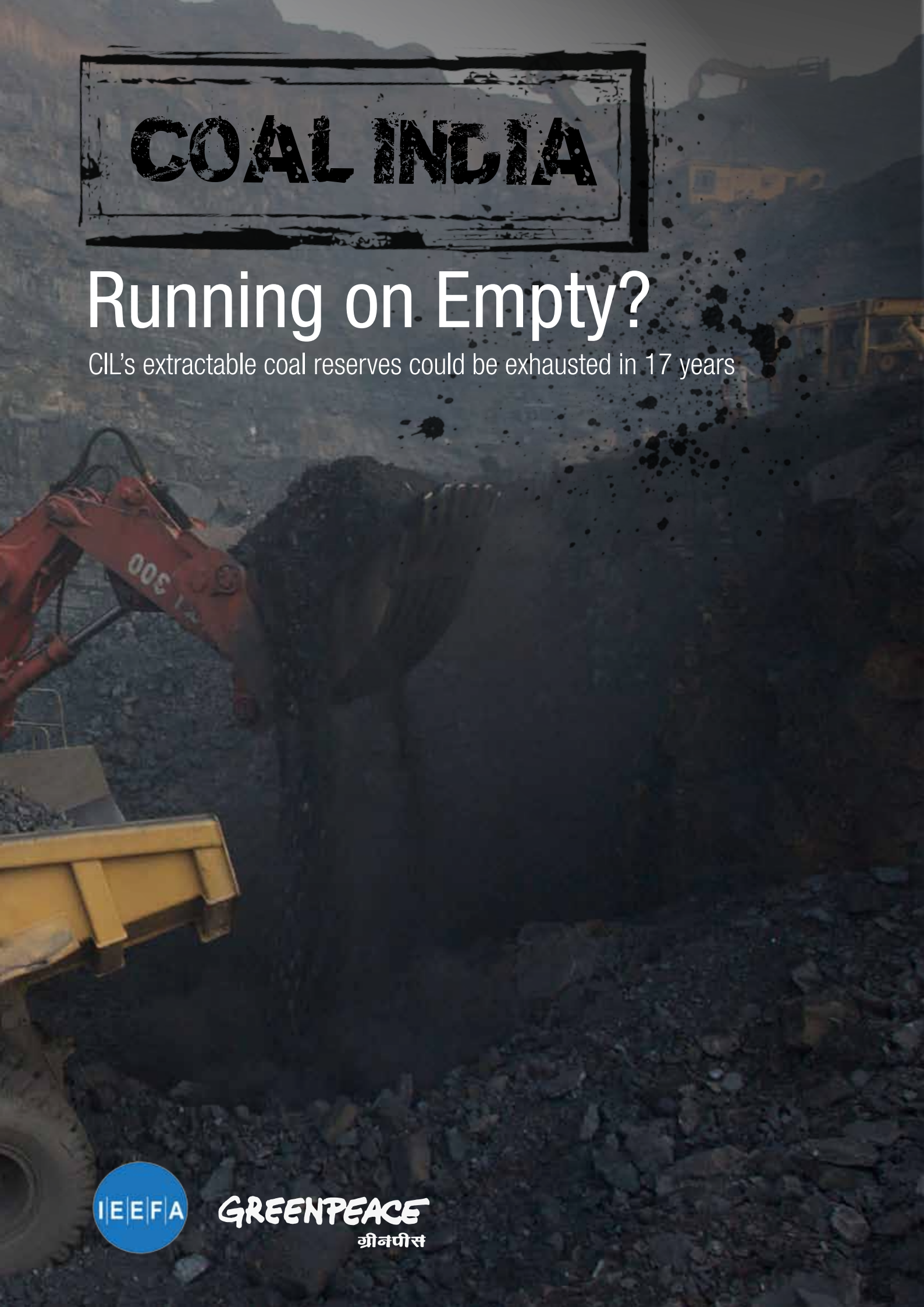

Running on Empty?

CIL's extractable coal reserves could be exhausted in 17 years

IEEFA

GREENPEACE
ग्रीनपीस

Contents

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Glossary

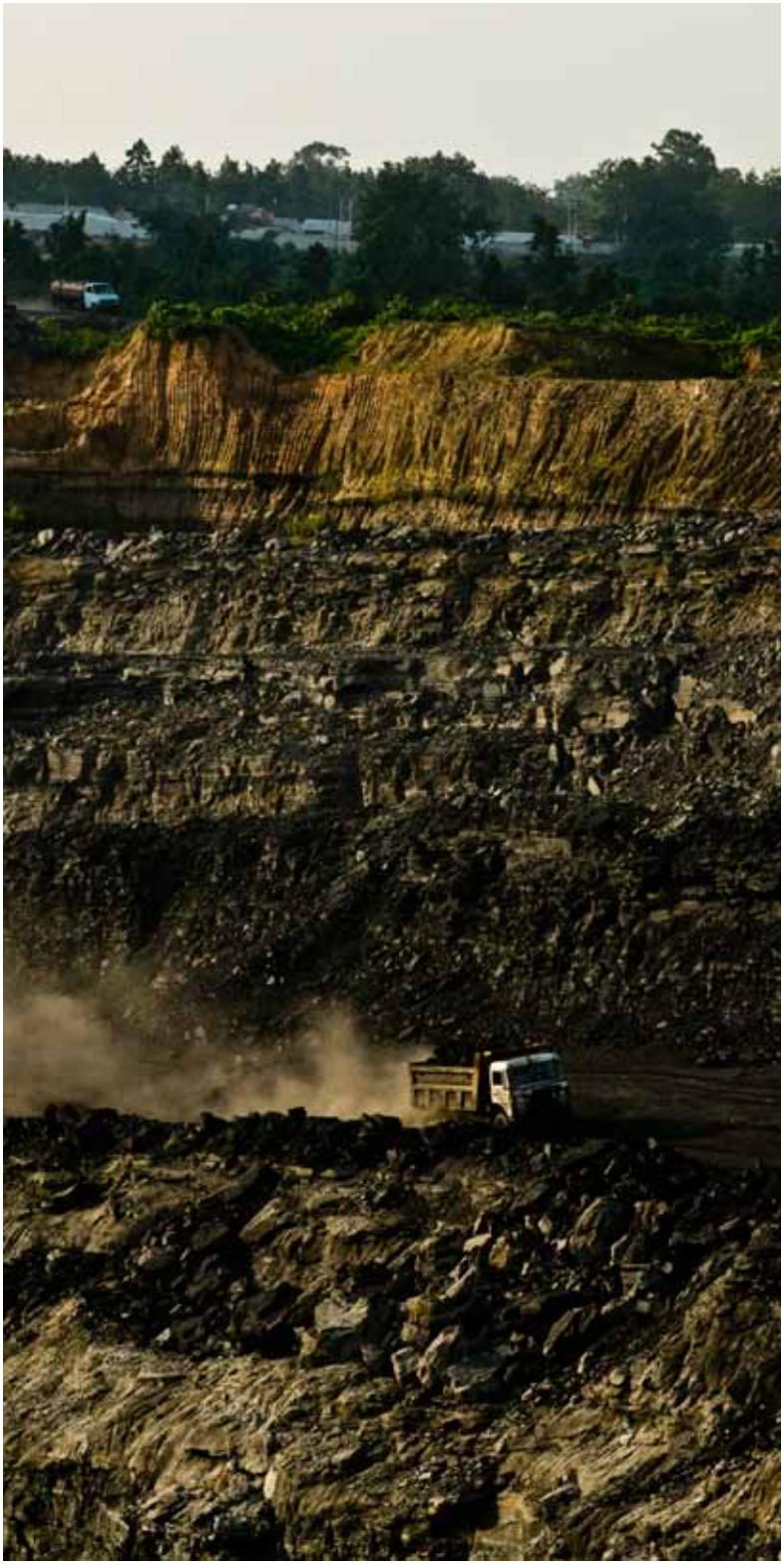
BSE	Bombay Stock Exchange
BT	Billion Tonnes
CAD	Current Account Deficit
CIL	Coal India Limited
CMPDIL	Central Mine Planning and Design Institute Limited
CRIRSCO	Committee for Mineral Reserves International Reporting Standards
GDP	Gross Domestic Product
GSI	Geological Survey of India
INR	Indian Rupee
IPO	Initial Public Offering
ISP	Indian Standard Procedure
JORC	Joint Ore Reserves Committee
MoEF	Ministry of Environment and Forests
MT	Million Tonnes (metric)
NSE	National Stock Exchange
SEBI	Securities and Exchange Board of India
TERI	The Energy Resource Institute
UNFC	United Nations Framework Classification for Fossil Fuel and Mineral Resources
UN-ECE	United Nations Economic Commission for Europe
USD	United States Dollar

Section 01
Executive Summary

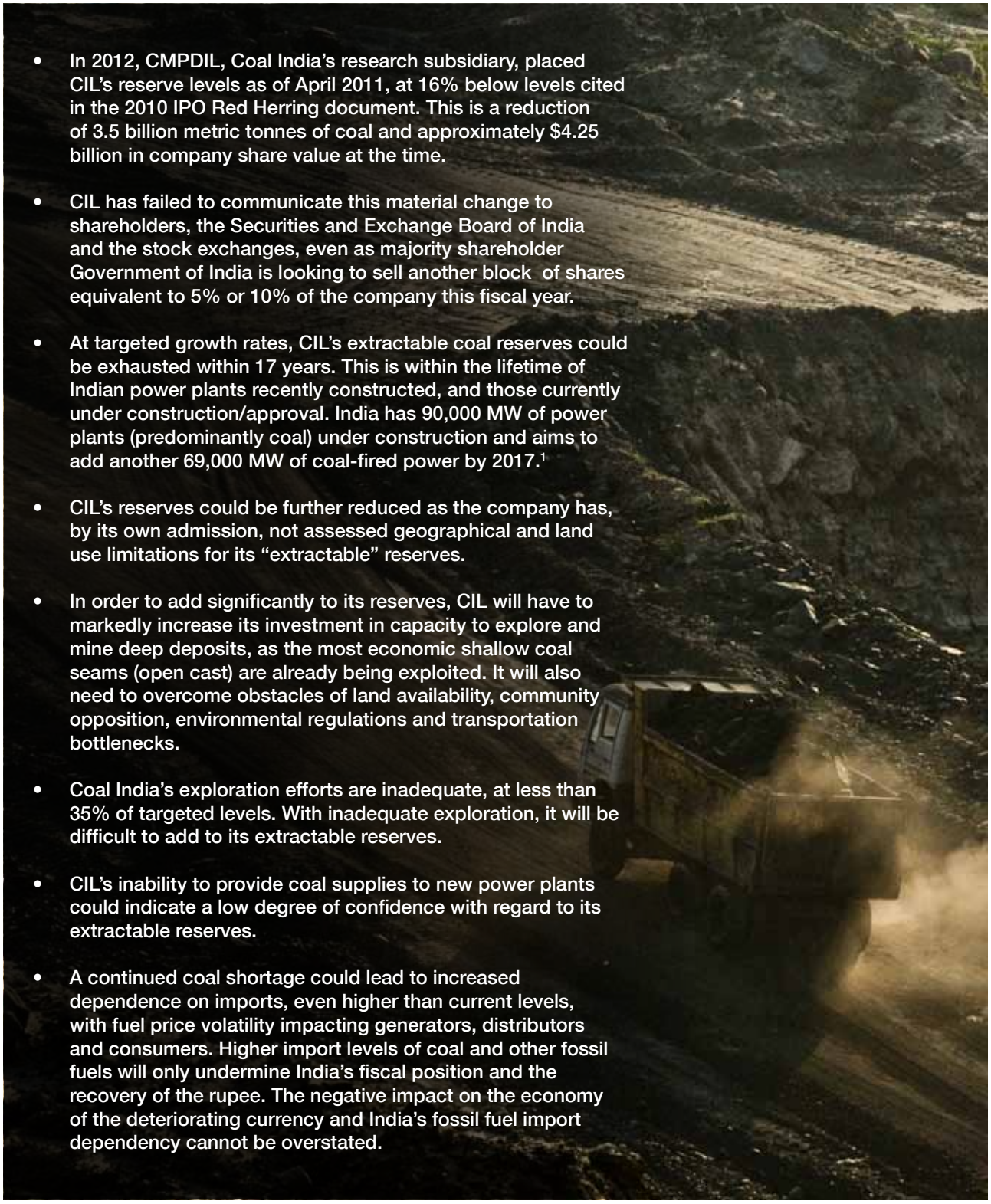
Coal India Limited (CIL) is one of the largest coal producers in the world, accounting for 80% of India's coal production. It is tasked with supplying coal to most of the country's power plants. The Government of India holds a 90% stake in CIL, with the remaining 10% held by Indian and overseas financial institutions, pension funds and other investors, pursuant to a 2010 IPO that drew significant international capital. The Government of India aims to further reduce its holding through a follow on share offer in the markets.

CIL's current measure of its extractable reserves, by its own research subsidiary the Central Mine Planning and Design Institute Limited (CMPDIL), is 16% below estimates contained in the 2010 IPO. CMPDIL commenced this assessment prior to the issuance of the 2010 IPO and academic researchers have been commenting on the issue of overstated coal reserves for nearly a decade. In 2001, the State of India abandoned the standards used by CIL to derive its estimates. There remains significant uncertainty about the true extent of CIL's extractable reserves.

Given the continued emphasis being placed by the Government of India on coal to deliver India's energy needs, the Indian Chamber of Commerce considers an accurate account of CIL's extractable reserves as a critical reform to the nation's coal policies. CIL has consistently failed to meet production targets. The resulting coal shortage has affected power generators. This analysis places the coal reserve issue as part of a broader risk scenario that raises significant concerns on the future production capabilities of Coal India, and in turn, on the viability of existing and proposed coal power projects that depend on CIL for fuel.



Key findings:



- In 2012, CMPDIL, Coal India's research subsidiary, placed CIL's reserve levels as of April 2011, at 16% below levels cited in the 2010 IPO Red Herring document. This is a reduction of 3.5 billion metric tonnes of coal and approximately $4.25 billion in company share value at the time.
- CIL has failed to communicate this material change to shareholders, the Securities and Exchange Board of India and the stock exchanges, even as majority shareholder Government of India is looking to sell another block of shares equivalent to 5% or 10% of the company this fiscal year.
- At targeted growth rates, CIL's extractable coal reserves could be exhausted within 17 years. This is within the lifetime of Indian power plants recently constructed, and those currently under construction/approval. India has 90,000 MW of power plants (predominantly coal) under construction and aims to add another 69,000 MW of coal-fired power by 2017.[1]
- CIL's reserves could be further reduced as the company has, by its own admission, not assessed geographical and land use limitations for its "extractable" reserves.
- In order to add significantly to its reserves, CIL will have to markedly increase its investment in capacity to explore and mine deep deposits, as the most economic shallow coal seams (open cast) are already being exploited. It will also need to overcome obstacles of land availability, community opposition, environmental regulations and transportation bottlenecks.
- Coal India's exploration efforts are inadequate, at less than 35% of targeted levels. With inadequate exploration, it will be difficult to add to its extractable reserves.
- CIL's inability to provide coal supplies to new power plants could indicate a low degree of confidence with regard to its extractable reserves.
- A continued coal shortage could lead to increased dependence on imports, even higher than current levels, with fuel price volatility impacting generators, distributors and consumers. Higher import levels of coal and other fossil fuels will only undermine India's fiscal position and the recovery of the rupee. The negative impact on the economy of the deteriorating currency and India's fossil fuel import dependency cannot be overstated.

Section 02

Current Status of Coal India's Reserve Estimates

The Government of India has announced plans to bring its majority stake in Coal India Limited (BSE: 533278, NSE: COALINDIA) down from 90% to 85 or 80%, selling shares representing between 5% and 10% of the company.[2] The company's stock price has dropped by 17% since the 2010 stock sale. The sale of 5% is expected to generate up to ~USD 1.16 billion. The company enjoys a near monopoly over India's coal supply, accounting for approximately 80% of India's domestic coal production.[3] Approximately 90% of CIL's production is non-coking coal,[4] and approximately 85% of India's coal is non-coking coal.[5]

Coal India Limited represented to investors in its August 2010 Red Herring that it had 21.7 billion tons of extractable coal reserves.[6] New estimates for 2011, released in 2012 by its geological exploration arm (Central Mine Planning and Design Institute Limited) show 18.2 billion tons, a 16% reduction in CIL's economically extractable coal reserves[7] as compared to extractable reserve figures identified in its 2010 Red Herring Prospectus. Since the new assessment was conducted, CIL has produced 1.02 billion tonnes, further reducing its extractable reserve.

One year later, as of August 1, 2013, the Coal India website does not reflect this 16% reduction in extractable reserves, nor have the stock exchanges been informed of this material change.

The rest of CIL's coal (62 billion tonnes) meets the United Nations Framework Classification for Fossil Fuel and Mineral Resources (UNFC) definition of 'resource'. A resource is currently not extractable, either for economic, technical or other reasons.

Figure 1: Coal India's extractable reserves -
Comparison between 2010 estimate under ISP and 2011 estimate under UNFC

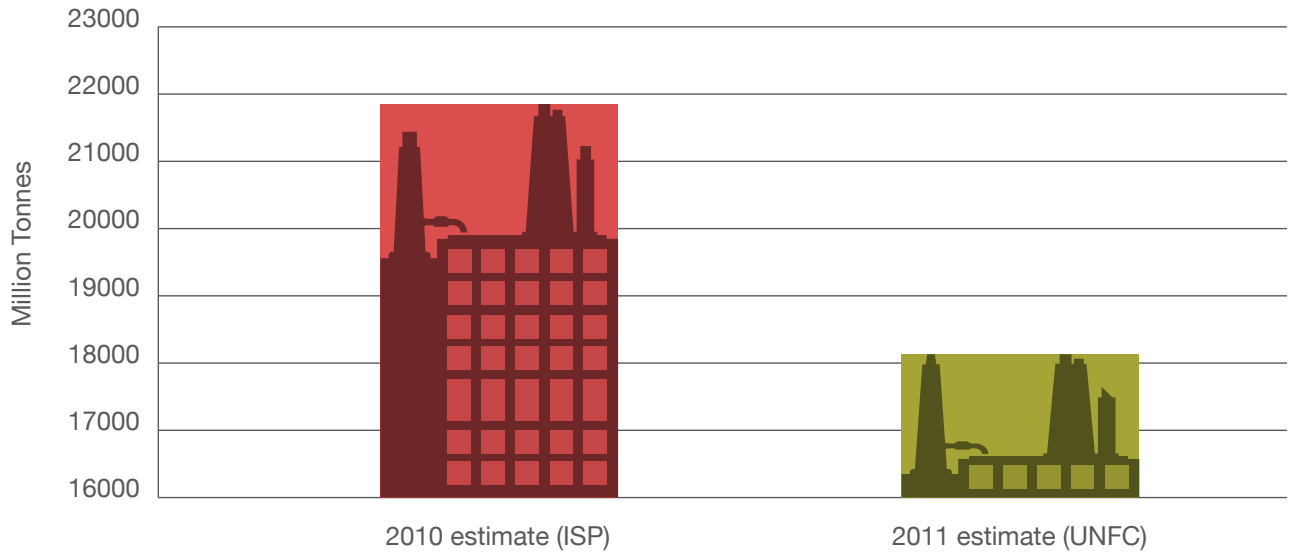
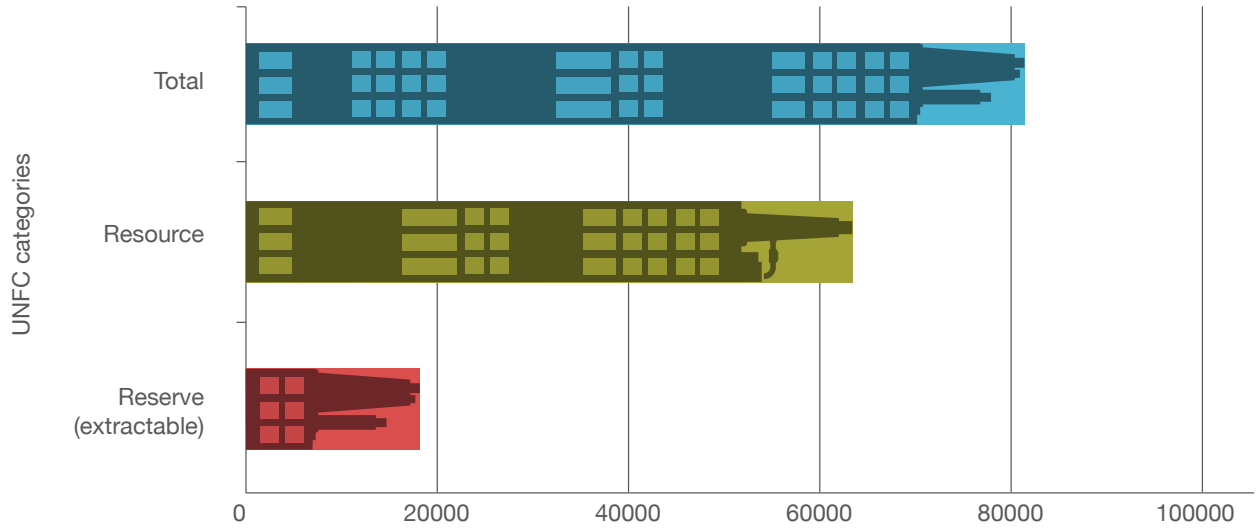


Figure 2: Coal India's Reserves under UNFC system



National and International Reserve Classification Systems

CIL's 2010 Red Herring estimate of 21.7 billion tonnes was made pursuant to the India Standard Procedure system (ISP), India's mineral classification system through 2001.[8] Extractable coal reserves under the ISP are those reserves remaining after deduction of losses due to: i) geological features, ii) coal under rivers, roads, railways etc, iii) barriers and iv) mining losses.[9] Per the Comptroller and Auditor General's 2012 performance report on coal augmentation,[10] the ISP system addresses only volume and tonnage and does not address structural delineation and what is economically and technically extractable. CIL has considered mining studies on 30.3 billion tonnes and estimated that its extractable coal reserves under the ISP system are 21.7 billion tonnes.[11]

According to SRK Consulting, Coal India's coal consultant for the purposes of the 2010 Red Herring,[12] "CIL's definition of Extractable Reserves is largely in line with that of Reserves as defined internationally."[13] SRK concludes that CIL's application of India's standards results in reserve classifications, including the Extractable Reserve classification that is "analogous to the feasibility studies that are typically produced for international projects and which form the basis of requirements for debt and equity finance."[14]

Coal India relies upon the SRK study in the 2010 Red Herring to make this summary representation to investors related to its coal reserves: "our definition of "Extractable Reserves" is largely in line with that of "Reserves" as defined under the JORC code and CRIRSCO Code."[15]

Like most other major mineral producing countries in the world, India's markets and decision makers have historically relied on nation-based mineral classifications like the ISP. The reserve estimates based upon a company's application of the standards are reported back to the government and investors. The reserve estimates are typically used for mineral and energy planning, government and corporate finance and for comparison of reserves between producers and regions. The ISP classification relied upon by India since 1956 was formally replaced by the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government of India in May 2001.[16]

The new system, the United Nations Framework Classification for Fossil Fuel and Mineral Resources (UNFC)[17] was adopted in order to move India and other nations toward a uniform system of mineral classification suited for global trade and international comparison. UNFC implementation remains an ongoing process for those countries committed to a rigorous reporting methodology for mineral extraction.[18] The UNFC standard was established during a several year dialogue. The dialogue takes place under the auspices of the United Nations Economic and Social Council, Economic Commission for Europe. The UN-ECE convenes meetings, assembles data, conducts research and disseminates the work of participants, coordinates and produces draft documents and outreach to mining experts worldwide.[19] At least one representative from the government of India participates in the deliberations.

The UNFC system classifies mineral resources and reserves using three criteria: economic viability, field project status and feasibility, and geological knowledge. Each criterion has numbers ranging from 1 to 3, where 1 represents the highest degree of economic viability, most advanced feasibility status and highest assessment of quality respectively. Class 1,1,1 is of prime interest to investors and is the 'proved mineral reserve'.[21]

In November 2012 the Indian Chamber of Commerce released a report it commissioned from Price Waterhouse Coopers on India's coal sector challenges and outlook.[22] This study concluded that the failure by coal producers in India to estimate their reserves consistent with the UNFC standards undermined investor confidence.[23] Updating reserve numbers consistent with the UN standards is a key element of any reform of the mining sector going forward.[24] Prior to this, in 2011 The Energy Resource Institute (TERI) voiced specific doubt about Coal India's actual extractable coal estimates under the ISP. Much of the paper reflects a decade worth of research raising questions with the accuracy of reserve calculations under ISP and the impact of the UNFC estimate on India's reserves in general and Coal India's in particular.[25]

The integration of nation-based protocols with a set of international standards pose challenges to national governments that seek transparent and accurate reporting of mineral reserves. National governments usually seek this information for planning purposes to support energy and mineral activities, government resource management and government financial planning. Company specific reserve estimates (including for State Owned Enterprises) use this data for corporate business, commercial purposes. Commercial use of reserve estimates[26] is often driven by mine specific coal deposit information. As stated in Coal India's 2010 Red Herring, its reserve calculations under the ISP are designed to be consistent with international reserve estimation models (and supportive of India's national governmental needs).

CMPDIL Applies New International Standards

The Central Mine Planning and Design Institute Limited (CMPDIL), Coal India's wholly owned research subsidiary, began research in 2005, and possibly earlier,[27] to assess India's coal reserves under the new UNFC system. In 2012, CMPDIL published on its web site the updated Coal India reserve classification. CMPDIL's new estimate placed coal reserves at 18.2 billion tons as of April 2011,[28] 16% below the levels published in the 2010 Red Herring. CMPDIL does not offer any narrative or qualitative statement that outlines the factors going into the estimate or limitations on the data. Since the CMPDIL posting there has been no public recognition by Coal India of the new reserve estimates.

The UNFC-2009, Australia (JORC) and CRIRISCO models should produce the same measure of economically recoverable reserves, also referred to as commercially viable.[29] In India's case the CMPDIL application of the UNFC standard has resulted in an estimation of reserves that is 16% less than Coal India's disclosure to investors in August 2010. Reconciling the two figures has the potential to reduce Coal India's reserve estimates for governmental planning purposes and the valuation of Coal India's coal reserves and share price. The company has an estimated worth of $27.25 billion in today's market.[30]

Coal India's participation in global markets requires careful attention to reserve estimations. The Lambert Geo Science Australia presentation emphasizes the importance of international standards.[31] In summary: National coal standards are important to domestic planning and commercial markets. To participate in the global marketplace however producer nations and their coal producing companies need to pay more attention to internationally recognized models of reserve estimations.[32] In India's case where there is a material difference between the country's reporting model (the ISP), and the international model (UNFC) additional mapping and disclosure is required to facilitate meaningful comparisons and valuations.[33]

Section 03
Implications for Coal Reserves and Future Energy Planning

1. CIL produced a total of 1.05 billion tonnes between April 2011 and August 2013. Therefore its extractable reserve figure should now stand at approximately 17.15 billion tonnes.

2. Approximately 90% of India's coal inventory is non-coking coal.[34] Using this yardstick, we estimate CIL's extractable non-coking coal reserves (2011) at 15.4 bt.

3. CIL and Government of India target an average 8% rate of growth in production from 2012 on.[35] If this rate were to be applied to CIL's current reserves the company would exhaust extractable coal supplies by 2030, 17 years from now. If CIL maintains a more realistic 5% growth rate, its extractable reserves would still be exhausted by 2034.

4. India's coal demand in 2011 was 640 mt,[36] and coal demand in 2030 is estimated variously at 1.5 billion tonnes for electricity[37] and 2 billion tonnes in total.[38] Hypothetically, if CIL were able to meet all of India's coal demand (assuming a government aspiration to meet all demand through domestic production and discounting imports), its extractable reserves would be exhausted within 13 years - by 2026/27.

5. India has plans to add over 100GW of new coal fired power generation by 2017.[39]

6. With current reserves of only 17 years remaining and no reasonable plan for substantial coal additions the price of coal and its reliability become a major risk factor to recently completed plants and new coal generation investments. As stated earlier, CIL accounts for approximately 80% of India's domestic production. Recent statements by the Coal Ministry that it will not be able to provide fuel to new power plants[40] may not reflect a temporary phenomenon, but could be an indication of the sector's future. However, new coal plant construction is typically financed and planned for a thirty year period. Reasonable assurances about coal supply and prices are sought during the planning phases of coal plant production.

> "The Coal Ministry has conveyed to an Inter-Ministerial panel that it would not be possible to provide fossil fuel to the power plants having an aggregate capacity of 16,000 MW due to coal shortages…"
> - Press Trust of India, April 10, 2013

7. Power plants stranded for want of domestic coal would be forced to rely on imports. Even in a down market the price of coal in India is typically far below the international price. (Fig. 6) Under the current regime, as more expensive imports are added to India's coal mix, upward pressure on coal and electricity prices can be expected. Greater reliance on exports brings with it greater risk related to price volatility, exchange risk and macro-economic issues involving India's energy security, current account deficit, balance of payments and currency value. In addition, coal is not entirely fungible; most plants built to run on domestic coal have a blending limit (with imported coal) of between 15% to 30% by weight.[41]

8. For Coal India to maintain or increase production, it will need to start tapping deeper coal deposits. Over 90% of CIL's production currently comes from open cast mines, all less than 150 m. depth. CIL will have to exploit deeper seams in existing open cast mines and significantly increase investment in underground mining capacity. This will place upward pressure on extraction costs, market prices and the price of power in India, further undermining the value of the company.

Coal India officials have stated that current coal prices do not permit an expansion in underground mining, with cost of production from underground mines escalating by an average of USD14 to 16 per ton in 2012.[42]

Section 04
Investor Risks

- According to commonly accepted global coal resource standards, Coal India's extractable reserves could be exhausted in 17 years or less.
- Coal India's conversion to the UNFC system might not be complete or accurate (refer Section 5). A significant reduction in its level of extractable coal could reduce the company's market capitalization.
- CIL has not assessed how much of its 18.2 bt of extractable coal reserves fall within Protected Areas/high biodiversity/forest cover regions or under human habitations, where mining will either not be permitted, or will have to overcome lengthy permitting processes/ public opposition/legal challenges.
- CIL's heavy reliance on open-pit mining has left it poorly positioned operationally to develop capacity to extract coal through underground mining techniques.
- Under the current structure Coal India's business strategy cannot meet India's planned expansion of new coal plants and unlock investor value. Political pressure keeps coal prices low. This undermines economic pressures from investors, import increases and intensified mining to raise coal prices.

Questions for Coal India:

1. Did Coal India have knowledge at the time of the issuance of the 2010 Red Herring that its coal reserves would be materially lower under the UNFC than 21.7 billion tons?
2. Was it capable at the time of the 2010 Red Herring of providing a range of reserve levels anticipated by the UNFC estimate?
3. When and how will Coal India correct its non-disclosure of the 16% reduction in its extractable reserves to shareholders and the stock exchanges?
4. What impact do the diminished reserves have on the value of the company's stock?
5. When will CIL offer a full estimate of its coal reserves based on UNFC standards and how will it treat specifically the issue of forest cover, townships, water bodies and other factors that will constrict coal exploration and development?
6. What measures does the company propose to take to address the issue of constrained reserves?
7. How much of CIL's extractable reserves fall within Protected Areas or other areas where mining will not be permitted?
8. Will Coal India commission an independent assessment of its extractable reserves?
9. Is CIL's chronic under-production a reflection of faulty calculations of its extractable reserves?

10. How will anticipated increases in production costs from wage revisions, inflation and a gradual removal of the diesel subsidy impact the level of economically extractable reserves?

11. How does CIL plan to increase its investment and capacity in underground mines, and what impact will that have on cost of production?

12. What, if any, impact do the diminished reserve estimates have on Coal India's short and long term ability to meet its annual coal production requirements?

Section 05

Technical Discussion of Coal India's Reserves, Risks to Reserve Assessment and viability of imports

1. How accurate is CIL's conversion from ISP to UNFC?

An accurate assessment of Coal India's extractable reserves is essential for investors and planners to make an informed decision on the future of Coal India and the energy infrastructure that depends on it. CMPDIL's estimate of coal resources based on the UNFC standard is not accompanied by any supportive analysis of the projection. Additional information indicates that there are weaknesses in the CMPDIL estimate. The weaknesses further indicate that the coal reserve estimate may be even smaller than the 18.2 billion ton figure currently on the CMPDIL website.

a. CMPDIL's estimate is not based on the results of necessary feasibility studies.

According to CMPDIL, CIL has 18.2 bt of extractable reserves per the UNFC definition,[43] that is reserves where extraction has been found viable through a feasibility study or actual production. The UNFC defines[44] a feasibility study as:

Geological study including infrastructure, meteorology and ecology aspects; mining plans including issues pertaining to methods, recovery, manpower; environmental study including baseline data generation and impact analysis; beneficiation studies at laboratory, pilot plant and industrial scales; analysis of both capital and operational costs; analysis of needs of infrastructure, construction and services; marketing analysis covering demand-supply and industry structure; cashflow forecasts; issues related to labour, land, mining and taxation.

Coal India has not done feasibility studies in the manner defined by the UNFC. CMPDIL has confirmed that it does not have basic geographical data on the 18.2 bt of extractable reserves such as amount under forest cover, agricultural land, water bodies or other zones where mining might be restricted.[45] This shows that feasibility studies have not been undertaken, and as such the 18.2 bt estimate is incomplete.

Further evidence of the lack of feasibility studies for most coal "reserves" in India can be found in public documents released by the Ministry of Coal. In early 2013 the Ministry released background documents as part of its allocation process for 17 coal blocks to public sector companies. The documents[46] state that CMPDIL does not have basic data pertaining to forest cover or infrastructure details in the coal blocks being considered for mining.[47] As a result, the uncertainty over the quantum of extractable coal in these blocks is high.

CMPDIL's estimate does not appear to meet UNFC methodological standards. The questions raised about these lapses indicate that appropriate testing to identify physical barriers that would diminish coal reserve estimates are not fully developed in the CMPDIL estimate.

b. Experience of other minerals in India

Other minerals in India (copper, lead-zinc, chromite, phosphate) that have undergone the process of becoming UNFC compliant have seen their extractable reserves decline by more than 50%.[48] Coal India's reserve reduction of 16%, while still significant, is small in comparison, casting doubt on the accuracy of even this reduced figure.

2. Can CIL achieve its 8% targeted growth rate and also add to its existing reserves?

Theoretically, CIL can address the twin challenges of reserve depletion and increased production by adding to its domestic extractable reserves, foreign acquisitions or importing coal from abroad.

a. Challenges to Increasing Domestic Extractable Reserves

According to a study carried out by CIL in 2006, the company's production would peak in 2017 at 664 million tonnes and decline thereafter, unless it was able to add significantly to its extractable reserves.[54]

This will necessitate overcoming practical challenges, key among them being:

(i) CIL has limited experience mining deep deposits below 150 m.,
(ii) 57% of CIL's extractable reserves lie in coalfields with extensive forest cover, and
(iii) The pace of geological exploration is inadequate to meet production targets.

Table 1. Coal India: Targets against actual production

Year	Production target (mn tonnes)	Actual production (mn tonnes)
2009-10	435[49]	431
2010-11	460 (later revised to 440)[50]	431
2011-12	486 (later revised to 440)[51]	435
2012-13	470 (later revised to 464)[52]	452
2013-14	482[53]	-

Figure 3: Coal India Production – Targetted vs Achieved

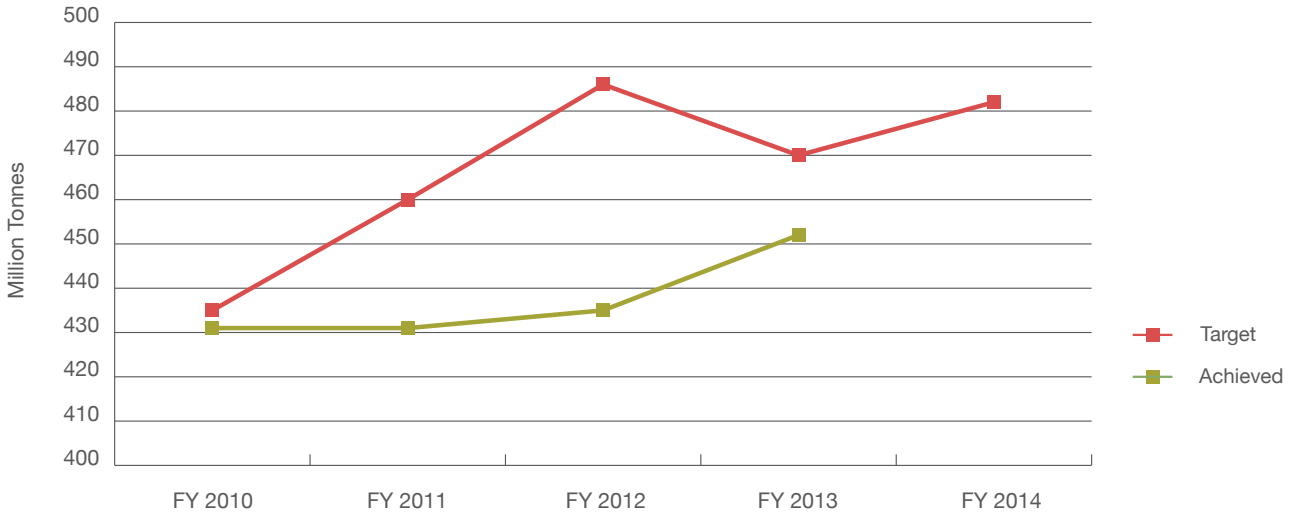
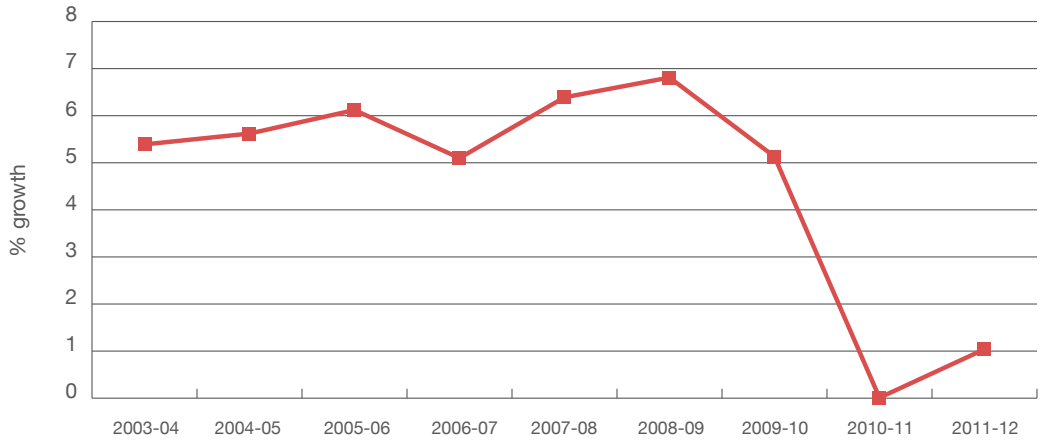


Figure 4: Coal India Production Growth Rate, 2005-2013



i. CIL has limited experience mining deep deposits below 150 m.

Current coal mining practices in India do not go beyond 300 m., with most open pit mines operating at depths of less than 150 m.[55] Over the last decade, the company has focused almost exclusively on open pit mines, due to the pressure to rapidly increase production. In 2001, almost 20% of CIL's production was from underground mines[56] – today that figure has fallen to less than 10%.[57] In contrast, the Coal Ministry's Expert Committee on Road Map for Coal Sector Reforms in 2007 had recommended that the contribution of underground mining be increased to 25% by 2022. As a result of the focus on open pit mines, CIL has neglected deep mining technology and expertise.[58] Indian mining experts believe that without a shift in focus to underground mining, Coal India's output will stagnate by the end of this decade.[59]

CIL will have to exploit deeper coal seams to add to its extractable reserves as many of the best shallow coal seams are now depleted, and the company has created very little new underground mining capacity for several decades.[60] 40% of India's coal resource lies beyond 300 m. depth,[61] and these resources are for all practical purposes inaccessible without significant new investments in machinery and training to best exploit deep coal reserves. If CIL were to start making these investments today, it will take several years to manifest in terms of enhanced production.

The case that few undiscovered shallow coal seams remain is strengthened by results of the Geological Survey of India's regional exploration in 2010-11.[62] In 2010-11 the GSI explored 24 blocks/areas spread over 11 coalfields. A total of 115 coal seams were encountered. 79 of these seams were at depths of 150 m. or more, and of these 79 seams, as many as 43 were encountered at depths of 300 m. or more.

A shift to underground mining will require a much smaller land footprint, potentially making community consent and regulatory approval easier to come by. However, a greater reliance on underground mining will have implications in terms of higher costs and lower output, since underground mining techniques are generally able to extract only 40-70% of a given coal deposit.[63]

ii. 57% Of CIL's Reserves Lie In Coalfields With Extensive Forest Cover,[64] where permits will be more difficult to obtain

Much of CIL's existing (virgin/untapped) extractable reserves lie in areas that are forested. CIL has also shown a preference to develop new mines in forest areas rather than outside forest areas, possibly to minimize land acquisition, compensation and community rehabilitation issues. However, opposition to open-pit mines in forest areas is growing on social and environmental grounds. This will make regulatory approvals and community consent (mandatory in the case of forest-dependent

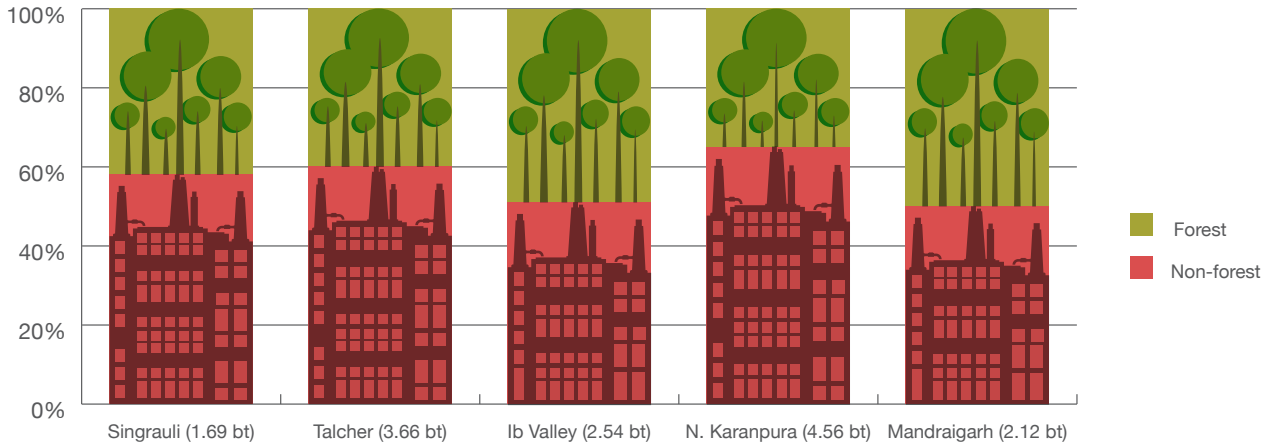
communities) harder and more time consuming.

The Singrauli, Talcher, Ib Valley, Mandraigarh and North Karanpura coalfields together account for 10.49 bt of Coal India's UNFC extractable reserves. Yet these coalfields also have, on average, forest cover over 43% of their area,[65] with most virgin coal blocks having moderate to dense forest cover. Mining in these blocks faces opposition and legal challenges from local communities and environmental /tribal rights groups, necessitating a lengthy clearance process with a higher likelihood of rejection. For example, the Mahan coal block in Singrauli was awarded in 2006 and has yet to receive final clearance, with local communities protesting that their rights over the Mahan forest have not been recognized.[66] Mining proposals in the heavily forested Parsa East and Kante Basan blocks in Hasdeo Arand are currently the subject of litigation before the National Green Tribunal (NGT).[67] The NGT also recently cancelled clearance for a 4 million tonne coal mine in the Mandraigarh coal field in Chhattisgarh state.[68]

Table 2: Percentage of Forest Cover in Major Coalfields

Coalfield	Extractable Reserve (mn tonnes)	Percentage of area covered by forest
Singrauli	1695.95	42
Talcher	3665.15	40.37
Ib Valley	2546.96	48.84
N. Karanpura	456.04	34.93
Mandraigarh	2126.7	49.7

Figure 5: Percentage of forest cover in major coalfields



The Ministry of Environment and Forests has invited opinion on its proposal for a system of inviolate forest areas[69] that will bar mining in certain forest areas.[70] Implementation of this system will further reduce CIL's extractable reserves. Though there is coal available outside forest areas, CIL will then need to invest in the process of securing community consent, land acquisition, compensation and rehabilitation.

iii. Exploration efforts have lagged

Approximately 70% of India's proven reserves have been earmarked to CIL.[71] These CIL blocks account for the bulk of CMPDIL's exploration. Outside of CIL's allotted blocks, CMPDIL has not conducted UNFC assessments.[72]

As against recommendations that CMPDIL have the capacity to undertake detailed exploration amounting to 1.5 million meters per annum,[73] the subsidiary currently undertakes about 500,000 meters of drilling.[74]

Apart from CMPDIL, which focuses on detailed exploration, the Geological Survey of India (GSI) is tasked with regional coal exploration.[75] During the 11th Five Year Plan (2007-2011), regional exploration was only 114,000 m., significantly below the 194,000 m. originally targeted.[76]

The poor level of exploration has been confirmed by the Secretary, Ministry of Coal S.K. Srivastava who was quoted in the Economic Times, May 28, 2013 saying, "We are constrained by the fact that we don't have too many explored blocks on offer."[77]

As coal exploration progresses over time, one would expect CIL's extractable reserves to increase. In fact, the opposite has happened. In 2005, CMPDIL estimated CIL's extractable reserves at 30 bt.[78] This figure came down to 21.7 bt at the time of CIL's IPO in 2010 (perhaps in part due to coal blocks being transferred to private parties during the coal allocation scam - 'Coalgate'), and is now 18.2 bt following the UNFC process.

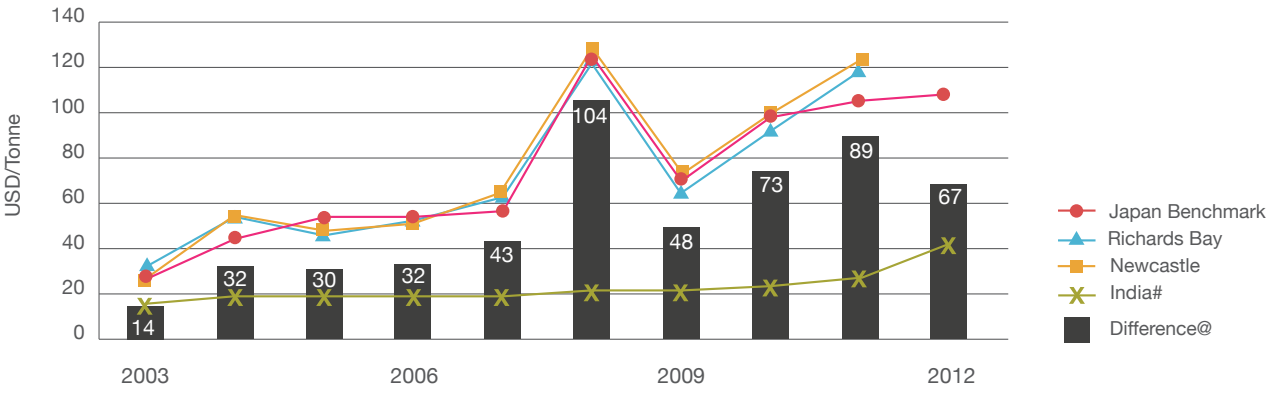
Given doubts about the accuracy of CIL's reserve estimates, the need for an independent assessment of India's extractable reserves is clear. This has been voiced repeatedly by, among others, the Ministry of Coal's Expert Committee on the Roadmap for Coal Sector Reforms in 2007. There are no indications from Coal India or the Indian government of such an independent assessment being forthcoming.

3. Can CIL import coal or acquire foreign coal assets to bridge shortfalls?

India's coal imports hit a record high in 2012-13, at approximately 135 million tons.[79] If the supply crunch for domestic coal persists, as this report predicts, this could lead to stronger demand for imported coal. The main restraint for prospective coal importers remains a significant price differential for imported coal vis a vis supply from Coal India, despite the softening of global coal prices in the first half of 2013.

According to the Indian Chamber of Commerce/PwC study the price of coal in India is historically far below the price of domestic coal. See Fig. 6 below. Under the current structure if more expensive imported coal is added to India's fuel mix then prices will have to rise for consumers to cover the increased cost.

Figure 6: Coal price comparison – India vs International



Credit: PwC/Indian Chamber of Commerce

Until higher electricity tariffs are agreed by regulators and accepted by state utilities, the ability of power producers to bridge the fuel supply gap with imports will be limited. Given the financial distress of most state utilities, it is probable that they will continue their current practice of curtailing purchase of higher tariff power generated from imported coal,[80] impacting the capacity utilization factors and revenues of power producers negatively.

Recently the World Bank, United States Export Import Bank and European Investment Bank have all adopted policies to minimize or eliminate financing for new and existing coal fired generation.[81] Each entity adopted these policies for environmental reasons. However, each has also identified the diminished economic competitiveness of coal as an additional factor for reduced reliance on coal. Diminished competitiveness comes at time when alternative fuel sources are maturing and, taken as a whole, provide a more desirable energy choice than coal power generation.

The coal import burden is also impacting India's current account deficit and the value of the rupee. In July 2013, India's CAD hit a record high of 4.8% of GDP,[82] with the rupee hovering around INR 65 to the dollar. The coal import bill touched nearly USD 18 billion in 2012-13, more than double 2010-11 figures.[83] Assuming a 5% domestic coal production growth rate, India will still need to import 185 million tons of coal by 2017 - this could then account for over 23% of the CAD.[84]

Any future escalation in global or domestic coal prices will require a realignment of investment and operational priorities of power producers, industrial and consumer interests and India's economy as a whole.[85]

4. Can CIL acquire coal deposits overseas?

The Government of India is pressuring Coal India to utilize its cash resources to acquire overseas mining assets, though the CIL Chairman has sought to temper expectations that this will resolve the coal supply shortfall.[86] CIL is currently exploring two blocks in Mozambique's Tete province, and has said that it hopes to commence mining operations by 2016 (original target 2015). The region is plagued by infrastructural challenges and political unrest. CIL will require the construction of a road across a perennial river as well as 500-600 km. of railway tracks.[87] There is no confirmed financing for this railway line yet, with the government of Mozambique expected to announce preferred bidders in the near future.

Rio Tinto is pursuing plans to sell part or all of its Mozambique assets in the same province for these reasons.[88] In a best case scenario, CIL will need to incur significant expenditure to overcome infrastructural challenges, for a resource that is yet to be quantified and will not start production until 2017 at the earliest. In a worst case scenario, the project will prove to be a non-starter due to political unrest and/or the lack of financial viability.

The other overseas location where CIL is looking to acquire majority stakes in two coal assets is Australia.[89] If these deals do go through, CIL will reportedly be in a position to import 28 million tonnes per year of high quality coal. It is not clear if this will be metallurgical or thermal coal. This would amount to an increase of 6% over its 2013 production. The cost of this landed coal will be significantly higher than domestic production and so the demand constraints in the case of the power sector will remain.

5. Can higher coal prices increase the extractable reserve?

An increase in the market price of coal could in theory lead to an increase in reserves as more of the coal resource becomes economically extractable. However, the coal price in India is unofficially regulated by the government, as seen by CIL's failed move to increase coal prices in 2012. As long as the coal price is regulated and kept artificially low, extractable reserves will not increase to any appreciable extent. On the other hand, an increase in the price of coal will make new coal power plants less competitive with other energy sources.

Is CIL's under production an indicator of poor reserve certainty?

CIL has consistently produced less coal than it is legally permitted to. Production levels stagnated from 2009 through 2012 at around 435 million metric tonnes (mt). In 2012-13 it managed a 3.8% production growth rate, ending the year with 452 mt against a target of 464 mt. For 2013-14, the management of Coal India Limited sought permission to not fix annual production targets but eventually has committed to a revised production target of 482 mt.[90]

Coal India and the Ministry of Coal have consistently blamed the under-production on delays in obtaining environmental and forest clearances from the Ministry of Environment. Data from CIL does not justify this claim.

A closer look at 2010-11 production levels from five CIL subsidiaries for which Greenpeace obtained data shows that these five companies had a permitted production level of 405 mt, against which they produced only 353 mt. These five subsidiaries accounted for 82% of CIL's production in that year.

In April 2012, Minister for Environment and Forests Ms. Jayanthi Natarajan stated that the MoEF has given clearances (for both CIL and non-CIL projects) for 830 mtpa of coal, against which the production in (2012) was only ~550 mtpa.[91] Other analyses have shown that the MoEF approval rate for projects is nearly 100%, with virtually no projects rejected.[92]

Table 3: Permitted vs actual production (million tonnes)

	2007-08		2008-09		2009-10		2010-11	
	Permitted	Actual	Permitted	Actual	Permitted	Actual	Permitted	Actual
ECL	19.41	24.05	31.5	28.09	31.02	32.37	32.88	30.76
NCL	58	59.62	61.25	63.65	66.5	67.67	72	66.25
MCL	132.57	88	132.57	96.33	132.57	104.13	132.57	100.27
SECL	100.85	88.50	102.85	93.79	111.915	101.89	117.71	108.44
CCL	44	44.05	47	44.30	48	47.08	50	47.52
Total	354.84	304.24	375.18	326.17	390	353.16	405.17	353.25

ECL: Eastern Coalfields, NCL: Northern Coalfields, MCL: Mahanadi Coalfields, SECL: Southeastern Coalfields, CCL: Central Coalfields. Data on permitted production levels for Western Coalfields and Bharat Coking Coal Limited was not provided to Greenpeace

Section 06

Conclusions

Coal India's initiative to rely upon global capital markets to support its corporate activities brings with it increased requirements for transparency. Investors in the global market seek a uniform system of assessing coal reserves. Coal industry officials from around the world have labored for over a decade to establish such a system. This brief study shows that the initial review by CMPDI using international standards has produced extractable coal reserve estimates 16% below Coal India's estimates contained in its 2010 Red Herring.

The relationship of the estimates under the international standards and that produced by CIL under India Standard Procedures (ISP) needs to be reconciled. The logical next step is an independent assessment of Coal India's extractable reserves and current mining practices, taking into account geological, economic and feasibility issues.

This study has identified at least one area where the information that formed the basis of CMPDI's 18.2 billion ton estimate is incomplete. An independent evaluation can test whether Coal India's extractable reserve figure of 18.2 billion tons is overestimated.

Coal India's efforts to secure additional extractable reserves from exploration, foreign acquisition and imports needs to be carefully monitored going forward. A failure to base these monitoring efforts on solid information and risk analysis will inevitably lead to poor financial performance, adverse shareholder reactions and global pressures on Coal India to reform.

Section 07
Endnotes

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[13]SRK-Report, p. xi.

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[15]2010 Red Herring, p. 77. The JORC Code refers to the Joint Ore Reserves Committee that derived the world's leading standards to serve Australia. The JORC Code forms the basis of much of the work on international standards. The Committee for Mineral Reserves International Reporting Standards (CRIRSCO) has been the focus of developing international mineral classification standards. CRIRSCO has been heavily involved, along with most of the mineral producing nations in the formation of the United Nation's Framework Classification for Fossil Fuel and Mineral Reserves (UNFC) discussed throughout this report.

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[29]Lambert-Report, Slide 19

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[31]Ian Lambert and Yanis Muzitis, National Mineral Resources Classification and Reporting in Relation to the CRIRISCO Template and the UNFC 2009: Australia's experience, GeoScience Australia, September 2012. Slides 5 and 17. (Lambert-Report)

[32]N. Miskally, The International Mining Industry – Linking the Upstream Mineralisation with Downstream Money, September 2004. See p. 64 for a discussion of the relationship between international standards and investor confidence.

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The Institute for Energy Economics and Financial Analysis (IEEFA) conducts research and analyses on financial and economic issues related to energy and the environment. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy and to reduce dependence on coal and other non-renewable energy resources.

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Greenpeace has been campaigning against environmental degradation since 1971 when a small boat of volunteers and journalists sailed into Amchitka, an area north of Alaska, where the US Government was conducting underground nuclear tests.This tradition of 'bearing witness' in a non-violent manner continues today, and ships are an important part of all its campaign work.

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