

80-20 of Industry

# Coal Shortage in India – Oct' 2021

Significant reasons and the way forward

# Prelude

## Understanding the Current Coal Dynamics in India

## Coal availability in India

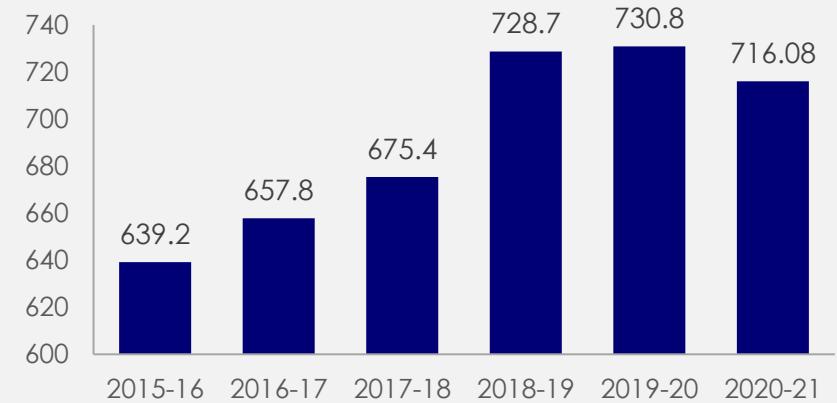
India is well endowed in terms of most minerals and the country's mining sector has great potential. The country has vast reserves of both metallic and non metallic minerals including iron ore, bauxite, coal, limestone and manganese. India is among the top ten producers for these minerals globally and while the demand of these mined commodities has been strong domestically, the supplies for the same has been constrained. Some of significant reasons owing to such a case are – unavailability of high tech equipment for exploration, low presence of private players, absence of international mining giants etc. Coal not being an aberration witnesses such imbalances too in its domestic requirement and availability.

Coal is among the most mined mineral in India being a primary source of energy consumption. As on 2020, the total coal reserves in India hovered around 3.19 Million Tonnes (MTs) for coal seams of 0.90 meters and above in thickness and a depth of upto 1200 meters depth from the surface. The major share of coal reserves accounting to nearly 99.5% are in the Gondwana coalfields and 0.5% rests in the Tertiary coalfields. These tertiary fields are spread across the north – eastern states of Assam, Meghalaya and Nagaland, whereas the Gondwana fields span across the states of Jharkhand, Odisha , Bihar and West Bengal in the eastern region, Madhya Pradesh, Chattisgarh and Maharashtra in the western region and Andhra and Telangana in the southern region. The eastern state of Jharkhand holds the maximum coal reserves in India followed by Odisha and Chattisgarh. It is significant to note that during 2020 , the total coal reserves in the above mentioned states stands to be 83151.68 MTs , 79294.8 MTs and 57205.87 MTs respectively.

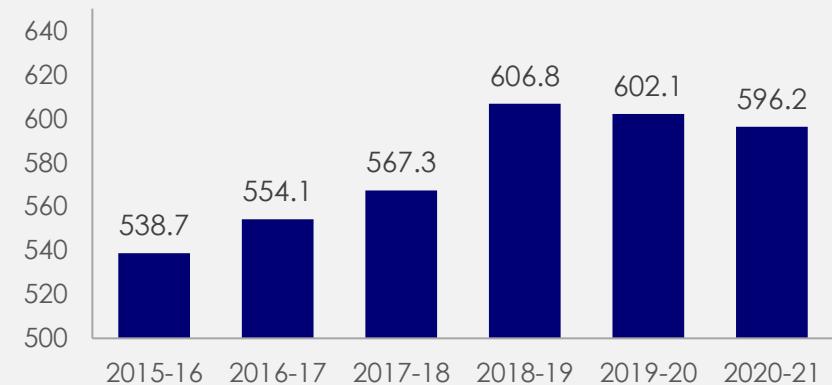
Coal production in India at large comes under the prerogative of Coal India Limited (CIL) and its subsidiaries. About 85% of the total coal produced domestically is being driven by CIL. Over the past few years there has been a consistent effort by the company to increase domestic coal production and a target to raise the same to 1 Billion Tonne by 2026 has already been set. Over the past decade overall growth witnessed in the coal production of CIL was approximately 38%. However, there were some variations witnessed with production levels increasing and falling. For example, during the period from 2010-11 to 2018-19, coal production by CIL increased consecutively and witnessed a growth of about 41% for the said duration. In year 2019-20, the production quantum of CIL declined marginally by 0.7%. The production volume further witnessed a decline by 1% in year 2020-21. [The annual production target of CIL for 2021-2022 is 670 MTs, of which 292.8 MTs was produced upto September from April'2021. The coal production by CIL & its subsidiaries for the month of September '2021 has been observed to be 51.7 MTs.](#)

Exhibit 1: Year Wise Volume of Coal Produced in India (In MTs)

Total Coal Production (In MTs)

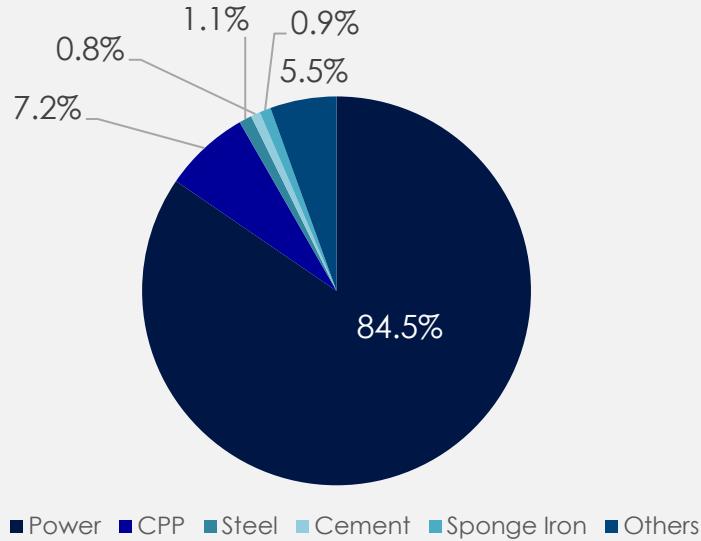


Contribution of CIL in Total Coal Production (In MTs)



Source: Eninrac Indian Coal Outlook Report, MoC

Exhibit 3: Breakup of Coal off take by key End Consumer Industries in India (In Percentage)



Source: Eninrac Indian Coal Outlook Report, MoC

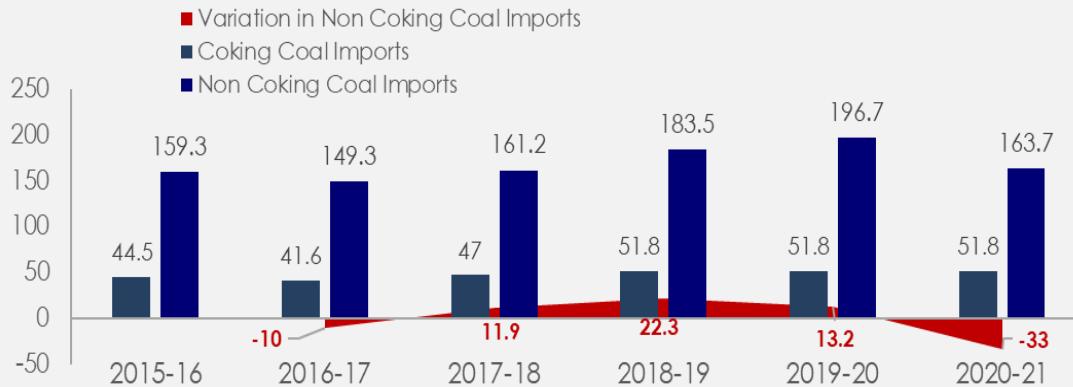
Exhibit 4: Domestic Coal Supplies in India for the Month of September 2021 (In MTs)

Domestic Coal Supplies in India to End Consuming Industries in the Month of September 2021 (Values in MTs)			
Sectors	Indigenous Coal Supply		
	CIL & Subsidiaries	SCCL	Other Captive
Power	40.38	3.77	6.41
CPP	4.09	0.19	NIL
Steel	0.20	NIL	0.43
Cement	0.21	0.18	0.08
Sponge Iron	0.54	0.02	NIL
Others	2.88	0.42	NIL

Note - The domestic supply indicates the indigenous coal dispatch in India cumulatively by CIL & its subsidiaries, SCCL and other captive mines and doesn't factor the imported coal supplies.

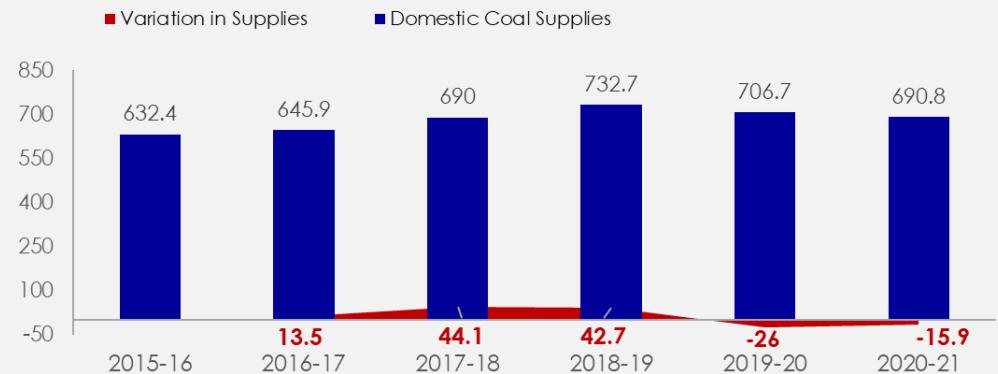
Source: Eninrac Research, MoC

Exhibit 5: Year Wise Volume of Coal Imports in India (In MTs)



Source: Eninrac Research, MoC

Exhibit 6: Year Wise Volume of Domestic Coal Supplies in India (In MTs)



Source: Eninrac Research, MoC

## Coal demand & offtake in India

Globally, the demand for coal has been stalled has plateaued in the west. Whereas in eastern side of the globe, situation is different. A strong growth in the demand for coal is likely to be seen in the Asian countries such as India, Vietnam, Indonesia etc as it is one of the most preferred and reliable options for generating electricity in these countries. Imports in small pockets including Pakistan, Turkey & Malaysia shall also drive the demand but India being the centrifugal force is likely to witness a rise of close to 5% a year through 2021, while that in association with the southeast Asian nations will jump 7.2% a year. The domestic demand of coal in India has grown by 10% from FY'2015 to FY'2017. **During FY'2017-18, the all India actual coal demand was 908 MTs against a domestic supply 688 MTs. While the same for FY'2018-19 hovered over 1000 MTs against a domestic supply of 732.7 MTs. For years 2019-20 & 2020-21, the domestic coal supplies was estimated to be 706.7 MTs & 690.8 MTs respectively.**

Power sector is the largest contributor to India's coal (steam/non coking coal) demand purely of the reason that India's electricity generation is still dominated by coal . It is significant to note that, power sector accounts nearly 92% (inclusive of CPPs, i.e. captive power plants) of India's coal consumption. **During year 2020-21, the domestic coal consumption by power sector (inclusive of CPPs, i.e. captive power plants) hovered around 670 MTs.**

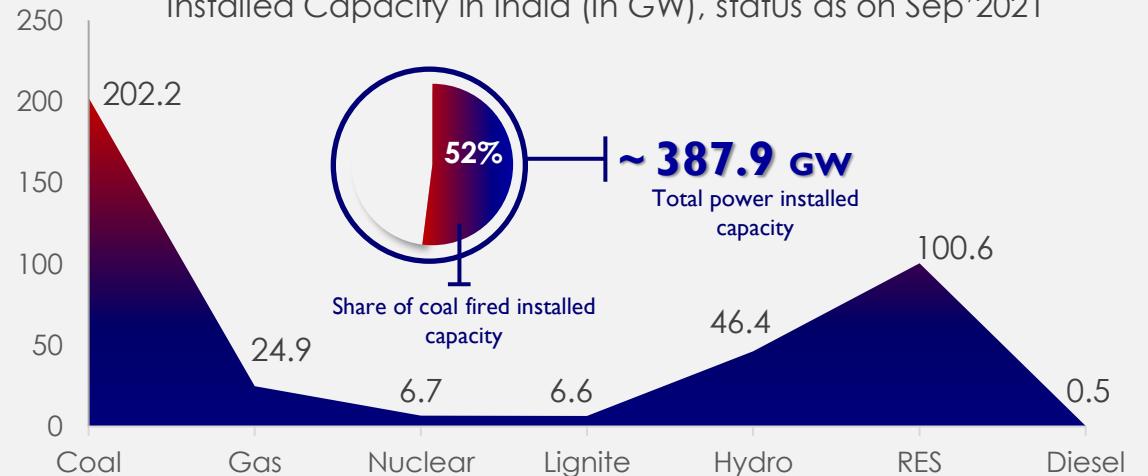
India is also one of the major importers of coal across the globe. The countries that hold a significant share in meeting India's coal requirements are – Indonesia, Australia, South Africa, Colombia, Mozambique, US & Canada. Indonesia has been the leading supplier of steam coal to India, but with the growing share of other countries its share has decreased. The country accounted for 78% of steam coal imports in 2014, with share of South Africa to be 15% and Australia to be 4%. Presently also Indonesia is the largest contributor to India's coal imports but its share has declined. It is pertinent to note that as on 2019, Indonesia accounts for 50% of coal imports. Where as the share of South Africa and Australia increased to 22% & 18% respectively. **During 2020-21, the total coal imports in India stood at 214.9 MTs. Of this, 163.7 MTs was the imported volume of steam coal (majorly used by power sector) , while 51.2 MTs was imported volume of metallurgical coal.**

## Coal & India's Electricity Mix

Power sector is the leading consumer of steam coal in India as electricity generation in the country is largely driven by the same. It is pertinent to note that during year 2020-21, **the domestic supply of steam coal was 646.8 MTs and of this about 550 MTs was consumed by thermal power plants.**

**Over 50% of the power installed in India is driven by coal fired power plants that accounts a capacity of 202 GW in September 2021.** Of this total capacity, private sector's contribution is maximum and stands to be 73.5 GW. Ownership of states owned thermal power plants is 65.9 GW followed by 62.7 GW of CPSUs (central public sector undertakings). In India, **Maharashtra, Uttar Pradesh, Madhya Pradesh & Gujarat** are the leading states w.r.t. coal fired electricity generation. The total coal fired installed capacity of these states as in September 2021 is recorded to be 26.3 GW, 19.7 GW, 16 GW and 15.9 GW respectively. Cumulatively, these states accounts approximately 39% of India's coal fired power installed capacity.

Exhibit 7: Source of Generation wise Breakup of Power Installed Capacity in India (In GW), status as on Sep'2021



Note: 1GW = 1000 MW

Source: Eninrac Research, MoP

**Frequently Asked Questions  
on  
Shortage of Coal Supplies in India**

## For which reasons India is on a coal shortage ?

To understand this, let's refresh some facts regarding coal production & dispatch in India for the month of August & September 2021. The overall coal production has been 51.70 MT in the month of Sept 2021 as compared to 39.48 MT in Sept 2019 and registering a growth of 30.93%. However, it has been observed that CIL produced 249.82 MT of coal upto Sept 2021 which is 37.29% of annual production target of 670 MT. Although, [rainy season has also badly affected the coal production and despatch during June 2021 to Sept 2021](#) but to achieve annual production target and meet the rise in demand, CIL has to ramp up the production from Oct 2021 onward. The overall coal supply has been 59.80 MT in the month of Sept 2021 as compared to 54.63 MT and 44.36 MT in Sept 2020 and Sept 2019 respectively. However, it has been observed that CIL despatched 307.62 MT of coal upto Sept 2021 which is 41.57 % of annual supply target of 740 MT. [Surge in power demand has been observed since Aug 2021 \(23.7% and 9.3% in Sept\), in view of the current scenario, the coal stock of only 7.83MT has been liquidated by CIL. 42.01 MT of stock is available with CIL as on 30th Sept 2021.](#)

The power sector despatch has been 50.55 MT in the month of Sept 2021 as compared to 43.43 MT and 36.53 MT in Sept 2020 and Sept 2019 respectively. The coal based power generation in the month of Sept 2021 has been 75691 MU (million units) in comparison to 85736 MU in Aug 2021 and registered a negative growth of 11.71% due to heavy rainfall in the Sept 2021. However, the share of coal based power generation has increased by 13.36 % in the month of Sept 2021 in comparison to Sept 2019. The overall power generation in Sept 2021 has been 9.34% higher than the power generated in Sept 20.

## Key reasons for coal shortage in India –

(i) Post the second wave of COVID'19, India has witnessed an increase in the power demand since July 2021 especially with rebounding of commercial and industrial activities. During July 2021, the peak power demand in India rose to all time high of 200.5 GWs with daily power consumption touching 4,508 MUs. During Apr-Jun '2021 (which was the second wave COVID'19 period), the coal stocks were not replenished due to restrictions imposed within and outside India. The coal crisis have been spurred in the country by deficiency observed in the existing stocks and the unprecedented growth seen in the power demand.

(ii) Delayed and extended monsoon in India, led to difficult mining situations, low production was observed by few of CIL's subsidiaries. For example For the month of Sept 2021, ECL (Eastern Coalfield Limited) achieved only 67% of the coal production target. Another subsidiary SECL (South eastern Coalfields Limited) recorded only 64% of targeted coal production. Further, heavy rains also impacted the transportation of available coal to the plant sides, hence cutting down the inventory.

(iii) Some of power plants owners in India are into self evacuation of coal from the mines/port sides on RCR (road cum rail) mode. With the advent of second wave of COVI-19 in India, logistics became tough, also unavailability of manpower at the unloading site led to decline in their coal inventory

(iii) Coal supplies by MDOs (mine development operators) to some of the thermal power plants were deliberately regulated due to outstanding payments. For example, Wardha Warora thermal power plant in Maharashtra has only 4 days of critical stock left as on October 1 2021. Dr. N TATA RAO thermal power station in Andhra Pradesh has only 1 day of super critical stock left as on October 1 2021.

(iv) Decline in the coal imports was also seen in India over the past few months due to soaring prices. The spike in thermal coal demand was observed globally. With Covid-19 vaccination in full swing in many countries, the global economies are scaling up production to reach their pre-pandemic levels. Further, the restrictions imposed by China (one of the largest producer) on coal exports as the large scale domestic industries facing a power crisis, China is also competing for imported coal in the internal market. This has led to thermal coal prices and freight costs soaring in the international market, witnessing over a 100 per cent increase this year.

## Why there is significant increase in the coal demand ?

India is among the largest electricity generating & consuming country across the globe. The annual electricity consumption in the country accounts for 4-5% of world's total electricity consumption and is set to grow at a level of approximately 10% per year in coming four to five years propelled by the country's accelerating economic growth. Since, coal (steam coal) plays a significant role in terms of addressing 60-70% of electricity base load in India, the demand for same shall observe a spike at par to the growth in electricity requirement.

Infrastructure development & industrial boom has been a major driver to the rapid economic growth and soaring power demand in India. With the sentiments all high to boost domestic manufacturing capabilities and become “Atmanirbhar Bharat”, further increase in the power demand levels is likely to happen. Apart from the industrial and infrastructure development, a lot is happening on the clean mobility front. The Govt has successfully rolled out electric vehicles (progress is still on). Subsequent charging infrastructure is already in development to support the EVs. Also, we have electrification targets of Indian railway routes and the ongoing progress on the metro rail expansion front etc. All of this will further lead to rise in the power demand. Hence, the demand for coal will increase.

## Key reasons for increase in the coal demand in India – The prime reason has been the increase in electricity demand that led to increase in the coal demand

- (i) Rise in the coal demand is largely driven by the increase in power demand in India. It is pertinent to note that surge in power demand has been observed since Aug 2021 (23.7% and 9.3% in Sept), in view of the current scenario, the coal stock of only 7.83MT has been liquidated by CIL. 42.01 MT of stock is available with CIL as on 30th Sept 2021. Spike in power demand witnessed is largely due to the pacing up of economic activities post second wave of COVID'19.
- (ii) Due to increase in the industrial activities post second wave of COVID'19, captive power generation by many of the industrial units have also been in place to support their manufacturing & operations . Since majority of the captive power units use coal/lignite as key fuel for generating electricity, the demand of coal has seen an increase
- (iii) Rise in travel & tourism industry post second wave of COVID'19 also increased the power consumption across commercial set ups such as hotels, malls/shopping complexes, shops etc. Hence, the increase in coal demand
- (iv) Increase in the work from home spiked the power demand of household consumers, hence the demand for coal shot up
- (v) Increase in the power demand will continue for this quarter as well as we have festivities in October – November.

## 3 days of coal stock left, when normally its 14 days. What does it mean? What are its consequences ?

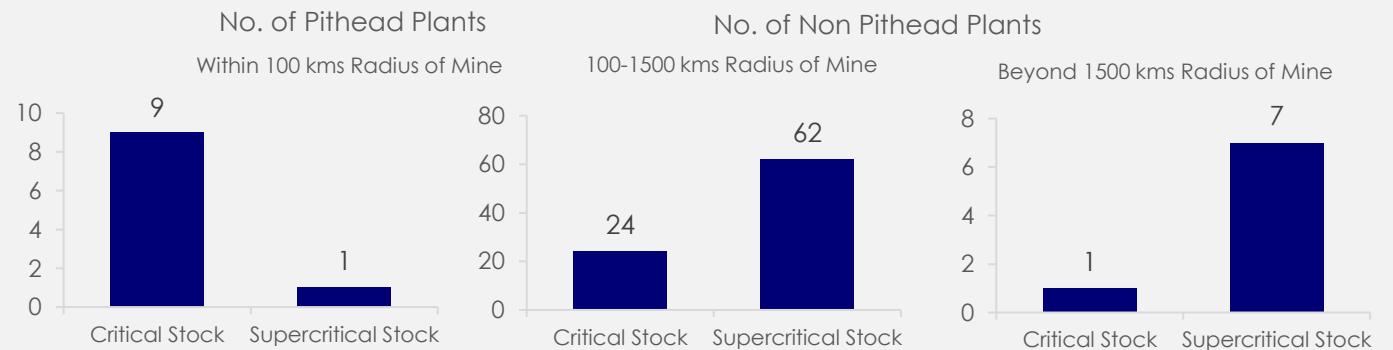
Lets first understand what does coal stock means. The coal stock is the planned inventory with thermal power plants for generating electricity. The shortage in the coal stocks is classified into two types – (i) critical stock (ii) super critical stock. These stocks vary as per the power plant types – (i) pithead thermal power plants (ii) non pithead thermal power plants

Exhibit 08: Coal Stocks Classification as per the Power Plant Type		
Power Plant	Coal Stock	
	Critical	Super Critical
<b>Pit head</b> (Plants within & upto radius of 100 kms from mine site)	Less than 5 days	Less than 3 days
<b>Non Pit head</b> (beyond 100 kms of radius from mine site)		
Plants in a radius of 100-1500 kms	Less than 7 days	Less than 4 days
Plants in a radius of beyond 1500 kms	Less than 9 days	Less than 5 days

Source: Eninrac Research, MoP

Normally, the normative requirement of coal stock by the power plants should be of 14 days. As on Oct, 2021 there are 104 thermal power plants having a combined capacity of 128.9 GW with a coal inventory of 7 days or less than that. 15 (capacity 16.8 GW) of them have zero day stock, whereas 23 number of thermal power plants with a capacity of 28.1 GW have coal stock of one day. Exhibit 09 indicates the plant type wise coal stock left.

Exhibit 09: No of Plants with Critical & Supercritical Coal Stock (classification as indicated in Exhibit 08)



Source: Eninrac Research, MoP

As of now in India , there are 135 operational thermal power plants. Of this, 16 are pithead and 119 are non pithead. The combined capacity of these plants are 35.2 GW and 129.8 GW respectively. The daily combined coal requirement of the pithead plants is 461.7 Thousand Tonnes and they have a total available stock of 2443.9 Thousand Tonnes. The daily combined coal requirement of the non pithead plants is 1365.6 Thousand Tonnes and they have a total available stock of 5518.8 Thousand Tonnes.

Due to the coal shortage witnessed in the country since July 2021, the electricity prices on power exchange has shot up. During Aug'2021 it rose to a level of to INR 20 per unit. However, in October'2021 it fall down to INR 7/unit. Having said that, if the coal shortage continued a surge in the power tariff will seen in the exchange market crossing a mark of as high as INR 22-25 per unit, which in turn will impact the industrial consumers. Further, if the shortage continued, then this may increase per unit cost of coal supplied to the power sector and that will inflate the per unit cost of power generated, followed by rise in tariffs. The gencos here with long term of PPAs will struggle again in terms of recovering their total costs and will be under financial burdens. In case there is a increase in power tariff , pass on to the domestic consumers seems unlikely, commercial & industrial consumers will be exposed to the heat of increased tariffs, or if the inflated tariffs are absorbed by the DISCOMs, then that may result in further burdening them financially. Discontinued quality power supply (power cuts) can also be observed by the domestic consumers.

## How can India resolve this problem ?

To resolve this issue of low coal inventories with the thermal power plants in India, some tough measures has to be taken by the government and the authorities.

- (i) Clear specification to be mandated for maintaining the coal stocks at thermal power plants w.r.t to the planned power demand in place along with contingency
- (ii) In the event of such stocks not maintained , penalization structure should be prepared. Further, such plants should also be disincentivized through lower priority for coal supplies
- (iii) Payments defaulting by the off takers should also be curtailed . For example , non-payments of coal dues from states such as Maharashtra, Rajasthan, Tamil Nadu, Uttar Pradesh and Madhya Pradesh has resulted in inadequate supplies
- (iv) To balance the situation, CIL has launched a multi pronged effort to help build up the coal stocks. The company has initiated prioritized supply of coal to the power stations having inventory of zero to 6 days by preparing a contingency supply plan to increase their stock.
- (vi) CIL has offered coal on 'as is where' basis through rail-cum-road mode from sources where high stock is available. Twenty-three such mines carrying 40.3 MT (million tonnes) of stock were identified in Aug'2021. In the case of availability issue at linked mines, alternative sources have already been allocated for smooth running of the plant. With plans to ramp up production, strengthening evacuation infrastructure and adequate coal stock at the pitheads, CIL prepared to meet any surge in coal demand from the power sector

## About Eninrac Consulting

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Truth is ever to be found in the simplicity, and not in the multiplicity and confusion of things

- Sir Isaac Newton



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