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INTRODUCTION

This News Letter is containing the write-ups on the following:

- 1 International Conference "Resurgent India – Vision 2020 in Metals and Minerals Sector" held at New Delhi from 28th to 30th September 2012.
- 2 Summary and Recommendations of the above International Conference.
- 3 Growth of Non-Ferrous metals in India.
- 4 Selection of Delhi Chapter as the best Chapter of IIM along with IIM Trichy for 2011-12.
- 5 Interview of Chairman SAIL with Economic Times.
- 6 Challenges of Indian Coal Industry.
- 7 Status of Rare Earth Minerals in India.

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"The Indian Institute of Metals – Delhi Chapter"

Jawahar Dhatu Bhawan, 39 Tughlakabad Institutional Area, M B Road

Near Batra Hospital, New Delhi-110 062

Tel: 011-29956738, Telefax: 011-29955084; E-mail: iim.delhi@gmail.com

Website: iim-delhi.com

INTERNATIONAL CONFERENCE “RESURGENT INDIA – VISION 2020 IN METALS AND MINETALS SECTOR”

The Delhi Chapter of The Indian Institute of Metals (IIM) organised an International Conference captioned “Resurgent India – Vision 2020 in Metals and Minerals Sector” at New Delhi from 28th to 30th September 2012.

The Conference was inaugurated by Dr Dalip Singh, Joint Secretary, Ministry of Steel. About 55 technical papers were presented in the Conference. The Conference was attended by about 200 persons from various organisations in India and abroad. The Conference consisted of ten technical sessions, inaugural session and a valedictory session.

Various subjects in the area of Metals and Minerals sector were touched upon in the Conference. The Delhi Chapter is happy to inform the readers that the feedback about the Conference has been very encouraging. The Chapter has also made a Summary and Recommendations of the Conference. These are being given in the succeeding pages. The Summary and Recommendations are being sent to the concerned Ministries for their information. It is hoped that this will form as an important reference document.

The technical papers presented in the Conference have been uploaded on our website. These can be accessed at the following site:

www.mmmmconferences.com

It is hoped that the readers will find the Summary and Recommendations informative.

MMMM 2012 - A SUMMARY

The Conference “Resurgent India-Vision 2020 in Metals and Minerals Sector” was organized to deliberate on the present status and vision for 2020 in the Minerals & Metals Sector. The Conference consisted of 10 technical sessions.

Two plenary sessions were on the aluminum, uranium/thorium and raw materials for iron and steel industry and raw material beneficiation aspects. These two sessions covered raw material security aspects and technological strategies for steel sector and special steels for strategic applications.

Two sessions were devoted to mining and two sessions to business scenario for ferrous and non-ferrous metals industry. There were two sessions on current and futuristic metals and minerals technologies, one session on new material development and applications and one session on energy and environment.

Nearly 55 papers of international standards, out of which 40 were from doyens of industry were presented in the International Conference. Over 200 delegates from Indian and overseas companies participated in the Conference deliberations. Date-wise salient points of the International Conference are as under:

28th Sept 2012

Inaugural Session

Shri Anil Gupta, Chairman, IIM DC welcomed the delegates participating in the Conference. He also briefed the delegates about the activities of the Chapter.





Shri S C Suri, Chairman, Technical Committee, IIM DC gave an overview of the Technical Conference.



Shri K V Rajan, Managing Director, ITEE spoke about the Exhibition details.

The keynote address was delivered by **Dr. S.K. Gupta (Former CMD MECON and Director JSW Steels)**. He discussed the current status of the iron and steel sector in India as compared to China and the effect of the present political scenario. He outlined two basic elements of growth of Iron & steel sector namely Raw Materials and Technology. He mentioned that presently, there is no definite methodology of selecting/adopting new technologies for iron and steel for making or high-risk investments that need to go to support new technologies. India requires concerted efforts for the large scale growth at a faster pace in the iron and steel sector. This is required to meet the growing requirements of the country and increase production capacity of 89 MTPA to ~200 MTPA by 2020. But lot more needs to be done to explore, develop and commit raw material resources for such projections of growth.



He also advocated serious view at national level on putting up large scale port based steel plants. He analyzed it as inevitable & sustainable in the long run as much of raw materials may have to be imported as well as to reduce disturbance to natural habitat including forests and water resources, as they require huge land and water for power plants and associated steel making.

The Inaugural Address was delivered by Dr. Dalip Singh, Jt. Secretary, Department of Steel. He dwelt upon the growth plans of Indian Steel Industry and also reviewed the details of the Process Routes for creation of enhanced steel capacity. He also informed that Department of Steel would welcome R&D proposals to cover the different facets of Iron and Steel production.



In the first plenary session, **Mr. R.N. Parbat (Past President-IIM)** delivered a talk on “India's position in international aluminum arena”. He projected that by 2020, Indian aluminum output is likely to reach 5 MT compared to the present level of 2 MT. He made some very specific suggestions w.r.t. raw materials for aluminium industry. Indian east-coast bauxite should be converted to low cost alumina and aluminum. This should be done close to the mining sites. Facilities should be set up near the ports to facilitate cost effective export to the world market. He emphasized that high quality bauxite from Chattisgarh, Odisha & around be made available to Aluminium producers while that from Gujarat should be used only for refractories. He mentioned several applications of aluminum in automobiles and general engineering purposes.



Mr. P.C. Gupta (Ex CMD NMDC) talked on “Raw material security aspects for Indian iron and steel industry”. He addressed the security of raw materials as an important aspect for the growth of iron and steel industry in India. He stressed that the government should frame policies, such as formulation of a Steel Mission be set-up for faster decisions. He also suggested setting up ultra-mega steel plants on the lines of Ultra High Power Plant to give benefits of economies of scale and forming an Iron and Steel Utilization Policy. He also informed about the quality issues of raw material and need for R&D initiatives required.



Mr. G.P. Kundargi, Director (Planning & Production) MOIL delivered presentation on “Raw materials - manganese ore for Ferro Manganese and other Ferro Alloys for steel production”. He stressed that domestic Mn-ore production should be increased to fully meet the present demand. Focused attention is needed to ensure higher recovery of Mn and improved quality of ores by engaging beneficiation and sintering processes.



Mr. Indu Bhushan Jha (Tenova-Bateman India) made his presentation on “Beneficiating low grade iron ore in India”. He reviewed the requirement and possible options available for beneficiation of low grade iron ores in India (in view of the present GOI norms of strict use of >45% Fe ore reserves compared to the earlier norms of using >55% Fe ores). He discussed about the various techniques for beneficiation of low grade iron ores by technologies such as, gravity separation, magnetic separation and flotation, which have become technoeconomically attractive even in India.



Mr. P.S. Parihar (Deptt. of Atomic energy) delivered talk on “Uranium and Thorium exploration in India”. He discussed the strategy of exploration of uranium and thorium in India. He discussed about pressurized heavy water reactor (PHWR) technique for uranium exploration in major uranium provinces in India. He reviewed the future exploration strategy for deep seated high grade deposits. He also discussed a three stage program for the exploration of thorium in India.



The second Plenary Session was focused on the present status of Indian steel industry and its growth potential. **Dr. G. Mukherjee (Ex-Vice Chairman SAIL)** shared his experiences in the Indian steel industry. Dr. Mukherjee stressed the need for enhancing the equipment manufacturing facilities for steel plant equipment and role of this capability in meeting the growth plans from present 75MTPA to 200 MTPA.



Mr. M. Narayana Rao (CMD MIDHANI & Past President IIM) talked on “Technology Strategy for Growth of Special Steels & Alloys Sector in India”. He shared his experiences about the current status of production of Special Steels & Alloys in the country. He reviewed the importance of clad steels, duplex steels and other special grade steels for various strategic applications. He mentioned that India is an innovating country and it has large growth potential in the special steel sector for various strategic applications.



Mr. Y.S. Kapadia (Ex-MD Lurgi India and Ex-GM Tata Steel) delivered presentation on “New technologies in process development and their relevance to Indian steel industry”. He discussed the problems of poor quality of raw materials in the Indian steel sector. He mentioned about the new technologies and futuristic processes of secondary steel metallurgy for the steel production, such as Energiron process, Corex/Finmet, futuristic concepts of electric arc furnace (EAF), CAS/OB process, etc. These processes can have sustainable development and expansion by the year 2020. He explained about the automation in the above processes, such as online monitoring and control of melting and stirring processes, optimization of process parameters, etc. The aim of these processes and improvements is to develop lighter and stronger steels targeting 35% weight reduction and the emission reduction by the development of 20 new grades of steel by 2020.



Mr. N.C. Mathur (Jindal Stainless Steel, New Delhi) presented his talk on “Growth potential for Stainless Steel Industry in India”. He stated that India is a high growth economy with increasing stainless steel consumption. He talked about the various growth areas, like architecture, building & construction, automobiles and railways, etc. However, the challenges ahead are the inadequate Indian infrastructures. With all these challenges, the Stainless Steel production is expected to grow up to 3.5 MTPA by 2015.



Technical Session on Mining Sector

There were two sessions in the Mining sector. In the first mining session invited experts from KPMG, SAIL and ESSAR discussed about the present scenario in this sector and the growing potential that exist in this key sector.

Mr. Harmeet Katari (Associate Director-KPMG) delivered presentation on “Improving mining efficiency through mechanization, automation and continuous improvement”. He presented brief introduction about KPMG, the opportunities in operation excellence in Mining through continuous improvement, modernization and automation. He mentioned that the Indian mining industry needs to start its journey towards mechanization and automation as the other countries are progressing very fast.



Mr. Sanjay Garg (Partner, Governance risk and compliance services, KPMG) delivered presentation on “Managing project risks in metals and mining sector in India”. He discussed that successful implementation of Metals and Mining projects requires addressing challenges through (i) robust project management processes implemented by a competent team, (ii) project-oriented financial and operating controls and, (iii) a reporting framework that guides timely and accurate decision making.



Mr. Santosh Jayaram (Technical Director, KPMG) delivered a presentation on “Sustainability practices in mining –globally and in India”. In this presentation, he discussed about the sustainability aspects of mining globally (e.g., adopted by Rio Tinto) and in India.



Mr. A.K. Pandey (Director-RM & logistics) SAIL talked on “Current challenges in raw material scenario for Indian steel industry”. He discussed the current challenges in raw materials scene for the Indian steel industry. He mentioned about the challenges faced by the industry

during the last decade, like obsolescence of technology, high capital costs, high cost of basic inputs, environmental issues and competition in global markets. The Government of India has taken initiatives addressing various issues being faced by industry and has intervened to support the industry to meet the growing demand of steel in the country.

Mr. Ramesh Babu (VP, Essar Engg. Services) delivered a presentation on “Utilization of iron ore fines/pellets in iron making”. He highlighted various steps and processes involved in low grade iron ore fines beneficiation process. He strongly advocated for the transportation of iron ore as slurry through pipelines to port based pellet plant for the production of different grades of pellets for economical iron making through Blast Furnace or Direct Reduction routes. He also discussed various concerns to be addressed by the concerned associations/government, to encourage usage of low grade iron ore fines for the iron making.



29th Sept 2012

Mining Session – II

The second session on mining was focused on challenges in the Indian scenario on mining & utilization of lower grade iron ore and coals, Government Policies and the importance of sustainable mining in the country.

Mr. K.K. Mehrotra (CMD, MECON) delivered talk on “Challenges for India-resources and technology”. He enumerated the challenges ahead in India for the mining resources and the available technologies to meet these challenges. He reiterated the India's vision of achieving the steel production capacity of 150-200 MTPA by 2020. To achieve this target, public and private sectors have decided to expand the existing capacities or setting-up new steel plants at green field locations. He discussed about the several greenfield steel plants being set-up by the steel giants, like, SAIL, NMDC, POSCO, Arcelor Mittal, TATA, Jindal group and Bhushan group in different states of the country. It was highlighted that the companies in the private sector, such as, TATA, Jindal, and Bhushan have planned to set-up new technologies for the steel production that will help India to take-up the challenges of scarcity of land, water, raw materials and to bring down the energy consumption.



Mr. H. J. Hussain (Rio Tinto) talked on “Importance of sustainable mining”. He discussed about the sustainable mining in the Indian scenario. He mentioned about the challenges being faced by the big miners, since lot of people get displaced due to the land acquisition. The



use of different forest and agricultural lands that causes erosions, sediment in a channel, deforestation, desertification, flattening of mountains, etc are the other challenges ahead for the sustainable mining. The other important aspects to be considered for the sustainable mining are the concerns towards the increased environmental pollution of air, water and lands that will affect the local community and the globe as well, threaten the livelihood of the local residents due to their displacements, etc.

Mr. N. N. Bhattacharjee (Director, KPMG) delivered presentation on “Utilization of lower grade iron ore and coals”. He addressed the unprecedented external challenges the mining companies have been facing presently. These are deterioration of the reserve quality over the years, difficulties in the land acquisition for mining, enhancing energy cost every year, etc. For the sustainable mining performance, three aspects of efficiency improvement have emerged over the last few years that are: (i) increased mechanization, innovative equipment design, continuous operation instead of the batch operation, etc (ii) improved information and communication technology, e.g., remote operations, autonomous mining and non-invasive mineralogy, (iii) continuous improvement in the operations by the involvement of large and uniquely skilled workforce and creating a generation of multifaceted leaders. These aspects need to be considered for the sustainable mining in the country.



Mr. Nabin Ballodia (Partner, Tax & regulatory services KPMG) talked on “Need for Fiscal and legislative support to provide growth impetus to the mineral value chain in India”. He discussed that a favorable tax and regulatory environment is key to the growth of any sector, e.g., the iron and steel sector. Although several steps have been taken in this direction by the Indian Government by liberalizing the foreign investment in mining sector, some fiscal incentives such as, liberalization of fiscal regime, higher depreciation for heavy mining equipment, etc are necessary for the sustainable growth of the industry.



Session on Business Scenario – Ferrous and Non Ferrous Metal Industry

The first session on **Business Scenario-Ferrous & non Ferrous Metal Industry** included six presentations.

Mr. S. S. Mohanty (Director-Tech. SAIL) talked on “Development and production strategies of SAIL steel plants in the 12th Plan period”. He discussed the global steel outlook and Indian perspectives in this area with emphasis on the SAIL's strategies. With the present growth rate of 9.7% per annum the steel production capacity of the country will be 130 MT by 2016-17. To achieve this target, the steel plants are being modernized and mechanized. SAIL with the annual turnover of Rs. 50000 crores has major production from



the integrated steel plants. SAIL has been increasing its finished steel products capacity and decreasing semi-finished products. SAIL is not only expanding by modernization in automation for competitiveness and sustainable development but also in energy efficient technologies. This includes increasing the LD steelmaking capacity and emphasizing on the continuous casting of steel. He also mentioned that the R&D plans of SAIL are being given extensive attention to meet the future challenges of quality requirements of the final steel products.

Mr. Y. Matsuoka (Nippon Steel Engg. Co. Ltd.) talked on “High Grade Bloom Continuous Casting Technology by Nippon steel engineering”. He highlighted NS-ENG as one of the major supplier of bloom continuous casters for the special steels. The company has ambitious plans on the production of high quality blooms/slabs through product development based on the customer’s need, provision of reliable products and continuous after care during the operation of relevant equipment.



Mr. Sushim Banerjee (Director General, Institute of Steel Development and Growth) made a presentation on “Growth and Development Scenario for the Indian steel industry”. He reiterated that India being the 4th largest producer of crude steel in the world and has ambitious growth plans for the steel production till 2020. He compared the Indian growth rate of steel with China and other countries in the world and highlighted the factors hindering the growth plans of India in this sector. He also talked about the present management policies and future strategies of SAIL on the raw materials, process technology, infrastructure, energy requirements, etc to find out solutions for the existing challenges ahead and to meet the targeted plans till 2020.



Mr. Zhiheng Tian (Ramon Science & Technology Co. China) talked on “Development and application of mould non-sinusoidal oscillation system”. The non-sinusoidal oscillation mould system, independently developed by Ramon Cooperation is an innovative product that uses advanced and mature computer technology and high-power digital servo actuator. The speaker discussed the features of the system, principle and characteristics of the above product.



Mr. Michele Turchetto (Denieli Wean United) made a presentation on “Denieli cold mill complex turboflo-pickling coupled to a 6 high tendom mill for automotive applications”. The above technology includes a patented technology for the hot rolling process (supplied by the Arvedi group in Europe) that produces thin and ultra-thin gauge sheet. Danieli, developed an innovative facility capable of handling hot rolled material from 0.6 to 3 mm to be reduced by and up to 70% in thickness. The author made a presentation on the technological aspects of the above product.

Mr. Carlo Piemonte (Danieli Wean United) made a presentation on “Danieli contributions to the development of thin slabs casting and rolling process-from “first generation” plants to the recent “world record breaking” applications. He highlighted that since its first pioneering applications on the rolling and slab castings, Danieli developed its own original design and technology strongly diversified from other available solutions on the market that allowed Danieli plants to largely overcome the original “first generation plants” limitations. The speaker discussed this progressive evolution through the outstanding results reached by Danieli reference plants, the different available solutions that can be adopted according to specific market needs as well as an outlook to future expansion already conceivable.

The second session on **Business Scenario-Ferrous & Non Ferrous Metal Industry** included five presentations. **Mr. Shuman Mukherjee (Director Commercial-SAIL)** talked on “Development and growth scenario for the steel industry in India”. He discussed the global and domestic steel scenario and gave an overview of SAIL’s present capabilities and future plans. He mentioned that inspite of the global slowdown, SAIL has registered a growth rate of 6.6% during the last financial year, which is promising and has good future prospects.



Mr. J.C. Marwah (Secretary General-The Indian Institute of Metals) presented his talk on “100 years of metallurgy”. The presentation gave a bird’s eye view of the discoveries and the developments that have taken place over a period of 100 years. The speaker discussed about the discovery of Periodic Systems, Developments in technology and processes, Environmental concerns and the future prospects of the Metals and the Materials.



Mr. Mukesh Kumar (MECON) made a presentation on “Emerging challenges for rapid expansion of the Indian steel industry”. This presentation was an investigation conducted to identify and assess the extent of challenges with regard to the steel industry’s internal and external infrastructure and what needs be done to meet the challenges. The study indicated that there is likely to be scarcity with respect to the entire internal and external infrastructure required for steel making. This is going to seriously create constraints in the process of the desired rapid expansion of Indian steel industry. However, this problem can be mitigated through well designed strategic planning combining the diverse objectives of several government ministries, agencies etc.



Ms. Sushmita Dasgupta (Joint Plant Committee)

delivered a talk on “Growth plans of Indian steel industry and the challenges”. The presentation was focused on the investment opportunities in the Indian steel industry by the year 2020. She discussed the challenges ahead of the steel industry. Among them the real challenge will lie in the environment and community issue that will decide the organization of steel producing facilities. Other issues would be the choice of technology, the pattern of technology import, etc. The speaker suggested that the appearance of the steel industry in 2020 is likely to undergo several changes in a bid to address issues of environment and natural resources.



Mr. Davide Masoero (Tenova)

talked on “Steel Technologies: Tenova innovative approach for energy saving and environmental friendship in the melt shop”. This presentation focused on highlighting the Tenova’s basket of technologies aimed at taking a holistic approach for dynamic process control and optimization for steelmaking operation along with process developments aimed at meeting the challenges faced by today’s steelmaker. These challenges are the reduced conversion costs and reduced environmental impact.

Current and Futuristic Metals and Materials Technologies

The first session on “**Current and Futuristic Metals and Materials technologies**” comprised of five presentations. **Mr. Jyunpei Kikuta (Nippon Steel Engg. Co.)** made a presentation on “Rotary hearth furnace process for steel dust recycling and iron making”. The speaker mentioned Nippon Steel Corporation and Nippon Steel Engineering Corporation have developed and commercialized rotary hearth furnace (RHF) as effective treatment equipment for making dust and sludge discharged from the steel mills recyclable. The RHF is equipment that reduces steel making duct and sludge containing impurities, such as, Zn, Pb, K, Na, etc at high temperatures to produce recyclable DRI and zinc. The presentation was focused on the characteristics of the RHF process and the possibility of using the RHF as an Iron making process.

Mr. Wang Li (Sinosteel Equipment & Engineering Co. Ltd.)

delivered a presentation on “Development of ore dressing technology for low grade complex and refractory iron ores in China”. He addressed that steel industry plays a vital role in the national economy and the high efficiency utilization of iron ore resources is an arduous task. The domestic institutions universities as well as the mining enterprises in China have made great efforts over the recent period and there are many achievements in the ore-dressing technology for iron ores.



Mr. Ryo Yamamoto (Nippon Steel Engg. Co.) talked on “Electrolytic fining line revamping of conversion to advanced insoluble anode system”. The speaker addresses that PT Latinusa is the only finplate producer in Indonesia. It conducted a major revamping project in 2011 that is expected to increase the Latinusa’s capacity of production from 130,000 tons to 160,000 tonnes per annum. This

project will enable the convergence of the electrolyte tinning system from a soluble to insoluble anode system and the addition of the induction heating reflow system. This Latinusa's electrolytic thinning line revamping project proves the insoluble anode system as an essential and vital for revamping projects.

Mr. Hiroaki Takesue (Nippon Steel Engg.Co.) presented his work on "Desulfurisation process for coke oven gas". The presentation was focused on the latest process (NNF) of desulfurization for coke oven gas. The speaker suggested that the NNF process is able to produce the concentrated sulfuric acid from contaminated waste water including elemental sulfur and ammonium salt. Moreover, the NNF process shows advantages both in efficiency and operating costs compared to the other wet oxidation processes or absorption/stripping processes. The speaker mentioned that in the view of initial investment and operating costs for COG (coke oven gas) desulfurization unit including the sulphuric acid production unit, the NNF process is an ideal choice for COG desulfurization field.

On behalf of **Mr. Pablo Duarte (Tenova)**, **Mr. Davide Masoero** delivered a presentation on "JSPL DR projects: a practical example of the flexibility of Energiron DR technology for using any energy source with the same ZR scheme". Based on the Energiron ZR technology, Tenova and Denieli have taken up a project for Jindal Steel & Power Ltd. In India for a DRP of 2.5 MTPA capacity of hot and cold DRI production. The speaker focused on the features of the above process that will be implemented for the JSPL project and that makes the Energiron ZR technology the most flexible, efficient and environmental friendly.

The second session on "**Current and Futuristic Metals and Materials technologies**" comprised of seven presentations. **Mr. R. Kulshreshtha (ED I/C-Corporate Planning-SAIL)** delivered presentation on "SAIL Strategy 2020". He presented current plans of SAIL to meet the growing requirements of steel in the country with the aim of achieving planned targets by 2020 and also to stay ahead in the steel business in terms of product quality, production capacity and cost aspects. The proportion of the value added product has to go up from 39% to 55% of the saleable steel post completion of the ongoing modernization plans of SAIL. Imported coking coal is a major component of SAIL's production cost and it has been evaluating emerging alternative iron making technologies which can utilize non-coking coal. SAIL has formed strategic alliances within India and abroad with international majors for the production of technologically advanced products. Joint ventures for power are also set-up by SAIL for achieving self-reliance in the availability of power for its own plants.

Dr. L.K. Singhal (Ex. CMD, MECON & Jindal Stainless Steel) delivered presentation on "Trends in special steel and stainless steel applications in automotive and transport sector". He highlighted the requirements for high strength steel (HSS) and advanced high strength steel (AHSS) for weight reduction in automotive sector. Mounting energy crisis, stringent emission law and strict safety rules have guided car manufacturers to improve strength/weight



ratio of the vehicle, thereby promoting application of special steel in the car bodies. He mentioned that automotive and transport sector are making increasing use of stainless steel for weight reduction, improved aesthetics, enhanced safety, etc. The speaker discussed future trends in the transport and automobile sector with a vision for 2020 for the use of high strength special steel and stainless steel.

Mr. A.K. Mishra (MECON) delivered presentation on “Iron ore resource base, a critical review for sustainable supply under changed scenario”. He addressed that to keep pace with the raw material (iron ore, etc) requirements for the fast growing steel industry in the country, there is urgent need to broaden the reserve base of the ores. Besides, it is important to use the low grade minerals, rejects and wastes effectively using the modern beneficiation technologies. At the same time, it is also required to conserve the large resources under low grade and sub grade ores for their future use instead of dumping them as waste. The broader aspects of possible steps to be taken to meet the above objectives were discussed in the presentation.

Ms. Liu Jia (Sinosteel Equipment and Engineering Co. Ltd.) talked on “Hematite pallet technology research and application-chain grate-rotary kiln process”. The speaker highlighted that Sinosteel Equipment & Engineering Co., Ltd. (Sinosteel MECC) has been actively engaged in hematite pellet technology study. Several studies have been conducted on hematite in Brazil, India and China. It was addressed that with the improvement of production process and adjustment and optimization of system thermal regime, one complete set of technology and equipment using hematite as the only raw material has been formed at Sinosteel and successfully applied in industrial production.



Mr. Carsten Born (Tenova) talked on “Heat recovery for EAFs, SAFs and walking beam furnaces - a comparison of technology and chances”. The speaker gave an overview of the parallels and differences in heat recovery technology, spotlights steam usage aspects and discussed the various approaches of waste heat power generation. The speaker observed that in several cases, a careful planning can get a project on the track to the steam turbine, still in other cases the problems remain significant, especially in small projects. For these projects, a discussion of alternative ways of power generation has shown that using the ORC turbine technology is a way that combines acceptable electrical efficiency with very easy operation.

Mr. Davide Masoero of Tenova delivered presentation on “The value of using BOF endpoint control as an effective tool while operating with higher phosphorous hot metal”. He discussed the factors affecting phosphorous removal and reversion including the importance of understanding and controlling the slag chemistry. He also discussed the increasing need for effective carbon and temperature endpoint prediction. A carbon, temperature, phosphorous endpoint control model was developed that was verified against in-blow and turndown chemistries and used to confirm the key factors needed to control turndown phosphorous level.



Mr. Suguru Sedoyama (Nippon Steel Engg. Co.) delivered presentation on “Modern blast furnace equipment of Nippon Steel Engineering”. He discussed some equipment recently developed by Nippon Steel Engg., such as, multi-vessel electrostatic precipitator, metallic burner type top combustion stove, chute type top charging equipment, etc. These newly developed equipments whose functions have been drastically enhanced on the basis of existing technologies with abundant actual performance have a high reliability in excellent maintainability and operational stability.

30th Sept 2012

The first session on the third day was on “**New Material Development and Applications**”. There were six speakers in this session. **Dr. R.K. Iyengar (President, Technovations International Inc.)** delivered presentation on “Knowledge management based innovations system”. He provided a road map for innovations in the metals and minerals companies, which he suggests should be foundation for the “Resurgent India”. He persuaded that under the present market situations of global competition and the extent and pace of structural changes, metals and minerals companies have to depend on their ability to innovate. With the explosion of knowledge and information, the dependence on in-house effort for innovation is no longer adequate. Collaborations amongst several knowledge workers and experts are necessary.



Dr. B.B. Agarwal (DGM I/C-TM & IPR & TDC & TPQ), SAIL RDCIS, Ranchi presented his views on “R&D plans of SAIL in the next five years”. He said that the Indian steel industry has potential to go for a quantum jump for its production capacity from current level of around 70 MT to more than 200 MT by 2020. He discussed about R&D plans of SAIL to meet the quality requirements of its products to meet the growth demand competitively. He mentioned that RDCIS Ranchi has been undertaking projects in SAIL plants in the area of iron ore/slime beneficiation, cost reduction, quality improvement, energy saving etc. and is open to taking up projects on behalf of other private sector steel plants also.



Mr. A.S. Saini (Head-product application group, Tata Steel) delivered presentation on “Development efforts for special steels production at Tata Steel”. He discussed that safety, increased fuel consumption and vehicular emissions are present concerns in the automobile industry and there is requirement of weight reduction by the usage of stronger and formable material for advanced vehicle applications. He talked about the plans of TATA Steel towards development of special steels to meet the above demand. He explained that TATA steel has developed special steels, such as, rephosphorised Al-killed high strength steels, bake hardening grades, etc. quite satisfactorily. He mentioned about the customer’s requirement and efforts at TATA Steel to meet those requirements.



Mr. Rajesh Chhabra (SMS Meer) made presentation on “Acting economically-growing sustainability, the ecoplants solutions from SMS Meer”. The speaker highlighted that Ecoplants is a new SMS mark for sustainable solutions, in recognition of the fact that sustainability has become a key growth factor for the growth of business due to the economic and ecological reasons. He discussed about the dedicated efforts of engineers at his company in redesigning processes to boost energy efficiency or reduce emissions. Ecoplants provides these efforts with a framework under a set of rules and makes them the highest priority for the future development of innovations.



Mr. Atul V. (SMS Siemag) delivered presentation on “The new continuous electric arc furnace access steady EAF (S/EAF)”. He discussed about the development of electric arc furnace using a novel combination using tried-and-tested components from submerged-arc-furnace (SAF) saved energy and production costs and improved productivity by upto 30%. The ARCESS® steady EAF (S/EAF®) is a stationary electric arc furnace that is designed for the use of DRI, HBI, hot metal and steel scrap. The novel design allows the S/EAF to operate continuously, with energy consumption reduced to the lowest level.



Dr. Rainer Tarmann (Senior Vice President, Inteco GmbH Austria) talked on “Latest developments in Electro Slag Remelting technology”. He presented INTECO special steel melting technologies that have been developed with the design and delivery of various small and large sized ESR furnaces. He highlighted the new developments in the ESR ingot that posed challenge far ahead of the design of such large ESR plants. He presented theoretical verifications of results regarding the electrical, mechanical as well as operational parameters due to practical relevant data. He emphasised that the main melt station and its high current line of INTECO’s large ESR furnaces is designed to enable the application of the CCM® – Technology (current conductive mould) which was discussed in the presentation.

Session on Energy and Environment

The final technical session at the conference was on “**Energy & Environment**”. There were three speakers in this session. **Mr. Palash Banerjee (MECON)** delivered presentation on “Strategies for advanced environmental management in iron ore mining industry in India”. He discussed about the gradually increasing industrial growth rate demand quantum increase of raw materials, such as, iron ore production. However, the inhibiting factors for such growth include strict environmental regulations, social pressures imposed by the local residents due to the environmental concerns and fear of



their displacement. The speaker discussed about the advanced system approaches as the key solutions for the above problems.

Mr. Deepak Vaidya (Business Head-N&E-Outokumpo India Pvt. Ltd.) delivered presentation on “Sustainable development in food & drink processing industry” relating to increased used of stainless steel. He discussed about the success stories of Outokumpo consultancy projects that were based on the development of stainless or special steels for their customers in India and solved the industrial problems of corrosion. Some of the case studies Outokumpo took up for its customers included: development of duplex/stainless steel for evaporation tubes for sugar processing, storage tank application of duplex steel, wine storage tank of duplex stainless steel, process tank (for mustard) using a suitable special steel, etc.



Dr. S.C. Jain (MECON) talked on “Environmental challenges & mitigation strategies in primary iron making units of integrated steel plants in India”. The speaker discussed about the sources of air emission (including particulate matters, SO_x, NO_x, CO₂) and fugitive emissions in the iron making process and methods to control it. He also described the available methods of air pollution control on the transmission path from process to stack vis-à-vis modern technology available to eliminate emissions at source itself. He illustrated the examples of upcoming steel plants adopting clean technologies and control measures for the emissions during iron making processes.



Valedictory Session

A Valedictory session was held on 30th September 2012. Shri B D Jethra spoke about the overall Exhibition and Conference proceedings. After the valedictory session, Shri K V Rajan, MD ITEE, Shri Anil Gupta Chairman IIM DC spoke on the occasion. Shri Rajan gave away prizes to some of the exhibitors.



MMMM 2012 RECOMMENDATIONS

The International Conference was attended by luminaries and stalwarts in the area of Mining, Metals, Metallurgy and Materials and allied sectors. The issues discussed were current and relevant. The following issues have come into sharp focus:

- 1 Minerals constitute the most valuable natural resource and form the basic raw material for development of infrastructure, capital goods and basic industries and their exploitation has to be guided by long-term national goals and perspective.
- 2 Increased emphasis is required on exploration activity for coal and Iron Ore reserves. Geological Survey of India has to play a more emphatic role in survey and increased exploration of minerals.
- 3 So far the exploration of Iron Ore resource in India is being done only to a depth of 60-70 meters against 100 meters the world over. In order to improve the resource base the exploration activities need to be permitted to the public and private sector by the government.
- 4 There is a need for preparation of a data-base of minerals resources as a resource inventory. The information available is scanty and obsolete.
- 5 Mining Sector should be treated as an industry and there exists a need for establishment of appropriate linkages for the concerned consuming industrial units.
- 6 There is a need and requirement of exclusive allocation of Iron Ore and Coal Mines to steel plants.
- 7 There is a need for adoption of scientific method of mining. This will include mechanization and automation of Iron and Coal Mines and other minerals. This will improve output, increase efficiency and production.
- 8 Utilization of leaner grade of Iron ore has to be undertaken after beneficiation. Some R&D work may be required in this context. With the revision of the threshold of the iron content in iron ore by IBM at 45%, there should be a thrust on R&D efforts for use of iron ores of different regions in India.
- 9 There is an urgent need for acquisition of Coal Mines in overseas countries to ensure Coal Security for Iron and Steel Production.
- 10 There is a need for utilization of Iron Ore fines at iron Ore Mines by creating large scale pellet facilities. This activity can be undertaken even on a centralized basis. This would mean creation of large scale pellet making facilities.
- 11 There is a need to seriously consider large port based steel plants which could meet future needs, flexible enough to use local/imported materials and satisfy land/ environmental conditions.
- 12 There exists a need for enhancing indigenous equipment manufacturing facilities for steel plant equipment. There has to be a greater thrust on

- development of design and engineering in organizations in addition to R&D efforts.
- 13 Extensive R&D work needs to be undertaken for utilization of red-mud generated at aluminium refining facilities.
 - 14 An allocation of Rs. 500 crores has been made for R&D in Iron and Steel Industry. R&D proposals are invited against these allotted funds.
 - 15 More intensive efforts in R&D area for Iron Ore beneficiation and Coal beneficiation are the need of the day
 - 16 Installation of dry coke quenching facilities for energy saving in all the coke producing units.
 - 17 Adoption of emerging technologies by usage of non-coking coals to tackle shortage of coking coal in the country.
 - 18 Enhanced production of special steels for critical applications by creation of secondary refining and usage of other new technologies like ESR etc.
 - 19 Co₂ generation in steel making in India is a major problem. There are technologies available for recovery of Co₂ generated during steel making and use it effectively for energy saving.
 - 20 Government should create top organizations to train the operatives and lay stress on technology transfer as different from the earlier tonnage concept which laid thrust on production / operations.
 - 21 Government of India may consider the following options:
 - (a) Allocation of Ore Mines for Steel Industry for captive use
 - (b) Sort out the issues related to water, land and power shortages. The setting up of ultra-mega steel plants may be considered so that clearances are easy. Ultra-mega steel plants require comparatively less space for creating a tonne of steel capacity vis-à-vis a requirement of space by smaller tonnage plants.
 - 22 Shore-based steel plants to be established to give impetus to steel exports.
 - 23 Thrust for 100% utilization of blast furnace and steel making slags for effective waste utilization.

Non-Ferrous Metals Aggressive growth ahead

By 2020, India is headed to become a global player in the non-ferrous metals industry. Sweeping changes are already evident in this industry, which is shedding its traditional image of complacency in favour of aggressive growth. Much of the change in complexion has been ushered in by the privatisation process initiated during early 2000. By 2020, the non-ferrous metals industry, mainly comprising aluminium, copper, lead and zinc will be completely privatised. Two business houses, the Aditya Birla group and Sterlite group, are fast emerging as leading forces, and will eventually circumscribe the non-ferrous metals sector.

Aluminium

In the late 1990s, India had total aluminium smelting capacity of 7.15 lakh tpa, out of which

6.28 lakh tpa was functional. (Capacity worth 0.87 lakh tpa belonging to Indian Aluminium Co. was redundant). The early years of this decade witnessed a phase of consolidation, privatisation and expansion, resulting in the total capacity reaching 8.24 lakh tpa. The expansion drive is far from over. It is encouraging to note that Greenfield ventures in the aluminium industry are shaping up after over 15 years of quietus. The aluminium industry did not witness a single Greenfield project between 1987, when public sector National Aluminium Co. went on stream, and 2003 when the Sterlite group began work on its 1.4 million tpa alumina refinery at Lanjigarh in Orissa. The AV Birla group, very recently, commenced work on its 3 million tpa aluminium smelter project, also in Orissa. By 2020, India would have an aluminium capacity of 17-20 lakh tpa. For a country endowed with nearly 10 per cent (2,525 million tonnes) of the world's bauxite reserves and having the lowest cost of production, this capacity would be technically justified. However, with India's per capita aluminium consumption of a meagre 0.6 kg, compared with the global metric of around 20 kg, absorption of this colossal capacity would be an intimidating challenge.

Thus, India's vision for 2020, besides being a global player in terms of size, should also include achieving international standards in terms of consumption. Today, 35 per cent of Indian aluminium is consumed by the power industry, compared with less than 10 per cent in USA and Japan. Areas like construction and packaging where global aluminium consumption thrives, has low relevance to India. Barely 6 per cent of the aluminium finds its way in the construction industry compared with 17 per cent in USA and 25 per cent in Japan. The Indian construction industry, which is headed for promising growth, can, therefore, be a major demand driver. Exports would, of course, be a major demand source. Even here, the industry needs to focus on value-added products instead of the conventional ingot exports. International developments surrounding China can influence India's aluminium industry in the medium term.

The aluminium industry has been identified as a priority area in China, traditionally a low aluminium consumer. Chinese smelting capacity has nearly doubled from 2.8 million tpa in 2002 to 5.2 million tpa. China is expected to have an exportable surplus of 2 million tonnes per year. This would cause intense competition. China, however, would need to source more than half of its alumina (raw material for aluminium) requirements through imports. The country is expected to import over 12 million tonnes of alumina annually. This would provide a good export opportunity to India, which might lead to projects investment in the alumina industry.

Copper

The Indian copper industry underwent a drastic transformation since the late 1990s, from an import sensitive industry to a potential exporter. As against a paltry capacity of 47,500 tpa till 1995, solely owned by public sector Hindustan Copper, India today has a copper smelting capacity of 4.77 lakh tpa with an overpowering presence of the private sector. The AV Birla group is a leading force in the domestic copper industry, followed by the Anil Agrawal-controlled Sterlite group. Hindalco Industries is doubling the capacity of its Dahej smelter in Gujarat to 5 lakh tpa. Sterlite is expanding its Tuticorin smelter in Tamil Nadu from the present 1.8 lakh tpa to 3 lakh tpa. In the coming months, SWIL's much-delayed 70,000-tpa Jhagadia smelter in Gujarat is expected to be fully operational. By 2020, copper capacity in India is projected to rise to 16-18 lakh tpa, going by the growth in domestic demand. From 4 lakh tonnes in 2003, copper demand are estimated to grow at 8 per cent annually, much higher

than world demand growth of 3 per cent. India has to rely on imported copper concentrates to feed its smelters. Therefore, international prices would hold the key not only to future expansion projects but also sustenance of existing capacity. In the coming years, a major shift would be noticed in the sourcing pattern, from conventional imports to acquisition of mining rights abroad. Already, the AV Birla group has acquired mining rights in two copper mines in Australia. This trend would need to persist if domestic capacity utilisation were to be ensured. Demand drivers for copper in India would be power, railways, telecommunication and exports. India's power capacity is targeted to double to 2 lakh mw. This, in conjunction with the programme of electrifying 80,000 Indian villages by 2012, would be the biggest demand avenue. In India, 57 per cent of the copper is used in wiring for power and telecom sectors. Shoring up consumption levels in areas like automobiles, railway engines and construction, would also hold the key to the successful exploitation of increasing capacity.

Exports would be a thrust area for Indian copper, particularly from China where copper consumption is growing phenomenally. China is expected to account for 19 per cent of world's copper consumption. Current shortages in worldwide copper supplies are expected to continue following production cuts by leading producers in Mexico and Chile. This would further shore up demand for Indian copper.

Zinc

The Indian zinc industry entered its transformation phase with the privatisation of the largest zinc producer, Hindustan Zinc Ltd, in favour of the Sterlite group in April 2002. The domestic zinc industry is now completely under the private sector and is in the midst of a serious expansion programme. India is expected to attain complete self-sufficiency in meeting its zinc demand. Thereafter, the process of India becoming an important zinc supplier to the world would be initiated, provided that another phase of capacity expansion is effected. Just before HZL was privatised, its capacity stood at 1.65 lakh tpa with the country's total zinc capacity being 1.95 lakh tpa. Binani Industries, the only other producer of zinc has a capacity of 30,000 tpa. HZL's capacity was revamped to 2.65 lakh tpa through fast-track de-bottlenecking exercises. Today, HZL is in the midst of a major capacity expansion aiming to add 3.4 lakh tpa of smelting capacity, taking total capacity to 5.75 lakh tpa. First, 1.7 lakh tpa of capacity would be added to the Chanderiya smelter of Rajasthan, followed by an equal addition to the Vizag smelter in Andhra Pradesh. Corresponding enhancements would also be effected to the mining and power capacities.

The total zinc capacity is expected to cross 6 lakh tpa that would be higher than the projected requirement. Over the next five-six years, zinc demand is likely to grow at 12-15 per cent annually, against the global average of 5 per cent. Even if one assumes that zinc demand grows by 10 per cent, India would require zinc capacity of 14 lakh tpa by 2020, in order to be self-reliant. Buoyancy in domestic zinc demand primarily emanates from the boom in the steel industry, given that over 70 per cent of zinc is used for galvanizing. The steel industry has bright prospects with demand drivers being the construction industry and exports. Other sources for demand would be die-casting, guard rails for highways and imported-substituted zinc alloys.

Magnesium

As the lightest metal available, magnesium has a high strength-to-weight ratio. With its low

modulus of elasticity combined with moderate strength, magnesium alloys can absorb energy elastically, providing excellent dent resistance and high damping capacity. Magnesium has good fatigue resistance and performs particularly well in applications involving a large number of cycles at relatively low stress. The metal is sensitive to stress concentration, however, so notches, sharp corners, and abrupt section changes should be avoided. Magnesium alloys are the easiest of the structural metals to machine and they can be shaped and fabricated by most metalworking processes, including welding.

Nickel

Nickel fits many applications that require specific corrosion resistance or elevated temperature strength. Some nickel alloys are among the toughest structural materials known. When compared to steel, other nickel alloys have ultrahigh strength, high proportional limits, and high moduli of elasticity. Commercially pure nickel has good electrical, magnetic, and magnetostrictive properties.

Precious Metals

Gold

It is an extremely inert, soft, ductile metal that undergoes very little work hardening. A gram of pure gold can be worked into leaf covering 6 ft² and only 0.0000033 in. thick. It is used chiefly for linings or electrodeposits and is often alloyed with other metals such as copper or nickel to increase strength or hardness.

Silver

It is a very malleable, ductile, and corrosion resistant metal that has the highest thermal and electrical conductivity of all metals and is the least costly of all the precious metals. Alloyed with copper, and sometimes with zinc, silver is also used in high-melting temperature solders.

Platinum

It is an extremely malleable, ductile, and corrosion resistant silver-white metal. When heated to redness, it softens and is easily worked. It is nearly nonoxidizable and is soluble only in liquids that generate free chlorine such as aqua regia. Because platinum is inert and stable, even at high temperatures, the metal is used for high-temperature handling of high-purity chemicals and laboratory materials. Other applications include electrical contacts, resistance wire, thermocouples, and standard weights.

Refractory Metals

Refractory metals are characterized by their extremely high melting points, which range well above those of iron, cobalt, and nickel. They are used in demanding applications requiring high-temperature strength and corrosion resistance. The most extensively used of these metals are tungsten, tantalum, molybdenum, and columbium (niobium).

Tin

Tin is characterized by a low-melting point (450°F), fluidity when molten, readiness to form alloys with other metals, relative softness, and good formability. The metal is nontoxic, solderable, and has a high boiling point. The temperature range between melting and boiling points exceeds that for nearly all other metals (which facilitates casting). Upon severe

deformation, tin and tin-rich alloys work soften. Principal uses for tin are as a constituent of solder and as a coating for steel (tinplate, or terneplate). Tin is also used in bronze, pewter, and bearing alloys.

Titanium

There are three structural types of titanium alloys:

- Alpha Alloys are non-heat treatable and are generally very weldable. They have low to medium strength, good notch toughness, reasonably good ductility and possess excellent mechanical properties at cryogenic temperatures. The more highly alloyed alpha and near-alpha alloys offer optimum high temperature creep strength and oxidation resistance as well.
- Alpha-Beta Alloys are heat treatable and most are weldable. Their strength levels are medium to high. Their hot-forming qualities are good, but the high temperature creep strength is not as good as in most alpha alloys.
- Beta or near-beta alloys are readily heat treatable, generally weldable, capable of high strengths and good creep resistance to intermediate temperatures. Excellent formability can be expected of the beta alloys in the solution treated condition. Beta-type alloys have good combinations of properties in sheet, heavy sections, fasteners and spring applications.

Zirconium

Relatively few metals besides zirconium can be used in chemical processes requiring alternate contact with strong acids and alkalis. Major uses for zirconium and its alloys are as a construction material in the chemical-processing industry.

Source: non-ferrous news

[Steel sector to grow at 8 per cent: CS Verma, Chairman, SAIL](#)

Steel Authority of India's Mr. C S Verma is confident the slump in the steel sector will bottom out soon. In an interview with ET's Meera Mohanty, the chairman of the country's largest steel producer says the impact on India has been less than that in the West. Excerpts:

❖ Demand has fallen below forecast. Does it worry you?

In 2011, global steel production grew at 6.2%, but between January and July this year it is down to 1%. During this period, output in India clocked 3.4% growth while real consumption in Q1 FY13 grew at 7.8%. Coming to raw materials, iron ore prices have fallen from a two-year high of \$184/tonne in April 2011 to \$99/tonne (FOB). Similarly, coking coal, which touched \$224/tonne in 2011, is down to \$160/tonne. In steel, while global prices, both for flat and long steel, have dropped significantly, in India it has not been as bad. It indicates that India can't remain insulated from the happenings in global markets, but being a demand centre, the impact here is lesser than that in saturated Western economies.

❖ How much growth should the domestic steel industry aim for?

With GDP growing at 5.5 %, the steel sector needs to grow at about 8%. Real consumption growing 7.8% is thus a positive indicator. Output growth has been affected by availability of raw material and the weakening rupee.

❖ Will imports bridge the raw material demand-supply gap? Is there a fear of dumping?

The government has promised to spend \$1 trillion on infrastructure. Interest rates are softening, or at least there's been no hike in borrowing rates of late. And the situation in Karnataka is settling. Imports have gone up during April-July 2012 (risen to 2.9 mt from 1.9 mt in the same period last fiscal), but prices, both global and domestic, don't suggest any dumping.

How do you reconcile the facts that as a steelmaker, you are looking at falling international iron ore prices, which is good against a not so buoyant steel demand. On the other hand, as acting chairman of NMDC, you have a different domestic situation for iron ore that only NMDC can profit from?

There is no issue there. NMDC has a clear-cut pricing policy, approved by its board. We are selling our entire production from Karnataka, and some from Bailadila, too, through an e-auction. But LTA are decided on a quarterly basis and there will always be a difference between short- and long-term prices. Sometimes our customers will be benefited, and sometime they might be put at a disadvantage. If international prices are falling this quarter, the benefits will be seen in the next.

❖ How will e-auction of raw materials affect steelmakers?

This has to be debated. Long-term customers need certainty of pricing, too. The benchmark negotiations with Japanese steel mills are already quarterly now. Some large miners are even fixing some of their coal on a monthly basis. If we were a fully developed commodities market, we could even be trading on commodity exchanges, but that level of maturity is a good while away.

Supply is the main challenge - Mr Narsing Rao CMD CIL

Mr S Narsing Rao gave up his IAS career to pick up the reins of Coal India Ltd the world's single largest coal mining company. As the immediate past Chairman and Managing Director of the Andhra Pradesh based joint venture coal mining company Singareni Collieries Company Ltd, he succeeded in jacking up the production from 36 million tonnes in 2006-07 to 53 million tonnes in 2011-12.

Q: What would you say are the biggest challenges before Coal India Ltd now?

A: In the given circumstances, it is production, production and production. The single-most important issue before me is to produce and supply. While as the CEO of the company, the effort always remains to address factors such as cost of production, which is anyway low for me due to CIL's relatively easy mining conditions, but for me the main challenge is to supply. Rest are all housekeeping issues. From next year, I am planning to do away with the present system of production targets. There should be only one target, and that is the off take target. This is something that CIL is considering and very likely that this will be introduced.

Q Why?

A I feel that the focus should shift from production to off-take. This will address three-four areas. I feel that there is need to change this present overwhelming obsession with production only.

In many cases, coal is just produced and dumped raising issues of loss of quality of the coal, fire safety, theft, vigilance issues and what not ... all this can be put to rest. What you

have despatched from your area should be your achievement, not just production. Therefore, instead of two numbers, there would be only one number. Merely producing will not do. Offtake is important. At the end of the day, this is what matters to the consumer. Despatch is what gets monetised.

Q: What is your XII Plan investment?

A: The proposed figure is INR 25,400 crore. However, my take is a little different on these matters. For me, there are only five numbers ... these are the respective figures of production for the five years. Capital investment by itself is not such a major thing, especially when 50% of CIL's production is outsourced.

Source - Economic Times

India Bets on Rare-Earth Minerals

India has embarked on an ambitious plan to increase its output of rare-earth minerals used in electronics manufacturing at a time when the world's largest producer, China, has tightened its own exports of the minerals. China accounts for about 95% of the global output of rare-earth minerals, which are used in a range of electronic equipment from cellphone batteries to flat-screen television sets, in defense equipment and clean-energy technologies. But since 2010, the U.S. and other large consumers of rare-earth minerals say China has unfairly restricted overseas sales through export taxes and quotas that have drastically pushed up prices. Beijing, they say, wants to force electronics and green-energy companies to set up production in China in return for access to the minerals. In March, the U.S., Japan and the European Union asked the World Trade Organization to facilitate formal consultations with China over the matter. The standoff has left India, currently the world's second-largest producer and home to large deposits of rare-earth minerals, with a window of opportunity to boost production to fill the drop-off in China's exports. State-owned Indian Rare Earths Ltd., which suspended mining in 2004 due to its inability to compete with China on price, is building a rare-earth processing plant in the eastern state of Orissa. A company official said the plant should begin operations shortly.

IIM DC – THE WINNER OF THE BEST CHAPTER AWARD

The Indian Institute of Metals (IIM) evaluates every year the technical performance parameters of its various chapters in India in large, medium and small category. On the basis of this evaluation, the Award Committee of IIM declares the Best Chapter Award on annual basis.

We feel happy and gratified to inform all our esteemed members that on the basis of the overall performance amongst the large Chapters of the Institute during 2011-12, the Delhi Chapter has bagged the 2012 Best Chapter Award in the large category along with IIM Trichy Chapter.

The National Council of IIM in its meeting held on 18.10.2012 at New Delhi announced the 2012 Best Chapter Award for Delhi Chapter along with IIM Trichy. We feel happy to mention that this is the first time in the history of IIM DC that the Best Chapter Award has been bestowed on us. Needless to say that this recognition to IIM DC has been because of the contribution and cooperation of IIM DC Collective.

The Award plaque will be presented to the Delhi Chapter at the Inaugural function of the 50th National Metallurgists' Day Celebrations & 66th Annual Technical Meeting of the Institute at Jamshedpur on 17th November 2012. Our heartiest congratulations to all the members of IIM DC

The government also has two ships prospecting off the southern coast of India for reserves on the seabed. Rare-earth deposits are abundant on the ocean floor but have never been mined on an industrial scale. The rare-earth metal Lanthanum is poured into a mould at a plant in China's Inner Mongolia Autonomous Region. China accounts for about 95% of the global output of rare-earth minerals. "The potential is good. This is at an exploratory phase," said Shailesh Nayak, the top bureaucrat in India's Ministry of Earth Sciences. "We have identified first-level mining sites over 2,500 square kilometers. Now we know where we have to concentrate." Others say India's ambitions are unlikely to be fulfilled in the near term. Indian Rare Earths plans eventually to produce 11,000 metric tons a year from its new plant. Even if successful, this would leave India well behind China, which produced 130,000 tons of the minerals in 2010, according to the U.S. Geological Survey. In the same year, India, a very distant No. 2, had only 2,700 tons of output.

India may face difficulties attracting investment in rare-earth plants due to concerns over corruption and red tape in the mining sector, said Louis James, a metals investment strategist with U.S.-based Casey Research LLC. "It's not enough for India to have large or high-grade deposits," Mr. James said. India's government is in talks with Japan to invest in the Orissa plant but so far there has been no agreement.

India's rare-earth strategy appears to be driven not just by economic considerations, but also by the country's rivalry with China. The two countries fought a border war in 1962, which Beijing won, and relations between them remain tense. In July, Mr. Ashwani Kumar, India's minister for earth sciences, said China was using deep-sea mining as a way of staking territorial claims in ocean areas. India, he told local media, was being forced to do the same. "Countries like China have taken to deep-sea mining with a strategic purpose," Mr. Kumar said. Until the mid-20th century, much of the world's rare-earth minerals came from the sands of India's coastlines, where the country's mines are still located.

The U.S. was a major producer from the 1960s until the 1980s. But China, using low-cost mining techniques at its mines, mainly in Inner Mongolia, has dwarfed other producers in the past 20 years. The U.S., which was once self-reliant in rare-earth production, became 100% dependent on imports after prices fell to levels that were only commercially sustainable in low-cost China. But with prices rising, there is now ample scope for other countries to increase output. China has about 55 million metric tons of rare-earth reserves, or half of the global total, the U.S. Geological Survey estimates. Miners in the U.S., Malaysia and Australia also are planning new projects to make up for the reduction in Chinese exports, which fell to 30,000 tons in 2010, down 60% on the previous year. The U.S. has reserves of about 13 million tons but no production currently. Last year, a U.S. company reopened a mine in Mountain Pass, Calif., that until the 1980s was one of the flagship rare-earth operations.

Lynas Corp., LYC.AU -0.57% an Australian company that is developing a mine in Western Australia, estimates that prices of an average basket of the

**NON-PUBLICATION OF THE
NEWSLETTER FOR AUGUST AND
SEPTEMBER 2012**

The Delhi Chapter of IIM brings out this Newsletter every month. However the Chapter could not publish its August and September 2012 issue because of our pre-occupation with the preparations for International Conference "**Resurgent India – Vision 2020 in Metals and Minerals Sector**" held at New Delhi from 28th to 30th September 2012.

The Chapter sincerely regrets its inability for non-publication of the two issues.

rare-earth minerals found at its mine are currently worth about \$56 per kilogram, down from highs of \$148 in 2011 but still more than five times the price in 2009. The price in China of the same rare-earth minerals is \$33, or about half the international price, according to Lynas. Mr. James of Casey Research estimates that prices of rare-earth minerals are about 30%-40% lower in China than elsewhere, depending on the mineral. India's reserves are about 3.1 million metric tons, putting the country in fourth place after China, the U.S. and former Soviet countries, which have a collective 19 million metric tons, the U.S. Geological Survey says. Dr. A.S Firoz, head of the economic research unit at India's Ministry of Steel, said India should look to exploit the full potential of its resources, which will also help its domestic industry be less dependent on China. "You have to be a global player, if you have the resources," he said. "It's like taking an insurance cover for your own industry."

Source: Reuters

India looks for rare earths under the sea

India is already building a rare-earth mineral processing plant in the east coast state of Orissa and will invest \$135 million in a new exploration ship and the refurbishing of another vessel to mine minerals under its oceans. Only last week, State-owned Rare Earths Ltd. (IREL) applied for approval from the Orissa state government for a rare earth exploration permit on a 2,500ha coastal land package at Bramhagiri in Puri district. IREL is hopeful the results of this exploration will help India meet its own demand for minerals. But according to The Guardian India's ocean exploration program is around two decades old. The country, says the report, has already tested seabed mining to a depth of 512 metres and it's now targeting depths up to 6,000m. Other than rare earths, India's underwater exploration plan focuses on nickel, copper, cobalt, and rare earths, which are particularly abundant in the Central Indian Basin. In 2011 the Papua New Guinea Government granted permission to Canada-based Nautilus Minerals Inc. (TSX:NUS)(OTCQX:NUSMF) (AIM:NUS) to start the world's first deep-sea mining project. Nautilus' gold and copper Solwara 1 project has been facing some issues recently, as the company is battling authorities in regards to its obligation to complete the agreement reached in March last year.

CONGRATULATIONS TO SHRI K L MEHROTRA



Shri K L Mehrotra, former Chairman-cum-Managing Director, Manganese Ore India Ltd (MOIL) and Vice Chairman of Delhi Chapter of The Indian Institute of Metals has been conferred Fellowship of the IIM. The Delhi Chapter conveys its heartiest congratulations to Shri Mehrotra on

the conferment of the Fellowship of IIM.

The National Council of IIM at its meeting held on 26th July 2012 decided to bestow Fellowship to Shri Mehrotra.

The Fellowship Plaque, a metal badge with IIM Logo, will be presented to Shri Mehrotra on 17th November 2012 at Jamshedpur, during the presentation of IIM Awards of the 50th National Metallurgists' Day of The India Institute of Metals.

Shri Mehrotra is also a Director in National Buildings Construction Corporation (NBCC) under Ministry of Urban Development, Government of India, Bharat Dynamics Limited under Ministry of Defence, Metals Scrap Trading Corporation (MSTC) under Ministry of Steel and Ferro Alloys Corporation. He is also a member of the Task Force appointed by Department of Public Enterprises (Govt. of India) to review and finalize the MOU for Trading & Marketing Public Sector Undertakings (PSUs).

India boosts rare earth production

Indian Rare Earths, which has bagged permission to mine rare earths in the coastal stretch, has taken a lease and is looking to mine around 2,500 hectares. The Atomic Minerals Directorate for Exploration and Research, Hyderabad, a constituent unit under India's Department of Atomic Energy, had conducted a survey and found huge deposits of rare earths minerals in the coastal stretch of Puri. Indian Rare Earths has been mining and separating heavy minerals like ilmenite, rutile, zircon, silimanite, garnet and monazite from beach sands which are high in demand domestically as well as for exports. These minerals are used in the manufacture of white pigment, ceramics, polishing glass and TV tubes. There is another 12,000 tonne Monazite processing plant near Vizag, the second largest city in Andhra Pradesh, and a major sea port, which is being set up with Toyota's help. The area is expected to yield high purity RE oxides, including Neodymium, that is used in permanent magnets.

"The Odisha plant could be commissioned by December. We will carry out dry runs, and hopefully, start production early next year," said R N Patra, chairman, Indian Rare Earths Limited. Set up at an investment of \$25 million (Rs 1.4 billion), around 2,250 tonnes of RE will be separated at Indian Rare Earth's Aluva facility in Kerala for domestic consumption, while the rest will be exported. Patra added that from a standing start, India would be able to achieve 4% of global production. The company has managed to mine around 35% of the leased area so far of the 2,400 hectares that has been taken on lease, and separated the heavy minerals from the sand. China, the world's largest rare earth exporter, reduced its export quotas for the minerals. Though China commands a 97% global monopoly on various stages of rare earth production, US Geological Survey estimates that China has half of the world's reserves at 55 million tonnes. Though India is unlikely to be able to catch up with China's rare earth export volume, the new plant in Odisha is expected to produce 11,000 metric tonnes of rare earth materials a year.

India is planning to increase its output three fold by 2017. Given the dangers of Chinese monopoly, countries like India, Japan and Vietnam have already started collaborating in REEs, with the expectation that more than 15% of rare earth minerals could be mined outside of China by the end of this decade. Vietnam is known to have significant rare earth reserves and by collaborating with Japan, is expected to make significant inroads in this field. India has regularly attributed RE reserve figures of 2-3%. Latest Indian government statistics, however, show India may well have 9% of global RE reserves at 10.7 million tonnes. The stranglehold by China upset many producers in India. As Indian Rare Earths Patra said, "We were producing oxide of RE Cerium at a price of \$10.83 (Rs 600) per kilo. China was providing the same for \$1.5 per kilo." Cheap rare earth from China also forced closure at the world's largest rare earth mine Mountain Pass, in California, he added. Patra said though in 2007, the company had pointed out the urgency to restart RE production to the Indian government, it was denied permission since the Thorium from Monazite was the only interesting aspect at that time. Today, the Indian government is making a concerted effort to identify potential RE reserves in India. The country is also exploring joint development of REs with Japan and other nations. Coal imports are likely to touch a whopping 185 million tonnes by 2017, almost 20% of the international dry-fuel trade, amidst a widening demand-supply deficit. Rangarajan added, "If you increase the domestic production of coal, then the import of coal, which we are doing on a large scale, will also come down."

Source: Mining.com