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# MEETING OF THE INDO-US COAL WORKING GROUP

24<sup>TH</sup> MARCH 2011

NEW DELHI

N C Jha  
Chairman, CIL

# India's Energy Outlook

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- India is the 3<sup>rd</sup> largest coal producing country after China and USA.
  - Coal contributes about 52% of the commercial energy consumption as compared to 27% world average.
  - More than 65% of electricity generation are coal based.
  - Domestic production not sufficient to meet the growing demand. As per NCDP, Coal India is required to meet the requirement of coal of the country, if required, even by import.
  - Demand is mainly driven by sectors like CPP, Sponge Iron, Cement & Chemical Industries.
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# Coal Industry in India

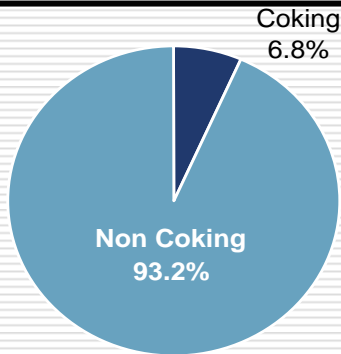
- Total resources : 277 BT
- Proved : 110 BT
- Indicated/inferred: 167 BT

- 88% of production from opencast mines; 12% from underground mines
- Coal present in 14 out of 28 states
- Indian coal contain generally high ash (4500 GCV) & low sulphur

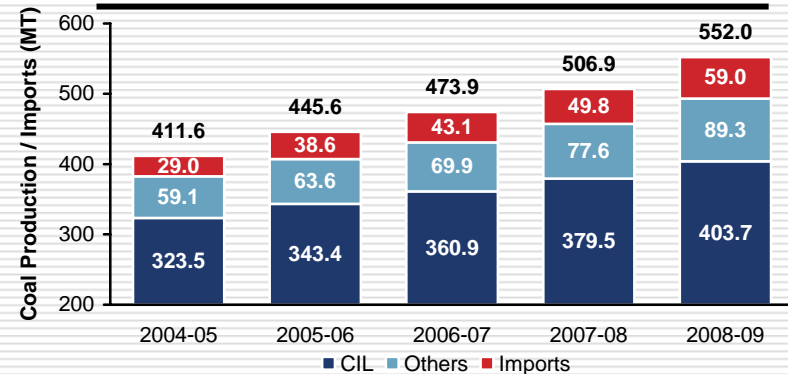
## Coal Reserves in India



## Types of Coal Produced in India

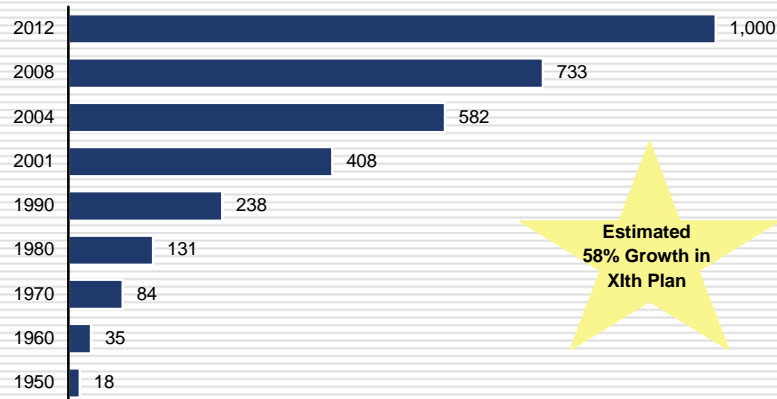


## Coal Production and Imports



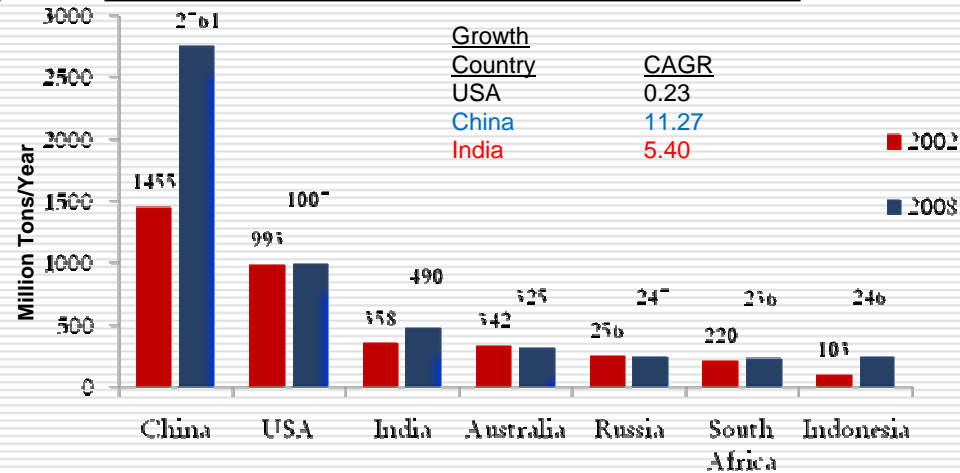
# Indian Coal Industry in Context

Annual Per Capita Electricity Consumption  
Growth in India (units per capita)

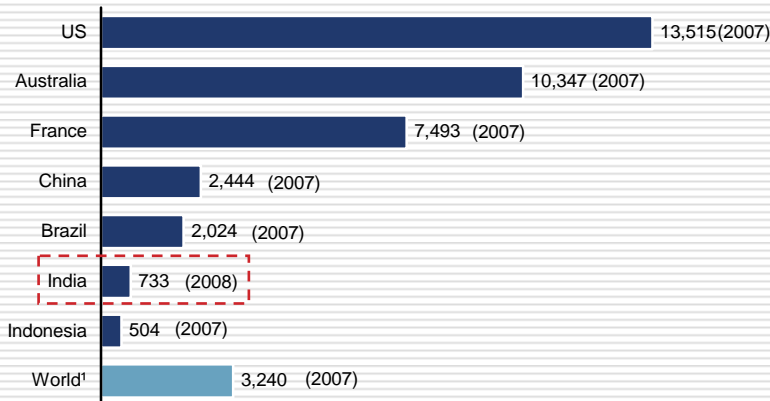


Estimated  
58% Growth in  
XIth Plan

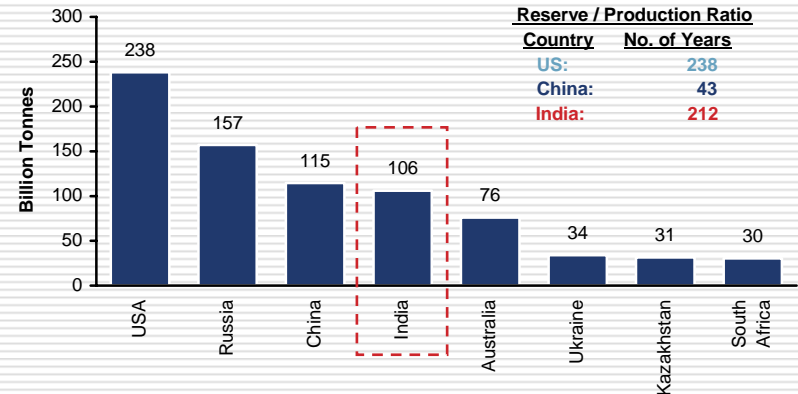
Global Coal Production by Country



Annual Electricity Consumption per Capita



Global Coal Reserves by Country



Source: International Energy Outlook, Planning Commission, BP World Energy Report 2009, International Energy Agency  
<sup>1</sup> Weighted Average

# COAL PRODUCTION TREND/ PROGRAMME (WG)

Million Tonne

Company	Actual		Programme		
	IX Plan (2001-02)	X Plan (2006-07)	XI Plan (2011-12)	XII Plan ** (2016-17)	
				Without Constraints	With Constraints
CIL (CAGR)	279.65 (2.22)	360.91 (5.23)	447.00 (4.37)	633.00 (7.21)	534.26 (3.63)
SCCL	30.81	37.71	51.00	--	--
OTHERS	17.18	32.21	56.00	--	--
<b>TOTAL</b> (CAGR)	327.64 (2.53)	430.83 (5.62)	554.00 (5.16)	--	--
CIL's GROWTH IN PRODUCTION		X over IX Plan	XI over X Plan	XII over XI Plan	XII over XI Plan
		81.26 Mt	86.09 Mt	186.00 Mt	87.26 Mt

\*\* XII Plan figures are not firmed up. Under consideration of competent authority.

# Coal India – The Company Profile:

- Largest coal company in the world
  - Produced over 431.26 MT in FY 2010
  - 81% market share in India
  - Over 397,000 employees
- Resource Base : 67 BT  
Proved : 52 BT
- Meets 40% of India's primary commercial energy requirement
- Gross Turnover: US \$12.3Billion  
PBT : US \$3.33 Billion  
PAT : US \$2.25 Billion  
Retained Profit : US \$1.50 Billion
- 90% owned by the Government of India (GoI)  
10% by Public and Financial institute
- Market Cap :US \$ 50.7 Billion

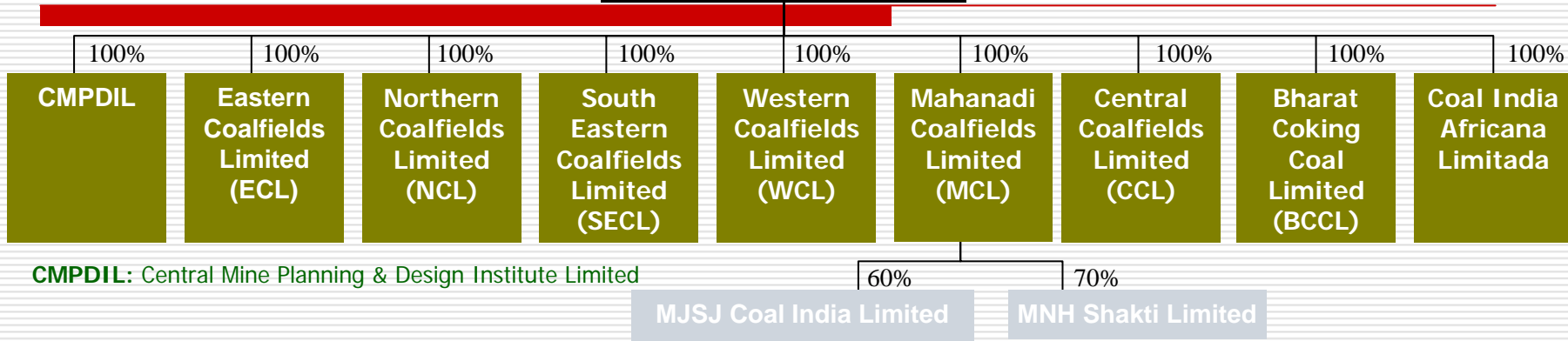


- 1 Eastern Coalfields Ltd
- 2 Bharat Coking Coal Ltd
- 3 Central Coalfields Ltd
- 4 Northern Coalfields Ltd
- 5 Western Coalfields Ltd
- 6 South Eastern Coalfields Ltd
- 7 Mahanadi Coalfields Ltd
- 8 Central Mine Planning & Design Institute
- 9 North Eastern Coalfields (A Unit Under CIL HQ)

Exchange rate of 48.39 INR/USD

# CORPORATE STRUCTURE

## Coal India Limited



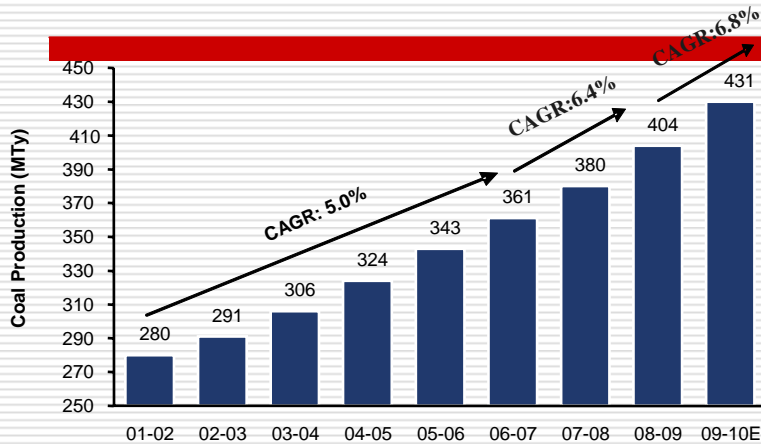
### Subsidiary wise coal-mine distribution ( as on 1.4.2010)

Subsidiary	UG	OC	M	Total
ECL	82	19	7	108
BCCL	40	18	23	81
CCL	24	37	2	63
NCL	0	10	0	10
WCL	45	38	2	85
SECL	68	22	1	91
MCL	9	16	0	25
NEC	5	3	0	8
<b>Total</b>	<b>273</b>	<b>163</b>	<b>35</b>	<b>471</b>

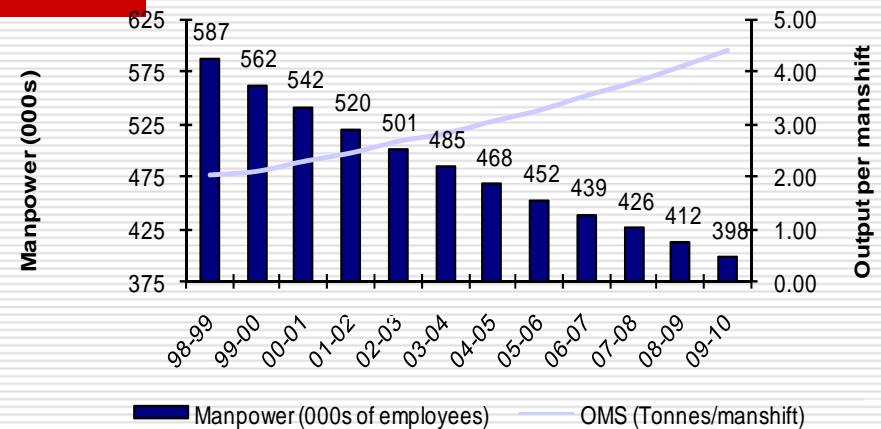
UG: Underground mines,  
OC: Open cast mines,  
M: Mixed mines

# Strong Track Record of Growth

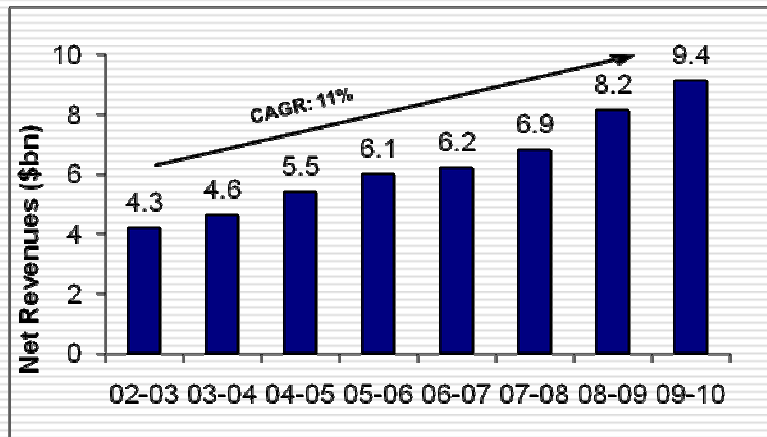
## Growth in Coal Production...



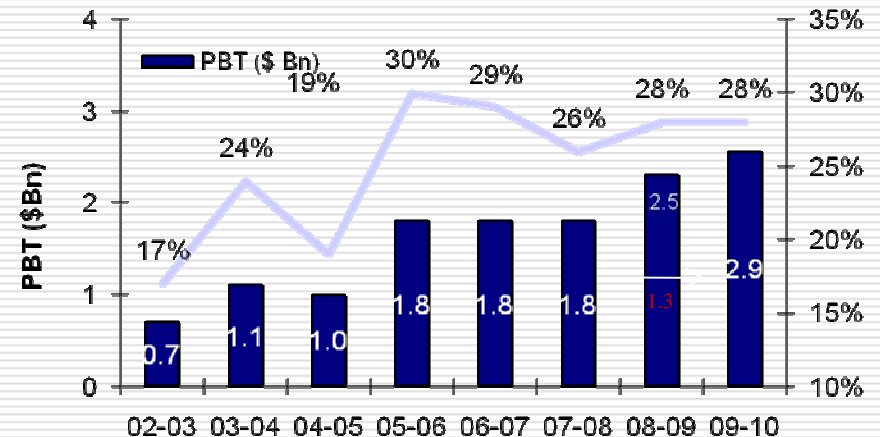
## ...While Improving Productivity<sup>1</sup>



## Leads to Growth in Net Revenues...



## ... And Growth in Profitability



<sup>1</sup> OMS: Output per man shift is obtained by dividing output of saleable coal obtained by total number of man-shifts worked

<sup>2</sup> 08-09 PBT numbers reflect add back of one time charges of ~\$1.1bn related to the most recent wage revision act. This includes ~\$0.6 in charges related to pension liability, ~\$0.2 in charges related to 06-07, ~\$0.3 in charges related to 07-08

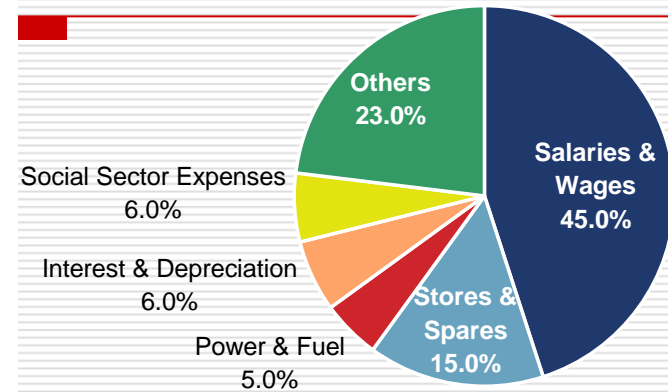
Exchange rate of 47 INR/USD



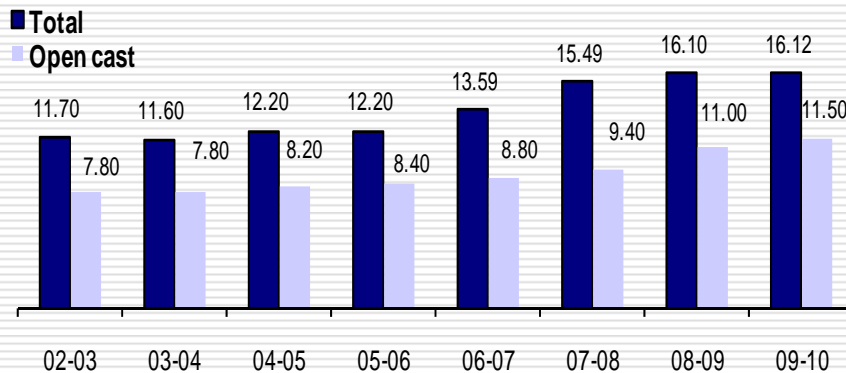
# Integrated Low-Cost Operations

- Opencast mines accounts for ~90% of total production and UG accounts for ~10% of total production
  - Difficult geo-mining conditions in UG mines
- Equipment of greater size and capacity being introduced to increase efficiency

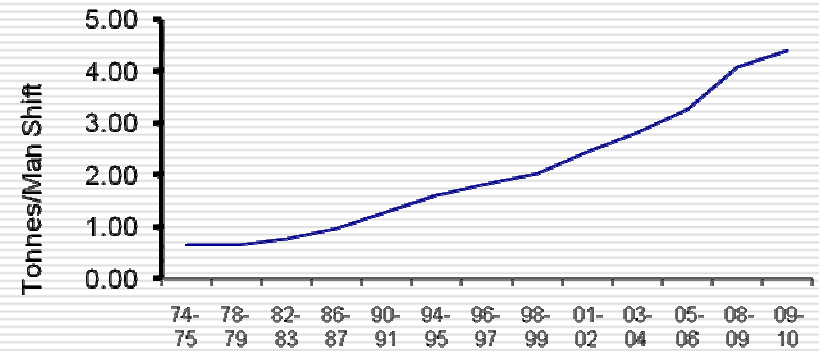
Expenditure Profile



Breakdown of Cost per Tonne of Coal Produced (\$)



Improving Labor Efficiency (Tonnes/Man Shift)



# Key Strategic Initiatives

## Key Initiatives

## Targeting

- *Enhancing Availability of Resources*
- *Ensuring Accessibility of Resources*
- *Increasing Acceptability of Mining Practices*
- *Improving Profitability and Efficiency*

- *Sustainable Development*
- *Growth*
- *Profitability*
- *Efficiency*

# Enhancing Availability of Resources

## EXPLORATION

- Drilling targets increased 3x
  - Aiming to convert ‘inferred’ and ‘indicated’ category of reserves to ‘proved’ category
- Systematic exploration being carried out to arrive at reliable estimate of coal reserves
- Application of information technology to create geo database

## NEW PROJECTS

- 142 new projects for ultimate capacity of 380.22 Mty identified
  - 35 UG and 107 OC
  - Estimated capex planned ~\$ 7.7 billion
- Setting up 20 washeries with a capacity of 111.1 Mty with estimated capex \$ 510 million

## FOREIGN ACQUISITIONS

- Process of acquiring coal resources abroad through equity stake in working or green field projects
  - Acquired 2 virgin coal blocks in Mozambique
- Global Expression of Interest (EoI) floated for selection of strategic partners for overseas operations
  - 5 proposals from three countries being considered for due diligence

# Ensuring Accessibility of Resources

## OPENCAST MINING

- Computer-aided mine planning for deeper OC mines
- Deploying high capacity equipment to achieve economies of scale
- OITDS<sup>1</sup> for efficient fleet management in 11 large OCP contributing 32% of production
- Increasing use of surface miners for better quality sized coal

## UNDERGROUND MINING

- Tapping large reserves below 300m depth
- 7 UG Greenfield properties being developed
- 18 abandoned mines with estimated reserves over 1600 MT identified for development
- Introduction of mass production technology:
  - PSLW
  - Continuous miner

## HIGHWALL MINING

- Mining of good quality thin seams
- Recovery of good quality coal in OC mines beyond economic stripping ratio limit

## CBM/UCG

- Recovery and commercial utilization of CBM from deep seated seams
- Underground coal gasification of deep seated seams

<sup>1</sup> OITDS: Operator Independent Truck Dispatch System

# Improving Profitability and Efficiency

## FINANCE

- Ensuring competitive delivered energy cost vis a vis imported coal
- Strategic cost reduction across operation value chain
- Reviving non-performing/loss making units
- Moving progressively to market driven pricing

## ORGANIZATION

- Improving corporate governance metrics
- Introduction of 'Integrity Pact' and transparency initiatives
- Web based business processes

# Increasing Acceptability of Mining Practices

## SOCIAL

- “Mining with a human face” through socially sustainable inclusive development
- Inclusive model of all-round growth for Project Affected Peoples (PAPs)
- Providing employment and cash compensation to land losers
- New CSR Policy adopted and provided CSR budget as 5% of retained earnings of previous year subject to minimum of Rs5/- tonne of coal production, whichever is higher
- Massive social investment in Education, Health and Community Development :
  - ✓ Supports 665 Educational Institutions
  - ✓ Provides 85 Hospitals, 1495 Doctors and 5835 Hospital Beds
  - ✓ Provides water to 2.3 million population in and around mining area

## ENVIRONMENTAL

- Setting up 20 washeries with a capacity of 111.1 MT/y
- Started satellite surveillance for land reclamation and restoration of OC mines
- Planted ~70mn trees with survival rate of over 75%
- 29 OC projects have ISO 14001 certification

## SAFETY

- High priority to safety
- Framed distinct ‘Safety Policy’ in every subsidiary
- Formed multidisciplinary ‘Internal Safety Organization’ (ISO) in every subsidiary

# **AREAS OF CO-OPERATIONS**

# UG Mining:

- US side may come up with new technologies and expertise to take part in mechanisation of UG mines, keeping in view the production, productivity, safety & economics.
- ECL has envisaged to **sink 7 new shafts** in 4 UG mines and **deepen / widen 6 existing shafts** in 4 UG mines.

US may collaborate in mechanised fast shaft sinking / deepening / widening jobs with state-of-the-art technology and expertise .



# UG Mining

# Contd.....

- Indo-US CWG may develop collaboration in technology / expertise for depillaring of upper coal horizons which are already developed and are mostly waterlogged in JCF with due regard to subsidence and land degradation.
- Indo-US CWG may come forward with suitable technology for mining deep seated coal reserve of Degree-III gassiness in JCF after taking up the operation of degasification.
- In JCF, to evolve possibility of high capacity production mechanisation for UG mines with virgin, thick multi-seams where overlying seams had been exploited by OC mining.

# OC Mining:

- US side may come up with new technologies and expertise to collaborate in mechanisation of OC mines concerning upgradation and standardisation of HEMM.
- Design & maintenance of OB slope is a major concern for OC mining. There are numerous incidences of OB dump collapse in the history of mining causing accidents and fatalities.
- US may come forward with proper design of the dump, technology with deployment of sensors in OB piles to detect slope failures.
- Cost effective installation of sensors and laser-based surveying of exterior of the dump may be a part of the technology transfer.

# Exploration / Sub-surface mapping:

- Presently coal exploration in India, both regional and detail, is primarily carried out by coring drilling supported by geophysical methods as and when required.
- **3-D High Resolution Seismic Survey (HRSS)** technique is a powerful tool for rapid subsurface mapping. Introduction of DTH non-coring drilling with **Borehole Imaging System (BIS)** as integral part of geophysical logging shall speed up exploration.
- In the field of BIS, US may provide technology / equipment (**Borehole Acoustic Tele-viewer System**) for a depth range of 1000 m and expertise with necessary software / hardware for the same .
- May take initiatives in arranging trial test and training of CIL personnel.

# Coal Beneficiation:

- For new washeries, US may come up with state-of-the-art technology / expertise responding to the NIT for Global Bidding.
- For existing washeries, assistance sought from US side for the technology / expertise in coal beneficiation as per followings:
  - Use of **Vari Wave Jigs**.
  - Use of **Spiral Concentrator** for more fine coal recovery.

## Other areas of possible co-operation

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- Underground Coal Gasification,
  - Dry Coal Beneficiation
  - Fine Coal Beneficiation
  - Extraction of CBM / CMM / AMM.
  - Coal Resource Characterization,
  - Study for developing a model to increase usable quantum of energy from indigenously mined coal.
  - Study on revival of selected abandoned mines in CIL companies.
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# CDM projects

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- CMPDIL has taken up R&D projects for viable CMM / AMM, which are in progress.
  - Identification of prospective CMM areas in BCCL and CCL has been done.
  - 5 blocks have been short listed for development of CMM.
  - Preparation of data dossier of these blocks is under preparation.
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# Underground Coal Gasification

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- **CIL intends to develop UCG in the identified blocks under the collaborative regime preparatory to which EOI is invited.**
  - **EOI for development of UCG was put on the website of CIL / CMPDI and India CBM/CMM Clearinghouse.**
  - **CIL will provide available geological information, infrastructure facilities, but will not create any infrastructure for this purpose**
  - **NIT prepared for Kaitha Block (Ramgarh CF) & Thesgora 'C' blocks (Pench). Global Tendering is in the process.**
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# Coal Mine Methane

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- Development of CMM is high on the agenda of CIL, to generate additional revenue and accrual of Carbon Credits.
  - CIL intends to develop CMM in BCCL & CCL under the collaborative regime preparatory to which EOI is invited for following coalfields:
    - Jharia Coalfield (BCCL): Moonidih, Pootkee Balihari, Mahuda Sub Basin
    - East Bokaro Coalfield (CCL): Asnapani-Jarangdih Shaft & North Kathara Phase-I-III, Uchitdih
  - Tender document under preparation and will be floated shortly.
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# Ventilation Air Methane

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- In India, there are 18 Degree-III mines & 102 Degree-II mines. As per an estimate, the total annual methane emissions from UG mines is about 213.8 million m<sup>3</sup>.
- CIL intends to commercially develop VAM projects at the identified gassy UG mines with accrual of Carbon Credit benefits and for this purpose.
- Broad Scope of Work for collaborator:
  - To get the area examined for suitability of the identified UG mines.
  - To generate additional data for taking up VAM
  - Feasibility study to be carried out and if found potential, further commercialization may be taken up.
  - To examine the possibility of getting carbon credits from VAM project.

Tender documents under preparation and will be floated shortly

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# Project proposal for funding under Indo-US CWG:

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## Project Title:

- Capacity building and skill development in the area of Geospatial technology application in mine land reclamation for sustainable coal mining in India.

## Project Objectives:

- Develop core competence of technical experts through training and site visits to make them capable of taking informed decisions for addressing land reclamation challenges.
  - Skill development of the remote sensing experts of CMPDI in the area of land reclamation planning, monitoring and management.
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# Course Modules

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- **Advanced GPS Mapping: For land Reclamation**
  - **Mobile Computing for Reclamation**
  - **Introduction to Arc GIS For Mining and Reclamation**
  - **Arc GIS Spatial Analyst: For Mining and Reclamation**
  - **Image Analysis For Arc GIS**
  - **Galena Slope Stability Analysis**
  - **Surface & Ground Water Hydrology**
  - **Soil & Revegetation**
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- **Erosion and Sediment Control**

# Long-term sustained supply of coal from sources abroad

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The initiatives are broadly classified into two models:

1. Equity Model wherein it is proposed to acquire stakes in operating mines or Greenfield coal blocks and import the produces from such acquisitions to India.
  2. Off-take model, wherein it is proposed to enter into Long-term Offtake Contract (10 years) with coal companies for procurement of imported coal.
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# Status of Indo-US Strategic Alliance

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- USA has been identified as a preferred country for both the equity and off-take models.
  - In response to the global Expression of Interest (EoI) for both the models encouraging responses were received from US coal companies.
  - Presently CIL is in advance stage of creating strategic alliance with a large US company through the “Equity Model”. While in the “Off-take Model”, several US coal companies have been qualified to participate in the final stage of the process and price bids shall be shortly invited from the qualified US coal companies
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# Status of Indo-US Strategic Alliance

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- Several responses were received from US based coal companies.
- Discussions are in progress with M/s Peabody, Massey Energy Corporation.
- Structures for strategic alliance are:
  - Equity with offtake in Brownfield projects
  - Long-term offtake arrangement
  - Equity in Greenfield projects
- Thermal coal exports from USA at a competitive price can potentially bridge India's demand-supply gap.
- Competitive model for maritime freight needs to be explored for making the landed cost of US coal in India attractive.
- Indo-US bilateral platform can be leveraged to sensitize stakeholders at Govt. level to create enabling situation for CIL to strike deals with US Coal Companies

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*Thank You*

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# Transformation of CIL

## PRE-NATIONALISATION

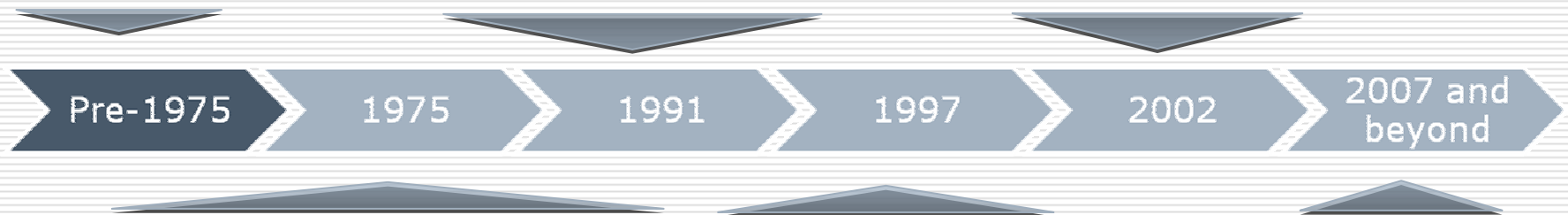
- Sector grew <2%
- Low returns
- Low investments
- "Born Sick"

## PRAGMATISM

- Phase out budgetary support
- Enforcing financial discipline
- Profitable from 1991-92
- Accessed financial markets

## LAUNCHING PAD

- Highest production growth – 5.2 % CAGR over IXth plan
- Improvement in capacity utilisation
- Reduced manpower by over 81,000
- Improved productivity by 37 %
- Funded investment from internal resources
- Debt/Total capital reduced from 60 to 10%



## COAL AT ANY COST

- Nationalisation
- Massive public investment
- Achieved target growth of 5% CAGR
- Balance sheet weakness

## CONSOLIDATION

- Consolidated financial position
- Slow growth in demand
- Foreign funding

## TAKE OFF

- Plans to grow at a CAGR of 7.60 % in XI Plan (Original).
- International growth plans by acquiring coal fields abroad



# Key Highlights

## Largest coal company in the world

- Largest coal producing company in the world
- Operates 471 mines across 8 states in India
- Operates 17 coal beneficiation facilities with capacity 39.4 Mtpa

## Capitalize on growth in the Power Sector

- Coal meets 52.4% of the total primary energy requirement of India (FY2010)
- CIL alone meets 40 % of India's primary commercial energy requirement
- Coal to be used as fuel for 80% of the incremental power capacity over the next 5 years

## Strategy for Growth

- Improve realisations through increased sales of beneficiated coal, use of e-auction and linking high quality raw coal price with imported price
- Continue to increase reserve base in India
- Acquire strategic international resources and identify joint development opportunities

## Expansion Plans

- Identified 70 coal projects with ultimate capacity of 230 Mtpa.
- Plan to develop 20 coal beneficiation facilities with proposed feedstock capacity 111.1 Mtpa

# Key Highlights - Contd

## Strong and recognized management

- Strong and high quality management team
- Awarded "Navratna" status in FY 2009
- Fulfils all criteria for award of MAHARATNA status.

## Track record of sustainable development

- Advanced equipment and technology for higher mechanization
- Environmental initiatives through water harvesting, reforestation & rehabilitation among other activities
- Investments in education, health and community development initiatives

## Robust financial position

- Strong financial position ( FY 2009-10)
  - o Total revenues :Rs. 52.188 Crs
  - o EBITDA :Rs 15430.84 Crs
  - o Net income :Rs 9622.45 Crs
  - o Net cash position :Rs 39.078 Crs