields of Chhattisgarh, viz, Korba (East & West), Baikunthpur, Chirimiri, Hasdeo, Sohagpur, Jamuna-Kotma and Johilia are under SECL. This subsidiary continued to be the leading producer of CIL.

NEC is responsible for development and production of coal in the North-Eastern States. The present mining activities are confined to Arunachal Pradesh, Assam and Meghalaya. The area has large proven reserves of low ash, high calorific value coal but because of its high sulphur content, it cannot be used directly as metallurgical coal.

SCCL operates coal mines in Telangana state which produces non-coking coal. The coal requirements of consumers in south are mostly met by this Company.

COAL & LIGNITE

MCL had been incorporated as another subsidiary Company of CIL. Its area of jurisdiction comprises Talcher and Ib Valley Coalfields of Odisha.

NCL covers the entire Singrauli Coalfields situated in Madhya Pradesh and Uttar Pradesh.

Jharkhand State Mineral Development Corporation Ltd (JSMDCL), Jammu & Kashmir Minerals Ltd (JKML) and Rajasthan Rajya Vidyut Utpadan Nigam Limited (RVUNL) are the State Government Undertakings and Damodar Valley Corporation (DVC) is the Central Public Sector Undertaking that are engaged in coal mining. IISCO steel plant of SAIL is the only Public Sector steel unit operating captive mines for coal. Bengal Emta Coal Mines Ltd (BECML), Jindal Steel & Power Ltd (JSPL), Hindalco and Tata Steel are the Companies operating captive mines in the Private Sector.

As on 31.3.2018, there were 455 operating mines for coal in the country out of which 219 were opencast, while 213 were underground mines. The remaining 23 were mixed collieries. There were 433 Public Sector mines and 22 mines in Private Sector (Table-19). Thrust is given on further increasing production from opencast mines where the gestation period is comparatively shorter. In 2018-19, the share of provisional production of raw coal from opencast mines was 686.212 million tonnes (94.2%) against 42.506 million tonnes (5.8%) from underground mines (Table-20). Production of coal by different mining technologies employed during 2017-18 is furnished in Table-21. The overall Output per Man Shift (OMS) in opencast and underground mines for CIL in 2018-19 was 8.67 tonnes as against 7.44 tonnes in 2017-18. The overall OMS in opencast and underground mines for SCCL was maintained at 6.22 tonnes in 2018-19 as against 4.89 tonnes in 2017-18.

Under the Colliery Control Order, 1945, the Central Government was empowered to fix the prices of coal gradewise and collierywise. As per recommendations of the Bureau of Industrial Costs & Prices and the Committee on Integrated

Coal Policy, prices of different grades of coal were subjected to deregulation since 22.3.1996, in a phased manner. As the prices of all grades of coking coal got deregulated with effect from 1.4.1996, distribution fell under the purview of CIL/coal companies. The Government of India amended the provisions of Colliery Control Order 1945 and Colliery Control Order 2000 were notified, according to which, the price & distribution of all grades of coal with effect from 1.1.2000 have been deregulated.

Coal movements by coastal shipment to southern and western regions through Haldia, Paradip and Vizag ports continued as usual. Major portion of the despatches was achieved through railways, followed by roads, Merry-Go-Round System, belt conveyor, ropeways and sea route.

**Table – 19 : Number\* of Coal Mines, 2017-18  
(By Sectors/States)**

State	No. of collieries			
	OC	UG	Mixed	Total
<b>All India</b>	<b>219</b>	<b>213</b>	<b>23</b>	<b>455</b>
Public Sector	205	207	21	433
Private Sector	14	6	2	22
Arunachal Pradesh	1	-	-	1
Assam	3	1	-	4
Chhattisgarh	25	29	1	55
Jammu & Kashmir	-	2	-	2
Jharkhand	77	33	10	120
Madhya Pradesh	19	41	1	61
Maharashtra	37	21	-	58
Meghalaya	3	-	-	3
Odisha	18	8	-	26
Telangana	19	30	-	49
Uttar Pradesh	4	-	-	4
West Bengal	13	48	11	72

*Source: Coal Directory of India, 2017-18, Coal Controller's Organisation, Kolkata.*

*\* Relates to no. of mines as on last day of the financial year (As on 31.3.2018).*

*Note: OC - Opencast UG - Underground.*

**Table – 20 : Production of Raw Coal**

(In million tonnes)

Year	Production from open-cast mines (% share)	Production from under-ground mines (% share)	Total production
2016-17	613.518 (93.3%)	44.350 (6.7%)	657.868
2017-18	633.569 (93.8%)	41.831 (6.2%)	675.400
2018-19 (P)	686.212 (94.2%)	42.506 (5.8%)	728.718

*Source: Provisional Coal Statistics, 2018-19  
Coal Controller's Organisation, Kolkata*

**Table – 21 : Production of Coal, 2017-18  
(By Technology)**

(In million tonnes)

Technology adopted	Production	Percentage of total
<b>All India : Total</b>	<b>675.400</b>	<b>100</b>
<b>Opencast (Total)</b>	<b>633.569</b>	<b>93.8</b>
Mechanised	633.569	100
Manual	-	-
<b>Underground (Total)</b>	<b>41.831</b>	<b>6.2</b>
Conventional B&P	0.566	1.4
Mechanised B&P	31.452	75.2
Conventional LW	0.146	0.3
Mechanised LW	2.170	5.2
Other methods	7.497	17.9

*Source: Coal Directory of India, 2017-18,  
Coal Controller's Organisation, Kolkata.*

*Note: B&P - Board-and-pillar; LW - Longwall*

## Lignite

As on 31.03.2018, the total number of operating lignite mines was 18 and all are worked by opencast method. Out of these, fourteen are captive and the remaining four are non-captive. Four mines are owned by Neyveli Lignite Corporation (NLC), six by Gujarat Mineral Development Corporation Ltd (GMDCL), three by Rajasthan State Mines & Minerals Limited (RSMML), two by Gujarat Industries Power Co. Ltd (GIPCL), one each by

Gujarat Heavy Chemicals Ltd (GHCL), Barmer Lignite Mining Company Limited (BLMCL) & V S Lignite Power Pvt. Ltd (VSLPPL). Sector-wise, sixteen mines are under Public Sector and the remaining two are under Private Sector, i.e., GHCL & VSLPPL.

The Neyveli Lignite Mine is the largest opencast mine in the country with eco-friendly technology. To increase the power demand and to manage both social and environmental externalities, NLC has now diversified into coal mining, coal-based power generation and green energy. NLC operates three opencast mines at Neyveli, Tamil Nadu and one opencast mine at Barsingsar, Rajasthan. The present installed capacity in lignite mining of all NLC mines stands at 30.6 MTPA viz. Mine-I with 10.5 MTPA, Mine-IA with 3.0 MTPA, Mine-II with 15.0 MTPA, Barsingsar with 2.1 MTPA. Besides, additional planned capacity of lignite mining of 31.55 MTPA viz. Bithnok Lignite Mine (2.25 MTPA), Hadla Mine (1.9 MTPA), Barsingsar expansion (0.40 MTPA), expansion of Mine-IA (4.0 MTPA), Mine-III project (11.50 MTPA) and South of Vellar & Palayamkottai lignite blocks (11.50 MTPA) is under implementation. The planned capacity of coal mining of 31.00 MTPA viz. Talabira II & III block (20.00 MTPA) in the State of Odisha and Pachwara South Coal block (11.00 MTPA) in the State of Jharkhand has been allotted to Neyveli Uttar Pradesh Power Ltd (NUPPL) and is under implementation. The production of lignite for all NLC mines was 242.49 lakh tonnes during 2018-19 which decreased by 3.6% from 251.53 lakh tonnes in the previous year. The NLC's mines are highly mechanised. Presently, these mines are linked to three thermal power stations.

In Power Sector, NLC has presently five thermal power stations, four at Neyveli, Tamil Nadu and one thermal power station at Barsingsar, Rajasthan with a total power generation capacity of 3,140 MW (viz. TPS-I with 500 MW, TPS-I expansion with 420 MW, TPS-II with 1,470 MW, TPS-II expansion with 500 MW & Barsingsar with 250 MW and taking into account the renewable energy projects of 794.56 MW viz. solar (743.56 MW) & Wind (51 MW), commissioned so far, the total installed capacity is 3,934.56 MW.

The Corporate Plan Document envisages increase in overall lignite production by 62.15 MTPA, coal production by 31.00 MTPA and power generation up to 21 GW by the year 2025.

## **Policy–Captive Coal and Lignite Block Allocation**

Under the Coal Mines (Nationalisation) Act, 1973, coal mining was originally reserved for the Public Sector exclusively. The said Act was amended from time to time to allow: (a) captive mining by private companies engaged in production of iron and steel and sub-lease for coal mining to private parties in isolated small pockets not amenable to economic development and not requiring rail transport (amended in 1976); (b) Private Sector participation in coal mining as linkage for power generation, for washing of coal obtained from a mine or for other end-uses to be notified by Government from time to time (amended on 9.6.1993), in addition to existing provision for the production of iron and steel; (c) mining of coal for production of cement (amended on 15.3.1996) and (d) mining of coal for production of syngas obtained through coal gasification (underground and surface) and coal liquefaction (amended on 12.7.2007).

A Government Company (including a State Government Company), a Corporation owned, managed and controlled by the Central Government, can undertake coal mining without the restriction of captive use.

The allocation of coal blocks to private parties is done through the mechanism of an Inter-Ministerial and Inter-Governmental body called Screening Committee.

With regard to small and isolated blocks, a new policy is being formulated in consultation with the Ministry of Law and Justice and the stakeholders for allocation of such blocks.

There has been an exponential rise in the demand for coal. With progressive allocation of coal blocks, the number of coal blocks available for allocation has considerably declined, whereas the number of applicants per block is on the rise. The processes adopted, therefore, for judicious selection of applicants in respect of coal blocks encountered inadequacies and have become vulnerable to criticism on the ground of lack of transparency and objectivity.

While efforts are on to continuously add blocks to the captive list, it is also expected that the demand for blocks would remain far ahead of supply. Therefore, there is an urgent need to bring in a process of selection that is not only objective but also transparent. Auctioning through competitive bidding is one such acceptable selection process.

With a view to bringing in more transparency, the Mines and Minerals (Development and Regulation) Amendment Act, 2010 the amendment for introduction of competitive bidding system for allocation of coal blocks for captive use has been passed by both the Houses of Parliament and it has been notified in Gazette of India (Extraordinary) on 9<sup>th</sup> September, 2010. The Amendment Act seeks to provide for grant of reconnaissance permit, prospecting licence or mining lease in respect of an area containing coal and lignite through auction by competitive bidding, on such terms and conditions as may be prescribed. This would, however, not be applicable to the cases: where such area is considered for allocation to a Government Company or Corporation for mining or such other specified end-use; where such area is considered for allocation to a Company or Corporation that has been awarded a power project on the basis of competitive bids for tariff (including Ultra Mega Power Projects).

The Government has finalised rules for allocation of blocks through competitive bidding and the same have been notified on 2.2.2012. The commencement of the Amendment Act has been notified on 13.2.2012. Further, the Government has notified the “Auction by Competitive Bidding of Coal Mines (Amendment) Rules, 2012” on 27<sup>th</sup> December, 2012 for allocation of coal blocks to Government Companies. It contains detailed terms and conditions for selection of Government Company for allocation on the basis of predetermined criteria for utilisation of coal.

Coal mining is kept under the purview of Public Sector except captive mining for the approved end-use industries viz. Iron & Steel, Power, Cement, Washing of Coal and Coal Gasification & liquefaction. Further, the Government decided in its new mining policy to allow the State Government companies and undertakings to go for coal and lignite mining without the earlier restriction of isolated small pockets only.

The policy of the allotment of Captive Coal Blocks was adopted by the Government of India in the year 1993 and as per this policy by the end of 2013-14, out of total allocated 218 coal blocks, 80 coal blocks were de-allocated. Thus at the end of 2013-14, 138 coal blocks and 28 lignite blocks remained allocated under the category of Captive Coal Block. During the year 2014-15 by virtue of the judgement dated 25.08.2014 read with the Order dated 24.09.2014 of the Hon’ble Supreme Court of India, out of 218 captive coal blocks, allocation of 204 coal blocks was cancelled except allocation of 12 coal blocks for UMPPs and one coal block each allocated to NTPC and SAIL.

Further, allocation of four coal blocks for UMPPs, i.e., Chhatrasal coal block and that Meenakshi, Meenakshi B & Dip side of Meenakshi blocks of UMPP was cancelled on 07.05.2015 and 15.12.2015, respectively. As such, as on 31.3.2018, only 10 coal blocks (allocated through earlier dispensations) remained allocated.

Subsequent to the order of the Hon'ble Supreme Court of India, 42 coal blocks [Schedule II coal mines as per the Coal Mines (Special Provisions) Ordinance, 2014 replaced by the Coal Mines (Special Provision) Act, 2015] were allowed to produce coal up to 31.03.2015. Thus, the total number of blocks that stood allocated from 25.09.2014 to 31.03.2015 was 52 (42 + 10 earlier coal blocks).

In 2018-19, 20 captive coal blocks vested/ allocated including 3 blocks under CIL custodian produced coal. From these total 23 coal blocks, production of coal reported was 54.852 million tonnes.

Under the "Auction by Competitive Bidding Rules, 2012", 13 regionally explored coal blocks have been allotted to Central/State Government companies.

In 2018-19, 3 coal blocks have been allocated. Therefore, as on 31.03.2019, the total number of coal blocks that existed was 110. Out of these, 80 blocks were vested/ allotted which accounted for 11,045.77 million tonnes; 13 blocks were under Auction by Competitive Bidding Rules, 2012 with 5,684.84 million tonnes; 7 blocks were that of Custodian with 364.86 million tonnes; and 10 blocks with 5,418.42 million tonnes remained as not cancelled by the Hon'ble Supreme Court.

During 2018-19, a total of 110 coal blocks with 22,513.89 million tonnes geological/extractable reserves have been allotted in various States (Table -22). Of these, 78 coal blocks with 18,143.56 million tonnes are under Public Sector Undertakings (PSU) and the remaining 32 blocks with about 4,370.33 million tonnes are under Private Sector companies. Among these, 60 blocks with 15,810.86 million tonnes have been allocated for Power, 22 blocks with 825.29 million tonnes for Non-regulated Sector (NRS), 8 blocks with 3,730.54 million tonnes for Ultra Mega Power Project (UMPP) and 20 blocks with 2,147.20 million tonnes for commercial mining.

Similarly, As on 31.03.2019, 23 captive lignite blocks stand allocated with 1,555.33 million tonnes geological/extractable reserves have been allocated during 2018-19. Of these, 21 blocks with 1,502.87 million tonnes are under Public Sector Undertakings

(State PSU) and the remaining 2 blocks are under Private Sector with 52.46 million tonnes. By sectors, 12 blocks with 1,138.60 million tonnes have been allocated for power generation and 11 blocks with 416.73 million tonnes for commercial end-use. Statewise, 13 lignite blocks with 762.84 million tonnes for Gujarat and 10 blocks with 792.49 million tonnes for Rajasthan states have been allocated.

**Table – 22 : Statewise Allotment of Captive Coal Blocks Allocated/Vested/Under Custodian including Blocks Allotted Under Auction by Competitive Bidding Rules, 2012 during 2018-19 (as on 31.03.2019)**

(In million tonnes)		
State	No. of blocks	Geological/ extractable Reserves
<b>Coal</b>		
Arunachal Pradesh	1	4.79
Chhattisgarh	23	5974.33
Jharkhand	33	7117.40
Madhya Pradesh	10	1758.36
Maharashtra	13	573.01
Odisha	16	6450.56
Telangana	2	156.23
West Bengal	12	479.21
Total	110	22513.89

*Source: Provisional Coal Statistics, 2018-19, Coal Controller's Organisation, Kolkata.*

*Note: Extractable reserves (in million tonnes) have been shown against the newly allocated/vested coal blocks as per CM(SP)Act, 2015.*

## FOREIGN COLLABORATION

To meet the country's growing demand for coal, Coal India Limited (CIL) has expressed intent for foreign collaboration with the following objectives:

(a) bringing in proven technologies and advanced management skills for running underground (UG) and opencast (OC) mines and in coal preparation, appropriate training for development of necessary skills for efficient management of the Indian Coal Industry;

(b) exploration and exploitation of coal-bed methane and in situ gasification of coal;

(c) locating overseas companies interested in joint ventures for overseas operations in the field of coal mining with special thrust on coking coal mining; and

(d) exploring financial assistance for import of equipment and other investment needs for Coal Industry.

To fulfil these objectives, a Joint Working Group on coal had been set up with a number of countries, such as, UK, France, Russia, USA, Poland, Germany, Australia and China. The priority areas, inter alia, include acquiring modern technology for mass production through underground and opencast mining; innovative methodology for underground mining in difficult Geological conditions including steep seams; fire & subsidence control; mines safety; coal preparation; use of washery rejects for power generation; exploitation of coal-bed methane from working mines & abandoned mines; coal gasification; application of Geographical Information System (GIS); environmental mitigation & emission trading; overseas ventures for sourcing coking coal; etc. Training of CIL personnel for effective adaptation of the state-of-the-art technologies, available with the developed countries is also a prime subject of focus.

## COAL WASHERIES

Presently, 17 coal washeries (13 in Public Sector and 4 in Private Sector) with 32.490 million tonnes per annum (MTPA) capacity produced about 5.973 million tonnes of coking coal in 2017-18. Production of washed coking coal during 2017-18 was about 2.576 million tonnes in Public Sector and 3.397 million tonnes in Private Sector. Under Public Sector, BCCL operates 6 coking coal washeries (Dugda, Bhojudih, Sudamdih, Moonidih, Mahuda and Madhuban), CCL operates 5 washeries (Kathara, Swang, Rajrappa, Kedla and Kargali), WCL operates one (Nandan) and SAIL too has one (Chasnala), whereas 4 washeries (West Bokaro-II, West Bokaro-III, Jamadoba and Bhelatand) are operated by Tata Steel Ltd (TSL) in Private Sector. Similarly, 20 coal washeries with 105.240 million tonnes per annum capacity produced about 37.801.32 million tonnes non-coking coal during the year. Of these, about 6.077 million tonnes has been under Public Sector and about 31.724.32 million tonnes under Private Sector. Under Public Sector, 3 non-coking coal washeries (two in CCL and one in NCL) were operational, whereas under Private Sector, 17 non-coking coal washeries were in operation.

By and large ash content in raw coal used by washeries varied between 24% and 33%. The ash content in the washed coal and middlings produced by washeries ranged from 19 to 22% and 35 to 40%, respectively. The rejects in most washeries contained over 50% ash. The capacity and production of washed coking/non-coking coal are shown in Tables - 23 to 26, respectively.

**Table – 23 : Production of Washed Coking Coal, 2016-17 & 2017-18 (Sector-wise/Company-wise)**

	(In '000 tonnes)	
	2016-17	2017-18
<b>All India : Total</b>	<b>6413</b>	<b>5973</b>
<b>Public Sector</b>	<b>3074</b>	<b>2576</b>
BCCL	1182	801
CCL	1139	1115
WCL	41	-
SAIL	712	660
<b>Private Sector</b>	<b>3339</b>	<b>3397</b>
Tata Steel Ltd	3339	3397

*Source: Coal Directory of India, 2017-18, Coal Controller's Organisation, Kolkata.*

**Table – 24 : Capacity of Washed Coking Coal, 2017-18 (Sector-wise/Company-wise)**

Coalfield/Washery	State	Raw Coal Capacity (In '000 tpy)
<b>Grand Total</b>		<b>32490</b>
<b>Public Sector</b>	<b>Total</b>	<b>24700</b>
<b>BCCL</b>		<b>10030</b>
Dugda-II	Jharkhand	2000
Bhojudih	West Bengal	1700
Sudamdih	Jharkhand	1600
Moonidih	-do-	1600
Mahuda	-do-	630
Madhuban	-do-	2500
<b>CCL</b>		<b>12070</b>
Kathara	Jharkhand	3000
Swang	-do-	750
Rajrappa	-do-	3000
Kedla	-do-	2600
Kargali	-do-	2720
<b>WCL</b>		<b>1200</b>
Nandan (Pench-Kanhan)	Madhya Pradesh	1200
<b>SAIL</b>		<b>1400</b>
Chasnala	Jharkhand	1400
<b>Private Sector</b>	<b>Total</b>	<b>7790</b>
<b>Tata Steel Ltd</b>		<b>7790</b>
West Bokaro-II	Jharkhand	2410
West Bokaro-III	-do-	3080
Jamadoba	-do-	1300
Bhelatand	-do-	1000

*Source: Coal Directory of India, 2017-18, Coal Controller's Organisation, Kolkata (except totals).*

**Table – 25 : Production of Washed Non-coking Coal : 2016-17 & 2017-18 (Sector-wise/Company-wise)**

(In '000 tonnes)		
Sector/Company	2016-17	2017-18
<b>All India : Total</b>	<b>45121.92</b>	<b>37801.32</b>
<b>Public Sector</b>	<b>12097.29</b>	<b>6077.00</b>
CCL	8942.00	6077.00
NCL	3155.29	-
<b>Private Sector</b>	<b>33024.63</b>	<b>31724.32</b>
Adani Enterprises Ltd	7414.91	7143.20
Aryan Coal Beneficiation Pvt. Ltd	11862.73	11586.65
Aryan Energy Pvt. Ltd	1284.58	726.93
Global Coal & Mining Pvt. Ltd	3082.98	2436.00
Jindal Power Ltd	379.26	506.65
Spectrum Coal & Power Ltd	9000.17	9293.22
Kartikay Coal Washeries Pvt. Ltd	-	31.67

*Source: Coal Directory of India, 2017-18, Coal Controller's Organisation, Kolkata.*

### Import Policy of Coal

The present import policy of coal allows imports to be carried out freely under Open General Licence by the consumers themselves considering their needs. Coking coal is imported by Steel Sector and coke manufacturers mainly on availability and quality consideration. Coal-based power stations and cement plants are also importing non-coking coal on

consideration of transport logistics and commercial precedence. In spite of hardening prices of both coking and non-coking coal internationally and increase in ocean freight, large amounts of coal continue to be imported.

### FDI Policy

Indian Government permits 100% automatic FDI approval for coal & lignite mining only for captive consumption by power projects, iron & steel and cement units and other eligible activities permitted under and subject to the provisions of Coal Mines (Nationalisation) Act, 1973. This is in addition to the existing stipulated policy applied for the Power Sector.

### CLASSIFICATION AND GRADES

Indian coal is classified into two main categories, namely, coking and non-coking. Coking coal is a type of coal from which, on carbonisation, coke suitable for use in metallurgical industries, particularly, in Iron and Steel industries can be produced. Parameters determining coking property of coal are coking index, volatile matter (VM %), vitrinite %, crucible swell no., fluidity, reflectance, etc. Although for commercial gradation, ash percentage is the sole criterion, for semi-weakly-coking coal, along with ash percentage, moisture percentage too is considered as an added criterion. For non-coking coal, an empirical formula is used to determine Useful Heat Value (UHV) of coal in kcal/kg.

The classification of coal as per the Ministry of Coal is reflected in Table - 27.

**Table – 26 : Capacity of Washed Non-coking Coal, 2017-18 (Sector-wise/Company-wise)**

(In '000 tpy)			
Washery/Location	Coalfield	State	Raw Coal Capacity
<b>Grand Total</b>			<b>105240</b>
<b>Public Sector</b>	<b>Total</b>		<b>13500</b>
<b>CCL</b>			
<b>East Bokaro Coalfield, Jharkhand</b>			<b>9000</b>
Gidi	East Bokaro	Jharkhand	2500
Piparwar	N. Karanpura	-do-	6500
<b>NCL</b>			<b>4500</b>
Bina Deshelling Plant	Bina	Uttar Pradesh	4500

(Contd)

COAL & LIGNITE

Table - 26 (Concl'd)

Washery/Location	Coalfield	State	Raw Coal Capacity
<b>Private Sector</b>	<b>Total</b>		<b>91740</b>
<b>Adani Enterprises Ltd</b>			<b>10000</b>
AEL	Parsa	Chhattisgarh	10000
<b>Aryan Coal Beneficiation Pvt. Ltd</b>			<b>35670</b>
Chakabuwa	Korba	Chhattisgarh	7500
Dipka	-do-	-do-	14500
Pander Pauni	Ballarpur	Maharashtra	2620
Gevra	Korba	Chhattisgarh	6250
Binjhri	-do-	-do-	4800
<b>Aryan Energy Pvt. Ltd</b>			<b>8340</b>
Hemgir	Hemgir	Odisha	5000
Talcher	Talcher	Odisha	2340
RKP	Mandamarri	Telangana	1000
<b>Global Coal &amp; Mining Pvt. Ltd</b>			<b>9960</b>
Ib Valley	Ib Valley	Odisha	4000
Ramagundam	Ramagundam	Telangana	1000
Talcher	Talcher	Odisha	4000
Manuguru	Manuguru	Telangana	960
<b>Jindal Power Ltd</b>			<b>4750</b>
JPL	Raigarh	Chhattisgarh	4750
<b>Kartikay Coal Washeries Pvt. Ltd</b>			<b>2500</b>
Wani	Wardha	Maharashtra	2500
<b>Spectrum Coal &amp; Power Ltd</b>			<b>20520</b>
Ratija	Korba	Chhattisgarh	11000
Talcher	Bharatpur	Odisha	9520

Source: Coal Directory of India, 2017-18, Coal Controller's Organisation, Kolkata.

Table – 27 : Classification of Coal

Sl. No	Class	Grade	Grade/Specification
1.	Non-coking coal produced in all States other than Assam, Arunachal Pradesh, Meghalaya and Nagaland	A	Useful Heat Value exceeding 6,200 kcal per kg.
		B	Useful Heat Value exceeding 5,600 kcal per kg but not exceeding 6,200 kcal per kg.
		C	Useful Heat Value exceeding 4,940 kcal per kg but not exceeding 5,600 kcal per kg.
		D	Useful Heat Value exceeding 4,200 kcal per kg but not exceeding 4,940 kcal per kg.
		E	Useful Heat Value exceeding 3,360 kcal per kg but not exceeding 4,200 kcal per kg.
		F	Useful Heat Value exceeding 2,400 kcal per kg but not exceeding 3,360 kcal per kg.
		G	Useful Heat Value exceeding 1,300 kcal per kg but not exceeding 2,400 kcal per kg.

(Contd)

COAL & LIGNITE

Table - 27 (Concl'd)

Sl. No	Class	Grade	Grade/Specification
2.	Non-coking coal produced in Arunachal Pradesh, Assam, Meghalaya and Nagaland	A	Useful Heat Value between 6,200 and 6,299 kcal per kg and corresponding ash plus moisture content between 18.85 and 19.57%.
		B	Useful Heat Value between 5,600 and 6,199 kcal per kg and corresponding ash plus moisture content between 19.58 and 23.91%.
3.	Coking coal	Steel Grade I	Ash content not exceeding 15%.
		Steel Grade II	Ash content exceeding 15% but not exceeding 18%.
		Washery Grade I	Ash content exceeding 18% but not exceeding 21% .
		Washery Grade II	Ash content exceeding 21% but not exceeding 24%.
		Washery Grade III	Ash content exceeding 24% but not exceeding 28%.
		Washery Grade IV	Ash content exceeding 28% but not exceeding 35%.
		Washery Grade V	Ash content exceeding 35% but not exceeding 42%.
4.	Semi-coking and weakly-coking coal	Semi-coking Grade I	Ash plus moisture content not exceeding 19%.
		Semi-coking Grade II	Ash plus moisture content exceeding 19% but not exceeding 24%.
5.	Hard coke	By-product Premium	Ash content not exceeding 25%.
		By-product Ordinary	Ash content exceeding 25% but not exceeding 30%.
		Beehive Premium	Ash content not exceeding 27%.
		Beehive Superior	Ash content exceeding 27% but not exceeding 31%.
		Beehive Ordinary	Ash content exceeding 31% but not exceeding 36%.

In order to adopt the best international practices, India decided to switch over from the grading based on Useful Heat Value (UHV) to the grading based on Gross Calorific Value (GCV); and, consequently on 16.01.2011 the Ministry of Coal notified the switch over. As per the new system, the following nomenclature has been introduced for gradation of non- coking coal:

Grades	GCV Range (kcal/kg)
G1	GCV exceeding 7,000
G2	GCV exceeding 6,701 but not above 7,000
G3	GCV exceeding 6,401 but not above 6,700
G4	GCV exceeding 6,101 but not above 6,400
G5	GCV exceeding 5,801 but not above 6,100
G6	GCV exceeding 5,501 but not above 5,800
G7	GCV exceeding 5,201 but not above 5,500
G8	GCV exceeding 4,901 but not above 5,200
G9	GCV exceeding 4,601 but not above 4,900
G10	GCV exceeding 4,301 but not above 4,600
G11	GCV exceeding 4,001 but not above 4,300
G12	GCV exceeding 3,700 but not above 4,000
G13	GCV exceeding 3,400 but not above 3,700
G14	GCV exceeding 3,101 but not above 3,400
G15	GCV exceeding 2,801 but not above 3,100
G16	GCV exceeding 2,501 but not above 2,800
G17	GCV exceeding 2,201 but not above 2,500

Based on the GCV ranges of proposed gradation and erstwhile gradation, a Concordance Table has been generated for better understanding. However, it may be noted that this concordance does not depict exact one-to-one relation between the two systems.

**Concordance Table**

Old grading based on UHV	New grading based on GCV
A	G1, G2, G3
B	G4, G5
C	G6
D	G7, G8
E	G9, G10
F	G11, G12
G	G13, G14
Non-coking coal Un-graded	G15, G16, G17

*Source: Coal Directory 2017- 18, Coal Controller's Organisation, Kolkata.*

## CONSUMPTION

Thermal power plants, iron & steel, sponge iron and cement continued to be the major consuming industries for coal in India. Sizeable quantities are also consumed by the railways, collieries and as domestic fuel. Data regarding consumption in these sectors is not available. However, industry-wise despatches of coal during 2016-17, 2017-18 and 2018-19 are depicted in Table - 28.

## DEMAND & SUPPLY

To comprehend the requirement of coal in real term, the erstwhile Planning Commission of India did maintain the practice of estimating demand for each year in advance. However, the apparent supply (Despatch + Import – Export) did show variance from the projected estimates. Against the estimated demand of coking coal and non-coking coal, the data on actual despatch, import and export of coal (coking coal and non-coking coal) during 2017-18 and 2018-19 are provided in Table -29.

**Table – 28 : Despatches\* of Coal 2016-17 to 2018-19  
(By Industries)**

Industry	(In million tonnes)		
	2016-17	2017-18 (R)	2018-19 (P)
<b>Total</b>	<b>645.98</b>	<b>690.00</b>	<b>732.79</b>
Electricity	535.04	585.49	637.95
Iron & steel <sup>1</sup>	10.34	11.45	17.66
Sponge iron	5.56	8.53	12.23
Fertilizer	2.13	1.88	1.79
Cement	6.36	7.71	8.82
Others (Chemical, other basic metals, paper & pulp, textile & rayon, bricks, others, etc.)	86.55	74.94	54.34

*Source: Coal Directory, 2016-17, 2017-18 and Provisional Coal Statistics, 2018-19.*

*\*Data on consumption is not available.*

*<sup>1</sup>Includes direct feed, coking washery and steel (boilers).*

**Table – 29 : Demand-Supply of Coal, 2017-18 & 2018-19**

Year	Demand*	(In million tonnes)			
		Apparent Supply			
		Despatch	Import	Export	Total
2017-18 (R)	908.40	690.003	208.253	1.504	896.752
2018-19 (P)	991.35	732.794	235.354	1.306	966.842

*Source: Provisional Coal Statistics, 2018-19.*

*\*Annual Plan, Ministry of Coal.*

## WORLD REVIEW

World proved coal reserves were estimated at 1,054.782 billion tonnes at the end of 2018 of which 734.903 billion tonnes (70%) has been classified as anthracite & bituminous coal and 319.879 billion tonnes (30%) as sub-bituminous coal & lignite. USA has the largest coal reserves with about 24% share of the total world reserves,

followed by Russian Federation (15%), Australia (14%) and China (13%) (Table-30).

World production of coal and lignite increased by about 3.4% from about 7.700 billion tonnes in 2017 to 7.964 billion tonnes in 2018. China continued to be the largest producer of coal & lignite in 2018 with about 46% share in total world production, followed by India (9.3%), USA (8.6%), Australia (6.3%) and Indonesia (7%) (Table-31).

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**Table – 30 : World Proved Coal Reserves at the end of 2018 (By Principal Countries)**

(In million tonnes)

Country	Anthracite and bituminous coal	Sub-bituminous coal and lignite	Total
<b>World : Total</b>	<b>734903</b>	<b>319879</b>	<b>1054782</b>
Australia	70927	76508	147435
Brazil	1547	5049	6596
Canada	4346	2236	6582
China	130851	7968	138819
Colombia	4881	-	4881
Germany	3	36100	36103
India*	96468	4895	101363
Indonesia	26122	10878	37000
Kazakhstan	25605	-	25605
Poland	20542	5937	26479
Russian Federation	69634	90730	160364
Serbia	402	7112	7514
South Africa	9893	-	9893
Turkey	551	10975	11526
Ukraine	32039	2336	34375
USA	220167	30052	250219
Other countries	20925	29103	50028

Source: BP Statistical Review of World Energy, 2019.

\*India's resources of coal as on 1.4.2019 are estimated at about 326.496 billion tonnes to a depth of 1,200 m and those of lignite are estimated at about 45.759 billion tonnes.

**Table – 31 : World Production of Coal and Lignite (By Principal Countries)**

(In million tonnes)

Country	2016	2017	2018
<b>World : Total</b>	<b>7472</b>	<b>7700</b>	<b>7964</b>
<b>Australia</b>			
Bituminous <sup>1</sup>	443	436	456
Brown coal	60	56	45
<b>Bosnia &amp; Herzegovina</b>			
Brown coal & lignite	13	14	14
<b>Bulgaria</b>			
Brown Coal & lignite	31	35	35 <sup>e</sup>
<b>Canada</b>			
Coal	61	61	55
<b>China</b>			
Coal	3411	3524	3683
<b>Colombia</b>			
Bituminous	91	91	86 <sup>e</sup>
<b>Czech. Rep.</b>			
Bituminous	6	5	4
Brown Coal	39	40	39

(Contd)

Country	2016	2017	2018
<b>Germany</b>			
Anthracite & Bituminous	4	4	3
Brown coal	172	171	166
<b>Greece</b>			
Lignite	33	38	37
<b>India*</b>			
Bituminous	658	679	697 <sup>e</sup>
Lignite	45	48	43 <sup>e</sup>
<b>Indonesia</b>			
Anthracite & Bituminous	456	461	558
<b>Kazakhstan</b>			
Bituminous coal	97	102	108
Lignite	6	6	7
<b>Korea, Dem. Rep. of</b>			
Coal	36	22	18 <sup>e</sup>
<b>Mexico</b>			
Bituminous	14	13	13 <sup>e</sup>
<b>Mongolia</b>			
Brown coal & Lignite	35	49	50
<b>Poland</b>			
Bituminous	71	66	64
Lignite	60	63	61
<b>Romania</b>			
Anthracite & Bituminous	1	1	1
Lignite	22	25	23
<b>Russia</b>			
Coal	385	410	440
<b>Serbia<sup>d</sup></b>			
Lignite & brown coal	38	40	38 <sup>e</sup>
<b>South Africa</b>			
Anthracite & Bituminous	251	252	253
<b>Thailand</b>			
Lignite	17	16	15
<b>Turkey</b>			
Anthracite	2	2	2
Lignite	78	87	85 <sup>e</sup>
<b>USA</b>			
Hard coal	594	641	634
Lignite	66	61	52
<b>Ukraine</b>			
Bituminous	32	35	26
<b>UK</b>			
Bituminous & Anthracite	4	3	3
<b>Vietnam</b>			
Anthracite	39	38	42
<b>Other countries</b>			
Coal & Lignite	101	105	108

Source: BGS, World Mineral Production, 2014-2018.

Hard coal – Including anthracite, bituminous & sub-bituminous coal. Coal- All ranks of coal. d- including production in Kosovo, 1- including sub-bituminous.

\*India's production of coal during 2016-17, 2017-18 & 2018-19 was 657.87, 675.40 & 728.72 million tonnes, respectively.

\* India's production of lignite during 2016-17, 2017-18 & 2018-19 was 45.23, 46.64 & 44.28 million tonnes, respectively.

Global coal demand increased by 1.1%, continuing the rebound that began in 2017 after three years of decline. The main driver was coal power generation, which rose almost 2% in 2018 to reach an all-time high. Coal maintained its position as the largest source of electricity in the world with a 38% share. The People's Republic of China, India and other Asian economies led the expansion, while coal power generation fell in Europe and North America. In non-power sectors, despite a lot of coal-to-gas switching in China, demand remained stable. The international coal trade grew by 4% in 2018, surpassing 1.4 billion tonnes.

Global production grew by 3.3% in 2018, mainly driven by the demand growth. Four of the world's six largest coal producing countries increased their output, with three of them – India, Indonesia and Russia – producing their largest outputs ever. Indonesia and Russia recorded all-time high coal exports.

Global production of coal, of which China accounts for more than 40 per cent, is expected to increase. Data from the IEA noted that in 2018, coal was the largest single source of electricity, contributing over 38 per cent to the world's electricity needs. Coal use in the Power Sector grew by 1.9 per cent and was responsible for 40 per cent of the additional power generation worldwide. Coal demand in Southeast Asia is forecast to grow by more than 5% per year through 2024, led by Indonesia and Vietnam.

Coal will continue to be a major component of global fuel supplies and will be key in powering up several different economies around the world – the IEA predicts that the future of energy growth will be led by non-OECD countries, such as, India, Bangladesh, Pakistan, Southeast Asia and China.

A significant challenge for countries is to balance their fast-growing electricity demand while simultaneously pursuing climate change aims at reducing their emissions in line with the goals of the Paris Agreement.

Recognising that coal is going to remain a major fuel source for power generation (fossil fuels, including coal will still make up 75% of the global energy mix in 2040 according to recent projections), countries need to take the necessary steps to develop and promote utilisation of low emissions technologies, including carbon capture use and storage (CCUS).

## **Australia**

Australia is the world's fifth largest producer and world's leading exporter of coal. Queensland and New South Wales were Australia's leading coal producing States and accounted for more than 95% of the country's total output.

## **China**

China was the world's largest producer of coal. Coal was the primary source of energy and two-thirds of the country's electricity was produced by coal-fired power plants. About 50% of the country's total coal output was consumed by the Power Sector.

## **Indonesia**

Indonesia was the leading producer of coal. To secure domestic supplies, the Indonesian Ministry of Energy and Mineral Resources has issued order to coal producers to reserve a specific amount of their production for domestic consumption (domestic market obligation). Moreover, the government can adjust its export tax to discourage coal exports. The government aims for more domestic consumption of coal as it wants coal to supply around 30 per cent of the country's energy mix by 2025.

## **Russia**

Russia is the leading producer of coal. The Coal Industry in Russia is mostly privately owned and joint-stock companies (often consolidated into large holdings) and they dominate the Industry. Siberian Coal Energy Co. (SUEK) was the largest coal producer in Russia in terms of annual production. In February 2011, Russia adopted a new programme for development of the Coal Industry by 2030. According to forecasts by the Ministry of Energy, annual coal production could increase to about 450 Mt by 2030. The Ministry of Energy projected that Russia would construct more than 100 new coal enterprises within the next 20 years.

## **FOREIGN TRADE**

### **Exports**

Exports of coal (excl. lignite) decreased by 13% to about 1.31 million tonnes in 2018-19 from 1.50 million tonnes in the previous year. Exports of coke increased by about 13% to 101.86 thousand tonnes in 2018-19 from 90.4 thousand tonnes in 2017-18. Coal was mainly exported to Nepal (63%), Bangladesh (31%), Egypt (4%) and Bhutan (2%). Coke was exported

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predominantly to Brazil (38%), Bhutan (34%), Nepal (19%) and Bangladesh & Pakistan (4% each). Exports of lignite were 2 thousand tonnes during both the years 2017-18 and 2018-19, while exports of coal water gas (except gaseous hydrocarbons) decreased drastically to negligible quantity in 2018-19 from that in the previous year. Coal, Water Gas was exported solely to Bangladesh (Tables - 32 to 35).

**Imports**

Unlike exports, imports of coal (excl. lignite) increased by 13% to 235 million tonnes in 2018-19 from 208 million tonnes in the previous year. Imports

of coke increased by 7.5% to about 4.93 million tonnes in 2018-19 from about 4.59 million tonnes in the previous year. Coal (excl. lignite) was mainly imported from Indonesia (48%), Australia (20%), South Africa (13%), USA (6%) and Mozambique (3%), whereas coke was imported mainly from China (39%), Poland (16%), Colombia (10%), Australia (9%), Japan (6%) and Russia (5%). Imports of lignite increased to one thousand tonnes from negligible quantity in the previous year. Lignite was imported solely from China. Imports of coal, water gas (except gaseous hydrocarbons) decreased to nil during 2018-19 from 2 tonnes in the previous year. (Tables - 36 to 39).

**Table – 32 : Exports of Coal (Excl. Lignite)  
(By Countries)**

Country	2017-18 (R)		2018-19 (P)	
	Qty (‘000 t)	Value (₹‘000)	Qty (‘000 t)	Value (₹‘000)
<b>All Countries</b>	<b>1504</b>	<b>8783040</b>	<b>1306</b>	<b>9500068</b>
Nepal	696	4988552	823	6292878
Bangladesh	758	3214397	403	1950030
Egypt	++	30	50	853028
Bhutan	45	515041	28	337418
UAE	2	28266	1	31575
Philippines	++	10797	1	18996
Qatar	++	1094	++	3649
Oman	1	12344	++	3006
Saudi Arabia	++	1710	++	2770
Malaysia	++	1524	++	2521
Other countries	1	9285	++	4196

Figures rounded off.

**Table – 33 : Exports of Coal, Water Gas, etc.  
(Except Gaseous Hydrocarbons)  
(By Countries)**

Country	2017-18 (R)		2018-19 (P)	
	Qty (t)	Value (₹‘000)	Qty (t)	Value (₹‘000)
<b>All Countries</b>	<b>37</b>	<b>1122</b>	<b>++</b>	<b>100</b>
Bangladesh	-	-	++	100
Ethiopia	15	947	-	-
Nepal	22	175	-	-

Figures rounded off.

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**Table – 34 : Exports of Coke  
(By Countries)**

Country	2017-18 (R)		2018-19 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
<b>All Countries</b>	<b>90400</b>	<b>1624504</b>	<b>101863</b>	<b>2205465</b>
Brazil	-	-	38500	1012161
Bhutan	55196	1261234	34754	867693
Nepal	28212	206848	19018	134959
Pakistan	3189	76114	3660	83535
Bangladesh	789	12605	4133	57312
Sri Lanka	364	10006	365	11316
Qatar	-	-	274	8937
Jordan	342	9692	283	8553
Saudi Arabia	537	13758	222	5371
UAE	84	1399	243	4484
Other countries	1687	32847	411	11144

*Figures rounded off.***Table – 35 : Exports of Coal : Lignite  
(By Countries)**

Country	2017-18 (R)		2018-19 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ( '000 t)	Value (₹'000)
<b>All Countries</b>	<b>2</b>	<b>263660</b>	<b>2</b>	<b>254653</b>
Oman	++	64009	1	82517
Saudi Arabia	1	76181	1	66836
Russia	++	28904	++	32826
Malaysia	++	6851	++	29708
UAE	++	7639	++	10043
Netherlands	++	6854	++	7629
Pakistan	++	5735	++	6477
Algeria	++	6425	++	4889
Azerbaijan	++	11493	++	4886
Kuwait	-	-	++	2537
Other countries	1	49568	++	6305

*Figures rounded off.*

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**Table – 36 : Imports of Coal : Lignite  
(By Countries)**

Country	2017-18 (R)		2018-19 (P)	
	Qty ( '000 t)	Value (₹'000)	Qty ( '000 t)	Value (₹'000)
<b>All Countries</b>	++	<b>1335</b>	<b>1</b>	<b>8171</b>
China	++	771	1	6798
USA	++	564	++	1373

*Figures rounded off.***Table – 37: Imports of Coal (Excl. Lignite)  
(By Countries)**

Country	2017-18 (R)		2018-19 (P)	
	Qty ( '000 t)	Value (₹'000)	Qty ( '000 t)	Value (₹'000)
<b>All Countries</b>	<b>208253</b>	<b>1384845575</b>	<b>235354</b>	<b>1709323905</b>
Indonesia	95814	400991857	112881	504328184
Australia	46121	538244476	48166	615424502
South Africa	38493	197041967	31153	189505469
USA	12032	103550183	14976	137460404
Mozambique	5914	48685156	7092	60010024
Russia	4297	33991078	4921	47382253
Canada	3562	42690531	4458	64211349
Singapore	-	-	5656	45371620
UAE	-	-	1464	12150476
Switzerland	-	-	1825	9349745
Other countries	2020	19650327	2762	24129879

*Figures rounded off.***Table – 38 : Imports of Coal Water Gas  
(Except Gaseous Hydrocarbons)  
(By Countries)**

Country	2017-18 (R)		2018-19 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
<b>All Countries</b>	<b>2</b>	<b>30</b>	-	-
China	2	15	-	-
Switzerland	++	15	-	-

*Figures rounded off.*

**Table – 39: Imports of Coke  
(By Countries)**

Country	2017-18 (R)		2018-19 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
<b>All Countries</b>	<b>4589015</b>	<b>91542188</b>	<b>4933340</b>	<b>120756967</b>
China	1827428	37468543	1901349	47031378
Poland	729516	15543107	800709	21481610
Japan	604306	12506609	315393	8048397
Colombia	580522	9416431	473379	10248959
Australia	490700	9527740	437267	11635560
Russia	136836	2996060	250908	6116093
Singapore	-	-	158432	3575825
Egypt	112736	2298646	138178	3292807
Switzerland	-	-	115502	2351713
Italy	-	-	47168	1196794
Other countries	106971	1785052	295055	5777831

*Figures rounded off.*

## FUTURE OUTLOOK

Coal is the backbone on which modern electricity generation rests. Coal currently supplies around 30% of primary energy and 41% of global electricity generation. The forecast for coal-use is that, it would rise to over 50% by 2030, with developing countries being responsible for 97% of this increase, primarily to meet their futuristic electrification targets.

To meet the country's growing demand for coal, foreign collaborations with advanced coal producing countries are also being considered by the Government with an aim to bring in new technologies both in underground and opencast sectors for efficient management of the Coal Industry along with building adequate support mechanism through comprehensive skill development and training activities.

As per the draft National Energy Policy (NEP), (version as on 27.06.2017) formulated by the NITI Aayog, India Vision 2040 envisages demand-driven provision of energy at affordable prices, high per capita consumption of electricity, access to clean cooking energy & electricity with universal coverage, low emission and security of supply as criteria that would characterise the energy parameters of India in 2040.

The installed coal-based electricity generation capacity is expected to grow to 330- 441 GW by 2040.

This is likely to translate into a coal demand of 1.1-1.4 billion tonnes. The known levels of proven coal reserves of about 138 billion tonnes as of 31.03.2016 may only be able to support an annual peak production of 1.2-1.3 billion tonnes till 2037, with a gradual decrease thereafter. This fact calls for intensifying exploration to enhance the proven coal reserves. Multiple institutions, such as, GSI and CMPDI are responsible for exploration of coal in India. There is a need to synergise the efforts of all these agencies to undertake 100% resource mapping of coal.

India aims to become an economy of USD 5 trillion by 2024 and for this investing heavily in infrastructure would be an essential imperative. This will boost energy demand for industry and, especially, for electricity production. Although India has succeeded in bringing some form of electricity access to almost all of its citizens, the country's per capita power consumption is still low, giving it significant scope to grow. Power generation from renewables is forecast to expand strongly, with wind capacity doubling and solar photovoltaics (PV) projected to increase fourfold between 2018 and 2024. But that is not enough to prevent coal power generation from increasing by 4.6% per year through 2024. Overall, India's coal demand is expected to grow by more than that of any other country, in absolute terms, over the forecast period.