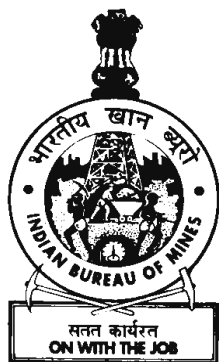


COAL & LIGNITE



Indian Minerals Yearbook 2014

(Part- III : Mineral Reviews)

53rd Edition

COAL & LIGNITE

(ADVANCE RELEASE)

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

Indira Bhavan, Civil Lines,
NAGPUR – 440 001

PHONE/FAX NO. (0712) 2565471
PBX : (0712) 2562649, 2560544, 2560648
E-MAIL : cme@ibm.gov.in
Website: www.ibm.gov.in

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Coal plays a pivotal role in 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. As per Integrated Energy Policy Committee of Planning Commission, coal will remain India's most important energy source till 2031-32 and possibly beyond. In India, about 76% coal output is consumed in 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 556.40 million tonnes in 2012-13 increased by 1.7% to 565.77 million tonnes in 2013-14. The production of lignite at 44.27 million tonnes in 2013-14 decreased by 4.7% from 46.45 million tonnes in the previous year. India ranks 3rd in world coal production.

RESOURCES

Coal

The coal deposits in India are primarily concentrated in the Gondwana sediments occurring mainly in the eastern and central parts of Peninsular India, although Gondwana coal deposits also occur in Assam and Sikkim in north eastern part of the country. The Tertiary coal-bearing sediments are found in Assam, Arunachal Pradesh, Nagaland and Meghalaya.

As a result of exploration carried out by GSI, CMPDIL and other agencies, 301.56 billion tonnes (including that estimated in Sikkim) coal reserves up to 1,200 m depth have been established in the country as on 1.4.2014. Out of these reserves, 125.91 billion tonnes are proved reserves, 142.50 billion tonnes are indicated reserves and the remaining 33.15 billion tonnes are in inferred category. Of the total reserves, the share of prime-coking coal is 5.31 billion tonnes, medium-coking & semi-coking is 28.76 billion tonnes and non-coking coal, including high sulphur is 267.49 billion tonnes. Statewise/coalfield-wise and statewise/typewise reserves of coal as on 1.4.2014 are given in Tables-1 & 2, respectively.

Lignite

Indian lignite deposits occur in the Tertiary sediments in the southern and western parts of peninsular shield particularly in Tamil Nadu, Puducherry, Kerala, Gujarat, Rajasthan and Jammu & Kashmir. The total known geological reserves of lignite as on 1.4.2014 is about 43.25 billion tonnes, of which 79% reserves are located in Tamil Nadu with about 34.35 billion tonnes. Other states where lignite deposits have been located are Gujarat, Jammu & Kashmir, Kerala, Rajasthan, West Bengal and the Union Territory of Puducherry. Statewise/districtwise reserves of lignite as on 1.4.2014 are detailed in Table - 3.

**Table – 1 : Reserves of Coal as on 1.4.2014
(By States/Coalfields)**

(In million tonnes)				
State/Coalfield	Proved	Indicated	Inferred	Total
All India : Total	125908.94	142506.29	33149.22	301564.45
Gondwana Coalfields*	125315.13	142406.95	32349.73	300071.81
Andhra Pradesh/ Godavari Valley	9729.25	9670.43	3068.47	22468.15
Assam/Singrimari	—	4.13	—	4.13
Bihar/Rajmahal	—	—	160.00	160.00
Chhattisgarh	16052.01	33252.70	3228.21	52532.92
Sohagpur	94.30	10.08	—	104.38
Sonhat	199.49	2463.86	1.89	2665.24
Jhilimili	228.20	38.90	—	267.10
Chirimiri	320.33	10.83	31.00	362.16
Bisrampur	1079.87	534.83	—	1614.70
East Bisrampur	—	164.82	—	164.82
Lakhanpur	455.88	3.35	—	459.23
Panchbahini	—	11.00	—	11.00
Hasdeo-Arand	1599.72	3665.40	263.70	5528.82

(Contd.)

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Table - 1 (Contd.)

State/Coalfield	Proved	Indicated	Inferred	Total
Sendurgarh	152.89	126.32	–	279.21
Korba	5651.14	5936.50	168.02	11755.66
Mand-Raigarh	6219.76	17699.13	2553.92	26472.81
Tatapani-Ramkola	50.43	2587.68	209.68	2847.79
Jharkhand	41377.04	32779.60	6559.47	80716.11
Raniganj	1538.19	466.56	31.55	2036.30
Jharia	15127.97	4302.09	–	19430.06
East Bokaro	3385.77	3903.71	863.32	8152.80
West Bokaro	3720.89	1308.71	33.66	5063.26
Ramgarh	710.59	495.30	58.05	1263.94
North Karanpura	9499.42	6914.61	1864.96	18278.99
South Karanpura	3230.09	1867.66	1480.22	6577.97
Aurangabad	352.05	2141.65	503.41	2997.11
Hutar	190.79	26.55	32.48	249.82
Daltongunj	83.86	60.10	–	143.96
Deogarh	326.24	73.60	–	399.84
Rajmahal	3211.18	11219.06	1691.82	16122.06
Madhya Pradesh	10411.43	12382.34	2879.33	25673.10
Johilla	185.08	104.09	32.83	322.00
Umaria	177.70	3.59	–	181.29
Pench-Kanhan	1465.78	878.66	692.13	3036.57
Patharkhera	290.80	88.13	68.00	446.93
Gurgunda	–	47.39	–	47.39
Mohpani	7.83	–	–	7.83
Sohagpur	1751.56	5464.87	193.12	7409.55
Singrauli	6532.68	5795.61	1893.25	14221.54
Maharashtra	5667.48	3186.35	2110.21	10964.04
Wardha Valley	3604.85	1497.52	1424.07	6526.44
Kamthi	1276.14	1204.88	505.44	2986.46
Umrer Makardhokra	308.41	–	160.70	469.11
Nand Bander	468.08	483.95	–	952.03
Bokhara	10.00	–	20.00	30.00
Odisha	27791.30	37873.24	9408.08	75072.62
Ib-River	9134.52	9923.55	5139.92	24197.99
Talcher	18656.78	27949.69	4268.16	50874.63
Sikkim/Rangit Valley	–	58.25	42.98	101.23
Uttar Pradesh/Singrauli	884.04	177.76	–	1061.80
West Bengal	13402.58	13022.15	4892.98	31317.71
Raniganj	13288.31	7300.71	4013.41	24602.43
Barjora	114.27	–	–	114.27
Birbhum	–	5721.44	864.57	6586.01
Darjeeling	–	–	15.00	15.00
Tertiary Coalfields	593.81	99.34	799.49	1492.64
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

(Contd.)

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Table - 1 (Concl.d.)

State/Coalfield	Proved	Indicated	Inferred	Total
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	—	306.65	315.41
Borjan	5.50	—	4.50	10.00
Jhanzi-Disai	2.00	—	0.08	2.08
Tiensang	1.26	—	2.00	3.26
Tiru Valley	—	—	6.60	6.60
DGM	—	—	293.47	293.47

Source: Coal Directory of India, 2013-14, Coal Controller's Organisation, Kolkata.

* Including Sikkim.

**Table – 2 : Reserves of Coal as on 1.4.2014
(By States/Types)**

(In million tonnes)

State/Type of coal	Proved	Indicated	Inferred	Total
All India : Total	125908.94	142506.29	33149.22	301564.45
Prime-coking	4614.35	698.71	—	5313.06
Medium-coking	13303.02	11866.78	1879.47	27049.27
Semi-coking	482.16	1003.68	221.68	1707.52
Non-coking	106915.60	128837.78	30248.58	266001.96
High sulphur	593.81	99.34	799.49	1492.64
Andhra Pradesh/Non-coking	9729.25	9670.43	3068.47	22468.15
Arunachal Pradesh/	31.23	40.11	18.89	90.23
High sulphur	—	—	—	—
Assam	464.78	46.85	3.02	514.65
Non-coking	—	4.13	—	4.13
High sulphur	464.78	42.72	3.02	510.52
Bihar/Non-coking	—	—	160.00	160.00
Chhattisgarh	16052.01	33252.70	3228.21	52532.92
Semi-coking	70.77	99.25	—	170.02
Non-coking	15981.24	33153.45	3228.21	52362.90
Jharkhand	41377.04	32779.60	6559.47	80716.11
Prime-coking	4614.35	698.71	—	5313.06
Medium-coking	12398.11	10306.67	1606.64	24311.42
Semi-coking	223.34	471.55	53.45	748.34
Non-coking	24141.24	21302.67	4899.38	50343.29
Madhya Pradesh	10411.43	12382.34	2879.33	25673.10
Medium-coking	354.49	1560.11	272.83	2187.43
Non-coking	10056.94	10822.23	2606.50	23485.67
Maharashtra/Non-coking	5667.48	3186.35	2110.21	10964.04
Meghalaya/High sulphur	89.04	16.51	470.93	576.48
Nagaland/High sulphur	8.76	—	306.65	315.41
Odisha/Non-coking	27791.30	37873.24	9408.08	75072.62
Sikkim/Non-coking	—	58.25	42.98	101.23
Uttar Pradesh/Non-coking	884.04	177.76	—	1061.80
West Bengal	13402.58	13022.15	4892.98	31317.71
Medium-coking	550.42	—	—	550.42
Semi-coking	188.05	432.49	168.23	788.77
Non-coking	12664.11	12589.66	4724.75	29978.52

Source: Coal Directory of India, 2013-14, Coal Controller's Organisation, Kolkata.

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**Table – 3 : Reserves of Lignite as on 1.4.2014
(By States/Districts)**

(In million tonnes)

State/District	Area/Lignite field	Proved	Indicated	Inferred	Total
All India : Total		6180.90	26282.67	10783.11	43246.68
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		—	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		1167.02	2671.93	1881.39	5720.34
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, Latamdesar Bada, East of Riri, Bania, Kuchaur-Athuni, Sarupdesar-Palana west, Palana East, Gigasar-Kesardesar, Ambasar-Gigasar, Girirajsar Extn., Bapeau, Bigga-Abhaysinghpura. Diyatra, Pyau, Deshnok-Ramsar-Sinthal, Borana, Bangarsar-Jaimalsar and Kenya-Ki-Basti & South of Bhane-Ka-Gaon.	558.79	231.42	305.45	1095.66
Barmer	Kapurdi, Jalipa, Bothia (Jalipa N Ext.), Giral, Jogeswartala, Sonari, Sachcha-Sauda, Bharka, Bothia-Bhakra-Dunga, Sindhari East & West, Kurla, 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	2379.94	1336.58	4211.75
Jaisalmer	Ramgarh & Khuiyala	—	—	70.44	70.44
Jaisalmer & Barmer	Khuri	—	—	13.80	13.80
Nagaur & Pali	Kasnau-Igiar, Matasukh, Mokala, Nimbri-Chadawatan, Kaprion-Ki-Dhani, Merta Road & Meeranagar, Indawar, Kuchera, Lunsara and Phalki.	113.00	60.57	79.04	252.61
Jalore	Sewara	—	—	76.08	76.08

(Contd.)

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Table - 3 (Concl'd.)

State/District	Area/Lignite field	Proved	Indicated	Inferred	Total
Tamil Nadu		3735.23	22900.05	7712.43	34347.71
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.	2831.00	2530.74	1199.78	6561.52
Ariyalur	Meensuruti, Jayamkondamcholapuram, Michaelpatti of Neyveli Lignite Field	904.23	302.50	481.07	1687.80
Thanjavur & Thiruvarur	Mannargudi-Central, Mannargudi-NE Mannargudi-NE Extn., Mannargudi SE, Melnattam-Araharam of Mannargudi Lignite Field	—	17248.06	3123.46	20371.52
Thanjavur	Mannargudi-NW & SW, Maharajapuram Orattanadu-Pattukottai, Vadaseri (Orattanadu-Pattukottai), Madukkur-Anaikadu Veppanagulam-Kasangadu of Mannargudi Lignite Field	—	2290.71	72.66	2363.37
Thanjavur & Nagapattinam	Alangudi, Pandanallur, Tirumangaicheri, and Thirumangalam of Mannargudi Lignite Field	—	359.21	534.19	893.40
Thiruvarur & Nagapattinam	Nachiyarkudi of Mannargudi Lignite Field	—	—	574.05	574.05
Ramnad	Rajasim Mangalam of Mannargudi Lignite Field	—	—	964.97	964.97
Ramnad & Sivaganga	Settanur of Mannargudi Lignite Field	—	—	20.24	20.24
Ramanathapuram	Misal, Bogalur, Bogalur (East) and Tiyanur of Ramanathapuram Lignite Field	—	168.83	742.01	910.84
Puducherry	Bahur & West of Bahur of Neyveli Lignite Field	—	405.61	11.00	416.61
West Bengal	Rakshitpur, Mahalla & Dhobbanpur	—	1.13	1.64	2.77

Source: Coal Directory of India, 2013-14, Coal Controller's Organisation, Kolkata.

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

EXPLORATION & DEVELOPMENT

The agencies engaged in exploration for coal during 2013-14 were mainly GSI, CMPDIL, MECL and State Directorates of Geology & Mining. Lignite exploration was carried out by GSI, MECL, NLC, DMGs Rajasthan & Nagaland and GMDC Ltd.

GSI carried out exploration for coal in Gondwana basins of Andhra Pradesh, Assam, Chhattisgarh, Madhya Pradesh, Maharashtra, Odisha and West Bengal to identify additional resources of power-grade coal and superior-grade coking coal. As a result of exploration carried out, additional resources of 1,827.90 million tonnes coal were assessed in the states of Assam, Chhattisgarh, Madhya Pradesh, Odisha and West Bengal during 2013-14 (as on 1.4.2014). GSI extensively continued its exploration for lignite in Rajasthan, Tamil Nadu and West Bengal,

keeping in view the high demand for accelerated growth of power and industrial sectors. However, no additional resources of lignite was estimated. GSI completed the CBM-related desorption studies in seven boreholes-two boreholes in each of Heruka sector, Birbhum Coalfield and Bandbahal block, Ib River Coalfield, and one borehole in each of Ghazipur (west) block of Birbhum Coalfield, Samarsingha and Amlidhonda block of Mand-Raigarh Coalfield during 2013-14. Details of additional resource estimation and exploration activities for coal by GSI are furnished in Tables - 4 and 5, respectively.

MECL carried out exploration in the states of Andhra Pradesh, Chhattisgarh, Jharkhand and Madhya Pradesh during 2013-14. As a result, a total of 936 million tonnes resources of non-coking coal and coking coal have been established

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at Godavari Valley coalfield in Andhra Pradesh, Mand-Raigarh coalfield in Chhattisgarh, Jharia & South Karanpura coalfield in Jharkhand and Singrauli coalfield in Madhya Pradesh. MECL also carried out exploration for lignite in Rajasthan during 2013-14. A total of 31 million tonnes of lignite resources have been established in Rajasthan.

DGM, Chhattisgarh carried out exploration for coal during 2013-14 in Surguja district and estimated 105 lakh tonnes of coal resources. DGM, Maharashtra carried out exploration for coal during 2013-14 in Nagpur, Chandrapur and Yavatmal districts and estimated about 23.32 million tonnes of coal resources. GMDC conducted exploration for lignite during 2013-14 in Bhavnagar and Kachchh districts in Gujarat. Neyveli Lignite Corporation Ltd (NLC) also carried out exploration for lignite in Barmer, Jaisalmer & Nagaur districts in Rajasthan and Cuddalore, Thanjavur & Nagapattinam districts in Tamil Nadu in 2013-14. DMG, Rajasthan carried out exploration for lignite during 2013-14 in Bikaner district and estimated 15.40 million tonnes of lignite resources. Details on exploration carried out by the various state Directorates and state undertakings are given in Table-6.

CMPDIL in its exploration programme for 2013-14 laid emphasis on proving power-grade and superior-grade non-coking coal in CIL and non-CIL blocks.

In 2013-14, a total of 6.97 lakh m exploratory drilling was achieved by CMPDIL through departmental resources (3.25 lakh m) and outsourcing (3.72 lakh m) to State Governments/MECL(MOU)/Tendering (CIL/Non-CIL blocks). Out of these, 4.59 lakh m has been drilled in CIL blocks and 2.38 lakh m in Non-CIL blocks.

CMPDIL deployed its departmental resources for exploration of CIL/Non-CIL blocks, whereas State Governments of Madhya Pradesh and Odisha deployed resources in CIL blocks only. Besides, eight other contractual agencies have also deployed resources for detailed drilling/exploration in CIL/Non-CIL blocks. A total of 120 to 140 drills were deployed in 2013-14 out of which 57 were departmental drills.

Besides, CMPDIL continued the technical supervision of promotional exploration work taken by GSI, MECL and DGM (Assam & Nagaland) and achieved 1.32 lakh m (0.63 lakh metre in coal sector)

and (0.69 lakh m in lignite sector) drilling in 2013-14. In coal sector, MECL (CIL & SCCL areas) in 9 blocks, namely, Mand Raigarh (3), Bistrampur (2), Singrauli (2) and Godavari valley (2) and achieved 46,753 m drilling. GSI in 11 blocks, namely, Raniganj CF(2), Talcher CF (2), Ib Valley (2), Sohagpur (3) and Tatapani Ramakola (2) and achieved 15,589 m drilling, while DGM (Nagaland) undertook one block in Northern Khar and 783 m drilling and DGM(Assam) undertook one block in Karbianglong and 123 m drilling for coal sector on behalf of Ministry of Coal. In lignite sector, GSI unertook promotional drilling and achieved 7,380 m drilling and MECL drilled 61,394 m on behalf of Ministry of Coal.

During 2013-14, CMPDIL and its contractual agencies conducted exploration in 100 blocks/mines spread over 22 coalfields situated in 5 states, namely, Raniganj (6 blocks/mines), Barjora (1), Brahmani (1), Rajmahal (3), Jharia (3), West Bokaro (2), Ramgarh (2), South Karanpura (5), North Karanpura (7), Kamthi (8), Nand-Bander (2), Wardha Valley(5), Sohagpur (11), Mand Raigarh (11), Korba (6), Bistrampur (2), Sonhat (1), Tatapani-Ramkola (4), Singrauli (4), Talcher (10) and Ib Valley (6). Out of the 100 blocks/mines, 26 were Non-CIL/Captive blocks and 74 CIL blocks/mines. Departmental drills of CMPDIL took up drilling activity in 53 blocks/mines, whereas contractual agencies drilled in 47 blocks/mines.

Table – 4: Additional Resources Estimated by GSI for Coal, 2013-14 (as on 1.4.2014)

(In million tonnes)	
State/Coalfield/Block	Additional resources
COAL	
Assam	1.34
A. Singrimari Coalfield Sukchar-Singrimari	1.34
Chhattisgarh	265.87
A. Mand-Raigarh Coalfield Teram	265.87
Madhya Pradesh	163.56
A. Sohagpur Coalfield Pachri	163.56
Odisha	1362.61
A. Talcher Coalfield Nuagaon North	919.91
B. Ib river Coalfield Khariapara	442.70
West Bengal	34.52
A. Raniganj Coalfield South of Hingla river	34.52
Total	1872.90

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Table – 5: Details of Exploration Activities conducted by GSI for Coal & Lignite, 2013-14

State/Coalfield/ Lignite Field	Area/Block	Exploration Activities
COAL		
Andhra Pradesh (Telangana)		
Godavari Valley Coalfield	Bugga-Khammamtogu sector, Khammam district	Regional Exploration under G-2 stage continued to explore and evaluate coal resource potentiality of Barakar coal seams which were already established in the adjoining Manuguru Mining Block. A total of 1,076.55 m was drilled in boreholes GBK-4 to 6 of which 847 m were geologically logged. An area of 0.75 sq.km was mapped on a scale of 1:10,000. Seven to nine Barakar coal/carbonaceous shale bands varying in thickness from 0.50 m to 4.80 m were intersected between 37.10 m and 516.35 m depths.
	Bugga-Khammamtogu area in Pagaderu (west) sector, Khammam district	Regional exploration under G-2 stage continued to establish the continuity of Barakar and Lower Kamthi seams which were established in Manuguru mining block. A total of 1,230.30 m was drilled in four boreholes. GPDW-3 to 6 of which 654 m was geophysically logged. An area of 3.00 sq.km was mapped on a scale of 1:10,000. Twenty seven Lower Kamthi coal/carbonaceous shale bands varying in thickness from 0.50 m to 3.70 m and eight Barakar coal/carbonaceous shale bands varying in thickness from 0.55 m to 1.70 m were intersected between 11.75 m and 447.28 m depths.
	Bugga-Khammamtogu area in Pagaderu (east) sector, Khammam district	Regional exploration under G-2 stage was initiated at Pagaderu (east) sector in the northern side of Manuguru mining block and adjacent to Pagaderu (west) sector to establish the dip continuity of the Barakar and Lower Kamthi seams. A total of 294.50 m has been drilled in borehole GPDE-1. Thin coal seams ranging in thickness from 0.50 m to 1.20 m were intersected from a depth of 14.45 m to 285.20 m. The work is in progress.
	Dorli-Bellampalli area Khairi sector, Adilabad district	An area of 100 sq.km has been mapped on a scale of 1:12,500 in Khairi sector, northwestern part of Dorli-Bellampalli coal belt in the northwestern margin of Main basi of Godavari Valley Coalfield, to examine the coal for delineating its extension below Deccan Trap cover and identifying Barakar coal seams in the northwestern side of Dorli mining block.
Assam		
Singrimari Coalfield	Sukchar-Singrimari block, Dhubri district of Assam & Meghalaya	Regional exploration under G-3 stage was taken up adjacent to Sukchar-Singrimari area of Dhubri district at the border of Assam & Meghalaya to explore the behaviour and the extension of Gondwana coal and their resource potentiality. A total area of 346.45 m was drilled in two boreholes SK-1 and 2. Exploration revealed 0.90 m thick coal seam occurring at a depth of 109 m. An area of 3 sq.km of the coalfield was also mapped and updated on a scale of 1:10,000.
	Shalibhuin-Nakaigiri-Ujangiri area of Dhubri district of Assam & West Garo Hills of Meghalaya	An area of 1.40 sq.km of the coalfield was also mapped and updated on a scale of 1:10,000. The work has been put on hold due to adverse ground conditions.
Bihar		
Northern Extension of Hura Coalfield	Mirjagaon area, Bhagalpur district	Regional exploration under G2 stage to the north of already explored Hura North Extension shows encouraging results. This work was taken up outside FSP to establish continuity of coal-bearing Barakar Formation below the cover of younger formations along strike and dip directions, to decipher the stratigraphy and structure of the block area and resource assessment of coal. A total of 798.25 m was drilled in two boreholes RBMG-1. Eighteen Barakar coal seams varying in thickness from 0.40 m to 7.65 m were intersected between 109.75 m and 443.40 m depths in borehole RBMG-1 whereas eight Barakar coal seams varying in thickness from 0.90 m to 10.40 m (Seam XIV) were intersected between 172.10 m and 321.80 m depths in borehole RBMG-2. Strike continuity of the seams for about 2 km towards further north of Hura North extension block and down-dip continuity of the seams for about 3 km in the south-eastern part of the block has been established. Investigation is underway.
Chhattisgarh		
Mand-Raigarh Coalfield	Samarsingha block Raigarh district	Regional exploration under G-2 stage studies were conducted to establish the continuity of the Barakar coal seams which were already established in the Nawagaon Block to the north and Sithra-Kurekela area in the west and to assess the coal resource potentiality. A total of 2,768.20 m was drilled in seven boreholes MRSS-7 to 13 and 1,068.20 m was

COAL & LIGNITE

Table - 5 (Contd.)

State/Coalfield/ Lignite Field	Area/Block	Exploration Activities
		geophysically logged. An area of 6 sq. km was mapped on a scale of 1:10,000. Twelve regional Barakar coal seams(I to X, XII & XIII in ascending order) and few coal seams have been intersected between depths of 16.85 m and 624.77 m. Thickness of individual coal section varies from 0.59 m to 10.75 m. Seam IV is the thickest seam with cumulative thickness ranging from 5.50 m to 10.75 m. The continuity of the coal seams have been established along dip direction towards south-west for about 5 km. The work is in progress.
	Amlidhonda block Raigarh district	Regional exploration under G-2 studies were conducted to establish the development pattern and continuity of the Barakar coal seams, already recorded in the Gare block to the north, Kesarchuan-Lamdand block in the east and to assess the coal resource potentiality of the area and to generate baseline data for CBM exploration. A total of 4,610.70 m was drilled in twelve boreholes. MRA-5 to 16 and 1,786.08 m was geophysically logged in the area. Six regional Barakar coal seams (seam III, IV, VI, VII, IX and X) varying in thickness from 1.30 m to 11.13 m and few local coal seams were intersected between 101.23 m and 425.04 m depths. Coal seams IX (2.85 m to 5.96 m) and combined coal seams VI+VII (4.91 m to 10.52 m) are important for their thickness and regional persistency. An area of 8 sq.km was mapped on a scale of 1:10,000. Continuity of the coal seams have been established for nearly 4 km along strike and 4 km in dip direction within the block. The work is in progress.
Tatapani Ramkola Coalfield	Vijaynagar-Giddhi block, Surguja district	Promotional exploration under G-2 studies were conducted to establish the stratigraphy and structural disposition of Lower Gondwana sequences, continuity of Barakar coal seams, coal resource potentiality of the area and to generate baseline data for CBM exploration. A total of 1,262.45 m was drilled in four boreholes. TRVG-9 to 12 and 1 sq.km area was mapped on a scale of 1:10,000. Ten regional Barakar coal seams (seam II to VIII, XI to XIII) varying in cumulative thickness from 0.71 m to 17 m and few local coal seams were intersected between 18 m and 521.90 m depths. Seam III (cumulative thickness from 9.89 m to 17 m) and IV(10.79 m) were important for their thickness and regional persistency. Continuity of the coal seams has been established over 6.5 km along strike and 1 km in dip direction. The investigation was completed in October, 2013.
	Pipraul block Surguja district	Promotional exploration under G-2 studies were carried out to establish the stratigraphy and structural disposition of Lower Gondwana sequences, continuity of Barakar coal seams, coal resource potentiality of the area and to generate baseline data for CBM exploration. A total of 1,565.20 m was drilled in four boreholes. TRP-1 to 4 and 596.43 m was geophysically logged in the area. An area of 2 sq.km area was mapped on a scale of 1:10,000. Regional Barakar coal seams III Top (cumulative thickness 11.46 m), III Bottom (5.94 m), II (1.13 m), I (1.25 m) and two local coal seams with 1.65 m and 1.49 m thickness were intersected between 383.43 m and 548.54 m depths in the borehole. The work is in progress.
Madhya Pradesh Singrauli Coalfield	Sarai (West) area Singrauli district	Regional exploration under G-3 studies was conducted to establish the development pattern and resource potentiality of coal horizons in Raniganj and Barakar Formations as intersected in adjacent area, stratigraphy and structural framework of the area and to generate baseline data for CBM exploration. A total of 2,539.65 m was drilled in six boreholes (SSW-4 to 9). An area of 5 sq km was mapped on a scale of 1:10,000 and 1,131 m of Geophysical logging was completed. Three regional Raniganj coal seams/zones I to III have been intersected in the depth range from 33.85 m to 229.80 m. The individual thickness of Raniganj coal seam varies from 0.50 m to 1.96 m. Seven regional Barakar coal seams/zones I to VII have been intersected in the depth range from 263 m to 585.81 m. The thickness of individual coal seams vary from 0.50 m to 3.50 m. Seam IV (cumulative thickness 3.41 m) and III (3.50 m) are important for their thickness and regional persistency. The work is in progress.
Sohagpur Coalfield	Malka block Shahdol district	Promotional exploration under G-2 stage was conducted to establish the development pattern and resource potentiality of coal horizons in Raniganj and Barakar Formations as intersected in adjacent Chainpa, Maiki and Maiki (north) blocks and structural set up of the area. A total

COAL & LIGNITE

Table - 5 (Contd.)

State/Coalfield/ Lignite Field	Area/Block	Exploration Activities
		of 1,800.50 m was drilled in four boreholes namely, SMLK-1 to 4. An area of 5 sq km was mapped on a scale of 1:10,000 and 630 m of geophysical logging was completed. Five regional Barakar coal seams namely, I, II, III, IV and V were intersected within the depth range from 380.95 m to 558.50 m with cumulative thickness of individual coal seam ranging from 0.60 m to 5.67 m. Seam III is the thickest seam. Raniganj coal seams, ranging in the thickness from 0.55 m to 4.70 m, are interbanded in nature and were intersected between the depth range of 12.95 m and 223.05 m. Continuity of the coal seam has been established along dip and strike directions for about 3 km and 7.5 km, respectively. The work is in progress.
	Bihar block Shahdol district	Promotional exploration under G-2 stage to establish the development pattern of superior grade Barakar coal seams at shallow depth, as intersected in adjacent Devanitola and Pachri blocks, structural set up of the area and evaluate the coal resources. A total of 3,042.25 m was drilled in ten boreholes namely, SBR-1 to 10 and 2,169.65 m was geophysically logged in the area. An area of 6 sq km was mapped on a scale of 1:10,000. Four regional Barakar coal seams (Seam I to IV) varying in cumulative thickness from 0.50 m to 9.20 m and few local coal seams were intersected between 109.40 m and 338.65 m depths. Seam III with cumulative thickness from 8.06 m to 9.20 m, is important for thickness and regional persistency. Continuity of the coal seam has been established for over 6 km in strike and over 2 km in dip direction within the block. The work is in progress.
Pench Valley Coalfield	Bhurkumdhana sector Chhindwara district	Regional exploration under G-3 stage were conducted to establish the dip continuity of Barakar coal seams already recorded in Payalidhana sector to the south, under favourable structural set up and to assess coal resource potentiality of the area. A total of 1,315.30 m was drilled in four boreholes namely, PBK-1 and 3 to 5 excluding in one borehole. An area of 3 sq km was mapped on a scale of 1:12,500. Four regional Barakar coal seams (I to IV) have been intersected in PBK-3 within the depth range from 379.85 m to 418.70 m. The cumulative thickness of coal is 13.50 m. The work is in progress.
	Dhorakuhi sector Chhindwara district	Regional exploration under G-3 stage was proposed to establish the dip continuity of Barakar coal seams, already recorded in the Payalidhana sector to the southwest, under favourable structural set up and to assess the coal resource potentiality of the area. An area of 6 sq.km has been mapped on a scale of 1:12,500.
Maharashtra Wardha Valley Coalfield	Jhamkola area Yavatmal District	Exploration under G-4 stage were conducted to establish the occurrence of Barakar coal seams below Deccan Traps, south-west of Parsoda-Ghonsa coal belt and to assess coal resource potentiality of the area. A total of 154.80 m was drilled in one borehole WJ-3 in Jhamkola with in-house drill machine and the borehole was abandoned within Motur Formation. The borehole WJ-4 outsourced for contractual drilling and progressed upto 66 m in Deccan Trap. Large scale mapping covering an area of 5 sq.km was mapped on a scale of 1:12,500. The work is in progress.
	Dabhadi sector Yavatmal district	Regional exploration under G-3 stage was proposed at Trap covered area of Dabhadi sector, northwest of Khadakdoh-Chichghat coal belt, as a successor item of Jhamkola with outsourced drilling. The objectives were to establish the occurrence of Barakar coal seams and to assess the coal resource potentiality of the area. However, no drilling has been done during the period. An area of 16 sq.km map of the coalfield was also updated on a scale of 1:12,500.
Odisha Talcher Coalfield	Nuagaon North area Angul district	Preliminary exploration for coal by scout drilling under G-4 stage was proposed in northeastern extension of Nuagaon North block, Angul district to explore continuity of the regional coal seam zones of Barakar Formation already explored in Nuagaon North area and Sarapal-Nuapara block and to appraise the coal resource potentiality of the area. An area of 2 sq.km has been mapped on a scale of 1:10,000. However, the work was abandoned due to overlapping with CBM leasehold area.
	Chadchadi block Deogarh & Sambalpur	Promotional exploration under G-4 stage to explore continuity of the regional coal seams of Barakar and Karharbari Formations, already

COAL & LIGNITE

Table - 5 (Contd.)

State/Coalfield/ Lignite Field	Area/Block	Exploration Activities
	districts	intersected in the Nuagaon North area towards north, and to appraise the coal resource potentiality of the area. A total of 330.80 m of drilling was done in borehole TCD-1 along with 656 m of geophysical logging. One coal seam of 4.17 m thickness was intersected between 577.17 m and 581.34 m depth. An area of 1.50 sq.km was mapped on a scale of 1:10,000. However, the work was abandoned prematurely due to overlapping with CBM leasehold area and exploration activity was shifted to Kantaikoliya block.
	Kantaikoliya block Angul district	Promotional exploration under G-3 stage was initiated to explore the strike continuity of the regional coal seam zones of Barakar and Karharbari Formations, already established in the central part of Talcher Coalfield, identification of suitable blocks for regional exploration and to appraise the coal resource potentiality of the area. A total of 682.20 m of drilling was completed so far in two boreholes TKK-1 and TKK-2. The thickest seam recorded from the Kantaikoliya block is of 5.23 m at a depth of 146.24 m and thinner seams are confined to depths between 61.35 m and 254.61 m. The work is in progress.
Ib River Coalfield	Grindola block Jharsuguda district	Promotional exploration under G-2 stage continued with the objectives to establish the continuity of Raniganj and Barakar coal seams of Kuraloi (A) North block, stratigraphy and structural set up of the area and resource potentiality. A total of 2,203.30 m of drilling was done in five boreholes, IBGD- 3 to 7. Four regional Raniganj coal seam zones, R-I to R-IV, varying in cumulative thickness from 1.22 m to 22.05 m were intersected within a depth range of 36.33 m to 204.80 m. Four regional Barakar seam zones Rampur, Lajkura, Parkhani and Belpahar in ascending order were intersected between 231.00 m and 794.14 m depths. Thickness of Barakar seam zones vary from 12.52 m to 62.89 m, thickest being Lajkura in borehole IBGD-5. The work is in progress.
	Bandbahal block Jharsuguda district	Promotional exploration under G-2 stage was continued with the objectives to establish the continuity of regional Barakar and Raniganj seams along with establishing the structural set-up of the area. A total of 2,260.20 m was drilled in five boreholes IBBA-1 to 4 and 1,603 m was geophysically logged. An area of 4 sq.km has been mapped on a scale of 1:10,000. Four regional Raniganj coal seam zones, varying in cumulative thickness from 1.57 m to 19.01 m were intersected within a depth range of 82.59 m to 242.95 m. Four regional Barakar seam zones Rampur, Lajkura, Parkhani and Belpahar in ascending order were intersected between 243.89 m and 797.61 m depths. Thickness of Barakar seam zones vary from 3.79 m to 67.69 m, thickest being Lajkura in borehole IBBA-1. A reduction in thickness of Rampur seam zone in this part of the coalfield is conspicuous. Investigation is underway.
	Bartap block Jharsuguda district	Promotional exploration under G-2 stage was taken up a successor item of Grindola block with the objectives to establish the continuity of regional Barakar and Raniganj seams along with establishing the structural set-up of the area. An area of 2 sq.km has been mapped on a scale of 1:10,000. However, due to extension of time frame of Grindola block, drilling in Bartap block could not be initiated. Bioturbation within Raniganj Formation has been noted in Ib River coalfield.
West Bengal Raniganj Coalfield	Kamalpur block Bardhaman district	Promotional exploration under G-2 stage was initiated to establish the development pattern and structural disposition of Raniganj seams under Panchet cover, strike continuity of coal horizons intersected in adjacent Bishtupur-Dandeshwar block, resource potentiality and preliminary assessment of CBM potentiality. A total of 1,303.35 m was drilled in two boreholes RKP-1 and RKP-2 and 1,303 m was geophysically logged. An area of 4 sq.km area was mapped on a scale of 1:10,000. Thin coal seams of Raniganj Formation varying in thickness from 1.00 m to 1.70 m were intersected between 458 m to 646.40 m depth. The work was abandoned prematurely on 11.01.2014 due to overlapping with CBM leasehold area. Gaurangapur-Bankati block has been taken up as an alternative project.

Contd.

COAL & LIGNITE

Table - 5 (Contd.)

State/Coalfield/ Lignite Field	Area/Block	Exploration Activities
Raniganj Coalfield	Gaurangapur-Bankati Bardhaman district	Promotional exploration under G-4 stage was initiated with the objectives to establish eastward continuity of the regional coal seams of Raniganj Formation, already established in the Bishtupur-Dandeswar Sector and to demarcate suitable blocks for follow up regional exploration for coal under G-2 Stage in the eastern part of Raniganj Coalfield. A total of 833.10 m was drilled in two boreholes RGB-1 and RGB-2. Seven thin coal seams/bands with thickness varying from 0.50 m to 1.78 m were intersected between 275.35 m and 316.00 m depths in borehole RGB-1 whereas nine thin coal seams/bands with thickness varying from 0.40 m to 1.80 m were intersected between 249.05 m and 417.17 m depth in borehole RGB-2. Needle Shale of Talcher Formation, Ajoy River section, Raniganj C.F. has been noted. Investigation is underway.
Birbhum Coalfield	Ghazipur west block Birbhum district	Regional exploration under G-2 stage continued to examine the extent of coal-bearing Barakar and other Gondwana formations below the Tertiary and Rajmahal Trap cover and to appraise the coal and lignite seam development. A total of 1,325.30 m drilling in three boreholes BGZW- 2 to 4 and 556.60 m geophysical logging was completed. An area of 6 sq.km was mapped on a scale of 1:10,000. Three regional coal seams, zones IV, III and II of Barakar Formation with cumulative thickness 4.82 m, 13.12m and 1.91 m, respectively were intersected in between 599.43 m and 720.57 m depth. Tests for baseline data generation for CBM were conducted. Investigation is underway.
	Heruka Sector, Birbhum district	Regional exploration under G-3 stage continued in south of already explored Dhobbanpur sector, to establish the continuity and development pattern of coal-bearing Barakar Formation below the Tertiary rocks. A total of 2,142.10 m drilled in five boreholes BHK-4 to 8 and 1,481 m geophysically logged. An area of 6 sq.km was mapped on a scale of 1:10,000. Thin seams/bands in-between the depths of 392.06 m and 471.94 m with a maximum thickness of 0.97 m was intersected in one borehole. Tests for baseline data generation for CBM were conducted. Investigation was closed.
	Djhara Sector, Birbhum district	Regional exploration under G-4 stage has been initiated on 12.03.2014, to the south of Ghazipur (west) block and east of Heruka Sector, to establish continuity of coal-bearing Barakar Formation below the cover of Tertiary sediments, to examine the development pattern of coal and lignite seams and generation of baseline data related to CBM. An area of 336.10 m has been drilled in borehole BDJ-1. Investigation is underway. Columnar joint within Rajmahal Trap is one of the notable features in Birbhum coalfield.
LIGNITE		
Tamil Nadu		
East Coast Lignite field	Uttarakosamangai sector, Ramanathapuram district	Promotional exploration under G-3 stage continued to delineate lignite-bearing areas and to assess the resource potentiality. A total of 3,817.55 m was drilled in twelve boreholes RUL-13 to 24. Geophysical logging of 3,240 m was conducted to demarcate the lignite zones. Three lignite seams varying in cumulative thickness from 5 m to 24.30 m were intersected between 175 m to 405 m depths within Neyveli Formation. The strike continuity of about 7 km and dip continuity of about 6.5 km has so far been established. Investigation is underway.
Rajasthan		
West Coast Lignite field	Kharicharnan area, Jaisalmer & Bikaner districts	Promotional exploration under G-4 stage continued to locate lignite-bearing blocks, stratigraphic set up of the area and preliminary assessment of resource. A total of 653.50 m drilling has been done in seven boreholes RPKS-10 to 16 without intersecting any lignite seam. Investigation was closed.
West Coast Lignite field	Panna Sector Jaisalmer and Bikaner districts	Promotional exploration under G-4 stage was initiated to locate lignite-bearing blocks, stratigraphic set up of the area and preliminary assessment of resource. A total of 2,124.50 m was drilled in ten boreholes RPP-1 to 10 and 1,256.80 m was geophysically logged to ascertain the presence of lignite zones. The maximum thickness of lignite seam intersected is of 1 m at 83 m depth along with thinner bands of about 0.10 m to 0.80 m thickness within a depth of 83 m to 118.35 m. Investigation is underway.

COAL & LIGNITE

Table - 5 (Concl.d.)

State/Coalfield/ Lignite Field	Area/Block	Exploration Activities
West Bengal		
	Krishnanagar area Birbhum district	Preliminary exploration under G-4 stage by scout drilling was initiated for assessing the resource potentiality of lignite within Tertiary sediments and to delineate stratigraphy and structural framework of the area. Exploration in Krishnanagar area does not yield any lignite seam although very thin coal bands of a maximum thickness 0.45 m were intersected in between the depths of 14.90 m and 26.90 m with a total drilling of 179.80 m in four boreholes RKN-1 to 4. An area of 40 sq.km was mapped on a scale of 1:25,000. Investigation was closed.
	Adharsuli area Bardhaman district	Promotional exploration under G-4 stage continued to search for the development of lignite within Tertiary sediments and to establish resource potentiality. Adharshuli Block was taken up based on sporadic intersection of lignite in earlier explored blocks in the surrounding area. A total of 740.90 m has been drilled in four boreholes RAS-6 to 9. However, no lignite seam has been intersected. Due to non-availability of lignite seam and overlapping with CBM leasehold area, the work was prematurely closed.

Table – 6 : Details of Exploration for Coal and Lignite by State Directorates of Geology & Mining and State Undertakings, 2013-14

Agency/State/ District	Location	Geological mapping		Drilling		Remarks Reserves/Resources estimated
		Area (sq km)	Scale	Boreholes	Meterage	
COAL						
DGM						
Chhattisgarh						
Surguja	Gotan-Birjupali area	125 0.50	1:50,000 1:4,000	-	-	Work under progress.
--do--	Saidu area	160 2.24	1:50,000 1:4,000	1	872.05	About 105 lakh tonnes of coal resources were estimated.
Maharashtra						
Nagpur	Dawa-Phukeshwar	-	1:5,000	-	1849.00	About 0.861 million tonnes resources of coal were estimated (10.531 million tonnes so far).
-do-	Nand-Panjrepar	-	-do-	-	7042.00	About 2.57 million tonnes resources of coal were estimated (31.97 million tonnes so far).
Yavatmal	Adkoli-Khadakdoh	-	-do-	-	1894.00	About 2.46 million tonnes resources of coal were estimated (5.49 million tonnes so far).
-do-	Ashtona Kothurna	-	-do-	-	1282.75	About 1.024 million tonnes resources of coal were estimated (1.87 million tonnes so far).
Chandrapur	Nandori	-	-	-	3577.40	About 6.13 million tonnes resources of coal were estimated (194.83 million tonnes so far).
-do-	Wislon block	-	-	-	1480.50	About 7.39 million tonnes resources of coal were estimated (59.99 million tonnes so far).
-do-	Chalbardi	-	-	-	1553.00	About 2.88 million tonnes resources of coal were estimated (4.17 million tonnes so far).

(Contd.)

COAL & LIGNITE

Table - 6 (Concl.d.)

Agency/State/ District	Location	Geological mapping		Drilling		Remarks Reserves/Resources estimated
		Area (sq km)	Scale	Boreholes	Meterage	
LIGNITE						
GMDC, Gujarat						
Kachchh	N/v Panandhro	-	1:5,000	-	-	-
Bhavnagar	Tagdi village	-	-	-	-	-
Neyveli Lignite Corp. Ltd (NLC)						
Rajasthan						
Barmer	Matasar Tala	-	-	5	2902.00	Exploration work underway.
-do-	Baytu	-	-	18	7214.70	-do-
-do-	Bhurtiya	-	-	45	15014.90	-do-
Jaisalmer	Aslai-Soda	-	-	4	356.00	Exploration work has been completed.
Nagaur	Phalodi, Gangardi & Ucharda	-	-	23	5008.90	Exploration work underway.
-do-	Deswal	-	-	4	866.30	-do-
Tamil Nadu						
Cuddalore	East of Sethiathope	-	-	35	14569.00	Exploration work underway.
-do-	Vayalampur	-	-	4	1862.00	-do-
Thanjavur & Nagapattinam	Kadalangudi	-	-	42	13600.00	Exploration work is completed.
DMG, Rajasthan						
Bikaner	N/v Kenya-Ki-Basti	-	-	25	4314.50	About 15.40 million tonnes of lignite was estimated.
-do-	N/v Ambasar, Barsinghsar & Hadla	-	-	2	349	

PRODUCTION, STOCKS AND PRICES

COAL

Production

The provisional total production of coal in 2013-14 was around 565.8 million tonnes which was higher by 1.7% as compared to the previous year. Chhattisgarh continued to be the largest coal producing state with a share of about 22.5% followed closely by Jharkhand and Odisha with contributions of 20% and 19.9%, respectively, to the national output. Next in order of share in the total production were Madhya Pradesh (13.4%), Andhra Pradesh (8.9%), Maharashtra (6.6%), West Bengal (5%) and Uttar Pradesh 2.6 percent. The remaining 1.1% of coal production was accounted for Arunachal Pradesh, Assam, Jammu & Kashmir and Meghalaya.

As a comparison, the production of coal in 2012-13 was 556.4 million tonnes with contribution from Chhattisgarh (21.2%) followed by Jharkhand (20%), Odisha (19.8%), Madhya Pradesh (13.6%), Andhra Pradesh (9.6%), Maharashtra (7%), West Bengal (4.8%) and Uttar Pradesh 2.9 percent. The remaining 1.1% of coal production share was from the states of Arunachal Pradesh, Assam, Jammu & Kashmir and Meghalaya (Table-8).

During the year 2013-14, coal mining was confined mainly to the public sector which contributed 93.3% to the national production. In 2013-14, out of the total production of coal, 10% was coking coal and the rest 90% was non-coking coal. As in the earlier years, bulk of the coking coal production i.e. about 87.1% was reported from the public sector. Gradewise analysis of coking coal in 2013-14 revealed that washery grade IV had the maximum share at 72.1%, followed by washery grade III (22.2%), washery grade II (3.6%) and washery grade I (0.3%). The remaining 1.8% production of coking coal was of steel grade I, steel grade II, semi-coking grade I and SLVI. Out of the total production of coking coal in India, bulk quantity i.e. 97% was produced in Jharkhand followed by West Bengal with 2.4 percent. The remaining 0.6% was contributed by Chhattisgarh and Madhya Pradesh.

During 2013-14, except a nominal quantity (6%), the balance production of non-coking coal (94%) came from the public sector. Out of the total non-coking coal production, 24.8% was of G11 grade, followed by 13.5% of G13 grade, 11.2% of G9 grade, 11.1% of G12 grade, 10.9% of G10 grade, 7% of G7 grade, 5.6% of G8 grade, 4.2% of G4 grade, 3.5% of G6 grade and 2.6% of G5 grade. The remaining 5.6% production was contributed by G1, G2, G3, G14, G15, G16, G17 and UNG grades of

COAL & LIGNITE

non-coking coal. Chhattisgarh was the largest producing state of non-coking coal in 2013-14 which alone accounted for 25% of the national output. Next in order were Odisha with a contribution of (22.2%), Madhya Pradesh (14.8%), Jharkhand (11.4%), Andhra Pradesh (9.9%), Maharashtra (7.3%), West Bengal (5.3%) and Uttar Pradesh (2.9%). The remaining 1.2% production came from the states of Assam, Arunachal Pradesh, Jammu & Kashmir and Meghalaya (Tables-9 to 11).

A total of 536 coal mines (as on 31.03.2014) in India reported production in 2013-14. Out of these, Jharkhand accounted for 152 mines while West Bengal for 100 mines, Madhya Pradesh (71), Maharashtra (63), Chhattisgarh (61), Andhra Pradesh (49) and Odisha (27). The remaining 13 mines were from the states of Arunachal Pradesh, Assam, Jammu & Kashmir and Uttar Pradesh (Table - 7).

Despatches

Despatches of raw coal at about 572.1 million tonnes in 2013-14 were higher by around 0.9% as compared to those in the previous year. Chhattisgarh was the leading state in the despatches in 2013-14 and accounted for 21.8% of the total despatches. The states next in order were Jharkhand and Odisha (20.4% each), Madhya Pradesh (11%), Andhra Pradesh (8.4%), Maharashtra (6.5%), Uttar Pradesh (5.4%) and West Bengal (5%). The remaining 1.1% despatches were from the states of Meghalaya, Assam, Arunachal Pradesh and Jammu & Kashmir.

During the year 2013-14, statewise analysis revealed that despatches of coal increased in the states of Chhattisgarh, Madhya Pradesh, Meghalaya, Odisha, Uttar Pradesh and West Bengal. The despatches from the remaining states of Andhra Pradesh, Assam, Arunachal Pradesh, Jammu & Kashmir, Jharkhand and Maharashtra decreased as against the previous year.

Of the total despatches of raw coal effected in 2013-14, a sizeable share of 76.5% was made to the Electricity Sector. As much as 2.7% was made to the Steel Industry, 2.2% to the Sponge Iron Industry, 2% to the Cement Industry, 0.4% to the Fertilizer and 0.3% to the Paper & Pulp Industry. The remaining 15.9% was made for other priority sectors including Textile & Rayons, Cokeries, Chemical and Other Basic Metals.

During the year 2012-13, the total despatches of raw coal, a sizeable share of 76.4% was made to the electricity sector. As much as 2.8% was made to the steel industry and 2.6% to the sponge iron industry, 2.3% to the cement industry, 0.4% each to the fertilizer and paper & pulp industry. The remaining 15.1% was made for other priority sectors including chemical, cokeries, textile & rayons and other basic metals (Tables-12 & 13).

Stocks

The mine-head stocks of coal at the end of the year 2013-14 were 55.5 million tonnes which decreased by 12% compared to the stocks available at the beginning of the year. Bulk of the coal stocks (about

99.7%) at the end of the year was accounted for by the mines located in the states of Odisha, Jharkhand, Chhattisgarh, Madhya Pradesh, Maharashtra, Uttar Pradesh, Andhra Pradesh and West Bengal (Table-14).

Prices

Domestic prices of coal during 2009-10 to 2013-14 are furnished in the General Review on 'Prices'.

LIGNITE

Production

During the year 2013-14, the production of lignite at 44.3 million tonnes decreased by 4.7% in comparison to that of the previous year. The production from Tamil Nadu alone accounted for 56.6%. The share of Gujarat in lignite production was 26.2% and that of Rajasthan was 17.2 percent (Table-15).

Out of the total 16 mines that reported lignite production in 2013-14, seven are located in Gujarat, six in Rajasthan and remaining three in Tamil Nadu (Tables - 16).

Despatches

The quantum of despatches of lignite was 43.9 million tonnes during the year 2013-14, which decreased by 5.2% as compared to that in the previous year (Table-17).

Stocks

The mine-head stocks of lignite at the end of 2013-14 were 1,860 thousand tonnes which increased by 24.58% compared to the stocks available at the beginning of the year. The bulk of the coal stocks (93.49%) at the end of the year was accounted for by the mines located in the state of Tamil Nadu (Table- 18).

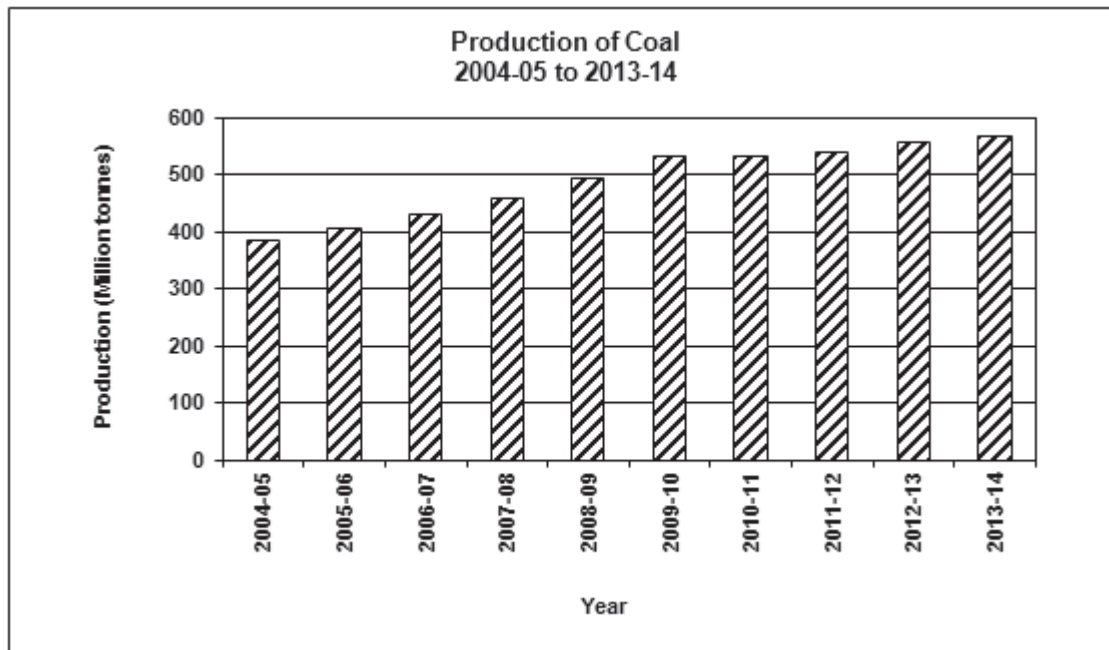
**Table – 7 : Number of Coal Mines,
2012-13 & 2013-14
(By States)**

State	No. of Mines	
	2012-13	2013-14#
India	559	536
Andhra Pradesh	50	49
Arunachal Pradesh	1	1
Assam	6	4
Chhattisgarh	60	61
Jammu & Kashmir	4	4
Jharkhand	176	152
Madhya Pradesh	71	71
Maharashtra	58	63
Odisha	28	27
Uttar Pradesh	4	4
West Bengal	101	100

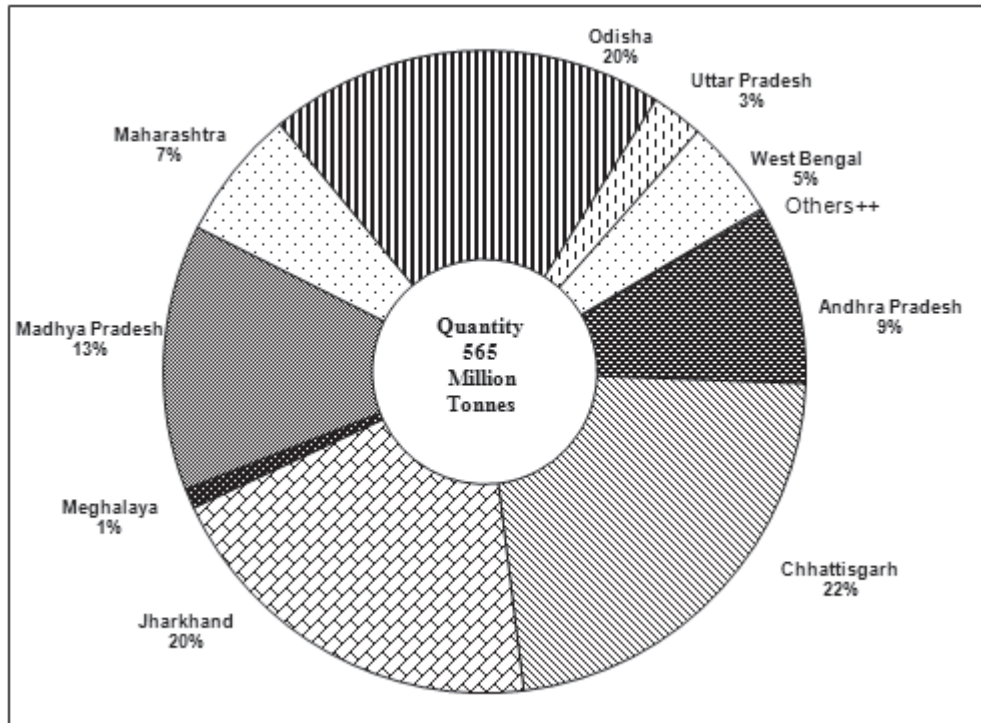
Relates to number of mines as on 31.03.2014.

Note: Coal Mines in the state of Meghalaya operated in private sector are not accounted here (Source: Coal Directory of India, 2013-14, Coal Controller's Organisation, Kolkata).

COAL & LIGNITE



Quantity of Production of Coal in Different States in 2013-14



Value of Production of Coal in Different States in 2013-14

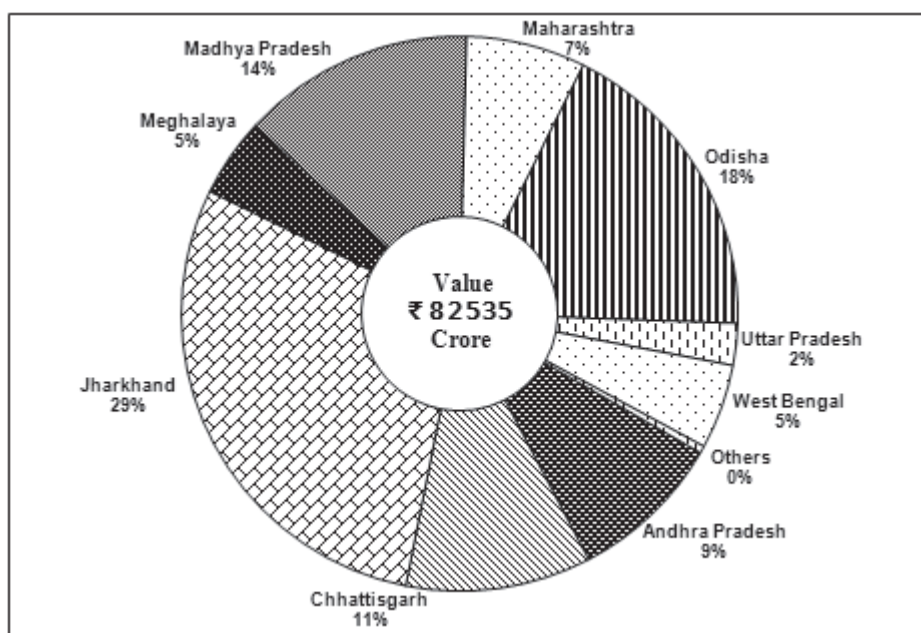


Table – 8 : Production of Coal, 2011-12 to 2013-14 (P)
(By Sectors/States)

(Quantity in '000 tonnes; Value in ₹ '000)

State	2011-12		2012-13		2013-14(P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	539950	701719100	556402	747186600	565765	825347500
Public sector	490755	594510600	509240	629747000	528080	754795200
Private sector	49195	107208500	47162	117439600	37685	70552300
Andhra Pradesh	52211	90008100	53190	91695800	50469	73998000
Arunachal Pradesh	221	1464100	73	483600	-	-
Assam	602	3988000	605	3591200	664	3392900
Chhattisgarh	113958	70740300	117830	90750700	127095	89275000
Jammu & Kashmir	20	42500	19	40400	19	40400
Jharkhand	109566	139887600	111274	175665400	113091	240509800
Madhya Pradesh	71123	83305500	75948	93737900	75590	111792700
Maharashtra	39159	53112600	39134	62356800	37223	57363500
Meghalaya	7206	47739800	5640	37365000	5732	37974500
Odisha	105476	96399000	110132	47256800	112917	150160600
Uttar Pradesh	16178	34369500	16090	35844200	14721	20046100
West Bengal	24230	80662100	26467	108398800	28244	40794000

Source: Coal Directory of India, 2013-14, Coal Controller's Organisation, Kolkata.

COAL & LIGNITE

Table – 9: Production of Coal, 2012-13 & 2013-14 (P)
(By Grades and Sectors)

(In '000 tonnes)

Grade	2012-13			2013-14(P)		
	Total	Pub. Sec.	Pvt. Sec.	Total	Pub. Sec.	Pvt. Sec.
All Grades	556402	509240	47162	565765	528080	37685
Coking	51582	44274	7308	56818	49503	7315
ST-I	72	72	–	61	61	–
ST-II	1370	1370	–	604	604	–
W-I	260	260	–	145	145	–
W-II	1711	1608	103	2042	1742	300
W-III	12346	10400	1946	12616	11579	1037
W-IV	35656	30397	5259	40962	34984	5978
SC-I	167	167	–	135	135	–
SLV1	–	–	–	253	253	–
Non-coking	504820	464966	39854	508947	478577	30370
G1	5899	259	5640	6130	331	5799
G2	480	480	–	416	416	–
G3	5622	5622	–	5374	5374	–
G4	17619	17619	–	21526	21526	–
G5	15162	15155	7	13236	13236	–
G6	22708	16671	6037	17714	16884	830
G7	34842	34365	477	35837	35278	559
G8	24189	20637	3552	28273	27767	506
G9	66817	61659	5158	57003	55680	1323
G10	59118	58981	137	55405	53622	1783
G11	120369	116963	3406	126328	123303	3025
G12	36932	33443	3489	56372	53281	3091
G13	81090	79505	1585	68984	67076	1908
G14	3168	–	3168	4556	898	3658
G15	3968	2213	1755	3858	2442	1416
G16	1630	–	1630	3093	613	2480
G17	5207	1394	3813	4786	845	3941
UNG	–	–	–	56	5	51

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

Table – 10: Production of Coking Coal, 2013-14 (P)
(By States and Grades)

(In '000 tonnes)

State	All-Grades	ST-I	ST-II	W-I	W-II	W-III	W-IV	SLV1	SC
India	56818	61	604	145	2042	12616	40962	253	135
Chhattisgarh	125	–	–	–	–	–	–	–	125
Jharkhand	55088	61	604	145	1439	11877	40962	–	–
Madhya Pradesh	249	–	–	–	249	–	–	–	–
West Bengal	1356	–	–	–	354	739	–	253	10

Source: Coal Directory of India, 2013-14.

Table – 11 : Production of Non-coking Coal, 2013-14
(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	
India	508947	6130	416	5374	21526	13236	17714	35837	28273	57003	55405	126328	56372	68984	4556	3858	3093 4786 56
Andhra																	
Pradesh	50469	-	-	-	-	731	17	5881	1333	9068	1906	15618	1	11797	236	2442	613 826 -
Assam	664	331	298	-	35	-	-	-	-	-	-	-	-	-	-	-	-
Chhattisgarh	126970	-	-	1796	3829	3351	3267	1575	938	1323	6525	79799	13723	-	3007	1416	2480 3941 -
Jammu &																	
Kashmir	19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19 -
Jharkhand	58003	67	62	794	324	3495	4903	1983	4663	20886	2861	17889	25	-	-	-	- 51
Madhya																	
Pradesh	75341	-	-	1647	1394	2030	7502	22642	3100	907	35452	-	-	-	662	-	- 5
Maharashtra	37223	-	-	-	-	162	806	1291	10540	23633	393	317	-	81	-	-	-
Meghalaya	5732	5732	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Odisha	112917	-	-	-	-	101	-	32	162	1186	1101	9997	42581	57106	651	-	-
Uttar Pradesh	14721	-	-	-	-	146	147	-	7261	-	7167	-	-	-	-	-	-
West Bengal	26888	-	56	1137	15944	3220	1072	2433	276	-	-	2708	42	-	-	-	-

Source: Coal Directory of India, 2013-14.

COAL & LIGNITE

Table – 12 : Despatches of Coal, 2012-13 & 2013-14 (P)
(By States)

(In '000 tonnes)

State	2012-13	2013-14(P)
India	567136	572060
Andhra Pradesh	52025	47892
Arunachal Pradesh	55	–
Assam	618	577
Chhattisgarh	121058	124674
Jammu & Kashmir	14	13
Jharkhand	119276	116798
Madhya Pradesh	60411	63096
Maharashtra	38316	37205
Meghalaya	5640	5732
Odisha	114213	116795
Uttar Pradesh	28824	30807
West Bengal	26686	28471

Source: Office of the Coal Controller's Organisation

Table –13 : Despatches of Raw Coal, 2012-13 & 2013-14 (P)
(By Priorities)

(In '000 tonnes)

Priority	2012-13	2013-14 (P)
Total	567136	572060
Steel	15988	15276
Sponge Iron	14971	12512
Chemical	350	351
Electricity	433621	437590
Cement	12813	11636
Cokeries	157	899
Paper & pulp	2118	1906
Fertilizer	2511	2288
Textile & Rayons	304	360
Other Basic metal	568	738
Others	83735	88504

Note: Steel includes direct feed & coking washery for metallurgical use and steel (boilers); non-coking washery and bricks included in others.

COAL & LIGNITE

**Table – 14: Mine-head Stocks of Coal, 2013-14
(By States)**

(In '000 tonnes)

State	At the beginning of the year	At the end of the year
India	63049	55514
Andhra Pradesh	3020	5548
Arunachal Pradesh	22	–
Assam	82	169
Chhattisgarh	5639	7186
Jammu & Kashmir	5	13
Jharkhand	17796	13987
Madhya Pradesh	7318	5756
Maharashtra	5656	5670
Odisha	18175	14293
Uttar Pradesh	3224	1274
West Bengal	2112	1618

Source: Coal Directory of India, 2013-14

**Table – 15 : Production of Lignite, 2011-12 to 2013-14 (P)
(By Sector/States)**

(Quantity in '000 tonnes; Value in ₹ '000)

	2011-12		2012-13		2013-14(P)	
	Quantity	Value	Quantity	Value	Quantity	Value
India	42332	53376500	46453	55114100	44271	59675300
Public sector	41095	51816764	46156	54761725	44081	59419189
Private sector	1237	1559736	297	352375	190	256111
Gujarat	14779	15249900	14528	14990900	11588	12547100
Rajasthan	2963	1161800	7081	2776600	7627	5136100
Tamil Nadu	24590	36964800	24844	37346600	25056	41992100

Source: Coal Directory of India, 2013-14.

**Table – 16 : Number of Lignite Mines
2012-13 & 2013-14
(By States)**

State	No. of Mines	
	2012-13	2013-14
India	16	16
Gujarat	7	7
Rajasthan	6	6
Tamil Nadu	3	3

Source: Coal Directory of India, 2013-14.

**Table – 17 : Despatches of Lignite
2012-13 & 2013-14
(By States)**

(In '000 tonnes)

State	2012-13	2013-14
India	46313	43897
Gujarat	14670	11831
Rajasthan	7331	7628
Tamil Nadu	24312	24438

Source: Coal Directory of India, 2013-14.

Table – 18 : Mine-head Stocks of Lignite, 2013-14 (By States)

(In '000 tonnes)		
State	At the beginning of the year	At the end of the year
India	1493	1860
Gujarat	320	69
Rajasthan	52	52
Tamil Nadu	1121	1739

Source: Coal Directory of India, 2013-14.

MINING & MARKETING

Coal

Coal mining in the country is carried out by both opencast and underground methods. Opencast mining contributes over 91% of total production whereas rest of the production (about 9%) comes from underground mining. Most mines are either semi-mechanised or mechanised. The machineries commonly deployed are drill machines, load-haul-dumper (LHD), ventilation fans, pumps for dewatering, haulage for transport, etc. In order to arrest the decline in production from a few underground mines, "mass production technology" by introducing 'continuous miner' is being practised. Modern roof-bolting technology with "flexibolts" up to 5 m length; 'smart bolting' for cost reduction of roof support; and introduction of mechanised roof bolting using hydraulic bolts for difficult roof are new technology absorptions in Indian Underground Coal Mining. Mechanised Long wall mining (long wall powered support) has also been introduced in a limited scale which yields higher output with high percentage recovery (70-80%). In opencast mines, machineries like draglines, dozers, shovels, dumpers and graders are deployed for various operations.

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

There are eight coal producing companies in the public sector. Out of these, Eastern Coalfields

Limited (ECL), Bharat Coking Coal Limited (BCCL), Central Coalfields Limited (CCL), Western Coalfields Limited (WCL), South-Eastern Coalfields Limited (SECL), Mahanadi Coalfields Limited (MCL), Northern Coalfields Limited (NCL) and CMPDIL are subsidiary companies of Coal India Ltd (CIL), a Government of India undertaking. 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 Andhra Pradesh. The coal mines in Assam and its neighbouring areas are controlled directly by CIL under the unit North Eastern Coalfields Ltd (NEC).

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 industries and power stations in the western region of the country.

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

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

COAL & LIGNITE

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 Andhra Pradesh producing 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) and 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 31.3.2014, there were 536 operating mines for coal in the country out of which 227 were opencast, while 282 were underground mines. The remaining 27 were mixed collieries. There were 508 public sector mines and 28 mines in private sector (Table-19). Thrust is given on further increasing production from opencast mines where the gestation period is comparatively shorter. In 2013-14, the share of production of raw coal from opencast mines was 516.12 million tonnes (91.2%) against 49.65 million tonnes (8.8%) from underground mines (Table-20). Production of coal by different mining technologies employed is furnished in Table-21. The overall Output per Man Shift (OMS) for CIL in 2013-14 was 5.79 tonnes as against 5.32 tonnes in 2012-13. The overall OMS for SCCL in 2013-14 was 3.86 tonnes as against 3.14 tonnes in the previous year.

**Table – 19 : Number* of Coal Mines, 2013-14
(By Sectors/States)**

State	No. of collieries			
	OC	UG	Mixed	Total
All India	227	282	27	536
Public sector	205	276	27	508
Private sector	22	6	—	28
Andhra Pradesh	16	33	—	49
Arunachal Pradesh	1	—	—	1
Assam	3	1	—	4
Chhattisgarh	23	37	1	61
Jammu & Kashmir	—	4	—	4
Jharkhand	74	56	22	152
Madhya Pradesh	24	47	—	71
Maharashtra	41	22	—	63
Odisha	17	10	—	27
Uttar Pradesh	4	—	—	4
West Bengal	24	72	4	100

Source: Coal Directory of India, 2013-14, Coal Controller's Organisation, Kolkata.

** As on 31.3.2014*

Note: OC - Opencast UG - Underground.

Table – 20 : Production of Raw Coal

(In million tonnes)

Year	Production from open-cast mines (% share)	Production from under-ground mines (% share)	Total production
2011-12	487.993 (90.4%)	51.957 (9.6%)	539.950
2012-13	504.195 (90.6%)	52.207 (9.4%)	556.402
2013-14	516.116 (91.2)	49.649 (8.8)	565.765

Source: Coal Directory of India, 2013-14, Coal Controller's Organisation, Kolkata.

**Table – 21 : Production of Coal, 2013-14
(By Technologies)**

(In million tonnes)		
Technology adopted	Production	Percentage of total
All India : Total	565.765	100
Opencast (Total)	516.116	91.20
Mechanised	515.745	99.90
Manual	0.371	0.10
Underground (Total)	49.649	8.80
Conventional B&P	3.313	6.70
Mechanised B&P	40.982	82.50
Conventional LW	0.177	0.40
Mechanised LW	0.216	0.40
Other methods	4.961	10.00

Source: Coal Directory of India, 2013-14,
Coal Controller's Organisation, Kolkata.

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

As the prices of all grades of coking coal was deregulated with effect from 1.4.1996, distribution is done by CIL/coal companies. The Government of India has amended provisions of Colliery Control Order 1945 and Colliery Control Order 2000 has been notified, according to which, the price & distribution of all grades of coal with effect from 1.1.2000 have been de-regulated.

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

Lignite

Out of the sixteen opencast working mines, four are owned by Neyveli Lignite Corporation (NLC), five by Gujarat Mineral Development Corporation Ltd (GMDCL), three by Rajasthan State Mines & Minerals Limited (RSMML), and one mine each by Gujarat Industries Power Co. Ltd (GIPCL), Gujarat Heavy Chemicals Ltd (GHCL), Barmer Lignite Mining Company Limited (BLMCL) & V S Lignite Power Pvt. Ltd (VSLPPL). Sectorwise, fifteen mines are under public sector and the remaining one is under private sector i.e. GHCL. NLC reported maximum production during the period under review. The Neyveli Lignite Mine is the largest opencast mine in the country with eco-friendly technology. The NLC operates three opencast mines at

Neyveli, Tamil Nadu and one opencast mine at Barsingsar, Rajasthan. The present installed capacity of all NLC mines stands at 30.6 MTPA (viz. mine-I (10.5 MTPA+mine-IA in 3.0 MTPA+mine-II in 15.0 MTPA+Barsingsar in 2.1 MTPA) and the production of lignite for all mines was 266.09 lakh tonnes during 2013-14 which increased by 1.47% from 262.23 lakh tonnes in the previous year. The NLC's mines are highly mechanised. These mines are linked to three thermal power stations at Neyveli and one thermal power station at Barsingsar with a total power generation capacity of 2740 MW (viz. TPS-I in 600 MW+TPS expansion in 420 MW+TPS-II in 1470 MW+Barsingsar in 250 MW) as on 31.3.2014. Besides, a 1000 MW lignite based Neyveli New Thermal Power Project, as a replacement to 600 MW old TPS-I and 500 MW TPS-II expansion at Neyveli are under implementation.

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 syn-gas 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 allocation of small and isolated blocks are concerned, 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 for introduction of competitive bidding system for allocation of coal blocks for captive use has been passed by both the Houses of Parliament and it has been notified in Gazette of India (Extraordinary) on 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 in the following 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.

At present, captive coal blocks are only allotted to different companies in power, iron & steel, Government commercial, private commercial & cement and coal to oil sectors. Till 31.3.2014, a total of 138 coal blocks with 34,419.35 million tonnes geological reserves have been allotted in various states (Table 22). Of these, 78 blocks with 23,364.92 million tonnes are under Public Sector undertakings (PSU) and the remaining 60 blocks with 11,054.43 million tonnes are under private sector. Among these, 72 blocks (23,238.91 million tonnes) are

allocated for power, 30 blocks (3,855.66 million tonnes) for iron & steel, and 34 blocks (7,099.39 million tonnes) for commercial mining and 2 blocks (225.39 million tonnes) for cement. Similarly, 25 captive lignite blocks with 1,597.23 million tonnes geological reserves have been allocated in Gujarat (11) and Rajasthan (14) till 31.3.2014. In Gujarat, 4 blocks (404.20 million tonnes) are allocated for power generation and 7 blocks (351.50 million tonnes) for commercial end use. In Rajasthan, the allocation of 11 blocks (728.70 million tonnes) is for power and 3 blocks (118.70 million tonnes) for commercial end use.

Table – 22 : Allotment of Captive Coal Blocks, (Till 31.3.2014) (Statewise)

(In million tonnes)		
State	No. of Coal Blocks	Geological Reserves
Total	138	34419.35
Arunachal Pradesh	1	4.79
Andhra Pradesh	1	77.04
Chhattisgarh	30	8973.90
Jharkhand	37	10428.03
Madhya Pradesh	17	2617.90
Maharashtra	15	391.19
Odisha	21	8987.13
West Bengal	16	2939.37

Source: Coal Directory of India, 2013-14, Coal Controller's Organisation, Kolkata. (except totals)

Coal Bed Methane (CBM) and Underground Coal Gasification (UCG)

As per the Govt. of India, CBM Policy 1997, the consortium of CIL and ONGC has been allotted 2 blocks—one each in Raniganj and Jharia coalfield for development of Coal Bed Methane. So far, 26 CBM blocks have been allotted to various operations for exploration and exploitation of CBM. Ten more blocks were offered in the 4th round of bidding concluded in October, 2009.

Under the guidelines for conducting underground coal gasification and allocation of blocks issued on 13.7.2009, five lignite blocks and two coal blocks have been identified for allocation.

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 for efficient management of the Indian Coal Industry and development of necessary skills by way of appropriate training, etc.;

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

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

(d) exploring financial assistance for import of equipment and other investment needs for coal industry.

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

adaptation of the state-of-the-art technologies, available with the developed countries, is also a prime subject of focus.

COAL WASHERIES

Presently, 19 coal washeries (15 in Public Sector and 4 in Private Sector) with 32.80 million tonnes per annum capacity produced about 7.65 million tonnes of coking coal in 2013-14. Production of washed coking coal during 2013-14 was about 3.99 million tonnes in Public Sector and 3.66 million tonnes in Private Sector. In Public Sector, BCCL operates 9 coking coal washeries (Dugda II, Bhojudih, Patherdih, Sudamdih, Barora, Moonidih, Mahuda, Madhuban and Dugda-I), CCL operates 4 washeries (Kathara, Swang, Rajrappa and Kedla), WCL one (Nandan) and SAIL one (Chasnala) whereas 4 washeries (West Bokaro-II, West Bokaro-III, Jamadoba and Bhelatand) are operated by Tata Steel Ltd, in Private Sector. Similarly, 38 coal washeries with 107.40 million tonnes per annum capacity produced about 64.70 million tonnes non-coking coal during the year. Of these, 10.82 million tonnes have been under Public Sector and 53.88 million tonnes under Private Sector. In Public Sector, 7 non-coking coal washeries (three each in BCCL & CCL and one in NCL) were operational, whereas in Private Sector, 31 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 is shown in Tables - 23 to 26, respectively.

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Table – 23 : Production of Washed Coking Coal, 2012-13 & 2013-14
(Sectorwise/Companywise)

	(In '000 tonnes)	
	2012-13	2013-14
All India : Total	6541	7646
Public Sector	3160	3990
BCCL	1329	2104
CCL	1239	1358
WCL	144	120
SAIL	448	408
Private Sector	3381	3656
Tata Steel Ltd	3381	3656

Source: Coal Directory of India, 2013-14, Coal Controller's Organisation, Kolkata.

Table – 24 : Capacity of Washed Coking Coal, 2013-14
(Sectorwise/Companywise)

Coalfield/Washery	State	Raw Coal Capacity (In '000 tpy)
Grand Total		32800
Public Sector	Total	27140
BCCL		14550
Dugda-I	Jharkhand	2500
Dugda-II	-do-	2000
Bhojudih	-do-	1700
Patherdih	-do-	1600
Sudamdih	-do-	1600
Barora	-do-	420
Moonidih	-do-	1600
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

Table-24 (Concl'd.)

Coalfield/Washery	State	Raw Coal Capacity (In '000 tpy)
SAIL		2040
Chasnala	Jharkhand	2040
Private Sector	Total	5660
Tata Steel Ltd		5660
West Bokaro-II	Jharkhand	1800
West Bokaro-III	-do-	2100
Jamadoba	-do-	900
Bhelatand	-do-	860

Source: Coal Directory of India, 2013-14, Coal Controller's Organisation, Kolkata (except totals).

Table – 25 : Production of Washed Non-coking Coal : 2012-13 & 2013-14
(Sectorwise/Companywise)

	(In '000 tonnes)	
Sector/Company	2012-13	2013-14
All India : Total	32372.05	64700.67
Public Sector	11282.00	10819.00
BCCL	108.00	111.00
CCL	7217.00	6930.00
NCL	3957.00	3778.00
Private Sector	21090.05	53881.67
BLA Ind. Pvt. Ltd	283.79	304.68
Aryan Coal Beneficiation Pvt. Ltd	13609.29	11771.87
Aryan Energy Pvt. Ltd	264.78	283.59
Bhatia Coal Washeries Ltd	-	576.63
Global Coal & Mining Pvt. Ltd	2954.56	33314.00
Kartikey Coal Washeries Pvt. Ltd	123.07	10.59
Earth Minerals Co. Ltd	223.06	-
Sarda Energy & Mineral Division	287.41	328.05
Jindal Power Ltd	-	1146.27
Jindal Steel & Power Ltd	740.07	2094.00
Tata Steel Ltd	1801.59	3125.16
Tata Bhelatand	354.62	530.90
IISCO	447.81	395.93

Source: Coal Directory of India, 2013-14, Coal Controller's Organisation, Kolkata.

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**Table – 26 : Capacity of Washed Non-coking Coal, 2013-14
(Sectorwise/Companywise)**

Washery/Location	Coalfield	State	Raw Coal Capacity (In '000 tpy)
Grand Total			107400
Public Sector	Total		20200
BCCL			
Jharia Coalfield, Jharkhand			3980
Dugda-I	Jharia	Jharkhand	1000
Lodna	Jharia	Jharkhand	480
Madhuban	Jharia	Jharkhand	2500
CCL			
East Bokaro Coalfield, Jharkhand			11720
Gidi	East Bokaro	Jharkhand	2500
Piparwar	N. Karanpura	Jharkhand	6500
Kargali	S. Karanpura	Jharkhand	2720
NCL			4500
Bina Deshelling Plant	Bina	Uttar Pradesh	4500
Private Sector	Total		87200
Jindal Steel & Power Ltd			6000
Pit Head Washery (JSPL)	Mand Raigarh	Chhattisgarh	6000
BLA Industries Pvt. Ltd			330
BLA Washery	Dharmasthal	Madhya Pradesh	330
Aryan Coal Beneficiation Pvt. Ltd			24960
Chakabuwa	Korba	Chhattisgarh	4000
Dipka	Korba	Chhattisgarh	12000
Pander Pauni	Ballarpur	Maharashtra	3000
Gevra	Korba	Chhattisgarh	5000
Binjhri	Korba	Chhattisgarh	960
Aryan Energy Pvt. Ltd			2600
Indaram	Ramagundam	Andhra Pradesh	600
Talcher	Talcher	Odisha	2000
Bhatia International Ltd			7730
Wani	Wardha	Maharashtra	3730
Ghugus	Wardha	Maharashtra	4000
Global Coal & Mining Pvt. Ltd			7500
Ib Valley	Ib Valley	Odisha	4000
Ramagundam	Ramagundam	Andhra Pradesh	1000
Talcher	Talcher	Odisha	2500

(Contd.)

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Table - 26 (Concl.d.)

Washery/Location	Coalfield	State	Raw Coal Capacity (In '000 tpy)
Gupta Coal field & Washeries Ltd			13920
Sasti	Wardha	Maharashtra	2400
Ramagundam	Ramagundam	Andhra Pradesh	2400
Ghugus	Wardha	Maharashtra	2400
Gondegaon	Kamptee	Maharashtra	2400
Majri	Wardha	Maharashtra	2400
Wani	Wardha	Maharashtra	1920
Kartikay Coal Washeries Pvt. Ltd			2500
Wani	Wardha	Maharashtra	2500
Spectrum Coal & Power Ltd (ST-CLI)			5200
Korba	Korba	Chhattisgarh	5200
Indo Unique Flames Ltd			5400
Nagpur	Wardha	Maharashtra	600
Punwat	Wardha	Maharashtra	2400
Wani	Wardha	Maharashtra	2400
Earth Minerals Company Ltd			4000
Talcher	Jharsuguda	Odisha	4000
Sarda Energy & Mineral Division			960
Karwahi Coal Washery Divn.	Raigarh	Chhattisgarh	960
Tata Steel Ltd.			3900
Washery No. 2	W. Bokaro	Jharkhand	1800
Washery No. 3	W. Bokaro	Jharkhand	2100
Tata Bhelatand			800
Bhehatand	W. Bokaro	Jharkhand	800
IISCO			1400
Chasnalla	Dhanbad	Jharkhand	1400

Source: Coal Directory of India, 2013-14, Coal Controller's Organisation, Kolkata.

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.

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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 6200 kcal per kg.
		B	Useful Heat Value exceeding 5600 kcal per kg but not exceeding 6200 kcal per kg.
		C	Useful Heat Value exceeding 4940 kcal per kg but not exceeding 5600 kcal per kg.
		D	Useful Heat Value exceeding 4200 kcal per kg but not exceeding 4940 kcal per kg.
		E	Useful Heat Value exceeding 3360 kcal per kg but not exceeding 4200 kcal per kg.
		F	Useful Heat Value exceeding 2400 kcal per kg but not exceeding 3360 kcal per kg.
		G	Useful Heat Value exceeding 1300 kcal per kg but not exceeding 2400 kcal per kg.
2.	Non-coking coal produced in Arunachal Pradesh, Assam, Meghalaya and Nagaland	A	Useful Heat Value between 6200 and 6299 kcal per kg and corresponding ash plus moisture content between 18.85 and 19.57%.
		B	Useful Heat Value between 5600 and 6199 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%.
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, therefore, 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 7000
G2	GCV exceeding 6701 and 7000
G3	GCV exceeding 6401 and 6700
G4	GCV exceeding 6101 and 6400
G5	GCV exceeding 5801 and 6100
G6	GCV exceeding 5501 and 5800
G7	GCV exceeding 5201 and 5500
G8	GCV exceeding 4901 and 5200
G9	GCV exceeding 4601 and 4900
G10	GCV exceeding 4301 and 4600

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Concl'd.

Grades	GCV Range (kcal/kg)
G11	GCV exceeding 4001 and 4300
G12	GCV exceeding 3701 and 4000
G13	GCV exceeding 3401 and 3700
G14	GCV exceeding 3101 and 3400
G15	GCV exceeding 2801 and 3100
G16	GCV exceeding 2501 and 2800
G17	GCV exceeding 2201 and 2500

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 2013-14, 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 a domestic fuel. Data regarding consumption in these sectors are not available. However, industrywise despatches of coal are depicted in Table - 28.

**Table – 28 : Despatches* of Coal
2011-12 to 2013-14
(By Industries)**

(In million tonnes)			
Industry	2011-12	2012-13	2013-14(P)
Total	535.30	567.14	572.06
Iron & steel ¹	15.84	15.99	15.27
Sponge iron	16.00	14.97	12.51
Fertilizer	2.82	2.51	2.29
Cement	12.88	12.81	11.64
Electricity	401.21	433.62	437.59
Others (Chemical, base metals, cokeries, paper & pulp, textile & rayon, bricks, etc.	86.55	87.24	92.76

Source: Coal Directory, 2011-12, 2012-13 and 2013-14.

* Data on consumption is not available.

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

DEMAND & SUPPLY

XIIth Plan Demand Projections

(In million tonnes)

Sl. No.	Sector	2016-17
1.	Steel & Coke Oven	67.20
2.	Power (Utility)	682.08
3.	Power (Captive)	56.36
4.	Cement	47.31
5.	Sponge Iron	50.33
6.	Others	77.22
Total		980.50

XII Plan Supply Projections

(In million tonnes)

Source	2016-17
CIL	556.40
SCCL	57.00
Others	101.60
Total Indigenous Supply	715.00
Import - Coking	35.50
Non-coking	230.00
Total Imports	265.50

Source: Report of the Working Group for Coal & Lignite for XIIth Plan.

WORLD REVIEW

World proved coal reserves were estimated at 891.53 billion tonnes at the end of 2014 of which 403.20 billion tonnes (45%) is classified as anthracite & bituminous coal and 488.33 billion tonnes (55%) as sub-bituminous coal & lignite (Table-29). World production of coal and lignite increased from about 7.89 billion tonnes in 2012 to 7.91 billion tonnes in 2013. China continued to be the largest producer of coal and lignite in 2013 with about 47% share in total world production, followed by USA (12%), India (8%), Australia (6%), Indonesia (5%), Russia (4%) and South Africa (3%). The remaining 15% of the total world coal production was from other countries (Table-30). Global primary energy consumption fell by 1.1% over that of the preceding year. Asia Pacific and the Middle East has increased coal consumption during the year under review.

**Table – 29 : World Proved Coal Reserves
at the end of 2014
(By Principal Countries)**

(In million tonnes)			
Country	Anthracite and bituminous coal	Sub-bituminous coal and lignite	Total
World : Total	403199	488332	891531
Australia	37100	39300	76400
Brazil	–	6630	6630
Canada	3474	3108	6582
China	62200	52300	114500
Colombia	6746	-	6746
Germany	48	40500	40548
India*	56100	4500	60600
Indonesia	-	28017	28017
Kazakhstan	21500	12100	33600
Poland	4178	1287	5465
Russian Federation	49088	107922	157010
South Africa	30156	–	30156
Turkey	322	8380	8702
Ukraine	15351	18522	33873
USA	108501	128794	237295
Other countries	8435	36972	45407

Source: BP Statistical Review of World Energy, June 2015.

* India's reserves of coal as on 1.4.2014 are estimated at about 301.56 billion tonnes to a depth of 1,200 m and those of lignite at about 43.25 billion tonnes.

**Table – 30 : World Production of Coal and Lignite
(By Principal Countries)**

(In million tonnes)			
Country	2011	2012	2013
World : Total	7690	7886	7906
Australia			
Bituminous coal	350	381	408
Brown coal	67	69	69 ^e
Bosnia & Herzegovina			
Brown coal & lignite	13	12	12
Bulgaria			
Brown Coal & lignite	37	34	29
Canada			
Hard coal	57	57	60
Lignite	10	9	9
China			
Hard coal	3520	3660	3680
Colombia			
Hard coal	86	89	85
Czech. Rep.			
Bituminous coal	11	11	9
Brown Coal	47	44	41
Germany			
Hard coal	13	12	8
Brown coal	176	185	183
Greece			
Lignite	58	62	54
India *			
Hard coal	540	556	563
Lignite	42	46	44
Indonesia			
Hard coal	353	359	375
Kazakhstan			
Hard coal	108	113	113
Lignite	8	8	6
Korea, Dem. People's Rep. of ^e			
Coal all form ^e	41 ^e	41	41 ^e
Mongolia			
Brown coal & lignite	32	29	29
Mexico			
Bituminous coal	21	16	16
Poland			
Hard coal	76	80	77
Lignite	63	64	66
Romania			
Hard Coal	2	2	2 ^e
Brown Coal & lignite	34	32	23
Russia			
Hard coal	334	354	347
Serbia			
Lignite	40	38	40
South Africa			
Hard coal	253	259	256
Thailand			
Lignite	21	19	18
Turkey			
Hard coal	9	7	7 ^e
Lignite	80	75	75 ^e
Ukraine			
Hard coal	63	66	64
UK			
Bituminous coal	19	17	13

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Table-30 (Concl'd.)

Country	2011	2012	2013
USA			
Hard coal	897	879	877 ^c
Lignite	73	72	72 ^c
Vietnam			
Anthracite	47	42	41
Other Countries	89	87	94

Source: World Mineral Production, 2009-2013.

Hard coal – Including anthracite, bituminous & sub-bituminous coal.

* India's production of coal and lignite during 2013-14 were 565.77 million tonnes and 44.27 million tonnes, respectively.

As estimated by the 'World Coal Association', coal provides around 30% of global primary energy needs and generates about 41% of the world's electricity and this proportion is expected to remain static for the next 30 years. About 70% of the world's steel production is based on coal. Without targeted global action, the International Energy Agency (IEA) estimates that in 2035 there will still be one billion people without access to electricity and 2.7 billion without access to clean cooking fuels. The World Coal Institute in its report "Coal Meeting the Climate Challenge: Technology to reduce Greenhouse Gas Emission" released in 2007, outlined two primary ways of reducing CO₂ emission from coal use. The first is by carbon capture and storage (CCS) which can reduce 80-90% CO₂ emission into atmosphere and second is storing CO₂ in geological formations. CCS is now acknowledged as the only technology that can significantly reduce emissions from fossil fuel power stations and other industrial plants. International Energy Agency has emphasised need to install CCS on coal-fired plants by 2030. With the widespread deployment of CCS, fossil fuels will become an important part of solution rather than part of the problem.

Australia

Australia is the world's fourth largest producer and world's leading exporter of coal. Queensland and New South Wales were Australia's leading coal producing States and accounted for more than 95% of the country's total output. New South Wales and Queensland are its major coal exporting States. However, to sustain export growth, the country's infrastructure would require significant expansion and upgrading so that minerals for export could be transported from inland to port terminals. BHP Billiton approved funding for the development of the Caval Ridge project and the expansion of the Peak Downs Mine in the Bowen basin in Queensland. The Caval Ridge Mine would have the

capacity to produce 5.5 Mt/yr of metallurgical coal, and the capacity of the Peak Downs Mine would increase by 2.5 Mt/yr with mine life that is expected to be more than 60 years. BHP Billiton subsequently decided to defer the development of the Peak Downs Mine but the construction of the Caval Ridge Mine is reported to be on schedule and is expected to be completed in 2014. The Daunia Mine, a new open pit coal mine with coal handling preparation plant, was scheduled for completion in 2013; the plant would have the capacity to produce 4 Mt/yr of coal for 21 years.

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. The Government continued to close small coal mines to reduce fatalities. However, in the long-term, several large companies are expected to produce coal along with small mines. Major coal-producing provinces were located in the northern and northwestern parts of the country and coal consumers were located in the southern and in the coastal Provinces. The Government planned to develop more reliable coal transportation system to ease the constraint during the next few years.

Indonesia

Indonesia was the world's second ranked exporter and leading producer of coal. Central Kalimantan Province held reserves of 1,400 million tonnes of high-quality metallurgical coal. The Province produced 1.5 million tonnes per year of high-grade coal from 15 coal mining companies.

Russia

Russia is the leading producer of coal. The coal industry in Russia was mostly privately owned, and joint-stock companies (often consolidated into large holdings) dominated the industry. About 80% of coal was mined by 12 major companies; those companies included both "proper" coal mining corporations and metallurgical holdings companies, which included divisions specializing on coking coal mining. Siberian Coal Energy Co. (SUEK) was the largest coal producer in Russia in terms of annual production. In February 2011, Russia adopted a new program for development of the coal industry by 2030. According to forecasts by the Ministry of Energy, annual coal production could increase to about 450 Mt by 2030. The Ministry of

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Energy projected that Russia would construct more than 100 new coal enterprises within the next 20 years. Because most of the new coal mines were to be located in Siberia and the Far East, the Government considered that its main role would be to assist coal producers by providing better and less expensive infrastructure facilities, such as ports and railroads.

FOREIGN TRADE

Exports

In 2013-14, exports of coal (Excl. lignite) decreased about 13% to 2.19 million tonnes from 2.51 million tonnes in the previous year. Exports of coke also decreased about 87% to 0.15 million tonnes in 2013-14 from 1.14 million tonnes in 2012-13. Coal was mainly exported to Bangladesh (75%), Nepal (17%), UAE (4%) and Bhutan (3%). Coke was exported predominantly to Nepal (59%), Italy (16%), Pakistan (15%), Bhutan (6%), and Bangladesh one percent. Exports of lignite also decreased drastically to only one thousand tonne in 2013-14 from 37 thousand tonnes in the previous year and was solely to UAE. The exports of coal gas at 9 tonnes showed an decrease of about 89% during 2013-14 from 83 tonnes that was reported in 2012-13 and was solely to Nepal (Tables - 31 to 34).

Imports

Imports of coal (Excl. lignite) increased by 14% to about 167 million tonnes in 2013-14 from about 146 million tonnes in the previous year. Imports of coke also increased by 35% to 4.17 million tonnes in 2013-14 from 3.08 million tonnes in the previous year. Coal was mainly imported from Indonesia (61%), Australia (21%) and South Africa (12%), whereas coke was imported mainly from China (49%), Ukraine & Japan (14% each), Australia & Colombia (6% each) and Poland (4%). Imports of lignite was negligible during both the year, while imports of coal water gas decreased to negligible quantity in 2013-14 from 6 tonnes in the previous year (Tables - 35 to 38).

**Table – 31 : Exports of Coal (Excl. Lignite)
(By Countries)**

Country	2012-13		2013-14	
	Qty (‘000 t)	Value (₹‘000)	Qty (‘000 t)	Value (₹‘000)
All Countries	2511	8987175	2188	10843195
Bangladesh	1621	5762975	1631	7178113
Nepal	627	1998899	377	2324215
Bhutan	96	428098	69	786265
UAE	89	399911	89	432010
Kuwait	-	-	20	101470
Ireland	-	-	++	2386
Germany	++	429	++	1869
Morocco	++	321	++	1442
Malaysia	1	15143	++	1384
Unspecified	1	5844	2	12308
Other countries	76	375555	++	1733

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

Country	2012-13		2013-14	
	Qty (‘000 t)	Value (₹‘000)	Qty (‘000 t)	Value (₹‘000)
All Countries	37	322476	1	55575
UAE	++	1844	1	13749
Saudi Arabia	-	-	++	8853
USA	++	38677	++	8764
Indonesia	++	8733	++	6647
Oman	++	14060	++	4690
Italy	++	8892	++	4203
Russia	-	-	++	2124
Nigeria	++	560	++	1845
Malaysia	-	-	++	1473
UK	++	3955	++	1151
Other countries	37	245755	++	2076

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

Country	2012-13		2013-14	
	Qty (t)	Value (₹‘000)	Qty (t)	Value (₹‘000)
All Countries	83	814	9	891
Nepal	++	6	9	815
Bangladesh	10	196	++	76
Other countries	73	612	-	-

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

Country	2012-13		2013-14	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	1137549	5649295	150636	1478657
Nepal	203299	445022	89308	422521
Pakistan	10186	224753	22972	409373
Italy	-	-	24000	368126
Bhutan	632292	475111	8517	166481
Bangladesh	985	11823	1893	23176
Sri Lanka	1280	36320	863	22967
UAE	1036	23047	1070	18411
Saudi Arabia	698	18381	689	17590
Jordan	234	6409	391	11498
Oman	22	345	411	6951
Other countries	287517	4408084	522	11563

**Table – 35 : Imports of Coal (Excl. Lignite)
(By Countries)**

Country	2012-13		2013-14	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	145790	868505454	166861	923353960
Indonesia	82393	329706331	101877	412913502
Australia	30450	315968552	34480	316111659
South Africa	20293	113565248	20615	111251371
USA	6390	55032644	3650	32069785
Canada	999	10843475	1247	12247579
Mozambique	978	10186976	1498	11862671
New Zealand	1047	11355827	1132	10729311
Russia	371	3564240	743	6116312
Chile	-	-	927	3309365
Ukraine	257	2514868	315	3092664
Other countries	2612	15767293	377	3649741

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

Country	2012-13		2013-14	
	Qty ('000 t)	Value (₹'000)	Qty ('000 t)	Value (₹'000)
All Countries	++	5407	++	5629
USA	++	1109	++	4420
Turkey	++	4298	++	1209

**Table – 38 : Imports of Coal Water Gas
(By Countries)**

Country	2012-13		2013-14	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	6	616	++	306
USA	6	616	++	306

**Table – 37 : Imports of Coke
(By Countries)**

Country	2012-13		2013-14	
	Qty (t)	Value (₹'000)	Qty (t)	Value (₹'000)
All Countries	3077258	56872490	4167206	67948149
China	104311	2422113	2028594	33093415
Japan	753810	14543546	577516	9671787
Ukraine	910358	16367687	580758	9319761
Australia	40199	654510	267238	4344275
Colombia	334583	5539177	255821	4000118
Poland	409433	7760713	170037	3097280
Russia	371207	6802047	137777	2202442
Italy	14799	235516	69906	1065141
Korea Rep. of	15384	261476	31758	527833
Indonesia	-	-	21941	375180
Other countries	123174	2285705	25860	250917

FUTURE OUTLOOK

The XII Plan Working Group for Coal & Lignite has assessed a coal demand of 980.50 million tonnes by terminal year i.e. 2016-17. The indigenous coal supply projection in the terminal year is projected to be 715 million tonnes. The

demand-supply gap emerging from these projections would be 265.50 million tonnes, which would have to be met by imports of 35.50 million tonnes of coking coal and 230 million tonnes of non-coking coal.
