

DOMESTIC COAL INDUSTRY

Domestic coal availability remains constrained as production ramp-ups are unable to keep pace with rising demand

October 2018



SUMMARY

- The domestic coal shortage during FY2018 was a result of not only a slowdown in production growth by Coal India Limited (CIL), but also of a shortage in rake availability from the India Railways. Following the anaemic production growth of 2.4% year-on-year (YoY) in FY2018, CIL has been able to achieve a double-digit production growth of 10.6% in the first six months of the current fiscal, a feat which has not been seen in recent history. However, notwithstanding this strong production growth, domestic coal supplies continue to remain significantly short of meeting the domestic demand, on the back of a strong recovery in power demand, lower hydropower generation in the current fiscal, as well as a healthy growth in production levels from non-regulated consuming sectors like cement, steel, and aluminum.
- Given the recently concluded monsoon season, CIL's coal production growth slowed down to 3.8% and 3.2% in September and August of 2018 respectively, against 10.6% in July 2018 and 13.2% in June 2018, leading to coal stocks at power plants steadily deteriorating from an intermediate high of 21.1 million tonne (mt) in end-July 2018 to 15.8 mt in end-September 2018. With a recovery to full-fledged production likely from November following the retreat of monsoons, and with CIL's pithead stock running critically low at around 18.4 mt as on September 30, 2018 (against a much higher level of 55.5 mt as on March 31, 2018), meeting the rising demand from power plants during the ongoing festive third quarter would pose a challenge for the state-owned miner. Spot power prices during the evening peak period touched a decade high, crossing Rs. 18/kwh on October 03, 2018, and CIL's spot e-auction premiums have reached 102% in September 2018, surpassing the level of 95% registered during October 2017, when coal stocks at power plants were at their lowest levels. Coal costs for a non-regulated player depending entirely on e-auction and/or imported coal have also increased in the range of 20-34% between April 2018 and October 2018, with the extent of increase depending on the mix between domestic vs. imported coal, as well as the grade of coal consumed.
- Going forward, following the waning down of the monsoons, CIL's ability to stage a quick recovery in production levels, and maintaining a double-digit production growth rate for the remainder of FY2019, would remain critical to overcome the ongoing shortage. Apart from CIL's own efforts, a closer coordination with the Railways for increasing rake availability for coal transport would also be an important lever to alleviate the ongoing coal shortage. In addition, debottlenecking the logistics network by a) increased swapping of coal linkages for government as well as privately-owned thermal power stations, b) evaluating alternate means of coal transport for pithead plants, which would include belt-conveyors and merry-go-round (MGR) networks, freeing-up rakes that can be appropriately deployed to meet the demand for distant stations, and c) exploring the possibility of increased coastal shipping of coal would be near-to-medium term strategies that could help tide over the ongoing coal supply deficit. Moreover, fast-tracking the development of key coal evacuation corridors remain an important medium-term target that can help CIL leapfrog to a high production growth trajectory over a sustained period, and come closer to its aspirational target of reaching 1 billion tonne of annual coal production.

Contact:

Jayanta Roy
+91 33 7150 1120
jayanta@icraindia.com

Ritabrata Ghosh
+91 33 7150 1107
ritabrata.ghosh@icraindia.com

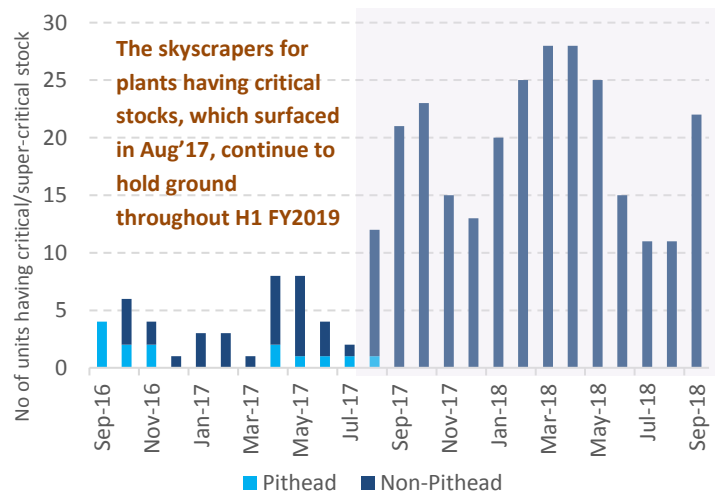
Soumyajyoti Basu
+91 33 7150 1109
soumyajyoti.basu@icraindia.com

The Coal Crisis: A one-year status check

Coal availability for power plants continue to remain tight, as spot power tariffs reaches a ten-year high

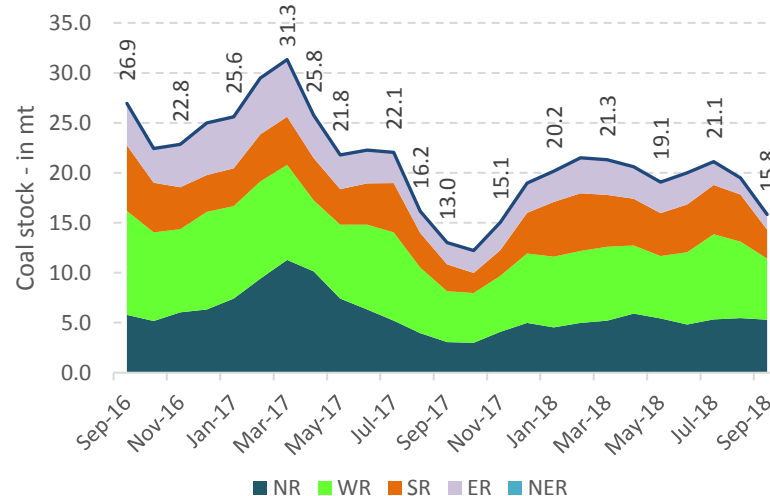
The domestic coal scarcity, which surfaced in August 2017, have continued to persist in the current fiscal. Notwithstanding CIL's healthy production and despatch growth rates of 10.6% and 8.1% respectively in the first six months of FY2019 (April to September), the incremental domestic coal supplies have been unable to keep pace with the rising demand from both the power and non-regulated sectors. As on September 30, 2018, 22 non-pithead power plants (refer Exhibit 1) had less than 7 days of coal stock, of which 14 plants were in the Western region alone, indicating that the severity of the coal shortage is being felt the most by plants located in Western India. Given the just concluded monsoon season, domestic coal production growth slowed down to 3.8% and 3.2% in September and August of 2018 respectively, against 10.6% in July 2018 and 13.2% in June 2018, leading to coal stocks at power plants steadily deteriorating from a high of 21.1 mt in end-July 2018 to an estimated 15.8 mt in end-September 2018 (refer Exhibit 2). With a recovery to full-fledged production likely from November following the full retreat of the monsoons, and with CIL's pithead stock running critically low at around 18.4 mt as on September 30, 2018 (against a much higher level of 55.5 mt as on March 31, 2018), meeting the rising demand from power plants during the ongoing festive third quarter would pose a challenge for the state-owned miner.

Exhibit 1: Month-end coal stock at power plants



Source: CEA, ICRA research

Exhibit 2: Power units having critical/super-critical stocks



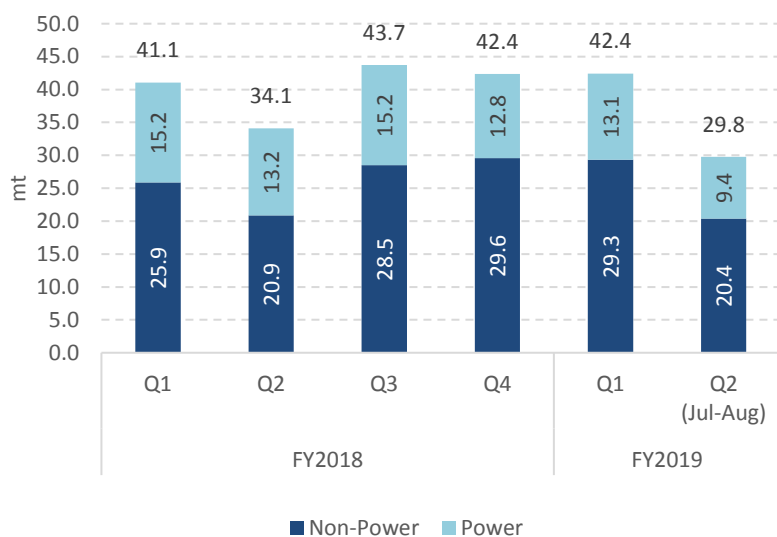
Source: CEA, ICRA research

Given the tightness in domestic coal availability, and the healthy demand from power distribution utilities, spot power tariffs during the evening peak period crossed Rs. 18/kwh on October 03, 2018, reaching a ten-year high. ICRA expects domestic power demand to grow at 5-6% during FY2019. If CIL can deliver a double-digit production and despatch growth during FY2019 full year, then the ongoing fuel scarcity for power plants is likely to gradually alleviate towards the end of the current fiscal.

As rake allocations to the power sector gets a higher priority, thermal coal imports by the non-regulated sector continue to remain elevated

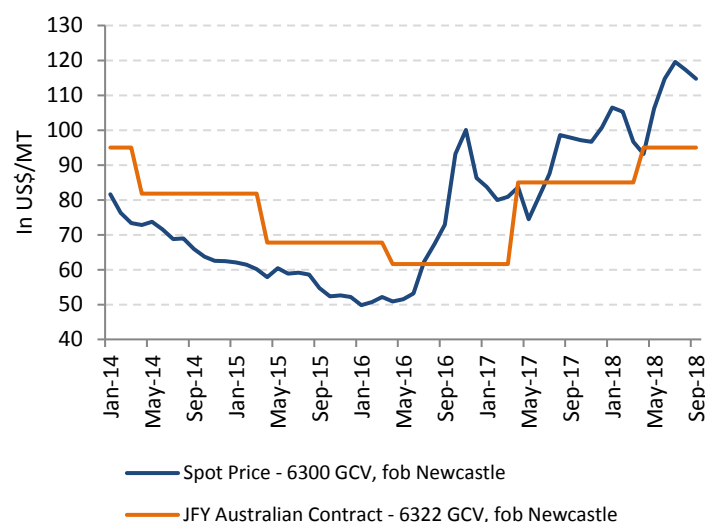
The domestic coal shortage has led to a rising levels of thermal coal imports by end-users, which increased from 34.1 mt in Q2 FY2018 to 43.7 mt in Q3 FY2018 (refer Exhibit 3). A closer look at the import data reflects that this increase has been largely contributed by end-users in the non-regulated sector, whose thermal coal imports have increased from 20.9 mt in Q2 FY2018 to 28.5 mt in Q3 FY2018, leading to an average thermal coal import of around 10 mt/month, and accounting for around 65% of the total thermal coal imports. Despite CIL increasing production and despatch levels in FY2019 thus far, thermal coal imports by end-users in non-regulated sectors, like cement, steel, aluminum, and captive power, have remained at elevated levels, maintaining the average run-rate of 10 mt/month in the first and second quarters of FY2019 (refer Exhibit 3). As rakes allocations to the power sector gets a higher priority, given their critical stock levels, the coal shortage for the non-regulated sector is expected to continue for the remainder of FY2019, and improvements remain unlikely before the beginning of FY2020.

Exhibit 3: Trend in thermal coal imports by end-users



Source: Ministry of Commerce, ICRA research

Exhibit 4: Trend in spot seaborne thermal coal prices



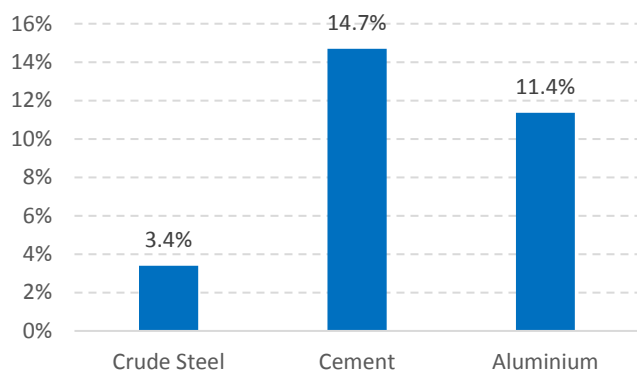
Source: World Bank, Bloomberg, ICRA research

Seaborne thermal coal prices have remained at elevated levels, adding to the woes of non-regulated players. Spot price of 6300 gross calorific value (GCV) thermal coal from Newcastle, Australia have increased by 26% between April and October of FY2019 (refer Exhibit 4), which, coupled with a 13% depreciation of the INR, has led to rising coal costs for steel, aluminum, cement, and captive power plants. With imports by such players expected to remain elevated in the near term, coal cost for non-regulated players is expected to remain high for the remainder of FY2019.

Coal costs for non-regulated players increases sharply, ranging between 20-34% between April 2018 and October 2018 due to the domestic coal shortage and hardening of imported coal costs

Production growth rates for the non-regulated sectors have remained healthy in FY2019 thus far, with the outputs of the cement and aluminium industries growing by a robust 14.7% and 11.4% YoY respectively during April – August of the current fiscal (refer Exhibit 5). Given the tightness in domestic coal availability, and the healthy demand from coal consuming sectors, spot e-auction premiums have reached 102% in September 2018, surpassing the level of 95% reached during October 2017, when coal stocks at power plants were at their lowest levels.

Exhibit 5: Production growth during Apr'18-Aug'18 for non-regulated players



Source: Department of Industrial Policy and Promotion, Ministry of Mines, ICRA research

Exhibit 6: Increase in coal cost between April'18 and October'18

Particulars	Units	Coal Price		% Change
		Apr'18	Oct'18	
Ex-Rate	INR/US\$	64.5	74.0	-12.9%
Landed cost of imported coal from Australia (6300 kcal/kg GCV)	Rs/MT	8467	11323	34%
Landed cost of imported coal from Indonesia (4200 kcal/kg GCV)	Rs/MT	4791	6007	25%
Landed cost of domestic e-auction coal (G6 grade, 5500-5800 kcal/kg GCV)*	Rs/MT	3357	4044	20%
Landed cost of domestic e-auction coal (G11 grade, 4000-4300 kcal/kg GCV)*	Rs/MT	5418	6932	28%

Source: ICRA research; *e-auction premium of 30% in April 2018 and 90% in October 2018

Given the critical coal stocks at power plants, despatches to the power sector has taken a higher priority, growing at a stronger pace of 9.6% year-on-year (YoY) during H1 FY2019, compared to a YoY growth of just 2.8% in despatches to the non-regulated sector during the same period. This has led to rising thermal coal imports by end-users in the non-regulated sector in the last one year, increasing from 75.1 mt in H1 FY2018 to 84.7 mt in H1 FY2019. Apart from rising import dependence, a steep 26% rise in seaborne thermal coal prices during the current fiscal thus far, a sharp depreciation of the rupee, and rising spot e-auction coal prices, is expected to lead to a 20-34% rise in coal costs (refer Exhibit 6) for a non-regulated player between April 2018 and October 2018, with the extent of increase depending on the mix between domestic vs. imported coal, as well as the grade of coal consumed.

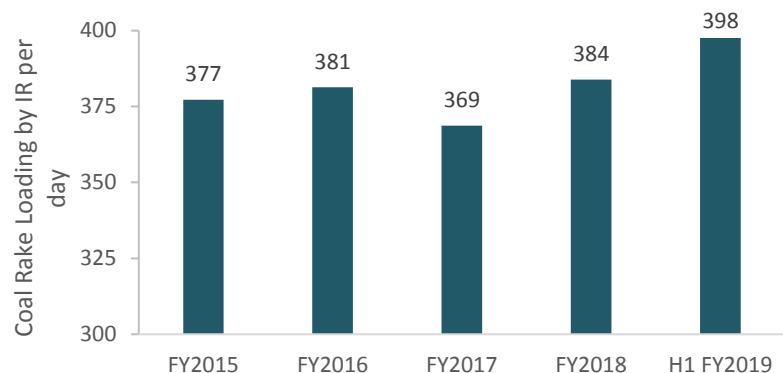
Evacuation Challenges: The rake availability scenario

Increase in coal rake loading by Indian Railways not adequate to meet the rising domestic coal demand

Loading of coal rakes by Indian Railways (which includes rakes for domestic coal transport, coal imports, and coal moved through dedicated MGR network between coal mine and plant) has increased steadily from 369 rakes per day in FY2017, to 384 rakes per

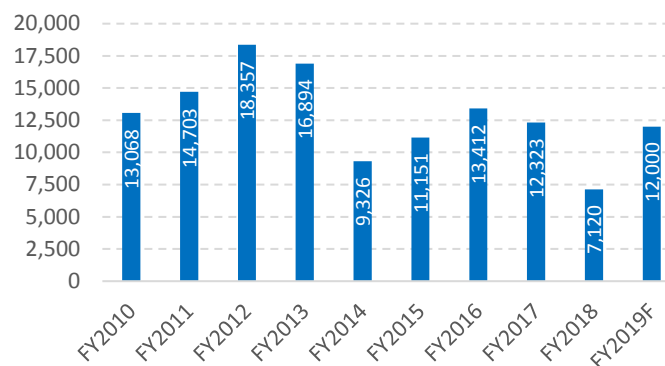
day in FY2018, and 398 rakes per day in H1 FY2019 (refer Exhibit 7). However, notwithstanding this increase in rake loading, coal supply to power plants remains constrained, indicating that additional rake supplies would be required going forward to plug the gap. In FY2018, wagon procurement by Indian Railways touched a multi-year low of around 7,120 units (refer Exhibit 8), a part of which would be BOXN and BOBR open wagons, which is used for coal despatch.

Exhibit 7: Trend in coal rake loading by Indian Railways



Source: Indian Railways, ICRA research

Exhibit 8: Trend in wagon procurement by Railways

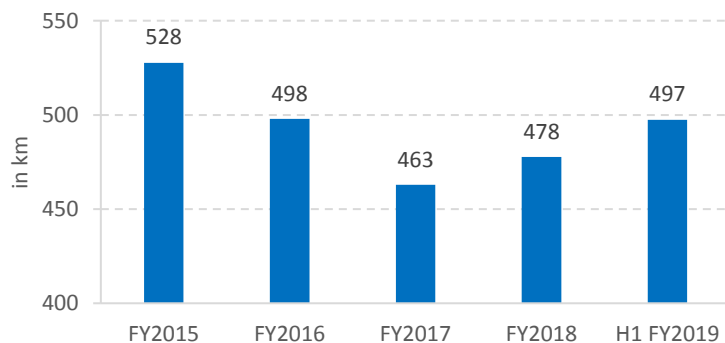


Source: Indian Railways, ICRA research

Given the ongoing shortage in rake availability, the wagon procurement target for FY2019 has been increased to 12,000 units, which despite the healthy sequential increase, ranks lower than the levels procured during FY2010 – FY2013. Going forward, maintaining a healthy pipeline of BOXN and BOBR wagon procurement would be critical for ensuring adequacy of rake supplies for coal transport.

Amidst the ongoing scarcity, average lead distance for coal transport through rail is steadily increasing, as CIL is trying to meet the demand for power units from distant mines

Exhibit 9: Trend in lead distance for coal moved by rail



Source: Indian Railways, ICRA research

Following the introduction of linkage rationalisation for Government owned generation units, average lead distance for movement of domestic coal by rail had seen a steady decline from 528 km in FY2015 to 463 km in FY2017. However, given the ongoing scarcity in coal supply, with CIL trying to meet the demand for power units from distant mines, the trend reversed, as seen from the average lead distance increasing to 478 km in FY2018, and further to 497 km in H1 FY2019 (refer Exhibit 9). Going forward, expediting the swapping of coal linkages for IPPs can help in debottlenecking and optimal utilisation of the existing railway infrastructure.

Evacuation Challenges: The missing links

Progress in several critical railway links for evacuation of coal have been slow, and commissionings have been delayed

Over the medium to long term, a major thrust towards CIL's coal production is expected to come from the coalfields of North Karanpura (in Jharkhand), Mand-Raigarh (in Chhattisgarh), Korba – Gevra (in Chhattisgarh), Talcher (in Odisha), and Ib Valley (in Odisha). However, given the logistical bottlenecks in some of these mine clusters, the development of eight rail corridors remains critical, as these railway lines can support incremental coal evacuation of 372 mtpa from these mine clusters (refer Exhibit 10).

Exhibit 10: Status of progress of critical railway links to be used for coal evacuation

Name	Line Length	Coalfield	Subsidiary	Evacuation Capacity	Commissioning Status
Tori-Shivpur	44.37 km	North Karanpura	CCL	32 mtpa	1) Tori to Balumath (19.3 km) commissioned in March 2018, which can carry 3 mtpa additional coal from Magadh and Amrapali mines. Can carry upto 6-7 mtpa in the near to medium term. 2) Line from Balumath to Bakru commissioned in May 2018. Line from Bakru to Shivpur expected to be completed by March 2019
Shivpur-Kathautia	49.09 km	North Karanpura	CCL	30 mtpa	Commissioning delayed from March 2020 to January 2022
East-Rail Corridor - Phase I (Kharsia-Dharamjaigarh)	132 km	Mand Raigarh	SECL	180 mtpa	Only 32% of project cost incurred till March 2018; commissioning delayed from September 2018 to September 2019
East-Rail Corridor - Phase II (Dharamjaigarh-Korba)	62.5 km	Mand Raigarh	SECL		DPR under finalisation; commissioning scheduled in March 2022
East-West Rail Corridor (Gevra Road - Pendra)	186 km	Korba - Gevra	SECL		Only 7% of project cost incurred till March 2018; commissioning delayed from March 2020 to March 2022
Jharsuguda-Barpalli-Sardega	52.41 km	Ib Valley	MCL	70 mtpa	All rail linking work has been completed in December 2017 and trial run started in April 2018; line can evacuate 15 mtpa at present
Angul-Balram-Jharpada-Tentuloi (Phase I)	69.1 km	Talcher	MCL	60 mtpa	Commissioning delayed from December 2018 to September 2019
Tentuloi-Budhapunk (Phase II)	136 km	Talcher	MCL		Commissioning delayed from December 2020 to September 2021

Source: ICRA research

Among these eight-railway links, benefits are expected to flow-in from only two links in the near term. This includes: a) the 52.41 km Jharsuguda-Barpalli-Sardega line, which has been commissioned recently, and can help evacuate 70 mtpa coal from the Ib Valley coalfield (refer Exhibit 10 and Exhibit 11), and b) the 44.37 km Tori-Shivpur line, which is expected to be commissioned in March 2019, and would help evacuate 32 mtpa from the North Karanpura coalfield. ICRA notes that progress in the remaining six railway links has been limited thus far, and this is expected to remain a bottleneck in the development of several large expansion projects of CIL, which could take the central miner closer to its stated aspirational goal of reaching one billion tonne of coal production.

Exhibit 11: Large ongoing expansion projects of CIL and the associated rail evacuation networks

Mine Name	Coalfield	Coal Company	Rated Mine Capacity	Associated Rail Evacuation Network
Amrapali OC	North Karanpura	CCL	12 mtpa	Tori-Shivpur-Kathautia (Line commissioning expected by March 2019)
Magadh OC	North Karanpura	CCL	20 mtpa	
Basundhara (West) Extension	Ib Valley	MCL	7 mtpa	Jharsuguda-Barpalli-Sardega (Line commissioned)
Kulda Expansion OC	Ib Valley	MCL	15 mtpa	
Kulda OC	Ib Valley	MCL	10 mtpa	
Siarmal OC	Ib Valley	MCL	40 mtpa	
Garjanbahal OC	Ib Valley	MCL	10 mtpa	
Gevra OC Expansion	Korba - Gevra	SECL	45 mtpa --> 70 mtpa (+25 mtpa)	East-West Rail Corridor (Progress has been delayed)
Kusmunda OC Expansion	Korba - Gevra	SECL	26 mtpa --> 50 mtpa (+24 mtpa)	
Baroud OC Expansion	Mand Raigarh	SECL	3 mtpa	East Rail Corridor - Phase I (Progress has been delayed)
Pelma OC	Mand Raigarh	SECL	15 mtpa	
Durgapur OC	Mand Raigarh	SECL	6 mtpa	
Chhal OC Seam III	Mand Raigarh	SECL	6 mtpa	
Total Incremental Production	-	-	193 mtpa	

Source: ICRA research

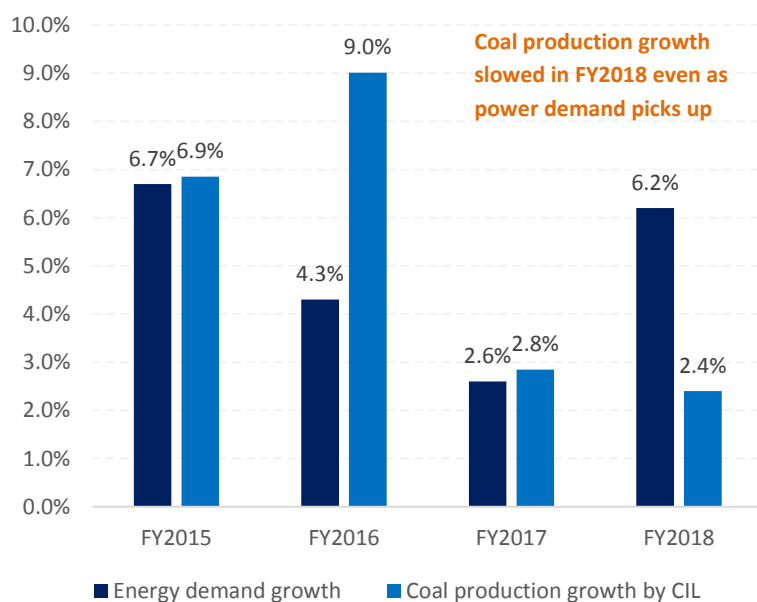
Sustained ramp-up in production over the medium-to-long term from CIL's two biggest subsidiaries, Mahanadi Coalfields Limited (MCL) and South-Eastern Coalfields Limited (SECL), hinges on their ability to develop some of the large mines highlighted in Exhibit 11. The operationalisation of the Jharsuguda-Barpalli-Sardega is expected to help MCL accelerate the development of five greenfield mines in the Ib Valley coalfields having a peak rated capacity of 82 mtpa. However, given the slow progress of all the three under-construction rail corridors in the SECL command area, the timeline for ramp-up in production from several greenfield and brownfield expansion projects having a cumulative incremental rated peak capacity of 79 mtpa remain uncertain at present.

Evacuation Challenges: Evaluating alternate means of transport to free-up railway network

Apart from linkage rationalisation, the Government is also evaluating alternative means of coal transport to decrease the load on the exiting rail evacuation network. This includes augmenting coastal shipping of coal, and transport of coal for pithead plants by belt-conveyors. The Government has set a target to construct belt-conveyors for all pithead plants located within 20 km from the nearest mine by April 01, 2020. At present, CIL has twenty-five such plants (situated within a distance of 20 km) having an annual contracted quantity of 19.5 mtpa which do not have captive means of coal transport. Connecting such plants with belt-conveyors can free-up around 15 rakes per day¹, which can be suitably deployed to meet the demand for distant plants. Further, the Government has also decided that for power plants located within 40 km from coal mine pitheads, MGR network would need to be constructed by April 01, 2021. Timely development of such alternate means of coal transport would help CIL better utilise the existing transport infrastructure to ferry coal to more remote plants where rail remains the only economically feasible alternative to ferry coal.

Conclusion

Exhibit 12: Growth in domestic coal production and power demand



Following an anaemic production growth of 2.4% YoY (refer Exhibit 12) in FY2018, CIL has been able to achieve a double-digit production growth of 10.6% in the first six months of the current fiscal, a feat which has not been seen in recent history. However, notwithstanding the strong production growth, domestic coal supplies remains significantly short of meeting the domestic demand, on the back of a strong recovery in power demand (which grew by 6.2% in FY2018, against 2.6% in FY2017, and is expected to grow by 5-6% in FY2019), lower hydropower generation in the current fiscal, as well as the healthy growth in production levels from non-regulated sectors like cement, steel, and aluminum. Given the supply vs. demand deficit, thermal coal imports have remained elevated since Q3 FY2018, and domestic coal prices remained at elevated levels, as indicated by spot e-auction premiums reaching at a high level of 88% between April and September of FY2019, against a much lower level of 49% in the same period of FY2018.

Source: CEA, CIL, ICRA research

¹ Assuming average rake-load of 3,659 MT

With coal production growth slowing down from the month of August due to the monsoons, and with a pick-up in full-fledged production expected from November 2018, meeting the coal demand during the ongoing festive third quarter may pose a challenge, given the depleted inventory at CIL's mine-heads, and limited buffer stock at power plants. Spot power prices touched a ten-year high, crossing Rs. 18/kwh on October 03, 2018, and CIL's spot e-auction premiums have crossed 102% in September 2018, a level last seen in October 2017, when coal stocks at power plants were at their lowest levels.

Going forward, following the waning down of the monsoons, CIL's ability to stage a quick recovery in production levels from November 2018, and maintaining a double-digit production growth rate thereafter for the remainder of FY2019, would remain critical. Apart from CIL's own efforts, a closer coordination with the Railways for increasing rake availability for coal transport would also be an important lever to alleviate the ongoing coal shortage. In addition, debottlenecking the logistics network by a) increased swapping of coal linkages for government as well as privately-owned thermal power generation stations, b) evaluating alternate means of coal transport for pithead plants, which would include belt-conveyors and dedicated MGR networks, thereby freeing-up rakes that can be appropriately deployed to meet the demand for distant stations, and c) exploring the possibility of increased coastal shipping of coal would be near-to-medium term strategies that could help address the logistical bottlenecks. Moreover, fast-tracking the development of key coal evacuation corridors remain an important medium-term target that can help CIL leapfrog to a high production growth trajectory over a sustained period, and come closer to its aspirational target of reaching one billion tonne of annual coal production.



Business Contacts

Mr. L. Shivakumar
E-mail: shivakumar@icraindia.com
Tel: +91 22 6114 3406 / +91 98210 86490

Mr. Jayanta Chatterjee
E-mail: jayantac@icraindia.com
Tel: +91 80 4332 6401/ +91 98450 22459

Media and Public Relations

Ms. Naznin Prodhani
E-mail: naznin.prodhani@icraindia.com
Tel: +91 124 4545 860

Ms. Malika Munjal
E-mail: malika.munjal@icraindia.com
Tel: +91 124 4545 840

Branches

Registered Office:

1105, Kailash Building, 11th Floor,
26, Kasturba Gandhi Marg,
New Delhi - 110 001
Tel: + 91 11 2335 7940-45

Corporate Office:

Building No.8, 2nd Floor,
Tower A, DLF Cyber City Phase II,
Gurgaon- 122 002
Tel: +91 124 4545300

Ahmedabad

907 & 908, Sakar – II,
Ellisbridge, Opp. Town Hall,
Ahmedabad - 380 006
Tel: +91 79 4027 1500/01

Bengaluru 1

'The Millenia', Tower- B,
Unit No. 1004, 10th Floor, 1 & 2 Murphy
Road,
Bengaluru - 560 008
Tel: +91 80 4332 6400

Bengaluru 2

2nd Floor, Vayudooth Chamber,
15-16, Trinity Circle, M.G. Road,
Bengaluru - 560 001
Tel: +91 80 4922 5500

Chennai

5th Floor, Karumuttu Centre,
634, Anna Salai, Nandanam
Chennai - 600 035
Tel: +91 44 4596 4300

Kolkata

A-10 & 11, 3rd Floor, FMC Fortuna 234/3A,
A.J.C. Bose Road,
Kolkata -700 0202
Tel: +91 33 7150 1100/01

Hyderabad 1

No. 7-1-58, 301, 3rd Floor,
'CONCOURSE',
Above SBI-HPS Branch,
Ameerpet,
Hyderabad - 500 016
Tel: +91 40 4920 0200

Mumbai

3rd Floor, Electric Mansion
Appasaheb Marathe Marg, Prabhadevi,
Mumbai - 400 025
Tel: +91 22 6169 3300

Hyderabad 2

4A, 4th Floor, SHOBHAN,
6-3-927, A&B Somajiguda,
Raj Bhavan Road,
Hyderabad – 500082
Tel: +91 40 40676500

Pune

5A, 5th Floor, Symphony, S. No. 210
CTS 3202 Range Hills Road, Shivajinagar,
Pune - 411 020
Tel: +91 20 2556 1194

Email: info@icraindia.com

Helpdesk: 124 3341580

Website: www.icra.in/ www.icraresearch.in

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