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INTRODUCTION

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Metallurgical Education in India: Its Relevance in Indian Industry, Education and Research

R N. Parbat
Past President
The Indian Institute of Metals

Introduction

Metallurgical education in India started nearly 90 years back at BHU, thanks to the foresight of the visionary Pandit Madan Mohan Malaviya. He saw the future of Indian economy in the exploitation of India's mineral resources and their further processing through hydro, pyro and electro refining to value added metallic products. Education in mining and metallurgy was thus born. Later, many engineering institutions embraced this academic programme in their curriculum.

Currently, nearly 35 engineering colleges offer courses on metallurgical and materials engineering at undergraduate, postgraduate, doctorate and post doctorate levels. Besides, The Indian Institute of Metals and Institutions of Engineers (India) also offer membership diploma, equivalent to university degree through examinations.

According to the current statistics, the total number of graduate metallurgical and materials engineers produced from those institutions is around 1200 per year.

Issues to be addressed

Two issues need to be addressed:

- Is the number of engineers that are produced adequate for Indian industry, academic institutions and research organisations in civil, atomic and defence fields?
- Is the quality of these engineers relevant for Indian industry, education and research organisations?

Issue 1

Taking the first issue to begin with. In 2007, the Ministry of Steel, Government of India engaged The Indian Institute of Metals to undertake an in depth study on availability of technical

manpower in India to man the projected growth in the iron and steel industry between 2007 and 2020. During this period, steel production in India is supposed to grow from 50 Mtpa to 350 Mtpa as per the forecast of the Planning Commission and the Ministry of Steel. The Indian Institute of Metals undertook this study and presented the final report after 10 months to the Ministry of Steel. The report was highly acclaimed. Since the author of this paper was a joint author of that report, he is privileged to quote some of the findings.

The important findings were:

- After due survey and study, it was found from the prospective investors that both in greenfield and brownfield locations, the total steel capacity was likely to grow to around 200 Mtpa by 2020 (greenfield-120 Mt and brownfield-80 Mt) and not 350 Mtpa as envisaged in the Government documents.
- In an existing integrated blast furnace / BOF steel plant, nearly 1350 technical personnel (ITI, BSc, MSc, graduate engineers and postgraduate / doctorate engineers) are engaged per million tonnes steel capacity.
- A newly designed modern iron and steel plant will engage only 600 technical personnel per million tonnes steel capacity
- However, an average of 900 technical manpower per million tonnes steel capacity was estimated in a mixed situation in India.

From interviewing the placement officers of the academic institutions and the recruiting officers of the steel plants, it was found that only 6.5% of the available engineers opt for recruitment in the iron and steel industry because of greater pulls from IT / computer related industries, higher education mostly in American universities and industries, post graduate / doctorate programme in India and MBA / other competitive services like IAS, IPS as well as executive officers in banks and financial institutions.

On the basis of intricate calculations, it became clear that while there would not be any serious shortage of ITI diploma engineers and degree engineers in mechanical, electrical, instrumentation, telecommunication and IT / computer related disciplines, there would be serious shortage in diploma and graduate engineers in metallurgy, mining, geology, refractory and ceramic materials.

It was, therefore, recommended that the existing ITI institutions should be "adopted" by the steel industries in and around their geographical areas to promote appropriate courses in these institutes with guaranteed employment.

Some other observations were that:

- The existing metallurgy, mining, ceramic and refractory departments should start evening courses till such time as additional seats are created or new colleges established for those courses.
- Industries were also advised to start extended training programmes for graduates from other disciplines to take-up technical positions in the iron and steel industry.
- There was also a serious shortage in engineering-teaching staff primarily because of poor remuneration. The Ministry of Steel, the academic institutions and the Ministry of Human Resource, Government of India were strongly advised to improve the pay package of the teachers.

Many of those recommendations were partly or fully implemented by the appropriate authorities.

Issue 2

This issue is more controversial, i.e., what is the quality of metallurgists produced by the academic system in India today?

If one looks at the recent history of growth in the metal industry in India, subsequent to the oil shock in 1971 and the fiscal control regime in India, it will be observed that the metal industry in particular went into hibernation. Economic liberalisation pursued by the Government of India since 1991 saw a 10 year period of industrial restructuring for improving the competitive position of Indian industry and only then could the industry embark on a national and international growth plan. The metal industry was no exception.

Meanwhile, the lack of interest in pure metallurgy all over the world brought metal physics, chemical metallurgy, ceramic and polymer sciences together to create an integrated science of diverse materials. This gave birth to materials science at Northwestern University at Illinois, USA in 1959.

Developed countries like USA, UK, Germany, Sweden, Austria and Japan that experienced shortage in minerals, energy and labour in their countries had no other option but to go for low material, low energy and high intellectual products. Those countries needed highly qualified and intelligent manpower from all over the world. Which country had the best potential for that resource? Of course, an English-speaking country like India. Hence, it did not take much time for India to accept the new concept of material science to produce material scientists for talent-export to the developed countries.

Advent of it

Around the same period, a handful of neo-entrepreneurs saw an international opportunity in information technology, both in hardware and software. They were the first ones to take full advantage of the economic liberation in India. The existing engineering colleges opened computer engineering and IT departments.

The Joint Entrance Examination systems also created an opportunity for the 'top slot' of successful candidates a sure position in computers and IT related courses. The successful candidates were immediately identified by this new service industry and offered handsome remuneration. This led to mushrooming of a large number of vertically constructed high-rise engineering colleges offering computer and IT related courses as against the classical horizontally constructed engineering campuses with various departments and workshops spread over a large area. Within a few years, it was established that IT education was not a must for IT related industries. Any engineer with a little training could embark on an IT career with a big pay packet.

Since then, it has been 'destination IT' for nearly 80% of engineers, irrespective of their basic engineering discipline. The IT industry also went for very aggressive campus interviews and selected students in their 3rd and 4th year and offered jobs. It has been a practice in engineering colleges that once a student accepts a job, he or she is debarred from attending any other campus interview. Classical industries who normally come for interviewing 4th year students, late in the year, were practically left with IT rejects or others who had decided to go for higher education in India or abroad or for MBA/IAS/IPS.

By 2000-2001, when the manufacturing industries got themselves restructured for global competition, they were too late to attract bright engineers to their 'smoke stack' industries.

What went wrong?

First, the metallurgy courses got changed to materials science and engineering and the metal

industry – the potential employer of metallurgists - almost stopped recruitment of fresh metallurgists, mining engineers, geologists, refractory / ceramic engineers for nearly 30 years or so. Now, when the metal industry, mining industry, auto industry, foundry and forge industry and thermal, hydro and nuclear power industries are in a mood to recruit metallurgists, there is no classical metallurgist available in the recruiting body!

Globally, the metal industry is concentrated mainly in China, India, Brazil, Russia, Azerbaijan, South Korea and South Africa. Some non-ferrous metals like aluminium, copper, zinc, lead, etc. are also produced in other continents like Australia, Africa and South America. Hence, the quality needs of metallurgists in say, India and China are quite different from that in USA and other developed countries. However, while India produces around 1200 materials engineers annually, China produces around 12,000 classical metallurgists annually to take care of their steel, aluminium, nuclear metals and rare/rare earth metals industry.

Solution

Is it now time for India to learn a lesson from its northern neighbour? Both India and China are mineral-rich countries with populations over one billion each. These two countries have no other option but to exploit their mineral resources and value-add for domestic consumption as well as for export earning from overseas markets.

The education level of the people in these countries is also low and hence, such a large population cannot be economically sustained through service activities like banking, tourism, global education and research and the like. This is not the situation in Japan and USA engaged in high-tech business along with specialty products like computer hardware, defence and civil aircraft, nuclear technology, drilling of offshore oil, space research, development of mass destruction weapons, biotechnological products, complex electronic and composite products, etc.

In India, nearly 40% of the population is below the poverty line. Can India afford the luxury of having USA-type of education for the majority of the educated population? The answer is not yes. Yet, professors and research scientists in India are greatly influenced by American universities to select the engineering curriculum and research plans. In the international arena, classical metallurgy has no position anymore; the reason being complete lack of interest in extractive metallurgy and engineering alloys for infrastructure, building, auto bodies, mass transportation systems like metro rail, high capacity highway and off highway transport vehicles, industrial roofing, packaging, etc.

In India, industries are now emerging as major metal producers. The projected targets in India by 2020 are given in Table 1

Table 1: Production of metals in 2013 and 2020

Metals	**Output in 2013, Mt**	**Projected Output in 2020, Mt**
Steel	75	200
Aluminium	2	5
Copper	1	2
Zinc	1	2
Lead	0.065	0.130

It is clear that in the next 7-8 years, metal production in India will more than double, which is unprecedented in Indian history. Who will provide the leadership in this spectacular growth? Of course, the metallurgist, mining engineers, geologists and refractory/ceramic engineers with full support from mechanical, electrical, chemical, civil, architectural, electronics and IT engineers.

If classical metallurgy is not taught, how will the materials engineers guide supervisors and workers on blast furnace operation, direct reduction processes, new developments like Corex and steelmaking in BOF / induction furnace / electric arc furnace? Who will provide guidance to run alumina refinery, aluminium electrolysis, copper reduction and refining, zinc and lead smelting and their separation? Nuclear metals like uranium, zirconium, titanium, plutonium, thorium and rare metals like lithium, selenium, tellurium and the like need serious intervention by extractive and process metallurgists. Complex alloying and their evaluation for specific properties for industrial applications will also need profound knowledge of thermodynamics, crystallography and their relation with material properties.

Nano materials are playing an increasing role in enhancing the properties of materials beyond the current levels by altering the microstructure. They are also extremely useful in genetic and medical science for transporting right information and /or material to the right place. It is likely to revolutionise nuclear therapy in cancer treatment. But the issue is how many metallurgists, material scientists and physicist can be engaged worldwide in nano-studies? India needs classical metallurgists as well as material scientists and the proportion of classical metallurgists will weigh very heavily against materials scientist. The developed world will, however, offer opportunities only for material scientists.

Hence, the question is "Should we sacrifice our "today" for the "tomorrow" of the developed world?"

Recommendations

The recommendations are therefore:

- There are lessons to be learnt from medical education. An MBBS degree is inadequate for pursuing medical practice, unless someone decides to engage himself/herself in a low-grade medical activity. A post graduate degree in the form of MD or MS is a must for minimum specialisation.
- Let the metallurgy courses in India also be designed for classical metallurgy with scope for specialisation through postgraduate programme in different fields. It could be in iron and steel making, aluminium extraction, copper extraction, lead and zinc making, nuclear metal making, defence and aerospace research and production, academic career or research career. One should decide on one's career path depending on one's academic attainment and personal brilliance.
- During the author's personal interaction with metallurgy cum materials engineering students at various academic institutions in India, some very disturbing comments were made by the students.

Some of them are reproduced below:

- We come to IIT not necessarily to learn metallurgy, but to use the excellent library to prepare ourselves for competitive exams like MBA, IAS, IPS, etc. those of us who wish to pursue career in materials engineering in USA also come here because there are excellent professors here who are well connected with the American universities.
- We are here to learn. But where are the teachers? The departments are often manned by more than 50% superannuated professors who are outdated.
- There are not enough students in metallurgy and mining departments. We are made to sit together to pursue a mixed academic programme. What is there in our future?
- Metal industry is the last one to come for campus interview. By then, most of us have already been hired by others. Besides, the remuneration package offered by metal industry is usually the lowest and the working environment is unhealthy. Career growth is also slow in the metal industry as we hear from those come for our interviews.

Well, there is a need for soul searching. Are we misguiding or misleading our future generation? I remember, in 1958 Jawaharlal Nehru, during one of his routine visits to London, addressed the Indian students and exalted them as "builders of modern India" with acquired advanced knowledge from the West. Where are such leaders today?

Conclusion

India is an emerging economy in the world today. India's strength is in mineral resources and human resources. These two resources must be put to 'proper use' for the benefit of millions of economically deprived population in our country. Science and technology is a powerful vehicle for the intellectual and economic growth of the nation.

India will experience unprecedented growth in the metal industry in the coming 50 years or so. This opportunity must not be allowed to go by. Science and technology should be harnessed primarily for the benefit of this country. Our Founding Fathers set out the objectives of CSIR as "conversation of scientific inventions to useable form of products and services for the benefit of our population" – the "green revolution" is one such example.

Academic curriculum in engineering courses in India should be in-line with the immediate needs of the country meshed with frontier knowledge and future directions. The basic engineering course for a degree level may be restructured into a 3 or 4 year course with further 2 years' postgraduate course in different areas of specialisations. The medical course in India which follows this approach is a success story.

Teaching and R&D activities should receive the highest priority in the education system. If adequate number of qualified teachers is not available, who will then educate and train India's future engineers?

80% of India's research should aim at solving national technical issues and the balance for front-line technologies. This is also in-line with the CSIR principles.

Metallurgical industries in India should be more proactive in their recruitment plan and remuneration package - a lesson can be learnt from the IT sector.

"Today, in a war for talents, we should understand that people don't come into a Company and stay for reasons other than compensation. Compensation part becomes the great leveller." said Indra Nooyi, Chairman, Pepsico Worldwide. Important observation to ponder over!

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China eliminating steel capacity to boost fundamentals

The Chinese State Council in mid-October instructed local governments to stop approving new production facilities, suspend the construction of unauthorized projects and order the closure of inefficient capacity in the steel industry. The government's goal is to eliminate more than 80 million tonnes per annum in steel production capacity. We estimate, using World Steel Association data that represents about 11% of 2012 domestic production. This effort is credit positive for most large steelmakers in Asia because it should reduce the lingering supply glut in China, which is the dominant driver of the region's weak industry fundamentals. That said, uncertainties remain as to the timing and scale of capacity reductions. Baosteel Group Corp and other large Chinese steel companies such as Wuhan Iron and Steel Corp will benefit most, because they can leverage their competitiveness to take over market share from those that exit the market. While other companies must close capacity to comply with the government's instructions, Baosteel and WISCO will increase their market share further as they have received government approval to build new steel facilities in southern China. Baosteel is constructing a nearly nine million tonnes per annum steel plant in Zhanjiang, Guangdong Province, which it

expects to complete in 2016. WICSCO is constructing a 10 million tonnes per annum new steel plant in Fangchenggang, Guangxi Province.

Increased market share and scale will strengthen the two companies' bargaining power with suppliers and customers and boost efficiencies, all of which will bolster their profitability. Concentration of the Chinese steel industry will increase after the removal of inefficient facilities. This will improve capacity utilization and profitability at the remaining Chinese steel companies, including China Oriental Group Co. Compared to advanced economies such as South Korea and Japan, the Chinese steel industry is highly fragmented. The three largest Chinese steel companies accounted for only 17% of the nation's steel output in 2012, versus 82% by the top two steel manufacturers in South Korea and 73% by the top two in Japan, according to the World Steel Association. Fragmentation in the Chinese steel industry worsened in 2012. The 10 largest steel companies accounted for 45.9% of the nation's steel output in 2012, down from 49.2% in 2011, according to the China Iron and Steel Association. While small steel companies in China expanded their capacity in an effort to increase their scale and bargaining power amid fierce competition, large steel companies refrained from capital investment given their already leveraged capital structure and weak profits. Oversupply and industry fragmentation have resulted in weakening profitability for Chinese steel mills.

Source: Steel Guru

SAIL may team up with RINL and MOIL for ferro alloy plant

Business Standard reported that steel major SAIL may join as the third partner in RINL MOIL JV for manufacturing ferroalloy as its plan for a separate unit with the manganese ore producer may not see the light of day. State run MOIL Limited formerly known as Manganese Ore India Limited had earlier inked 2 separate JV pacts with SAIL and Rashtriya Ispat Nigam Limited to set up two ferro alloy plants with a total outlay of INR 600 crore. Ferro alloys are used in steel-making for de oxidizing purposes. Sources said that "The decision to set up the 3 way venture instead of going for 2 separate entities was taken at a recent meeting in the presence of Steel Secretary Mr G Mohan Kumar." Mr C S Verma Chairman of SAIL said that the earlier plan of setting up a 50:50 JV with MOIL has not been scrapped. He admitted though that discussions were on to explore as to why a three-way venture for manufacturing of ferro alloys could not be formed. MOIL, which proposed to have 50% stake in the 2 proposed ventures, is the largest producer of manganese ore in the country. The Nagpur based firm operates 10 mines, 6 in Nagpur and Bhandara districts of Maharashtra and 4 in Balaghat district of Madhya Pradesh. The INR 400 crore SAIL MOIL JV was proposed to be set up in Chhattisgarh with an annual capacity of one lakh tonnes per annum. It had even got environmental clearance. On the other hand, the parties involved recently decided to change the original location for the INR 200 crore RINL MOIL JV from Vizianagaram to Vizag for manufacturing 50,000 tonne of ferro alloys. MOIL was to supply raw material for both the ventures. However, nothing is clear as to where the 3 way JV would be set up or the shareholding pattern or the capacity of the proposed entity.

Source: Steel Guru

SAIL to set up new strip mill at Rourkela plant

Economic Times reported that Steel Authority of India plans to set up a 3 million tonne per annum hot strip mill at Rourkela Steel Plant at an estimated cost of INR 4,360 crore to cater to auto and white goods sectors. SAIL would start the tendering process for the proposed mill shortly and plans to install it within 35 months from the date of signing of the contract. A source said that "The Hot Strip Mill, where steel slabs are reheated and rolled to hot rolled coil, will produce high-quality products that would cater to the high end automobile and white goods segment." The source said that "Installation of a 3 million tonne per annum new Hot Strip Mill at an estimated capital cost of INR 4,360 crore has been accorded in-principle approval by the Board on

September 20th 2013." He said that "The mill which is envisaged to be installed in 35 months from the date of contract will enable SAIL to produce high-quality HRCs especially for the high end automobile and the white goods segment." The domestic steel major has also plans to set up a 1.2 million tonne per annum cold rolling mill at RSP, which may entail an investment of around INR 5,000 crore, through a JV. The plant at RSP currently has 2 million tonne per annum hot metal producing capacity and this would go up to 4.5 million tonne per annum once the ongoing expansion is over.

Source: Steel Guru

Steel recycling rate at 88% for 2012

According to a recent report released by the Steel Recycling Institute, the overall recycling rate for steel was 88% in 2012 with nearly 84 million tons of steel recycled. That number is down from 2011's overall recycling rate of 92% according to a chart provided by the organization. Steel cans were recycled at a rate of 72%, the highest among packaging materials. Automotive scrap was recycled at a rate of 93% for the year which is down from 95 percent in 2011. More than 1 billion tons of steel have been recycled in North America since 1988, the year SRI was formed. SRI calculates the rates based on data from the American Iron and Steel Institute's annual statistical reports, U.S. Geological Survey, the Environmental Protection Agency's Characterization of Municipal Solid Waste, the National Automobile Dealers Association, the Association of Home Appliance Manufacturers and the Institute of Scrap Recycling Industries.

Source: Steel Guru

JSW Steel aim to export 3 million tonne in 2013-14

Leading industry player JSW Steel aims to export 3 million tonne steel in FY 14 versus 1.9 million tonne YoY. In an interview to CNBC TV18, Mr Seshagiri Rao Joint MD & Group CFO said that the export market has improved on the back of better realizations and demand. Rupee's deprecation has aided realizations and the Indian currency is likely to stabilize in range of USD 61 to 62. Further, he said that the company's net debt currently stands at INR 30,435 crore and is looking at hedging costs to zero and balance forex exposure. Below is the edited transcript of Mr Seshagiri Rao's interview with CNBC TV18.

Q: Your topline has beat street estimates because of higher contribution that you had from the export sales volumes, for FY14 you had a sale target of around 12 million tonne or so. Given the fact that exports are improving so much, do you think you may have to scale up that target?

A: Yes, we have already given the guidance of 3 million tonne of exports in this year as against 1.9 million tonne in the last year. So, it is almost 1.1 million tonne of more exports from India. At the same time, last year, India had exported 4.5 million tonne out of that our share was 1.9 million tonne. First 6 months of this year if you take total India's export of steel, it has improved by 200,000 tonne, out of that 50.3% is from JSW Steel. That way, on one side India is exporting more and when Indian steel industry demand is flattish then export markets is looking better and India is competitive in terms of steel production. We are able to capture that advantage and then increase our exports. That is why one million tonne of more exports which we are talking in this year.

Q: You were talking to us also about how because of the currency you are ready to replace steel that would have otherwise been important, how much of the sales have come from that and therefore what will you extrapolate as sales growth for the second half?

A: Today imports are falling. In the first 6 months of this year, import of steel into India has come down by 23% and exports are growing. So one way is out of these imports, which are happening into India, how much is replaceable, how much is substitutable, how much cannot be substituted if you look at it only a few elements of steel which are getting imported into India

particularly high technology oriented steel are imported. I don't think they are more than 2 million tonne out of 8.6 which were imported last year. So 6.6 million tonne of steel can be substituted subject to certain constraints majorly relating to iron ore availability.

If it can be increased, Indian steel industry is quite competitive to meet the challenge and also taking the advantage of what is vacated by other countries like China is slowing down next year. This is a great advantage for India to do better and to substitute these imports and at the same time become the global hub. We have that competitive strength, low labour cost, iron ore availability. Also, technology is coming from companies like Japanese and Koreans into India.

So, we will be able to produce very high-end value added steel products and then reduce the pressure on the overall balance of payment.

Q: Tell me how you manage currency volatility, you are trying to win export orders, domestic orders over the next 12 months what you are assuming for the currency and how you are going to manage this volatility?

A: The way we have seen so far is that steel as a product is a globally traded product whether we sell in the domestic market or we export, economic exposure wise we have the dollar exposure. Whether rupee appreciates or depreciates it gets reflected by higher realizations or lower realizations in the sales. Therefore there is no need for hedging that is the view which we have been taking so far. But what it results in is there is mark to market on the outstanding payables are long-term loans, which is bringing a lot of volatility in the earnings. Therefore, what we have decided is that imports also we cover, exports also we cover. Thereby there is no volatility in the earnings at the same time, we need not worry about what happens to rupee/dollar. This brings stability in the cash flow and reduces volatility in the earnings. So, we are changing the hedging policy from this quarter onwards. Rupee will be stable going forward. It has already depreciated from almost 54/USD as on March 31st 2013 to USD 61 to 62. So it may stabilise at that level.

Source: Steel Guru

Indian ferro chrome industry hopes to ride stainless steel growth wave

Economic Times reported that the domestic ferrochrome industry is expecting stainless steel capacity to double in the next 2 to 3 years. With Asia, particularly China, emerging as the hub of global stainless steel industry, Indian ferrochrome producers, who have been hit by indifferent growth in last 2 to 3 years, are gearing up to cater to growing demand for ferrochrome in the region. The ferrochrome industry has remained virtually stagnant at 0.9 to 1 million tonne for the last 3 years. However, with new capacities planned in the stainless steel sector, ferrochrome companies may get a shot in the arm. Of late, better data coming out of China and depreciation of the rupee against the dollar has sent out positive signals for the industry. As a result, prices of ferrochrome have climbed up to touch INR 70,000 per tonne in the last 4 to 6 weeks. Mr Subrakant Panda MD of Indian Metals & Ferro Alloys an integrated producer of ferrochrome said that "With domestic stainless steel capacity due to go up to 3 million tonne demand for ferrochrome is also slated to rise in the coming years. This is in sharp contrast to the situation in recent years, when domestic demand hardly picked up. The company, which currently exports 80% of its output, is also gearing up to cater to an increasing share of the market at home.

Over the next few years, IMFA could thus be looking at raising domestic sales at around 40% of its output. Analysts said that the strategy makes business sense. A metals sector analyst pointed out that "Price realisation at home is more or less in line with exports. Logistically too, domestic sales could be profitable." Mr Panda was recently appointed president of International Chromium Development Association, the Paris based apex body. Incidentally, IMFA was one of the

founding members of ICDA when it was formed in 1984 and Panda is only the third Indian to head the organisation in its nearly 3 decades of existence. It comes at a time when China has emerged as a top player in ferrochrome, replacing the sector's traditional powerhouse, South Africa. ICDA, which is due to celebrate three decades of its existence in 2014, has thus opened an office in Beijing for the first time. China has become the largest producer in the world surpassing South Africa despite not having its own chrome ore reserves. Mr Panda said that "In South Africa, the traditional stronghold with 80% of world chrome ore reserves, Ferro Alloys makers are facing few challenges due to the power shortage. However, its influence is unlikely to fade away. New capacities will be added but these will perhaps come up a t a higher cost." Nearly 9 million tonne of ferrochrome were produced globally last year. Given its quality and grade, India is a niche player with almost a tenth of the global ferrochrome market with a production of almost one million tonne per annum. Last year, China produced 50% of the world's stainless steel.

Source: Steel Guru

New start for the New Street station

Deepak Vaidya
EC Member, IIM DC &
Business Head (North & East), Outokumpu India Pvt. Ltd.

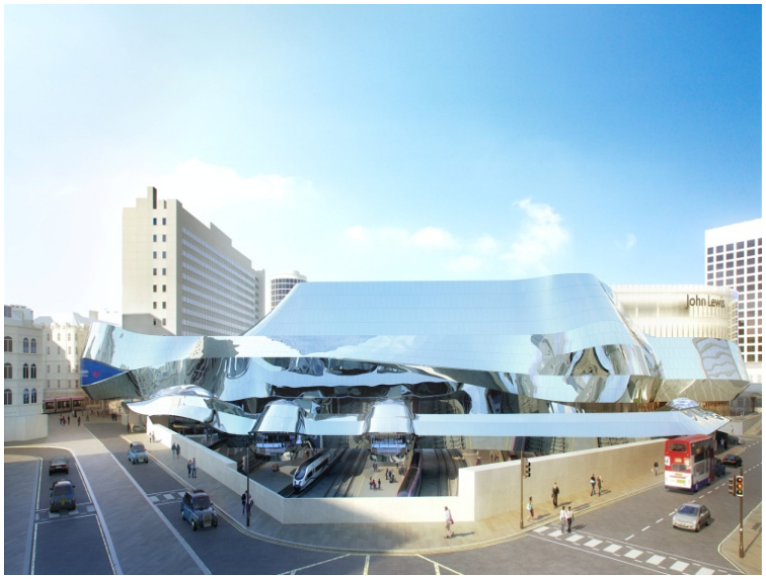
Outokumpu stainless steel gives a new look for the New Street station in Birmingham, UK. More than 8 000 bright polished, laser-cut panels of stainless steel, altogether more than 20 000 square meters, will cover the façade of the station. Outokumpu supplies up to 400 tons of stainless steel for the cladding of the building.

One of the busiest stations in UK

Birmingham is one of the busiest train stations in the UK, used by 1,40,000 passengers a day. Originally it was built accommodate less than half that number in the 1960s. Network Rail is now undertaking redevelopment work which will give passengers a concourse with three and a half times more space, more accessible platforms with new escalators and lifts. During the work, the concrete exterior of the building will be cladded in stainless steel.

All Stainless Steel from Outokumpu

Martifer is managing the entire steelwork project, which was started in 2010 and takes place in the Birmingham city centre. They approached Outokumpu, requesting a very brightly polished stainless steel for the façade of the building. All of the stainless steel in the new New Street station comes from Outokumpu. Tornio produced three-millimeter 316 coils which were then cut to length, bright polished and finished in Sheffield by Outokumpu and its subcontractor, a long-time partner of Outokumpu who was recommended to the customer by Outokumpu. Outokumpu's plate service centre in Sheffield also advised the station contractors on how to handle stainless steel.



Deliveries to the hour

"The stainless steel facade is an integral element of our project to completely transform Birmingham New Street station. We are working in and around an original 1960s structure that has long given a tired and poor impression to the busiest station outside of London and Britain's second city. The steel cladding transforms the dated structure into a stunning, 21st century, world class building and puts the station on the map as a landmark in Birmingham, adding to the city's growing reputation for good design. The steel cladding completed so far has already created a buzz around the city and all involved are excited about the future final completion," says Chris Montgomery, Network Rail Project Director.

"After a careful market analysis and detailed tendering process, Martifer selected Outokumpu due to the high-end characteristics of the product and the confidence instilled in us during the several technical meetings that preceded the order issue. As the extreme complexity of this project is only surpassable through careful management of processes and adequate monitoring of all operations, Outokumpu proved to be the partner we needed for a project of this magnitude and technical requirements. Outokumpu is technically and in Martifer's opinion the leading expert in stainless steel solutions," says Francisco Loureiro at Martifer. "Due to the nature of the project and from the fact that almost no single panel is the same and unique laser-etched references were used, Outokumpu's production process, understanding the best way to streamline and optimize time-consuming tasks and finishing with just-in-time deliveries showed the level of cooperation that is required every day to achieve our common goals."

"This was a very complicated process and we were working a lot together with the client. New Street station is located in the city centre in Birmingham, so deliveries and project managing had to be done in a time critical manner and to the hour," says Alison Kinna, VP, British Isles, Middle East & Africa. But managing the entire process was precisely what Outokumpu could do – cutting to length, bright polishing which was one of the specific requirements in this project and managing the entire process from subcontractors to the customers. The first half of the New Street station has opened up for passengers in April 2013. The station will be completed in 2015.

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INDIA'S LEGENDARY WOOTZ STEEL

The book titled "**INDIA'S LEGENDARY WOOTZ STEEL**" has been authored by Ms. Sharada Srinivasan of National Institute of Advanced Studies, Bangalore and Prof. Srinivasa Ranganathan of Indian Institute of Science and National Institute of Advanced Studies, Bangalore. This Book covers in detail the achievements of India in the field of ancient Metallurgy.

The Delhi Chapter of IIM has subscribed to the above Book. This publication is devoted to an Advanced Material of Ancient World.

The early accomplishments of Indian Metallurgists are appreciated due to the exemplary and unparalleled artefacts such as the remarkable Iron Pillar in Delhi, with a Gupta era inscription, ca 400 CE. The Indian subcontinent can be credited with playing a seminal role in the development of high grade steel in antiquity. European accounts point to the making of 'wootz' known as ukku, which was traded widely from India to West Asia to make the reputed patterned Damascus blades. The significance of wootz steel, can be gauged from the fact that the TMS of the USA in its compilation of the 50 greatest moments in the history of materials listed wootz steel as seventh on the list.

Heritage related to steel has excellent and unique contributions from India. It was eclipsed for the past few centuries, until it was revived early in the twentieth century, when the dream of J N Tata was realized at Jamshedpur. In the past hundred years, India has made enormous progress and has an ambition of producing 200 million tons of steel per annum to become the second largest producer of steel. It is hoped that this book shall inspire readers of all ages and disciplines, particularly the young, to become torchbearers of the new emerging, vibrant and innovative India.

This book is available in our Library. Our esteemed members may like to refer to this book by visiting our Library.

SAIL plans to raise iron ore output to 43 million tonne

PTI reported that in sync with the expansion of its steel-making capacity, state-owned SAIL plans to raise the iron ore production capacity to 43 million tonne per annum by 2015-16 from the existing 28 million tonne per annum. The country's largest steel maker, which is also the second-largest iron ore producer after NMDC, also believes that with the ongoing and proposed expansion at the mines, it would be able to achieve 58 million tonne per annum iron ore production by 2020. SAIL plans to raise production capacity of its Kiriburu mines to 5.5 million tonne per annum from 4.25 million tonne per annum now. Plans are also there to jack up production capacity at Meghataburu and Bolani mines to 6.5 million tonne per annum and 10 million tonne per annum from 4.3 million tonne per annum and 4.1 million tonne per annum respectively. The Steel Authority of India Ltd also plans to raise its Gua mine's production capacity to 10 million tonne per annum from 2.4 million tonne per annum now. It also proposes to raise capacity of its Barsua, Kalta and Taldih mines to 6.5 million tonne per annum from 3.3 million tonne per annum. The major boost in iron ore production might come from the Rowghat mine, where the company plans to produce 12 mtpa iron ore. SAIL has already received all statutory clearances for the mine to develop.

Source: Steel Guru

India may have to start importing iron ore soon - Steel Ministry

PTI reported that Indian steel ministry is of the view that India will have to import iron ore in the immediate future to meet significantly increasing demand from domestic companies. The Steel Ministry has said in a recent presentation to the Planning Commission that "With many projects in the pipeline, both brownfield and greenfield expansion of steel capacity, iron ore requirement will increase significantly leading to imports of iron ore in near future." The Ministry in its mid year plan review has identified iron ore availability as one of the challenges to achieve the steel production target of 300 million tonnes per annum by 2025. With current production capacity of around 90 million tonnes per annum, India needs at least 140 million tonnes iron ore to meet its need. It requires 1.5 to 1.6 million tonnes iron ore to produce one million tonne of steel. It said that "Domestic requirement of iron ore is increasing with the capacity addition in steel production. Between the 2008-09 and 2012-13 period the demand for iron ore has gone up from 87.4 million tonnes to 124.8 million tonnes." India, the world's fourth largest producer of steel after China, Japan and the US, had produced 78.31 million tonnes steel during 2012-13. It is likely to slightly inch up in current fiscal During the January-October period of the current year India produced 66 38 million tonnes steel. The Steel Ministry also said iron ore production has come down from 213 million tonnes in 2008-09 to 136 million tonnes 2012-13 due to ban on mining in Karnataka and sharp fall in production in Odisha. The ministry added that "It would require sufficient time for 200 million tonnes plus production (of iron ore)."

Source: Steel Guru

Coal ministry has defeated every sense of logic: Monnet Ispat

Monnet Ispat & Energy has alleged breach of trust by the coal ministry that last week cancelled the company's Rajgamar Dipside and Urtan North coal blocks for slow progress. In an exclusive interview with ET, Monnet Ispat CMD Sandeep Jajodia says fear psychosis has set in within the government resulting into 'illogical' decision-making and non-co-operation towards industrialists. Edited excerpts:

- Why do you blame the coal ministry for de-allocating the company's blocks when the progress was slow?

  The coal ministry has defeated every sense of logic and has breached our trust. We were given a block Rajgamar Dipside in June 2009 for setting up a sponge iron and steel plant in Raigarh. Till late 2010, we were not given the geological report by CMPDIL, the coal ministry's technical arm. How are we supposed to achieve the milestones? Coal mines were given to companies that committed the much-needed investment in the sectors of power, steel and cement. You cannot give coal mine to somebody, push him over the years and when thousands of crores have been invested in the end use project, cancel the mine for reason beyond the control of the allottee company.

- What are the obstacles that you faced in development of the blocks and what is the status of the end use plants?

  The surface area of the Rajgamar mine has been acquired by the South Eastern Coalfields (SECL) under Coal Bearing Act and till they relinquish the land we cannot even apply for land. We wrote several letters, held meetings with that company and complained to the ministry several times. The coal ministry itself has written to SECL to clear the land at the earliest.

  The conditions of allotment clearly says that in case there is overlapping of coal block with a government company, any delay beyond 2 months in transferring the land to allocatee company can be claimed as grace period. Even our zero date has not started, so where is the question of us defaulting in meeting the deadlines? By deallocating our block the coal ministry is grossly in violation of its own conditions.

- Do you agree with the ministry's argument that developing captive coal blocks is an absolute responsibility of the companies?

  The ministry has no teeth. It cannot even direct its own companies like CILBSE 1.41 % or the SECL leave aside questioning another ministry or the state government. If the ministry in various review meetings has not been able to influence and help the allottee companies in securing the clearances in time, what right do they have to cancel the allocation? If the administrative ministry is not able to get it done, what is a private allottee company supposed to do. Who will pay the loans taken by these companies that have in good faith invested thousands of crores.

Source: Coaljunction

Vedanta chief pitches for 51% stake sale in PSUs

Business Line reported that pitching for 51% stake sale in PSUs, metal and mining conglomerate Vedanta Resources chief Mr Anil Agarwal has said that this can change the face of modern India by creating more jobs and bringing in prosperity. Mr Agarwal said that "We may be having more than 250 state and central government companies. Why not divest 51% of these companies in the market, with the caveat that no one can own more than 10% of these companies. This is bound to change the face of modern India. A lot of them must be listed and have a very good structure but these companies are not progressing as were to be expected." He said that "Who can stop ONGC becoming another EXXON and SAIL be like VALE. When companies like L&T, ICICI Bank and HDFC Bank can run world class organizations without being owner driven. I am sure these over 250 states and central government owned companies will also follow the example. The funds generated can be used by the government to strengthen infrastructure." Mr Agarwal also advocated giving shares to the employees in the companies, which he said will in turn bring security, as well in terms of financial as they would be getting more money than they currently draw and their interests will be aligned. The most talented, professional management will be identified and fully incentivized so that they can create world-class capacities and quality with the possibility to make the company 10 times bigger, including creating huge valuation, he said. With this capacity, the companies may generate employment for a further 50 million people. Further, he stressed that ultimately, the government should be looking to divest further and hold only 26% stake. Stating the country is struggling with ever mounting import bill and this year it has imported USD 19 billion of coal, he said that the government should look into auctioning of coal blocks. He said that "Coal India is sitting with a lot of coal blocks, why not government decide to sell 51% of these various coal blocks to produce coal in India." About aluminium, he said that India has potential to produce 15 to 20 million tonne against present 2 million tonne output and has a reserve of about 3,000 million tonne. Last month, Mr Agarwal has said that the government was unnecessarily spending so much time on taking a final call on selling its remaining stake in Hindustan Zinc and it needs to take a decision at the earliest on the issue. Vedanta, which holds 51% stake in Balco and 64.92% stake in Hindustan Zinc through its subsidiary Sterlite Industries is keen to acquire the remaining stakes.

Source: Steel Guru

Aluminum Industry Hurt by EU Climate Rules, Study Shows

European Union regulation, including carbon and renewable-energy policies, reduced the profitability of the bloc's aluminum smelters, according to a study by the Centre for European Policy Studies. The expenses associated with meeting European laws accounted for an average of 8 percent of total production costs for the industry over the 2002-2012 period, CEPS said in the analysis, published today in Brussels. The price of power, boosted by costs linked to carbon emissions passed on by utilities, and surcharges to support renewable energy imposed a significant burden on the industry, according to the study. "The analysis of cost differentials with

the least cost producers -- primary aluminum smelters in the Middle East -- shows that EU regulatory costs represented about one-third of this competitive gap in 2012," according to the study, prepared for the EU as a part of its fitness check on the aluminum industry. European requirements affected the profitability of the industry not only in time of crisis but also in boom years, according to CEPS. EU aluminum smelters are a part of the bloc's Emissions Trading System, in which polluters' discharges are subject to a decreasing cap. The industry gets a bigger share of free carbon permits to meet its quota as a part of protection against relocating production to regions without emission curbs.

Carbon Policies

The assessment highlights the difference between EU-based smelters that are still shielded from the cost of carbon policies thanks to long-term contracts negotiated before the ETS, and those that are fully exposed to the bloc's electricity market and the carbon cap-and-trade program, according to the European Aluminium Association, or EAA. "The latter have become the least competitive smelters in the world and face extra costs of up to 228 euros ($308) per ton of aluminum produced, i.e. 11 percent of total production costs, including raw materials," EAA Director General Gerd Goetz said in a statement today in Brussels. The EAA called on the European Commission, the EU executive, to ensure competitive energy prices through sound energy, climate and industrial policies. The 28-nation bloc started earlier this year a debate about its 2030 framework for energy and climate and is considering strengthening the ETS after carbon prices fell to a record low of 2.46 euros in April. The CEPS analysis draws on a sample of 11 primary aluminum plants, representing 60 percent of the total EU primary aluminum production in 2012. As it focuses only on the cost side of EU rules, the benefits of operating in the bloc, including proximity to high-added-value customers, should be borne in mind when analysing it, CEPS said.

Source: Bloomberg

Copper Analysis and Forecast Q2 2013

Introduction

The rebound off last November's low around $7,500 per tonne continued until February when prices reached a high of $8,346 – since then prices have been under pressure and have fallen to a low of $6,613. There appear to be three reasons for the weakness, firstly demand has not recovered as much as it was expected to; secondly, the market has moved from a supply deficit to a surplus and thirdly, the market has started to anticipate the winding down of quantitative easing (QE) in the US.

Current Situation

A year ago, during the May to August period, base metals had a base, which for copper was around the $7,220 level. The breach of that support level in April changed the profile of the market from a sideways – rangebound market, into a downward trending one and the breach of lows from October 2011 at $6,635 opened up the way for a move back towards $6,000 and possibly $5,000, which is around where the marginal production costs lie. Demand growth for metals has suffered as China's economy is being transformed to be less export driven and more focused on domestic consumption and service providing. The situation has been made worse as lending in China has been more targeted and there has been a crackdown on shadow banking, which has caused credit tightness. The US seems to be the one large economy that is continuing to recover, but the impact of sequestration means it is still far from a strong recovery. Europe is in contraction mode and other emerging markets are suffering as liquidity is withdrawn in anticipation of QE being wound in. All of which has weakened the demand outlook for copper at a time when supply is rising.

Summary of Outlook for 2013

Up until recently, our forecast for copper envisaged a range bound market as we expected apparent demand to recover following the period of destocking in 2012. Although there does seem to have been some drawdown in copper stocks in China, stocks on the LME and CME have risen and consumption in the world ex-China has fallen 1.7 percent according to the International Copper Study Group's (ICSG) data for the first three months of the year. As such, the recovery in demand has not appeared yet and the combination of tighter controls on lending in China and the likelihood of less liquidity in the global system as central banks rein in stimulus, means the outlook for economic growth remains weak. Indeed if the liquidity and credit brakes are applied too hard in the US and China then there is a danger of the global economy weakening again. As such, we see little reason to be bullish on copper in the near-term, but feel that policymakers will have to prompt stronger growth later in the year that may lead to some restocking.

Supply Outlook

Copper supply is set to increase at a faster pace in the medium-term as the investments made during the period of high copper prices now start to be commissioned. This is part of the boom/bust commodity cycle when high prices attract investment in new production capacity and as these all start to be brought on line it takes time for demand to rise to the extent that it once again absorbs the new capacity. The fact that this new capacity is coming on stream during a period of weak demand will no doubt add extra downward pressure to prices and that is the situation we are now in. The latest data from the ICSG for the first three months of the year, estimates that world mine supply has increased eleven percent, compared with the same period in 2012. The rise is partially due to a recovery in production that was for various reasons idled last year, either due to strike action, or production disruptions. That said, this year and next, production is set to rise as new capacity comes on stream. Output has been expanded at Antamina, Los Bronces, Buenavista and Frontier, with further capacity coming on stream this year at Oyu Tolgoi, Caserones, Antapaccay and Toromocho. Production is expected to grow 5.2 percent this year and 5.5 percent in 2014, according to the ICSG, which is a considerably higher rate of growth than was seen in the preceding five year period when the compound annual growth rate was around 1.5 percent. That said, earlier supply disruptions at Freeport-McMoRan's Grasberg mine, at Rio Tinto's Bingham Cannon mine and lower ore grades at other mines, will offset some of the mine increases. Refined copper production is estimated to have increased by 5.2 percent in the first quarter of 2013, compared with the same period last year, with primary production rising 3.8 percent and secondary output up 11.6 percent. Output was up in China, the Democratic Republic of Congo (DRC) and in Zambia, while declines were seen in Chile. Refined copper production is expected to grow 4.3 percent this year and 5.1 percent in 2014, but with world refined production capacity running at 79.8 percent in the first quarter, there is considerable room for the extra mine supply, that is being ramped up, to be processed. For 2013, we expect refined production to reach 20.9 million tonnes, which is lower than our earlier forecast and takes into account the production disruptions already seen this year.

Historical global copper production and consumption (thousand tonnes)

	2009	2010	2011	2012	Jan- Mar '12	Jan-Mar '13	Change
Mine production	15,943	16,053	16,076	16,700	3,851	4,262	+10.7%
Refined production	18,248	18,981	19,596	20,114	4,934	5,189	+5.2%
Refined capacity utilisation	77.8%	79.6%	80.4%	78.9%	80.1%	79.8%	
Consumption	18,070	19,346	19,830	20,512	5,264	4,926	-6.4%
Refined balance	+178	-365	-234	-397	-312	222	
Period stock change	+275	-177	6	200	-54	263	
Refined stocks (end period)	1,376	1,199	1,205	1,406	1,151	1668	+44.9%

Source: ICSG

Demand Outlook

In the first three months of 2013, global apparent usage has declined 5.3 percent compared with the same period in 2012, with Chinese apparent demand declining ten percent, according to ICSG data. Given the data does not take into account changes in unreported stocks in China, the decline in apparent usage is likely to be masking Chinese consumer destocking. Earlier in the year, bonded warehouse stocks in China were thought to have climbed to around 900,000 tonnes, but have since dropped back towards 500,000 tonnes and Shanghai Exchange stocks have also fallen since the start of the year. As such, the fall in Chinese imports of refined copper (which ICSG data would pick-up as a fall in demand), has probably happened as consumers have drawn down stocks. Excluding China, global demand for copper in the first three months of the year has dropped 1.7 percent, with all regions showing a decline, including the Americas. Given poor PMI data in Europe, deteriorating data in the US and only a recent pick-up in Japan's numbers, we are not surprised that copper demand is down 1.7 percent as the weak economic outlook and falling prices may well have prompted further destocking.

Looking forward, we remain generally positive for the outlook for US demand as we expect the auto and housing sectors to improve, and as the latter of these two industries is a major driver of sentiment, we feel there is room for the recovery to feed on itself. Any retreat in QE may dent investor confidence, but as the net fund position on Comex copper is already short, we feel if anything there is room for short-covering. In Europe, there seems little room for optimism and whereas we thought there was scope for apparent demand to improve as last year's destocking ran out of steam, we fear that a slower than expected recovery in China and a more competitive Japan, on the back of the weaker yen, may depress export demand for European goods and machinery. As such, we feel copper demand in Europe will remain depressed this year. We are more bullish for Japan, where the lower yen will have increased competitiveness, but higher import costs may well dampen domestic demand for all imported products, which could end up acting as a drag on the country's domestic demand for copper. In addition, Japan's demand for copper to produce goods for the export market is seen a zero-sum game, as if demand for Japanese goods rises, then demand of other countries' exports are likely to suffer.

In emerging markets, the capital flight and currency weakness that goes hand in hand with that is likely to hit domestic consumer demand and strain government finances. This, in turn, is likely to lead to less investment in infrastructure. We remain positive for Chinese growth overall, but feel the recovery may be further delayed as the new leaders stamp their authority on local governments, the shadow banking sector and on the practice of misallocating capital investment, which has in the past led to the building of too much surplus capacity. As such, we now expect a period of relatively slow growth in China, in the 7.0 to 7.5 percent band, as the government aims for sustainable growth which will not bring with it inflation.

Chinese Trade

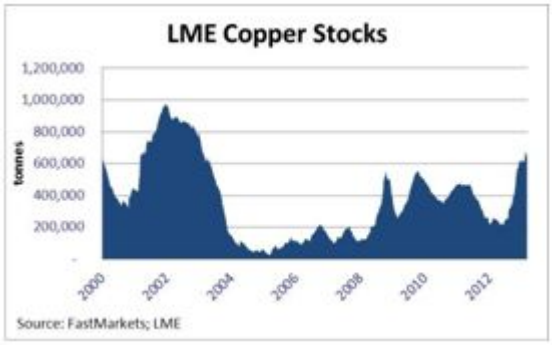
In the first five months of the year, refined copper imports have dropped 33 percent to 1,092,000 tonnes, from 1,632,000 tonnes in the same period of 2012. Higher domestic production and stock drawdowns, no doubt made up for the lower level of imports. In addition, copper concentrate imports rose 31 percent in the January to May period, compared with a year earlier and that is likely to have been driven by a shortage in scrap availability, which saw scrap imports fall seven percent during the same period. Although net refined metal imports were down in the first five months, they did jump 42 percent in May, compared with April, as lower prices and the opening up of the LME/Shanghai copper arbitrage window encouraged more imports and less exports. Looking forward, we feel that lower copper prices will be seen as an opportunity by China's

State Reserve Bureau to build up its strategic stockpile of copper, which in turn should help cushion any potential fall in LME prices.

Chinese copper trade ('000 tonnes)							
	2009	**2010**	**2011**	**2012**	**Jan- May 2012**	**Jan –May 2013**	**Change**
Exports							
Refined copper	72.9	38.7	154	274	157	169	+7.6%
Imports							
Refined copper	3,185	2,920	2,776	3,403	1,632	1,092	-33%
Copper scrap	3,998	4,364	4,687	4,859	1,857	1,729	-7
Copper concentrates	1,717	1,813	1,789	2,192	803	1,062	+9%

Source: Official customs statistics

Stocks



Exchange traded stocks were around 935,000 tonnes in late-June, up from 596,000 tonnes at the end of 2012, an increase of 57 percent, or 339,000 tonnes. Most of the increase has happened at LME warehouses, while there was a small increase at Comex warehouses and a 15,564 tonne drop at Shanghai Futures Exchange warehouses. Offsetting the rise in exchange stocks, has been a fall in Chinese bonded warehouse stocks which are believed to be around 550,000 tonnes at the time of writing, these have fallen by around 250,000 tonnes from the start of the year. As such, there does seem to have been a build-up of stock outside of China and a reduction inside China, which makes for a more balanced market. That said, with the LME/Shanghai copper arbitrage window open, we would not be surprised to see metal flow back into China, especially if prices weaken further.

One of the reasons for the build-up in LME stocks was that some warehouse companies offered incentives of around $100/tonne to attract metal into warehouse. In line with the rise in stocks, cancelled warrants on the LME have also shot higher, which effectively means an exit queue has now built up in copper; 54 percent of LME copper warrants are cancelled. At the start of the year cancelled warrants totalled 50,150 tonnes – they have since climbed to 360,000 tonnes. The bulk of the warrants and cancelled warrants are held in Johor, (267,075 tonnes & 209,025 tonnes, respectively), New Orleans (188,475 tonnes and 62,675 tonnes) and Antwerp (135,050 tonnes and 61,575 tonnes). This means 88 percent of LME copper is held at these three locations and 56 percent of the metal at those locations is already cancelled. Despite this level of cancelled warrants, it is interesting that there has been little sign of tightness in the spread, with the cash-to-three months spread around $26/tonne in mid-July, just slightly less than the $29/tonne average, until recently.

In line with the comments outlined in the Aluminium section, the effect of the LME consultation document, we also expect an impact. Copper does not have the same supply overhang as aluminium, but the effects on load out rates for copper should ease since certain locations for copper stocks had been caught behind cancelled warrant queues for aluminium. This situation had been eased recently by minor adjustments made by the LME a few months ago, but whilst the cancelled warrants number for copper remains high and, indeed, the warehousing companies have been incentivising shipments into warehouse, the effects of the consultation document, if implemented, could possibly impact the copper spreads in so far as the implementation of possibly restricted deliveries into warehouse could lead to backwardations developing. The current tightness around the August date is a possible manifestation of this.

Global supply/demand balance in refined copper (million tonnes)						
	2008	**2009**	**2010**	**2011**	**2012**	**2013(f)**
Production	18.21	18.25	18.98	19.60	20.11	21.00
Consumption	18.05	18.07	19.35	19.83	20.51	20.80
Balance	+0.16	+0.18	-0.37	-0.23	-0.40	+0.20
Price	$6,969	$5,155	$7,535	$8,810	+$7,946	+$7,100

Sources: ICSG, FastMarkets forecasts

Balance

After a supply deficit of 397,000 tonnes in 2012, according to ICSG data, the market has swung into a supply surplus, which the ICSG forecasts at being around 417,000 tonnes, followed by an even bigger surplus in 2014 of 681,000 tonnes. Now that there have been some supply disruptions, this year's surplus is likely to be less than originally forecast, although as growth has also been lower than we expected, we have reduced our forecast surplus from 270,000 tonnes to 200,000 tonnes. Given this is just one percent of global consumption means the market remains fairly well balanced, but the outlook is likely to be biased to the downside as a bigger supply surplus is expected next year.

Conclusion

In the first half of the year prices have averaged $7,537, so if we look for prices to trade between $6,500 to $7,500 in the second half, with most of the trading being seen in the $6,800 to $7,200 range, then we would expect an average price for the year of around $7,100. Although the supply/demand surplus is relatively small, we feel sentiment will focus on the likelihood of a larger surplus next year, which in turn may well keep prices in the lower levels of our expected ranges, with the upper reaches only likely to be seen during short-covering rallies.

Source: Basemetal.com

Aluminium: A better roofing option

The importance of using an appropriate roof for any housing unit cannot be under- estimated as it is not only critical but also adds beauty to the structure and depicts the social status of a person. Housing remains a basic necessity of life and as such throughout history, various items have been used for roofing, which include tree barks, bamboo sticks, thatch and clay, depending on the location. Roofing houses have undergone a striking evolution during the current era in both style and type of material used. These include clay tiles, aluzinc, galvanised aluminium, asbestos and cement. The individual's choice of a particular roofing product is usually born out of a consideration of affordability, product knowledge and level of sophistication. However, for those who are willing to spend a little extra for long-lasting quality, aluminium is the best choice. Aluminium does not rust, especially when it is thick enough. Unprotected aluminum is resistant to weathering, fresh and salt water, many foodstuffs and chemicals as long as the correct alloy, thermal treatment and suitable joining techniques are employed. A classical example of the long life of aluminium is the roof of St. James Church in Rome, built in 1897 but still in good condition. Another peculiar property of aluminium has to do with its thermal attributes. Aluminium is known to reflect about 90 per cent of sunlight helping to moderate the temperature in a room. In our tropical environment, this must be an invaluable consideration for the choice of roofing product. Aluminium is simply fire – resistant. Embers and wind–blown sparks cannot cause an aluminium roof to ignite. It will also protect the house from other wind–blown detriments that can cause fire.

The real advantages why house owners and project managers should choose aluminium and not the other metals which are marketed under various brand names – galvalume, aluzinc, z–nal, zintro–alum, galval etc. are clear. These products are steel which are coated using a fused mixture consisting of aluminium, zinc and silicon. This brings into question the durability of the product. Steel rusts very easily even if it is painted. This means roofs made under the brands

mentioned above will be replaced several times as against those produced with aluminium, making the latter (aluminium), rather inexpensive; since it does not require replacement just because of weathering. Another issue has to do with material thickness (gauge). The general standard for aluminium roof gauge is 0.40mm and above. The general gauge for Aluzinc and the others is very thin as there is no minimum set (by the Ghana Standards Authority). However, on the Ghanaian market, the thickness is usually below 0.20mm which increases its vulnerability to corrosion and the effect of strong winds. Also, a lot of the inferior metal products come as colour–coated to conceal the product's quality and composition, which makes it difficult to detect. Unscrupulous sellers and contractors capitalise on this to reap undeserved advantage. Many consumers have unfortunately been enticed by the prospects of lower costs to their long–term detriment. This obviously stems from their insufficient knowledge about the unique properties of aluminium. A vigorous and continuous education of the consumer has become imperative and the Ghanaian property owner must always remind himself that "aluworks" aluminium roof will last you a life time.

Source: Ghanaweb.com

China's Aluminium Capacity to Exceed 30-Mln tpy on Falling Cash Costs, SMM's Zhang Says

China's aluminium capacity would exceed 30 million tpy by the year's end and reach over 34 million tpy in 2014, helped by declines in cash costs, Shanghai Metals Market said at its 2013 China Metal Summit. The country would have a capacity of 30.3 million tpy to produce the lightweight metal by the end of this year, with actual output estimated at 24.9 million tonnes, SMM's aluminium analyst Zhang Chenguang said at the summit in Shanghai on Tuesday. China's aluminium capacity would grow by another 12.8% year-on-year to 34.2 million tpy next year and production by 13.8% to 28.3 million tonnes in 2014, he said. The growth was helped by sharp declines in cash costs as most Chinese aluminium producers use cash basis accounting nowadays. Average cash loss ratio has dwindled to 17% at present, from as high as 40% last year, Zhang told delegates at the summit. He attributed causes of the declines to the exit of some high-cost capacity as well as the commissioning of low-cost capacity in China's northwest region. In addition, falling domestic coal prices considerably saved costs for producers with self-run power plants. China had 27.65 million tpy of aluminium capacity at the end of 2012, according to a statement by the ministry of industry and information technology (MIIT) in February.

Source: www.metal.com

China's Alumina Imports Rise in October on Growing Demand from Aluminum Smelters

China's alumina imports rose in October due to aluminum smelters stockpiling raw materials for winter production and falling imported alumina prices, Shanghai Metals Market has learned. Inbound shipments of alumina grew 25% from a year ago to 460,000 tonnes in October. This was because aluminum smelters began to build up stocks in September in preparation for production in winter. In addition, lower imported alumina prices also enticed aluminum smelters to step up imports. Imports from January through October, however, fell 28% year-on-year to 2.94 million tonnes. Aluminum smelters preferred domestic alumina early this year due to its growing supply and falling prices, cutting into demand for imported alumina. As a consequence, China's alumina imports during the first ten months of the year fell from a year earlier. SMM expected China's demand for imported alumina to remain high for the near future since aluminum smelters would continue to replenish stocks till December. Meanwhile, traders would also ramp up imports due to brisk trading and falling inventories at ports. FOB prices for Australian alumina climbed $ 7 per tonne month-on-month to $325 per tonne in mid-November, while prices at Lianyungang port also rose 30 yuan per tonne to 2,580 yuan ($421) per tonne, driving by growing demand for imported materials.

Source: www.metal.com

Aluminium: The metal that just keeps on giving

Two hundred years ago, no-one knew aluminium existed. Today it is everywhere - in cans, window frames, packaging, even car bodies. New uses for it are constantly being discovered - but it's possible that one day we'll be able to stop mining the ore, and rely completely on recycling.

Aluminium has a split personality.

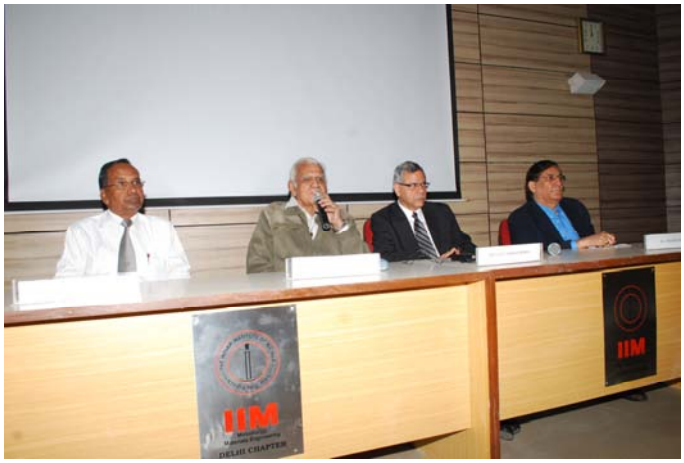
It may look dull, but it is one of the most reactive metals in the periodic table.

"Aluminium fires are quite terrifying," says Andrea Sella, chemistry professor at University College London. "When you take aluminium and you burn it, you get a very, very intense fire." From that point of view, it may not be ideal for aircraft construction - but this disadvantage is outweighed by its strength, flexibility and exceptional lightness. The soft, malleable metal's alter ego is aluminium oxide, which forms a skin on the pure metal the moment it is exposed to air (and makes it unlikely that an aircraft will catch fire). This oxide is so hard that it is used to make sandpaper and other abrasive materials. Among gemstones, sapphires - crystals formed from the oxide - are second only to diamonds in their hardness. Indeed, there is a growing industry for manufacturing industrial sapphires the size of a large bucket, suitable for use in bullet-proof glass, aeroplane windows and soon - unscratchable smartphone displays. Although Aluminium is the third most abundant element in the earth's crust, it was not isolated until 1825, and remained so scarce that it was valued more highly than silver for decades. The reason it remained hidden for so long, unlike gold or silver, is that it is too reactive to occur in its pure form.

Instead it is found as bauxite, a reddish-brown ore named after the French town Les Baux, where it was first discovered. Bauxite is found across the globe, and mining it is the easy part. Far trickier is extracting the metal. It was not until 1886 that a Frenchman and an American both cracked it. You have to melt the bauxite in another mineral called cryolite, and then pass an electric current through it, separating the oxygen atoms from the aluminium. It takes four tonnes of bauxite to produce one tonne of aluminium. The process is highly energy-intensive and therefore expensive. But recycling aluminium uses a fraction of the energy. "Beverage cans get recycled within 60 days, so a can of soda is back on the shelves 60 days later," says Nick Madden, who is responsible for buying raw metal for Novelis, the world's biggest manufacturer of rolled aluminium sheets. Once you have the metal, you can re-use it again and again, almost indefinitely. "It is one of the few materials that is genuinely 100% recyclable," Madden says. In theory, a day may come when we have mined all we need, and we can just keep re-using what we already have. "If demand stops growing, and scrap comes back from older uses like buildings in the future, then that will start to reduce the required primary consumption," says Madden. For now, though, demand *is* growing, and carmakers are one reason why. Lighter car bodies mean more fuel efficiency, better acceleration and braking, and lower carbon emissions. Novelis has seen a 25% increase in demand from the motor industry in the last year, most of it coming from one of its biggest customers, Jaguar Land Rover, which has just begun manufacturing Range Rovers with aluminium. The new car uses use 25% less fuel partly because its body is 39% lighter, helping to reduce the car's total weight by 420kg (925lb). "That's the equivalent of five people," says Nick Rogers, the Range Rover vehicle line director. "So, if you imagine driving around with all your family in the car - you feel the weight of the vehicle. "When you get in the new Range Rover Sport, all of your family has gone." Currently, Novelis obtains almost 50% of its aluminium used to make a new Range Rover from junk - empty cans, scrapped vehicles, demolition sites - and it aims to raise that to 80% by 2020. One challenge is to ensure that more aluminium finds its way into the recycling loop. "In the UK, I believe the recycle rate [of household aluminium waste] is about 75%," Madden says. Whether bauxite mining is still needed in our grandchildren's day may depend on the proportion we succeed in recycling, and whether we keep coming up with new uses for aluminium - either the light, malleable metal, or the hard almost unscratchable sapphire.

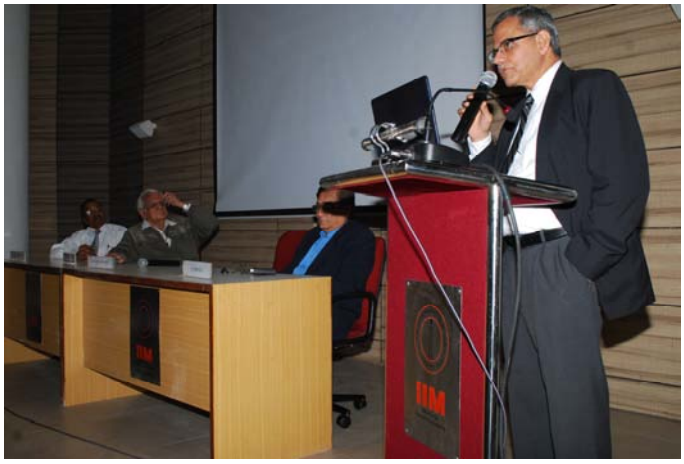
Source: BBC News magazine

Talk on "Current Concepts in the Holistic Management of Heart Disease – Back to the Future" by Dr. Vijay Mohan Kohli



A talk on "*Current Concepts in The Holistic Management of Heart Disease – Back to the Future*" was organised at Delhi Chapter on 9th November 2013.

At the outset Shri S C Suri, Chairman IIM Delhi Chapter welcomed Dr Vijay Mohan Kohli and others present in the gathering. He gave brief details about the origin of the Indian Institute of Metals and its various activities at national level. He also highlighted the activities being undertaken at Delhi Chapter level. It was emphasised that while bulk of the programmes being organised are related to different metallurgical disciplines, this specific programme has been organised to generate interest amongst family members too.



Shri K L Mehrotra, Vice Chairman, IIM Delhi Chapter introduced the speaker, Dr Kohli. After introductory reference, the floor was handed over to Dr Kohli for presentation.

Dr Vijay Mohan Kohli, *Senior Consultant Cardiac Surgeon, Metro Heart Institute, Lajpat Nagar, N. Delhi* gave a detailed presentation. He touched upon the following salient features during his presentation:

- Different kinds of heart diseases
- Manifestations of heart problems
- Diagnostic procedures of various cardiac-related diseases
- Current modalities of treatment
- Causes of heart diseases
- Life styles of people
- Yoga and its importance
- Meditation
- Role of negative emotions in the heart problems
- Preventive maintenance of heart
- Importance of maintaining a balance between mind, body and spirit
- Getting closer to nature
- Good food habits

The presentation which was supported by excellent visuals, evoked a lively interaction amongst the audience. There was a question and answer session after the presentation.

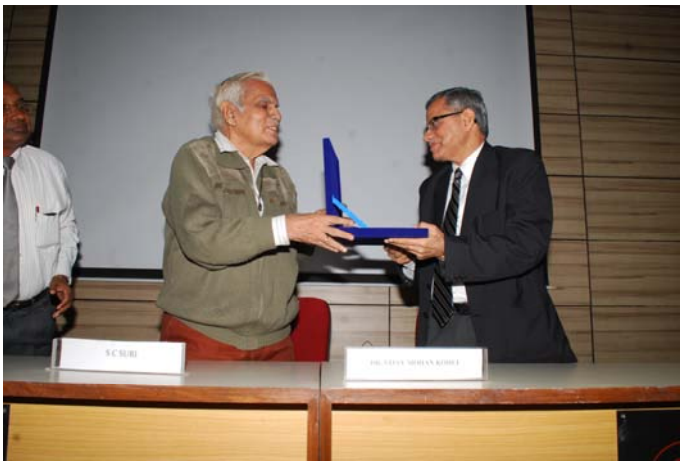
The talk was attended by IIM DC members and their family members.

The audience found the programme very interesting and informative.

Shri O P Gupta, Member, Executive Committee, IIM DC, proposed a vote of thanks to Dr Vijay Mohan Kohli and all the participants.

As a token of appreciation, a memento was presented to Dr Kohli by Chairman.

The programme concluded with lunch.



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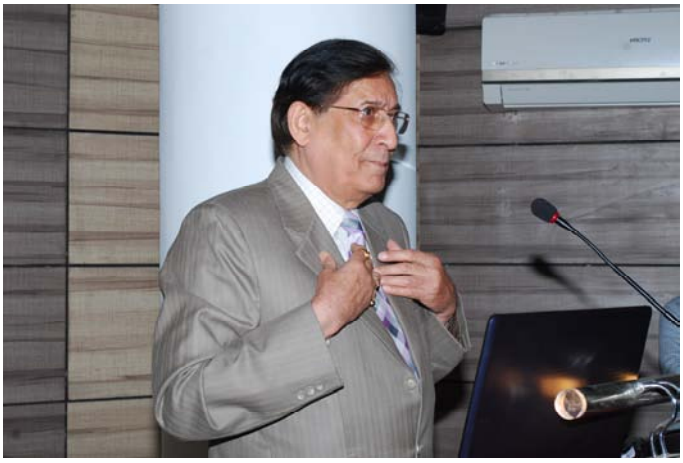
TALK ON CORPORATE GOVERNANCE

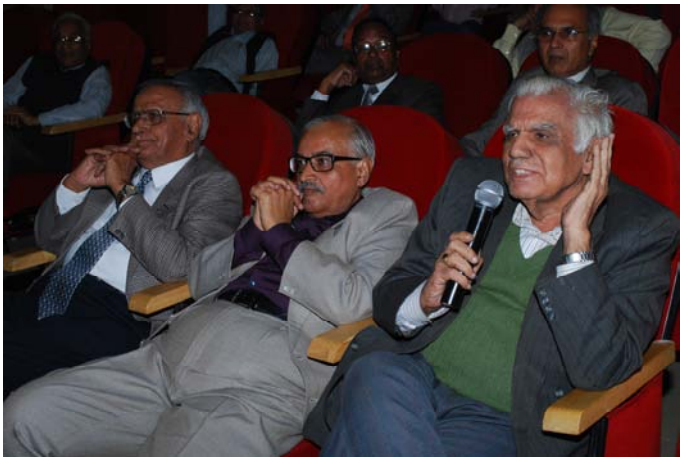
Today, the "Corporate Governance" is a buzz word in the corporate sector. A talk on this topic was organised at Delhi Chapter of IIM on 23rd November 2013.

Shri K L Mehrotra, Vice Chairman of the Chapter & Former CMD, Manganese Ore India Ltd (MOIL) delivered an exhaustive talk on the subject.



He stated that Corporate Governance plays an important part in the functioning of a company. The role of Corporate Governance has acquired a central stage in the running of a company after the unfortunate developments which took place in the companies like Enron, Lehman Brothers, Satyam, etc.

He informed that a company (whether listed or not) in India is required to have 50% of their directors as independent directors. Nominee directors of a company wherein the majority shareholding is of Government are not counted in the category of independent directors. The independent directors have to see that the interests of stakeholders of a company are protected. They have also to see that there is no breach of ethics in running of a company. He talked about the role of the Audit Committees in the functioning of a company. The Audit Committee is headed by an independent director. As a matter of fact, there is a majority of independent directors in the Audit Committee. The role of Audit Committee is defined and Do's and Don'ts are also indicated in the role.



The Corporate Governance consists of different factors. The Corporate Governance is measured by evaluating factors which are indicated in the Memorandum of Understanding wherein marks are assigned against each factor of Governance and at the end of the year, the score card is prepared taking into account the achievement of an enterprise against each factor.

Corporate Governance gives a lot of importance to Research & Development activities .The Corporate Governance also talks about the institution of Risk Management System and Whistle Blowing System in an enterprise .Corporate Governance is considered more as a compliance measure focussed on accountability.

The Corporate Governance also envisages Grievance Redressal Committee which is headed by an Independent Director. The Corporate Governance talks about competency building, commitment building, culture building and systems building.

The Corporate Governance has to ensure that the affairs of a company are conducted in a transparent and ethical manner keeping the interests of the shareholders and long term interest of society in mind. This also speaks about the timely disclosure and financial information about a company to the shareholders who are the ultimate owners of companies.

The talk on the Corporate Governance evoked a lot of interest in the audience. There was a question & answer session after conclusion of the talk. The programme was attended by about 30 participants.

The talk ended with a lunch.

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CONGRATULATIONS

Shri SC Suri, Chairman, Delhi Chapter of IIM, has been conferred the Honorary Membership of IIM. This honour was conferred to him by The Indian Institute of Metals, at Varanasi on 14th November 2013.

This award was presented to him to recognise his distinguished services and contributions to the metallurgical profession and industry and to the Indian Institute of Metals.

Shri Suri superannuated from SAIL, New Delhi, as Executive Director in 1995. During his tenure in various positions of SAIL, he played a leading role in the formulation of business strategies and their implementation. He acted as the coordinator of laboratory facilities for SAIL RDCIS and also headed the Centre for Engineering & Technology (CET).

He has published over 40 technical papers and authored a book on" Indian Steel Perspectives – 2025" and also a booklet on "Glossary of Iron & Steel Making terminologies". After his superannuation he was also associated with the Centre for Policy Research and the Minerals & Metals Trading Corporation of India (MMTC) as a Consultant.

He has been serving The Indian Institute of Metals since 1963-64 in various positions at its Chapters located at Durgapur, Ranchi and Delhi. He is also a member of the National Council of IIM. For the last few years he was actively involved in organising the International Conference on Metals, Minerals, Metallurgy & Materials (MMMM) which is held by Delhi Chapter of IIM every two years at Pragati Maidan, New Delhi.

Ours heartiest congratulations to Shri SC Suri on conferment of Honorary Membership of IIM which is the highest IIM award.