

RESOURCE QUALITY ASSESSMENT

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The following facilities are available for Quality Assessment of Coal (at Digwadih and Ranchi, Bilaspur , Nagpur units)

1. Field Sampling

- i) Run-of-mines
- ii) Seam Channel
- iii) Stack
- iv) Wagon / Rake

2. Standard Sampling for Laboratory feeding

- i) Proximate Analysis
- ii) Ultimate Analysis
- iii) Calorific Value Determination
- iv) Determination & Distribution of Sulphur
- v) Ash Fusion Test
- vi) Hardgrove Grindability Index Determination
- vii) Abrasive Index Determination
- viii) Moisture at Specific Humidity
- ix) Carbonate Carbondioxide Determination
- x) Lab-scale Washability Study
- xi) Specific Gravity Determination
- xii) Geological Coal-Core Logging

3. Training Course (Theoretical & Practical) for Personnel from different industries

4. Refresher Course on Resource Quality Assessment

Energy Auditing

Energy Auditing of different industries done as sponsored project by authorized Energy auditors





Technical enquiry

Head,
Resource Quality Assessment Division,
CIMFR, (Digwadih Campus) P.O. FRI,
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For business enquiry

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COAL PETROLOGY

Geological activity of erstwhile CFRI has been started ever since the start of exploration for coal in the country. Soon after the discovery of major coalfields, such activity is mostly concentrated around the petrological study with the evolution of a centre of excellence for coal petrological research in the country. The R & D work encompasses several original contributions both in fundamental and applied aspects of coal petrology.

The petrological assessment of coal has significant contributions in different industrial activities related to coal beneficiation, coal carbonization, coal liquefaction and coal combustion. These days the section has taken new initiative in the clean coal technological moves especially for coal bed methane and CO₂ sequestration etc.

Significant Contributions

- Basic research on of coal structure with reference to vitrinite reflectance, fluorescence study of coal and lignite etc.
- Systematic petrographic profiling and their correlation with chemical composition of coal seams for exploration of new coalfields and extension of existing mines and reserve estimation of different type of coals
- Categorization and classification of Indian coals and introduction of the concept of 'Semi-vitrinite' in the classification of Indian coals
- Petrographic assessment of coal/blends for coke making and, correlation of petrographic and chemical/technological properties for metallurgical uses.
- Coke microtextural and char morphological study for performance assessment of coke ovens and power plants, respectively.
- Optimization of composite washing of mixed coals and difficult-to-wash coals
- Mineralogical investigation for sulphur bearing minerals and their distribution pattern to the possibilities of their removal
- Petrographic studies of coal measures for coal bed methane (CBM) potentiality assessment
- Gainful industrial utilization of large unused reserve of jhama
- Identification and quantification of mesophase, developed from coal tar pitches through microscopic studies, finds its use in the making of carbon fibers

New Initiatives

- Application of Image analysis system for petrographic studies
- State-of-art of in-place gas estimation through desorbed and residual gas measurements, specifically for CBM operations
- Capacity building for CO₂ sequestration and CBM related activities are in the process of formulation

Our Clients

ONGC, Total CBM Solution Pvt. Ltd., NTPC, SAIL, TISCO, CIL, Vizag Steel Plant, DPL, Reliance Industries Ltd. etc.



TEMPERATURE CONTROLLED



**SPECIALLY DESIGNED CRUSHING UNIT
FOR RESIDUAL GAS MEASUREMENT**

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ENERGY MANAGEMENT

With Energy Audit becoming mandatory for all energy intensive industries, Central Institute of Mining & Fuel Research (CIMFR) has diversified its activity in the most challenging field of **Energy Management** to cut down energy bill and help the industries to save crores. The Energy management Cell (EMC) of CIMFR set up in 1998 at Nagpur has well-equipped infrastructure with latest instruments for proper evaluation of different parameters of electrical & thermal equipment to analyse and recommend cost-effective energy conservation measures with attractive payback period.

Industries identified for Energy Audit: As per the Energy Conservation Act 2001 which came into force in March 2002, following industrial sectors have been identified as energy intensive industries .

Thermal power stations, Fertilizer plant, Cement Plants, Iron & Steel , Textile industry, Chlor-Alkali, Railways, Aluminum etc.

In addition to above industries ; **Mining sectors, Dairy sector, Solvent extraction plants , Commercial establishments(above 500 kW) are also energy intensive.**

Energy Audit Capabilities of CIMFR

Energy Audit is a systematic search of Energy conservation opportunities in a limited time frame by energy experts with an objective to reduce energy consumption level by identifying the major energy losses and by adopting new technologies & processes, changes in design based on scientific and R&D inputs.

Accreditation: CIMFR, erstwhile Central Fuel Research Institute (CFRI) is one of the 62 agencies **accredited to the Bureau of Energy Efficiency (BEE), Ministry of Power**, Govt. of India to carry out Energy Audit services as per the Energy Conservation Act 2001.

Energy Management Cell (EMC) has experienced scientists who have qualified the Energy Auditors examination conducted by BEE and technical manpower from various faculties such as Electrical, Mechanical, Chemical and Energy Management for field studies, data analysis & report preparation.

Energy Management Cell, CIMFR Nagpur Unit is competent in providing the Energy Audit services in the different industrial sectors such as **Thermal Power Plants, Mining, Dairy & Food Industries, Textile Industry, Iron & Steel, Transport & Services etc.**

Since its inception in the year 1998, CIMFR, Energy Management Cell Nagpur has completed about **25 major Detailed Energy Audits in Industrial sector** including for thermal power plant & mines. Some of our major assignments are “Energy Audit of One 50 MW and one 100 MW Unit of Thermal Power plant of Neyveli Lignite Corporation” (T.N), “Energy audit of 9 Mines and 2 Plants of Manganese Ore India limited”, Nagpur, Energy Audit of Boiler House and Power House of M/s Century Rayon, Thane” & “ Energy Audit of Umrer Open Cast Mine”, WCL. Also we have completed

Energy audits in several dairy units like Govt. Milk Scheme, Nagpur, Rajarambapu Patil Sahakari Dudh Sangh, Sangli, Jalgaon Jilla Sahakari Dudh Sangh, Jalgaon, Solvent Extraction plant etc. Industry reported to have saved about 10-15% on their energy bill.

FACILITIES FOR ENERGY AUDIT

CIMFR-Energy Management Cell has well equipped instrumentation for measurement & analysis. List of the instruments available is as follows:

Ultrasonic Flow Meter , Flue Gas Analyzer, Digital Thermometer, Digital Anemometer, Ph Meter, TDS Meter, Thermo-Hygro Meter, Load Manager –Krykard ALM-3, ITT-Clamp On Multimeter, Lux Meter, Digital Tachometer, Non Contact Infra –Red Thermometer etc.



Ultrasonic flow meter



Flue gas Analyzer

PLAN FOR CONDUCTING ENERGY AUDIT

The schedule of the detailed energy audit services for any industry is as follows:

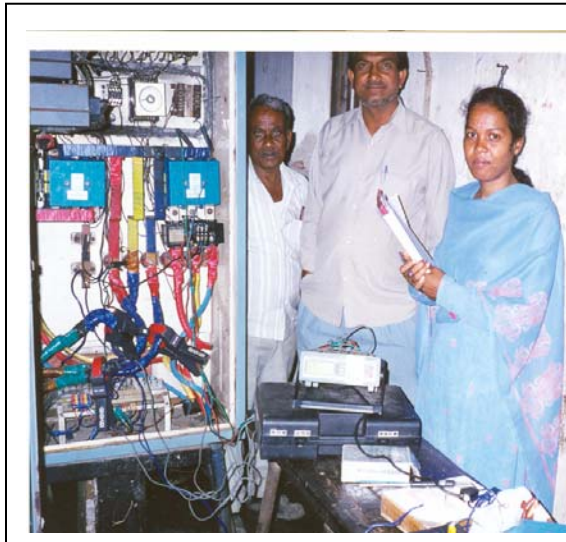
- Award of Energy Audit to CIMFR
- Submission of action plan for conducting Energy Audit
- Field visit for Data collection and measurements using the instruments
- Brain storming , Data Analysis & Report preparation & Submission

SCOPE & METHODOLOGY OF ENERGY AUDIT

Plant equipment in any industry can be classified as thermal & electrical equipment such as Boiler & Furnaces ,Electrical Motors & Pumps ,Air compressor & blowers . Scope of Energy Audit includes study of energy consumption pattern, evaluation of specific energy consumption & performance evaluation of each equipment .Designed & actual data are taken from thrust areas of energy usages like Boilers, Turbines, Electrical motors, Air compressors & Pumps and then performance parameters are compared.. The performance parameter like efficiency, loading of equipment is evaluated by estimating the associated losses in the equipment. Cost effective energy conservation measures are provided as an output of energy audit to reduce the present energy consumption of plant. Scientist/Energy auditor of

CIMFR explore the possibility of energy conservation/saving by New R & D ideas/Initiative in process & equipment.

Energy Saving recommendations are provided in the Energy Audit report by blending the existing technology with energy efficient new technology for process & equipment and integrating renewable energy. Implementation & Energy management plan of energy saving measures is also provided in the energy audit report for smoother implementation.



Scientists of CIMFR- Nagpur Unit taking measurement during field studies at Manganese Ore(I) Ltd

BENEFITS OF ENERGY AUDIT

- Substantial energy saving on implementation
- Provide cost effective energy saving measures
- Improve energy efficiency & reduce energy cost

CUSTOMERS & BENEFICIARIES ON IMPLEMENTATION

| Sr. No. | Name of Client |
|---------|---|
| 1 | Western Coal Fields Ltd.,Nagpur(MH) |
| 2 | Manganese Ore (India) Limited, Nagpur(MH) |
| 3 | M/s Indorama Synthetics Ltd.,Nagpur(MH) |
| 4 | Century Rayon Ltd, Shahad, Mumbai(MH) |
| 5 | Neyveli Lignite Corporation, Neyveli(TN) |
| 6 | Meerut Dugdh Utpadak Sahakari Sangh,Meerut (UP) |