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COAL & LIGNITE

(ADVANCE RELEASE)

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7 Coal & Lignite

Coal 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. In India, coal accounts for around 55% of the country's primary commercial energy. Nearly 72% of the entire power generated in the country is coal based. 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 2019-20, about 89% 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 730.874 million tonnes in 2019-20 increased by about 0.30% from 728.718 million tonnes in 2018-19. The production of lignite at 42.096 million tonnes in 2019-20 decreased by about 4.94% from 44.283 million tonnes in the previous year. In 2019, India ranked 2nd 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 344.021 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 01.04.2020. Out of these resources, 163.461billion tonnes are Proved resources, 150.392 billion tonnes are Indicated resources and the remaining about 30.168 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 29.692 billion tonnes and non-coking coal, including high sulphur (tertiary) is 309.017 billion tonnes. State-wise/ Coalfield-wise and State-wise/Type-wise Geological resources of coal as on 01.04.2020 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, Gujarat & Rajasthan and also in Jammu & Kashmir. The total known geological resources of lignite as on 01.04.2020 is about 46.02 billion tonnes, of which 79% resources (about 36.490 billion tonnes) are located in Tamil Nadu. Other States where lignite deposits have been located are West Bengal and Kerala. State-wise/ District-wise Geological resources of lignite as on 01.04.2020 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.

Table – 1 : Geological Resources of Coal as on 01.04.2020
(By States/Coalfields)

(In million tonnes)

State/Coalfield	Proved	Indicated	Inferred	Total
All India : Total	**163460.84**	**150391.96**	**30168.04**	**344020.84**
Gondwana Coalfields*	**162867.03**	**150270.79**	**29259.37**	**342397.19**
Andhra Pradesh/ Godavari Valley	**97.12**	**1078.44**	**431.65**	**1607.21**
Assam/Singrimari	–	**14.49**	–	**14.49**
Bihar/Rajmahal	**309.53**	**2430.58**	**11.30**	**2751.41**
Chhattisgarh	**24984.86**	**42367.83**	**2079.14**	**69431.83**
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	1734.63	695.91	5.15	2435.69
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	12817.84	27038.96	1545.85	41402.65
Tatapani-Ramkola	906.42	2906.73	104.11	3917.26
Jharkhand	**49468.59**	**30283.80**	**5849.71**	**85602.10**
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	10699.76	6173.27	1864.96	18737.99
South Karanpura	5176.08	1312.28	1143.28	7631.64
Aurangabad	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	6462.60	10668.19	1335.61	18466.40
Madhya Pradesh	**12597.25**	**12888.39**	**3799.31**	**29284.95**
Johilla	185.08	104.09	32.83	322.00
Umaria	177.70	3.59	–	181.29
Pench-Kanhan	1536.86	991.93	1166.36	3695.15
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	8269.80	5956.48	2185.26	16411.54

(contd)

(Table-1, concld) (In million tonnes)

State/Coalfield	Proved	Indicated	Inferred	Total
Maharashtra	**7623.74**	**3257.37**	**1846.59**	**12727.70**
Wardha Valley	4567.65	1723.27	1440.98	7731.90
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
Odisha	**40871.77**	**36067.17**	**7713.12**	**84652.06**
Ib-River	15355.91	13135.30	3610.53	32101.74
Talcher	25515.86	22931.87	4102.59	52550.32
Telangana	**10840.88**	**8521.40**	**2862.84**	**22225.12**
Godavari Valley	10840.88	8521.40	2862.84	22225.12
Sikkim/Rangit Valley	**–**	**58.25**	**42.98**	**101.23**
Uttar Pradesh/Singrauli	**884.04**	**177.76**	–	**1061.80**
West Bengal	**15189.25**	**13125.31**	**4622.73**	**32937.29**
Raniganj	14770.75	7094.29	3706.39	25571.43
Barjora	200.79	–	–	200.79
Birbhum	217.71	6031.02	901.34	7150.07
Darjeeling	–	–	15.00	15.00
Tertiary Coalfields	**593.81**	**121.17**	**908.67**	**1623.65**
Assam	**464.78**	**42.72**	**3.02**	**510.52**
Makum	432.09	20.70	–	452.79
Dilli-Jeypore	32.00	22.02	–	54.02
Mikir Hills	0.69	–	3.02	3.71
Arunachal Pradesh	**31.23**	**40.11**	**18.89**	**90.23**
Namchik-Namphuk	31.23	40.11	12.89	84.23
Miao Bum	–	–	6.00	6.00
Meghalaya	**89.04**	**16.51**	**470.93**	**576.48**
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
Nagaland	**8.76**	**21.83**	**415.83**	**446.42**
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: *Coal Directory of India 2019-20, Coal Controller's Organisation,Kolkata, West Bengal.*

* *Including Sikkim.*

Table – 2 : Geological Reserves/Resources of Coal as on 01.04.2020 (By States/Types)

(In million tonnes)

State/Type of coal	Proved	Indicated	Inferred	Total
All India : Total	**163460.84**	**150391.96**	**30168.04**	**344020.84**
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)	143398.10	137506.65	28111.97	309016.72
Andhra Pradesh/Non-coking	**97.12**	**1078.44**	**431.65**	**1607.21**
Arunachal Pradesh/ High sulphur	**31.23**	**40.11**	**18.89**	**90.23**
Assam	**464.78**	**57.21**	**3.02**	**525.01**
Semi-coking/Non-coking	–	14.49	–	14.49
High sulphur	464.78	42.72	3.02	510.52
Bihar/Non-coking	**309.53**	**2430.58**	**11.30**	**2751.41**
Chhattisgarh	**24984.86**	**42367.83**	**2079.14**	**69431.83**
Semi-coking	70.77	99.25	–	170.02
Non-coking	24914.09	42268.58	2079.14	69261.81
Jharkhand	**49468.59**	**30283.80**	**5849.71**	**85602.10**
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	30606.86	19481.92	4206.23	54295.01
Madhya Pradesh	**12597.25**	**12888.39**	**3799.31**	**29284.95**
Medium-coking	354.49	1560.11	272.83	2187.43
Non-coking	12242.76	11328.28	3526.48	27097.52
Maharashtra/Non-coking	**7623.74**	**3257.37**	**1846.59**	**12727.70**
Meghalaya/High sulphur	**89.04**	**16.51**	**470.93**	**576.48**
Nagaland/High sulphur	**8.76**	**21.83**	**415.83**	**446.42**
Odisha/Non-coking	**40871.77**	**36067.17**	**7713.12**	**84652.06**
Sikkim/Non-coking	–	**58.25**	**42.98**	**101.23**
Telangana/Non-coking	**10840.88**	**8521.40**	**2862.84**	**22225.12**
Uttar Pradesh/Non-coking	**884.04**	**177.76**	–	**1061.80**
West Bengal	**15189.25**	**13125.31**	**4622.73**	**32937.29**
Medium-coking	550.42	–	–	550.42
Semi-coking	225.33	423.68	139.76	788.77
Non-coking	14413.50	12701.63	4482.97	31598.10

Source: *Coal Directory of India 2019-20, Coal controller's Organisaton, Kolkata.*

Table – 3 : Fieldwise Geological Reserves/Resources of Lignite as on 01.04.2020 (By States/Districts)

(In million tonnes)

State/District	Area/Lignite field	Proved	Indicated	Inferred	Total
All India : Total		**6787.53**	**26237.09**	**12993.84**	**46018.46**
Gujarat		**1278.65**	**283.70**	**1159.70**	**2722.05**
Kachchh	Panandhro & Panandhro Extn., Barkhan Dam, Kaiyari Block-A & B, Mata-No-Madh, Umarsar, Lakhpat-Dhedadi (Punahrajpur), Akrimota, Jhularai-Waghapadar, 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
Jammu & Kashmir U/T		–	**20.25**	**7.30**	**27.55**
Kupwara	Nichahom, Nichahom-Budhasung	–	20.25	7.30	27.55
Kerala		–	–	**9.65**	**9.65**
Kannur	Madayi, Kadamkottumala, Kayyur and Nileswaram	–	–	9.65	9.65
Rajasthan		**1168.53**	**3029.78**	**2150.77**	**6349.08**
Bikaner	Palana, Barsinghsar, 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-Abhaysingpura. Diyatra, Pyau, Deshnok-Ramsar-Sinthal, Borana, Bangarsar-Jaimalsar and Kmta-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 Ucharda,	113.00	289.49	156.48	558.97
Nagaur & Pali	Phalki, Phalki North and Phalodi	-	0.50	18.69	19.19

(contd)

Table - 3 (concld)

State/District	Area/Lignite field	Proved	Indicated	Inferred	Total
Tamil Nadu		**4340.35**	**22496.63**	**9652.62**	**36489.60**
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,Kalari North West & East of Ramanathapuram Lignite Field	–	168.83	2072.35	2241.18
Ramanathapuram & Sivaganga	Rajasing Mangalam & Settanur of Ramanathapuram Lignite Field	–	–	985.21	985.21
Puducherry U/T	Bahur & West of Bahur of Neyveli Lignite Field	–	**405.61**	**11.00**	**416.61**
West Bengal		–	**1.13**	**2.80**	**3.93**
Bardhaman	Rakshitpur, Gaurangapur-Bankati	–	0.29	1.82	2.11
Birbhum	Mahalla, Dhobbanpur & Djara	–	0.84	0.98	1.82

Source: *Coal Directory of India 2019-20, Coal Controler's Organisation, Kolkata and Geological Survey of India.*

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

PRODUCTION AND STOCKS

COAL

Production

The total reported production (provisional) of coal in 2019-20 was 730.874 million tonnes which was higher by 0.30% in comparison to that of the previous year. Chhattisgarh is the largest coal producing State with a share of about 21.6% followed by Odisha with contribution of 19.6% to the national output. Next in order of share in the total production were Jharkhand (18%), Madhya Pradesh (17.2%), Telangana (8.99%), Maharashtra (7.5%), West Bengal (4.6%) and Uttar Pradesh (2.5%). The remaining 0.21% of coal production was accounted for from Assam and UT Jammu & Kashmir. Coal mining was confined mainly to the Public Sector which contributed 96% to the national production. The remaining 4% was countributed by the private sector.

Table – 4 : Production of Coal, 2017-18 to 2019-20 (By Sectors/States)

(Quantity in '000 tonnes)

State/UT	2017-18	2018-19	2019-20 (P)
India	**675400**	**728718**	**730874**
Public Sector	**641774**	**694983**	**698224**
Private Sector	**33626**	**33735**	**32650**
Assam	781	784	517
Chhattisgarh	142546	161893	157745
Jammu & Kashmir	14	13	14
Jharkhand	123297	134666	131763
Madhya Pradesh	112127	118661	125726
Maharashtra	42219	49818	54746
Meghalaya	1529	-	-
Odisha	143328	144312	143016
Telangana	62010	65160	65703
Uttar Pradesh	18309	20275	18030
West Bengal	29240	33136	33614

Source: *Coal Directory of India 2019-20.*

A total of 442 coal mines (as on 31.03.2020) in India reported production in 2019-20. Out of these, Jharkhand accounted for 119 mines while West Bengal 70 mines, Madhya Pradesh 60, Maharashtra & Chhattisgarh 54 each, Telangana 46 and Odisha 29. The remaining 10 mines were from Assam, UT Jammu & Kashmir and Uttar Pradesh (Table - 5).

Table – 5 : Number of Coal Mines, 2018-19 & 2019-20 (P) (By States)

State	No. of Mines	
	2018-19	2019-20 (P)
India	**454**	**442**
Assam	4	3
Chhattisgarh	55	54
Jammu & Kashmir	2	2
Jharkhand	122	119
Madhya Pradesh	61	60
Maharashtra	58	54
Odisha	27	29
Telangana	50	46
Uttar Pradesh	5	5
West Bengal	70	70

Source: *Coal Directory of India 2019-20.*
Note*: Coal Mines in the State of Meghalaya operate under the Private Sector.*
#: Relates to number of mines as last day of financial year 2

During the year 2019-20, out of the total production of coal, 7.24% was coking coal and the rest 92.76 was non-coking coal. As in the earlier years, bulk of the coking coal production in 2019-20 i.e., about 88.3% was reported from the Public Sector. Grade-wise analysis of coking coal in 2019-20 revealed that Washery Grade IV had the maximum share at 62.5%, followed by Washery Grade V (18%), Washery Grade III (14%) and Washery Grade II (4%) . The remaining 1.5% production of coking coal was of Semi-coking Grade, Washery Grade I & VI and Steel Grade I & II. Out of the total production of coking coal in India, bulk quantity, i.e., 98.92% was produced in Jharkhand (52.364 million tonnes). The remaining 1% (0.572 million tonnes) was contributed by Chhattisgarh, Madhya Pradesh and West Bengal (Tables-6 & 7).

During 2019-20, 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 (12.8%), G10 (11.5%), G12 (10.6%), G14 (8.7%), G8 (6.7%) and G7 (6%). The remaining about 15% production was ccounted for G1, G2, G3, G4, G5, G6, G9, G15,G16, G17 and UNG grades of non-coking coal. Chhattisgarh was the largest producing State of

Table –6: Production of Coking Coal, 2018-19
(By States and Grades)

(In '000 tonnes)

State	All-Grades	ST-I	ST-II	W-I	W-II	W-III	W-IV	W-V	W-V1	SC
India	**41132**	**35**	**-**	**58**	**4339**	**6577**	**29874**	**2**	**-**	**247**
Chhattisgarh	247	-	-	-	-	-	-	-	-	247
Jharkhand	39641	35	-	58	3699	6161	29686	2	-	-
Madhya Pradesh	188	-	-	-	-	-	188	-	-	-
West Bengal	1056	-	-	-	640	416	-	-	-	-

Source: *Coal Directory of India, 2018-19, Coal Controller's Organisation, Kolkata.*
*** Note**: Gradewise figures vis-a-vis States not available.*

Table –7: Production of Coking Coal, 2019-20
(By States and Grades)

(In '000 tonnes)

State	All-Grades	ST-I	ST-II	W-I	W-II	W-III	W-IV	W-V	W-V1	SC
India	**52936**	**18**	**132**	**136**	**2303**	**7361**	**33094**	**9635**	**7**	**250**
Chhattisgarh	250	-	-	-	-	-	-	-		250
Jharkhand	52364	18	132	136	2244	7276	32916	9635	7	-
Madhya Pradesh	178	-	-	-	-	-	178	-	-	-
West Bengal	144	-	-	-	59	85	-	-	-	-

Coal Directory of India, 2019-20.

non-coking coal in 2019-20 which alone accounted for 23% of the national output. Next in order were Odisha with a contribution of (21%), Madhya Pradesh (18.5%), Jharkhand (11.7%), Telangana (9.7%), Maharashtra (8.1%), West Bengal (4.9%) and Uttar Pradesh (2.7%). The remaining 0.4% production came from Assam and U. T. Jammu & Kashmir (Tables-8 to 10).

Despatches

The provisional despatches of coal at 707.176 million tonnes in 2019-20 were lower by around 3.5% as compared to that of the previous year. Chhattisgarh was the leading State in the despatches in 2019-20 and accounted for 20.8% of the total despatches. The States next in the order were Odisha (19.2%), Jharkhand (18.7%), Madhya Pradesh (15.5%), Telangana (9.1%), Maharashtra (7.1%), Uttar Pradesh (4.8%) and West Bengal (4.7%). The remaining 0.1% despatches were from the State of Assam and UT Jammu & Kashmir.

During the year 2019-20, statewise analysis revealed that there was decrease in the despatches of coal from almost all States namely Chhattisgarh, Jharkhand, Maharashtra, Odisha, Telangana, Uttar Pradesh, West Bengal, Assam and UT Jammu & Kashmir, except Madhya Pradesh where increase in despatch was reported as against that of the previous year.

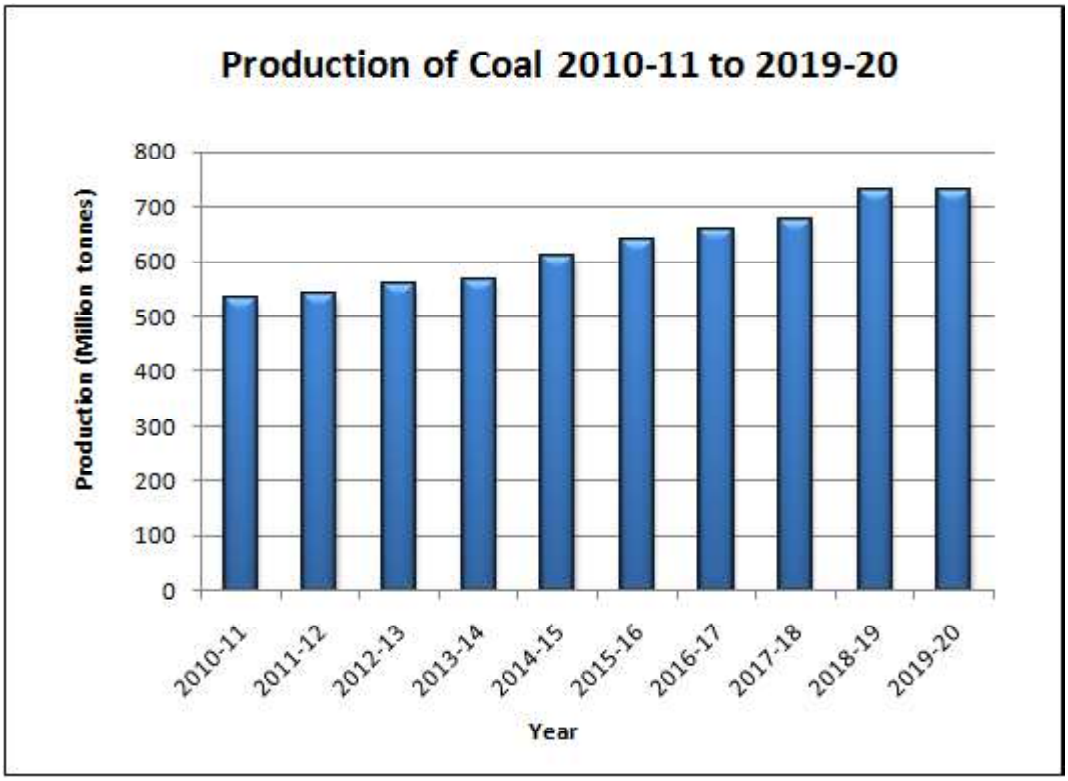
Of the total provisional despatches of raw coal effected in 2019-20, a sizeable share of 88.5% was made to the Electricity Sector (Power utility and Power captive). As much as 1.7% was made to the Steel Industry, 1.5% to the Sponge iron Industry, 1.2% to the Cement Industry, 0.25 % to the Fertilizer Industry, 0.2% to Pulp & Paper Industry and 0.1% to the other basic metals. The remaining 6.5% was made for other priority sectors including Chemical, Steel (boilers), Textile & Rayons, Bricks and Other (Tables-11 & 12).

Stocks

The mine-head stocks of coal at the end of the year 2019-20 were 81.43 million tonnes which increased by about 41% 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 2019-20, 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 2018-19 were 57.64 million tonnes which decreased by 7.1% 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).


Production of Coal 2010-11 to 2019-20
Production (Million tonnes)
800
700
600
500
400
300
200
100
0
2010-11
2011-12
2012-13
2013-14
2014-15
2015-16
2016-17
2017-18
2018-19
2019-20
Year

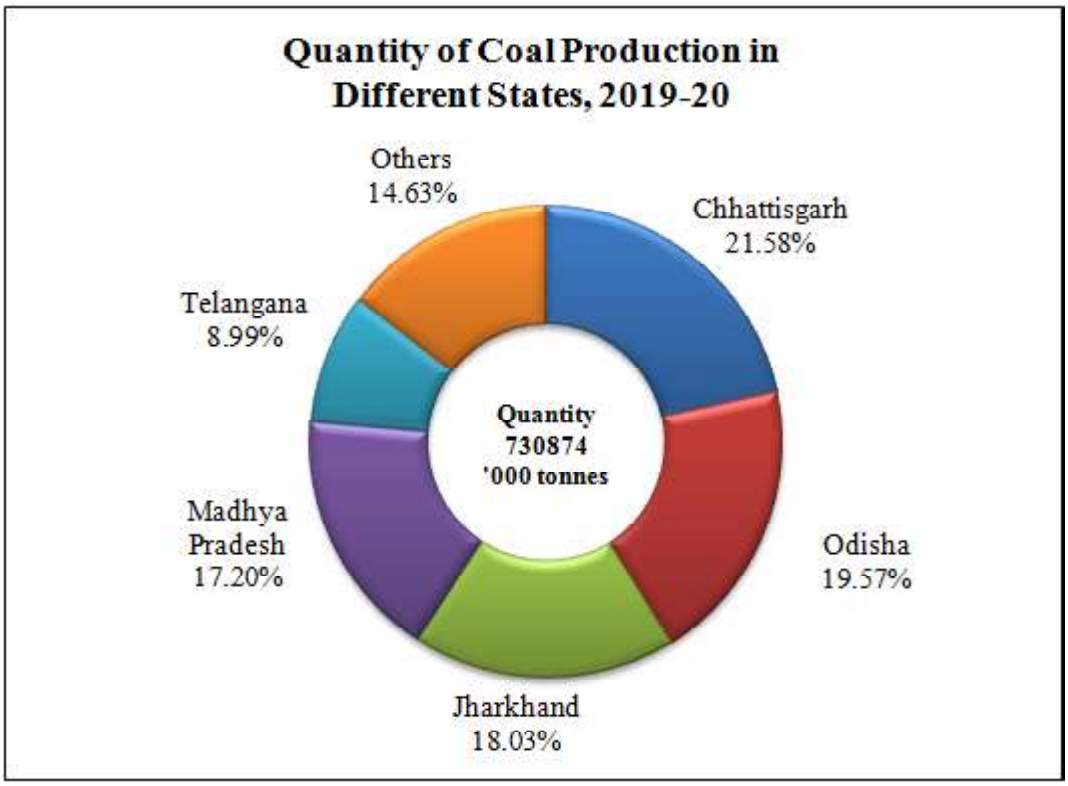

Quantity of Coal Production in Different States, 2019-20
Others
14.63%
Chhattisgarh
21.58%
Telangana
8.99%
Quantity
730874
'000 tonnes
Madhya
Pradesh
17.20%
Odisha
19.57%
Jharkhand
18.03%

Table – 8: Production of Coal, 2018-19 & 2019-20 (By Grades and Sectors)

(In '000 tonnes)

Grade	2018-19			2019-20 (P)		
	Total	Pub. Sec.	Pvt. Sec.	Total	Pub. Sec.	Pvt. Sec.
All Grades	**728718**	**694983**	**33735**	**730874**	**698224**	**32650**
Coking	**41132**	**34586**	**6546**	**52936**	**46726**	**6210**
ST-I	35	35	-	18	18	-
ST-II	-	-	-	132	132	-
W-I	58	58	-	136	31	105
W-II	4339	3890	449	2303	1862	441
W-III	6577	5940	637	7361	6473	888
W-IV	29874	24414	5460	33094	28318	4776
W-V	-	-	-	9635	9635	-
W-VI	-	-	-	7	7	-
SC-I	247	247	-	250	250	-
Mg feed	2	2	-	-	-	-
Non-coking	**687586**	**660397**	**27189**	**677938**	**651498**	**26440**
G1	87	87	-	21	21	-
G2	480	480	-	288	288	-
G3	3313	3313	-	3231	3231	-
G4	15545	15545	-	14472	14472	-
G5	12453	12453	-	14633	14633	-
G6	7900	7102	798	4605	4550	55
G7	41348	41106	242	40891	40722	169
G8	54420	52762	1658	45546	44108	1438
G9	35595	35372	223	37869	37869	-
G10	84227	75442	8785	78135	68448	9687
G11	199705	184994	14711	193872	179693	14179
G12	66297	65525	772	71628	70716	912
G13	111210	111210	-	86864	86864	-
G14	41037	41037	-	58795	58795	-
G15	6885	6885	-	17598	17598	-
G16	3847	3847	-	4033	4033	-
G17	3109	3109	-	5282	5282	-
UNG	128	128	-	175	175	-

***Source**: 1. Coal Directory of India, 2018-19 & 2019-20,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, 2018-19

(By States and Grades)

(In '000 tonnes)

State	Grades																		
	All-Grades	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	UNG
India	**687586**	**87**	**480**	**3313**	**15545**	**12453**	**7900**	**41348**	**54420**	**35595**	**84227**	**199705**	**66297**	**111210**	**41037**	**6885**	**3847**	**3109**	**128**
Assam	784	87	480	1	53	-	163	-	-	-	-	-	-	-	-	-	-	-	-
Chhattisgarh	161646	-	-	1642	91	2239	1580	3861	1525	1303	7092	124720	1971	4856	1673	2955	3147	2891	-
Jammu & Kashmir	13	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	13	-
Jharkhand	95025	-	-	520	372	534	995	4223	13041	17633	14230	16252	4444	22241	537	-	-	-	3
Madhya Pradesh	118473	-	-	-	367	640	2983	27641	16173	1819	30354	30670	7464	245	-	117	-	-	-
Maharashtra	49818	-	-	-	-	-	-	123	1561	6795	19200	11224	8085	2830	-	-	-	-	-
Meghalaya	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Odisha	144312	-	-	-	-	-	-	-	107	316	481	387	42174	65566	35281	-	-	-	-
Telangana	65160	-	-	-	-	736	-	2496	7239	7729	6691	14349	2159	15372	3546	3813	700	205	125
Uttar Pradesh	20275	-	-	-	-	-	-	-	13849	-	6179	247	-	-	-	-	-	-	-
West Bengal	32080	-	-	1150	14662	8304	2179	3004	925	-	-	1856	-	-	-	-	-	-	-

Source: *Coal Directory of India , 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.*

Table – 10 : Production of Non-coking Coal, 2019-20
(By States and Grades)

(In '000 tonnes)

State	Grades																		
	All-Grades	G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	G17	UNG
India	**677938**	**1710**	**264**	**3513**	**14535**	**14730**	**10868**	**36817**	**40980**	**27547**	**91478**	**179975**	**53418**	**101743**	**44637**	**7894**	**3544**	**1467**	**132**
Assam	517	21	288	-	14	-	194	-	-	-	-	-	-	-	-	-	-	-	-
Chhattisgarh	157495	-	-	1590	123	2512	948	2386	2662	1247	2447	121379	2089	5823	1873	4799	2483	5134	-
Jammu & Kashmir	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	14	-
Jharkhand	79399	-	-	612	-	1301	912	3548	5503	18634	4754	13810	8566	21759	-	-	-	-	-
Madhya Pradesh	125548	-	-	-	30	579	1305	27535	13275	5020	43938	26747	6802	165	152	-	-	-	-
Maharashtra	54746	-	-	-	-	-	-	101	1350	6356	18114	17886	6355	4584	-	-	-	-	-
Meghalaya	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Odisha	143016	-	-	-	-	-	-	115	85	30	-	-	44234	37205	53605	7742	-	-	-
Telangana	65703	-	-	-	-	682	42	3560	6582	6206	6514	11732	3582	16722	3165	5057	1550	134	175
Uttar Pradesh	18030	-	-	-	-	-	-	-	14926	376	2368	360	-	-	-	-	-	-	-
West Bengal	33470	-	-	1029	14305	9559	1204	3646	1163	-	-	1958	-	606	-	-	-	-	-

Source: *Coal Directory of India, 2019-20, Coal Controllers' Organisation, Kolkata.*

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

Table – 11: Despatches of Raw Coal, 2018-19 & 2019-20 (By States)

(In '000 tonnes)

States	2018-19 (R)	2019-20 (P)
India	**732794**	**707176**
Assam	754	562
Chhattisgarh	159984	147076
Jammu & Kashmir U/T	16	10
Jharkhand	136061	132418
Madhya Pradesh	103404	109283
Maharashtra	51793	50008
Meghalaya	-	-
Odisha	142464	135878
Telangana	68426	64122
Uttar Pradesh	36654	34775
West Bengal	33238	33044

Source: *Coal Directory of India, 2018-19 & 2019-20, Coal Controller's Organisation, Kolkata.*

Table –12 : Despatches of Raw Coal, 2018-19 & 2019-20 (By Priorities)

(In '000 tonnes)

Priority	2018-19 (R)	2019-20 (P)
Total	**732794**	**707176**
Power (Utility)	546170	540995
Power (Captive)	91779	85154
Steel	17365	11908
Cement	8817	8569
Sponge Iron	12231	10529
Fertilizer	1789	1764
Paper & Pulp	1637	1326
Other Basic metal	1097	603
Steel (Boilers)	297	-
Chemical	251	209
Textiles & Rayons	204	101
Bricks	93	26
Others	51064	45992

Source: *Coal Directory of India, 2018-19 & 2019-20, Coal Controller's Organisation, Kolkata.*
Note: *Steel includes direct feed & coking washery for metallurgical use and steel (boilers);*
Others include non- coking washery and Bricks.

Table – 13: Mine-head Stocks of Coal, 2018-19 (By States)

(In '000 tonnes)

State	At the beginning of the year	At the end of the year
India	**62036**	**57640**
Assam	69	100
Chhattisgarh	7359	8424
Jammu & Kashmir U/T	5	3
Jharkhand	20645	19286
Madhya Pradesh	2846	4187
Maharashtra	10917	8939
Odisha	11178	12906
Telangana	4921	1611
Uttar Pradesh	2389	759
West Bengal	1707	1425

Source: *Coal Directory of India, 2019-20.*

Table – 14: Mine-head Stocks of Coal, 2019-20 (P)
(By States)

(In '000 tonnes)

State	At the beginning of the year	At the end of the year
India	**57640**	**81432**
Assam	100	54
Chhattisgarh	8424	18264
Jammu & Kashmir U/T	3	7
Jharkhand	19286	17959
Madhya Pradesh	4187	4078
Maharashtra	8939	13673
Odisha	12906	20999
Telangana	1611	3192
Uttar Pradesh	759	1388
West Bengal	1425	1818

Source *: Coal Directory of India, 2019-20.*

LIGNITE

Production

During the year 2019-20, the provisional production of lignite at 42.10 million tonnes decreased by about 4.94% in comparison to that of the previous year. The production from Tamil Nadu alone accounted for 56%. The share of Gujarat in lignite production was 24.6% and that of Rajasthan was 19.5 % (Table-15).

Out of the total 19 mines that reported lignite production in 2019-20, ten mines are located in Gujarat, six in Rajasthan and the remaining three in Tamil Nadu (Table - 16).

Despatches

The provisional quantum of despatches of lignite was about 42.27 million tonnes during the year 2019-20, which decreased by about 7.4% as compared to 45.81 million tonnes in the previous year (Table-17).

Stocks

The mine-head stocks of lignite at the end of 2019-20 were 5,495 thousand tonnes which decreased marginally by 3% from that of the stocks that were available at the beginning of the year (Table- 18).

Table – 15 : Production of Lignite, 2017-18 to 2019-20
(By Sectors/States)

(Quantity in '000 tonnes)

State	2017-18	2018-19	2019-20 (P)
India	**46644**	**44283**	**42096**
Public Sector	**46161**	**43885**	**41366**
Private Sector	**483**	**398**	**730**
Gujarat	13781	12566	10357
Rajasthan	9294	8676	8223
Tamil Nadu	23569	23041	23516

Source*: Coal Directory of India, 2019-20, Coal Controller's Organisation, Kolkata.*

Table – 16 : Number of Lignite Mines 2018-19 & 2019-20 (By States)

State	No. of Mines	
	2018-19	2019-20
India	**19**	**19**
Gujarat	10	10
Rajasthan	6	6
Tamil Nadu	3	3

***Source**: Coal Directory of India, 2019-20.*
No. of mines as on the last day of financial year

Table – 17 : Despatches of Lignite 2018-19 & 2019-20 (By States)

(In '000 tonnes)

State	2018-19	2019-20 (P)
India	**45811**	**42267**
Gujarat	12555	10354
Rajasthan	8746	8138
Tamil Nadu	24510	23775

***Source**: Coal Directory of India, 2019-20.*

Table – 18 : Mine-head Stocks of Lignite, 2019-20 (By States)

(In '000 tonnes)

State	At the beginning of the year	At the end of the year
India	**5672**	**5495**
Gujarat	25	28
Rajasthan	328	408
Tamil Nadu	5319	5059

***Source:** Coal Directory of India, 2019-20.*

MINING & MARKETING

Coal

Coal mining in the country is carried out by both open-cast and underground methods. Opencast mining contributed 94.44% of the total provisional production, whereas the rest of the production (5.56%) came from underground mining during 2019-20. 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. CIL has planned to introduce 26 nos. of 'continuous miner' in 19 mines and 2 PSLV in 2 mines in the coming 5 years. 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. CIL has introduced high capacity HEMM's like 42 CuM shovel with 240 tonnes rear dumper in Gevra Expansion, Dipka & Kusmunda open-cast mines.

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.

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 the 8 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 Jharkhand. 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.

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) 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 31.3.2020, there were 442 operating mines for coal in the country out of which 222 were open-cast, while 195 were underground mines. The remaining 25 were mixed collieries. There were 420 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 2019-20, the share of provisional production of raw coal from opencast mines was 690.208 million tonnes (94.44%) against 40.666 million tonnes (5.56%) from underground mines (Table-20). Production of coal by different mining technologies employed during 2019-20 is furnished in Table-21. The overall Output per Man Shift (OMS) in open-cast and underground mines for CIL in 2019-20 was 9.64 tonnes as against 8.67 tonnes in 2018-19. The overall OMS in open-cast and underground mines for SCCL was 4.89 tonnes in 2019-20 as against 6.22 tonnes in 2018-19.

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, 2019-20 (By Sectors/States)

State	No. of collieries			
	OC	UG	Mixed	Total
All India	**222**	**195**	**25**	**442**
Public Sector	209	188	23	420
Private Sector	13	7	2	22
Arunachal Pradesh	-	-	-	-
Assam	2	1	-	3
Chhattisgarh	24	29	1	54
Jammu & Kashmir U/T	-	2	-	2
Jharkhand	74	33	12	119
Madhya Pradesh	22	36	2	60
Maharashtra	38	16	-	54
Meghalaya	-	-	-	-
Odisha	21	8	-	29
Telangana	19	27	-	46
Uttar Pradesh	5	-	-	5
West Bengal	17	43	10	70

Source: *Coal Directory of India, 2019-20, Coal Controller's Organisation, Kolkata.*
** Relates to no. of mines as on last day of the financial year (As on 31.3.2020).*
Note: *OC - Open-cast UG - Underground. U/T - Union Territory*

Table – 20 : Production of Raw Coal

(In million tonnes)

Year	Production from open-cast mines (% share)	Production from under-ground mines (% share)	Total production
2017-18	633.569 (93.8%)	41.831 (6.2%)	675.400
2018-19	686.212 (94.2%)	42.506 (5.8%)	728.718
2019-20 (P)	690.208 (94.44%)	40.666 (5.56%)	730.974

Source: *Coal Directory of India, 2019-20 Coal Controller's Organisation, Kolkata*

Table – 21 : Production of Coal, 2019-20 (By Technology)

(In million tonnes)

Technology adopted	Production	Percentage of total
All India : Total	**730.874**	**100**
Open-cast (Total)	***690.208***	***94.44***
Mechanised	690.208	100
Manual	-	-
Underground (Total)	***40.666***	***5.56***
Conventional B&P	0.578	1.4
Mechanised B&P	29.729	73.1
Conventional LW	0.167	0.4
Mechanised LW	2.416	5.94
Other methods	***7.776***	***19.1***

Source: *Coal Directory of India, 2019-20, Coal Controller's Organisation, Kolkata.*
Note: *B&P - Board-and-pillar; LW - Longwall*

Lignite

As on 31.03.2020, the total number of operating lignite mines was 19 and all are worked by open-cast method. Out of these, fifteen 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 each by Rajasthan State Mines & Minerals Limited (RSMML) & Gujarat Industries Power Co. Ltd (GIPCL) and one each by Gujarat Heavy Chemicals Ltd (GHCL), Barmer Lignite Mining Company Limited (BLMCL) & V S Lignite Power Pvt. Ltd (VSLPPL). Sector-wise, seventeen mines are under Public Sector and the remaining two are under Private Sector, i.e., GHCL & VSLPPL.

The Neyveli Lignite Mine is the largest open-cast 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 open-cast 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 30.60 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-I A (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 248.64 lakh tonnes during 2019-20 which increased by 2.5% from 242.50 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, was promulgameted with the amendment for introduction of competitive bidding system for allocation of coal blocks for captive use. Both the Houses of Parliament ratified the Amendment Act and the same was notified in Gazette of India (Extraordinary) on 9th 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 27th 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 the 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 and 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 2017-18, CMPDA of 5 captive coal blocks have been terminated.

In 2019-20, 29 captive coal blocks vested/ allocated including 3 blocks that were not cancelled by the Hon'ble Supreme Court produced 61.296 million tonnes of coal.

Under the "Auction by Competitive Bidding Rules, 2012", 11 regionally explored coal blocks have been allotted to Central/State Government companies.

Therefore, as on 31.03.2020, the total number of coal blocks that existed was 105. Out of these, 82 blocks were vested/ allotted which accounted for 10,994.79 million tonnes; 11 blocks were under Auction by Competitive Bidding Rules, 2012 with 4,054.84 million tonnes; 8 blocks were that of Custodian with 417.02 million tonnes; and 4 blocks with 2,262.88 million tonnes remained as 'not cancelled' by the Hon'ble Supreme Court.

During 2019-20, a total of 105 coal blocks with 17,729.89 million tonnes geological/extractable reserves have been allotted in various States (Table - 22). Of these, 78 coal blocks with 16,414.74 million tonnes are under Public Sector Undertakings (PSU) and the remaining 27 blocks with about 1,314.79 million tonnes are under Private Sector companies. Among these, 54 blocks with 13,792.13 million tonnes have been allocated for Power, 4 blocks with 475.41 million tonnes for Non-regulated Sector (NRS), 0 blocks with 100 million tonnes for Ultra Mega Power Project (UMPP) and 20 blocks with 2,147.20 million tonnes for commercial mining. The CCEA in its meeting held on 19.02.2019 has approved the proposal with regard to allowing allocatees of coal mines for specified end-use or own consumption to sell 25% of actual production in open market (ROM basis) with payment of additional premium on such

sale and on Order in this regard has been isued on 07.03.2019. So far 10 mines have been allowed for incorporating the above proposal.

Similarly, As on 31.03.2020, 23 captive lignite blocks stand allocated with 1,555.33 million tonnes geological/extractable reserves have been allocated during 2019-20. Of these, 21 blocks with 1,502.87 million tonnnes 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 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 2019-20 (as on 31.03.2020)

(In million tonnes)

State		No. of blocks	Geological/ extractable Reserves
Coal			
Arunachal Pradesh		1	4.79
Chhattisgarh		23	4860.66
Jharkhand		31	5976.71
Madhya Pradesh		10	1758.36
Maharashtra		12	473.01
Odisha		14	4020.56
Telangana		2	156.23
West Bengal		12	479.21
	Total	105	17729.54

Source: *Coal Directory of India 2019-20, 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 open-cast (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, Russia, USA, Poland, EU, Australia, Idonesia and China. The priority areas, inter alia, include acquiring modern technology for mass production through underground and opencast mining; innovative methodology for undergound 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-mine methane (CMM) and coal-bed methane (CBM) from working mines & abandoned mines; coal gasification, coal liquification and shale gas; 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 in preparation & implementation of Safety Management Plans etc. available with the developed countries is also a prime subject of focus. Also SCCL and NLC India Ltd. have entered into collaborative research projects with Australia and other countries.

COAL WASHERIES

Presently, 16 coal washeries (12 in Public Sector and 4 in Private Sector) with 29.840 million tonnes per annum (MTPA) capacity produced about 5.25 million tonnes of coking coal in 2019-20 out of which about 1.773 million tonnes were produced by the Public Sector and 3.477 million tonnes by Private Sector. Under Public Sector, BCCL operates 6 coking coal washeries (Dugda, Bhojudih, Sudamdih, Moonidih, Mahuda and Madhuban), CCL operates 4 washeries (Kathara,

Swang, Rajrappa and Kedla), 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) under Private Sector. Similarly, 20 coal washeries with 113.60 million tonnes per annum capacity produced non-coking coal of about 41.802 million tonnes during the year. Of these, about 6.48 million tonnes have been under Public Sector and about 35.322 million tonnes under Private Sector. Under Public Sector, 3 non-coking coal washeries (in CCL) 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, 2018-19 & 2019-20 (Sector-wise/Company-wise)

(In '000 tonnes)

	2018-19	2019-20
All India : Total	**5570**	**5250**
Public Sector	**1835**	**1773**
BCCL	634	626
CCL	805	762
SAIL	396	386
Private Sector	**3735**	**3477**
Tata Steel Ltd	3735	3477

Source: *Coal Directory of India, 2019-20, Coal Controller's Organisation, Kolkata.*

Table – 24 : Capacity of Washed Coking Coal, 2019-20 (Sector-wise/Company-wise)

Coalfield/Washery	State	Raw Coal Capacity (In '000 tpy)
Grand Total		**29840**
Public Sector	**Total**	**21980**
BCCL		**10030**
Dugda-II	Jharkhand	2000
Bhojudih	West Bengal	1700
Sudamdih	Jharkhand	1600
Moonidih	-do-	1600

(contd)

Table - 24 (concld)

Coalfield/Washery	State	Raw Coal Capacity (In '000 tpy)
Mahuda	-do-	630
Madhuban	-do-	2500
CCL		**9350**
Kathara	Jharkhand	3000
Swang	-do-	750
Rajrappa	-do-	3000
Kedla	-do-	2600
WCL		**1200**
Nandan (Pench-Kanhan)	Madhya Pradesh	1200
SAIL		**1400**
Chasnala	Jharkhand	1400
Private Sector	**Total**	**7860**
Tata Steel Ltd		**7860**
West Bokaro-II	Jharkhand	2500
West Bokaro-III	-do-	2560
Jamadoba	-do-	1300
Bhelatand	-do-	1500

Source: *Coal Directory of India, 2019-20, Coal Controller's Organisation, Kolkata (except totals).*

Table – 25 : Production of Washed Non-coking Coal : 2018-19 & 2019-20 (Sector-wise/Company-wise)

(In '000 tonnes)

Sector/Company	2018-19	2019-20
All India : Total	**47912**	**41802**
Public Sector	**6631**	**6480**
CCL	6631	6480
Private Sector	**41281**	**35322**
Adani Enterprises Ltd	11980	11709
Aryan Coal Beneficiation Pvt. Ltd	14612	18003
Aryan Energy Pvt. Ltd	1115	1426
Global Coal & Mining Pvt. Ltd	3392	2790
Jindal Power Ltd	68	372
Spectrum Coal & Power Ltd	9841	9293.22
Kartikay Coal Washeries Pvt. Ltd	102	89
Maruti Clean Coal	171	933

Source: *Coal Directory of India, 2019-20, Coal Controller's Organisation, Kolkata.*

Table – 26 : Capacity of Washed Non-coking Coal, 2019-20
(Sector-wise/Company-wise)

(In '000 tpy)

Washery/Location	Coalfield	State	Raw Coal Capacity
Grand Total			**113600**
Public Sector	**Total**		**11720**
CCL			
East Bokaro Coalfield, Jharkhand			**11720**
Gidi	East Bokaro	Jharkhand	2500
Piparwar	N. Karanpura	-do-	6500
Kargali	Bokaro	-do-	2720
Private Sector	**Total**		**101880**
Adani Enterprises Ltd			**15000**
AEL	Parsa	Chhattisgarh	15000
Aryan Coal Beneficiation Pvt. Ltd			**60690**
Chakabura	Korba	Chhattisgarh	7500
Dipka	-do-	-do-	14000
Pander Pauni	Ballarpur	Maharashtra	2620
Gevra	Korba	Chhattisgarh	6250
Binjhri	-do-	-do-	4800
Hemgir	Hemgir	Odisha	5000
Ratija	Korba	Chhattisgarh	11000
Talcher	Bharatpur	Odisha	9520
Aryan Energy Pvt. Ltd			**2340**
Talcher	Talcher	Odisha	2340
Global Coal & Mining Pvt. Ltd			**10000**
Ib Valley	Ib Valley	Odisha	3500
Ramagundam	Ramagundam	Telangana	1000
Talcher	Talcher	Odisha	4000
Manuguru	Manuguru	Telangana	1500
Jindal Power Ltd			**4750**
JPL	Raigarh	Chhattisgarh	4750
Kartikay Coal Washeries Pvt. Ltd			**2500**
Wani	Wardha	Maharashtra	2500
Maruti Clean Coal			**6600**
Maruti	-	Chhattisgarh	6600

Source: *Coal Directory of India, 2019-20, 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 for other eligible activities 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 – 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.
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%.
		Washery Grade VI	Ash content exceeding 42% but not exceeding 49%.
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 2019-20, 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 2017-18, 2018-19 and 2019-20 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 2018-19 and 2019-20 are provided in Table -29.

Table – 28 : Despatches* of Coal
2017-18 to 2019-20
(By Industries)

(In million tonnes)

Industry	2017-18	2018-19 (R)	2019-20 (P)
Total	**690.00**	**732.79**	**707.18**
Electricity	585.49	637.95	626.15
Iron & steel[$]	11.45	17.66	11.91
Sponge iron	8.53	12.23	10.53
Fertilizer	1.88	1.79	1.76
Cement	7.71	8.82	8.57
Others (Chemical, other basic metals, paper & pulp, textile & rayon, bricks, others, etc.)	74.94	54.34	48.26

Source: *Coal Directory of India 2018-19 & 2019-20.*

** Data on consumption is not available.*

$ *Includes direct feed, coking washery and steel (boilers).*

Table – 29 : Demand-Supply of Coal, 2018-19 & 2019-20

(In million tonnes)

Year	Demand*	Apparent Supply			
		Despatch	Import	Export	Total
2018-19 (R)	991.35	732.794	235.354	1.306	966.842
2019-20 (P)	1000.00	706.77	248.54	1.047	954.263

***Source**: Coal Directory of India 2019-20.*
**Annual Plan, Ministry of Coal.*

WORLD REVIEW

World proved coal reserves were estimated at 1,069.636 billion tonnes at the end of 2019 of which 749.167 billion tonnes (70%) has been classified as anthracite & bituminous coal and 320.469 billion tonnes (30%) as sub-bituminous coal & lignite. USA has the largest coal reserves with about 23% share of the total world reserves, followed by Russian Federation (15%), Australia (14%) and China (13%) (Table-30) .

Table – 30 : World Proved Coal Reserves at the end of 2019 (By Principal Countries)

(In million tonnes)

Country	Anthracite and bituminous coal	Sub-bituminous coal and lignite	Total
World : Total	**749167**	**320469**	**1069636**
USA	219534	30003	249537
Russian Federation	71719	90447	162166
Australia	72571	76508	149079
China	133467	8128	141595
India*	100858	5073	105931
Indonesia	28163	11728	39891
Germany	-	35900	35900
Ukraine	32039	2336	34375
Poland	21067	5865	26932
Kazakhstan	25605	-	25605
Turkey	550	10975	11525
South Africa	9893	-	9893
Serbia	402	7112	7514
Brazil	1547	5049	6596
Canada	4346	2236	6582
Colombia	4554	-	4554
Other countries	22851	29109	51950

***Source:** BP Statistical Review of World Energy, 2020.*
** India's resources of coal as on 1.4.2020 are estimated at about 344.021 billion tonnes to a depth of 1,200 m and those of lignite are estimated at about 46.02 billion tonnes.*

World production of coal and lignite slightly increased from about 8.02 billion tonnes in 2018 to 8.08 billion tonnes in 2019. China continued to be the largest producer of coal & lignite in 2019 with about 48% share in total world production, followed by India (9.06%), USA (7.92%), Indonesia (7.63%) Australia (6.25%) and Russia (5.44%) (Table-31).

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

(In million tonnes)

Country	2017	2018	2019
World : Total	**7683**	**8022**	**8076**
Australia			
Bituminous[1(j)]	436	457	463
Brown coal[(g)]	56	45	42
Bosnia & Herzegovina			
Brown coal & lignite	14	14	13
Bulgaria			
Lignite	32	29	29
Brown Coal	2	1[e]	1[e]
Canada			
Coal	61	55	52
China			
Coal	3524	3698	3846
Colombia			
Bituminous	91	86[e]	85[e]
Czech. Rep.			
Bituminous	5	4	3
Brown Coal	39	39	37
Country	2016	2017	2018
Germany			
Anthracite & Bituminous	4	3	0
Brown coal	171	166	131
Greece			
Lignite	38	37	26
India*			
Bituminous[(h)]	675	729	691
Lignite[(h)]	47	44	41

(contd)

Table - 31 (concld)

Country	2017	2018	2019
Indonesia			
Anthracite & Bituminous	461	558	616
Kazakhstan			
Bituminous coal	102	108	105
Lignite	6	7	6
Korea, Dem. Rep. of			
Coal	22	18[e]	18[e]
Mexico			
Bituminous	13	13[e]	13[e]
Mongolia			
Brown coal & Lignite	49	50	51
Poland			
Bituminous	66	64	62
Lignite	63	61	53
Romania			
Anthracite & Bituminous	1	1	0.2
Lignite	2523	22	
Russia			
Coal	410	439	439
Serbia [d]			
Lignite & brown coal	4038	39	
South Africa			
Anthracite & Bituminous	252253	254	
Thailand			
Lignite	1615	14	
Turkey			
Anthracite	2	2	2[e]
Lignite	8499	99[e]	
USA			
Hard coal	641	634	592
Lignite	61	52	48
Ukraine			
Bituminous	24	26	26
Vietnam			
Anthracite	38	42	46
Other countries			
Coal & Lignite	110	113	90

Source: *BGS, World Mineral Production, 2015-2019.*
Hard coal – Including anthracite, bituminous & sub-bituminous coal. Coal- All ranks of coal.
d- excluding production in Kosovo, 1- including sub-bituminous.
**India's production of coal during 2017-18, 2018-19 & 2019-20 was 675.40, 728.72 & 730.87 million tonnes, respectively.*
** India's production of lignite during 2017-18, 2018-19 & 2019-20 was 46.64, 44.28 & 42.10 million tonnes, respectively.*
(j) includes sub-bituminous.
(g) year ended 30th June of that stated.
(h) year ended 30th March following that stated.

As per data from the IEA, worldwide coal demand dropped 11% year-on-year (y-o-y) in the first quarter of 2020 owing to mild weather, competitive gas prices and COVID related lockdowns in China. China eased its lockdowns in the second quarter but lockdowns and related restrictive measures spread to other economies, pulling the global coal demand down 7.5% y-o-y. Through the rest of the year, an increasing number of countries eased their lockdowns and their economies rebounded, with coal consumption keeping pace, particularly in China and India.

Despite legitimate concerns about air pollution and greenhouse gas emissions, coal use is likely to continue to be significant in the future in the absence of concerned government policy. For coal to have a place as a cleaner energy source in the decads to come, greater efforts are needed by government and industry to develop and deploy less polluting and more effective technologies.

After three years of growth and a record high of over 10000 TWh in 2018, coal fired power generation dropped by 3% in 2019. Although coal generation plummeted in the USA and Europe, growth in China and other Asian countries kept coal firmly in place as the largest source (36%) of power generation. Preliminary IEA analysis indicated a sharp drop in power sector coal demand in 2020 as a result of Covid-19 crisis, with coal showing the greatest uncertainty of all fuels used for power. Looking ahead, coal fired generation with CCUS needs to decrease 5.3% per year by 2030 to be in line with the SDS.

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. In the year 2016, Queensland and New South Wales were Australia's leading coal producing States accounted for 55% and 49% respectively 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. It has moved ahead from 9th ranking in 2016 to 4th in 2019 in the world production 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 world 6th largest 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 2016, coal production in Russia was taking place in 181 coal mines with combined capacity of 414.4 million tonnes. As of 2015, Russia was the 5th ranked consumer of coal with 2.8% share of world consumption, after China, India, USA and Germany. Russia exports about 165.5 million tonnes of coal, out of which 44% is exported to China, Japan and Rep. of Korea.

FOREIGN TRADE

Exports

Exports of coal (excl. lignite) decreased substantially by 20% to about 1.05 million tonnes in 2019-20 from 1.31 million tonnes in the previous year. On the other hand exports of coke increased marginally by about 9.5% to 111.51 thousand tonnes in 2019-20 from 101.86 thousand tonnes in 2018-19. Coal (excluding lignite) was mainly exported to Nepal (79%), Bangladesh (19%), and Bhutan (2%). Coke was exported predominantly to Bhutan (48%), Brazil (30%), Nepal (16%) and Bangladesh (4%). Exports of lignite were 3 thousand tonnes during the years 2019-20 as compared to 2 tonnes during 2018-19, while exports of coal water gas (except gaseous hydrocarbons) was not reported in 2019-20. There was reportage of negligible quantity in the previous year. (Tables - 32 to 35).

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

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	**1306**	**9500068**	**1047**	**5929548**
Nepal	823	6292878	824	4685903
Bangladesh	403	1950030	202	992977
Bhutan	28	337418	21	211431
UAE	1	31575	1	14109
Myanmar	-	-	++	4121
Malaysia	++	2521	++	3603
Madagascar	-	-	++	3096
Jordan	++	149	++	2426
Saudi Arabia	++	2770	++	2385
Qatar	++	3649	++	1977
Other countries	51	879076	++	7522

Figures rounded off

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

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	**++**	**100**	**-**	**-**
Bangladesh	++	100	-	-

Figures rounded off

Table – 34 : Exports of Coke (By Countries)

Country	2018-19 (R)		2019-20 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**101863**	**2205465**	**111507**	**2383341**
Bhutan	34754	867693	52999	1294897
Brazil	38500	1012161	33500	804168
Nepal	19018	134959	18080	141990
Bangladesh	4133	57312	4169	67648
Pakistan	3660	83535	1102	26399
Qatar	274	8937	459	14280
Jordan	283	8553	451	13917
Sri Lanka	365	11316	214	6599
Morocco	-	-	114	3085
Nigeria	-	-	68	2129
Other countries	876	20999	351	8229

Figures rounded off

Table – 35 : Exports of Coal : Lignite (By Countries)

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	**2**	**254653**	**3**	**319839**
Saudi Arabia	1	66836	2	138879
Oman	1	82517	1	80041
Russia	++	32826	++	29419
Malaysia	++	29708	++	19092
UAE	++	10043	++	14192
Ukraine	-	-	++	6347
Azerbaijan	++	4886	++	5301
Thailand	++	2467	++	5217
Netherlands	++	7629	++	5081
Algeria	++	4889	++	5021
Other countries	++	12852	++	11250

Figures rounded off

Imports

Unlike exports, imports of coal (excl. lignite) increased by 6% to 248.55 million tonnes in 2019-20 from 235.36 million tonnes in the previous year. Imports of coke decreased by 41% to about 2.91 million tonnes in 2019-20 from about 4.93 million tonnes in the previous year. Coal (excl. lignite) was mainly imported from Indonesia (47%), Australia (19%), South Africa (17%), USA (5%), Russia (3%) and Singapore (2%) whereas coke was imported mainly from Poland (28%), Colombia & Japan (14% each), China (12%), Russia (11%) and Australia (5%). Imports of lignite remained unchanged in 2019-20 as compared to preceding year. Lignite was imported solely from China. (Tables - 36 to 38).

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

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	**1**	**8171**	**1**	**5170**
China	1	6798	1	5168
Indonesia	-	-	++	2
USA	++	1373	-	-

Figures rounded off

Table – 37: Imports of Coal (Excl. Lignite)
(By Countries)

Country	2018-19 (R)		2019-20 (P)	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	**235355**	**1709323907**	**248546**	**1527478150**
Australia	48166	615424502	46718	510169875
Indonesia	112881	504328184	116663	460848909
South Africa	31153	189505469	42481	212693029
USA	14976	137460404	12158	97484006
Russia	4921	47382253	8226	60491642
Canada	4458	64211349	4686	57586236
Singapore	5656	45371620	5728	45071485
Mozambique	7092	60010024	5476	40272624
Colombia	509	3339093	1912	9529639
Switzerland	1825	9349745	1329	8934503
Other countries	3718	32941264	3167	24396202

Figures rounded off

Table – 38: Imports of Coke
(By Countries)

Country	2018-19 (R)		2019-20 (P)	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	**4933340**	**120756971**	**2912775**	**61067395**
Poland	800709	21481610	814762	19526722
Japan	315393	8048397	413660	8706920
China	1901349	47031378	347189	7263254
Colombia	473379	10248959	394210	7123899
Russia	250908	6116093	322561	6659792
Singapore	158432	3575825	176351	3439457
Indonesia	25077	370926	132088	2898905
Australia	437267	11635560	141056	2491710
Finland	-	-	40812	946358
Egypt	138178	3292807	37675	645955
Other countries	432648	8955414	92411	1364424

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 open-cast 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 consequently improving electricity production would be high in the agenda. 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 forecasted 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.