



US Department of Energy



Sharpe International LLC



# **Enhanced Use of Clean Coal in India: An Essential Step towards Energy Security and Environmental Protection**

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Coal Preparation Workshop  
Ranchi, India  
August 22-24, 2007



# Overview

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# INTRODUCTION

- ▶▶ **Indo-US Energy Dialogue Coal Working Group and Asia-Pacific Partnership Coal Mining Task Force identified coal beneficiation as priority need for international collaboration;**
- ▶▶ **US Department of Energy funds review and analysis of recent coal beneficiation experience in India;**
- ▶▶ **Results lay foundation for discussing barriers and plans for enhancing coal washery capacity;**



## INTRODUCTION - Continued

- ▶▶ Coal Beneficiation Study is one of several US Department of Energy activities associated with the Indo-US Energy Dialogue and the Asia Pacific Partnership that address coal preparation and use of clean coal, including joint R&D proposed work;
  - ▶ *Developing a Coal Cleaning Plant Simulator;*
  - ▶ *Cost Effective Technology for Beneficiation and Recovery of Fine Coal;* and
  - ▶ *Beneficiation Technology for Low Volatile Coking Coal*
  
- ▶▶ Critical role for US technology and assistance, and efforts underway to:
  - ▶ Improve visibility and access to US firms and products through technical visits, workshops, etc.
  - ▶ Improve existing programs and policies for facilitating transfer of technology and assistance.



# **BENEFITS FROM COAL BENEFICIATION: CASE STUDIES and SPECIFIC FINDINGS**

## CASE STUDY LISTING

- ▶▶ **Satpura Thermal Power Station, 210MW, National Thermal Power Corporation - 1987**
- ▶▶ **Simulation by National Energy Technology Laboratory, US DOE -1994,**
- ▶▶ **Dadri Power Plant (4x210 mw), National Thermal Power Corporation**
- ▶▶ **BSES (currently Reliance Natural Energy's) Dahanu Thermal Power Station, 2X250MW - 2000**
- ▶▶ **“Estimating the Cost of Coal-Fired Generation, An Application of VISTA”, 500MW SIMULATION - 2001**
- ▶▶ **Technical Economic Feasibility of Low Ash Power Station Fuel in India, - 2004**



## **BENEFITS FROM COAL BENEFICIATION: CASE STUDIES and SPECIFIC FINDINGS**

- ▶▶ **More immediate power generation without investment or lag time**
  - ▶ 10% Increase
- ▶▶ **Sustainable, highly efficient power generation**
  - ▶ Efficiency improvements
- ▶▶ **More rail way transport capacity**
  - ▶ 7.5% lower tonnage shipped with 10% ash reduction
- ▶▶ **Lower pollution emissions**
  - ▶ 13 million tons of Carbon from existing plants, additional 8.0 million when applied to planned capacity growth of 50,000MW



## EXTRAPOLATION TO POTENTIAL NATIONAL BENEFITS

- ▶▶ Coal based generation in 2006-2007 approximately 50,000 Mkw
- ▶▶ Washed coal has shown at least a 10% improvement in generation in all studies, which would add 5,000Mkw from existing infrastructure
- ▶▶ Estimated capital cost to built this 5000Mkw of capacity would be the equivalent of 12 x 500MW plants operating at 80%PLF or approximately US\$7,500 Million (Rs36,900 crores).
- ▶▶ Reduction in rail freight of 7.5% will increase capacity to deliver coal on existing system.
- ▶▶ Higher efficiency means lower emissions. A 10% ash reduction has proven to reduce CO<sub>2</sub> by 190kg/kWh. On average this will mean 650 tons of CO<sub>2</sub> reduction per year from a 500MW power plant.



# SUMMARY AND NEXT STEPS

- ▶▶ **Benefits of coal preparation well documented**
  
- ▶▶ **Expansion of coal beneficiation capacity not a technical problem**
  
- ▶▶ **Changes are needed to build upon recent initiatives and establish appropriate regulatory and market based systems**
  - ▶ **Duties on coal preparation equipment at par with other energy sector imports**
  - ▶ **Costs of coal effectively tied to coal quality**
  - ▶ **Restrictions on emissions, generation/disposal of fly ash, etc.**
  
- ▶▶ **Coal Preparation Workshop provides excellent forum to identify key actions needed to foster growth in coal washing and the use of clean coal.**



## FOR MORE INFORMATION

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