



# Coal Sector in India

## Introduction

- Coal is the most important and abundant fossil fuel in India. **It accounts for 55% of the country's energy needs.** The country's industrial heritage was built upon indigenous coal.
- Commercial primary energy consumption in India has grown by about 700% in the last four decades.
- **The current per capita commercial primary energy consumption in India is about 350 kgoe/year which is well below that of developed countries.**
- Driven by the **rising population, expanding economy** and a quest for improved quality of life, energy usage in India is expected to rise.
- Considering the limited reserve potentiality of petroleum & natural gas, eco-conservation restriction on hydel project and geo-political perception of nuclear power, coal will continue to occupy centre-stage of India's energy scenario.

## Coal Production

- Through sustained programme of investment and greater thrust on application of modern technologies, it has been possible to raise the All India production of coal at 730.354 million tonnes in 2018-19 (Provisional) with a positive growth of 7.9%.
- Coal India Limited has set up Regional Sales Offices and Sub-Sales Offices at selected places in the country to cater to the needs of the consuming sectors in various regions.

## Import of Coal

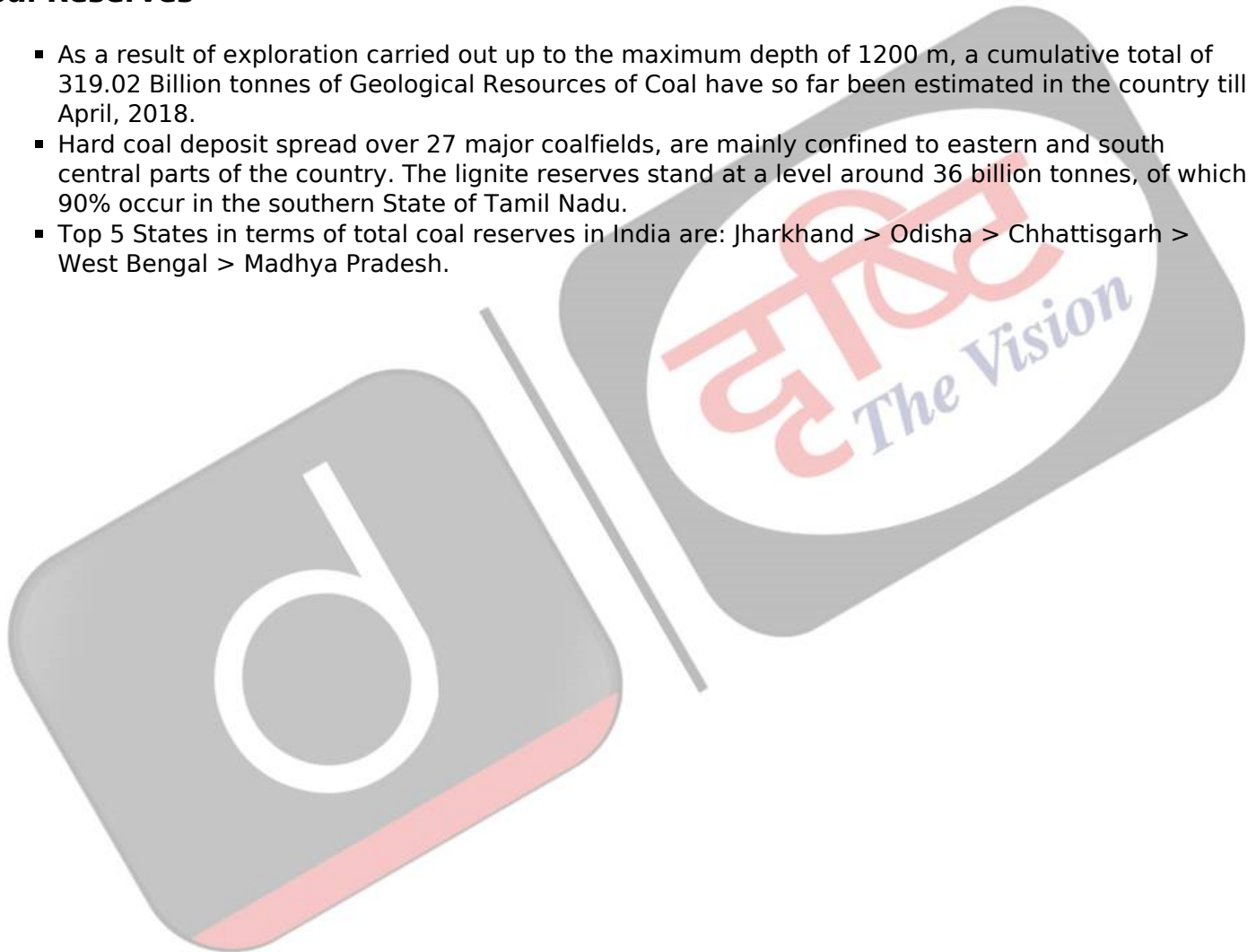
- As per the present import policy, **coal can be freely imported** (under Open General Licence) by the consumers themselves considering their needs based on their commercial prudence.
- Coking Coal is being imported by Steel Authority of India Limited (SAIL) and other Steel manufacturing units mainly to bridge the gap between the requirement and indigenous availability and to improve the quality of production.
- Coal based power plants, cement plants, captive power plants, sponge iron plants, industrial consumers and coal traders are importing non-coking coal.
- Coke is imported mainly by pig-Iron manufacturers and Iron & Steel sector consumers using mini-blast furnace.
- Details of import of coal and products i.e. coke during the last six years is as under:

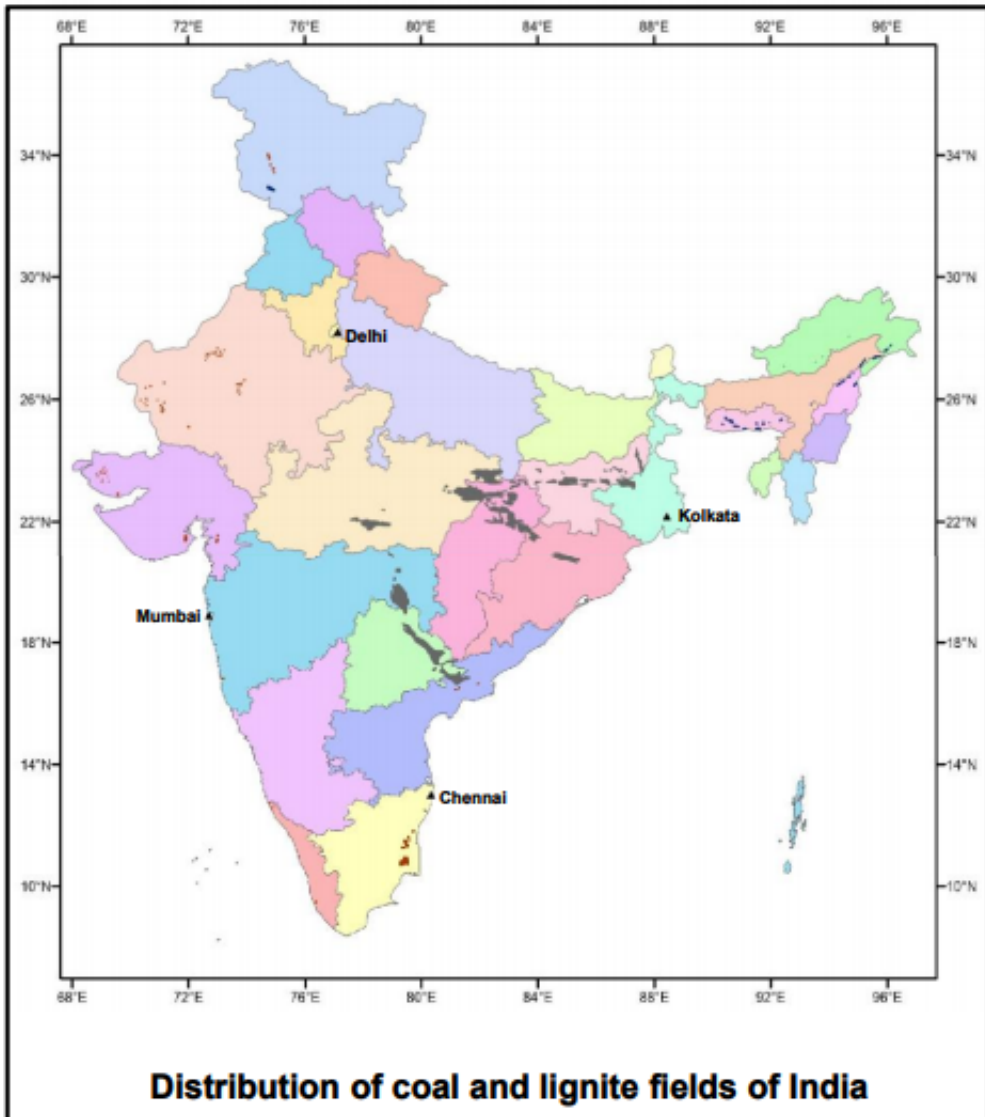
\*Import upto February, 2019

Coal	2013-14	2014-15	2015-16	2016-17	2017-18(Prov.)	2018-19*
Coking Coal	36.87	43.72	44.56	41.64	47.00	47.57
Non-Coking Coal	129.99	174.07	159.39	149.31	161.27	166.13
<b>Total Coal Import</b>	<b>166.86</b>	<b>217.78</b>	<b>203.95</b>	<b>190.95</b>	<b>208.27</b>	<b>213.70</b>
Coke	4.17	3.29	3.07	4.35	4.58	4.69

## Coal Reserves

- As a result of exploration carried out up to the maximum depth of 1200 m, a cumulative total of 319.02 Billion tonnes of Geological Resources of Coal have so far been estimated in the country till April, 2018.
- Hard coal deposit spread over 27 major coalfields, are mainly confined to eastern and south central parts of the country. The lignite reserves stand at a level around 36 billion tonnes, of which 90% occur in the southern State of Tamil Nadu.
- Top 5 States in terms of total coal reserves in India are: Jharkhand > Odisha > Chhattisgarh > West Bengal > Madhya Pradesh.





## Categorization of Resources

- The Coal resources of India are available in **older Gondwana Formations of peninsular India and younger tertiary formations of north-eastern region.**
- Based on the results of Regional/ Promotional Exploration, where the boreholes are normally placed 1-2 Km apart, the resources are classified into **'Indicated'** or **'Inferred' category.**
- Subsequent Detailed Exploration in selected blocks, where boreholes are less than 400 meter apart, upgrades the resources into more reliable **'Proved/Measured' category.**
- The Formation-wise and Category-wise Coal resources of India as on 1.4.2018 are given in table below:

(Million tonnes)

Formation	Proved/Measured	Indicated	Inferred	Total
Gondwana Coals	148194	139065	30174	317433
Tertiary Coals	594	99	895	1588
<b>Grand Total</b>	<b>148787</b>	<b>139164</b>	<b>31069</b>	<b>319020</b>

## Classification of Coal

- Coal is originated from organic matter wood. When large tracts of forests are buried under sediments, wood is burnt and decomposed due to heat from below and pressure from above. The phenomenon makes coal but takes centuries to complete.
- **Classification of Coal can be done on the basis of carbon content and time period.**
- On the basis of carbon content it can be classified into following three types:
  - **Anthracite:** It is the best quality of coal with **highest calorific value** and carries **80 to 95% carbon content.** It ignites slowly with a blue flame and found in small quantities in Jammu and Kashmir.
  - **Bituminous:** It has a low level of moisture content with **60 to 80% of carbon content** and has a high calorific value. **Jharkhand, West Bengal, Odisha, Chhattisgarh and Madhya Pradesh** have deposits of Bituminous.
  - **Lignite** carries **40 to 55% carbon content** and is often brown in colour with high moisture content thus, gives smoke when burnt. **Rajasthan, Lakhimpur (Assam) and Tamil Nadu** has deposits of Lignite.
  - **Peat** is the first stage of transformation from wood to coal with **low calorific value and less than 40% carbon content.**

## History of Coal Mining in India

- India has a long history of commercial coal mining covering nearly 220 years **starting from 1774 by M/s Sumner and Heatly of East India Company in the Raniganj Coalfield** along the Western bank of river Damodar.
- However, for about a century the growth of Indian coal mining remained sluggish for want of demand but the **introduction of steam locomotives in 1853 gave a fillip to it.**
- Within a short span, production rose to an annual average of 1 million tonne (mt) and India could produce 6.12 mts. per year by 1900 and 18 mts per year by 1920.
- **The production got a sudden boost from the First World War but went through a slump in the early thirties.** The production reached a level of 29 mts. by 1942 and 30 mts. by 1946.
- With the advent of Independence, the country embarked upon the 5-year development plans. At the beginning of the 1st Plan, annual production went up to 33 mts.

- During the 1<sup>st</sup> Plan period itself, the need for increasing coal production efficiently by systematic and scientific development of the coal industry was being felt.
- Setting up of the **National Coal Development Corporation (NCDC)**, a Government of India Undertaking in **1956** with the collieries owned by the railways as its nucleus was the first major step towards planned development of Indian Coal Industry.
- Along with the Singareni Collieries Company Ltd. (SCCL) which was already in operation since 1945 and which became a Government company under the control of Government of Andhra Pradesh in 1956, India thus had two Government coal companies in the fifties.
  - SCCL is now a joint undertaking of Government of Andhra Pradesh and Government of India sharing its equity in 51:49 ratio.

### Nationalisation of Coal Mines

- Right from its genesis, the commercial coal mining in modern times in India has been dictated by the needs of the domestic consumption.
  - On account of the **growing needs of the steel industry**, a thrust had to be given on systematic exploitation of coking coal reserves in Jharia Coalfield.
  - Adequate capital investment to meet the burgeoning energy needs of the country was not forthcoming from the private coal mine owners.
  - **Unscientific mining practices** adopted by some of them and poor working conditions of labour in some of the private coal mines became matters of concern for the Government.
  - On account of these reasons, the Central Government took a decision to nationalise the private coal mines.
  - **The nationalisation was done in two phases, the first with the coking coal mines in 1971-72 and then with the non-coking coal mines in 1973.**
  - In October, 1971, **Coking Coal Mines (Emergency Provisions) Act, 1971** provided for taking over in public interest of the management of coking coal mines and coke oven plants pending nationalisation.
  - This was followed by the **Coking Coal Mines (Nationalisation) Act, 1972** under which the coking coal mines and coke oven plants other than those with the Tata Iron & Steel Company Limited and Indian Iron & Steel Company Limited, were nationalised on from May 1972 and brought under **Bharat Coking Coal Limited (BCCL)**, a new Central Government Undertaking.
  - Another enactment, namely the **Coal Mines (Taking Over of Management) Act, 1973**, extended the right of the Government of India to take over the management of the coking and non-coking coal mines in seven States including the coking coal mines taken over in 1971.
  - This was followed by the nationalisation of all these mines in May 1973 with the enactment of the Coal Mines (Nationalisation) Act, 1973 which now is the piece of Central legislation determining the eligibility of coal mining in India.
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- After nationalisation of the coal industry in India, India never witnessed demand-supply gap until 1991.
  - After **liberalisation reforms in 1993**, to focus on the increasing energy demand, the government decided to allocate coal mines to various players for captive consumption (*in captive mining coal is taken out by a company for its own use and it won't be able to sell it in the market*).
  - Also the **power sector reforms of 2003**, resulting in significant growth in power sector.
  - Increasing demand of Coal by growing power sector could not be fulfilled by the state run CIL in the meantime, leading to higher demand-supply gap. This resulted into higher demands of imports.
  - By 2012, this demand-supply gap widened to near 20%. Moreover, the LARR Act, Forest Rights Act etc., also challenged the further expansion of coal mines.
  - The CAG report followed by the Supreme Court verdict in 2014 resulted into cancellation of allocation near all coal mines allocated after 1993.
  - Gov enables allocation of coal mines through auctions by enacting the Coal Mines (Special Provisions) Act, 2015.
  - In February 2018, CCEA permitted entry of private firms in commercial coal mining in the country.

### What Troubles Coal sector in India?

- India has to **import near 213 million tons coal** and some Indian companies have also acquired coal mines overseas to ensure continuous supply. The import dependency for good quality coal is neither good for India's energy requirement nor for its fiscal health.

#### **Following reasons can be listed for Coal sector abysmal condition:**

- **Delayed environment and forest clearances:** Environment ministry in past has classified ecological sensitive areas in 'Go and No Go areas' and there was total prohibition on mining in no go areas.
- Further there are **other clearances** required from State and Central Governments.
- **Land Acquisition problems.**
- **Lack of adequate technology.**
- **Allocation process was arbitrary, discretionary and non-transparent.**
- There was **no consideration of Merit**, no Price discovery mechanism for national resources.
- Till now, the PSU, Coal India was the only commercial miner in the country for more than four decades which has shown **monopolistic tendencies in the sector**. Monopoly in mining sector was incapable of meeting domestic demands.
- **Low productivity** of Coal India is still a concern.
- Coal plants have **higher operation and maintenance costs** because of strict regulatory issues.
- India's power regulators are not regularly updating prices to accommodate increases in operational costs due to regulation.
- State Pollution Control Boards are ineffective at monitoring or enforcing compliance.
- Expansion in power generation in India has been largely based on state financing i.e many coal power plants in India are constructed through massive debt financing from state-owned banks.
  - It shows that international investment in coal generation assets in India has been very less.

#### **Government Initiatives**

- In April 2018, The Ministry of Coal has launched **UTTAM (Unlocking Transparency by Third Party Assessment of Mined Coal) Application for coal quality monitoring**.
  - The app aims to **ensure transparency and efficiency in coal quality monitoring** process and bring coal governance closer to people.
- The Cabinet Committee on Economic Affairs (CCEA) has approved a **new coal linkage policy** to ensure adequate supply of the fuel to power plants through reverse auction. The new policy will help in ensuring fuel supplies to the power plants in an organised manner.
- Ministry of Coal has developed **Online Coal Clearances System** to provide a single window access to its investors to submit online applications for all the permissions / clearances and approvals granted by Ministry of Coal.
- **Coal Allocation Monitoring System (CAMS)** is developed to monitor the allocation of coal by CIL to States, States to SNA and SNA to such consumers in a transparent manner.
- **Opening up of commercial coal mining** for Indian and foreign companies in the private sector.
- The CCEA approved the methodology for auction of coal mines/ blocks for sale of the commodity on 20 February 2018. The move has been defined as the most ambitious reform of the sector since its nationalisation in 1973.
  - The auction will be done on an online transparent platform. The bid parameter will be the price offer in Rupees/ Tonne, which will be paid to the State government on the actual production of coal.
  - This reform is expected to bring efficacy into the coal sector by moving from an era of monopoly to competition. It will increase competitiveness and allow the use of best possible technology in the sector.

#### **Suggestions**

- There is a **need for increasing production and competition** by leveraging higher producing mines to enable more world-scale operations.
- **Government should revisit coal grades pricing mechanism from grades based on coal mined to grades based on coal desired for end use.**
- With a competitive coal mining sector in the country, the **ability to raise competitive finance should also improve.**
- Coal mining needs to be facilitated with **offtake routes for bulk transportation** over long distances as with railways projects delayed for long periods of time it is imperative to look at alternatives
- Risk is the biggest challenge in the sector and **risk management needs new instruments, contracting, and incentives.**
- **Creative and targeted financing** should be brought in to address the power sector's burgeoning problems.
- As India's coal is high in ash content, **coal beneficiation** should be done to reduce the ash content and improve its grade.

**Note:**

**Coal beneficiation** is a process by which the quality of raw coal is improved by either reducing the extraneous matter that gets extracted along with the mined coal or reducing the associated ash or both.

**Way Forward**

- The arrival of private players in the coal mining practices can bring a lot of better things into the picture.
- In the long term, India needs to look at coal to gas i.e. more cleaner energy sources.
- Clean coal as an idea has huge potential in India because of the age and inefficiency of some of our plants.
  - With government's efforts to push renewable energy due to international conventions on climate change, increase in carbon cess and other initiatives for lesser use of coal, there is a need for 'Vision 2030 for the coal sector', which takes into account the environmental factors such as reduction of carbon footprint, abatement of global warming.