



Indo-US Energy Dialogue Joint Working Group on Coal

Beneficiation of Coking Coal

Project Proposal on :

**Beneficiation Technology for Low
Volatile Coking Coal of Lower Seams
(V,VI,VII,VIII) of Jharia Coalfields, BCCL**

CMPDI



Indo-US Energy Dialogue Joint Working Group on Coal

The proposal is currently under preparation as per the standard format of S&T / CIL R&D research proposals. Main points discussed in the proposal are presented below:

- **Implementing Agency, Location & Action Point**
- **Name of Project Coordinators & Co-investigators**
- **Definition of the Problem**
- **Objective**
- **Need & Justification of Subject Area**
- **Work Plan**
 - **Methodology**
 - **Organization of Work Element**
 - **Time Schedule**
- **Details of Proposed Outlay with Justification for Capital expenditure, equipment, manpower, consumables etc.**
- **Scope & End Application**

PROJECT : Beneficiation Technology for Low Volatile Coking Coal

IMPLEMENTING AGENCIES & PARTICIPATION

➔ Implementing Agencies:

- US Government
 - Mr. Mark Sharpe, Sharpe International
 - Dr. Roe-Hoan Yoon, Virginia Polytechnic Institute and State University
- India Government
 - Lead : Mr. P. R. Mandal, Adviser (Projects), MoC
 - Co-Lead : Director (Engineering Services), CMPDI

Director (Tech), BCCL

PROJECT : Beneficiation Technology for Low Volatile Coking Coal

IMPLEMENTING AGENCIES & PARTICIPATION

- ⇒ Participation :
 - India Lead – CMPDI
 - Participant – BCCL

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PROJECT : Beneficiation Technology for Low Volatile Coking Coal

OBJECTIVES

❖ To develop/ establish a suitable technology for beneficiation of high ash difficult-to-wash coking coal from V,VI,VII,VIII seams of Jharia coalfield by way of setting up a demonstration plant of capacity around 1.0 Mty of raw coal to obtain the following products :

- Metallurgical grade coking coal (Ash % $\simeq 18_{\pm 0.5}$) as Cleans
- Power grade coal (Ash $\leq 34\%$)
- Low Carbon Rejects

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NEED & JUSTIFICATION OF SUBJECT AREA

- This variety of coal can not be beneficiated in the existing coking coal washeries due to their typical characteristics
- Production of such coal in CCL & BCCL at the end of XI plan (2011-12) : around 13 Mt, constitutes 32% of total coking coal production (40.65 Mty).
- LVC coals are presently being despatched to thermal power plants

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NEED & JUSTIFICATION OF SUBJECT AREA

- In the context of fast depleting reserves of prime coking coal it has become necessary to utilize LVC Coal for metallurgical purpose after proper blending
- In this context, it is necessary to set up a demonstration plant with suitable technology for future commercial application

PROJECT : Beneficiation Technology for Low Volatile Coking Coal

WORK PLAN - METHODOLOGY

- ➔ Identification of work site
- ➔ Laboratory testing of coal samples from linked mine(s)
- ➔ Supply of basic engineering, system design and detail design & drawings
- ➔ Preparation of technical specifications for procurement of P&M

PROJECT : Beneficiation Technology for Low Volatile Coking Coal

WORK PLAN - METHODOLOGY

- ⇒ Bid process Management
- ⇒ Erection & Commissioning of the plant
- ⇒ Performance guarantee tests, data generation and plant hand over
- ⇒ Completion Report

PROJECT : Beneficiation Technology for Low Volatile Coking Coal

WORK PLAN – ORGANISATION OF WORK ELEMENT

- ➔ MoC to approve the proposal through SSRC under S&T scheme
- ➔ BCCL shall identify the worksite and linked mine(s) and provide infrastructure facilities & assistance during execution
- ➔ Laboratory testing by CMPDI
- ➔ Basic engineering, selection of technology & equipment, system design and detail design & drawings by US agencies

PROJECT : Beneficiation Technology for Low Volatile Coking Coal

WORK PLAN – ORGANISATION OF WORK ELEMENT

- ➔ Preparation of NIT & Bid process management by US agencies assisted by CMPDI
- ➔ Execution of the project will be done by US with assistance from CMPDI & BCCL
- ➔ Laboratory testing during PGT by CMPDI
- ➔ Completion report by US with assistance from CMPDI

PROJECT : Beneficiation Technology for Low Volatile Coking Coal

WORK PLAN – TIME SCHEDULE

36 months, Zero date will start with the signing of agreement between Indian & US agencies under Indo-US Energy Dialogue or receipt of letter of approval of the project under S&T / CIL R&D scheme, whichever is later.

(Detail break-up to be worked put after consultation with all agencies involved)

PROJECT : Beneficiation Technology for Low Volatile Coking Coal

Details of Proposed Outlay (1\$ = Rs. 41/-)

Sl. No	Item	Total Estimate in million	
		INR*	USD (included in the INR)
1	Cap. (Civil & Structures)	170.00	
	Cap. (P&M), US	328.00	8.0
2	Rev. Salary (CMPDI)	8.41	-
	Rev. Salary (US)	18.45	0.45
	Rev. Travels (US)	6.15	0.15
	Rev. Testing & Lab. (US)	2.05	0.05
	Rev. Test & Lab. (Indigenous)	4.29	-
Sub-Total (Cap. + Revenue)		537.35	8.65
3	Less (US Contribution)	8.20	0.2
4	Contingency	7.26	-
Grand Total		536.41* (= USD 13.08 million)	8.45

* Including FE component of US \$ 8.45 million

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SCOPE AND END APPLICATION

Successful completion of the project is expected to set a trend for beneficiation of the Low Volatile Coking coal, which constitutes about one-third of the mineable coking coal reserves. Similar plants operating at commercial level will help in exploiting this variety of coal for its proper use i.e. metallurgical purposes.

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Thank You

Current coal quality management

Type of Coal	X Plan	XI Plan Period				
	2006-07	2007-08	2008-09	2009-2010	2010-2011	2011-2012
Metallurgical Grade Coking Coal	17.90	18.29	20.34	23.70	25.55	27.65
Non-coking coal	405.29	429.21	466.66	513.30	571.45	639.35
Non-Metallurgical Coking Coal	9.31	13.00	13.00	13.00	13.00	13.00
Total	432.50	460.50	500.00	550.00	610.00	680.00

- ⇒ Total coal production in India in 2006-07 is anticipated to be 432.50 Mt, which is estimated to be augmented to 680 Mt by the XI Plan terminal year 2011-12.

Source : "Report of the Working Group on Coal & Lignite for formulation of XI Five Year Plan (Nov'06).

Current Coal Quality Management

COKING COAL

- Coking coal production for Steel sector would be 27.65 Mty in XI Plan from 17.90 Mty in 2006-07.
- Only 60 to 65% of the total coking coal production could be used for metallurgical purpose after processing in Coal Washery.
- Balance is Low Volatile High Rank coking coal and not outright suitable for Steel sector due to quality reason, hence, being used for non-metallurgical purpose.
- Production of LVHR coking coal is 9.3 Mty at present and is expected to rise to 13 Mty in XI Plan.
- No. of Coking Coal Washeries : 19
- Capacity : 27.38

Current Coal Quality Management

NON-COKING COAL

- ⇒ Non-coking coal production
 - ⇒ During X Plan period : 405.29 Mty
 - ⇒ During XI Plan terminal year : 639.35 Mty
- ⇒ Superior grades with ash content < 34 % : 143 Mty
- ⇒ Inferior grades with ash > 34 %
 - ⇒ linked to Pit-head TPS : 160 Mty
 - ⇒ Captive Mining Production : 104 Mty
 - ⇒ Remaining : 232.35 Mty
- ⇒ Non-Coking coal washing capacity : 103 Mty
- ⇒ Additional Capacity Requirement : 127 Mty