



Opportunities in India mining sector

Agenda

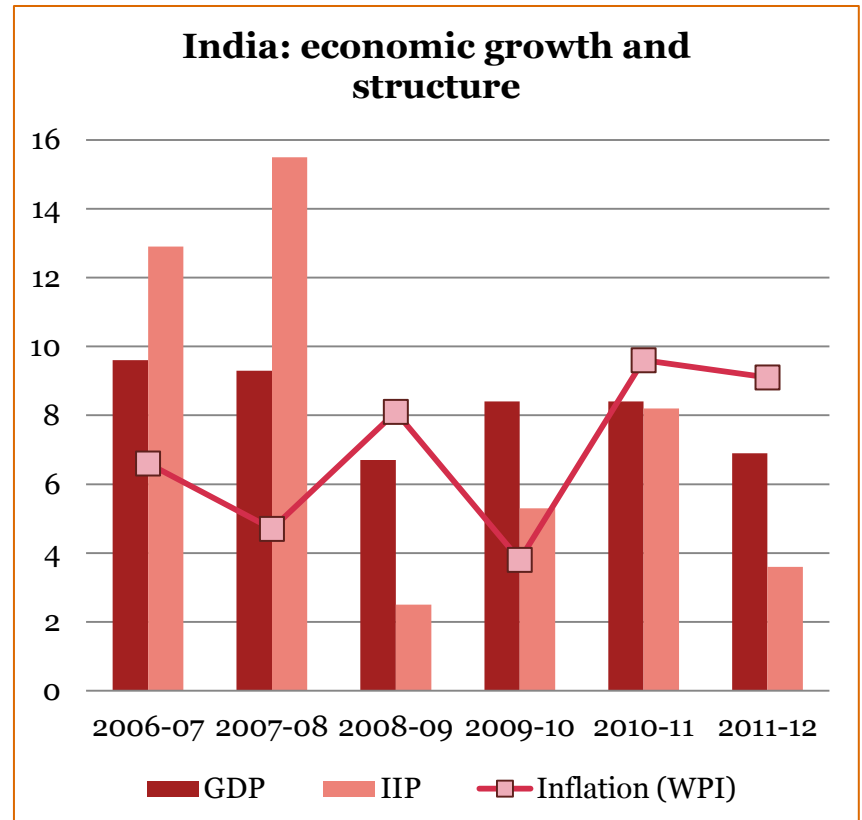
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Section 1

Mining industry in India

Overview of the economy and sector drivers

- A higher growth trajectory over the last two decades albeit under pressure lately.
 - 4.1% (1950-90) vs. 6.9% (1990-2012)
- The fundamental drivers remain:
 - change in structure of the economy: to services (59%), industry (27% of GDP)
 - urbanization (28% to 41% by 2030)
 - infrastructure deficit
- Some key challenges to be addressed:
 - industry structure reform
 - proper use of natural resources
 - equitable growth
 - environment, safety, and health



IIP – Index for Industrial Production
WPI – Wholesale Price Index

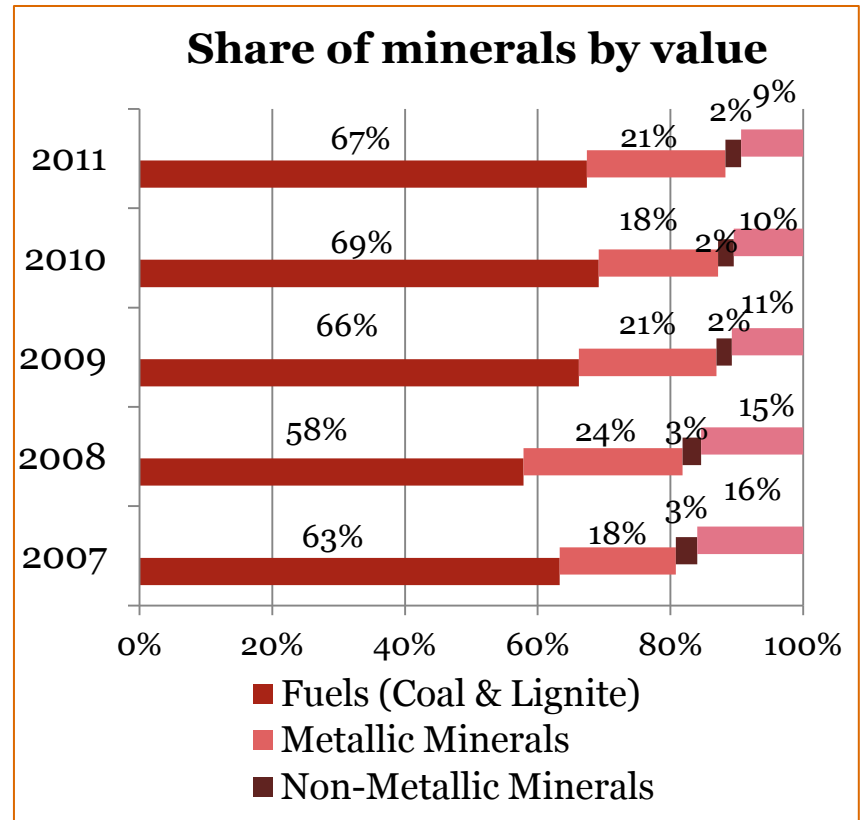
Doing business in India

Doing Business 2012 Rank	Australia	South Africa	Brazil	Mozambique	India
Overall Rank	15	35	126	139	132
Starting Business	2	44	120	70	166
Getting Credit	8	1	98	150	40
Dealing with construction permit	42	31	127	126	181
Getting electricity	37	124	51	172	98
Protecting Investors	65	10	79	46	46
Logistics	11	23	45	67	46

Source: World Bank

Structure of the Mining industry

- Large listed state owned mining companies, integrated private mining-metal companies, and independent holdings.
 - **SOMC dominate: 72% by value produced but differ by sector (92% in coal, 31% in iron ore).**
- A large part of the industry is fragmented (573 coal, 553 metallic, 1523 non-metallic mines) and in under-developed regions.
 - **fuel minerals dominate 67%**
 - **metallic minerals: robust private sector activity and growing**
 - **focussed on domestic use**
 - **size: 2.26% of GDP (~\$22 billion)**



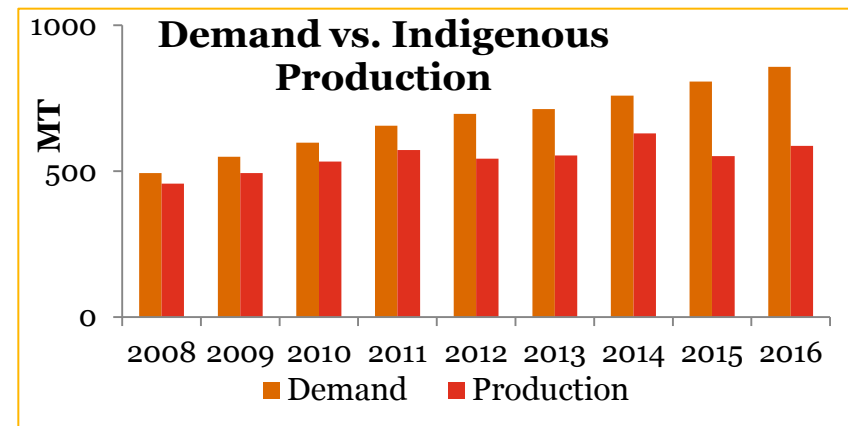
Source: Indian Bureau of Mines

Coal sector scenario

- Total coal resources stands at 286 BT.
- The demand for coal is growing at annual rate of 6.37% per annum against local production of 5.79%.
- Demand supply gap is rising
 - shortfall is now about 84 MT
 - estimated domestic shortfall is over 300 MT in medium term, if all LoAs issued are activated.
- Power generation drives demand
 - contributes to ~70% of total demand
- The demand for coal is estimated at over 1.6 BT by 2025 (IEP, Vision 2025 @ 8% GDP)

Resource classification	In billion tonnes
Proved	114.00
Indicated	137.47
Inferred	34.39
Total	285.86

Source: Ministry of Coal

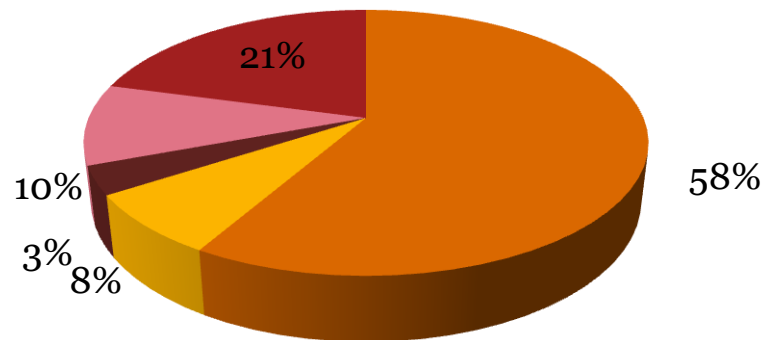


Figures for future years are estimated figures. Source: Infraline database

The changes in downstream industries

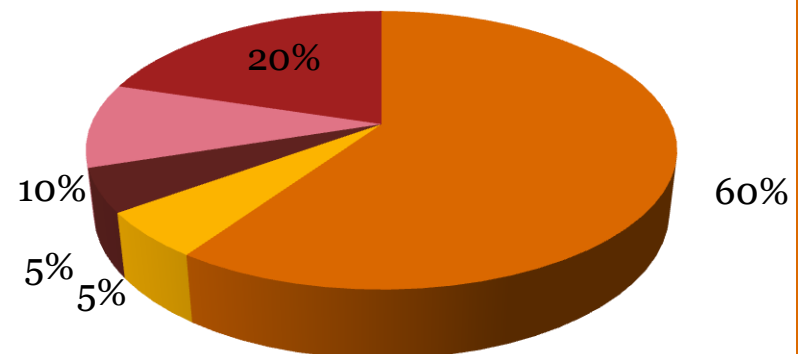
- Coal remains key to core sectors even over longer term.
- Implications of market concentration in coal sector on downstream sectors, and its mitigation (e.g., regulation, competition)
- Deregulation in key downstream industry e.g., retail competition in power

Coal use by sector: FY12



Electricity Iron & Steel Cement
Others Non-elect.

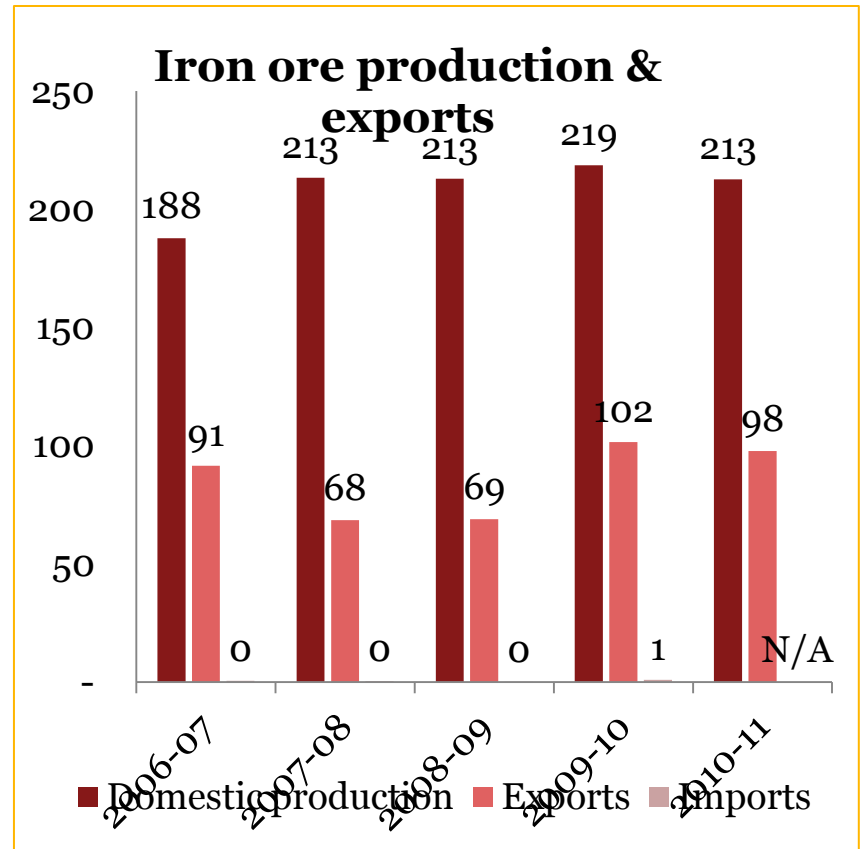
Coal use by sector: FY32



Electricity Iron & Steel Cement
Others Non-elect.

Iron ore scenario

- Significant iron ore reserves
 - 26 BT, cut off grade of 55%
 - almost double if cut off grade 45%
- Fourth largest producer in world: Current production >200 MTPA
- Share in mineral value: 17%
- Resource utilisation:
 - new steel capacity; value addition requirement in most states
 - exports (duty on ore increased to 30% and withdrawn from pellets - Dec '11)
- Large quantity of low grade in-situ reserve, low grade fines and slimes.
 - IBM directive for iron ore produced with Fe 45-55% stacked at mine for future use

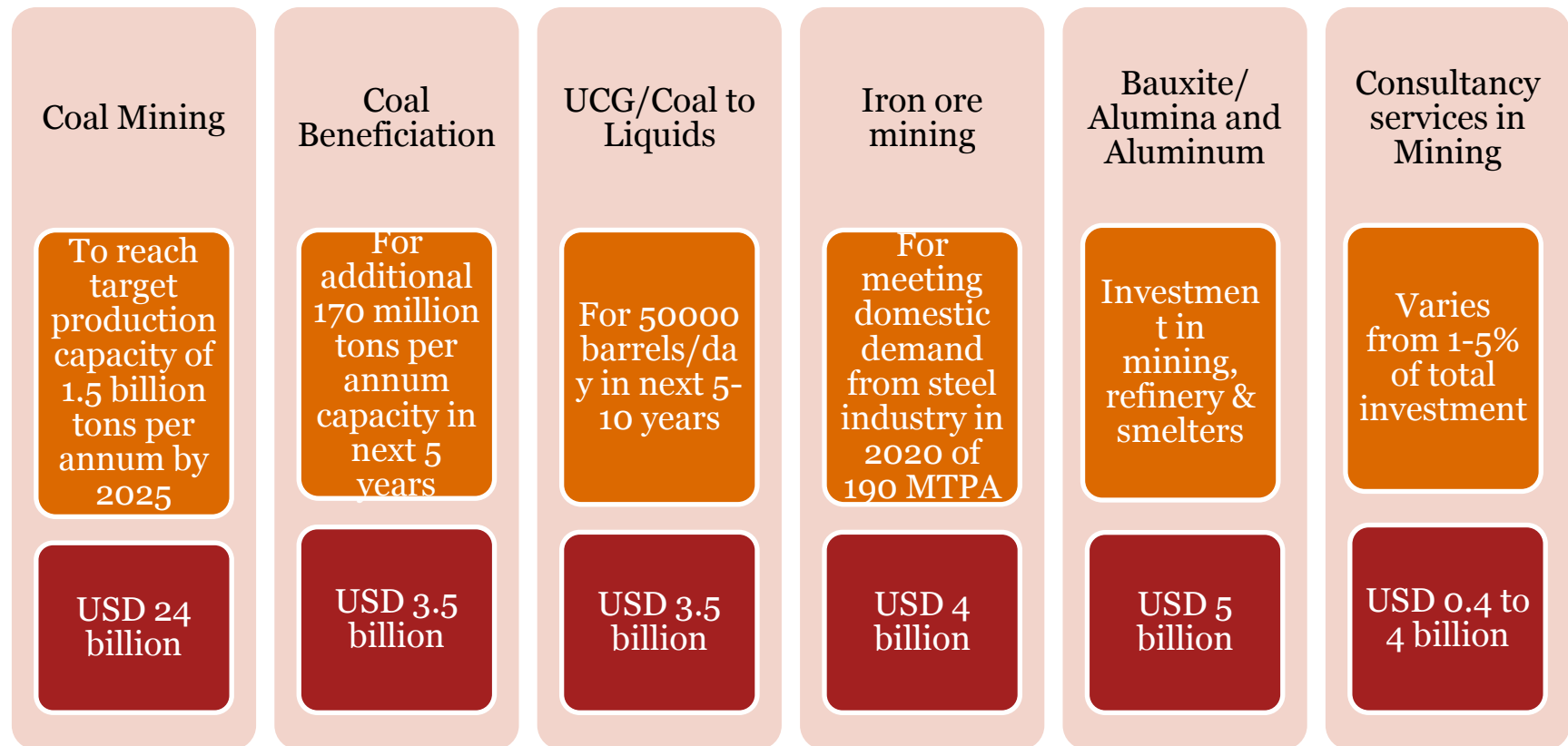


Source: Ministry of Mines

Section 2

Potential opportunities in India

Estimated investment potential in mining



Source: PwC Analysis with Ministry of Coal & Ministry of Mines, Ministry of Steel data

International collaborations (Govt. of India)

Source: Ministry of Coal, Ministry of Mines

Mining Activities	Geophysical Exploration / 3D Seismic survey	CBM/ CMM/ AMM/ VAM/ UCG	Deep shaft for coal mines	Mechanization of UG mines	Thick seam and steep seam mining	Mining technology services	Clean coal tech., and coal preparation	Training related to safety
European Union	✓	✓		✓	✓			
South Africa		✓	✓	✓			✓	
Germany	✓	✓	✓		✓		✓	
USA		✓						
Russia		✓					✓	
Japan							✓	✓
Australia						✓		

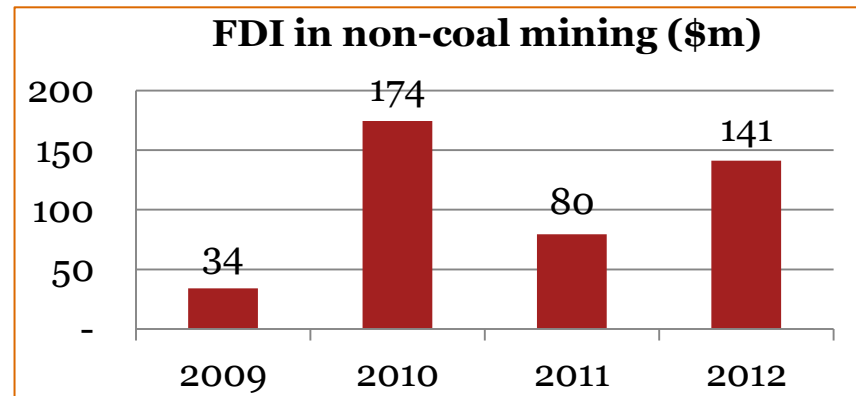
Rising private participation in mining industry

- State owned mining companies viz. CIL, SCCL, NMDC are expanding their production capacity to meet growing demand.
- They are adopting various modes of PPP to accelerate development:
 - Bhubaneswari OCP has been awarded to Essel Mining for 20 MTPA.
 - Magadh (20 MTPA), Amrapali (12 MTPA) projects of CCL are likely to be on PPP.
 - Ore handling plant (2.5 MTPA) of OMC to be on PPP
 - Reject beneficiation (NMDC) to be on PPP
- 100% FDI permitted in coal and non-coal mineral sectors. Potential opportunity with competitive auctions.

Ongoing projects in state owned coal companies

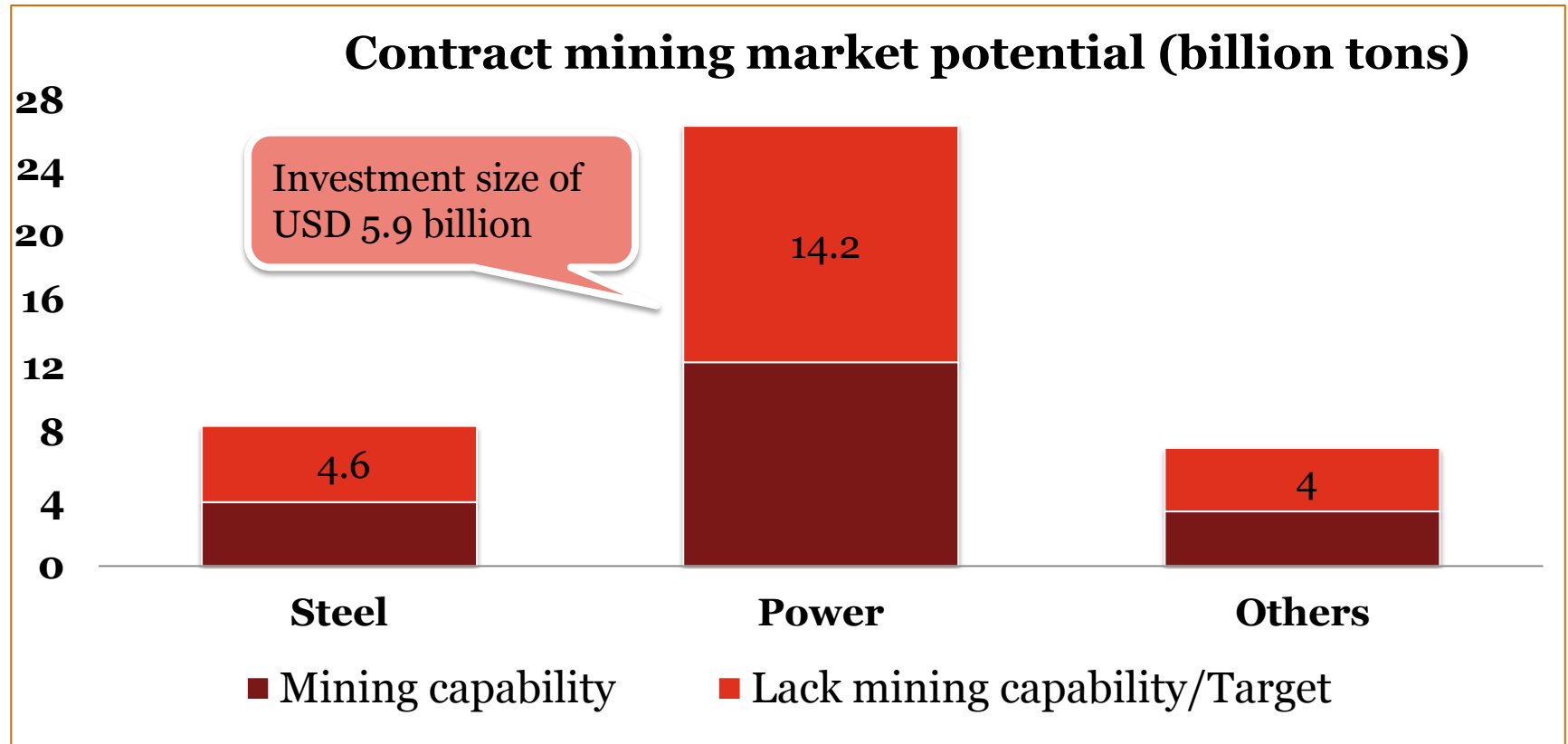
Entity	No. of ongoing projects	Estimated investments (USD bn)	Capacity addition (Mty)
CIL	138	5.1	397
SCCL	29	0.7	47
NLC	5	2.3	7/ 1750 (MW)

Source: Ministry of Coal



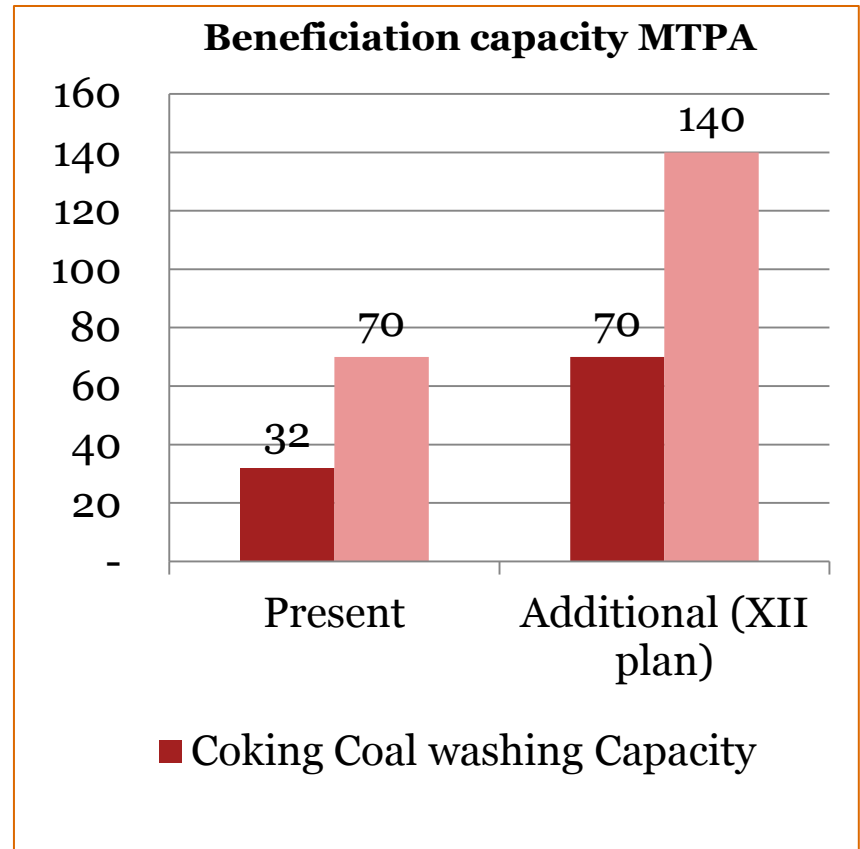
Source: Indian Bureau of Mines

Opportunity size for contract mining in coal



Opportunities in coal beneficiation

- Coal washing was notified as approved end use for coal in 1993.
- The Ministry of Environment and Forests mandates thermal power plants located 1,000 km away from pithead and in other environmentally-sensitive areas to use coal with ash content not exceeding 34%.
- Construction of beneficiation plants on Build-own-operate (BOO) basis is also allowed.
- 100% FDI is allowed in setting up coal beneficiation plants.



Opportunities in iron ore sector

- Exploration in proposed exploration zones
 - Odisha: Bonai - Keonjhar belt, Tomka - Daitari and Umerkoke belt
 - Jharkhand: All major high grade ore deposit contain low grade lateritic ores.
 - Karnataka: Bagalkot, Tumkur and Chitradurga districts.
 - Maharashtra: Sindhudurg, Gadchiroli, Gondia
 - Chattisgarh : All 14 deposits of Bailadila range, Dantewara district
 - Andhra Pradesh: Cudappah, Kurnool, Karimnagar, Adilabad and Guntur District.
- Opportunities for value addition projects and agglomeration plants for fines utilisation
 - fines production in country in 2009-10 ~ 126 MT, while
 - pelletisation capacity ~24 MTPA
 - sintering capacity ~ 29 MTPA
- Scope for domestic / foreign firms in upcoming PPP opportunities.
 - JV or technical participation with midcap players with lease/license and seeking capital, expertise, and technology.
 - in coal mines with auctions; and iron ore mines with larger scale

Opportunities in services...

Opportunity	Implications
Contract Mining (MDO opportunities)	<ul style="list-style-type: none">• NTPC (Kerendari A – 6 million tons per annum)• Mahaguj (Mahanadi coal block - over 20 million tonnes per annum)• OMC (2.5 MTPA iron ore beneficiation plant)
Equipment procurement with maintenance and repair contracts	<ul style="list-style-type: none">• Excavator (10-12 cubic meters bucket capacity)• Rope shovels (20 and 42 cubic meters bucket capacity)• Dumper (150T, 190t and 240 T)• Crawler Dozer (850 HP)• Wheel Dozer (460 HP)
Software (IT solutions)	<ul style="list-style-type: none">• In various public and private mining companies• Surpac, Minex, Vulcan, Geological modelling software, Simulation software to predict underground mine environment and mine design.

Opportunities in services...

Opportunity	Implications
Low grade iron ore beneficiation	<ul style="list-style-type: none">• In integrated mining companies and large mining licensees.• Requirement for jigs, spirals, teeter bed separators• Requirement for low/high intensity, high gradient magnetic separators• Flotation banks
BHQ/BHJ beneficiation	<ul style="list-style-type: none">• In integrated mining companies and large mining licensees.• Requirement for crushers, screens & teeter bed
Jharia Master Plan	<ul style="list-style-type: none">• Investment potential of over 2 billion over next 10 years through GoI initiatives.• Opportunities for mine fire control• Mine environment improvement• Infrastructure development

Section 3

Outbound investments

Recent development in India for securing coal imports

Target	Buyer
Coal India Limited	<ul style="list-style-type: none"> • Coal India has recently finalised Side Agreement for Import of Coal. • Cost of import is pass-through to the buyers. • Around 10-15% of coal for new utilities to be imported every year. • Coal India in talks with MMTC/MSTC for importing the coal quantities.
NTPC Limited	<ul style="list-style-type: none"> • NTPC imports coal through bidding route. • Provisions of delivery of coal to the specified power projects.
Mahagenco and TANGEDCO	<ul style="list-style-type: none"> • Mahagenco and TANGEDCO are in process of finalisation of Coal Supply Agreement for imports. • Coal would be imported through a bidding process on long-term basis
Adani, LANCO, GVK	<ul style="list-style-type: none"> • These companies have already acquired resources.
Tata Power	<ul style="list-style-type: none"> • Signing long-term coal offtake agreements directly with the mine owners, thereby ensuring fuel security and guaranteed offtake • Investments in coal mines (Pt. Bumi, PT Baramulti Sukses Sarana Tbk (BSSR).

Investments outside India by Indian companies

Target	Buyer	Year	Deal Value	Resources	Value/tonne
Gujarat NRE Resources NL (35.038%)	Gujarat NRE Coke Ltd	2007	31	91	0.34
Mozambique Coal Project (35%)	Tata	2007	85	175	0.48
PT Kaltim Prima Coal (30%), Arutmin Indonesia	Tata	2007	1,100	2,160	0.51
PT Baramulti Sukses Sarana Tbk (BSSR)	Tata Power	2012	--	1,000	--
Mozambique Coal Asset	Jindal Steel & Power	2008	57	150	0.38
Homeland Mining and Energy SA (5%)	GMR Energy Ltd.	2008	15	25	0.60
PT Barasentosa Lestari	GMR Infrastructure	2008	100	100	1.00
Acquisition of 65% stake in Maamba Collieries Ltd.	Nava Bharat Ventures Ltd.	2009	26	80	0.33
Broughton Coal Mining Pty Ltd (90%)	Ennore Coke Ltd	2009	12	30	0.40
Acquisition of 90% stake in Broughton Coal Mining Pty Ltd.	Ennore Coke Ltd.	2009	12	27	0.44
Linc Energy	Adani	2010	2,700	7,800	0.35
Griffin Coal	Lanco Infratech	2010	760	800	0.95
Hancock Group	GVK Energy Limited	2011	1,260	7,900	0.16

Section 4

Proposed reforms & implications

Sector reforms and opportunities

Proposed reforms	Implications	Opportunities
Auction of coal licenses/non-coal minerals via competitive bids	<ul style="list-style-type: none">• More robust licensing process and investment security.• Opportunity in coal: 54 coal blocks (reserves of 16 BT). The auction route is pure-play as well as tariff based bidding.• Coal block auctions only after exploration and Geological Report to provide better clarity of asset base.	<ul style="list-style-type: none">• High capacity/suitable equipment configuration to help the owners aim higher efficiency to win bids.• Mining and beneficiation equipment suppliers tie-up with prospective bidders.• Equipment leasing.• Market for new technologies (e.g. Coal to gasification and CMM capture and usage).

Sector reforms and opportunities

Proposed reforms	Implications	Opportunities
Reconnaissance Permit/ Prospecting License	<ul style="list-style-type: none"> • Open sky policy with non-exclusive RPs to be allowed i.e. open to all interested. • Assured transition of licences; transfer of RP/PL allowed. • New composite license for high technology RL/PL to explore deeper deposits 	<ul style="list-style-type: none"> • Mineral exploration companies may apply for exploration in thrust areas like copper, lead and zinc. • On successful discovery the same may be transferred to prospective miners. • Incentivize investment and technology flows
Coal Regulatory Authority/ National Mining Regulatory Authority	<ul style="list-style-type: none"> • Will review sustainability, pricing, supply agreements. • Ensure timely allocation of mineral licenses. • Check illegal mining. 	<ul style="list-style-type: none"> • Information systems • GIS /RFID system use by regulators and licensees • Sustainability reporting

Sector reforms and opportunities

Proposed reforms	Implications	Opportunities
Safety Conference recommendation implementation	<ul style="list-style-type: none">• Will help in increasing safety in open-cast mines and underground mines in light of mechanisation.	<ul style="list-style-type: none">• Market for underground and opencast safety equipment, technologies.• R&D opportunities with CMPDIL
Profit Sharing with host population	<ul style="list-style-type: none">• 26% profit sharing local population.	<ul style="list-style-type: none">• R&R framework set on a clearer, standard basis for mine owners.
Sustainability reporting introduced	<ul style="list-style-type: none">• Will encourage scientific mining• More efforts to reduce adverse impact on environment	<ul style="list-style-type: none">• Sustainability reporting• Technologies for mitigation efforts.

Section 5

How can we work together

How we can work together

PwC Mining Industry Advisory can support across our services:

- Investment and Business development
 - bid advice on tendered projects and services, post-award reviews, business alliances
 - opportunity identification and country / state / sector attractiveness
- New entry and investments into new business segments
 - entry strategy, market assessments, business plans
- Production location and optimization
 - site decisions, supply sourcing, cost optimization, supply chain advisory
- Tax planning and investment structuring
- Partnering, Financing and Acquisitions
 - target search, M&A advisory, local fund raising

Thank you

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