

7th

Roundtable Conference on Coal

Underground Mining

Coal Gasification - Angul (Odisha)

Opencast Mining

Coal to Oil

Theme :

Indian Coal : Potential and Diversification

Tuesday, 24th September, 2019
Sovereign 1, Hotel Le Meridien, New Delhi

Shri Anil Kumar Jha, Chairman, CIL exchanged MoU with Mr. Leonid Gennadievich Petukhov of "The Far East Agency for Attracting Investment & Supporting Export" & "Far Eastern Mining Company" to Explore Coal Mining in Russia.

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Recommendations



Organisers

INDIA ENERGY FORUM
India Energy Forum



Mining, Geological & Metallurgical
Institute of India - Delhi Chapter



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Recommendations

A. Introduction to Theme

The Theme of the Conference was “Indian Coal-Potential and Diversification”. Response to the theme came through 3 Technical Sessions at which 12 learned papers were presented and Inaugural and Valedictory Sessions. The response confirmed the tremendous potential of Indian Coal for the present and also the diversification in its use for keeping it relevant for future.

Coal started as the prime source of Commercial Energy over best part of the developed world and though part of Europe has successfully reduced its dependence on Coal and large number of countries across the world have also fixed the dates for minimisation of coal use for power generation, it continues to be the main stay of Energy sources in the Developing world including India.

We however, as a responsible global citizen have appreciated the adverse impact of large scale coal consumption on Global warming and have launched a massive programme for generating power from Renewables for containing sharp increase in coal consumption, Notwithstanding this till an economical viable technology is developed for storage of this Power, coal will continue to dominate the power scenario in India for may be as long as 3-4 decades.

The country is well endowed with coal resources- of the order of 320 Billion Tons, 60% thereof is available at a depth of less than 300 mtrs and thus amenable to O/C

mining and fast ramp up of production, the country has an old history in Coal Mining and it has technically well qualified technical and managerial base but there is endemic coal-shortage and it is to a large extent, dependent on coal import and this dependence is growing.

While Import of metallurgical coal and superior grade power coal of which country's resources are inadequate is understandable, import of medium grade power coal which constitutes almost 70% of the import is just not acceptable.

It is therefore, an imperative necessity that a sharp growth in coal production is achieved and this is what was discussed in the “Potential” part of the theme of the conference.

Simultaneously, the industry has to remember that going forward, dominance of coal as a fuel for power generation would go down but by the time this happens the country will be producing close to 2 Billion Tons of coal p.a. and will not be able to afford losing the value of this wealth which would be a very significant part of the GDP. Fortunately, coal is a very versatile commodity and can be used more gainfully than for power generation by using it as a feed stock for valuable items like Chemicals, Fertilisers, Methanol, Gasoline etc.

Attempts in the direction of alternative usage of Coal has already started internationally leading to Commercial





scale operations and it is time that India joins this Caravan so that Nature's valuable gift in the form of Coal can continue to be utilised for economic development and well-being of the masses. This is what was discussed in the second part "Diversification" of the theme of the Conference".

The following recommendations emerged :

B. Recommendations

I *Achieving the "Potential":*

Based on the above the following recommendations have been arrived at:

1. **Exploration :** For ensuring increased coal production for meeting country's requirement, additional Coal Reserves have to be proved and additional resources are to be deployed for exploring unexplored areas and converting Indicated/Inferred resources into Proved Reserves. Forestry Clearance for Exploration in Forest Land has to be simplified so as to remove meaningless impediments to Exploration efforts.
2. **Increase in Production:** Despite huge Coal resources, country has become Import - dependent not only for Coking coal of which country is deficient in endowment (and import thereof is therefore understandable) but also for Non-Coking coal which is available in plenty and import thereof is totally unacceptable. This shortage can be over come by simplifying and

expediting procedures for Clearances and Approvals for opening new mines and upgrading existing mines.

3. **Greening Coal production:** For reducing adverse Environmental impact of Coal mining and use, mining technologies have to be improved, truck transportation has to be eliminated and universal washing of coal should be adopted. In respect of use, Modern "HELE" technologies like super critical & ultra supercritical have to be adopted.
4. **Land Acquisition:** Land Acquisition has become and is becoming more and more difficult by the day. Consideration may be given to "Leasing" of land being made the default system for obtaining land for mining purposes. After mining is over , land should be reclaimed and given back to the land owners. During the Lease period, the owner should be compensated adequately with lump sum grant at the start and end of Lease period.
5. **Evacuation:** A comprehensive Rail system for Developing and under-developed coalfields should be constructed with funding from Clean Environment Cess and contribution from Mine Owners which should be treated as their Equity in the Capital structure of the system.
6. **Coking Coal:** For addressing acute shortage of Coking coal, greater coordinated attention should be paid to implementation of Jharia Master plan, Washing of Washery Grade III and IV coal which is presently used as Power grade coal and R&D efforts for converting non-coking coal into coking coal.
7. **Commercial Mining:** Coal Sector should be opened to Commercial Mining with mine sizes being capable of producing atleast 10 mill tons p.a. and clear -cut policies about production levels and pricing .





II. *Identifying Roads for "Diversification":*

- i. **Coal Gasification:** Coal is generally used as Fuel for power generation in its solid state. This utilisation system however, suffers from major contribution to atmospheric pollution and this is the main contributor to Coal having been declared as responsible for Global warming.

Coal utilisation can however be made cleaner and greener by converting it into Gaseous form. This is achieved by heating the Coal away from Air leading to production of Syngas which is a mixture primarily of Carbon mono-oxide, Hydrogen, Carbon Dioxide, Methane and water vapour . It is this gas which is used as a fuel for power generation.

- ii. **Underground Coal Gasification:** Currently however, Syngas is produced only from Coal which is taken out from the mine and then gasified. An alternative is to produce syngas from in-situ Coal through the process of U/G Gasification. Though commercial success had been achieved on this process the operation has got stopped on account of contamination of U/G water sources. Studies have to be made for finding a solution to this problem but if it succeeds, it will open huge opportunities of utilising Coal locked in deep-seated and geologically disturbed formations which cannot be produced by Conventional Mining Systems.
- iii. **Metallurgical Coal from non-Coking Coal:** Coal is and will continue to be an important input for steel production. For this purpose the coal that is required has to have certain properties which bulk of the global coal

resources which are non-coking type do not have. Scientists in USA have developed a technology for converting Non-Coking coal to Coking Coal. Once developed on commercial scale it will open new Vistas for more gainful utilisation of non-coking coal than for power generation.

- iv. **Non-Coking coal for Steel making:** A technology called Stamp Charging has successfully been developed for utilisation of Non-coking coal for conventional steel making systems. More work needs to be done so that non-coking coal can be used in higher proportions.
- v. **Pulverised Coal Injection:** This is another technology which successfully been developed for utilising Non-coking Coal for Steel making in suitable proportions.
- vi. **Coal Bed-Methane:** This gas which is "adsorbed" in coal seam can be extracted as a Clean Fuel. Though India's resources of CBM have not been fully explored, this can contribute significantly to the objective of switching our energy base to 15% Natural Gas.

It has however to be appreciated that the success on these fronts like (i) to (v) cannot be replicated directly in Indian conditions since our quality of India Coal is rather poor. Serious R&D efforts on this front have therefore to be made and they have to be started straight away. One Source of funding can be the money collected through Clean Environment Cess of which inflow comes to close to Rs. 40000 crores p.a.

Detailed Recommendations are enclosed herewith as Annexure.

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