

COAL & LIGNITE



# Indian Minerals Yearbook 2022

(Part- III : Mineral Reviews)

**61<sup>st</sup> Edition**

**Coal & Lignite**

**(ADVANCE RELEASE)**

**GOVERNMENT OF INDIA  
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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. 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.

## 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 are also 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 361.411 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 01.04.2022. Out of these resources, 187.105 (51.77%) billion tonnes are Proved resources, 147.252 (40.74%) billion tonnes are Indicated resources and the remaining about 27.052 (3.66%) billion tonnes are in the Inferred category. Of the total resources, the share of prime-coking coal is 5.318 billion tonnes, medium-coking 28.08 billion tonnes and blendable/semi-coking 1.708 billion tonnes. Share of non-coking coal, including high sulphur (tertiary) is 326.306 billion tonnes. State-wise/Coalfield-wise and State-wise/Type-wise Geological resources of coal as on 01.04.2022 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 also in Jammu & Kashmir and Odisha. The total known geological resources of lignite as on 01.04.2022 is about 46.024 billion tonnes, of which 79.3% resources (about 36.56 billion tonnes) are located in Tamil Nadu, Rajasthan (13.98%) and Gujarat (5.89%). Other States where lignite deposits have been located are West Bengal and Kerala. State-wise/District-wise Geological resources of lignite as on 01.04.2022 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.

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**Table – 1 : Geological Resources of Coal as on 01.04.2022  
(By States/Coalfields)**

(In million tonnes)				
State/Coalfield	Proved	Indicated	Inferred	Total
<b>All India : Total</b>	<b>187105</b>	<b>147252</b>	<b>27054</b>	<b>361411</b>
<b>Gondwana Coalfields*</b>	<b>186512</b>	<b>147131</b>	<b>26113</b>	<b>359756</b>
<b>Andhra Pradesh/</b> Godavari Valley	<b>921</b>	<b>2443</b>	<b>778</b>	<b>4142</b>
<b>Assam/Singrimari</b>	-	14	-	14
<b>Bihar/Rajmahal</b>	<b>310</b>	<b>4080</b>	<b>48</b>	<b>4437</b>
<b>Chhattisgarh</b>	<b>32053</b>	<b>40701</b>	<b>1437</b>	<b>74192</b>
Sohagpur	94	10	-	104
Sonhat	365	2304	2	2671
Jhilimili	228	39	-	267
Chirimiri	320	11	31	362
Bisrampur	2014	678	5	2698
East Bisrampur	-	165	-	165
Lakhanpur	456	3	-	459
Panchbahini	-	11	-	11
Hasdeo-Arand	2032	3273	223	5529
Sendurgarh	153	126	-	279
Korba	7055	5763	159	12976
Mand-Raigarh	17978	25307	924	44209
Tatapani-Ramkola	1358	3011	93	4462
<b>Jharkhand</b>	<b>53245</b>	<b>28260</b>	<b>5155</b>	<b>86660</b>
Raniganj	1594	445	-	2039
Jharia	16653	2880	-	19533
East Bokaro	3831	3690	762	8284
West Bokaro	3926	1279	17	5218
Ramgarh	937	912	58	1906
North Karanpura	10929	6173	1865	18967
South Karanpura	5614	1312	1143	8070
Aurangabad	352	2142	503	2997
Hutar	191	27	32	250
Daltonganj	84	60	-	144
Deogarh	326	74	-	400
Rajmahal	8811	9267	774	18852
<b>Madhya Pradesh</b>	<b>14052</b>	<b>12723</b>	<b>4142</b>	<b>30917</b>
Johilla	185	263	33	481
Umaria	178	4	-	181
Pench-Kanhan	2112	923	1548	4583
Pathakhera	291	88	68	447
Gurgunda	-	85	53	138
Mohpani	8	-	-	8
Sohagpur	2417	5449	293	8159
Singrauli	8861	5912	2147	16919

(contd)

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(Table-1, conclud)

(In million tonnes)

State/Coalfield	Proved	Indicated	Inferred	Total
<b>Maharashtra</b>	<b>7984</b>	<b>3390</b>	<b>1847</b>	<b>13221</b>
Wardha Valley	4928	1856	1441	8225
Kamptee	2046	938	107	3091
Umrer Makardhokra	308	–	161	469
Nand Bander	691	596	118	1405
Bokhara	10	–	20	30
<b>Odisha</b>	<b>48573</b>	<b>34080</b>	<b>5452</b>	<b>88105</b>
Ib-River	17134	14621	2228	33982
Talcher	31439	19460	3224	54122
<b>Telangana</b>	<b>11257</b>	<b>8344</b>	<b>3433</b>	<b>23034</b>
Godavari Valley	11257	8344	3433	23034
<b>Sikkim/Rangit Valley</b>	<b>–</b>	<b>58</b>	<b>43</b>	<b>101</b>
<b>Uttar Pradesh/Singrauli</b>	<b>884</b>	<b>178</b>	<b>–</b>	<b>1062</b>
<b>West Bengal</b>	<b>17234</b>	<b>12859</b>	<b>3779</b>	<b>33871</b>
Raniganj	16815	6680	2862	26357
Barjora	201	–	–	201
Birbhum	218	6179	901	7298
Darjeeling	–	–	15	15
<b>Tertiary Coalfields</b>	<b>594</b>	<b>121</b>	<b>941</b>	<b>1656</b>
<b>Assam</b>	<b>465</b>	<b>57</b>	<b>3</b>	<b>525</b>
Singrimari	–	14	–	14
Makum	432	21	–	453
Dilli-Jeypore	32	22	–	54
Mikir Hills	1	–	3	4
<b>Arunachal Pradesh</b>	<b>31</b>	<b>40</b>	<b>19</b>	<b>90</b>
Namchik-Namphuk	31	40	13	84
Miao Bum	–	–	6	6
<b>Meghalaya</b>	<b>89</b>	<b>17</b>	<b>471</b>	<b>576</b>
West Darangiri	65	–	60	125
East Darangiri	–	–	34	34
Balphakram-Pendenguru	–	–	107	107
Siju	–	–	125	125
Langrin	10	17	106	133
Mawlong Shelia	2	–	4	6
Khasi Hills	–	–	10	10
Bapung	11	–	23	34
Jayanti Hills	–	–	2	2
<b>Nagaland</b>	<b>9</b>	<b>22</b>	<b>448</b>	<b>478</b>
Borjan	6	–	5	10.00
Jhanzi-Disai	2	22	109	133
Tiensang	1	–	2	3
Tiru Valley	–	–	7	7
Changki	–	–	32	32
DGM	–	–	293	293

**Source:** Coal Directory of India 2021-22, Coal Controller's Organisation, Kolkata, West Bengal.

\* Including Sikkim. Figures rounded off.

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**Table – 2 : Geological Reserves/Resources of Coal as on 01.04.2022  
(By States/Types)**

(In million tonnes)

State/Type of coal	Proved	Indicated	Inferred	Total
<b>All India : Total</b>	<b>187105</b>	<b>147252</b>	<b>27054</b>	<b>361411</b>
Prime-coking	4673	645	–	5318
Medium-coking	15670	10648	1761	28080
Blendable/Semi-coking	530	992	186	1708
Non-coking	165639	134846	24166	324651
High Sulphur	594	121	941	1656
<b>Andhra Pradesh/Non-coking</b>	<b>921</b>	<b>2443</b>	<b>778</b>	<b>4142</b>
<b>Arunachal Pradesh</b>	<b>31</b>	<b>40</b>	<b>19</b>	<b>90</b>
High sulphur				
<b>Assam</b>	<b>465</b>	<b>57</b>	<b>3</b>	<b>525</b>
Semi-coking/Non-coking	–	14	–	14
High sulphur	465	43	3	511
<b>Bihar/Non-coking</b>	<b>310</b>	<b>4080</b>	<b>48</b>	<b>4437</b>
<b>Chhattisgarh</b>	<b>32053</b>	<b>40701</b>	<b>1437</b>	<b>74192</b>
Semi-coking	71	99	–	170
Non-coking	31983	40602	1437	74022
<b>Jharkhand</b>	<b>53245</b>	<b>28260</b>	<b>5155</b>	<b>86660</b>
Prime-coking	4673	645	–	5318
Medium-coking	14765	9088	1489	25342
Semi-coking	223	472	53	748
Non-coking	33583	18055	3613	55252
<b>Madhya Pradesh</b>	<b>14052</b>	<b>12723</b>	<b>4142</b>	<b>30917</b>
Medium-coking	354	1560	273	2187
Non-coking	13697	11163	3869	28729
<b>Maharashtra/Non-coking</b>	<b>7984</b>	<b>3390</b>	<b>1847</b>	<b>13221</b>
<b>Meghalaya/High sulphur</b>	<b>89</b>	<b>17</b>	<b>471</b>	<b>576</b>
<b>Nagaland/High sulphur</b>	<b>9</b>	<b>22</b>	<b>448</b>	<b>478</b>
<b>Odisha/Non-coking</b>	<b>48573</b>	<b>34080</b>	<b>5452</b>	<b>88105</b>
<b>Sikkim/Non-coking</b>	<b>–</b>	<b>58</b>	<b>43</b>	<b>101</b>
<b>Telangana/Non-coking</b>	<b>11257</b>	<b>8344</b>	<b>3433</b>	<b>23034</b>
<b>Uttar Pradesh/Non-coking</b>	<b>884</b>	<b>178</b>	<b>–</b>	<b>1062</b>
<b>West Bengal</b>	<b>17234</b>	<b>12859</b>	<b>3779</b>	<b>33871</b>
Medium-coking	550	–	–	550
Semi-coking	236	420	133	789
Non-coking	16448	12439	3646	32532

*Source: Coal Directory of India 2021-22, Coal Controller's Organisation, Kolkata.*

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**Table – 3 : Fieldwise Geological Reserves/Resources of Lignite as on 01.04.2022  
(By States/Districts)**

		(In million tonnes)			
State/District	Area/Lignite field	Proved	Indicated	Inferred	Total
<b>All India : Total</b>		<b>7374.10</b>	<b>25721.65</b>	<b>13108.41</b>	<b>46204.16</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 U/T</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>Odisha</b>		-	-	<b>5.93</b>	<b>5.93</b>
Kendujhar Sundargarh	Gandhalpada West	-	-	5.93	5.93
<b>Rajasthan</b>		<b>1168.53</b>	<b>3029.78</b>	<b>2259.41</b>	<b>6457.72</b>
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-Abhaysinghpura, 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	1555	4559.69
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	204.74	607.23
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>4926.92</b>	<b>21981.18</b>	<b>9652.62</b>	<b>36560.72</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.	4022.69	1525.29	1302.23	6850.21
Ariyalur	Meensuruti, Jayamkondamcholapuram, Michaelpatti, & Michaelpatti Extn. of Neyveli Lignite Field	904.23	302.50	512.37	1719.10
Thanjavur & Thiruvaur	Mamargudi-Central, Mamargudi-NE Mamargudi-NE Extn, Mamargudi SE, Melhattam-Araharam of Mamargudi Lignite Field	-	17248.06	3123.46	20371.52
Thanjavur	Chidapuram Mamargudi-NW & SW, Meharajapuram Orattanadu-Pattukottai, Vadaseeri (Orattanadu-Pattukottai), Madukkur-Anaikkadu, Veppanagulam-Kasangadu of Mamargudi Lignite Field	-	2306.17	156.33	2462.50
Thanjavur & Nagapattinam	Alangudi, Pandanallur, Kadalangudi, Tirumangalcheri, and Thirumangalam of Mamargudi Lignite Field	-	359.21	926.62	1285.83
Thiruvaur & Nagapattinam	Nadiyarkudi of Mamargudi Lignite Field	-	—	574.05	574.05
Ramanathapuram	Misal, Bogalur, Bogalur (East), Ulthakosamangai & Tiyarur, Kalai North West & East of Ramanathapuram Lignite Field	-	168.83	2072.35	2241.18
Ramad & Ramanathapuram	Rejasing Mangalam Pandiyur & Sattanur of Ramanathapuram Lignite Field	-	71.12	985.21	1056.33
<b>Puducherry U/T</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:** Coal Directory of India 2021-22, Coal Controller's Organisation, Kolkata and Geological Survey of India.

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

**PRODUCTION AND STOCKS****COAL****Production**

The total production of coal reported in 2021-22 was 778.21 million tonnes which increased by around 9% in comparison to that of the previous year. Odisha is the largest coal producing State with a share of about 24% followed by Chhattisgarh and Madhya Pradesh having contribution of 20% and 18% respectively in the national output. Statewise production is furnished in Table-4.

Next in order of share in the total production were Jharkhand (16.71%), Telangana (8.64%), Maharashtra (7.26%), West Bengal (3.74%) and Uttar Pradesh (2.32%). Small quantity of coal production was reported by Assam and Union Territory of Jammu & Kashmir. During the year 2021-22 coal mining was confined mainly to the Public Sector that contributed about 96%. The remaining 4% was contributed by the Private Sector.

**Table – 4 : Production of Coal, 2019-20 to 2021-22  
(By Sectors/States)**

State/UT	(Quantity in '000 tonnes)		
	2019-20	2020-21	2021-22 (P)
<b>India</b>	<b>730874</b>	<b>716083</b>	<b>778210</b>
<b>Public Sector</b>	<b>698224</b>	<b>685950</b>	<b>747441</b>
<b>Private Sector</b>	<b>32650</b>	<b>30133</b>	<b>30769</b>
Assam	517	36	28
Chhattisgarh	157745	158410	154120
Jammu & Kashmir	14	10	11
Jharkhand	131763	119295	130105
Maharashtra	54746	47435	56528
Meghalaya	0	0	0
Madhya Pradesh	125726	132531	137975
Odisha	143016	154151	185068
Telangana	65703	52603	67233
Uttar Pradesh	18030	17016	18073
West Bengal	33614	34596	29069

*Source: Coal Directory of India, 2021-22.*

A total of 533 coal mines (as on 31.03.2022) in India reported production in 2021-22. Out of these, Jharkhand accounted for 171 mines while Madhya Pradesh 79, Chhattisgarh 77 West Bengal 72, Maharashtra 57, Telangana 46 and Odisha 21. The remaining 10 mines were from Assam, Union Territory of Jammu & Kashmir and Uttar Pradesh (Table - 5).

**Table – 5 : Number of Coal Mines, 2020-21 & 2021-22 (P)  
(By States)**

State	No. of Mines	
	2020-21	2021-22 (P)
<b>India</b>	<b>442</b>	<b>533</b>
Arunachal Pradesh	0	0
Assam	3	3
Chhattisgarh	53	77
Jammu & Kashmir	2	2
Jharkhand	113	171
Madhya Pradesh	61	79
Maharashtra	54	57
Meghalaya	0	NA
Odisha	31	21
Uttar Pradesh	5	5
Telangana	48	46
West Bengal	72	72

*Source: Coal Directory of India, 2021-22.*

During the year 2021-22 coal mining was confined mainly to the Public Sector that contributed about 96%. In the year 2021-22, out of the total reported production of coal, 6% was coking coal and the rest 94% was non-coking coal. The bulk of the coking coal production, i.e., about 91% was reported from the Public Sector.

Grade-wise analysis of coking coal in 2021-22 revealed that Washery Grade IV had the maximum share at 50% followed by Washery Grade V (39%), Washery Grade II (5%) and Washery Grade III (3%). The remaining 3% 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., 99% was produced in Jharkhand (51.219 million tonnes). The remaining 1% was contributed by Chhattisgarh, Madhya Pradesh and West Bengal collectively (Tables-6 & 7).

During 2021-22, except for a nominal quantity around (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 31% followed by G13 (14%), G14 (11%), G12 (10.7%), G10 (8.6%), G8 (6.4%), G9 (6%) and G7 (5.5%). The remaining about 6.8% production was accounted for by G1, G2, G3, G5, G6, G15, G16, G17 and UNG grades of non-coking coal. Odisha was the largest producing State.



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**Table –6: Production of Coking Coal, 2020-21  
(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
<b>India</b>	<b>44787</b>	<b>1</b>	<b>8</b>	<b>202</b>	<b>2365</b>	<b>1820</b>	<b>26943</b>	<b>12798</b>	<b>431</b>	<b>219</b>
Chhattisgarh	219	-	-	-	-	-	-	-	-	219
Jharkhand	44387	1	8	202	2365	1820	26762	12798	431	-
Madhya Pradesh	181	-	-	-	-	-	181	-	-	-
West Bengal	-	-	-	-	-	-	-	-	-	-

**Source:** Coal Directory of India, 2020-21.

**Table –7: Production of Coking Coal, 2021-22  
(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
<b>India</b>	<b>51702</b>	<b>225</b>	<b>-</b>	<b>234</b>	<b>2501</b>	<b>1539</b>	<b>25740</b>	<b>20171</b>	<b>1292</b>	<b>-</b>
Chhattisgarh	225	225	-	-	-	-	-	-	-	-
Jharkhand	51219	-	-	234	2401	1539	25582	20171	1292	-
Madhya Pradesh	158	-	-	-	-	-	158	-	-	-
West Bengal	100	-	-	-	100	-	-	-	-	-

**Source:** Coal Directory of India, 2021-22, Coal Controller's Organisation, Kolkata.

For non-coking coal in 2021-22 which alone accounted for 25.5% of the national output. Next in order were Chhattisgarh with a contribution of (21.2%), Madhya Pradesh (19%), Jharkhand (10.9%), Telangana (9.3%), Maharashtra (7.8%), West Bengal (4%) and Uttar Pradesh (2.5%). Production minor quantities was reported from Assam and Union Territory of Jammu & Kashmir (Tables-8 to 10).

### Despatches

Despatches of Raw coal at 819.2 million tonnes in 2021-22 were higher by around 19% as compared to that in the previous year. Odisha was the leading State in the despatches in 2021-22 accounting for 24 % of the total despatches. The States next in the order were Chhattisgarh (20.31%), Jharkhand (16.91%), Madhya Pradesh (14%), Telangana (8.26%), Maharashtra (7.66%), Uttar Pradesh (5.42%) and West Bengal (3.65%). The remaining very small quantity of despatches were from the Union Territory of Jammu & Kashmir.

During the year 2021-22, statewide analysis revealed that there was increase in the despatches of coal from almost all States, namely, Odisha, Chhattisgarh, Jharkhand, Madhya Pradesh,

Telangana, Maharashtra, West Bengal and Union Territory of Jammu & Kashmir as against that of the previous year.

Of the total provisional despatches of raw coal effected in 2021-22, a sizeable share of 86% was made to the Electricity Sector (Power utility and Power captive). As much as 1% each to the Sponge Iron Industry and Steel Industry. The remaining 12% was made for other priority sectors including Cement Industry, Fertilizer Industry, Other Basic Metals, Pulp & Paper Chemical, Steel (boilers), Textile & Rayons, Bricks and Others (Tables-11 & 12).

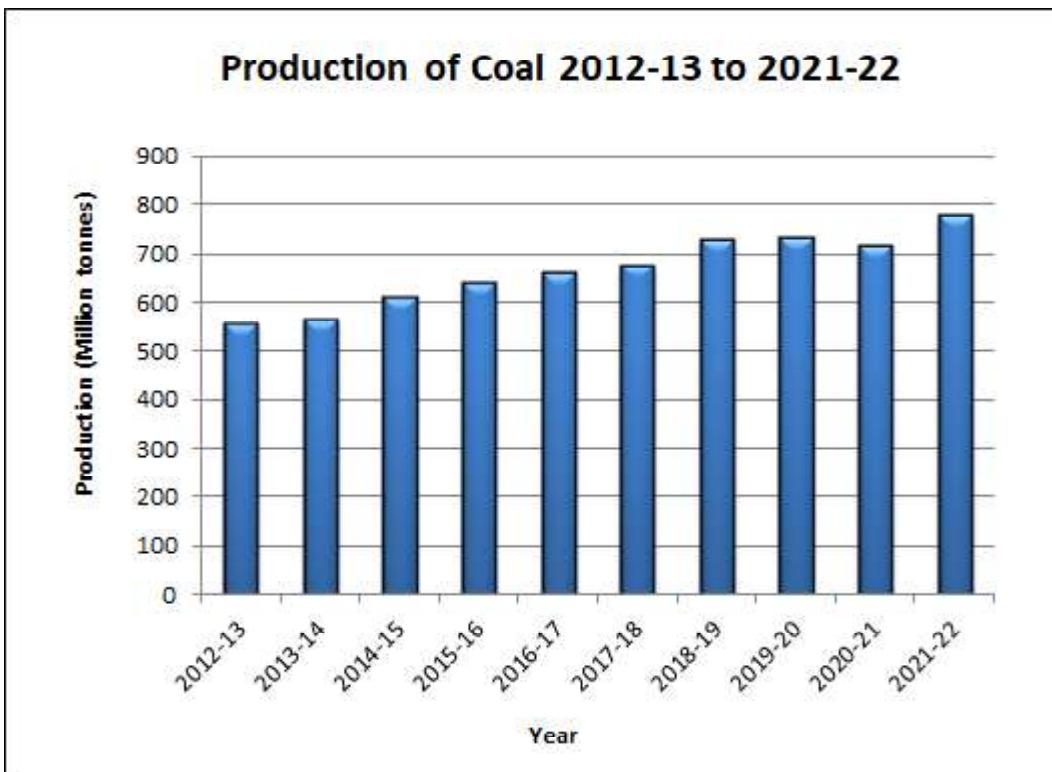
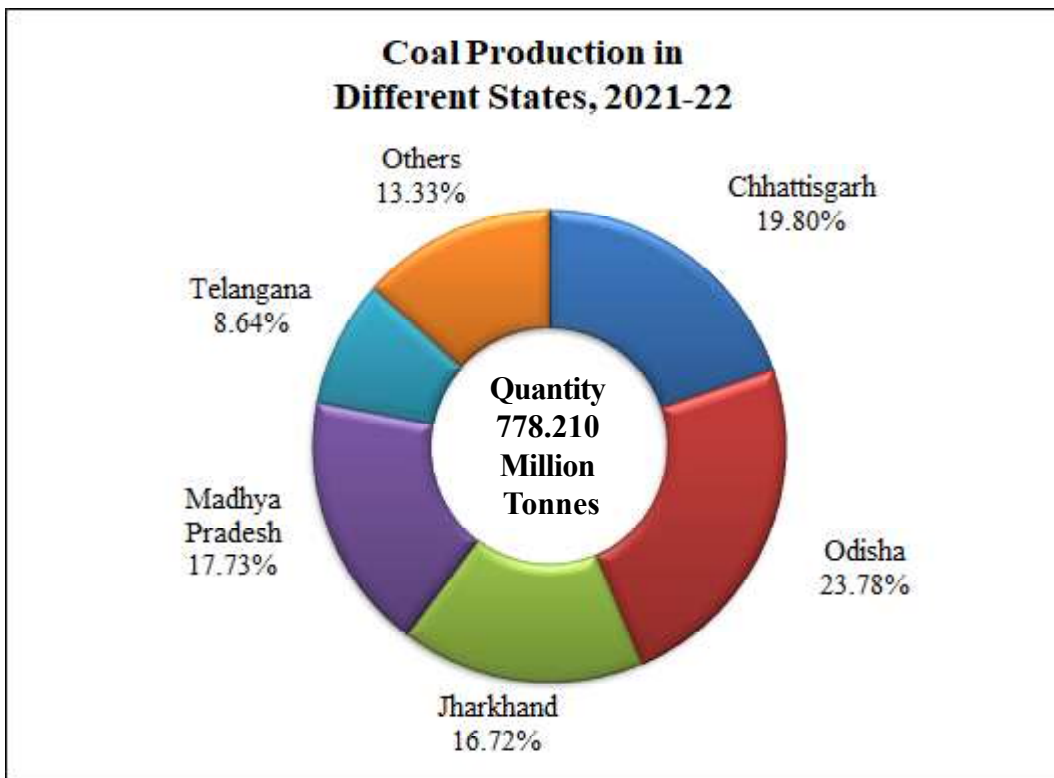
### Stocks

The mine-head stocks of coal at the end of the year 2021-22 were 69 million tonnes which was around 37% less than that at the beginning of the year.

Similarly, the mine-head stocks of coal at the end of the year 2020-21 were 109.06 million tonnes which increased by 34% 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).

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**Table – 8: Production of Coal, 2020-21 & 2021-22  
(By Grades and Sectors)**

(In '000 tonnes)

Grade	2020-21			2021-22 (P)		
	Total	Pub. Sec.	Pvt. Sec.	Total	Pub. Sec.	Pvt. Sec.
<b>All Grades</b>	<b>716083</b>	<b>685950</b>	<b>30133</b>	<b>778210</b>	<b>747441</b>	<b>30769</b>
<b>Coking</b>	<b>44787</b>	<b>38934</b>	<b>5853</b>	<b>51702</b>	<b>47022</b>	<b>4680</b>
Steel-I	1	1	0	225	225	0
Steel -II	8	8	0	0	0	0
Wash-I	202	202	0	234	234	0
Wash -II	2365	1716	649	2500	1901	599
Wash -III	1820	1431	389	1539	1266	273
Wash -IV	26943	22128	4815	25740	21932	3808
Wash-V	12798	12798	0	20172	20172	0
Wash-VI	431	431	0	1292	1292	0
SC-I	219	219	0	0	0	0
SLV1	0	0	0	0	0	0
Mg feed	0	0	0	0	0	0
<b>Non Coking</b>	<b>671296</b>	<b>647016</b>	<b>24280</b>	<b>726508</b>	<b>700419</b>	<b>26089</b>
G1	3	3	0	0	0	0
G2	27	27	0	9	9	0
G3	2681	2681	0	2012	2012	0
G4	14221	14221	0	13049	13049	0
G5	9707	9707	0	8657	8657	0
G6	4252	4206	46	5492	5126	366
G7	37446	37446	0	40742	40209	534
G8	47702	47262	440	46402	46236	166
G9	36723	36723	0	43597	43597	0
G10	69883	59558	10325	62426	53153	9273
G11	194693	181515	13178	223091	209271	13820
G12	73346	73167	179	77626	76926	699
G13	80935	80823	112	100358	99991	367
G14	66297	66297	0	81184	80682	501
G15	26201	26201	0	14047	14047	0
G16	6790	6790	0	7442	7442	0
G17	236	236	0	375	11	363
UNG	153	153	0	-	-	-

**Source:** 1. Coal Directory of India, 2020-21 & 2021-22, 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, 2020-21**  
(By States and Grades)

(In '000 tonnes)

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>671296</b>	<b>3</b>	<b>27</b>	<b>2681</b>	<b>14221</b>	<b>9707</b>	<b>4252</b>	<b>37446</b>	<b>47702</b>	<b>36723</b>	<b>69883</b>	<b>194693</b>	<b>73346</b>	<b>80935</b>	<b>66297</b>	<b>26201</b>	<b>6790</b>	<b>236 153</b>
Arunachal	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pradesh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Assam	36	27	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-
Chhattisgarh	158191	-	1640	-	1860	945	2601	2212	1561	2379	120900	2039	5899	1093	8272	6790	-	-
Jammu &	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Kashmir (UT)	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10
Jharkhand	79041	-	228	43	1070	669	3396	4865	18491	6638	11939	9795	21907	-	-	-	-	-
Madhya	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Pradesh	132350	-	-	-	436	1335	25073	17696	3840	38692	33426	7825	3929	98	-	-	-	-
Maharashtra	47435	-	-	-	-	-	107	696	5377	16058	17635	4645	2917	-	-	-	-	-
Meghalaya	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Odisha	154151	-	-	-	-	-	-	76	-	-	-	44769	34105	62925	12276	-	-	-
Telangana	52603	-	-	-	450	76	3741	5967	6882	3159	8546	3621	11948	2181	5653	-	226	153
Uttar Pradesh	17016	-	-	-	-	-	-	14319	572	1957	168	-	-	-	-	-	-	-
West Bengal	30463	-	-	813	14178	5891	1221	2528	1871	-	1000	2079	652	230	-	-	-	-

**Source:** Coal Directory of India, 2020-21, Coal Controllers' Organisation, Kolkata.

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

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**Table- 10: Production of Non-coking Coal, 2021-22**

**(By States and Grades)**

State	All-Grades	Grades																(In '000 tonnes)
		G1	G2	G3	G4	G5	G6	G7	G8	G9	G10	G11	G12	G13	G14	G15	G16	
<b>India</b>	<b>726508</b>	<b>9</b>	<b>2012</b>	<b>13049</b>	<b>8657</b>	<b>5492</b>	<b>40742</b>	<b>46402</b>	<b>43597</b>	<b>62426</b>	<b>223091</b>	<b>77626</b>	<b>100358</b>	<b>81184</b>	<b>14047</b>	<b>7442</b>	<b>375</b>	<b>-</b>
Arunachal																		
Pradesh	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Assam	28	9	19	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-
Chhattisgarh	153893	-	1186	102	1326	1063	1378	1847	1195	3004	116355	3100	6045	2082	7406	7442	364	-
Jammu &																		
Kashmir	11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	11
Jharkhand	78884	-	143	88	579	1216	3564	5528	23107	4228	20023	6731	13678	-	-	-	-	-
Madhya																		
Pradesh	137818	-	-	-	312	1298	29151	15088	5440	30450	44734	8501	2737	107	-	-	-	-
Maharashtra	56529	-	-	-	-	-	88	808	4944	17746	21092	6675	5176	-	-	-	-	-
Meghalaya																		
Odisha	185069	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Telangana	67233	-	-	-	675	99	5142	6439	7302	4585	18250	309	15337	2457	6640	-	-	-
Uttar Pradesh	18073	-	-	-	-	-	-	14367	1292	2414	-	-	-	-	-	-	-	-
West Bengal	28970	-	665	12859	5765	1816	1420	2265	268	-	2637	913	363	-	-	-	-	-

**Source:** Coal Directory of India, 2021-22, 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.

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**Table – 11: Despatches of Raw Coal,  
2020-21 & 2021-22  
(By States)**

States	(In '000 tonnes)	
	2020-21 (R)	2021-22 (P)
<b>India</b>	<b>690884</b>	<b>819213</b>
Arunachal Pradesh	-	-
Assam	90	0
Chhattisgarh	146253	166428
Jammu & Kashmir (UT)	8	18
Jharkhand	122238	138560
Madhya Pradesh	105384	115332
Maharashtra	46571	62755
Meghalaya	0	0
Odisha	151911	193638
Telangana	50533	67743
Uttar Pradesh	38355	44804
West Bengal	29541	29935

*Source: Coal Directory of India, 2020-21 & 2021-22, Coal Controller's Organisation, Kolkata.*

**Table –12 : Despatches of Raw Coal,  
2020-21 & 2021-22  
(By Priorities)**

Priority	(In '000 tonnes)	
	2020-21 (R)	2021-22 (P)
<b>Total</b>	<b>690884</b>	<b>819213</b>
Power (Utility)	535447	668298
Power (Captive)	45786	36699
Steel	8975	9159
Cement	6754	7306
Sponge Iron	9565	9023
Fertilizers	1527	1111
Pulp & Paper	1045	1244
Other Basic metal	683	2933
Chemical	158	196
Textiles & Rayons	80	80
Bricks	25	23
<b>Others</b>	<b>80839</b>	<b>83141</b>

*Source: Coal Directory of India, 2020-21 & 2021-22, 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, 2020-21  
(By States)**

State	(In '000 tonnes)	
	At the beginning of the year	At the end of the year
<b>India</b>	<b>81432</b>	<b>109060</b>
Arunachal Pradesh	-	-
Assam	54	-
Chhattisgarh	18264	29723
Jammu & Kashmir (UT)	7	9
Jharkhand	17959	19320
Madhya Pradesh	4078	6796
Maharashtra	13673	14533
Odisha	20999	24922
Telangana	3192	5247
Uttar Pradesh	1388	5163
West Bengal	1818	3347

*Source: Coal Directory of India, 2021-22.*

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**Table – 14: Mine-head Stocks of Coal, 2021-22 (P)  
(By States)**

(In '000 tonnes)

State	At the beginning of the year	At the end of the year
<b>India</b>	<b>109060</b>	<b>68901</b>
Arunachal Pradesh	-	-
Assam	-	28
Chhattisgarh	29723	16890
Jammu & Kashmir (U/T)	9	1
Jharkhand	19320	10799
Madhya Pradesh	6796	6708
Maharashtra	14533	8312
Odisha	24922	17445
Telangana	5247	4726
Uttar Pradesh	5163	1678
West Bengal	3347	2314

*Source : Coal Directory of India, 2021-22.*

## LIGNITE

### Production

During the year 2021-22 the reported production of lignite was 47 million tonnes which increased by around 25% in comparison to that of the previous year. The production from Tamil Nadu accounted for around 50%. The share of Gujarat in lignite production was around 28% and that of Rajasthan was 22% (Table-15).

Out of the total 20 mines that reported lignite production in 2021-22, ten mines are located in Gujarat, seven in Rajasthan and the remaining three in Tamil Nadu (Table-16).

### Despatches

The quantum of despatches of lignite was 49 million tonnes for the year 2021-22 which increased by around 27% as compared to that in the previous year (Table-17).

### Stocks

The mine-head stocks of lignite at the end of 2021-22 were 3,389 thousand tonnes which decreased by 32% from that of the stocks that were available at the beginning of the year (Table-18).

**Table – 15 : Production of Lignite, 2019-20 to 2021-22  
(By Sectors/States)**

(Quantity in '000 tonnes)

State	2019-20	2020-21	2021-22 (P)
<b>India</b>	<b>42096</b>	<b>37895</b>	<b>47492</b>
<b>Public Sector</b>	<b>41366</b>	<b>36903</b>	<b>46411</b>
<b>Private</b>	<b>730</b>	<b>992</b>	<b>1081</b>
Gujarat	10357	10813	13331
Tamil Nadu	23516	18026	23635
Rajasthan	8223	9056	10526

*Source: Coal Directory of India, 2021-22, Coal Controller's Organisation, Kolkata.*

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**Table – 16 : Number of Lignite Mines  
2021-22  
(By States)**

State	No. of Mines	
	2020-21	2021-22
<b>India</b>	<b>20</b>	<b>20</b>
Gujarat	10	10
Rajasthan	7	7
Tamil Nadu	3	3

*Source: Coal Directory of India, 2021-22.*

*Note: No. of mines as on the last day of financial year*

**Table – 17 : Despatches of Lignite  
2020-21 & 2021-22  
(By States)**

State	(In '000 tonnes)	
	2020-21	2021-22 (P)
<b>India</b>	<b>38492</b>	<b>49074</b>
Gujarat	110819	13385
Rajasthan	9157	10235
Tamil Nadu	18516	25454

*Source: Coal Directory of India, 2020-21 & 2021-22.*

**Table – 18 : Mine-head Stocks of Lignite, 2020-21 & 2021-22  
(By States)**

State	2020-21		2021-22	
	At the beginning of the year	At the end of the year	At the beginning of the year	At the end of the year
<b>India</b>	<b>5495</b>	<b>4981</b>	<b>4981</b>	<b>3389</b>
Gujarat	28	103	103	49
Rajasthan	408	307	307	588
Tamil Nadu	5059	4571	4571	2752

*Source: Coal Directory of India, 2020-21 & 2021-22*

## MINING & MARKETING

### Coal

Coal mining in the country is carried out by both open-cast and underground methods. Opencast mining contributed 95.50 % of the total provisional production, whereas the rest of the production (4.50%) came from underground mining during 2020-21. 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



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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 Pathakheda Coalfields in Madhya Pradesh and Wardha Valley & Kamptee Coalfields in Maharashtra. This Company largely meets the requirements of thermal power plants 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. At present, there are 3 Nos. of existing mines, namely, Tirap, Tikale and Tipong. Out of these, Tipong colliery is an underground mine while the remaining collieries are openast mines. 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 which produces non-coking coal. The coal requirements of consumers in south are mostly met by this Company. SCCL contributes around 9% of the total all India production of coal.

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 (JSMDC) and Jammu & Kashmir Minerals Ltd (JKML) are State Government Undertakings and Damodar Valley Corporation (DVC) is 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 31.3.2022, there were 533 operating mines for coal in the country out of which 249 were opencast, while 258 were underground mines. The remaining 26 were mixed collieries. There were 512 Public Sector mines and 21 mines in Private Sector (Table-19). Thrust is given on further increasing production from opencast mines where the gestation period is comparatively shorter. In 2021-22, the share of provisional production of raw coal from opencast mines was 745.027 million tonnes (95.74%) and 33.183 million tonnes (4.26%) from underground mines (Table-20). Production of coal by different mining technologies employed during 2021-22 is furnished in Table-21. The overall Output per Man Shift (OMS) in opencast and underground mines for CIL in 2021-22 was 9.54 tonnes as against 10.32 tonnes in 2020-21. The overall OMS in opencast and underground mines for SCCL was 8.53 tonnes in 2021-22 as against 6.80 tonnes in 2020-21.

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

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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, 2021-22 (By Sectors/States)**

State	No. of collieries			
	OC	UG	Mixed	Total
<b>All India</b>	<b>249</b>	<b>258</b>	<b>26</b>	<b>533</b>
Public Sector	238	250	24	512
Private Sector	11	8	2	21
Arunachal Pradesh	-	-	-	-
Assam	2	1	-	3
Chhattisgarh	28	46	3	77
Jammu & Kashmir (U/T)	-	2	-	2
Jharkhand	92	66	13	171
Madhya Pradesh	23	54	2	79
Maharashtra	40	17	-	57
Odisha	18	3	-	21
Telangana	21	25	-	46
Uttar Pradesh	5	-	-	5
West Bengal	20	44	8	72

**Source:** Coal Directory of India, 2021-22, Coal Controller's Organisation, Kolkata.

\* Relates to no. of mines as on last day of the financial year (As on 31.3.2022).

**Note:** OC - Opencast UG - Underground. U/T - Union Territory

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

(In million tonnes)

Year	Production from opencast mines (% share)	Production from underground mines (% share)	Total production
2018-19	686.214 (94.17%)	42.504 (5.8%)	728.718
2019-20	690.393 (94.46%)	40.481 (5.54%)	730.874
2020-21	683.872 (95.50%)	32.211 (4.50%)	716.083
2021-22	745.027 (95.74%)	33.183 (4.26%)	778.210

**Source:** Coal Directory of India, 2021-22 Coal Controller's Organisation, Kolkata

**Table – 21 : Production of Coal, 2021-22 (By Technology)**

(In million tonnes)

Technology adopted	Production	Percentage of total
<b>All India : Total</b>	<b>778.210</b>	<b>100</b>
<b>Opencast (Total)</b>	<b>745.027</b>	<b>95.74</b>
Mechanised	745.027	100
Manual	-	-
<b>Underground (Total)</b>	<b>33.183</b>	<b>4.26</b>
Conventional B&P	0.033	0.10
Mechanised B&P	28.457	85.76
Conventional LW	0.246	0.74
Mechanised LW	2.532	7.63
<b>Other methods</b>	<b>1.914</b>	<b>5.77</b>

**Source:** Coal Directory of India, 2021.22, Coal Controller's Organisation, Kolkata.

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

### Lignite

As on 31.03.2022, the total number of operating lignite mines was 20 and all are worked by opencast method. Out of these, 16 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), GPCL & V S Lignite Power Pvt. Ltd (VSLPPL). Sector-wise, seventeen mines are under Public Sector and the remaining three are under Private Sector, i.e., GHCL, GPCL & 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 30.60 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

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expansion (0.40 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 blocks (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 251.13 lakh tonnes during 2021-22 which increased by 30% from 192.63 lakh tonnes in the previous year. Due to poor demand on account of pandemic situation and shutdown of few units, Lignite production is restricted accordingly during 2020-21. The NLC's mines are highly mechanised. Presently, these mines are linked to three thermal power stations.

In Power Sector, NLC has added 500 MW Thermal Power and 17.5 MW Renewable power during the year 2020-21 and retired 350 MW of its installed capacity with addition and retirement of unit.

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.

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.

Up to 2020-21, a total of 126 coal blocks with 21,488.45 million tonnes geological/extractable reserves have been allotted in various States (Table - 22). Of these, 80 coal blocks with 18,853.48 million tonnes are under Public Sector Undertakings (PSU) and the remaining 46 blocks with about 2,634.97 million tonnes are under Private Sector companies. Among these, 62 blocks with 14,146.41 million tonnes have been allocated for Power, 26 blocks with 1,018.90 million tonnes for Non-regulated Sector (NRS), 2 blocks with 350.11 million tonnes for Ultra Mega Power Project (UMPP) and 36 blocks with 5,971.33 million tonnes for commercial mining.

Similarly, up to 31.03.2021, 23 captive lignite blocks stand allocated with 1,555.33 million tonnes

geological/extractable reserves. 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 have been allocated.

**Table – 22 : Statewise Allotment of Captive Coal Blocks that stand Allocated/Vested/ including Blocks Allotted Under MMDR Act up to 2020-2021 (Except CIL as custodian)**

(In million tonnes)		
State	No. of blocks	Geological/ extractable Reserves
<b>Coal</b>		
Chhattisgarh	23	4078.24
Jharkhand	36	7027.08
Madhya Pradesh	18	1415.58
Maharashtra	13	370.92
Odisha	19	5472.26
Telangana	2	151.79
West Bengal	15	2972.58
Total	126	21488.45

*Source: Coal Directory of India 2020-21, 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;

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

## COAL WASHERIES

Presently, 18 coal washeries (14 in Public Sector and 4 in Private Sector) with 40.02 million tonnes per annum (MTPA) capacity of washed coking coal produced about 4.7 million tonnes of coking coal in 2021-22 out of which about 2.09 million tonnes were produced by the Public Sector and 2.6 million tonnes by Private Sector. Under Public Sector, BCCL operates 9 coking coal washeries (Dugda, Bhojudih, Sudamdih, Moonidih, Mahuda, Madhuban, Dahibari, Patherdih, NLW and TSL washery) CCL operates 4 washeries (Kathara, Swang, Rajrappa and Kedla), and SAIL operates one (Chasnala), whereas 4 washeries (West Bokaro-II, West Bokaro-III, Jamadoba and Bhelatand) are operated by Tata Steel Ltd (TSL) under Private Sector. During 2021-22, 19 coal washeries with 110.88 million tonnes per annum capacity washed non-coking coal of about 24.721 million tonnes. Of these, about 5.510 million tonnes production have been reported under Public Sector and about 19.211 million tonnes under Private Sector. Under Public Sector, 2 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.

**Table – 23 : Production of Washed Coking Coal, 2020-21 & 2021-22 (Sector-wise/Company-wise)**

	(In million tonnes)	
	2020-21	2021-22
<b>All India : Total</b>	<b>4.422</b>	<b>4.701</b>
<b>Public Sector</b>	<b>1.303</b>	<b>2.088</b>
BCCL	0.270	1.209
CCL	0.436	0.401
SAIL	0.597	0.478
<b>Private Sector</b>	<b>3.119</b>	<b>2.613</b>
Tata Steel Ltd	3.119	2.613

*Source: Coal Directory of India, 2021-22, Coal Controller's Organisation, Kolkata.*

**Table – 24 : Capacity of Washed Coking Coal, 2020-21 (Sector-wise/Company-wise)**

Coalfield/Washery	State	Raw Coal Capacity (In million tonnes)
<b>Grand Total</b>		<b>40.02</b>
<b>Public Sector</b>	<b>Total</b>	<b>29.52</b>
<b>BCCL</b>		<b>18.13</b>
Dugda	Jharkhand	2.00
Bhojudih	West Bengal	1.70
Sudamdih	Jharkhand	1.60
Moonidih	-do-	1.60
Mahuda	-do-	0.63
Madhuban	-do-	2.50
Dahibari		1.60
Patherdih NLW		5.00
TSL washery		1.50
<b>CCL</b>		<b>9.35</b>
Kathara	Jharkhand	3.00
Swang	-do-	0.75
Rajrappa	-do-	3.00
Kedla	-do-	2.60
<b>SAIL</b>		<b>29.52</b>
Chasnala	Jharkhand	2.04
<b>Private Sector</b>	<b>Total</b>	<b>10.50</b>
<b>Tata Steel Ltd</b>		<b>10.50</b>
West Bokaro-II	Jharkhand	2.50
West Bokaro-III	-do-	4.50
Jamadoba	-do-	2.00
Bhelatand	-do-	1.50

*Source: Coal Directory of India, 2021-22, Coal Controller's Organisation, Kolkata (except totals).*

**Table – 25 : Production of Washed Non-coking Coal : 2019-20 & 2020-21 (Sector-wise/Company-wise)**

	(In million tonnes)	
Sector/Company	2019-20	2020-21
<b>All India : Total</b>	<b>41.802</b>	<b>24.721</b>
<b>Public Sector</b>	<b>6.480</b>	<b>5.510</b>
CCL	6.480	5.510
<b>Private Sector</b>	<b>35.322</b>	<b>19.211</b>
Adani Enterprises Ltd	11.709	12.170
Aryan Coal Beneficiation Pvt. Ltd	18.003	4.444
Aryan Energy Pvt. Ltd	1.426	0.549
Global Coal & Mining Pvt. Ltd	2.790	1.138
Jindal Power Ltd	0.372	0.463
Kartikay Coal Washerries Pvt. Ltd	0.089	0.009
Maruti Clean Coal	0.933	0.438

*Source: Coal Directory of India, 2020-21, Coal Controller's Organisation, Kolkata.*

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**Table – 26 : Capacity of Washed Non-coking Coal, 2020-21  
(Sector-wise/Company-wise)**

(In '000 tpy)

Washery/Location	Coalfield	State	Raw Coal Capacity
<b>Grand Total</b>			<b>113600</b>
<b>Public Sector</b>	<b>Total</b>		<b>11720</b>
<b>CCL</b>			
<b>East Bokaro Coalfield, Jharkhand</b>			<b>11720</b>
Gidi	East Bokaro	Jharkhand	2500
Piparwar	N. Karanpura	-do-	6500
Kargali	Bokaro	-do-	2720
<b>Private Sector</b>	<b>Total</b>		<b>101880</b>
<b>Adani Enterprises Ltd</b>			<b>15000</b>
AEL	Parsa	Chhattisgarh	15000
<b>Aryan Coal Beneficiation Pvt. Ltd</b>			<b>60690</b>
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
<b>Aryan Energy Pvt. Ltd</b>			<b>2340</b>
Talcher	Talcher	Odisha	2340
<b>Global Coal &amp; Mining Pvt. Ltd</b>			<b>10000</b>
Ib Valley	Ib Valley	Odisha	3500
Ramagundam	Ramagundam	Telangana	1000
Talcher	Talcher	Odisha	4000
Manuguru	Manuguru	Telangana	1500
<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>Maruti Clean Coal</b>			<b>6600</b>
Maruti	-	Chhattisgarh	6600

*Source: Coal Directory of India, 2020-21, 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

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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 2019-20, 2020-21 and 2021-22 are provided 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 2019-20, 2020-21 and 2021-22 are provided in Table -29.

**Table – 28 : Despatches\* of Coal  
2019-20 to 2021-22  
(By Industries)**

Industry	(In million tonnes)		
	2019-20	2020-21	2021-22 (P)
<b>Total</b>	<b>707.18</b>	<b>690.884</b>	<b>819.213</b>
Electricity	626.15	574.731	704.997
Iron & steel <sup>§</sup>	11.91	8.975	9.159
Sponge iron	10.53	9.565	9.023
Fertilizer	1.76	1.527	1.111
Cement	8.57	6.754	7.306
Others (Chemical, other basic metals, paper & pulp, textile & rayon, bricks, others, etc.)	48.26	82.83	87.617

*Source: Coal Directory of India 2021-22.*

\* Data on consumption is not available.

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

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**Table – 29 : Demand-Supply of Coal, 2019-20, 2020-21 and 2021-22**

(In million tonnes)

Year	Demand*	Apparent Supply			
		Despatch	Import	Export	Total
2019-20	1000.00	706.77	248.537	1.029	954.278
2020-21	1085.00	690.884	215.251	2.945	903.19
2021-22	1142	819.213	208.627	1.316	1026.524

**Source:** Coal Directory of India 2021-22, Apparent supply= Despatch+Import-Export

\*Annual Plan, Ministry of Coal.

## WORLD REVIEW

World proved coal reserves were estimated at 1074.108 billion tonnes at the end of 2020 of which 753.639 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 Russia (15%), Australia (14%) and China (13%) (Table-30).

**Table – 30 : World Proved Coal Reserves at the end of 2020 (By Principal Countries)**

(In million tonnes)

Country	Anthracite and bituminous coal	Sub-bituminous coal and lignite	Total
<b>World : Total</b>	<b>753639</b>	<b>320469</b>	<b>1074108</b>
USA	218938	30003	248941
Russia	71719	90447	162166
Australia	73719	76508	150227
China	135069	8128	143197
India*	105979	5073	111052
Indonesia	23141	11728	34869
Germany	-	35900	35900
Ukraine	32039	2336	34375
Poland	22530	5865	28395
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	23608	29109	52717

**Source:** BP Statistical Review of World Energy, 2021.

\*India's resources of coal as on 1.4.2022 are estimated at about 361.411 billion tonnes to a depth of 1,200 m and those of lignite are estimated at about 46.20 billion tonnes.

World production of coal and lignite slightly increased from about 7.559 billion tonnes in 2020 to 7.883 billion tonnes in 2021. China continued to be the largest producer of coal & lignite in 2021 with about 50% share in total world production, followed by India (9.0%), USA (7.88%), Indonesia (7.80%), Australia (6.02%) and Russia (5.48%) (Table-31).

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

(In million tonnes)

Country	2019	2020	2021
<b>World : Total</b>	<b>8108</b>	<b>7559</b>	<b>7883</b>
<b>Bosnia &amp; Herzegovina</b>			
Brown coal & lignite	13	13	12
<b>Bulgaria</b>			
Lignite	29	29	29
Brown Coal	1	1 <sup>e</sup>	1 <sup>e</sup>
<b>Czech Republic</b>			
Bituminous	3	1	2
Brown coal	37	29	29
<b>Georgia</b>	15900	33134	147878
<b>Germany</b>			
Anthracite & Bituminous	-	-	-
Brown coal	131	107	126
<b>Greece</b>			
Lignite	26	14	12
<b>Poland</b>			
Coking coal	12	12	12
Other bituminous coal	50	42	42
Lignite	52	47	54
<b>Romania</b>			
Anthracite & bituminous	410765	428368	*300000
Lignite	21	15	17
<b>Russia</b>	439	398	432
<b>Serbia</b>			
Bituminous	108000	30000	26000
Lignite (b)	38	39	36
Brown coal	350000	306000	271000

(contd)



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Table - 31 (concl'd)

Country	2018	2019	2020
<b>Turkey</b>			
Anthracite	1	1	1
Lignite	92	84	90
<b>United Kingdom</b>			
Anthracite	510000	345000	266000
Bituminous	2	1	788000
<b>South Africa</b>			
Anthracite	3	4	3
Bituminous	251	243	225
<b>USA</b>			
Anthracite	2	2	1
Bituminous	307	215	235
Sub-bituminous	282	222	243
Lignite	48	44	42
<b>Colombia</b>			
Anthracite (d)	127090	231	109798
Coking coal	7	7	7
Other bituminous coal	77	42	48
<b>China</b>	3846	3747	3962
<b>India</b>			
Bituminous (g)	729	716	*676
Lignite (g)	42	36	*34
<b>Indonesia</b>			
Anthracite & Bituminous	616	563	613
<b>Iran (e)</b>	1	1	1
<b>Kazakhstan</b>			
Bituminous	104	104	107
Lignite	5	5	4
<b>Korea, Rep. of</b>			
Anthracite	1	1	897900
<b>Korea, Dem.P.R.of</b>	*18	*17	*17
<b>Kyrgyzstan</b>	2	2	2
<b>Thailand</b>			
Lignite	14	13	14
<b>Vietnam</b>			
Anthracite	47	44	48
<b>Australia</b>			
Bituminous (i)	462	426	432
Brown coal (f)	42	40	42

**Source:** BGS, *World Mineral Production, 2017-2021*.

*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 2019-20, 2020-21 & 2021-22 was 730.87,716.10 & 778.21 million tonnes, respectively.*

*\* India's production of lignite during 2019-20, 2020-21 & 2021-22 was 42.09, 37.89 & 47.49 million tonnes, respectively.*

*(j) includes sub-bituminous.*

*(g) year ended 30<sup>th</sup> June of that stated.*

*(h) year ended 30<sup>th</sup> March following that stated.*

(cont'd)

Global coal demand rebounded strongly in 2021 to 5,640 million tonnes of coal equivalent (Mtce) as economies recovered from the pandemic and coal-fire power generation reached a historic high in 2021. Both China and India have boosted investment in domestic coal production, but global production struggled to keep pace with demand increases, causing coal prices to surge. Russia – the world's third-largest coal exporter – and its invasion of Ukraine complicated coal market dynamics and brought additional pressure on prices.

The outlook for coal is heavily dependent on the strength of the world's resolve to address climate change. In the Stated Policies Scenario (STEPS), coal demand declines gradually. In the Announced Pledges Scenario (APS), it declines about 20% below current levels by 2030, and 70% by 2050; coal demand peaked in China in the early 2020s and in India in the late 2020s. In the Net Zero Emissions by 2050 (NZE) Scenario, demand fall by 45% by 2030 and by 90% by 2050.

Coal use in industry is expected to fall by 20% to 2030, in part reflecting an increase in the production of near zero emissions primary steel and near zero emissions clinker for use in cement. In India, coal demand in the STEPS is expected to rise by 25% 2030. Strong economic growth – the economy is expected to expand by 90% between 2021 and 2030 – will bring with it more demand for coal-fired power generation and in the use of coal to produce iron and steel and cement. Coal-fired power capacity is bound to increase from 240 GW in 2021 to 275 GW in 2030, while there will be limited use of electric arc furnaces in industry. In the APS, coal demand in India would show an increase by just under 15% between 2021 and 2030, this would reflect increased deployment of renewables, improvements in energy efficiency, and the installation of gas and electricity-based equipment in industry. The increase in coal demand in the Industry Sector is around half of that seen in STEPS, and the increase in the Power Sector is about 20% less. To provide generalised view of the development in various countries, the countrywise description sourced from the latest available publication of USGS is detailed below.

## Australia

Queensland remained Australia's leading producer of anthracite and bituminous coal (reported as black coal by Geoscience Australia), accounting for 54% of the country's production in 2017, followed by New South Wales, 44%; Western Australia, 1%; and Tasmania, 0.1%. The BHP Billiton Mitsubishi

Alliance (BMA) (owned by BHP Billiton, 50%, and Mitsubishi Corp. of Japan, 50%) was the leading producer of anthracite and bituminous coal in Australia. BMA operated seven mines in Queensland. In March, Cyclone Debbie affected coal operations at multiple mines in the Bowen basin in northern Queensland and caused coal export delays, which led to an increase in global coal prices. The affected mines stockpiled coal while repairs to rail and port infrastructure were completed. The majority of lignite was produced in Victoria and used for domestic energy generation. Loy Yang Power Ltd. operated the Loy Yang Mine, which was Australia's leading lignite mine by capacity. The Hazelwood Mine, which was owned by ENGIE SA of France, and the associated Hazelwood coal-fired powerplant closed in March owing to the powerplant no longer being commercially viable.

### **China**

In 2019, coal production increased by 4.6% to 3.85 Gt. China accounted for 51.7% of the world's coal production (in terms of contained energy) in 2019. China's coal production reached a peak of about 4 Gt in 2013 and had declined since then until 2016 owing to the slowdown in the economy, weak domestic demand, and low prices for coal. Production had gradually increased since 2016 because of increasing demand, the restart of some inactive existing capacity, and the commissioning of new capacities. As of 2019, there were 5,271 coal mines in the country with total production capacity (including capacity under construction) of 5.2 Gt/yr, of which 3.9 Gt/yr capacity was in operation, 1.0 Gt/yr capacity was under construction, and about 300 Mt/yr capacity was inactive. Coal imports in 2019 were 299.7 Mt, which was an increase of 6.6% compared with imports in 2018. China's leading import trade partners (in terms of energy content of imported coal) in 2019 were Indonesia, which supplied 34% of China's coal imports; Australia 32%; Mongolia 16%; Russia 13%; and Canada 2%. Coal exports in 2019 were 6.03 Mt, which was an increase of 22.3% compared with those of 2018. Coal consumption increased by 1.0% in 2019

to 4.0 Gt, of which 2.37 Gt was used for electricity generation; 660 Mt, by the steel industry; 380 Mt, for construction material production; 300 Mt, by the chemical industry; and 320 Mt, for other uses. In 2019, the revenue of the coal industry totaled \$360 billion, which was an increase of 3.2% compared with that of 2018, and the profits of these companies totaled \$41 billion, which was a decrease of 2.4%

## **FOREIGN TRADE**

### **Exports**

Exports of coal (excl. lignite) decreased substantially by 55% to about 1.31 million tonnes in 2021-22 from 2.94 million tonnes in the previous year. On the other hand, exports of coke increased manifold to 1,299.46 million tonnes in 2021-22 from 207.41 million tonnes in 2020-21. Coal (excluding lignite) was mainly exported to Bangladesh (50%), Nepal (44%) and Bhutan & UAE (3% each). Coke was exported predominantly to Italy (19%), Japan (17%), Vietnam (12%), Brazil (8%), Bhutan & Indonesia (7% each), Malaysia (6%) and Australia, France & Romania (5% each). Exports of lignite were 1 thousand tonnes during the year 2021-22 as compared to 2 thousand tonnes during 2020-21. (Tables - 32 to 35).

### **Imports**

Imports of coal (excl. lignite) decreased slightly by 3% to 208.64 million tonnes in 2021-22 from 215.26 million tonnes in the previous year. Imports of coke increased slightly by 2% to about 2.50 million tonnes in 2021-22 from about 2.46 million tonnes in the previous year. Coal (excl. lignite) was mainly imported from Indonesia (35%), Australia (32%), South Africa (12%), USA (7%), Russia (4%) and Singapore & Mozambique (3% each) whereas coke was imported mainly from Poland (42%), Colombia (18%) & Japan (12%). Imports of lignite remained unchanged in 2021-22 as compared to preceding year. Lignite was imported solely from China. (Tables - 36 to 38).

COAL & LIGNITE

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

Country	2020-21 (R)		2021-22 (P)	
	Qty (‘000 t)	Value (₹‘000)	Qty (‘000 t)	Value (₹‘000)
<b>All Countries</b>	<b>2943</b>	<b>5736794</b>	<b>1314</b>	<b>11233701</b>
Nepal	2200	4294441	575	5456932
Bangladesh	665	738728	656	4951323
Bhutan	48	472514	43	475844
UAE	++	8436	39	298546
Chile	-	-	1	17735
Saudi Arabia	++	5091	++	6623
Thailand	--	-	++	5855
Philippines	--	-	++	4287
Srilanka	++	264	++	4031
Nigeria	-	-	++	4010
Other countries	30	217320	++	8515

*Figures rounded off*

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

Country	2020-21 (R)		2021-22 (P)	
	Qty (‘000 t)	Value (₹‘000)	Qty (‘000 t)	Value (₹‘000)
<b>All Countries</b>	-	-	++	2
Bhutan	-	-	++	2

*Figures rounded off*

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

Country	2020-21 (R)		2021-22 (P)	
	Qty (‘000 t)	Value (₹‘000)	Qty (‘000 t)	Value (₹‘000)
<b>All Countries</b>	<b>207412</b>	<b>4771075</b>	<b>1299461</b>	<b>41017403</b>
Japan	2	38	225820	8557910
Italy	-	-	249722	7361197
Vietnam	60500	1547731	153000	4828967
Bhutan	62746	1531890	96842	3028825
Brazil	40501	964977	97600	2982790
Australia	-	-	70514	2838090
France	-	-	64000	2824093
Indonesia	14872	365032	88232	2470554
Malaysia	56	1711	74328	2167153
Romania	-	-	60500	1735071
Other countries	28735	359696	118903	2222753

*Figures rounded off*

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

Country	2020-21 (R)		2021-22 (P)	
	Qty (‘000 t)	Value (₹‘000)	Qty (‘000 t)	Value (₹‘000)
<b>All Countries</b>	<b>2</b>	<b>234709</b>	<b>1</b>	<b>203336</b>
Saudi Arabia	2	159214	1	58654
Singapore	++	22430	++	48589
Oman	++	29999	++	45780
UAE	++	7543	++	13333
Indonesia	++	5422	++	13079
Malaysia	-	-	++	7640
Netherlands	-	-	++	5346
Thailand	++	2547	++	2573
Colombia	-	-	++	1977
Egypt	-	-	++	1655
Other countries	++	7554	++	4710

*Figures rounded off*

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

Country	2020-21 (R)		2021-22 (P)	
	Qty (‘000 t)	Value (₹‘000)	Qty (‘000 t)	Value (₹‘000)
<b>All Countries</b>	<b>1</b>	<b>5746</b>	<b>1</b>	<b>9495</b>
China	1	5738	1	8592
USA	-	-	++	901
Germany	-	-	++	2
Ghana	++	8	-	-

*Figures rounded off*

COAL & LIGNITE

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

Country	2020-21 (R)		2021-22 (P)	
	Qty (’000 t)	Value (₹’000)	Qty (’000 t)	Value (₹’000)
<b>All Countries</b>	<b>215260</b>	<b>1160506410</b>	<b>208636</b>	<b>2288189160</b>
Australia	54952	426857044	66798	971299396
Indonesia	92535	341262086	72531	488344670
South Africa	31095	142867128	25765	241288992
USA	12203	86477695	14374	167868788
Russia	6748	45686817	8251	118743461
Singapore	4486	28538085	6143	116403819
Mozambique	3570	23492408	6572	75620474
Canada	2963	27359117	2147	34904679
China	25	755889	2616	31774993
Switzerland	1968	11401971	2018	26018652
Other countries	4715	25808170	1421	15921236

*Figures rounded off*

**Table – 38: Imports of Coke  
(By Countries)**

Country	2020-21 (R)		2021-22 (P)	
	Qty (t)	Value (₹’000)	Qty (t)	Value (₹’000)
<b>All Countries</b>	<b>2463036</b>	<b>44821773</b>	<b>2501153</b>	<b>81047701</b>
Poland	956636	18379850	1053358	36814753
Colombia	511793	8254215	460962	12558649
Japan	396558	7439354	312603	10220095
Switzerland	212135	3437938	203554	5543786
China	33179	777874	97782	3854328
Indonesia	134664	2877509	87971	3182243
Australia	21519	225853	79299	2607937
Netherlands	-	-	38418	1668713
Russia	118850	2223214	44710	1411611
Korea, Rep. of	-	-	36371	1209220
Other countries	77702	1205966	86125	1976366

*Figures rounded off*

## FUTURE OUTLOOK

Coal is the cornerstone of Indian economy 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 to 1.4 billion tonnes. The known levels of proven coal reserves of about 187 billion tonnes as of 01.04.2022 may only be able to support an annual peak production of 1.2 to 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 advance & developed country in future 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.