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# THE INDIAN INSTITUTE OF METALS
# DELHI CHAPTER

# NEWS LETTER

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## INTRODUCTION

This News Letter contains the write-ups on the following:

1 Interview of Shri Malay Mukherjee, CEO, Zamin Ferrous Ltd

2 Status of Re-rolling Industry in Punjab

3 Plant Visit to M/s Metso, Alwar

4 Holi-Milan get-together – A brief

5 Steel Industry Feeling Stress as Automakers Turn to Aluminum

6 Many National and International news items relating to Ferrous and Non-Ferrous Sector.

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## *Interview of Shri Malay Mukherjee Group CEO of Zamin Ferrous Ltd with Shri Tamajit Pain, Executive Editor of Steel Insights.*

***What do you think is the main problem being faced by the Indian steel industry currently?***

There is a gap between knowledge and expertise. India is targeting 300-350 million tons of steel production by 2025-2035 and inadequate attention is being paid to metallurgy as a stream. The huge gap between technological and managerial expertise required by the country in meeting its ambitious target needs to be bridged immediately. In the present global steel scenario, the world is looking towards India, Africa and Latin America for providing direction and support. The expertise of steel professionals from India has been fruitfully utilised in Mexico and several places across the world and they command respect across the globe. Steel professionals in India must make a master plan and create a roadmap for the development of the steel industry in India, taking into consideration the shortage of rich raw materials, environmental restrictions and present the same for the government's consideration.

***What strategies do you think the industry needs to adopt immediately?***

The industry has to start work on the process of using low grade iron ore with the help of adequate technology. Efforts should be undertaken to see how one can start using low grade ore. The tailings of NMDC, for example, have 58 per cent iron content. It is estimated that 120-130 million tons (mt) of such tailings are lying unused. Somebody has to take up this matter and see that these tailings could be used in a proper way. Also, large blast furnaces are coming up now-a-days. We have to attune ourselves to the new technologies to deliver proper results. Management styles also need to undergo drastic changes in these trying times.

***How far has India attuned itself to technology, specifically with regard to the use of low-grade ores?***

Today, we do not have the technology. Some of the prime steel mills are making some progress in this area but we still need do a lot in this area. It's a 'must have' for the industry to grow. I have been associated with a research wherein a prototype of a blast furnace, which can use up to 45 per cent iron content successfully to make steel, has been tested at a research institute in France. We have to look for such technologies for growth.

***Capacities are not coming up as planned by the policy makers. Also, there is lack of demand within the country. Where have we failed?***

For example, take the Rowghat project of Bhilai Steel Plant. In June 1992, I signed the agreement. Things have not happened still today! It's a combination of failures. At the time, when clearances

were being thought of, we failed to realise that we need to carry the ore from the mine to the mill. Discussion for railway lines started only in 2003-04. Unless we address issues speedily and get clearances urgently we won't get investors. It's not an issue of a lack of investments. A strong policy has to be in place and there will be investors. I am glad that unscrupulous miners have been identified and the Supreme Court has laid down guidelines for iron ore mining. I am now very optimistic about the country's raw material security. Once there is a definite policy in place, investments are bound to happen.

***China had been continually increasing its capacity. Oflate, there had been curbs in production. Do you think china will be able to consume its odd 800 mt production every year?***

I cannot vouch for 800 million tons. Its main consumption is towards urbanisation. This country has a target of bringing 30-31 million people under its urbanisation programme. Thus, 300-350 mt of the production goes in for urbanisation. And China will continue with this. I am told engineering exports make up 100-150 mt of steel consumption. Thus, you can see this makes up around 500 mt of consumption of steel. The rest must be going to infrastructure development. Also, China has many steel-intensive industries. Thus, we can pretty well say 650-700 mt of steel production is very much viable for China.

***How can the government help the steel industry in India?***

There is no quick-fix solution to the problem we are in. Policy-makers have to understand that the country will suffer if no progress is made by the steel industry. There is no infrastructure without steel. India is thinking of doubling its power production capacity. But 80 per cent of the power producing equipment is imported. Let me also say that the imports are not of high quality.

***Why have the steel industry's plans mismatched in India? What has China done right?***

Yes, the plans have mismatched. This is because there is no proper planning. I will give a small example from China. Around 10 years back, China, for producing 3 million tons, used to have manpower resources of 300,000. Recently, when I visited this country, I saw it is producing 15 million tons and the total employee strength within the plant is around 5,000! The rest of the employees are being engaged in other activities like logistics. This is what transformation is all about.

***What is the way forward for the Indian steel industry?***

You should not see the scenario as the result of just one key issue. All the issues need to be looked at. If you solve the raw material situation it does not mean the industry will start growing. Do we have the manpower to run the industry? We have to understand why the industry is not growing. It is not that it is not growing but we have not been able to increase the boundary of steel consumption. The per capita consumption in the rural areas is 12 kg when in the other areas of India it is over 60-100 kg. So there is a gap. That means, we have not been able to market steel products effectively. That is what needs to be worked on, to enhance the steel consumption intensity.

***Many primary steel mills are now branding their products. But there is a huge secondary market as well as many rolling mills which do not follow specifications. How do you see the situation, going forward?***

The problem had existed for a long time. However, this is not an issue anymore. The solution lies in implementing the proper standards. There had been many buildings built with unbranded and unspecified steel products. That is the reason why in cities like Mumbai there were house collapses till recently because of sub-standard materials. But let's look at it in a different way. There will definitely be a gap between the organised and unorganised sectors. And that gap is getting skewed and moving increasingly towards the organised sector. At the policy and regulatory levels, that gap needs to be removed.

***The steel industry is a major worry for banks now-a-days. They are topmost on the list of NPAs. In such a situation, how will the steel mills fund capacity expansion if banks refuse to lend to new projects?***

NPAs in the steel industry are definitely alarming. But a pragmatic view should be taken on this aspect by not painting all entrepreneurs with the same brush. It's not that entrepreneurs are not being

honest in their endeavours. And that honesty can easily be judged by the circumstances forcing them into not keeping their commitments. You may look at a company like Essar. It has a pipeline which is supposed to carry 6 million tons of ore. Its pipeline got sabotaged. Nobody could do anything. You can't keep on blaming it for the NPAs. Some were assured of gas supply but that is not forthcoming. So there has to be a different approach. The banks will tend to lose everything unless they provide the necessary concessions. For example, interest rates may not be applied for some time or payment can be kept in abeyance for some time. Measures like these need to be adopted. Otherwise, we are going to put in jeopardy at least 25 million tons of steel capacity.

***India recently turned into a net exporter, may be, because of the favourable currency?***
This is short-term phenomenon.

***Value-addition can be a way forward and can also increase exports. Manufacturing of special grades of steel can also decrease imports. What do you think?***
Let us look at galvanised coated products for automotives. Because of the sophistication of the category, these are imported. It is not that Indian producers cannot do the job. But it calls for investment and also securitisation of supplies. I was personally looking at this with the Japanese counterparts. The problem is, if nobody is ready to commit, why would you put in $100-150 million of investment unless the automotive companies say they will take 20,000 tons from you? This understanding will have to come from within the industry where the manufacturer will tell the consumer it will make the products the latter desires. Thus, there is a gap. The question is, will it take six months, one year, two year… all depends on the attitude of individuals in the management. But the good news is that it is happening, albeit, slowly.

***You mentioned that, in France, a prototype of a blast furnace has been tested which can utilise iron ore with 45 per cent iron content. Please elaborate.***
I was told this, I have not verified it personally. During 1947-52, all European blast furnaces operated with 40-42 per cent Fe content. At that time, there was no beneficiation and the region across Luxemburg, France and Germany was full of ore with 43-44 per cent Fe content. So, it is not something new for them. If the plant managers get hold of some of their old records they will see how it was done. I was running blast furnaces at Kazakhstan with 49 per cent Fe. Even today these are run with 49 per cent Fe. It is a question of the heat regime you keep, type of pores, kind of slag holes, if the design of the blast furnace requires two slag holes etc. Today, you might have a type of slag hole, tomorrow you might have to build two slag holes....

***Going forward, do you expect steel consumption to increase in India?***
As I said, we must enhance the base of people who use steel. In 1991 or 1992 we had done an exercise. Fencing, for instance. In the rural areas, fencing is important to keep off intrusion. Everything is done by cutting down trees. These wood fences last for 3-4 years and it takes about two men months to set them up. But if you build this with steel, it will last at least 25 years, will involve no man months and is economically cheaper too. Steel is cheaper in the long run but the consumer has to bear the initial cost. Bamboo fencing has been in practice since around 1991. At that time it was estimated, this will lead to consumption of about 9 million tons of steel. Today, it will be much more since the agricultural sector has improved since then. It's an exercise that you have to undertake on a larger scale. Look at Thailand, a small country, where the per capita consumption is higher than ours. This country has better roads and cultivation than ours.

Source: Steel Insights

## Re-Rolling Industry Scenario in Punjab

There is nothing left here," 52-year-old Ram Kishen states matter-of-factly, absently looking up at the smoke rising out of his makeshift chullah, meagrely fuelled with drying twigs. It reminds him of his hectic shifts at the steel mill. His wife died shortly after he was laid off two years ago, when the factory he worked in went out of business. The once-proud steel worker, who moved from Rae Bareli to Punjab's Mandi Gobindgarh town 35 years ago, lives on scant earnings doing odd jobs and spending

most of his time in a dank, 6x8 feet hovel for which he hasn't been able to pay the rent for months. Industry in Punjab is in the grip of a crisis and Ram Kishen's story is one of numerous tragic tales symptomatic of the crisis. Disclosures made by the Department of Industries & Commerce, Punjab, on January 31 in response to queries under the Right to Information (RTI) Act reveal that as many as 18,770 factories have been forced to shut shop over the past seven years. Information provided to Jasdeepak Singh, who heads the RTI cell at the Pradesh Congress office in Chandigarh, indicates large-scale shutdowns in the once-bustling industrial hubs of the state, including Amritsar, Jalandhar, Ludhiana, Mandi Gobindgarh, Batala and Kapurthala.

Mandi Gobindgarh, located prominently along the Grand Trunk Road (National Highway 1) between Ambala and Ludhiana, starkly demonstrates the malaise that seems to be afflicting Punjab's industrial sector. One of the oldest iron and steel hubs, in operation since the 1930s, and still counted amongst the most important ferrous metal markets in South Asia. Mandi Gobindgarh essentially comprised a dense cluster of some 450 induction furnaces, coal-fired foundries and rolling mills that churned out everything from ingot, construction steel, specialised high carbon steel to every known description of angles and channels. Motorists on the GT Road had routinely cribbed about the smog in the area but business was great and the 'Mandi', as locals call their town, had innumerable 'rags-to-riches' tales to tell. All that has changed, "The air here has become cleaner but the mills are literally being choked out of existence," says Jatin Sood, a 24-year-old mill owner who faces a daily challenge in keeping his father's two steel rolling units going. More than a third of the units in Mandi Gobindgarh's industrial cluster – between 150 and 170 steel factories (40 to 60 more than the 111 closed units acknowledged in the state government's response to the RTI query) – have shut down. Many have literally vanished. Others are beginning to rust amidst fading hopes of a miraculous rebirth. Some, repossessed by banks hoping to recover pending loans. And dozens more are on the verge of closure. Barely a furlong off the highway along the rutted road to Wazirpur, three former factory workers – Sukhram, Darshan Singh and Karnail Singh – have found temporary employment to dismantle APS International, a Rs 25-crore rolling mill that was set up less than five years ago but had to be shut down amidst mounting losses six months back. "Things are so bad that there are no buyers for the mill's machinery," says Rajiv Sood, 46, a factory owner himself and the incumbent president of the All India Steel Rerollers Association (AISRA). With no one prepared to set up new units, he says, APS International's perfectly good machines are being sold off as scrap metal in bid to cut losses.

### *Making Ends Meet*

Back along GT Road, the owners of another rolling unit, Bikaner Industries, evidently hope to make better earnings from a commercial complex on their prominently located lot. With the last of the mill's machinery carted away to be sold as scrap, teams of labourers are now engaged in excavating three feet of the factory floor. Raj Jindal, vice president of AISRA, explains: "Strapped for cash, the owners are trying to squeeze every last rupee from their dead mills. Over the years, the soil of the factory floor becomes rich in iron fragments and sells at ten times the price of ordinary earth".

### *The Big Story*

Many mill and furnace owners have moved on. An oxygen bottling unit on GT Road, for instance, is now a dairy with two dozen buffaloes while the once-profitable JK Mills is now part of AIPL, Ambuja's residential and commercial project, DreamCity, "The steel industry is terminally ill and on dialysis," says Jindal, who is struggling to keep his own re-rolling unit, Kalyan Industries on the Amloh Road, afloat. Besides reducing older workers like Ram Kishen to near destitution, the factory closures have led to a major migration of the steel town's workforce. Balmukund Mishra, 45, of Sultanpur, Uttar Pradesh, who started out as a wage labourer over 25 years ago and is now president of the Loha Factory Karamchari Union, estimates that as much as 60 to 70 per cent of the 100,000-plus workforce from Uttar Pradesh and Bihar has either migrated in search of work to Himachal Pradesh, Uttarakhand and Gujarat, or has headed home. "Aadhi dihadi to ghar pe bhi kama lenge (They know they can earn a half-wage closer home too)," says Ramchet Gaur, 47, who heads the Punjab Purvanchal Sabha. Punjab Pradesh Congress Committee chief Partap Singh Bajwa's February 3 news conference

claiming "the shocking shutdown of thousands of industrial units since the Shiromani Akali Dal (SAD)-BJP government came to power in April 2007" clearly has the incumbent state government in a bind. Industries Minister Madan Mohan Mittal, an old Punjab BJP hand, insists that the information handed out in response to congress's HTI query actually refers to industrial units that had shutdown in the seven years preceding 2007, five of which were under Amarinder Singh-led Congress rule. Punjab's Industries Secretary Vikas Pratap Singh adds that most of the information on closed units was drawn from the last all-India census by the Union Ministry of Micro, Small and Medium Enterprises in 2007-2008. Their contention may be partially correct, but the state administration, as reflected in its response to the RTI, appears clueless about the number of factory closures over the past seven years. For instance, scores of steel units that, according to Sood and Jindal, shut down in the last three years do not even find a mention in the government's response.

### *Taxing Times*

Aware that the industry's plight could fall victim to rival politics between the ruling SAD-BJP and Congress, Jindal, a BJP supporter, insists, "We are neither for Congress, nor BJP or the Akali Dal. Our only religion is to work for progress." Why then do things look so terrible in a state renowned for its entrepreneurial prowess?

Rajiv Sood says policies pursued by both the Centre and Punjab have led to the crisis. The problems began with New Delhi's 1995 decision to withdraw a freight equalisation scheme to compensate manufacturers in Punjab for transporting raw materials from source areas. The issue was compounded in 2003 when the NDA government excluded Punjab from the 10-year tax holiday extended to new industrial units in three contiguous states – Himachal Pradesh, Uttarakhand and Jammu& Kashmir. "In the old days, coal and sponge iron could be bought at the same prices it was available to factories in Bhilai. Today, we have to pay a freight of Rs 2,800 for every metric ton," says Jindal. The tax holiday in the neighbouring states that has now been extended for another five years makes it virtually impossible for local manufacturers to compete. Factory owners say their competitive edge in delivering better quality has been compromised by higher VAT and electricity tariff – higher than even Haryana, where arc furnaces pay just Rs 5.30 per unit compared to Punjab's Rs 6.33. Officials, meanwhile, blame local entrepreneurs for failing to add value to products. "Value addition is the key and moving up the value chain automatically renders sops redundant," says an industries department officer associated with framing Punjab's industrial policy. But the official admits the state has no scheme to assist small and medium units upgrade their technologies. "Here, it is every man for himself," says Amandeep Bhullar, 28, who builds rice shellers in Amritsar.

### *Tension in the Air*

Though there is reluctance in acknowledging the crisis, the government is concerned. In response to large-scale shutdowns in Mandi Gobindgarh, Deputy Chief Minister Sukhbir Badal announced a 50 per cent reduction in VAT on steel products on January 21, Earlier, at the Progressive Punjab industrial summit in December 2013, Sukhbir had unveiled a series of incentives to attract investments in housing, manufacturing, biosciences, agri-processing and infrastructure. As many as 124 MOUs, worth an estimated Rs 65,000 crore, were inked with Reliance, Infosys, Bharti Airtel, ITC, DLF and Hinduja Group among others. But industrialists point out that incentives being offered under Punjab's December 2013 'Fiscal Incentives for Industrial Promotion' will benefit new investors. "There is little to rescue existing enterprises." says Bhullar. Back in the steel town, owners of a closed Rs 40-crore mill allow access to their deserted premises on Nasrali Road strictly on the condition that it would not be identified, fearing this could scare away potential partners that could help revive the units. A small group of workers goes around inspecting the heavy machinery on a daily basis in the hope of restarting it one day. But with no rescue plan in sight, it is clearly a losing battle. This is where Ram Kishen used to work and quite like the closed mill, is now staring at a bleak future.

Source: India Today Group of Magazine

# Visit to METSO Alwar (22Mar.2014)
## – A Brief Review

The Indian Institute of Metals – Delhi Chapter regularly organizes visits to eminent industries in and around NCR, for benefit of its members. In this series, a team of IIM-DC members visited METSO Alwar, Rajasthan on 22March2014 on initiative taken by some of IIM-DC members. The visiting members went around various Production Shops, Design Office and modern facilities at Alwar, and had extensive deliberations with the senior officials. Senior officials took the trouble of personally making a presentation about different activities and taking around Team members & explaining working of different Units.

## METSO Corporation

METSO is a leading global engineering and technology corporation. METSO is also known for its advanced automation solutions for pulp, paper and power generation. The focus is on the continuous development of intelligent solutions that improve sustainability and profitability. Global net sales (2013) totalled over EUR 3.86 billion. Its 27 000 employees in more than 50 countries serve customers in the pulp and paper industry, rock and minerals processing, the energy industry and selected other industries.

METSO Materials Technology is part of METSO Corporation's business area Metso Minerals. Metso Materials Technology co-operates very closely with other Metso units in development projects concerning materials technology solutions.

## METSO in India

Metso's incremental expansion has led to a strong foothold in India where all segments enjoy the benefits brought by the large markets. Metso's strong presence in the country and positioning in the markets together with India's strong growth projections set the scene for future success.

Since the deliveries of the first paper machines in the 1980's to the inauguration of the latest multi-functional premises Metso Park in March 2010, Metso has been developing a strong relationship with India. Initially set up through a set of licenses and joint ventures, the company established itself independently in 1992, serving the Indian markets in the pulp and paper, mining, construction, oil and gas, civil engineering, and power industries.

With over 5 branch offices and 4 manufacturing units at Alwar (Rajasthan), Bawal (Haryana), Vadodra (Gujarat) and Ahmedabad (Gujarat), METSO employs over 1140 professionals in India (2012). In 2012, Metso's Indian operations recorded net sales of EUR 127 million and Metso's total sales to India were EUR 208 million. Metso continues to participate in India's infrastructure and industrial development through world-class manufacturing facilities, technological expertise and strong service support. Metso has an established network of over 27 sales and services locations in India.

Metso has set up the first Metso DNA Engineering Center in India for domestic and all global projects. The centre is the third engineering center after Finland and USA and will serve as the engineering hub for its global operations.

**Mining and Construction Segment**

Mining and Construction segment (MAC) is the fastest-growing customer segment for Metso in India. MAC operates in India with the legal name of Metso Minerals (India) Private Ltd. and is a market leader in India in several product groups, including mobile crushing and screening plants, grinding mills, pyro-processing, coal washing, bulk material handling systems, recycling and waste management solutions and services. Metso has delivered country's largest crushing and screening plant to Jindal Steel and Power Ltd. and the largest iron ore beneficiation facility to ESSAR steel. Over 40% of the aggregates for the Golden Quadrilateral Highway network is produced using Metso equipment.

**Automation Segment**

Automation segment (AUT) consists of Process Automation Systems, Flow Control and Services business lines. AUT operates in India with the legal name Metso Automation (India) Private Ltd. The main Indian customers in the AUT segment are served together by Metso Automation and the local energy sector equipment manufacturer BHEL. Metso and BHEL together control around 65% of DCS market in the Indian power industry with their patented product *Max DNA*. Metso Power has also entered the power generation segment in India with its first order of recovery boiler from Grasim Industries.

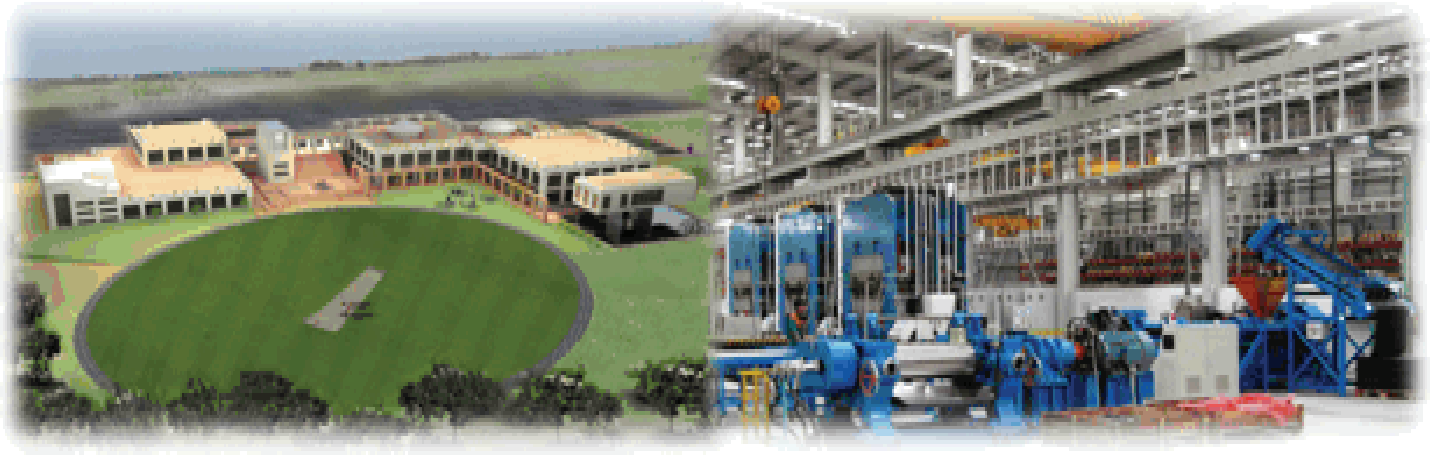
**Metso's strong footing in India**

Overall, Metso has a strong footing in India, with good references and a growing reputation. The expanding demand for Metso's products and services, coupled with the country's exceptional potential, form a good basis for future growth.

**METSO Park at Alwar**

Metso's single largest greenfield investment, "Metso Park" is a state-of the art facility situated in Alwar, Rajasthan. The facility started production in March, 2010, and paves the way for significant

operational and manufacturing presence in the sub-continent that caters to the growing demand for Metso's products across India and other rapidly growing markets in Asia Pacific.



Built with state of the art utilities, spanning over 78 acres Metso Park boasts of one of the highest standards in manufacturing in India. Some of the highlights

include water treatment and sewerage treatment plants, air compressors, steam boilers, electrical reticulation with 100% power backup, roads, footpaths, parking areas and street lighting. In March 2011, Metso Park gained IMS certification in three critical management systems: Quality Management System- ISO 9001: 2008; Environmental Management System - ISO 14001:2004 and Occupational Health & Safety System - OHSAS 18001:2007.

Metso Park is being developed in three phases. In the first phase, two factories were opened to produce slurry pumps and rubber products. The second phase, production of lokotracks, feeders, imapct crushers, NPs and vibrating equipment has started with two new dedicated factories.

| | |
|---|---|
| **Land area** | **3,15,092 $m^2$** |
| **Factory Area** | **33,732 $m^2$** |
| **Certifications** | **ISO 9001: 2008<br>ISO 14001:2004<br>OHSAS 18001:2007** |

## Interactions with Senior Officials of METSO India

Activities of IIM Delhi Chapter were discussed. Copies of IIM-DC Monthly Newsletter, IIM-DC Brochure and MMMM2014 Information were handed over. Senior as well as working level officials of METSO were invited to participate in various activities of IIM Delhi Chapter. They were also invited to participate in the Exhibition being organized at MMMM2014 Event during 04-07Sept.2014 at Pragati Maidan.


The visit to METSO, Alwar, ended with thanks to their senior officials for facilitating this visit.

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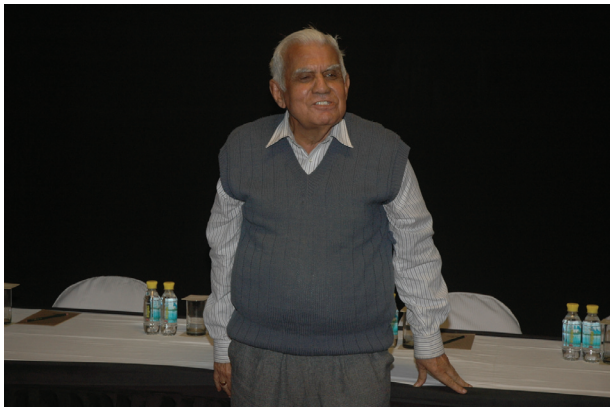
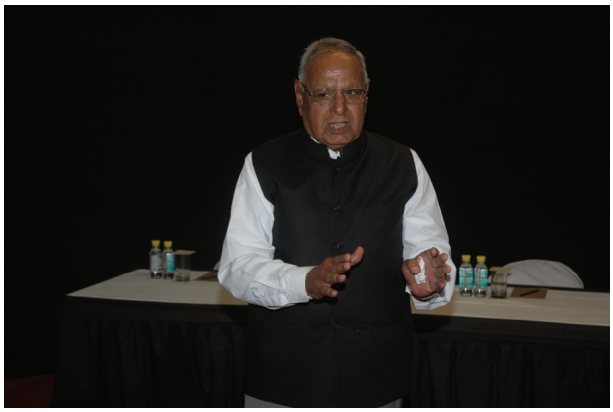
## HOLI MILAN GET-TOGETHER



The Delhi Chapter of IIM organised Holi Milan get together on 15th March 2014 at India Habitat Centre, New Delhi.

The members of IIM DC along with their families participated in the social get-together. The Chairman IIM DC welcomed the members and their families in the function.

Holi-Milan greetings were exchanged among the members and their families. Members of the IIM DC enjoyed the function through various jokes and anecdotes. Some family members recited poems in the function. The function enabled networking among members of the Chapter and their family members. The function was very much appreciated by the members and their families. As a matter of fact, some members stated that they always look forward to participate in the Holi-Milan get-together function with a lot of excitement.



About 50 members including their families participated in the function.

The function ended with a lunch organized for the event.

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## Steel Industry Feeling Stress as Automakers Turn to Aluminum

For nearly a century, Ford's River Rouge factory and its neighboring steel mill have worked in close harmony to produce some of America's most popular vehicles, from the Model A to the F-150 pickup truck. But ever since Ford announced that it would make the body of its new F-150 mostly out of aluminum, that steel maker, which was spun off by Ford in 1989, has faced the unsettling prospect that its longtime partner is drifting away. Carmakers' shift to aluminum has raised apprehension among steel makers, which have been fighting an increasingly uphill battle simply to maintain their business. Now, they are trying to respond, making lighter, stronger steel in a bid to retain one of their most important customers, the automakers. "The traditional view has been steel or nothing else," said Saikat Dey, chief executive of Severstal North America, the United States

### Addtions of the books in our Library

The Chapter conveys its sincere thanks to Dr. (Mrs.) Meera Batra, who was kind enough to contribute the following books to our Library.

1. Materials for the Third Millennium
2. Iron and Steel Heritage of India
3. Brazing Handbook
4. Advanced Welding Systems – Fundamentals of Fusion Welding Technology
5. Mechanical Metallurgy
6. Electric Furnace Steel Making

Dr. (Mrs.) Meera Batra is wife of Late Prof. N K Batra of IIT Kanpur.

The books are very informative and useful. The members may like to visit our Library for perusal of the books.

subsidiary of Russia's Severstal Group, which now owns the Rouge steel operations. "I think we all need to accept the reality that we live in a mixed-material world." Steel makers, which have been riding a wave of prosperity as the economy has recovered, have a lot to lose. Automakers account for about 20 percent of annual sales overall for American steel makers, the second most important source of revenue after the construction business, according to the Steel Marketing Development Institute. For those companies with historic ties to the auto industry, the loss would be more acute. At Severstal's Dearborn factory, for example, carmakers including Ford and others account for 70 percent of sales, the company said, though it declined to give specific figures for Ford. The shift to aluminum is gaining momentum. Automakers are under increasing pressure to meet strict new fuel-economy standards by 2025, and their use of lighter aluminum is expected to double between 2008 and 2025, according to Ducker Worldwide, a research firm in Troy, Mich. As a result, Severstal sees little choice but to move toward making advanced — and lighter — high-strength steel.

This year, it plans to make half a million tons more in its Dearborn facility than last year's run of 2.1 million tons. Part of that demand will come from the F-150, whose frame has increased its use of high-strength steel from 23 percent to 77 percent, a change that will save up to 60 pounds, according to Ford. The F-150 is a big turning point," said Andrew Lane, a metals analyst with Morningstar. "It's a bold effort by Ford." Other steel makers are changing their ways, too. United States Steel has invested $400 million in a joint venture with Kobe Steel of Japan to make advanced high-strength steel in a Leipsic, Ohio, factory expected to produce 500,000 tons annually. The consideration by carmakers of using more aluminum is actually opening up opportunities for producers of advanced steel, according to Jody Shaw, manager of automotive technical marketing at U.S. Steel. "It's those little changes that they're willing to accept that's creating an opportunity," Mr. Shaw said. Inside Severstal's steel mill on a cold January day, hissing heavy machinery removed oxides from steel sheets, reducing their thickness to the equivalent of five human hairs. "We're sold as a raw commodity, but we're built to specifications," said Jim Mortensen, Severstal's director of technical business development. "These are parts that are customized within one-hundredth of a millimeter." As steel becomes more advanced, Mr. Mortensen said, "the challenge is making it strong and retaining its formability." This batch of coils coming off the line is a high-strength, low-alloy blend that will most likely show up in the body structure of a Cadillac CTS sedan. At the coating factory next door, machines dip steel sheets to be used for body panels in molten zinc to protect them. These are headed for Mexico, to Navistar's stamping plant there.

Steel makers argue that they still have advantages in price — aluminum can cost as much as three times more — and flexibility, both for the manufacturer and the mechanic who will be fixing the car. "When you build a mass-produced vehicle, you really need to think about the consequences of the supply chain and repair and insurance costs," Mr. Dey said. But despite their confidence in some of their advantages, steel makers face an uncertain future, analysts say. Automakers are scrambling to meet demanding new federal fuel-efficiency standards that will require a fleetwide average of 54.5 miles per gallon by 2025, a significant boost from the roughly 25 m.p.g. that vehicles average today. When four major steel companies had quarterly earnings calls with analysts last month, "they all said as a constant refrain, 'Steel remains the material of choice for now,'" Mr. Lane said. "Looking out over the next five years, that could be a different story," Mr. Lane said, adding, "Aluminum is so much lighter, there's only so much the steel guys can do." Until now, automakers largely have tried to meet the fuel-economy mandates with smaller cars as well as slow-selling hybrid and electric vehicles. The challenge lies in continuing to provide the larger, and more profitable, vehicles that buyers want.

## Enter the new F-150.

"The heavier the truck, the more light weighting can be achieved by the switch to aluminum," Mr. Lane said. This is a battle that has played out before, notably when Audi introduced its mainly aluminum R8 sedan in 2007. Aluminum is also used in smaller quantities by Land Rover, Mercedes, Mazda and Tesla. General Motors uses aluminum in the hoods of its pickup trucks and full-size sport utility vehicles, as well as for components of the Cadillac ATS and CTS and Chevrolet Corvette

Stingray. The Detroit automaker said it planned to incorporate more lightweight materials in its next-generation pickup truck. "Sometimes there is a push from the aluminum side, and they win over with a particular model, and steel tends to be the comeback kid, with more innovation," said Felix Schuler, a Munich-based partner in the Boston Consulting Group's metals and mining practice. Over all, he said, it's a "healthy race." Ford said its new Mustang would have a hood, fenders and other components made of aluminum to reduce weight and improve fuel economy. "Our approach with any material is that we treat each vehicle on a case-by-case basis, applying the right material at the right time to improve efficiency and performance," said Said Deep, a Ford spokesman. Even before the recent interest in aluminum, steel makers confronted a threat from the use of plastic in body panels. The ill-fated Pontiac Fiero in the 1980s, for example, had plastic body panels, which helped save on weight but were not strong or rigid enough. What seems certain is that ordinary steel is likelier to lose out to its new and improved cousin than to aluminum, Mr. Schuler said. Advanced steel materials that are lighter, stronger and cheaper represent a middle ground between the metals.

"It could be in absolute terms one of the most winning materials," Mr. Schuler said of the new steel. But at the same time, demand from automakers for aluminum is soaring, expected to reach one billion pounds this year, up from 200 million in 2012, and to grow by more than 30 percent annually through 2020. Aluminum companies are making expensive bets on this future, building plants and reconfiguring factories to meet anticipated demand. So far, these investments are paying off: They are selling out their automotive capacity as fast as they can build it, according to analysts. Novelis is investing nearly $550 million to upgrade plants in Oswego, N.Y., and Nachterstedt, Germany, and to build a new factory in Changzhou, China, to triple its capacity from a year ago to 900,000 tons annually. It expects the auto industry to account for 25 percent of its business in two years, up from just 6 percent two years ago. Alcoa, the country's biggest aluminum producer, is investing about $670 million in its Iowa, Tennessee and Saudi Arabia facilities. But all eyes will be on how well the F-150 is embraced and whether a pickup made out of aluminum will be rugged enough in the eyes of consumers. Ford sold 763,402 F-150 pickup trucks last year; it has not given a 2014 sales projection. For Severstal, such competition from aluminum would have been hard to imagine, even 10 years ago. The River Rouge campus was the world's first experiment in automotive integration, and it provided the roots of just-in-time manufacturing, said Robert Casey, the retired curator of transportation at the Henry Ford Museum in Dearborn. "Henry Ford was a control freak, and he wanted to control as much of the manufacturing as possible," Mr. Casey said. "He made the steel, he made the glass, he made the tires." When Japanese automakers visited after World War II, Mr. Casey said, "they copied a whole lot of what was going on at the Rouge." Today, the factory is once again a leader in innovation, but this time, it is to see whether aluminum proves a viable material for body panels, he said.

Source: www.nytimes.com

## Global eyes target growth in India & US. China sidelined

China has suddenly been side-lined in review of global growth target for 2014-15. Staying in the limelight for a rapid growth in the steel sector for so many years, suddenly experts have started to feel that it's time for China to pull down the gears and look for some stabilization. Major groups of analysts and industrialists have shared an opinion with OreTeam, where they feel that India and US would be the main centers of growth and investment for 2014-15. Mainly picturing the steel sector, the experts believe that India would be a centre for Merger & Acquisitions (M&A) this coming financial year as India became the world's third largest steel consumer and has the prospects to take the second spot. There are problems related to raw material and costing and the best solution as per the experts is the M&A channel. Moreover, the M&A is based on key reasons like the survival of the smaller steel players would depend heavily on the local availability of resources and due to their absence, consolidation is expected in major growth centers across the country. In the last few years, companies focused on conserving cash, shedding un-productive operations, cutting costs and restructuring but now the signs are far different and expectations are totally fitting to support growth in the country. Automobile sales in India have remained dull and the construction sector was also keeping slow in the last year.

The beginning of 2014 has shown some improvement and chances of betterment in these sectors which is attracting a lot of interest. Going ahead, experts believe that the growth would pick up in these sectors and depending on the new government, the infra projects should also start showing up to increase the pace. Moving onto US, the ideology for 2014-15 points towards mild improvement. Steel demand will grow in the U.S. on the back of an improving global economy and the strong momentum in the automotive markets. The turnaround in the construction sector will definitely provide a much needed boost to steel. The improvements are clearly visible in the last 2-3 months since the steel companies have been raising their product prices due to an increase in demand, unlike India where the prices were rising due to the inadequate raw material. However, China's steel usage is expected to lose steam due to government's ongoing attempt to restructure the economy away from exports and towards domestic consumption. A slowdown in the real estate market and weaker infrastructure investment growth is likely to lead to slower growth in steel demand during 2014. China□s steel consumption is nearly 45 percent dependent on its real estate demand and a slowdown in this sector along with a weaker export realization, the extent of hardships being faced by the steel industry is unimaginable. Also, the Chinese provinces have adjusted their GDP growth target to a lower level this year due to the recent slowdown and environment problems concerning the steel industry. After the central government decided not to evaluate local government's performances based on GDP growth, about half of the provinces cut their 2014 GDP growth target to lower than 10% for slower but reasonable economic development. This would directly impact the steel consumption as lower GDP would mean weaker consumption. Also, with the companies now under no pressure of the local authorities to keep up production, there could be major cuts visible in the year. Big steel producers like Hebei, Jiangsu and Shan-dong provinces have cut their 2014 GDP growth rate by 0.6 to 1 percentage point, which will affect downstream steel demand and upstream production. This slowdown or cut down could hamper the growth of the country for some time but any strategic measures taken in this duration would definitely help China to strengthen its steel foundation and bounce back into the system. Overall, as the global economies are slowly coming into shape and development activities are picking up in various sectors, 2014-15 is likely to be a better year for the steel industry across the globe and mainly for India and US. The World Steel Association also expects continued recovery in steel demand in 2014 and projects global steel usage to in-crease 3.3% in 2014. Improving demand is also expected to perk up steel prices.

Source: www.oreteam.com

## SAIL records 7 percent sales growth in February

India's state-owned steelmaker, Steel Authority of India Ltd. (SAIL) recently indicated that its sales grew by 7 percent in February to 1.04 million tons on higher off-take from domestic and export markets. The country's largest steel maker had clocked sales of 0.974 million tons in the same month last year. Moreover, the production of sale-able steel in the reporting month also rose by seven per cent to 1.006 million tons from 0.94 million tons a year ago. "For the cumulative 11-month period, SAIL's concerted effort in increasing domestic sales as well as exports paid off as these grew by 8 percent and 33 percent respectively," SAIL said in statement. Furthermore, the cumulative sales during the April-February period rose to 10.877 million tons from 10.068 million tons in the corresponding period a year earlier. Moreover, the exports grew to 0.427 million tons from 0.320 million tons a year ago. "Consistent growth in sales over the last few months has given us the confidence of reporting a better outcome in the coming months, which will further pick-up with the expected strengthening of the market," SAIL Chairman Mr. C.S. Verma said.

Source: www.oreteam.com

## India's Steel Minister asks steel companies to set up rural stockyards

India's Steel Minister, Mr. Beni Prasad Verma recently asked the major steel companies, including state-owned SAIL, to set up stockyards in rural areas so that consumers save on time and cost of transportation. "We have asked leading steel players, including SAIL and RINL, to establish stockyards in rural areas for providing products required in construction and other applications. This will save time and cost of transportation for consumers and boost per man consumption," Mr. Verma recently stated. Indian per capita steel is barely 60 Kg as against the global average of 210 kg, while in China

it is around 460 kg. A Parliamentary panel on Steel and Coal in December had expressed disappointment over low steel consumption. A high-level panel had asked the government to issue necessary direction to all major steel producers to set up processing units and stockyards, particularly in rural areas, to boost the per capita consumption. Steel Minister said a few players have already begun setting up such stock-yards in rural areas. "Latest in this series of initiatives is the establishment of stockyards by Steel Authority of India Ltd (SAIL) and Rashtriya Ispat Nigam Ltd (RINL) in rural areas of Gorakhpur and Gonda," he said. "Taking this concept a step forward, it has been decided that the stock-yards would also have service centers in their premises, where small fabrication jobs could be carried out," he said. The service centers would facilitate small fabricators to manufacture steel products according to the needs of customers and at the same time pro-vide better infrastructure to small entrepreneurs, he added. India's steel consumption grew 3.3 percent, the lowest in three years, to 73.3 million tons in 2012-13 on subdued demand due to slackening economy and high interest rates. It grew by 5.5 percent in 2011-12 and 9.9 percent in 2010-11.

Source: www.moneycontrol.com

## Book Review on P V Indiresan – Ideas and Ideals

Prof. P V Indiresan (1928-2013) was a legend in his lifetime.

A Padma Bhushan Awardee, he was a Professor and Dean at IIT Delhi and Director, IIT Madras. He was President of the Indian National Academy of Engineering and of several professional bodies. He was also Chairman of innumerable number of committees. He wrote and spoke extensively on variety of issues of National importance.

Prof. Indiresan was a man of great vision, wisdom, spirit of service, courage, fighter for justice and a legend in his lifetime.

The publication describes the lifes sketch of Prof. Indiresan and the reforms and experiences of Prof. Indiresan at IIT Delhi and IIT Madras. The publication reviews some of the writings and articles of Prof. Indiresan.

Some of the quotes are as below:

- More than think tank and commentators, the government needs an executive that is far-seeing and unafraid to resist political pressures.
- The bureaucracy is often compared to elephant because of its size and cost, but, it is more accurately, like the khedda elephant that helps enslave the free ones.
- True capital for growth is not money; it is innovation
- Go and experiment fearlessly. Even if you make mistakes let those be your own original mistakes.
- The fundamental issue of reservation policy is whether the social justice can be sustained without social harmony.
- Whether social justice should imply that there shall be no institution at all in the country where merit shall be the criterion and also while the socially-deprives should have special privilages, the talent need have no right of their own...
- Some people are born with honours; some acquire honours and some have honours thrust on them.

Prof. Indiresan was a legend in his lifetime. He has sown the seeds of progress in the minds of many people whose lives he touched. As a visionary leader, he has shown the path – to be a better individual, to a better nation and a better world.

Rich tribute have been paid to Prof. Indiresan by Dr. A P J Abdul Kalam (Former President), Dr. Manmohan Singh (Prime Minister), Mr. V S Sampath (Chief Election Commissioner), Prof. M S Swaminathan (Member of Parliament).

(A compilation by Prof. V S Raju and Prof. Jaya Indiresan)

(Reviewed by Shri S C Suri, Chairman, IIM DC)

## China Steel projects 2.5 percent increase in output in Q2

China Steel Corp., Taiwan's largest steel maker, recently indicated that its output for the second quarter will rise about 2.5 percent from the previous quarter on increased orders. The increase in orders is being driven by China Steel's decision to raise its domestic wholesale prices for April-May contracts, market analysts said. In late February, China Steel announced an increase of NT$78 (US$2.57) per metric ton for domestic wholesale delivery for the April-May period, a 0.37 percent average hike from March delivery, citing a better outlook for global demand. Company stated its second-quarter output will not be affected by the closure of its No. 1 furnace since March 1 for annual maintenance or by similar action on its No. 2 furnace immediately after the first one reopens. China Steel further indicated that the annual maintenance of its first and second furnaces will be completed by the end of the second quarter, which means its four furnaces will be in operation in the second half of the year to meet rising market demand. Latest price hike by China Steel followed its average 1.2 percent price increase for March delivery and similar moves by some steel makers in China. China Steel is expected to become more profitable in the second quarter on the back of its price hikes. The steel maker generated more than 60 percent of its sales from domestic shipments last year. In January, China Steel posted about NT$1.50 billion (US$49.50 million) in pretax profit, up from NT$1.44 billion in the same period of last year, and also higher than its NT$1.18 billion recorded in December.

Source: www.moneycontrol.com

## SAIL to increase international presence – Report

Economic Times reported that exports by SAIL are likely to go up in coming years, a high level panel has asked the state run PSU to look into possibilities of strengthening presence in international market by setting up offices abroad. The Parliamentary Standing Committee on Steel and Coal has said that SAIL maintains a strategic presence in foreign markets and has been exporting around 3% to 5% of its saleable steel production during last few years. With higher production capacities of SAIL plants post expansion and modernization, share of exports is likely to go up in future. The Kalyan Banerjee headed panel in its latest report has asked the Steel Authority of India to explore the possibility of opening international marketing offices in order to increase its presence in the global market on the pattern of Rashtriya Ispat Nigam Limited. The panel said that RINL products are well accepted in the international market. In order to tap new market, RINL is proposing to open its first international market office at World Trade Centre at Colombo, Sri Lanka.

Source: Steel Guru

# Steel Industry Stock Outlook: March 2014

### *Steel: The Measure of Economic Progress*

Steel can be rightly termed the basic building block of modern society given its usage in almost every sphere -- ranging from buildings, vehicles, machines or even a tin can that preserves food. The industry's fortunes are dependent on the growth of its user industries, namely, automobiles, consumer durables and infrastructure. The volume of steel consumed has thus been the barometer for measuring development and economic progress. Increasing modernization in the 21st century has led to a doubling of global steel production from 851 Mt (million tons) at the turn of the century to 1,607 Mt in 2013. The size notwithstanding, the industry remains relatively fragmented. It is also highly cyclical and intensely competitive. In the past two years, the continuing Euro-zone problem, economic stagnation or slow growth in developed economies and a cooling of emerging economies took a toll on the industry. Growth in the Chinese economy, which in recent years has been one of the main demand drivers for steel, slowed down. Overcapacity has also been a perennial problem. Stiff competition in the United States from cheaper imports and from domestic producers with new or expanded facilities continues to result in significant oversupply of steel compared to demand. However, as urban population increases worldwide, so will the need for steel to build skyscrapers and public-transport infrastructure. Emerging economies will also continue to be a major driver of demand due to the huge amount of steel required for urbanization and industrialization. The demand for steel is thus expected to remain strong in the years to come.

## ***Global Production: Up in 2013, Starts 2014 on a Tepid Note***

As mentioned above, world crude steel production was 1,607 Mt in 2013, reflecting a 3.5% annual climb, led by increase in Asia and the Middle East that helped counter the declines elsewhere. China was once again the leading producer of steel, contributing a record 48.6% of the global output at 779 Mt, a 7.5% annual rise. Production in Japan, the second largest producer, increased 3% year over year to 111 Mt. The United States held the third spot, producing 87 Mt of crude steel, which declined 2% annually. India commanded the fourth position with a production of 81 Mt, up 5% year over year. Production in Europe declined 1.8% year over year to 165.6 Mt of crude steel in 2013. Even though production in Europe declined in for the full year, the fourth quarter registered the first positive year-over-year movement since the fourth quarter of 2011. However, the steel industry sputtered in the New Year with world crude steel production declining 0.4% to 130 Mt in January. China was a drag with a 3.2% decline due to the slowdown in industrial activities during the Chinese Lunar New Year holidays. Japan increased 6.1% while production in India remained flat. Production in the U.S was down 0.5%. Europe outshined the other regions with a 7.3% rise in production, continuing the positive momentum witnessed in the fourth quarter of 2013.

## ***Capacity Utilization Below 80%***

The average capacity utilization ratio in 2013 was 78% compared with 76% in 2012. Despite the global rise in supply in 2013, total capacity utilization remained stubbornly below the 80% level throughout the year. The crude steel capacity utilization ratio in Jan 2014 was 74.4%, 2.5 percentage points lower year over year, but up 0.2 percentage points sequentially.

## ***Steel Prices - Drivers & Trends***

Steel prices are generally volatile owing to the highly cyclical nature of the global steel industry. Rising raw material prices have a direct impact on steel prices. Furthermore, overcapacity, a glut in cheaper Chinese steel imports, economic conditions and shifts toward other substitutes significantly impact steel prices. This was what affected steel prices in 2013. The oversupply of steel due to imports from China in the market outstripped demand. Add to this, the situation in Europe and tempering growth in Asia, kept prices in check. The lower steel prices have affected margins of major steelmakers including ArcelorMittal (MT), United States Steel Corp. (X), Nucor Corp. (NUE) and AK Steel Holding Corp. (AKS) for major part of the year. A sustained downside in steel prices will materially affect the margins of steel companies. We believe that the recovery in pricing momentum will be driven by a reviving economy, stabilization in the Euro-zone and a rebound in construction activity in the developing countries, in particular China, India and South Korea.

## ***Raw Material Trends***

The primary inputs for the steel industry are iron ore and coking coal, as well as coke, scrap, alloys and base metal. The industry also uses large volumes of natural gas, electricity and oxygen for its steel manufacturing operations. The cost of iron ore is crucial as it directly affects the price of steel. Iron ore prices had an overall good run in 2013 thanks to Chinese demand. China is currently the largest producer of steel and consequently the largest consumer of iron ore, accounting for around 60% of the global seaborne market. Recently, in Feb 2014, iron ore price has fallen below the level of $120 a ton for the first time since July last year. This was triggered by reports that the Chinese government and banks are intending to curb lending to the property market and cut down steel capacity. China's property sector consumes almost 45% of the country's steel and thus is a key driver of iron ore prices. After a strong spell last year, demand for steel will moderate as the Chinese government targets the real estate sector. In the next few years, a wave of new supply of iron ore is slated to hit the market as large players such as BHP Billiton Limited (BHP), Vale S.A. (VALE), Rio Tinto plc (RIO) and Fortescue Metals Group Limited (FMG.AX) are going gung ho with their expansion plans to augment iron ore production capacity. Brazil and India will also step up their exports. In case this excess supply is not matched by adequate demand, it will expose the market to the risk of a decline in prices. On top of this, a less bright outlook for China's economy will put iron ore prices under threat. We believe the fate of iron ore prices now mainly hinges on Chinese demand.

## ***Consolidation & Divestitures***

Mergers and acquisitions (M&A) have remained an important growth strategy in the steel industry, leading to additional steel capacity, production efficiency and economies of scale. However, consolidation was minimal in the past two years, given the economic uncertainties. Companies focused on conserving cash, shedding unproductive operations, cutting costs and restructuring. ArcelorMittal, the world's largest steelmaker by volume, sold its 15% stake in iron ore mines in Canada for $1.1 billion to a consortium that included South Korean steelmaker POSCO (PKX) and Taiwan-listed steelmaker China Steel. The divestiture is in line with the company's effort to get rid of production overcapacity in Europe as well as to reduce its debt. Despite its strategy of growing through acquisitions, ArcelorMittal had suspended M&A activity in 2008 and 2009. After the notable acquisition of Baffinland Iron Mines in 2011, ArcelorMittal resumed acquisitions in Nov 2013 by announcing the acquisition of ThyssenKrupp Steel USA from ThyssenKrupp AG (TYEKF) through a joint venture partnership with Nippon Steel & Sumitomo Metal Corporation (NSSMY). The acquisition will complement ArcelorMittal's existing operations in the United States and strengthen its product offering. ThyssenKrupp, one of the top 20 steel producing companies in the world and the biggest steelmaker in Germany, is undergoing a radical restructuring in which it is trying to sell assets to slash debt. The sale of the loss-making Steel Americas business will allow the company to focus on its core Steel Europe and engineering assets. We expect M&A activity to remain slow in 2014 until prices stabilize and the industry strikes a balance between supply and demand. Going forward, the abatement of the Euro-zone crisis, recovery in the U.S. and Chinese economy will determine the fate of such deals. M&A activity is expected to go up in the Indian steel industry. The country has become the world's third largest steel consumer and has the prospects to take the second spot.

## ***Q4 Scorecard, Sector-wise***

Top and Bottom Line, So Far So Good: We are in the last leg of the fourth quarter earnings season. 92% of the companies in the sector have already reported their financial results. Earnings increased 30% while revenues edged up 1.4%. In fact, the basic materials sector has displayed an upbeat beat ratio (percentage of companies coming out with positive surprises) this quarter. Major surprises came up during this reporting season, leading to a rekindled interest in the so far faltering steel sector. After incurring losses through the major part of 2013, some notable steel names like United States Steel and AK Steel Holding returned to profit, delivering solid earnings surprises of 203.85% and 80%, respectively.

## ***Projections for 2014 and 2015***

Taking into account all the companies yet to report fourth-quarter results, earnings of the Basic Material sector are expected to increase 21.4% in the quarter. For 2014, earnings at the sector are expected to grow at a rate of 1.6% in Q1, then 16.5% in Q2 and 12.4% in Q3. Overall, in 2014, the sector's earnings are projected to grow 10.5%. In fiscal 2015, the growth will accelerate further to 15.4%.

## ***Industry Ranking: Overall Negative***

Within the Zacks Industry classification, the steel industry falls under the broader Basic Materials sector (one of 16 Zacks sectors). We rank all of 260 industries in the 16 Zacks sectors based on the earnings outlook for the constituent companies in each industry. This ranking is available in the Zacks Industry Rank page. The way to align the ranking and outlook from the complete list of Zacks Industry Rank for the 260+ companies is that the outlook for the top one-third of the list (Zacks Industry Rank of #87 and lower) is positive, while the outlook for the bottom one-third (Zacks Industry Rank #174 and higher) is negative. The steel producers, steel specialty industry and the steel-pipe and tubes producers are currently in the bottom tier with a respective Zacks Industry Rank #202, #254 and #256. This indicates a bearish outlook for the industry. Please note that the Zacks Rank for stocks, which are at the core of our Industry Outlook, has an impressive track record, verified by outside auditors, to foretell stock prices, particularly over the short term (1 to 3 months). The rank along with Earnings ESP helps to predict the probability of earnings surprises.

***What's in Store for the Industry?***

The overall scenario is expected to improve in 2014. Steel demand will grow in the U.S. on the back of an improving global economy and the strong momentum in the automotive markets. The turnaround in the construction sector will definitely provide a much needed boost to steel. China's steel usage is however expected to lose steam due to government's ongoing attempt to restructure the economy away from exports and towards domestic consumption. A slowdown in the real estate market and weaker infrastructure investment growth is likely to lead to slower growth in steel demand during 2014. India on the other hand will pick up pace. Demand in Japan will also increase due to rebuilding activity in the major earthquake affected areas. Tokyo is also gearing up to host the 2020 Olympic Games.

Macroeconomic conditions in the Euro-zone began to stabilize in 2013. The momentum has continued into 2014. After two years of contraction, steel demand is likely to improve thanks to a rise in demand from the automobile sector and recovery in the construction sector. Overall, with the global economy gradually on the mend and activities picking up in automotive and construction, prospects look bright for the steel industry this year. The World Steel Association expects continued recovery in steel demand in 2014 and projects global steel usage to increase 3.3% in 2014. Improving demand is also expected to perk up steel prices.

Source: Investing.com

**Steel demand in India to remain high: Tata Steel**

Steel demand in India is expected to remain high, derived by strong fundamentals and the sector is expected to see an investment to the tune of about INR 2 lakh crores in coming years, Tata Steel recently indicated. "Small per capita consumption will be a major growth driver and India will need to add substantial steel capacity in coming years. More than INR 1,500-2,000 billion is expected to be invested in the steel sector over the next 6-7 years," Tata Steel has said in a presentation to Ministry of Mines. Small per capita consumption will be a major growth driver, it said. Tata Steel, which is among the top-10 global steel companies also said the projected capacity addition "is expected to generate 3-4 millions jobs by the year 2017." India's per capita steel consumption is just around 60 kg, as against the world average of over 210 kg, and 460 kg in China. The country's steel consumption grew 3.3 percent, lowest in three years, to 73.3 million tons in 2012-13 on subdued demand due to slackening economy and high interest rates. It grew by 5.5 percent in 2011-12 and 9.9 percent in 2010-11. In the presentation, "Potential Areas for Technical Co-Operation in Underground Coal Mining," Tata Steel also said that the steel industry is an important contributor to Indian economy. "Steel industry is the second highest contributor to excise revenues (8 percent) after oil and gas," it said. Tata Steel Group with an annual crude steel capacity of over 29 million tons per annum is the world's second-most geographically-diversified steel producer with operations in 26 countries. It has a turnover of USD 24.82 billion in FY 13. Its Jamshedpur facility comprises of 9.7 million tons per annum (MTPA) crude steel production facility. Besides, three new greenfield steel projects in Odisha, Jharkhand and Chhattisgarh are underway to augment production capacity further by 23 MTPA.

Source: www.oreteam.com

**Steel sector may witness temporary over-supply: Mr. C. S. Verma**

With around 50 percent capacity increase in the offing, India's steel industry is likely to face a temporary over-supply situation, as suggested by SAIL's Chairman Mr. C.S. Verma. "Substantial capacity additions are lined up in the next 1-2 years in the country taking the capacity from the current level of around 90 million tonnes per annum (MTPA) to around 135 MTPA by 2015-16," he said. The rise in production may lead to a "temporary phase of over-supply," he said adding, this is because "typically the increase in capacities is in spikes, whereas the increase in consumption follows a relatively smoother trajectory." Almost all the leading steel producers in the country have been jacking up capacities, anticipating a boost in demand with an estimated USD one trillion to be invested in the infrastructure space during the current Plan Period. On the other hand, the demand has not been rising on the expected lines. During the April-February period of the current fiscal, India's steel consumption expanded by just 0.7 percent to 67.253 million tons (MT) over the same period last

fiscal, mainly due to slow economic growth. Typically steel consumption rises by 1.1 times of the GDP growth rate for an economy. It remained largely subdued so far in the current fiscal considering India's slow GDP growth. India's economy grew below expectations at 4.7 percent in October-December on falling output in the manufacturing sector. The country's GDP had expanded 4.8 percent in the July-September quarter and 4.4 percent in April-June period. Growth in the first nine months (April-December) was at 4.6 percent. Increased capacity and subdued consumption might lead to more ex-ports. In the first 11 months of the current fiscal, India's steel exports were up by 8.1 percent at 5.045 million tons. Imports on the other hand, saw a 31.1 percent decline during the period.

Source: www.oreteam.com

**SAIL chairman Mr CS Verma sees bright future for Indian steel industry**

PTI reported that Steel Authority of India Limited believes the future of the Indian steel industry is bright as India's per capita consumption is low and the government is planning to increase infrastructure spending. India's per capita consumption has increased to 59 Kg in 2012-13 but per capita consumption in rural areas accounting for about 70% population is approximately one fifth of the national average at 12 kg as compared the world average of 216.9 kg presenting huge opportunity. Mr CS Verma chairman of SAIL told PTI "The future of the Indian steel industry is indeed very bright and there are several enablers which indicate this and includes low per capita consumption and government's plan to hike infrastructure spending." Stating that government plans to increase infrastructure spending from the current 5 per cent of GDP to 10 per cent by 2017, he said India is committed to investing $one trillion in infrastructure during XIIth Five Year plan. He added "Taking 15 per cent as steel component in the total investment, then it can generate additional demand worth $75 billion of steel in the next few years or USD 15 billion worth of additional demand a year or in terms of quantity, an additional demand of 18.75 million tonnes per annum." He also said "Besides, the National Manufacturing Policy envisages the share of manufacturing in GDP to increase from 14% in 2012-13 to 25% by 2025 with manifold increase in steel intensity translating into finished steel consumption of 230-255 MTPA by 2025."

He said "All these augur well for the steel industry."

Source: Steel Guru

**SAIL aiming for 1 million tonnes steel export in 2014-15**

Business Standard reported that buoyed by nearly 30% rise in exports in 2013-14, Steel Authority of India Limited aims to more than double the shipments to 1 million tonne next fiscal docking special quality products from its expanded capacity. SAIL, which has been largely catering to domestic market instead of pushing exports, started overseas shipments vigorously since the beginning of the current fiscal to tide over the subdued demand at home and arrest the impact of the rupee's fall against the US dollar. A company official said that this has yielded results with exports clocking nearly 30% growth at 0.475 million tonnes in the current fiscal over last fiscal and going by the momentum, we hope to achieve 1 million tonne exports next fiscal. During 2013-14, SAIL's export basket consisted of wire rods, HR coils, CR coils, stainless steel and billets & blooms to around 18 countries including Saudi Arabia, Canada, Indonesia and Vietnam. The basket got bigger with the company commencing exports of slabs produced by its Rourkela Steel plant. Plates from the Bhilai plant were also exported directly to project customers in SE Asia for the first time. The export product mix in 2014 to 2015 will be qualitatively enriched with special quality products coming from the newly commissioned mills at ISCO Steel Plant and Bokaro Steel Plant.

Source: Steel Guru

**SAIL plans to expand to 50 million tonnes – Report**

Times of India reported that setting the hot metal production target to 17 million tonnes for 2014, the Steel Authority of India Limited is set to catch up with the government's steel vision for 2025, which envisions the annual crude steel production to touch the 300 million tonne mark from the present 90 million tonne per annum. Mr CS Verma CMD of SAIL said that "To achieve the 300 million tonne per annum target by 2025, SAIL will increase its annual production to 50 million tonne per annum. The

target for calendar year 2014 is around 12% to 14% higher than the present production. Achieving the target set for 2025 is a daunting task requiring huge investments and mobilization of funds." Mr Verma said that "We have no plans to come up with new plants, but the process of capacity expansion of the existing seven state owned units will continue in a phased manner, the Rourkela Steel plant, ISCO Burnpur and Bhilai Steel Plant have already been revamped." He said that "Once the present modernization and capacity enhancement programme is accomplished, SAIL will have 24 million tonne per annum production capacity, thereby requiring another 26million tonne per annum capacity addition in the next 12 years." Mr Verma said that "By the time we achieve 25 million tonne per annum production, the requirement of iron ore would be 42 million tonne per annum. Whereas by the time our production reaches 50 million tonne per annum, the requirement for ore would be around 80 to 85 million tonne per annum for which sufficient reserves are present."

Source: Steel Guru

## Steel industry heads for shake-out

*Nearly three-fourths of the listed steel firms trading at a big discount to their enterprise value.*

The steel industry is ripe for a shake-out. Nearly three-fourths of the listed steel makers are trading at a big discount to their enterprise value and debt on their books, putting them in debt trap. Most stressed are medium and small size firms that expanded aggressively during pre-2008 boom funded through debt. For example, Chhattisgarh-based Monnet Ispat's market capitalisation of Rs 480 crore is just 5 per cent of its total debt at the end of FY13. Odisha-based Adhunik Metaliks' market value is now down to Rs 364 crore against its total debt of around Rs 5,000 crore. It's even worse for Varun Industries that came out with its initial public offer in 2007. At its current stock price, the company's market capitalisation is now less than one percent of its total debt, making it financially insolvent. (See table)At operating level too, most of these companies are grappling to make two ends meet. Poor steel demand and fall in realisations has led to a sharp decline in operating profits while interest payment continue to mount. In the first nine months of FY14, interest outgo ate-up near two-third of Adhunik Metaliks operating profit. The ratio is one-third in case of Monnet Ispat, while Electrosteel Steel reported operating losses against interest obligations of Rs 128 crore during April-December 2013 period. Mumbai-based Mukand operating profit fell short of interest payments.

**ON THEIR METTLE**

| FACING HEAT | Mkt Cap EV* (%) | Mkt Cap to Debt (%) | Total Debt | Market Cap | Net Sales | (₹ crore) Net Profit |
|---|---|---|---|---|---|---|
| Jindal Stainless | 5.44 | 5.7 | 11,600.6 | 658.97 | 11,304.7 | -660.2 |
| Monnet Ispat | 5.75 | 5.5 | 8,606.5 | 477.27 | 2,065.9 | 221.8 |
| Electrosteel Steel | 9.61 | 10.5 | 7,150.1 | 750.05 | 163.1 | -280.0 |
| Adhunik Metal | 6.93 | 7.4 | 4,941.1 | 364.33 | 2,960.5 | 87.2 |
| Visa Steel | 7.02 | 7.4 | 2,356.9 | 174.9 | 1,019.2 | -236.6 |
| IN COMFORT ZONE | | | | | | |
| SAIL | 55.3 | 101.0 | 22,540.5 | 22,759.22 | 45,087.2 | 2468.2 |
| JSW Steel | 51.8 | 98.4 | 21,346.0 | 21,010.3 | 38,209.7 | 1,144.14 |
| Jindal Steel | 47.9 | 91.2 | 24,618.2 | 22,439.62 | 19,806.8 | 2,855.26 |
| Kalyani Steels | 53.3 | 109.6 | 218.1 | 239.04 | 809.1 | 23.87 |
| Pennar Inds. | 67.3 | 149.5 | 163.2 | 243.97 | 1,156.3 | 41.78 |
| All Companies** | 36.7 | 52.6 | 247,131.0 | 129,930.7 | 356,837.5 | 2,915.36 |

* Enterprise value (Market Cap + Gross Debt – Cash & Equivalents) at the end of FY13
** All 98 steel companies with Market Cap of ₹100 crore and more as on 3 March 2014
Source : Capitaline Compiled by BS Research Bureau

At the end of FY13, 98 steel makers with market capitalization of Rs 100 crore and more were cumulatively sitting on total debt worth Rs 2.5 lakh crore against their combined market capitalization of Rs 1.3 lakh crore. Over three-fourth of the industry's market cap is accounted for by top four steel makers – Tata Steel, JSW Steel, SAIL and Jindal Steel and Power. Their share in industry's revenues and debt is however much lower at around 55 per cent and 66 per cent respectively. Experts say the widening gap between market value and assets on ground (enterprise value) makes smaller companies ripe candidates for acquisitions by larger peers. Best acquisitions targets are those that either produce value added products or have access to raw materials. "A company which is into

speciality products are good acquisition targets as it would enable acquirer to strengthen its forward integration," said Vikram Dhawan, director-wealth management, Equentis Capital. A case in point of JSW Steel's recent acquisition of 50 per cent stake in Vallabh Tinplate that gave former an entry in tinplate segment. Similarly in 2010, JSW Steel acquired Ispat Industries making an entry into value added products such as galvanised steel, colour coated steel and cold rolled steel among others. In late 2012, Uttam Galva acquired majority stake in loss making Lloyd Steel for Rs 257 crore to emerge an integrated manufacturer of value added steel. Lloyd Steel since renamed to Uttam Value Steel makes HR coils using pig-iron sourced from Uttam Galva.Lenders are also encouraging take-over in the hope of recovering their money stuck-up in loss making firms. "The steel sector is under stress no doubt, especially the small and medium sized companies. Take-over by larger companies is one of the many options that we are looking at while restructuring their stressed balance sheets," said an official from Indian Overseas Bank.

However, it's not an easy choice for the acquirer, given an oversupply in the domestic steel market. "If the company makes intermediate products then the acquirer will assess the upfront cost of acquisition against post-acquisition investment in turning around the operations and the additional debt that it added to their books," said Abhisar Jain, analyst with Centrum Broking. Uttam Glava Steel for instance plans to invest Rs 380 crore in turning around Lloyd Steel operations. Some of the small companies are profitable at operating level but are saddled with huge debt, while some others have valuable asset but is making losses at operational level. In such cases acquirers will have to look into financial restructuring of these companies or improve their operati onal performance to turn them around. Experts say that companies like Usha Martin, Uttam Galva, Electrosteel Steel, Godawari Power and Visa Steel among others seem to be some of the ripe candidates for such acquisitions as they either have good assets or they are doing well at the operational level. "A lot depends on the business model of the small company. If the company has some raw material linkage then an acquistion makes sense as it will strengthen the back-end of the acquirer else it will just add capacity without any raw material to feed it," said the official with Ernst & Young.

Despite the availability of suitable candidates for acquisition, shutdowns more than take-overs is the fate of smaller companies in near future, industry officials said. "There is already an overcapacity in steel at present plus investment is also stalled. In such a scenario acquistions may not happen," said Revathi Kasture head-macro industry research of CARE Ratings."All big companies are engaged in their own capex. There is no one to acquire these small companies," said Jain of Centrum.

Source: Business Standard

## Indian mines ministry against cap on production of minerals

Even though Justice M B Shah Commission and the environmentalists in the State have raised concern about limited iron ore resource, the Union Mines Ministry, putting to rest all such worries, has clarified that 'mineral resources are likely to be augmented further in Goa for preserving the asset for future generation'. The iron ore rich state still has a resource balance of about 1,150 million tonne. Ascertaining that the ore resource would be augmented, the Ministry has refused to put any cap on production of minerals solely on the basis of reserves and resources claiming that the capping would not be in the interest of growth of mining industry. Union Mines Ministry has drafted 25 pages updated action taken report on Shah Commission' inquiry reports taking into account the comments received from the Ministry of Coal, Department of Commerce, Department of Legal Affairs, Union Ministry of Environment and Forest, Ministry of Shipping, Ministry of Steel and Goa government. Ministry has pointed out that earlier, exploration was upto 50 to 60 meters depth, whereas, the Goan ore, primarily vein type is deep seated. Therefore with advances in technological intervention in exploration, which is an ongoing process, iron ore resource is likely to be augmented further. It has said that the reserve of Hematite iron ore in Goa in 1971 was 396 million tonne. As on April 1st 2010, after excavating about 500 million tonne in last 29 years, Goa still has resource balance of about 1,150 million tonne. Ministry said that hence fixing a cap on production solely on the basis of reserves and resources proved as at the present will not be in the interest of the growth of the industry. Shah

Commission in its inquiry report had recommended that 'for preserving non-renewable assets for future generation, there is a need to bring down the production to safe guard environment, ecosystem, biodiversity and wildlife of the state'. Commission has suggested cap of 12.5 million tonne per annum. Goa government has already proposed gross capping of 45 million tonne per annum. Supreme Court that has suspended all mining activities in Goa, has appointed 6 member capping committee to conduct micro level environment impact study and suggest annual ore production for the state.

Source: Steel Guru

**Indian iron ore exports fall 28pct to 13 million tonnes in last 11 months**

Business Standard reported that the iron ore exports witnessed a 27.56% slump at 12.57 million tonne during the April to February period of the current fiscal due to continuation of the export duty. Federation of Indian Mineral Industries showed that India, once the 3rd largest exporter of iron ore had exported 17.35 million tonne of the mineral in the corresponding period of the last fiscal. Mr RK Sharma Secretary General of FIMI said that "This is a disturbing trend as exports have declined continuously in last few years due to imposition of export duty. We will continue to persuade the government to withdraw the export duty on iron ore as well as on iron ore pellets. This fiscal's iron ore exports are expected to come down by over 20% to about 13.5 million tonne to 14 million tonne from 18.37 million tonne in 2012 to 2013." According to FIMI data, Paradip, Vizag and Haldia are the major ports accounting for the bulk of mineral exports. Indian iron ore exports have been hurt badly in last few years due to mining bans in Goa and Karnataka, leading to a drastic fall in domestic production. Besides an increase in export duty to 30% on both types of iron ore, lumps and fines in December 2012, also impacted the sector. However, China continues to be the biggest export market for Indian iron ore, though the quantity has declined by over 31% to 10.44 million tonne in April to February. Japan is the 2nd biggest market, where 1.65 million tonne ore has been shipped during the same period."

Source: Steel Guru

**JSPL to achieve 80% self-sufficiency in metallurgical coal soon**

Reuters reported that India's Jindal Steel and Power Limited will stop buying coking coal from Australia in three months from now as its own mines there start shipping, a move that could further soften prices of the commodity. Mr VR Sharma deputy MD of JSPL said that "We get 50,000 tonne per month from our mine in Mozambique and another 50,000 tonne we buy from Australia. But after three months we will not be buying because we have our own mines there." Mr Sharma said that "Jindal Steel's coking coal consumption will more than double to 2.6 million tonne by 2016 as it expands capacity. About 80% of the coal will come from its mines abroad and the rest it will buy from the open market." JSPL got access to 650 million tonne of coking coal resources in October after buying a majority stake in Gujarat NRE Coking Coal, the Australian unit of Gujarat NRE Coke Limited. Gujarat NRE Coking's 2 mines, located in New South Wales, are currently producing 1.5 million tonne per year and are expected to have an output of 5 million tonnes by 2016.

Source: Steel Guru

**Coking coal prices drop to record low**

Spot coking coal prices dropped to a record low in three years in the month of February 2014, according to data available with Steel Insights. The continued sluggishness in steel sector and protracted slowdown in emerging economies led to the prolonged softness in prices, market sources said. Peak Downs prices dropped to $121 per ton fob Australia on February 28 from $126 per ton fob on January 31. There was a mild resistance early in January 2014 but prices declined steadily afterwards. The premium variety was quoted at $119.5 per ton fob Australia on February 28, down from $125 per ton fob on January 31. The semi-soft variety closed lower at $83.75 per ton fob on February 28, compared to $87.75 per ton fob on January 31. The steady plunge in February exceeded market expectation. Market sources had forecast a flat trend in prices based on the sentiment in Chinese steel market. However, recent analysts' reports indicate that the problem with China's steel industry could run deeper than a mere slackness in demand.

For instance, the average margins in Chinese steel sector have dropped to 1 percent from 7.5 percent before the onset of recession. Additionally, the pollution menace has forced closure of a number of steel plants. Capacity utilisation is becoming a matter of concern for many. And yet, the industry is expected to grow by around 3 per cent this year. This is so because the steel industry in China is not only a huge employer but also runs many social services which have a bearing on the life of local populace. "The Chinese steel sector is in a strange trap-like situation and this is sending a very negative message to the coking coal segment," said a trading source in India.

In fact, China's major producers of coking coal have been lowering prices in recent weeks to address the weakening demand. This is in sharp contrast to the resilience seen in the market around the same time last year, sources familiar with the sector said. Along with the low demand in steel sector, there were reports that regular spot buyers of coking coal are looking for high-vol coals for blends without seeing the need to pay a premium for better coking characteristics.

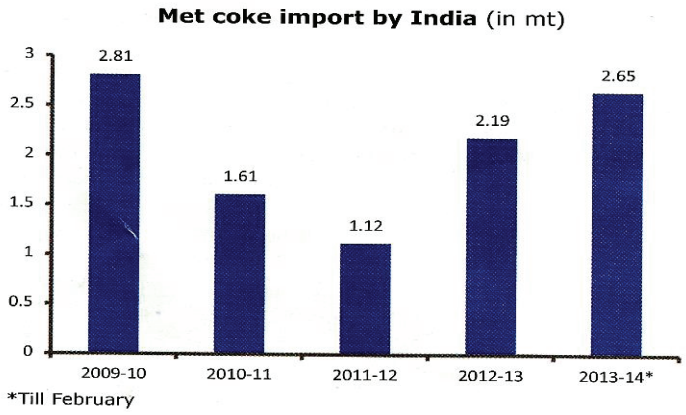
### ***Q2 contract***

Sources said that oversupply in coking coal market would continue to drive prices lower and they expect contract prices to drop below $130 per ton FOB in the April-June quarter (Q2) of 2014. BHP Billiton-Mitsubishi Alliance (BMA) offered January pricing at $143 per ton FOB, a price which has been accepted by some steelmakers. Earlier, Anglo American had settled January-March (Q1) 2014 coking coal deals with Asian steelmakers at $143 per tonne FOB Australia, down $9 per tonne from the October-December quarter (Q4) of 2013. The price applied to the miner's flagship premium low-vol hard coking coal brand German Creek, and is down from $152 per tonne FOB in Q4 2013. Ceteris peribus, coking coal prices may see further drop in March and even a production cut is not going to help much in the near term, sources said. However, once the negotiations for Q2 contract kick-starts, the market may see some resistance to the free fall, albeit briefly, the sources said.

Source: Steel Insights

### **Met Coke prices plunge**

With spot coking coal prices hovering around $120 per ton fob Australia, imported met coke price plummeted by $15 per ton cfr India in February, according to information available with Steel Insights. Met coke prices closed at $246 per ton cfr on February 28, compared to $265 per ton cfr on January 31 and $272 per ton cfr at the end of December. In the Indian market, met coke prices eased by around 3-5 per cent or Rs 500-1000 per ton of late as demand has shrunk across India, a source in the coke industry said. The west coast market has been hit the most as steel manufacturers have reduced their purchases, prompting coke-makers to operate at a much lower capacity utilisation. "They (domestic coke makers) are waiting for steel demand to revive as only then can they increase their production," the source said. Gujarat-based manufacturers are selling met coke of size 25-80 mm at around Rs 16,000 per ton, excluding taxes, which is almost Rs 800 per ton less from the previous quotation. The source said there are reports that a material of size 40-60 mm is being sold at Rs 18,000 per tonne, excluding taxes, which is down Rs 1,000 per ton from the previous quotation.

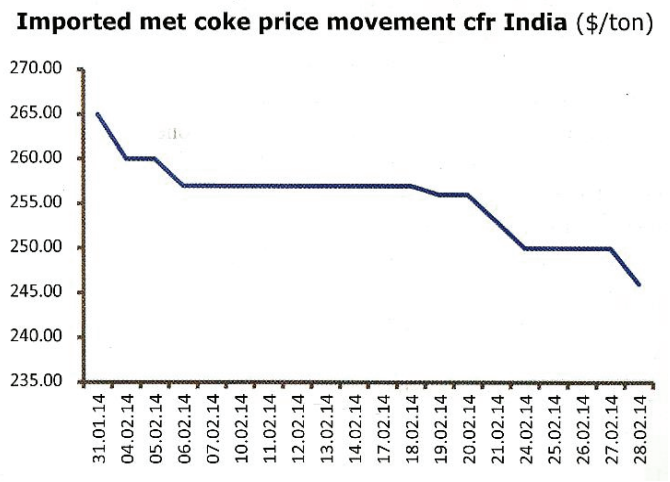



"Coke-makers are facing margin pressures and some of them are selling their material at only slightly above the manufacturing cost," said the source, adding, material of size 25-80 mm is quoted at Rs 16,500 per tonne (ex-Vizag) and size 80-150 mm at Rs 20,500 per ton in Kolkata.

### ***Import up***

Meanwhile, met coke import by India has surged by around 38.6% during the 11 months ended February 2014, compared to the same period previous year. Met coke import in 2013-14 (April-

February) has increased to 2.65 million tons (mt) from 1.91 mt in the corresponding period of 2012-13. This was in line with the trend witnessed last year. India's met coke import declined steadily during FY10-12, before showing a substantial jump in FY13. The decline was caused by increasing capacity in the domestic market. Merchant coke makers such as Gujarat NRE, Ennore Coke and Balaji Coke had come up with new capacity in recent years. Also, expansion of capacity by primary and secondary steel makers contributed to increased availability in the domestic market. Commenting on the increasing imports, an industry source said the higher quality of the imported material is driving some consumers to opt for imports. "We do not procure domestically as the quality does not match our requirement," the source said. Asked about the outlook on the market, the source said that the industry was passing through a very lean patch and there is not much hope until the general elections are over. India is going to hold its Parliamentary elections during April-May, 2014. "The new government, whoever it may be, cannot yield results from the very first day. We must hold patience and let it work. You cannot expect results within a short period of say, six months. In my opinion, the industry may see a growth turnaround only after the new government places its first full-fledged Budget in 2015," the source added.




Source: Steel Insights

## Outlook stable to negative for non-ferrous metals: Ind-Ra

India Ratings has kept the outlook stable-to-negative for non-ferrous mining and metals for next fiscal as it expects a global over-supply risk but stable margins for firms in the sector. Aluminium, copper and zinc are the major contributors of the non-ferrous metals mining sector. "The rating outlook for mining and metal companies remains stable on expectations of stable margins. This is partly because these companies are able to charge a physical premium, given the oligopolistic nature of the metals and mining market in India," the credit rating agency said in a statement. Moreover, if the Indian rupee continues to remain at the current Rs 62 per 1 USD level, it will likely provide some cushion to the mining firms, India Ratings said but cautioned that margins of larger players can get negatively impacted if the rupee appreciates to 60 per US dollar. Talking about the aluminium sector, it said that global over-supply situation is unlikely to correct for the sector in the short term though about 2 million tonnes (MT) of high cost smelting capacity has closed down in last 12 months and the trend is expected to continue. This is because 3.2-3.8 MT capacity, which is more efficient in terms of cost, is likely to come up. The increase in cost-efficient capacity "may prevent the prices (of aluminium) from exceeding USD 1,800 per tonne", it said. It added that potentially the global aluminium cost curve may recalibrate marginally downward. Talking about domestic aluminium companies, India Ratings said that their operating profitability will remain challenged due to cost inflation and lower physical premiums in the next fiscal. "Cost inflation expectation is backed by inflation in coal and furnace oil prices. Bauxite availability is likely to be strained and could pressurise the operating margins of non-integrated players in FY'15," it said. Moreover, key sectors driving aluminium growth, such as construction, power, automobiles and packaging are unlikely to generate robust demand in FY'15, it said. Talking about Copper, India Ratings said it anticipates a global over-supply risk to persist in the near term and reduced demand from China in 2013 and historically high systemic inventory levels of the metal will keep its price suppressed. However, an uptick in demand from the US and Europe could support copper price above the current level, it said, adding that Indian companies are likely to benefit from a surplus in concentrates in China and consequent stable treatment charges and refining charges (TCRC) in FY15. Integrated players such as Hindustan Copper are better placed currently as India is largely dependent on imported ore, it said.

Source: www.moneycontrol.com

## Supply constraints add zing to zinc – ILZSG

According to the data from the International Lead and Zinc Study Group, the zinc market faces a supply deficit after six continuous years of surplus. Last calendar year ended with a 60,000 tonne deficit compared with a surplus of 2,36,000 tonnes in 2012 and 3,74,000 tonnes in 2011. A drop in inventories following closure of zinc mines even as demand continued to rise has led to deficit in the market. Globally, zinc consumption rose 7.4% in 2013 compared with a 3.3% drop in 2012. This was helped by increased demand for the metal in China, the US and Japan. Consumption in China, the world's largest consumer of zinc, rose 13.7% in 2013 after a 4% decline in 2012. Similarly, consumption in the US and Japan increased 4.7% and 5% respectively, following a 2.6% and 4.4% decline in the year earlier. ILZSG said that zinc consumption in India rose 12.3%. But, even as demand is growing robustly, supply is getting tighter. Many major global mines such as Australia's Century Zinc are reported to have almost exhausted their resources and are slated for closure by 2015 and 2016. The output from new mines is not expected to fill the gap. The supply threat could keep zinc prices higher in the coming months. Though the recent weak economic data from China has dragged zinc price sharply lower, with outlook for 2014 on China continuing to be positive, there is a case for further increase in demand for zinc.

Source: Steel Guru

## The Chinese Economy Is Destroying the Copper Price

The No. 1 commodity buyer in the world is China. Therefore, the natural result of weak trade data emitted from China is a downturn in the price of copper, accompanied by decreases in oil, coal, steel and iron ore. With export figures exhibiting a destabilizing Chinese economy, the U.S. stock market likewise takes a hit, along with the currencies of Australia and Canada.

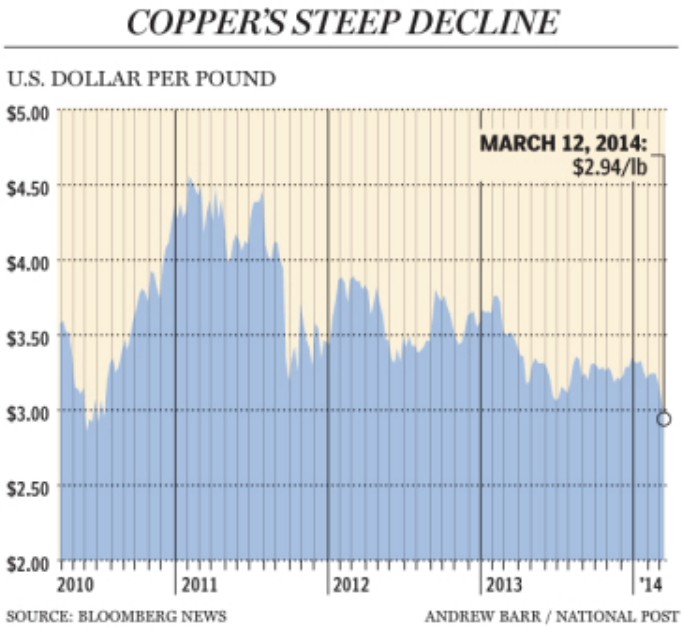
### *Copper Prices Define China's Financial Health*

The financial system of China is enwrapped in its storehouse of copper. A full 60% of China's stored copper is utilized as loan collateral. The aspect of copper as a monetary product in China has long since caused its price to rise above its value as an industrial metal. After China's recent disclosure of its sharp and unexpected decrease in exports, the London Metal Exchange (LME) saw copper prices fall to almost a three-year low. Globally, copper trading has dropped under $3 a pound, not seen since July 2010. On Dec. 3, 2014, high-grade copper earmarked for delivery in May 2014 fell to $2.91. The market prediction of a possible complete meltdown in the price of copper has thrown global investors for a loop. The drop in copper is directly sourced in the economic slowdown of China. Binary options trading is the silver lining to this cloud, as there is an ongoing downward trend in copper prices. That trend can be utilized in the binary options market and traders are finding ways of profiting off the downturn. February exports declined 18.1% as compared to the February 2013 data. The substantial drop sent China's balance of trade into deficit figures. The financial outlook for China is a source of global concern. During the first week in March, a small Chinese company, Chaori Solar, defaulted on a bond payment. The seriousness of the default is highlighted by the fact that it was the first enterprise within the course of modern trading to do so. On the heels of that default is the corporate bond suspension of a second company, Baoding Tianwei Baobian Electric, from the Shanghai Stock Exchange (SSE). The potential for imminent default led to the suspension. The financial system that harbors company bond defaults is susceptible to a further decline in the overall economy. The two-pronged economic attack includes the increased reticence of banks to offer loans given the potential for default, and the inability of companies to utilize deflated copper as a security for loans. The vast number of Chinese corporations housing large debts faces a situation where essential new loans to absorb prior debt are increasingly harder to obtain. Many economists forecast a difficult landing for the Chinese economy in 2014. In response to the decline in exports and the ongoing weakened financial forecast for China, the government lowered its yuan in the hopes of jump-starting an increase in exports. However, it is the downward trend in the value of copper that focuses the world on the continuing destabilization of the country's economy.

### *Copper as an International Economic Predictor*

With a long history of use in industry, copper is often noted by analysts as a focal point in the

assessment of the global economy. The use of copper as an indicator of the financial health of individual nations has been upgraded in respect to China. In addition to its use in Chinese manufacturing, businesses have imported massive quantities of the metal, produced as loan collateral. The New York Metal Exchange has recorded a current precipitous and continuing drop in the price of copper as of March12. The year 2014 has already seen a fall of 13%, with over 4% down during the second week of March. The price of copper is forecast to deteriorate further. The question appears to center around the degree of the decline. At the end of the day, investors are wondering how much will be left in the value of this metal. Some analysts predict a total crash. Others take note that with the end of China's Lunar New Year celebrations, quarter two may see an upswing in China's economy and in copper. In the likely event that lenders will tighten the reins, a diminishing amount of copper will be needed as collateral for loans. Further, the present drop in price has created a decrease in the use and acceptance of copper as security for debts. Both factors will lead to the dumping of huge amounts of the metal onto the market. Since supply and demand play a large part in market prices, an enormous increase in the copper supply will force the price to plummet. Chinese businesses would obtain only a small portion of their initial outlay for copper upon a return of the asset to the marketplace, incurring large losses. It is apparent that a continuing decrease in copper will further erode the financial base of China.




### *The Global Economy*

As nations struggle to leave the Great Recession of 2008 behind them, there is a realization that a slowdown in any major economy will cause the remainder of the globe to falter. Therefore, the world is concerned about a downturn in the financial stability of China. A sudden deficit in China's trade balance has duly alarmed investors and adversely affected many markets. China's export decline caused the Australian Dollar and its Canadian counterpart to decrease against the USD. February U.S. hiring figures, disclosed during the initial week of March, showed a modest increase, yielding a stable U.S. dollar as against other prime currencies. The GDP of the U.S. grew 3.2% in quarter four. However, the monetary weakness in China drove the U.S. stock market down by 0.5% to 16,369.76, and decreased a worldwide stock index by a comparable 0.5%. By far the greatest negative effect of the decline in the exports of China was felt by the global mining sector, a testimony to China's voracious acquisition of raw metals. The question remains as to whether China has the ability to turn around its economy, thereby reversing the current downward trend in the price of copper.

Source: www.gurufocus.com

### Why miners aren't panicking about the latest commodity drop

While steep declines in copper, iron ore and coking coal prices have spooked investors, they are not severe enough to disrupt the mining sector at this stage. The vast majority of projects can generate decent margins at these price levels, according to experts. Though in the case of coal, there has been enough of a drop to make high-cost producers nervous. Prices for all three commodities have been under pressure throughout 2014, but they plummeted over the last several days due to economic concerns out of China. Manufacturing activity has been weaker than expected, and a bond default by a solar company raised fears of tighter credit conditions. That hit the copper market in particular, as many Chinese companies use the red metal as collateral to raise money. Chinese steel mills are also being threatened as the government tightens environmental standards. That is putting pressure on coal and iron ore. Copper has sunk to near a four-year-low, falling below the

psychological barrier of US$3.00 a pound. Iron ore dropped to US$104 is a tonne after trading above US$130 for most of last year. And steelmaking coal has fallen to US$110, compared to more than US$150 last fall. Mining executives said they are not panicking yet. They have seen numerous fluctuations just as dramatic as this one over the last few years. For example, iron ore prices plunged 30% in August of 2012, sinking below US$85 before rebounding. And copper has dropped below US$3 a few times since 2009, bouncing back quickly each time. Nonetheless, there is some concern in the industry that this copper slump could last a little longer than the prior ones.

"The market is very jittery about risk right now. I think people are going to want to wait and see how this pans out over the next few weeks," said Derek White," chief executive of KGHM International Ltd. (formerly Quadra FNX). He added that at a long-term copper price around US$3, there is no real threat to mining operations. That could change if the price drops below US$2.50 for a prolonged period. The iron ore market is unique in that prices have defied analyst expectations for the last couple of years, performing much better than anticipated. This week's drop brings them closer to many forecasts. Experts said that most iron ore projects are fine at a long-term price above US$100. But the real question is whether US$100 will be the long-term price, rather than the much higher one that mining companies have enjoyed in recent years. Mark Morabito, executive chairman of Alderon Iron Ore Corp., said his Chinese partner, the giant steelmaker Hebei Iron & Steel Group, believes the average price will fall between US$110 and US$140 for the next several years. If it trades above or below that range, it will not stay there very long.

***The market is very jittery about risk right now***

"There is short-term volatility. But Hebei has been bang on the money now for 18 months, which is why I don't read the other sector reports that predict prices anymore," he said. Coking coal has been the most volatile of the three commodities, with spot prices soaring above US$300 a tonne in 2011 before dropping dramatically to the current US$110 level. In addition to the China concerns, investors are worried about excess supply, especially from Australia. Prices are still not low enough to disrupt most operations, but they may cause companies to rethink greenfield projects. TD Securities analyst Greg Barnes said that Teck Resources Ltd. will likely defer its Quintette project in British Columbia until the market recovers.

Source: Financial Post

## Nickel price nears one-year high

Nickel has closed at is highest price in almost a year on the London Metal Exchange (LME), after moving into a bull market amid persistent concerns over supply of the metal to the market. The LME's three-month nickel contract was up two per cent at $US16,190 a metric ton at the PM kerb close recently, its highest settlement since April 11 last year. The metal earlier hit an intraday peak at $US16,235 a ton. This represents a gain of more than 20 per cent since its January 9 low of $US13,334 a ton, the definition of a bull market. Nickel prices have been driven by restricted supply from Indonesia, which has banned exports of ore. Concerns that Crimea-related sanctions on Russia could disrupt exports of its metal have also propped up prices. Along with the Philippines, Russia and Indonesia are the world's biggest producers of the metal that is used in the production of stainless steel. While the US and Europe have so far imposed sanctions only on individuals, "players on the nickel market still appear to assume that the Crimean crisis will escalate and that further-reaching sanctions will be imposed," said analysts at Commerzbank. Nickel's break above $US16,000 a ton a few days back sparked technically-driven buying, as stop-loss orders -- automatic orders to buy at a certain level -- were triggered, Standard Bank analyst Leon Westgate said. "Nickel's break above $US16,000 today should, therefore, see prices run higher. However, prices have moved a long way and it may need further fresh buying interest to give it a necessary shove," he said. LME three-month copper closed 0.04 per cent higher at $us6,482.

Source: The Australian

## Nalco inks MoU with ministry of mines for higher production

National Aluminium Company (Nalco) has signed an MoU with the Union ministry of mines regarding financial and non-financial targets for 2014-15. The MoU was signed between Anup K Pujari, secretary, ministry of mines and Ansuman Das, chairman and managing director, Nalco, in New

Delhi, on Friday, a company release said on Saturday.

Source: Financial Express

## Silver imports hit a record in 2013 amid curbs on gold

Even as gold imports fell substantially, those of silver reached a record high in 2013. Sector estimates suggest India imported around 5,500 tonnes of silver, 180 per cent more than the previous year. The only earlier occasion when India imported more than 5,000 tonnes of silver in a year was in 2008. Traders needed to restock on silver; with gold costlier, there was a sudden rise in demand for silver jewellery, in India and in the export market. Also, prices were lower — these averaged $23.85 an ounce in 2013, from $31.17 in 2012, leading to higher demand. The price is down as its industrial demand is lagging, due to an overall slowing of economic activity; in 2014, so far, the average silver price has been $20.53 an oz. Silver jewellery is still in demand. According to a survey by the Washington-based The Silver Institute, with the National Jeweler magazine, 36 per cent of the respondents said silver jewellery gave the highest and consistent margins. Last in the list were gold and platinum. "Silver jewellery has a better resale value and making charges are much lower," said Monal Thakkar, director of the Gujarat-headquartered Amrapali group. Average making charges for silver jewellery is a third or even a fourth of gold jewellery's. Of the 2,700 jewellers surveyed, 73 per cent said their silver jewellery sales had risen in 2013; 15 per cent said these had remained the same. Price-sensitive investors have been moving to silver jewellery. About 92 per cent of the participants were optimistic or bullish on silver, saying it would remain so for many more years.

Source: Business Standard

**YEARLY IMPORTS**

| Year | Tonnes |
|---|---|
| 2008 | 5,048.02 |
| 2009 | 1,284.55 |
| 2010 | 3,029.43 |
| 2011 | 4,086.93 |
| 2012 | 1,900.39 |
| 2013* | 5,500.00 |

*Industry estimates;
Compiled by BS Research Bureau
Source: GFMS Thomson Reuters

**China in the lead**

(in million tonnes)

| | 2013 | Forecast 2014 | 2015 |
|---|---|---|---|
| **Global demand for lead** | | | |
| China | 4.7 | 5.0 | 5.3 |
| Europe | 1.8 | 1.8 | 1.8 |
| USA | 1.3 | 1.2 | 1.2 |
| Rest of the World | 2.9 | 3.1 | 3.3 |
| **World production** | 10.7 | 11.1 | 11.6 |
| **Usage of lead** | | | |
| China | 4.6 | 4.9 | 5.1 |
| Europe | 1.6 | 1.7 | 1.7 |
| USA | 1.7 | 1.7 | 1.7 |
| Rest of the World | 2.8 | 2.9 | 3.0 |
| **World use** | 10.7 | 11.2 | 11.5 |

## Lead shines as supply tightens

Lead is one base metal with a distinctly bullish outlook going by market fundamentals. A deficit is forecast for 2014 and 2015, pushing the stocks-to-consumption ratio to its lowest level since 2010. The projected tightness is underpinned by the US demand. The 400,000-tonne market deficit in 2013 is likely to expand to 500,000 tonnes in 2014 and continue into the following year, resulting from the closure of a primary smelter with 110,000-tonnes-a-year capacity. Fortunately, growth in primary smelter production, outside China, is set to expand by about 100,000 tonnes, neutralising the impact of the US closure. Yet, with a projected 3-4 per cent increase in total ex-China demand, tightness appears inevitable. Then there is the question of non-reported stocks. How large are they? According to International Lead and Zinc Study Group data, there is a 50,000-tonne off-warrant build-up in the US since 2012, which is a small buffer to the tightness projected in the region in the context of depleted LME stocks.

### *Supply drops*

From a supply perspective, there is likely to be restraint in the growth of mine output following anticipated shutdowns of key mines around the world over 2014-15 despite potential spare capacity in China. Lead output may be expected to grow at 3-4 per cent per annum this year and the next. On the demand side, in countries such as China where new car sales have expanded at more than 10 per cent in recent years, demand for lead will be driven by both the continuing expansion in automobile sales as well as the steadily increasing demand for replacement batteries. It is this dynamic that supports a bullish forecast for lead demand among the BRIC (Brazil, Russia, India and China) countries, anticipating growth in demand of 6 per cent for these countries. Importantly, Chinese demand for lead benefits from rapid expansion in the use of e-bikes in China and neighbouring countries. The e-bike batteries typically have a shorter life prior to renewal, raising the volume of replacement demand. Additional demand growth is expected to arise from power

storage for the rapidly expanding network of 3G and 4G telecom masts. As for India, demand for lead acid batteries is seen rising by 10-12 per cent a year as the country embraces solar power and e-bikes. However, domestic supplies are unlikely to expand as rapidly. So, demand may be rationed. The US demand for lead acid batteries has grown steadily over the past three years at about 2 per cent a year. Within this overall demand, original equipment demand has expanded rapidly in line with the growth in new vehicle sales while growth in demand for replacement equipment (which makes up about 90 per cent of total battery demand) has grown more slowly. Demand could rise faster with fundamental changes to both recycling and new battery technology.

### ***Price outlook***

Despite deficit in the global lead market, prices have failed to make marked gains. In part, this can be attributed to the general weakness in the base metals complex. China could possibly raise its domestic output more rapidly, which can temper the bullish outlook. As for price outlook, in H1 this year, lead could average $2,200/t, rising to $2,300/t in H2.

Source: The Hindu Business Line

## Tin must hit $ 24,000/ tonne for investments in industry

Tin should climb to an average of $ 24,000 a tonne this year to enable further investment in the industry in Indonesia, according to the only exchange in the country that's permitted to trade refined metal before export. The so- called ideal price compares with average production costs of $ 21,500 for local smelters, said Indonesia Commodity and Derivatives Exchange Commissioner Fenny Widjaja. That's 5 per cent higher than futures in London, and 3.2 per cent above the ICDX's PB300 grade, the most- active contract on the Jakarta- based bourse, according to data compiled by Bloomberg. The world's largest exporter of the metal used as packaging and solder required that all refined tin be traded through the ICDX before export since August, seeking to create a benchmark price and challenge the role of the London Metal Exchange. Indonesia is a significant producer of commodities and it needs to create more reference prices, with nickel, copper and rubber as the next possible contracts, Widjaja said in an interview. "ICDX has been quite successful so far, with the main producers like PT Timah ( TINS) consistently trading ingots through the exchange," said Wilim Hadiwijaya, a Jakarta- based analyst at PT Ciptadana Sekuritas. "The current price is already favourable. If it gains further of course it will be better for companies." Tin advanced 2.3 per cent on the LME this year, the best performer after nickel, on forecasts for a global deficit and prospects for reduced shipments sold through the ICDX. The metal, which traded in at $ 22,860 a tonne at 12: 20 p. m. in Singapore, averaged $ 22,298 last year. Prices rose 18 per cent in the third quarter after the ICDX rule change took effect.

### *Ideal Level*

A price of "$ 24,000 is the ideal level for this year, that it will allow smelters to invest more in exploration, maintenance and postmining activities," Widjaja said on March 21. "The government will get high royalty payments that can be used for infrastructure such as ports and power plants, which will not only support the tin industry but other sectors."

### *Deficit market*

The global tin market will have a fifth year of deficit in 2014, Barclays Plc said in a January 13 report, forecasting a shortage of 5,000 tonnes. Global demand was 344,000 tonnes in 2013, beating production of 341,000 tonnes, according to Barclays. ICDX plans to start a tin futures contract in the fourth quarter, said Widjaja. The exchange will wait until September, or after a year of tin auction trading, before deciding on contracts in other commodities such as nickel and copper, with plans dependent on whether the government backs the creation local reference prices, said Widjaja. For a potential rubber contract, ICDX will team up with exchanges in Malaysia and Thailand to create dollar- denominated physical contracts, he said without elaborating.

Source: The Hindu Business Line

## Leader in mineral resources

NAMIBIA is rich in mineral resources and uranium mining is of considerable importance to the national

economy. In 2011, Namibia was ranked as the fourth largest producer of uranium worldwide, behind Kazakhstan, Canada, and Australia.

Namibia has two significant uranium mines - Rossing Uranium and Langer Heinrich Uranium – capable of providing 10% of world mining output. The government is taking stringent steps for the development of the industry and is exploring was to break-out of the colonial approaches used to extract its natural resources, especially mineral resources. It is also being seen as to how these vast resources would contribute to structural transformation or otherwise of Namibia. These mineral resources are valuable instruments in addressing the key issues of transforming the sector into a vehicle for sustainable and all-inclusive development. In this connection Namibia has embarked on a policy of mineral beneficiation , or a strategy that favours a commodity based growth at home or domestic industrialisation, which it insists must be grounded in the reality of Namibia. Namibia is keen to experience positive ramifications on its current approach of Growth at Home Strategy towards not only ensuring investment but also the re-investment, recruiting, keeping expertise and skills, and research undertaken on its mineral wealth, which are key factors in the success of the mining industry. This opens up numerous opportunities for Indian companies looking for investment in the Namibian mining industry. Further the advantages legislative and fiscal environment will work in favour of the Indian companies. The country offers extensive mineral deposits, diamonds, uranium, gold, copper, lead, zinc and other base metals and semi-precious stones and many types of dimension stones. There are also good prospects for oil and gas prospecting exploration and processing.

Source: Financial Express

## Unalloyed Success

Be it in India's Light Combat Aircraft (LCA) Tejas, the aircraft carrier Vikrant II (under construction), the main battle tank Arjun, the Polar Satellite Launch Vehicle (PSLV), or aeronautical turbine engines, there is a silent player who has a crucial role in building these machines involving complex technologies. That player is the Defence Metallurgical Research Laboratory (DMRL), Hyderabad. It developed a special forging process that has gone into the making of critical titanium alloy components. The titanium alloy is used in the fabrication of the solid motor rocket casings of the PSLV and the Geosynchronous Satellite Launch Vehicle (GSLV) and in petrochemical industries and even biomedical implants. A low-alloy steel named Jackal steel developed at the DMRL is used in the construction of infantry combat vehicles, light vehicles and body armour. Another DMRL invention is the cermet composite used in the making of aircraft brake pads. "We are like the backstage players, meeting the big challenges in staging a drama. We are there but our role is not well publicised," said Amol A. Gokhale, Director, DMRL, adding: "We provide complete material solutions for the defence forces… Our major successes are in developing composites for aircraft brake pads; titanium sponge extraction technology; superalloys for aircraft engines; special steel for naval applications; and rare-earth magnets for accelerometers." The DMRL, a premier laboratory of the Defence Research and Development Organisation (DRDO), meets India's needs for the complex metals and materials to build modern weapons systems. The DMRL celebrated its golden jubilee on October 26, 2013. Its 50-years history is a record of success story after success story. It is known worldwide for its R&D in metals, alloys, ceramics and composites. It has developed a number of front-line technologies in metallurgy and materials science.

## *Midhani*

Its research effort has led to the founding of new production and technology centres: Mishra Dhatu Nigam Limited (MIDHANI), established in 1973 for the manufacture of special metals and superalloys; the Non-Ferrous Materials Technology Development Centre; and the International Advanced Research Centre for Powder Metallurgy and New Materials, all in Hyderabad, and the Heavy Alloy Penetrator Plant (HAPP), an ordnance factory in Tiruchi, Tamil Nadu. MIDHANI and Steel Authority of India Limited (SAIL), both public sector units, are the DMRL's production partners. The DMRL was carved out of the Inspectorate of Metals and Steel at Ishapore, near Kolkata. Soon plans were afoot for the DMRL to grow as an R&D centre and compete with modern metallurgical institutions, not merely stagnate as an inspectorate. After the Chinese invasion in 1962, there was a felt need for a separate campus on which the DMRL could grow and that was why it was relocated to Hyderabad

in 1963. A reputed metallurgist, R.V. Tamhankar, was appointed its Director and entrusted with building the institution. "Since then, there has been no looking back," said Gokhale, who has a B.Tech in metallurgical engineering from the Indian Institute of Technology Bombay and an M.S. and PhD from the University of Pittsburgh, United States. For more than 25 years, he has been involved in developing light-alloy cast and wrought products. His role in the development of aluminium-lithium alloys led to their use in the Indian Space Research Organisation's (ISRO) INSAT II satellites. Gokhale led teams in developing forged and rolled magnesium alloys for INSAT III and complex aluminium alloy components for torpedoes.

## ***Kanchan Armour***

A.K. Gogia, scientist, DMRL, said the laboratory tasted its big success when it developed the Kanchan armour for India's main battle tank, Arjun-MK I, in the 1990s. Battle tank traditionally had steel armour as protection against anti-tank ammunition and missile attacks, but this added weight to the tank, hindering its mobility. So for Arjun, the DMRL developed compound armour with multiple metallic, polymeric and ceramic layers. "Last year, we developed a new, improved version of Kanchan armour, which gives a 10 per cent improvement in performance for the same weight," said Gogia. The laboratory has also developed lightweight armour for the Russian Mi-17 helicopters in the employ of the Indian Air Force (IAF). The Mi-17 was originally plated with steel armour that weighed about 363 kg. "The IAF wanted to put more payloads in this helicopter. They wanted light-weight armour. It is metallic and ceramic and only weighs 200 kg," Gokhale explained. It is being produced at MIDHANI. The fitment has started. It has cleared airworthiness trials at the Centre for Military Airworthiness and Certification (CEMILAC), the DRDO unit that certifies military air-craft and airborne systems. "This is one of the latest developments in lightweight armour here," the Director said. In collaboration with the High Energy Materials Research Laboratory, Pune, another DRDO facility, the DMRL has developed a line of armour called explosive reactive armour (ERA), which offers tanks more protection from anti-tank guided missiles.

## ***Titanium Sponge***

The DMRL's success in extracting titanium sponge from titanium ore is a big story in itself. Although India has rich reserves of titanium ore in the beach sands of Andhra Pradesh, Kerala, Odisha and Tamil Nadu, a gap existed in India in the technology of converting the ore to sponge. "We have filled the gap," said the Director. The laboratory first established on its premises a pilot plant to produce premium quality titanium sponge, which met the international standards for the manufacture of high-quality aeronautical products. On the basis of this technology, India's first commercial titanium sponge plant, Kerala Minerals and Metals Limited, with a capacity of 500 tonnes a year, was established at Chavara, Kollam, with funding from ISRO, which uses titanium alloy for its launch vehicles. Gokhale said: "India is now the seventh country in the world with the capability to produce aeronautical-grade titanium sponge on an industrial scale". Titanium alloy is used in fabricating the bottles that contain air to initially start the rocket engines and in the forging of solid rocket motor casings. What is heartening is that there is now a burgeoning interest worldwide in titanium. A substantial amount of the structure of the Boeing 787 Dreamliner aircraft is made of titanium. So the DMRL is working on another process for the extraction of titanium sponge. The DMRL also fabricates metals and alloys that go into the manufacture of components for aero engines. It has established an advanced precision casting technique called investment casting technology to produce components such as compressor discs, shafts and blisks for the Adour aero engine and the Kaveri aero engine, which is under development; and the jet fuel starter castings for Tejas and the engine for the pilotless target aircraft Lakshya. The production of jet fuel starter castings for the LCA has begun at the engine division of the Hindustan Aeronautics Limited (HAL) Koraput, Odisha. Using the same technology, turbine blades for the Adour engine of Jaguar aircraft have been developed. HAL Bangalore makes Adour engines under licence from Rolls-Royce/Turbomeca.

"The advantage in this investment casting process is you can go for intricate geometry," Gogia said. "The same technology is used in making bronze idols, which have intricate features and demand exacting geometry. They are precision castings." Gogia added: "This technology is one of the most

difficult ever practised in the DMRL." It took the laboratory 25 years to establish this technology and transfer it to HAL Koraput, which makes components for aero engines for Sukhoi 30-Mark India. Another recent development and important achievement at the DMRL was to ensure the micro-structures in these castings were perfectly cast. The micro-structures should be perfectly aligned so that there are minimum deformities in the castings during service. For the entire component is made of a single crystal. Gokhale called it "one of the topmost metallurgical technologies in the world". It was a difficult technology. "There are only a handful of companies in the world to have this level of castings expertise," he said. Nickel-based alloys are the DMRL's forte too. Since these alloys are used in making components that experience temperatures close to melting point, they receive coatings for thermal oxidation protection, Gogia explained. The laboratory has developed these coating technologies as well. These nickel-based superalloys are used in making high-temperature compressor sections for aero engines. In fact, the DMRL has a strong programme to develop titanium alloys for compressor sections for the Adour and Kaveri aircraft engines. MIDHANI will produce these titanium and nickel alloys using DMRL technology and facilities. The DMRL's Titan-29k alloy is under industrial production at MIDHANI.

It is again the DMRL's aluminium and titanium alloys that are being used to build airframes, said S.V. Kamat, scientist. There is a programme under way in collaboration with MIDHANI for the production of Beta-titanium alloy for use in the airframes for Tejas. "We have another big programme for aluminium alloys," said Gokhale. "We have developed six types of aluminium alloys. Out of these six, the patents for four have expired…. So we have re-engineered them and productionised them at the Ordnance Factory at Ambajhari [near Nagpur]. The remaining two are patented by the DMRL and will go into production," he added. These aluminium alloys will be used in building missiles, the LCA, superstructure of ships, armaments, and so on. When the project is completed, hundreds of tonnes of these varieties of aluminium alloys will be supplied to the defence forces. The DMRL has successfully tried its hand in fabricating advanced aluminium-lithium alloys. When used in making aircraft components, they help reduce the weight of the aircraft. "There is pressure on the DMRL to revive its aluminium-lithium programme. We are considering it because there is a worldwide demand for aluminium-lithium alloys to some extent," Kamat said.

### ***Naval Steel***

Yet another big success story is the laboratory's naval steel programme. The DMRL has been associated with the Naval Materials Research Laboratory (NMRL), a DRDO unit near Mumbai; SAIL; and the Navy in the indigenous development and production of the warship-grade steels called DMR-249A and DMR-249B used in the building of ships and submarines. These steels are the indigenised versions of the Russian ABA AND AB2 steels. Thousands of tonnes of DMR-249A are being used in the construction of India's first aircraft carrier Vikrant at Cochin Shipyard Limited.

Eleven different sections of bulb-bar, used to build ship hulls, have been developed. A private industry succeeded in making these bulb-bars using a rolling process. The Navy has procured 14,000 tonnes of DMR-249A and DMR-249B steel manufactured by SAIL and private industries and about 5,000 tonnes has been used in the construction of Vikrant's hull, body and the flight deck. (About 30 per cent of Vikrant's construction has been completed so far and it is expected to be inducted into the Navy in 2018). Kamat has a passion for high-energy, rare-earth-based, permanent magnets. "There are three types of rare-earth-based magnets. You can get high energy form a small magnet belonging to these three varieties," he said. The three are ND-Fe-B, $SmCo_5$ and $Sm_2Co_{17}$ magnets. They find applications in miniaturisation of devices, high-speed rotors, brushless direct current motors, travelling wave tubes, magnetrons, inertial navigation systems such as gyroscopes and accelerometers in launch vehicles, electro-mechanical devices such as actuators and radio frequency switches. "The rare earths are not exactly rare. They occur as a group and it is difficult to separate them," explained Kamat. The Indian Rare Earths (IRE), a public sector unit belonging to the Department of Atomic Energy, has come forward to float a special purpose vehicle to establish an industry to make magnets using rare earths. "They will get the technology from the DMRL. Preliminary discussions have taken place. The demand for high-energy, rare-earth, permanent magnets will be huge," he predicted. The DMRL has plans to forge smart magnets, which are used in sonars in ships

and actuators. Gokhale summed up: "The DMRL covers the entire spectrum in metallurgy from basic sciences, applied sciences, technology development, pilot plant operation and production support. We hold hands with production people for supporting the production of metals, alloys, composites and ceramics we have developed…. The future lies in developing materials through computer modelling."

Source: Frontline

## A composite tale

On the vast wooded campus of the missile complex of the Defence Research and Development Organisation (DRDO), about 25km from Hyderabad, is a facility that is mostly unknown to the outside world. There are no boards announcing its existence. In ordinary-looking buildings and sheds, front-line work is under way in forging the composites that go into the making of missile motor casings and nozzels. The facility is called the "Composite Products Development Centre" (CPDC) and comes under the Advanced Systems Laboratory (ASL), the DRDO unit that developed the Agni series of missiles. The CPDC was established when R.N. Agarwal was Director, ASL. The ASL was formed on September 28, 2001, with special emphasis on the development of composite products and large-sized motors for Agni missiles. The missile world could scarcely believe it when the CPDC developed a carbon-carbon composite for the Agni missiles' heat shield (Frontline, "A Young Achiever/ A Success Story", October 7, 2005). In simple terms, a composite is made of a fibre – carbon fibres, Kevlar fibres, and so on reinforced with resin or plastic. When these fibres are reinforced, they become exceedingly strong but are light in weight. In a missile system, what is important is tis propulsion system, that is, its rocket motor, which is surrounded by a casing. In a missile or civilian rocket, propellants are burnt and the flames are let out through a nozzle to achieve thrust. Missiles have a radar/antenna and warheads. If the missile is carrying a nuclear warhead, then the warhead should be protected by a nose cone. The vehicles' radar/antenna should be protected by a radome: a portmanteau term from radar and dome. Nakka Sudarshan, scientist, CPDC, explained why it was important to use composites to fabricate missile motor casings, nozzles, nose cones and radomes. The motor casing can be made of maraging steel or 15CDV6 steel, which is a high-strength steel. However, such a casting or nozzle will increase the missile weight, thereby reducing the weight of the warhead or the missile's range. So the CPDC embarked on developing composites that would be as strong as steel but much lighter. "In the CPDC, we have developed composites which will bring down the missile's weight by one-third. So you can increase the warhead's weight or range," Sudarshan said.

Ravi Gupta, scientist and Director of Public Interface, DRDO, explained that nozzle design was critical to achieve the desired optimum conditions in a missile's flight. The nozzle has to face drastic conditions of high temperatures and hot, burning gases which are corrosive and reactive. "So we have to choose a material which can withstand these conditions. These technologies are closely guarded," he said. The CPDC has, therefore, developed technologies from the grassroots level to make nozzle of composite material that are strong, lightweight and can withstand high temperatures. Gupta, who is a specialist in polymer chemistry, added: "In this particular case of nozzle [made of composites developed at the CPDC], carbon fibre is reinforced with a special kind of phenolic resin. The ratio of the resin and fibre is a critical parameter. Besides, during the qualification process, it needs to be ensured that solvents and by-products formed during curing are carefully eliminated. So the DRDO has developed and realised the technologies to make defect-free composites. The CPDC has also developed composites for other missile components which have to face extreme environments." The composites have several components. The fibres give strength and they are held together by resin. The CPDC has developed carbon composites reinforced with an epoxy resin system for motor casings and composites reinforced with a phenolic resin system for nozzle liners. K. Jayaraman, who is now Director, ASL, was earlier Technology Director, CPDC. He designed and developed the structure of the carbon composite re-entry vehicle for Agni-III. Besides Nakka Sudarshan, among the other young scientists in the CPDC are Y. Gangadhar Sinha and V. Kalyan Chakravarty.

Source: Frontline

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- Indian Stainless Steel Development Association
- SIDEREX — The Spanish Association of Steelworks Exporters
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