Global Energy Monitor

BRIEFING: October 2022

Why India's New Coal Mines Won't Solve its Power Crisis

INDIA'S COAL MINE BUILD-OUT IS UNNECESSARY GIVEN THE FUNDAMENTALS OF THE MINING SECTOR, AND PUTS ENVIRONMENTS AND COMMUNITIES AT NEEDLESS RISK

Global Energy Monitor – Medha Kapoor, Tiffany Means, Ryan Driskell Tate

Summary

The onset of a power crisis in India this year has emboldened the national government's plans to mine more coal and advance its long-standing commitment to produce 1,000 million tonnes in 2023-2024. As the coal ministry devises new measures to rally production, the backbone of the scheme is the continued privatization of the mining sector and opening of new coal blocks for commercial auction.

Global Energy Monitor (GEM) has conducted a survey of every operating coal mine and proposed project in the country and found that the industry suffers from chronic underutilization. The sector has 1,211 million tonnes per annum (mtpa) of approved capacity at its operating coal mines, yet leaves 433 mtpa, or 36% of that capacity idled and unused. At some large coal mines, underutilization is so severe that operators mine just 1% of available capacity.

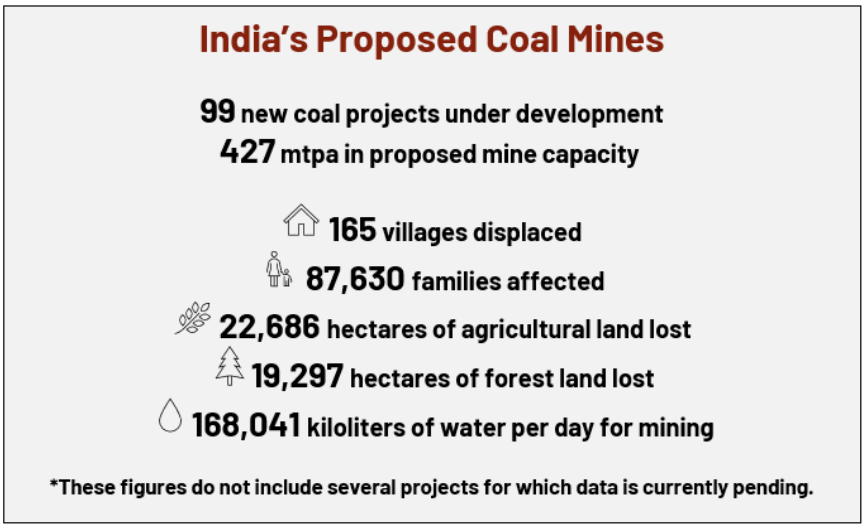
The scale of underutilization suggests that India's 99 coal mine projects and 427 mtpa of capacity under development are not needed: the opening of new coal mines is not immediate enough to ease the short-term supply crunch, nor is this expansion of India's coal supply by 55% necessary to meet the country's long-term coal demand, even when accounting for the mining sector's depletion rate.

GEM has surveyed the annual reports of Coal India, the largest coal producer in the world, and its subsidiaries and found that the company has not listed capacity constraints among the reasons it fails to reach production targets. Instead, the companies have blamed competition from renewables, infrastructure impasses, and land-use concerns for hindering output. But those issues could actually become worse, not better, by building new mines in the coming years.

India's mining expansions pose significant hazards for local communities and environments. GEM'S analysis shows that coal mines under development threaten to displace at least 165 villages and affect 87,630 families, of which 41,508 families live in scheduled areas of India (PESA) where the predominant population is tribal communities,

though those figures are likely higher since some fresh applications have not yet reported that information. Coal mines under development also threaten 22,686 hectares (ha) of agricultural land and 19,297 ha of forest, and will consume at least 168,041 kiloliters per day, comparable to the daily water needs of over 1 million people, at a time of severe water stress in the country.

On the heels of Prime Minister Modi's recent announcement of a net zero target of 2070, these new mines increase India's likelihood of stranded assets and carbon lock-in—the prospect that building out new mine infractures in the coming years will lock in coal dependency and delay a clean energy future—and in the process pose irreversible impacts on India's rural communities and environments for the sake of economically precarious mining ventures.



Why is India Boosting Coal Supply?

India is the second largest producer of coal in the world, next to China, and its national government has a long-standing goal to end coal imports and hit a production record of 1,000 million tonnes in 2023-24. The start of the power crisis earlier this year, in the spring of 2022, provided a short-term justification for the government's ongoing efforts to rally production. In the first quarter, coal stocks at more than 100 of India's 285 coal-fired power plants dropped to less than one quarter of their coal inventories. Those thermal plants were responsible for about 70% of the country's electricity, making power generation vulnerable to supply disruptions.

Just as a short-term squeeze on coal hit the market, high global coal prices provided a further incentive to consume domestic coal and reduce imports. In May, the coal ministry announced a host of measures to boost supply at home: recommission old and abandoned mines, some after 20 years of closure; extended mine leases up to 50 years; ease regulations on captive mines to sell on the open market; grant operators approval to mine 50% more than original planned capacity; champion the ongoing privatization of the mining sector; and grease the wheels of the project approvals through a streamlined, "single-window" clearance process.

The national government has, all the while, continued to open up new coal blocks for commercial auction. The commercial mining scheme first began two years ago, in June 2020, when

the government opened public coal blocks to private companies with direct foreign investment. But the auctions have struggled to secure bidders. Undeterred, the government continues to put new coal blocks up for sale. The most recent auctions occurred in September 2022.

As a result, India ranks second in the world behind China for the amount of new mine capacity under development, with 99 proposed coal mines and mine expansions, amounting to 427 million tonnes of new annual capacity.

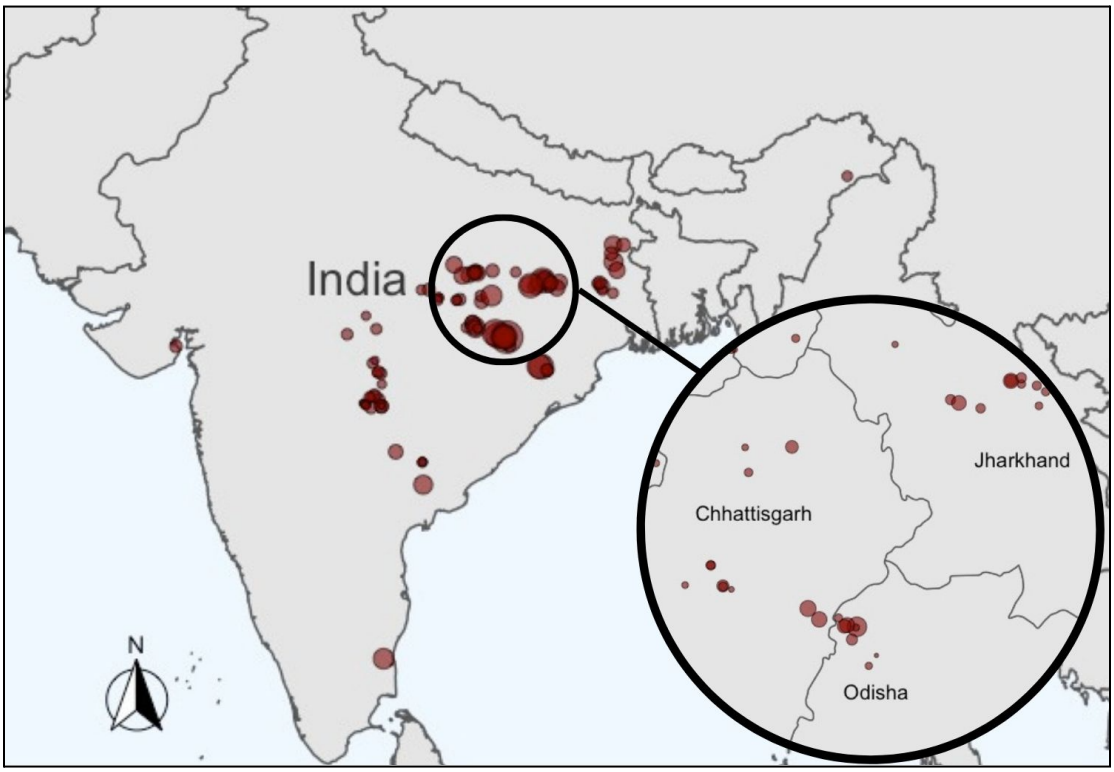


FIGURE 1. Proposed coal mines in India

The red dots represent proposed coal mines, sized by designed capacity. There are 99 proposed coal mines in India with 77% of planned capacity clustered in just three states: Chhattisgarh, Jharkhand, and Odisha. Circle size increased on India map pullout. *Source: Global Energy Monitor, Global Coal Mine Tracker*.

What about Existing Coal Mine Capacity?

GEM's analysis of every operating coal mine shows that India's mining sector suffers chronic underutilization. We found that more than one-third (36%) of mine capacity remains untapped and unused at operating coal mines, constituting 433 mtpa. In some major mining regions, like Jharkhand and Odisha, the industry has over 100 million tonnes in unused capacity at active mine sites, amounting to over 40% of unused mine capacity in those states (Figure 2).

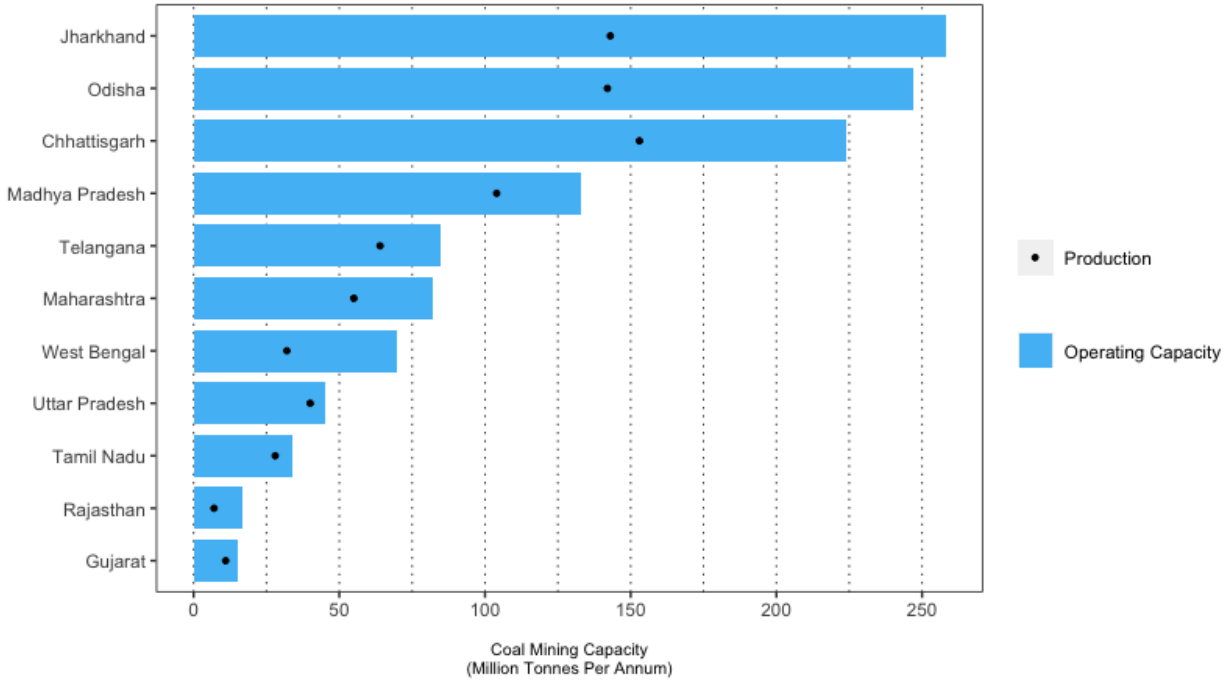


FIGURE 2. Coal mine capacity and actual production per state (mtpa)

The blue bars represent the approved normative capacity at operating coal mines in each state, and the black dots represent the actual production in 2019-2020. *Source: Global Energy Monitor, Global Coal Mine Tracker.*

India's mining sector has 1,211 million tonnes of normative capacity approved at operating mines alone, according to our data –not including recently closed or mothballed mines that the government has signaled it could recommission in the event of a crisis. The Center for Research on Energy and Clean Air (CREA) recently estimated that India has over 1,500 mtpa of approved and available capacity all together.

Coal India (CIL) and Singareni, both state-owned enterprises, have a large share of underutilization, even as they plan to build more mines. The highest underutilization rate is at the mines run by CIL subsidiaries Central Coalfields Limited (CCL) and Eastern Coalfields Limited, where nearly half (47%) of mine capacity is unused in each. Despite the excess capacity, CCL is planning to expand 41 million tonnes, even with 64 million tonnes already approved and untapped at its operating mines. Other CIL subsidiaries, like Northeastern Coalfields Limited (NECL) and Western Coalfields Limited (WCL), have more capacity idled at their operating mines than they do in development, suggesting those development projects are entirely unnecessary to meet any future production targets (Figure 3).

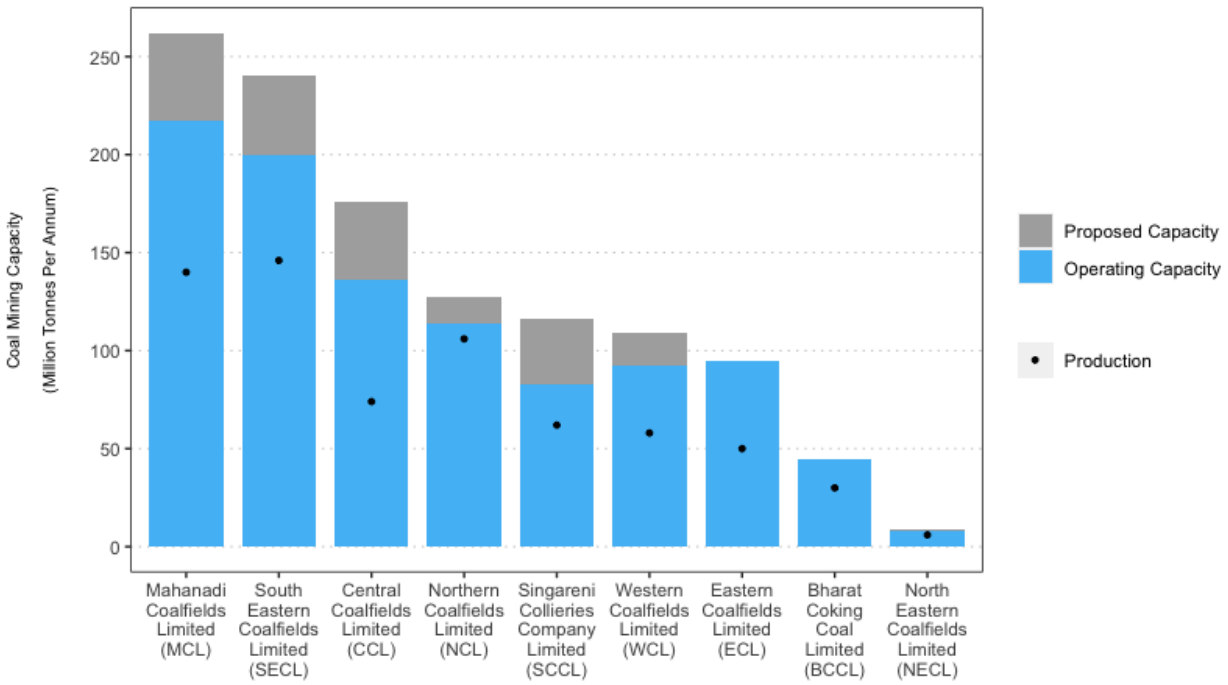


FIGURE 3. Coal mine capacity and actual production at Coal India subsidiaries and Singareni (mtpa)

The blue bars represent the approved normative capacity at operating coal mines for each operator, and the black dots represent the actual production in 2019-2020. The gray bars represent proposed capacity in the pipeline as of 2022. *Source: Global Energy Monitor, Global Coal Mine Tracker.*

At some of the worst performing mines, our analysis found that up to 99% of operating capacity is unused for actual output, including those owned by commercial and state-owned enterprises (Table 1).

TABLE 1. 5 coal mines with the most unused operational capacity (mtpa)

Coal Mine	Owner	Capacity	Actual Output (2019-2020)	Utilization Rate
Talabira II & III Coal Mines	Neyveli Lignite Corporation (NCL India Limited)	20	0.27	1.35%
Talaipalli Coal Mine	National Thermal Power Corporation	18	0.19	1%
Bharatpur Coal Mine	Mahanadi Coalfields Limited (MCL)	20	4.781	24%
Pachhwara (North) Coal Mine	The West Bengal Power Development Corporation	15	0.1	0.66%
Magadh Coal Mine	Central Coalfields Limited (CCL)	20	5.21	26%

The slack in the industry suggests that the national government may have misjudged why production targets remain so elusive. As it turns out, plenty of supply remains on hand to meet a short term supply crunch. But the continued shortfall is a stark reminder that up to 70% of the country's active mines operate at a financial loss and low labor productivity jeopardizes output.

By Coal India's own assessments, capacity shortfalls are not a major obstacle or "threat" to its operations. Our review of Coal India's annual SWOT (Strengths, Weaknesses, Opportunities, and Threats) analyses shows that available capacity is not mentioned by the company as a concern. The company and its subsidiaries instead list competition from renewables, land acquisition issues, transportation and infrastructure constraints, and other impasses, but not limits on available mine capacity. Of note, each of those recognized threats won't be removed by building new mine capacity, and could even worsen circumstances, since new projects will require more land use and infrastructural developments.

Are Proposed Coal Mine Projects Necessary?

Despite the recent uptick in coal demand in India, the 99 coal mines and 427 million tonnes of capacity under development in India are unnecessary to meet power-sector demand. In 2018, Coal India commissioned a report– Coal Vision 2030– that recommended no new coal mines to meet demand up to 2030. The assessment followed a coal slowdown in India after a dramatic drop in new coal power installations and capacity after 2016. The Central Electricity Authority (CEA) had previously projected that the country would mine over 1,200 million tonnes by 2027, but reduced that figure to 900 million tonnes in subsequent plans. This year, in September 2022, CEA lowered the figure even further, to 871 million tonnes for 2027, and 1058 million tonnes in 2030.

Yet the coal ministry has issued conflicting assessments: that coal supply will reach 1,448 million tonnes for the power sector in 2030. In recent months, the coal minister has publicly pushed the forecasted peak of 1,500 million tonnes back even further to 2040. Before the onset of the 2021-2022 power crisis, the Covid-19 pandemic set the stage for inadequate coal levels by triggering global supply disruptions, including mining slowdowns, shutdowns, and shipping congestions. The reduction in coal imports because of Covid-19 led to extra demand for India's domestic coal supplies. Once India's economy began to regain momentum post-pandemic, the associated spike in power demand (from 956 Mt in FY20 to 1027 Mt in FY22) exacerbated existing shortages. India's prolonged monsoon rains in coal mining regions hampered production and transportation. Meanwhile, Russia's invasion of Ukraine contributed to skyrocketing coal prices and encouraged many countries, India among them, to double down on policies of energy independence.

But India's proposed coal mines would not open fast enough to take the edge off the immediate power crisis, nor would they resolve the mining sector's chronic issues, including financial insolvency and low labor productivity. In fact, new coal mines will likely grapple with the same inefficiencies that have led to chronic underutilization in the first place, and may struggle to remain financially viable if high coal prices falter in the future.

The forecasts of long term coal demand still provide little justification for these projects. Even under the most ambitious consumption scenarios, India's existing capacity is still enough to sustain peak output (1,448 mtpa). The mining sector has 1,211 million tonnes of approved normative capacity at operating mines and an estimated 1,500 million tonnes available when also accounting for idled mines and recently closed operations. On top of that,

India's operating mines harbor more than 17 billion tonnes of coal reserves, according to mine-level data in GEM's Global Coal Mine Tracker, enough to maintain supply into the 2040s, when accounting for the standard depletion rate (Figure 4).

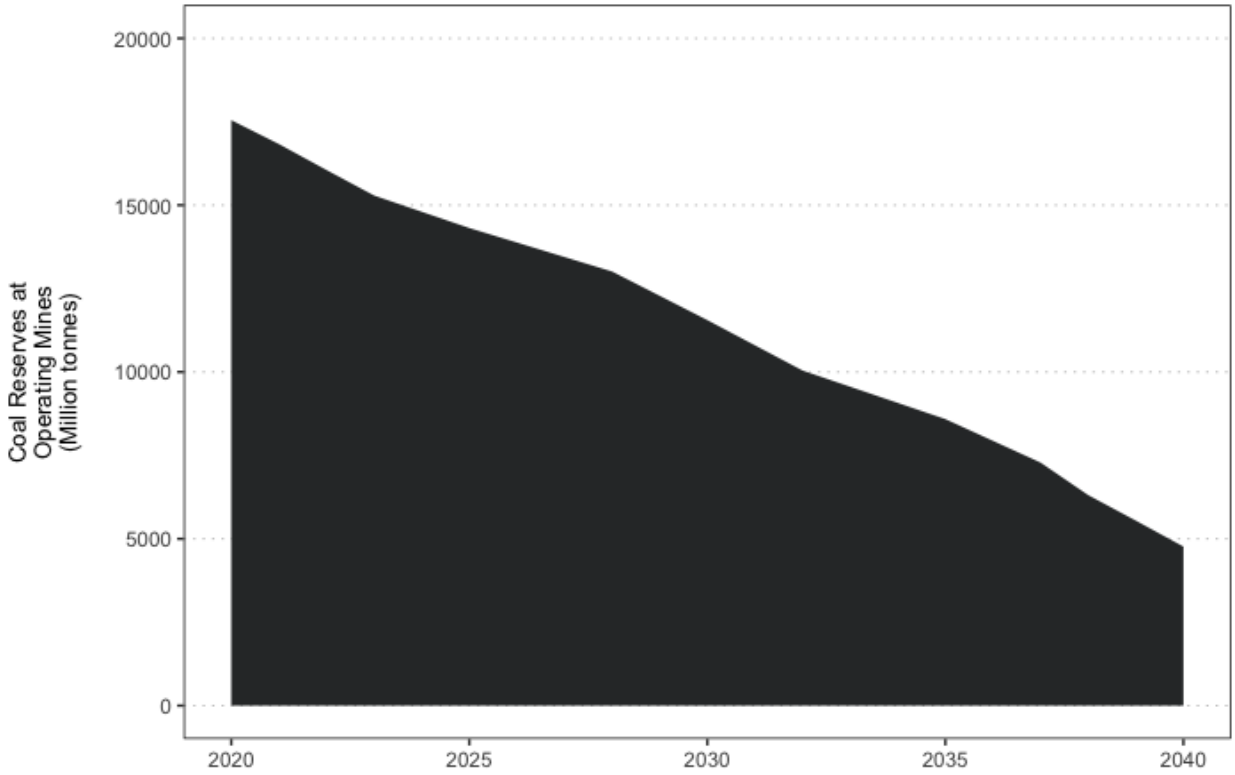


FIGURE 4. Depletion Rate of Coal Reserves at Operating Mines in India (Mt)

Sources: Coal reserves at operating coal mines available at Global Energy Monitor, Global Coal Mine Tracker. Coal demand and supply for depletion rate based on the Government of India, Ministry of Coal, Medium Term Coal Projections, 2021 and IEA, India Energy Outlook, 2021.

What's the Impact of Building New Coal Mines?

As in much of the world, India's proposed mines are highly concentrated, with 77% (329 mtpa) of the nation's planned capacity located in just three states: Jharkhand (115 mtpa), Odisha (130 mtpa), and Chhattisgarh (84 mtpa) (Figure 5). Within those states, mine locations are clustered even further, with Odisha's proposed mine capacity, the most of any other states, proposed almost entirely in two districts, Angul and Sundargarh.

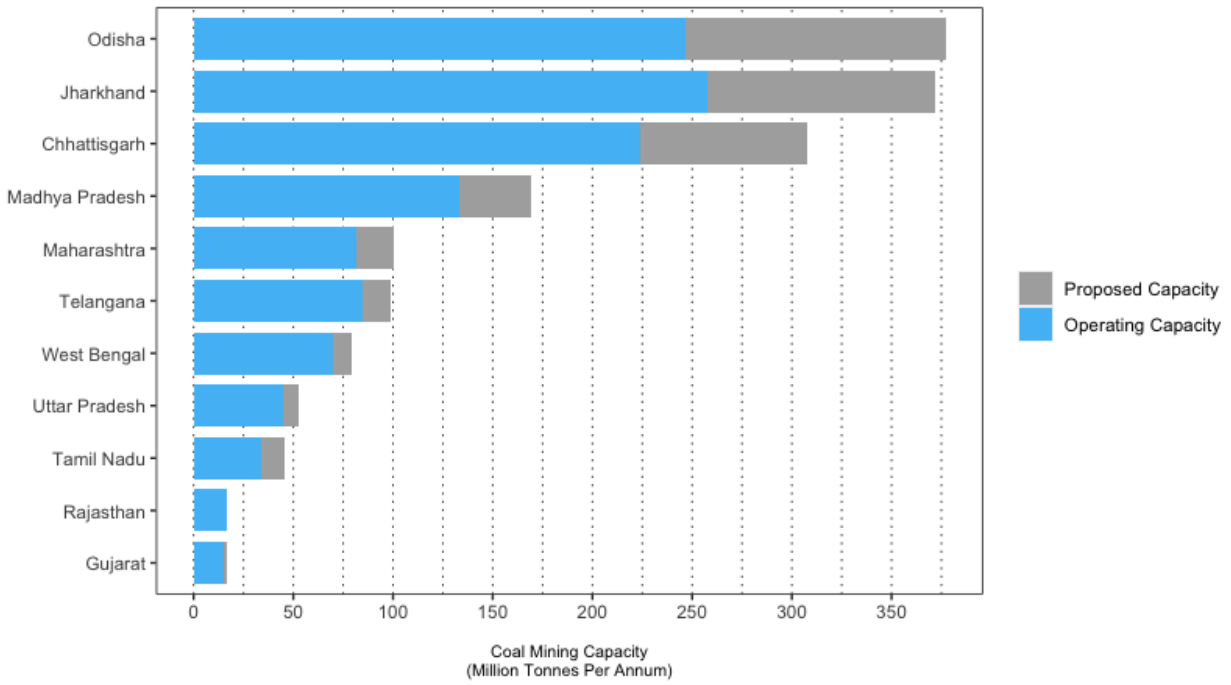


FIGURE 5. Coal mining capacity under development in each state (mtpa)

The blue bars represent the normative capacity at operating coal mines in each state and the gray bars represent capacity expansions currently under development. *Source: Global Energy Monitor, Global Coal Mine Tracker.*

The single largest project in the country, the Siarmal Open Cast mine in the Ib Valley of Sundergarh, Odisha, could produce 50 mtpa at peak capacity, with an operational life of 38 years, making it the second largest proposed coal mine in the world after Australia's Carmichael Project (60 mtpa), which is owned by India's Adani Group. The Siarmal project, which has been delayed because of legal conflicts with local villagers, remains ongoing, similar to other high-profile projects like the Deocha Pachami coal block, which faces staunch opposition from local communities.

New mine developments pose a significant environmental hazard to local communities. We found that 40% of the proposed projects fall within cities whose air quality does not meet national ambient air quality standards (known as non-attainment cities) and areas that the Ministry of Environment and Forests and Climate Change and the Central Pollution Control Board have deemed critically and severely polluted.

In addition to triggering worries about coal pollution, proposed mines are also deepening water concerns. By the Ministry of Coal's admission, India is currently facing acute water stress, but the 99 mine proposals (427 mtpa) in the pipeline will add an additional estimated water burden of 168,041 kiloliters per day. And of this number, 159 mtpa (37%) will be located in high risk water zones, while 230 mtpa (54%) is planned for extremely high water risk zones, while the fresh applications have yet to report. The projects also entail diversions of water bodies (174 mtpa) and groundwater extraction (246 mtpa), which further exacerbates water issues and complicates water access for neighboring communities. And with information for all mine proposal projects not yet available, it's possible these are conservative estimates.

As for changes in land use, the mining projects propose to divert at least 19,297 ha of forest land, of which 8,875 ha falls under scheduled areas of India (PESA) where the predominant population is tribal

communities whose major source of sustenance is forest produce. The 99 project proposals also threaten to displace 165 villages and 87,630 families, of which 41,508 families reside in the scheduled areas of India, jeopardizing the livelihoods of a vulnerable population. Still, more than half of the new mine projects have yet to provide their data on village removals, and more than a third have provided no information on the number of affected families.

New projects also raise ecological issues for wildlife, especially for India's elephants and its endangered national animal, the tiger. Mining claims vast chunks of forestland and is among the leading causes of habitat loss, habitat fragmentation, and increasing human-animal conflict within the country. Odisha's Marki-Mangli II project, which seeks to divert nearly 150 hectares of tiger habitat, is just one such example. Since more than half of India's new mine proposal projects remain in the pre-environmental clearance stage and have yet to publish information on proximity to wildlife reserves/national parks or the presence of schedule I species, with the highest degree of protection, a full picture of the disbenefits to biodiversity isn't yet known. But even if projects won't directly affect protected lands or animal corridors, their associated pollution and land use changes will undoubtedly still yield irreversible impacts.

What about Long Term Ramifications?

Just as the coal ministry plans to build new coal mines, the renewables sector in India is on the ascent. In 2021, the IEA claimed India had neared a "solar powered revolution." Indeed, when coal shortages began earlier this year, India's utilities relied on solar power to ease the burden. Solar power has experienced the fastest growth in recent years and in 2020, the cost of electricity from solar PV plants outcompeted coal-fired power plants. The newfound cheapness and accessibility of renewables undercut coal power and slowed growth in coal forecasts.

The reality is not lost on India's mining industry. Coal Vision 2030 recognized the displacement of coal in the power sector by renewables, a finding now supported by the International Energy Agency (IEA) in its roadmap for Net Zero 2050. Coal India has begun to diversify its own portfolio in renewables and cited competition from renewables as a threat to its coal operations. As a result, coal mine projects under development today are languishing now pose a very real risk of stranded assets and carbon lock-in as the country's gears-up renewables in the energy mix.

What's more, India's new net-zero target of 2070 requires long-term planning in the coal sector, and greater scrutiny of those projects previously under development prior to those commitments. The reason the mining sector struggles to produce at record levels has little to do with available capacity. Without resolving the chronic issues that besiege India's mining sector, opening new mines today could intensify the sector's weaknesses and inefficiencies, rather than reduce them, especially as competition from renewables and conflicts over land-use continue to emerge.

As for local communities, the stakes couldn't be higher. The hidden costs of building a new coal mine will not come cheap. When a new coal mine opens, it can cause community displacements and environmental concerns. If the fundamentals of the project are not sound or justified, those human and environmental costs are for naught.

Background on Global Energy Monitor

Global Energy Monitor is a nonprofit research organization developing information on fossil fuel projects worldwide. Through its Global Coal Mine Tracker (GCMT), Global Energy Monitor provides biannual updates on coal mine operations and development projects. GEM data is used by the International Energy Agency (IEA), UN Environment Programme, U.S. EPA, World Bank, and more.

MEDIA CONTACT

Ryan Driskell Tate
Project Manager, Global Coal Mine Tracker
ryan.driskell.tate@globalenergymonitor.org
+1-763-221-3313