Mark Millett on bearing the torch for SDI

Iron ore markets
Industry 4.0 marches on
Top steelmakers 2018 edition
We grow together with our industry with half a century of experience in steel production
Features

20

Cover story
Mark Millett, chief executive officer of Steel Dynamics Inc, recalls the company's origins and stresses the importance of sustaining its corporate culture

Top steelmakers

29

Top steelmakers 2018 edition
Metal Bulletin publishes its annual table of the top global steelmakers, and our correspondents around the world assess their regional steel markets

Iron ore

44

Iron ore pricing explained
Metal Bulletin's experts explain how price indicators, indices and differentials provide transparency and opportunities for risk management

48

Tough times for India's iron ore miners
Multiple factors are impinging on India's iron ore industry. What are they and what are their impacts on market dynamics and outlook?

Turkish steel

52

Challenges for Turkish steel
With its prominent role as a ferrous scrap importing country and as an important player in global steel markets, Turkey has wrestled with several challenges this year

Spotlights

59

Technology spotlight: Industry 4.0
Digital technologies increase momentum

69

Technology spotlight: Robots on the rise
Robots are extending their reach to new applications in steel mills

73

Market spotlight: High-performance alloy markets gather speed
The risks, rewards and advances in light metals alloys

77

End-user spotlight: heavy equipment
Rising demand for mineral extraction is boosting the order books of yellow goods manufacturers
News and analysis

7
Comment
Top steelmakers

9
Non-ferrous news review
A summary of recent key developments in the international non-ferrous industries

13
Steel news review
A round-up of important recent developments in the global iron and steel sectors

16
Base metals and steel analysis
Metal Bulletin Research analyses the drivers of the base metals, steel and steel raw materials markets

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The Netherlands
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Top steelmakers

Metal Bulletin’s ranking of top steelmakers by output has been a long-standing opportunity to take an annual snapshot of the geographical distribution of production, and one indicator of the relative health of different national and regional steelmaking industries.

The 2018 edition published in this issue of Metal Market Magazine is no exception. Our international team of steel journalists provide a summary of the key trends in their areas. Trade protection measures are looming large in the minds of steelmakers worldwide, while the consolidation of China’s dominant steelmaking capacity continues to capture attention.

A vital ingredient for integrated steelmaking, global iron ore supplies and prices are constantly monitored for potential volatility in spot prices nowadays – with the previously dominant annual ‘mating’ season to agree the price between iron ore producers and steelmakers becoming a distant memory. Regional ore quality and availability impact local costs. Metal Bulletin’s suite of indicators, indices and differentials for iron ore provide transparency and opportunities for price risk management. Our own experts explain the suite’s value in this issue.

Whatever price steelmakers are paying for their raw materials, extracting the greatest yield achievable from them in an efficient and environmentally friendly way is a key factor for profitability. The hot end of steelmaking is just one part of the complete process, but it and all the downstream processing steps are encompassed by Industry 4.0 — the topic of a major feature article looking at the ways in which digital technologies from boardroom to factory floor are being harnessed and connected to maximize efficiency, quality and profitability.

Our next issue of Metal Market Magazine will include the winners of the American Metal Market Awards for Steel Excellence. It will be a further opportunity to see how steel companies themselves, and their suppliers, are pushing the boundaries in many ways to further enhance the future for steelmakers and their products.

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June 2018 | Metal Market Magazine | 7
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Cobalt 27 gets $80m credit facility

Cobalt 27 has agreed to an $80 million revolving credit facility to help fund its investments in the mineral industries, including streaming and royalty agreements, the company said in mid-May. The credit facility, “significantly strengthens Cobalt 27’s liquidity and provides the financial capacity to accelerate our plans to close streaming transactions,” Anthony Milewski, chairman and chief executive officer of Cobalt 27, said in a statement.

The investment vehicle holds close to 3,000 tonnes of cobalt and manages a portfolio of 10 royalties through its subsidiary, Electric Metals Streaming. The company intends to continue investing in a cobalt-focused portfolio of streams, royalties and direct interests in mineral properties containing cobalt, potentially adding to its cobalt physical holdings when opportunities arise.

LME shelves dealer-to-client platform idea

The London Metal Exchange has shelved its idea of developing a dealer-to-client platform following the results of last year’s discussion paper, LME chief executive officer Matthew Chamberlain said. He confirmed during the LME Asia Metals Seminar in Hong Kong on Thursday May 17 that the overwhelming response from discussions was that the new platform was not wanted by the market.

“We got the very strong message that our members already provide the right set of connections and there was very little demand from the market,” he told attendees. “The question we posed is ‘should we build it?’ But if the market do not want something, we will not do it,” Chamberlain added.

“We are not going to look into it anymore... But we are seeing growth in our core business and that is exciting,” Chamberlain said. “We have a lot of other stuff to focus on, and what we can do with new contracts on the LME excites us.” The LME has plans to launch contracts for such battery materials as cobalt and lithium, for such base metals as aluminium premiums and alumina, and for such ferrous products as hot-rolled coil.

Ta Chen to spend $1 billion in US

Ta Chen International (TCI) will invest $1 billion in the aluminium market in the United States in response to a growing supply deficit, the company’s top executive said. The master distributor, a subsidiary of Taiwan’s Ta Chen Stainless Pipe, plans to bring new material online to help mitigate a “huge supply deficit” in the US stemming from multiple trade cases that have led to vast uncertainty in the market, TCI president Johnny Hsieh told American Metal Market.

Aluminium producer Century Aluminium Co has estimated a global primary aluminium supply deficit of nearly 1.19 million tonnes for this year, the company said in a first-quarter earnings slide presentation on Thursday May 3. Some of the recently announced US trade cases, including Section 301 and Section 232, “came down way too fast and consecutively, with really no time for domestic mills to [add] any capacity. Nor do domestic mills seem inclined to make any significant investments by themselves due to these trade cases being very esoteric and transitory in nature,” Hsieh said.

TCI is considering four different investment options for the majority of the funds, and plans to follow through on at least two of these options. “It’s probably impossible to do all four, but they’re not mutually exclusive,” Hsieh said.

The company’s preference is to purchase a domestic rolling mill, although Hsieh cautioned that any merger and acquisition (M&A) activity is contingent on a number of factors. “We can only say that if an opportunity presents itself and [the] terms of a deal can be done, we’d prefer to acquire domestic assets.”

Outside of its four options, TCI is allocating about $20 million for an expansion of its Primus Pipe & Tube stainless pipe mill in Wildwood, Florida. Half of that will go toward building a new facility on the mill campus, while the remaining $10 million will go toward new tube mills and pipe mill upgrades, Hsieh said.

Tharisa buys stake in Salene Chrome Zimbabwe

Tharisa has acquired a 90% stake in Salene Chrome Zimbabwe Ltd for an undisclosed sum, the South African chrome producer announced on Wednesday May 16. The company acquired the holding from the Leto Settlement Trust.

Leto will keep a 10% free carried shareholding in Salene and will be entitled to a 3% royalty on gross proceeds from chrome concentrates sales. Salene has been awarded three special grants under the Zimbabwe Mines and Minerals Act covering about 9,500 hectares, allowing the mining of minerals including illuvial chrome.

The grant is valid for 24 months and includes the right to renew annually. Salene intends to pursue a mining lease valid for the life of mine.

Salene also intends to apply for National Project Status and for the areas covered by the special grant to be contained with a Special Economic Zone.

It also plans to spend $3.2 million over a 12-month period on a trenching program to determine with extent of mineralisation and chrome content grade. “Based on available geological information and similar illuvial chrome mining activities in the region, Tharisa considers this to be a highly prospective opportunity to meaningfully expand its chrome mining interests,” the company said.
News review: non-ferrous

CMC opens non-ferrous recovery plant

Commercial Metals Co (CMC) has commissioned a non-ferrous recovery plant at its facility in Lexington, South Carolina. The new system will allow Irving, Texas-based CMC to recover nearly all the non-ferrous metals from the automobile shredder residue generated during the auto shredding process.

The equipment and technology – which was supplied by Buffalo, New York-based Wendt Corp – will allow CMC to recover scrap commodities such as zorba and zurik, insulated copper wire and metal fines. These commodities have been threatened by big changes in Chinese trade policies.

So far this year, China has implemented aggressive restrictions on contaminants in scrap metal imports; set a 25% tariff on aluminum scrap imports; suspended its North American customs inspections division for 30 days, effective from May 4; and expedited its ban on imports of Category 7 copper scrap, to be effective the end of the year. These changes have stung US non-ferrous scrap exporters and has prompted many recyclers in the United States to explore and in invest in technology to upgrade materials.

EV nickel demand to surge tenfold

Mass production of electric vehicles (EVs) will transform the nickel market, which must evolve from pricing and supply perspectives in order to meet the anticipated surge in demand, a Vale executive said ahead of Metal Bulletin’s 6th International Nickel Conference, which began on May 31 in Toronto.

“We’re already preparing to enter the EV space but we’re going to preserve optionality until it’s time and we can extract value,” Robert Morris, Vale’s executive vice president of sales and marketing for base metals, told Metal Bulletin.

Nickel prices are not nearly high enough to incentivize more production to come online.

“If we want to supply this battery revolution with the appropriate nickel units, prices will have to be substantially higher,” he said, adding that it would likely take a couple of years for that to occur.

Morris did not have a specific nickel price point in mind for warranting additional production but it would “certainly” need to be above $17,000 per tonne, he said. Demand for nickel in the EV space is expected to total 36,000 tonnes in 2018, according to Frank Nikolic, Vale’s manager of market intelligence for base metals. That figure is expected to surge to 350,000–500,000 tonnes by 2025, according to Morris.

Most EV battery chemistries will be eight parts nickel, one part cobalt and one part manganese by 2025, Morris said. Battery chemistries currently use less nickel. Nickel is attractive because it allows for a higher energy density, and the more nickel that is used means there will be less cobalt, which is much more expensive.

Although technically difficult and complicated to increase the amount of nickel used in EV batteries, “everyone is moving toward that ... cheaper and higher performance,” Morris said.

Draft rules for new DRC mining code

The draft regulations required for the Democratic Republic of the Congo’s (DRC’s) new mining code have been completed and will be reported to the Minister of Mines by the inter-ministerial commission appointed to carry out the task, major international mining companies active in the country said. The minister will then work with the commission ahead of presenting the new code to the government for approval, according to industry representatives.

A legal and technical team representing Randgold Resources, AngloGold Ashanti, Glencore Plc, Ivanhoe Mines, Gold Mountain International, Zijin Mining Group, MMG (Pty) Ltd, Crystal River Global Ltd and China Molybdenum Co Ltd has been in the DRC to negotiate with the government since mid-March. The industry team participated actively in the process and influenced several regulations arising from the code. But because the commission’s terms of reference were restricted to the regulations it could not deal with key issues, notably those involving the rights vested under the former code, the representatives said.

The miners submitted a formal proposal to the DRC’s Ministry of Mines on Thursday March 29 to address concerns about the new code. In particular, these concerns focused on the stability clauses embodied in the previous code, which included taxation, customs and exchange control.

“The industry is still awaiting a formal response to this proposal, which among other things assumed the honoring of these rights and offered a sliding scale on royalties, allowing the government to benefit from rising commodity prices,” the mining companies said. The miners, which will continue to engage with the government at all levels as well as with the influential Civil Society, a member of the Mining Code Revision Tripartite Group, “remained hopeful that meaningful changes could still be made to the code,” they added.

LME warehouses in China?

The head of Chinese metals trader Maike Group aims to convince the country’s authorities to allow a network of warehouses that are bonded to the London Metal Exchange to be established on the mainland within the next five years.

“Every year we have massive amounts of metals shipped to Shanghai from nearby LME locations, such as Malaysia and South Korea. Chinese customers are paying an unreasonably high transport cost,” Maike chief executive officer He Jinbi said on Thursday May 17 at a panel discussion during LME Week Asia in Hong Kong.

He, elected this year as a National People’s Congress (NPC) delegate of Shaanxi province, has been pushing for the creation of an onshore LME warehousing system for many years. “Now is the time - conditions are ripe,” he said, after raising the proposal at the NPC in March to set up LME warehouses in Shanghai’s free-trade port. He did not disclose how that proposal has been received.
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China’s daily crude steel output up

China’s major steel mills raised their crude steel output rates in early May on healthy profit. Member mills of the China Iron & Steel Association (Cisa) produced crude steel at an average rate of 1.94 million tonnes per day during the first 10 days of May, up 1.6% from 1.91 million tpd in April, according to data released by the industry body on Monday May 21.

Cisa member mills, which are mainly medium-sized and large steelmakers, account for roughly 80% of the country’s total steel output. These steel mills had 13.61 million tonnes of finished steel in their inventories on May 10, up 9.4% compared with 12.44 million tonnes 10 days earlier, according to Cisa statistics.

The healthy profit, brought about by high steel prices, is still regarded as the major reason for mills’ high production rate.

Outokumpu focused on US growth

Outokumpu continues to focus on improving operations at its mill in Calvert, Alabama, while simultaneously growing its market share in the United States and expanding its product offerings, according to the company’s top executive. “We see the US as an extremely important market – a significantly growing market,” chief executive officer Roeland Baan told American Metal Market.

Following a slew of issues at Calvert, “we are well on our way to get to the full potential of the mill,” Baan said. Challenges at the mill include a 2014 machinery breakdown and outages last year at ArcelorMittal SA’s steel mill in Calvert, which supplies Outokumpu’s cold-rolling operations. As a result of the machinery breakdown, stainless consumers replaced volumes the Finnish steelmaker could not deliver with imports, Baan said. “We lost a gap in the market.”

To help turn things around, Outokumpu made a number of US management changes in mid-2015, which “made a huge difference,” Baan said. The company also worked very closely with ArcelorMittal last year, helping to fix operations at its mill and identifying technology that required upgrades and maintenance, including burners in the furnace and the side guides on the rolling table.

The Calvert mill is “running extremely well and is very reliable at the moment,” Baan said, but there is still “room for improvement.”

One initiative the company is targeting is selling more material from Calvert in the United States. In the past, the company relied on exporting because it would have had to lower its prices to be competitive in the domestic market. “We prefer to keep pricing in the US at a decent level,” Baan explained. The company is also working on expanding its product portfolio at Calvert, including adding more ferritic grades of stainless steel, Baan said.

Outokumpu produces ferritic grades at its Mexinox mill in Mexico, but it’s expensive to transport the material back to the US.

Shuttlesworth replaces Bula at Big River Steel

Big River Steel chief commercial officer Mark Bula has left the company he has been involved with since its inception. He will be replaced by steel industry veteran Keith Shuttlesworth, now general manager of the company’s carbon sales group.

Shuttlesworth worked at Pittsburgh-based U.S. Steel Corp for 18 years before joining Big River Steel, the newest flat-rolled mini-mill in the United States. He last served as director of sales for industrial solutions at U.S. Steel, and prior to that worked at the company’s mill in Slovakia.

Bula has left Big River to pursue “new entrepreneurial opportunities,” the company said on Thursday May 17. “All of us at Big River appreciate Mark’s contributions to the launch and early operations of our company and our mill,” chief executive officer Dave Stickler said in a statement. “Knowing that start-ups are Mark’s true passion, the Big River Steel family wishes Mark every success in his future ventures.” Bula had been at Osceola, Arkansas-based Big River Steel since before its groundbreaking in 2014.

Salzgitter expects higher 2018 earnings

Salzgitter expects its earnings to rise in 2018 despite “strained market conditions,” the German steelmaker said in its first-quarter results published on Tuesday May 14. The company said it expects volatility in raw materials prices as well as “massive distortions of competition in countries outside the EU, and sustained import pressure and foreign policy developments.”

Nucor invests $4m to boost Decatur output

Nucor Corp’s Decatur, Alabama, steel mill is undergoing a $4-million investment that will increase production by 80,000 tons per year. Nucor Steel Decatur LLC has been granted a 10-year tax abatement on the project, which will add additional equipment to the mill’s caster. Work was scheduled to begin at the sheet mill by May 15 and be completed by April 1, 2019, according to an application for the abatement submitted and approved by the Industrial Development Board (IDB) of the city of Decatur.

“We are always looking for ways to increase our productivity and efficiency. In Decatur, we are investing in improvements that will increase our casting speed and make our facility more efficient. The project involves adding an additional segment to each of the mill’s two casters. As a result, the additional cast speed will allow Nucor Steel Decatur to produce an additional 80,000 tons of flat-rolled steel per year,” a Nucor spokeswoman said.

While the project won’t create any additional jobs at Nucor, the investment will “enhance the security of all jobs at Nucor and will help to secure the future of Nucor’s operations in Decatur,” according to IDB documents. There are 720 employees at the Decatur facility.

“Maintaining our position as the low-cost producer of steel is a priority, and this investment will help keep Nucor Steel Decatur competitive in the global marketplace,” the Nucor spokeswoman added.
The certainty of uncertainty: Financing strategies for success and survival

When President Trump announced broad-reaching tariffs on imported steel and aluminum products, there was a collective sigh of relief from most U.S. producers who believe they have been hurt by unfairly traded imports. But as time moves forward, it may be difficult to ascertain the real winners of the tariff imposition. Right out of the gate, it looked like steel and aluminum producers could stand to benefit. But it’s not that simple; there could be increases in scrap prices that could impact the mini–mills, a significant and growing part of raw steel production in the U.S., while helping the integrated mills that have a captive raw material supply. A surge in demand to replace import volume could boost capacity utilization at the mills but also necessitate workforce hiring and cause operational and supply issues.

Limited steel availability in the U.S., which sounds positive, may actually add to inflationary pressures on steel and aluminum that constitute a wide range of everyday products from beverage and food containers to durable goods, such as appliances and automobiles, to infrastructure materials. And if the Trump Administration does introduce—and Congress passes—an infrastructure program, the tariffs could make the cost of those improvements higher than originally anticipated.

The impact of trade actions also varies depending on where one sits in the supply chain, whether one is a supplier, producer, distributor, manufacturer or end–user. Higher domestic steel prices could trigger a rise in imports of products with high steel content, such as appliances, HVAC, machinery and equipment, and agricultural products. As we have seen in the past, seeming certainty is frequently replaced by uncertainty, and success can turn to survival in this industry.

For that reason, the recipe for success and survival is cautious optimism, establishing a defensible position, trying to take advantage of opportunities and mitigating risks. And, at Bank of America Merrill Lynch we are able to help our clients navigate the challenges and opportunities that may lie ahead.

Bank of America Merrill Lynch has been a key financing partner for the steel industry for over 40 years. We’ve done this through many industry cycles. In addition to providing substantial credit commitments to companies in the industry ranging from middle market to large corporates, we provide a full array of banking, investment banking, risk management and wealth management solutions for our clients.

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“...We have the distinction of advising, providing financing and raising debt and equity capital for some of the world’s largest and most successful steel companies in myriad circumstances – from transformational mergers and acquisitions to everyday financial management strategies that can help ensure long–term success,” says Ira Kreft, senior vice–president, Bank of America Merrill Lynch. Kreft also notes: “Flexibility and liquidity have been key goals for our clients. They want to create a fortress balance sheet and tap the markets as either their performance improves or market conditions are attractive.”

From a debt financing perspective, a senior credit facility can be structured as a cash–flow loan or an asset–based loan. There are advantages and disadvantages to each. Companies in cyclical industries with lower operating margins and/or higher levels of capital expenditures often opt for an asset–based credit facility.

Bank of America Merrill Lynch has been a leader in providing asset–based financing for companies across the spectrum, including scrap metal recyclers, iron ore producers, integrated steel manufacturers and mini–mills and distributors. These financing arrangements give companies additional flexibility in the management of their businesses. “Our approach is to structure credit facilities that provide liquidity through cycles. Our clients can then focus on managing liquidity and aspects of their business they can control such as inventory levels, capital expenditures and expense reduction,” Kreft explained.

WORKING CAPITAL
Rising metal prices put a pressure on working capital as the investment in accounts receivable and inventory increases. Accordion features can allow for increases in the credit facility, and FILO tranches can help provide incremental liquidity under the facility, which can position companies for both internal and external growth opportunities.

ACQUISITIONS AND CONSOLIDATION
With modest organic growth, favorable industry conditions and attractive financing available, more companies have taken the acquisition route to growth. Acquisitions can provide value–added capabilities and processes as well as facilitate geographic and product line expansion and enable companies to enter new markets. For asset–based credit facilities in a rising price environment, the appraised value of inventory can become elevated, but borrowers need to be cautious about over–extending themselves.

GROWTH INITIATIVES
The financing for growth initiatives can include capital expenditure financing facilities, leasing and tapping the capital markets for longer–term debt and equity.

INTEREST RATE AND COMMODITY PRICE RISK MANAGEMENT
With rising interest rates, more companies are evaluating their mix of floating versus fixed rate debt and hedging strategies around interest rate risk. In addition to providing interest rate risk management solutions, Bank of America Merrill Lynch works with clients to develop and execute hedging programs for metals, natural gas, power, fuel, etc. The increase in steel prices has resulted in more customers of our clients asking for fixed prices, which has heightened our clients’ interest in hedging solutions.

RISK AND POSITIONING
Bank of America Merrill Lynch is experienced in helping our clients achieve their strategic objectives. We help them mitigate risk, build a solid financial foundation and position them to thrive through industry cycles.

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Salzgitter raised its full-year earnings forecast at the end of April; it now expects sales to rise to more than €9 billion ($10.7 billion) and a pre-tax profit of €250–300 million.

The steel market will remain volatile this year due to high volumes imported from countries such as Turkey, India and South Korea, the company said. Meanwhile, the volume of cheap Chinese imports will decline in the European strip steel market following the European Union’s adoption of anti-dumping measures, such as the 18.1–35.9% duties applied on hot-rolled coil from China.

The EU heavy plate market is dominated by high volumes of imports from non-EU countries, while increases in other material costs — such as for graphite electrodes and alloying agents — are a constricting factor on region’s steel sector, the company added.

During the first quarter of 2018, Salzgitter’s crude steel production rose by 34,200 tonnes to 1,773,800 tonnes from 1,739,600 tonnes in the first quarter of 2017.

Salzgitter’s earnings before interest, taxes, depreciation and amortization (Ebitda) increased by €8.2 million to €193 million during the first quarter of 2018, from €184.8 million during the first quarter of 2017. Salzgitter’s sales dropped by €46.4 million to €2.31 billion from €2.35 billion.

Salzgitter attributed higher selling prices of its strip steel products to the positive first quarter reported by its strip steel unit, which boosted orders and shipments from a year earlier due to improved demand for steel in Germany and elsewhere in the EU.

**SteelCo grows with Douglas asset buy**

SteelCo USA has purchased certain assets of West Coast steel processor Douglas Steel Supply to expand its production capabilities, according to the service center. The move is in line with industry views that the service center sector is expected to enter a period of consolidation, which sources said last month is primarily being driven by fragmentation within the sector and the current strength of the steel industry.

“The opportunity to acquire proven, class-leading processing equipment allows us to continue to grow and maintain the reputation for quality that our customers have come to rely on,” SteelCo chief executive officer Erik Gamm said in a statement on Tuesday May 1.

The assets acquired by SteelCo include multiple large-scale production lines, material handling equipment, vehicles, tooling and inventory, the Chino, California–based company said. The acquired processing equipment comprised three 60-inch wide precision multiblanking lines, a 60-inch wide slitting line, a 51-inch wide slitting line and multiple overhead cranes and shears.

“The addition of this equipment to SteelCo USA’s existing production operations marks a significant step forward in our ability to provide our customers with the breadth and depth of processing services that they need, while maintaining the level of quality and speed of service that they expect,” SteelCo vice president and general manager Tim Miller added.

**B.L. Duke adds steel terminal services**

Metals recycler B.L. Duke has expanded its scope of business with the addition of a subsidiary that offers stevedore services for finished steel products.

B.L. Duke River Transport has opened on a 30.5–acre facility in Joliet, Illinois, that includes 250,000 square feet of warehouse space. The new division, which has indoor and outdoor storage, offers transloading and stevedore services that enable it to offload finished steel products coming off the river from mills in the South and Gulf Coast and then reload the steel onto rail or truck for further shipment, Forest View, Illinois–based B.L. Duke said.

“We’re always looking for new ways to strengthen our services and improve cost-savings for our customers. This expansion allows us to help link mills with our customers and suppliers, and illustrates just one more way we’re revolutionizing the recycling industry,” B.L. Duke president and chief executive officer Lou Plucinski said.

The facility offers an advantage in that it is closer to Chicago and its suburban industrial areas compared with Indiana ports, B.L. Duke said, adding that the new site is in close proximity to several major highways and rail terminals.

**Calstrip to add facility at Nucor Steel Arkansas**

Calstrip Industries is building a $15 million processing facility at Nucor Steel Arkansas as part of the company’s efforts to support traditional medium- and high-volume service center customers.

Construction of the Mississippi County, Arkansas–based facility is slated to begin during the second quarter of 2018, with an initial size of more than 100,000 square feet. Two planned expansions will push the facility’s size to more than 300,000 square feet, the company said on Wednesday May 16.

Calstrip’s announcement follows a spate of expansion activity for Nucor in Arkansas. The steelmaker recently unveiled plans to build a $240 million, 500,000-tons-per-year galvanizing line at its sheet mill near Blytheville, Arkansas to increase its share in the automotive market.

This follows Nucor’s 2016 announcement to invest $230 million to build a new specialty cold mill at the same location.

Calstrip’s new facility will feature slitting and multi-blank, cut-to-length lines and provide specified storage and processing requirements for Nucor Steel Arkansas and its customer base, Calstrip said.

“Site selection and building design have been completed,” Calstrip chief operating officer Ed Camden said. “We are communicating with Nucor and our customers on appropriate equipment requirements.”
Aluminium

Still plenty of metal around

LME aluminium prices have done well to consolidate around the $2,300 per tonne level during May, considering that the panic over US sanctions and tariffs has subsided somewhat after the White House softened its initial stance. This is still an uncertain situation though, and the risk remains that potentially significant supply disruptions still lay ahead. Consumers are focusing on diversifying to a new source of supply and Chinese aluminium has offered the needed material sufficiently. In fact, the Chinese domestic market is in a surplus. It does not need to import for now, which explains the low stocks in Shanghai-bonded warehouses. As such, the aluminium market is adjusting well to its new settings, but prices are vulnerable to the fact that there is still plenty of metal around. As this becomes more evident — and episodes on LME backwardation will be a good gauge of off-market availability — the consolidation pattern of aluminium prices may assume a downward bias.

Copper

More bullish for Q3–Q4 than for Q2

Although the fundamentals of the copper market are supportive over the long term, we see only limited upward pressure for the remainder of Q2. This is principally owing to a weaker-than-expected seasonal rebound in China’s copper demand ahead of what is usually a quiet period in the summer. The lack of major mine supply disruptions is not helping the short-term bull case for copper either. At the macro level, the current short-covering rally in the dollar is a cap on copper’s upside too. Hence our Q2 base-case LME cash price forecast is at $6,450 per tonne, which is up 2% from the quarter-to-date average, at the time of writing, of $6,333 per tonne. We are more constructive towards copper for H2 2018, in part reflecting a tighter concentrate market, stronger global growth dynamics, growing inflation pressure, and the likelihood of renewed weakness in the dollar. Our H2 base-case LME cash price forecast is at $7,250 per tonne, up 6% from prices levels now.

Nickel

Right to raise Q2 price forecasts

After the spike to a three-year high of $16,690 per tonne in April, at the height of the market’s panic about the possibility of US sanctions impacting Rusal and potentially affecting Nornickel too, nickel prices naturally retreated into the $13,000s to consolidate. But they have rallied again in May into the high $14,000s, attempting to retest the $15,000 per tonne level. What is driving this rally is bullishness about the electric vehicle (EV) revolution at LME Week Asia. This is somewhat reminiscent of the EV excitement that engulfed nickel around the time of LME Week in London last October. Right to raise Q2 price forecasts.
Tin

Under pressure

We have held our Q2 tin price forecast unchanged at $21,000 per tonne for some time, even as prices threatened $22,000 per tonne in April. We have been confident that the supply-side fundamentals will weaken and this now seems to be happening. In turn, and as daily prices have broken below the $21,000 per tonne level, the average price for the quarter is moving towards our forecast. Driving prices lower has been a surge in exchange stocks, which jumped 3,233 tonnes, or 50% over the first half of Q2 alone. The Indonesian supply bottleneck has passed now that the government has cleared rules on export permit applications and issued permits to 12 companies to ship a total of 51,368 tonnes this year. Chinese exports are also surging; they reached 1,960 tonnes in Q1, compared with 110 tonnes in the same period of 2017. In light of this, tin prices and premiums are likely to remain under downward pressure in the short term.

Zinc

Deficit shrinking, but still significant

Zinc prices have continued to trade in a down-channel since peaking in February, and that trend arrived at the psychologically significant $3,000 per tonne level in May, where there has been a good attempt to consolidate. Interestingly, there was a similar down-channel to zinc prices during February-June last year. Ultimately, that turned out to be a continuation pattern within zinc’s impressive multi-year up-cycle. Prices broke higher and went on to score fresh highs later last year and again earlier this year. While it is not presently our base case, we would not rule out the current down-channel being the precursor to another up-swing in the multi-year bull market. While we have recently adjusted our Chinese supply-demand forecasts for 2018, which has reduced the global deficit to 235,000 tonnes — around half of last year’s supply shortfall — inventories will still be drawn down again this year, which should continue to underpin prices. Our Q2 average price forecast is $3,100 per tonne.

Analysis by Andy Cole, Metal Bulletin Research

Steel

Booming construction sector in China supports steel prices

Growth rates in the construction sector in China have been robust, with new building floor-space starts up by 9.7% year-on-year in the first quarter and estimates that the industry continued to accelerate in the second quarter, by far the strongest in the country.

High demand has exceeded supply, which has led to a drawdown of rebar stocks during the last two months and supported prices. MBR analysis suggests that this led to a rise in rebar margins to over 1,000 yuan ($157) per tonne in May, a level last seen during the panic at the end of 2017.

Responding to a booming construction sector, Chinese mills opted to raise their rebar output rates at the expense of flat products, tightening the market and supporting hot-rolled-coil prices as well.

In the US, after a period of uninterrupted growth, flat steel prices saw their first falls this year, as end-users started to question the sustainability of the increases. HRC prices ticked down for two weeks in the middle of April, and although they resumed an upward trend after that, the pace of increases has visibly slowed down.

MBR believes that rising arbitrage with prices in other markets is bound to make foreign material more attractive for US buyers, putting pressure on the domestic price level. For example, in the second week of May the differential between domestic north European and US Midwest HRC prices was as high as $291 per tonne, meaning that even if European Union prices were under the 25% tariff regime, the spread would be $121 per tonne, above the long-term average of $96 per tonne. This can also explain why the EU is so strongly opposed to a proposal of quotas as a requisite for keeping its exempt status from the US Section 232 tariffs; were US prices to remain at an elevated level, European producers would prefer not to be bound by volume limitations.

Meanwhile, a number of bilateral agreements for permanent Section 232 tariff exemptions were finalized in April, with the US pushing for an imposition of quotas on all countries seeking exclusions. This mechanism will be more effective in limiting import

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volumes than tariffs alone, allowing US domestic producers to capture the larger market share, while tighter supply should give greater support to the price level.

In early May, the European Commission (EC) conditionally approved ArcelorMittal’s acquisition of Ilva. ArcelorMittal submitted its bid in March 2017, but the process has been delayed by an antitrust investigation, with concerns about concentration and competition in HRC, CRC and HDG markets after the merger. According to earlier released plans, ArcelorMittal will increase crude steel output at Ilva to 6 million tonnes, capping it at that level until 2023. However, the company aims to raise finished steel production by importing slab and coils, steadily raising shipments to 9.5 million tonnes by 2023 (from 5.5 million in 2016).

In 2016, Ilva’s share of the Italian apparent flat steel consumption would have been 33% (assuming all material went into the domestic market). ArcelorMittal proposals indicate that it targets to increase Ilva’s share to over 50%. If the EC brings in protective measures against steel imports to the EU as a result of its safeguard investigation, this will assist ArcelorMittal in its plans. In the longer term, this consolidation should lead to a greater uniformity of steel prices in Europe, as ArcelorMittal seems unlikely to continue with Ilva’s past strategy of being a low-cost leader, with Italian prices likely eventually to move closer to the Spanish and north European level.

Analysis by Marina Maliushkina,
Metal Bulletin Research

### Steel raw materials

#### Markets strengthen on China steel–rates recovery

Metal Bulletin’s 62% Fe fines index recovered slightly to $66.92 per tonne cfr Qingdao on Friday May 18, from $64.96 per tonne cfr five-weeks earlier on April 13. With half of the trading days in May remaining, this month has so far averaged slightly higher than April.

Rising Chinese crude steel production has been able to wave off the bearish risks from oversupply as domestic iron ore supply growth appears moderate. But we still believe iron ore prices will come down in the second quarter as we enter a seasonally weaker period.

Crude steel output in China continues to outperform the rest of the world and has beaten many expectations. According to preliminary statistics published by the National Bureau of Statistics of China, April crude steel production in China grew by 5% month-on-month to 76.7 million tonnes. This was a surprisingly bullish result, especially given the 11% upsurge in crude steel output the previous month. Despite the rising demand, April seaborne iron ore imports into China were 3.30% lower than March. In order to meet the demand from growing steel production, Chinese mills have drawn from stocks which shrank by 2.40 million tonnes in April. It was the first time since September 2017 that we saw stocks shrink month-on-month.

Average blast furnace utilization rates in China in April saw the largest month-on-month increase in at least two years. It is quite rare to see blast furnace utilization rates rise sharply in two consecutive months as in March and April this year. This followed the four-month-long decline in utilization rates since October last year, which was the last month before the cap on blast furnace utilization was put in place. Once winter caps were lifted in mid-March, the monthly average rate climbed to a six-month high of 86% (see chart). Australian coking coal exporters also established, whether temporarily or otherwise, a floor for the price of coal.

While Chinese coal prices seem likely to find support from Australian competitors keen to raise prices, a threat is revolving from local coke producers, given the persistent decline in their apparent margins over local coals. Chinese domestic coke prices are beginning to look unprofitable for suppliers seeing as the conversion margin is trending down to around $20 per tonne, which is equivalent to no marginal. The average conversion margin during the past two years of profitable times has been $40 excluding sales taxes, and every time profitability has been tested during that period, such as last month, there has been a recovery. But with coal suppliers in no mood to drop prices, the onus is on coke producers to push for further price rises too, and they have threatened to restrict production.

In the ferrous scrap market, the US prices faced headwinds in May after two months of increases. As MBR forecast, prices for obsolete scrap fell further than those for prime grades. Prime grades prices remained unchanged in Chicago and Pittsburgh after scrap sellers pointed to strong finished steel prices as a reason to resist mill attempts to reduce buying prices. The export-dependent Philadelphia market performed worse. The US domestic scrap demand recovery remains sluggish. Raw steel output inched up by 1.70% to 33.25 million net tons thought May 12, lagging behind MBR’s relatively bearish 2018 forecast of a 3.47% year-on-year growth.

Analysis by Alona Yunda,
Metal Bulletin Research

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**Markets strengthen on China steel–rates recovery**

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Analysis by Alona Yunda,
Metal Bulletin Research
Profile
Metallurgy definitely did not top the list of Mark Millett’s career aspirations as a young man growing up in the southwest of England. “I wanted to become a mechanical engineer,” the president and chief executive officer of Fort Wayne, Indiana-based Steel Dynamics Inc (SDI), recalled recently. “But I hated math.”

No surprise then that when it came time to set off for college, Millett followed the path of least resistance and pursued ‘Plan B’. Several years and the requisite number of credits later — and with little more than a newly minted degree in metallurgy, a subject he majored in “by default” — Millett headed straight to America.

“I grew up exploring,” he said, shedding some light on the decision to jet off to foreign shores soon after graduating from Surrey University. “We were always camping, hiking, kayaking.”

Looking for adventure, Millett found that and a whole lot more since departing England and ultimately settling in Fort Wayne, with stops in Aspen, Colorado, Darlington, South Carolina, and Charlotte, North Carolina, along the way.

“I came over in 1981 and spent the winter in Aspen as a ski bum,” he recalled his early days in the

‘We grew from a few locations to 85 locations and almost doubled the number of reports’

Six years into his role as Steel Dynamics Inc’s chief executive officer, Mark Millett has built on a bloodline that links back to the birth of the mini-mill movement. As he engineers the company’s growth, his challenge is to preserve the very culture credited as being key to the success of the sector, he explained to Jo Isenberg-O’Loughlin

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US. “I washed dishes and skied. It was fun. I remember breaking my last twenty-dollar bill waiting on the snow.”

Today, almost four decades since trading-in his skis to join then mini-mill upstart Nucor Corp, Millett has proven markedly adept at not only applying his metallurgical expertise to real-world environments, but managing a measured and deliberate approach over the past five-plus-years to growing the company that he co-founded with fellow Nucor alumni Keith Busse and Richard “Dick” Teets some twenty-five years ago.

Busse, who served as SDI’s top executive since it was founded in 1993, handed the reins of the company to Millett in January 2012 in a transition that Russ Rinn, executive vice-president of the company’s OmniSource Metals Recycling Operations, describes as “absolutely seamless. It was really a great testimony to both of them,” Rinn adds.

“When I retire, you are the boss,” Busse told his would-be successor. “You’re in charge.”

“I trusted Keith and he was true to his word,” Millett said. “I give Keith a lot of credit for that.”

Hail, hail to thee

Graduates of “Iverson U.,” the informal and unofficial institute of higher learning named after F. Kenneth Iverson, Nucor’s legendary former CEO, SDI’s co-founders helped write steelmaking history at the company’s Crawfordsville, Indiana plant. All three played pivotal roles in the commercialization of the revolutionary Continuous Strip Production (CSP) process there and since then have been steadfast in their commitment to preserving and passing on the culture that pervaded, underpinned and propelled the ascent of the Charlotte, North Carolina electric-furnace-based steelmaker.

“I guess I didn’t know how lucky I was,” Millett reflected on his early days at Nucor’s Darlington plant. “For me, it was purely a job where I could make some money. I didn’t realize at the time that that plant was essentially a test bed of technology for Nucor.

“Virtually every piece of new technology developed for use with or in the electric furnace — the direct current (DC) furnace, Consteel, a whole bunch of things — came through Darlington,” Millett noted. “As a kid, I got to play. Being exposed to that pioneering spirit and technical kind of interest was terrific.

“At the same time, being in the shadow of Ken Iverson and seeing, watching, and absorbing the way he inspired and motivated people was incredible,” he added.

“Iverson was an absolute leader. The innovation, technical education, and managerial leadership were phenomenal.”

Although reasons behind the decision to depart Nucor and form SDI vary from co-founder to co-founder, Millett said the choice, for him, was “very easy. I was always looking for the next challenge,” he comments. “And I wasn’t sure of future opportunities at Nucor.”

SDI was established in 1993 with Busse, who retired some 18 years later from his post as CEO, leading the charge through the company’s formative years.

“Keith was obviously the leader, kind of the principal architect,” Millett reflects. “Dick was the epitome of an engineer. You can’t get any better. And me . . . I was just jack-of-all trades I guess.”

“It’s a great team,” Millett added. “We would challenge each other.”

Compare and contrast

When pressed to describe the differences in his versus Busse’s leadership style, Millett is quick to point to the quantum changes in the size, complexity and
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day-to-day operational dynamics of SDI over the past decade or so. “Keith and my styles are very different and it’s not that one style is better than the other,” Millett is careful to note. “His was much better for the early part of the life-cycle of the company. “Keith tended to be a lot more intuitive and reactionary. He just had an incredible sense about business,” Millett elaborated. “I tend to be a little more structured and intentional.”

To illustrate his point, Millett referred to a “great book” (Power Ambition Glory) he was reading about the rise and fall of different civilizations. In it, they talk about Rome and Caesar, who obviously built the Roman Empire,” he said. “And that’s definitely Keith. He is our Caesar.

“But Caesar was followed by Augustus,” Millett drew a comparison. “He tended to bring a little structure to the Empire.”

A New York Times bestseller, the full title of the 320-page book (in paperback) is Power Ambition Glory: The Stunning Parallels Between Great Leaders of the Ancient World and Today... and the Lessons You Can Learn. In a section titled “The Roman Republic, the Ultimate Multinational,” authors Steve Forbes, of Forbes Media fame, and classics professor John Prevas subtitle the chapter on Caesar’s successor “Augustus: Stability and Moderation.” It may not be an exact analogy, but the parallels between ancient Rome and 21st Century Fort Wayne, Indiana are not far-fetched.

“Keith has great instincts. He is relentless. He doesn’t allow people to become complacent,” Chis Graham, vice-president, steel fabrication operations, downstream manufacturing, comments. “His approach was perfect for an upstart company. He instilled a toughness in the team that carries us to this day.”

“Like Keith, Mark has great vision. He’s added valuable structure and discipline to our approach,” Graham adds. “Mark has created a roadmap for the future that will keep the next generation focused on what makes us best-in-class. Both Keith and Mark were the right leaders at the right times.”

**Step-by-step**

Maintaining stability across an enterprise that has grown from a single, flat-rolled mill in Butler, Indiana to a veritable industrial powerhouse sporting a total annual flat-rolled steel shipping capacity of 12.4 million tons — counting the agreement announced only weeks ago to acquire Companhia Siderurgica Nacional LLC (Heartland), from CSN Steel S.L.U. — is no small chore.

Today, with facilities located throughout Mexico and the US, SDI is one of the country’s largest steel producers and metal recyclers. Besides serving the hot-rolled, cold-rolled, coated sheet, structural beams and shapes, rail, engineered special bar quality (SBQ), cold-finished, merchant bar, specialty sections and steel joists and deck markets, the company produces pig iron and processes and sells ferrous and non-ferrous scrap. Last year, SDI charted revenues of $9.5 billion, with net income pegged at $813 million. Cash on hand in March of this year totaled one billion dollars.

“The complexity of the company today is a lot different than it was a decade ago,” Millett said. “We went through a pretty large growth spurt about ten years ago when we bought OmniSource. We grew from a few locations to 85 locations and almost doubled the number of reports. So, it [the company] needs a little structure.” SDI acquired OmniSource, America’s second largest ferrous and non-ferrous scrap processor, in a transaction valued at slightly more than $1 billion in 2007. Last year, 63% of the wholly owned subsidiary’s ferrous scrap shipments were earmarked for delivery to the company’s six steel mills.

Seven years later — and just shy of three years into Millett’s tenure as CEO — SDI added what is now known as the Flat Roll Columbus (Mississippi) Division. The $1.6-billion transaction marks the steelmaker’s largest acquisition to date and has proven a pivotal junction in SDI’s evolution in more ways than one.

“Right around the mid- to late-2016 timeframe, you started to see a change in our stock valuation relative to our peers,” Theresa Wagler, executive vice-president and chief financial officer, observes. “The team gained a considerable amount of credibility with the execution of the Columbus acquisition, and the step function improvement in our through-cycle cash earnings capability.

“And with that, I believe our investors view us differently today,” she allows. “Now, there are a lot of different aspects to that premise, but Mark is a key component. It means a great deal to people when you say something and you actually do it.”

**Culture is sacrosanct**

For all its importance as a performance metric, the pursuit of “prudent growth” comes in second to what SDI’s CEO views as his most critical mission.

“People ask: ‘What is the most important thing you do?’” Millett reflected. “For me, our success...
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has been driven in large part by our culture. The challenge is to sustain that culture as you grow bigger. Sustaining our culture is sacrosanct.”

Over the years, much has been written about the ownership culture pioneered by Iverson at Nucor and fully embraced, evident and thriving today at SDI. Ironically, some argue, the very success and subsequent supersizing of the nation’s top-tier, one-time, “mini” steelmakers have weighed against the preservation of that culture.

“It goes beyond good incentives,” Millett cited one of the hallmarks of the culture he is fiercely dedicated to sustaining. “It may sound trite, but it’s maintaining that family feeling. You have an employee that deep down feels like an owner. And once you have that,” Millett says, “you have passion and everything that goes with it.

“It’s hard work,” he added. “You’ve got to show them you love them.”

**Geared for ‘prudent’ growth**

Ask SDI’s CEO what he expects the company to look like in five years and he is quick to answer: “More profitable, bigger, but hopefully not massive. We’re not emotional. We’re not interested in growing to get bigger.

“We need to sustain our culture, we need to sustain our track record – higher highs, higher lows – and grow to create shareholder value. And have fun,” Millett emphasized. “You’ve got to have fun!”

SDI’s search for the right fit in an acquisition, such as the pending purchase of Heartland, is highly selective, focused to deliver key strategic goals, and has evolved over the years. “It [adding Heartland] leverages our core strengths and at the same time fulfills our initiatives to further increase value-added product and market diversification,” Millett commented in mid-May when the purchase was announced.

“As we assess transactional growth, we have one metric that we actually look at, which is maybe a little different than most people” Millett suggested. “Everyone looks at return on capital and return on this that. But I also look at Ebitda per employee or profit per employee,” he noted.

“Going back to culture being fundamental, if you worry that the bigger you get, the greater the probability and risk there is of losing that culture, looking at earnings per employee is critical,” he insisted. “Let’s just say we go ahead and buy a building products company, get $200-million of Ebitda or something like that, and pick up 5,000 or 6,000 employees. Compare that to buying or building a steel mill and employing 600 people that generate the same amount (of Ebitda) if not more.”

SDI is equally prudent in its approach to capital outlays, which

“We recognize we are in a commodity market and a cyclical marketplace”, says Millett.
Founded in 1993, today Steel Dynamics is one of the largest and most diversified domestic steel producers and metals recyclers in the United States.

We are extremely proud of our accomplishments and look forward to celebrating our 25th anniversary during 2018. We are thankful to all who have contributed to the safety and performance of our growing company.

We differentiate ourselves through an exceptional and unique operating culture, a diversified and value-added product portfolio, a low-cost operating base, and an entrepreneurial spirit that permeates our entire organization. These factors drive us forward, and create long-term value for all those involved with our company—and we thank you.
Top steelmakers in 2017

As global steelmaking capacity continues to outpace demand, trade protection measures and their consequences for the international flow of steel products are foremost in the minds of many steel producers. Alongside Metal Bulletin’s annual ranking of steelmakers by output, correspondents around the world review developments in their regional steel sectors.

NORTH AMERICA

Global steel trade, and the much-litigated abuses that can attend it, have been a persistent feature of the North American steel landscape for decades. Last year, and in step with President Donald Trump’s pledge to “Make America Great Again,” international trade not only dominated but drove the market dynamics, mindset, and fortunes of the five US-based steel producers listed in the accompanying table and their counterparts across the North American industry, as well as up and down the supply chain.

In an April 2017 move resulting in what has been described as “the mother of all trade cases,” the Trump Administration self-initiated an investigation under Section 232 of the Trade Act of 1962 to determine if steel imports threaten to impair US national security. Several missed deadlines and some nine months later, in mid-January 2018, the US Department of Commerce submitted its findings in the form of a report to the president.

On March 8 of this year, and after weighing three options put forth by Commerce, President Trump announced that imports of steel products into the US will be subject to a 25% tariff. The decision drew reactions ranging from a mounting flood of requests for exclusions and exemptions to quota-based arrangements negotiated with individual countries. As Metal Market Magazine went to press, steel trading partners in Canada, Mexico and the EU were awaiting a June 1 exemption deadline.

Seemingly undeterred by the Section 232 trade action, or more likely rushing to land product in the US before the tariffs took hold, steel traders upped the ante in 2017. Total steel imports jumped by more than five million net tons, or 15.5%, compared with 2016 volumes, with finished steel imports accounting for an estimated 27% share of the US market. The US capacity utilization rate averaged 75% last year, according to the Steel Manufacturers Association (SMA), a Washington, D.C.-based, primary trade association for electric-arc steel producers.

The double-digit ramp-up in 2017 imports was offset to a degree, however, by a steady strengthening in steel prices and what Steel Dynamics Inc (SDI) president and CEO Mark Millett described in a fourth-quarter conference call with analysts as “an improvement in underlying demand. The automotive sector remained strong and the construction and energy sectors continued to improve,” he noted.

Other events of significance to steel producers playing out in the nation’s capital in 2017 ranged from the bipartisan confirmation of Wilbur L. Ross, a financier with extensive knowledge of the steel sector, as US Secretary of Commerce and then the confirmation several months later of Robert Lighthizer as US trade representative (USTR).

Add to that the signing in late December by President Trump of a sweeping and hotly contested tax reform bill (the Tax Cuts and Job Act) into law. The measure, effective January 2018, creates a single corporate tax rate of 21% – well below the previous top corporate rate of 35% – and promises to deliver an immediate step-up in earnings, stronger balance-sheets, and an increase in fixed asset investment, which is typically accompanied by a rise in steel consumption.

All five US-based steel producers cited in the accompanying list moved up in global ranking. Nucor Corp, the highest-ranked North American producer, continued to grow its footprint, expanding organically and through acquisition. In late 2017, the Charlotte, North Carolina-based steelmaker announced that it would add a $180-million, 500,000 ton per
Top steelmakers in 2017

<table>
<thead>
<tr>
<th>Ranking 2017</th>
<th>Company</th>
<th>Country of origin/ Main domicile</th>
<th>2016 Output</th>
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<tbody>
<tr>
<td>1</td>
<td>ArcelorMittal SA</td>
<td>Luxembourg</td>
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<td>93,100</td>
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<td>2,192</td>
<td>2,344</td>
</tr>
<tr>
<td>▼ 124</td>
<td>Xingtai Iron &amp; Steel Co Ltd</td>
<td>China</td>
<td>2,414</td>
<td>2,323</td>
</tr>
<tr>
<td>▼ 125</td>
<td>ESCO - Esfahan Steel Co</td>
<td>Iran</td>
<td>2,750</td>
<td>2,300</td>
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<tr>
<td>-</td>
<td>Valoreux (x)</td>
<td>France</td>
<td>1,281</td>
<td>2,256</td>
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<tr>
<td>▲ 127</td>
<td>New Tangshan Wenshangchuan Wheel</td>
<td>China</td>
<td>2,046</td>
<td>2,252</td>
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<tr>
<td>▼ 128</td>
<td>Badische Stahlwerke GmbH</td>
<td>Germany</td>
<td>2,371</td>
<td>2,240</td>
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<tr>
<td>-</td>
<td>New Tangshan Guoyi Special Steel</td>
<td>China</td>
<td>2,072</td>
<td>2,300</td>
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<tr>
<td>-</td>
<td>New Mingfeng Steel</td>
<td>China</td>
<td>2,277</td>
<td>2,108</td>
</tr>
</tbody>
</table>

All figures in thousand tonnes

(i) Listed as Hebei Iron & Steel Group Co Ltd in 2016 ranking
(ii) JFE figure includes subsidiary company outputs calculated by percentage
(iii) Nucor figure converted from reported figures in US tons to metric tonnes
(iv) 2017 output figure unavailable at time of going to press, so figure repeated from 2016
(v) Valin Group’s figures for 2016 and 2017 now include the production of ‘Longchun New Steel.
The figure published last year of 15,482,500 for 2016 did not include the production for this company.
(vi) Temur’s figures are shipped steel
(vii) AK Steel Corp figure represents volume of shipments rather than crude steel production
    – converted from reported figures in US tons to metric tonnes
(viii) CSN’s figure includes 4.2 million tonnes from its Brazil operations and 0.8622 million tonnes
    from its SWT subsidiary in Germany
(ix) Commercial Metals figure converted from reported figures in US tons to metric tonnes
(x) Outokumpu figure is for delivered tonnages rather than production
(x) Valoreux figures relates to tonnes sold

*Based on 2016 data, updated where new data has become available

Ranking movement: ▲ Up ▼ Down  • Unchanged  – New entries this year
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Top steelmakers in 2017

year, full-range merchant bar quality (MBQ) mill at its existing facility in Bourbonnais, Illinois, as well as construct an “at least” $250-million rebar micro-mill in Sedalia, Missouri.

Last year was a pivotal one for US Steel (USS), which announced the retirement of Mario Longhi, CEO and a key architect of the “Carnegie Way” rejuvenation/rescue plan. David Burritt, president and COO and former top executive at Caterpillar, succeeded him.

A month later, in late-June and after extensive negotiations, USS finalized the restructuring and sale of USS Canada (formerly known as Stelco) to the Bedrock Industries Group LLC – a New York-based, privately funded metals, mining and natural-resource company.

Throughout 2017, and like Nucor and US Steel, SDI, AK Steel and Commercial Metals Co. spent significant time and energy traveling to Washington to attend and testify at a series of Section 232-related hearings.

Closer to home, AK Steel ratified a string of successive labor agreements covering operations at its Mansfield (Ohio) and Dearborn (Michigan) Works, Rockford (Illinois) plant, and AK Tube LLC operation in Walbridge (Ohio). In April, AK opened the doors of its world-class, $36-million Research and Innovation Center in Middletown, Ohio, and in late summer completed the $360-million downstream acquisition of Ontario-based Precision Partners Holding Co, a provider of engineering, tooling, and hot and cold stamped products.

Commercial Metals Co (CMC), which also saw a change at the top with Barbara Smith promoted to CEO in September and adding the title of chairman in November, completed the sale and exited its raw materials trading business last year. And only days into 2018, the Texas-based steelmaker acquired rebar steel mill and fabrication assets from Gerdau S.A. for a cash purchase price of $600-million.

The buy added four steel mills and 33 rebar fabrication plants to the CMC fold.

Jo Isenberg-O’Loughlin

CIS

In 2017 the steel producers in the Commonwealth of Independent States benefited from increased steel consumption, after a continuous decline during the previous three years. Consumption reached 52.8 million tonnes in 2017, rebounding from the decline in 2016, when it was 49.4 million tonnes, according to Worldsteel data.

The growth was mainly related to higher consumption in Russia, where steel use improved to 40.6 million tonnes after two years of decline. Steel consumption in Russia started to decrease in 2015, when it fell to 39.4 million tonnes, from 43.1 million tonnes in 2014. In 2016 consumption reduced to 38.2 million tonnes.

The economic slowdown in Russia accounted for the reduced consumption.

In 2018, steel consumption in the CIS is forecast by Worldsteel to increase by 3-4%, mainly due to an improvement in the construction sector,” Severstal’s sales director Evgeny Chernyakov has told Metal Bulletin.

Novolipetsk Steel (NLMK), Russia’s largest steelmaker, expects that Russia’s 2018 steel consumption will increase by 1.5-2%, and the country’s long-term growth rate will be around just 1%. “The Russian market is too small for us, we can’t achieve our growth goals in this market, considering the slow rate of its growth,” Oleg Bagrin, NLMK’s CEO, said.

In contrast to the favorable situation in domestic markets, CIS producers faced challenges in exports. In early October 2018, the European Commission (EC) imposed fixed charges in the range of €17.60-96.50 per tonne as a definitive trade defense measure in the case against hot-rolled coil originating from four countries; Russia and Ukraine were among them.

As a result, Severstal, which received a relatively low duty €17.60 per tonne, managed to continue HRC sales to the EU, but volumes were reduced. Metinvest was able to sell HRC to the EU too, but only when the market was high and the price
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for its products, including €60.50 per tonne duty, was competitive.

The next shock came from the US, when it imposed the Section 232 tariffs in early March 2018.

Even if Russian and Ukrainian suppliers can overcome the 25% import tariffs in the US, they will meet tightened competition in other outlets, where other global suppliers will redirect volumes away from the US market. In 2017, Russia shipped 2.9 million tonnes of steel products to the US, while Ukraine exported 241,000 tonnes there in 2017, according to data from the US Department of Commerce.

Later in March, the EC launched its safeguard investigation into 26 steel product types to prevent the redirection of imports from the US to the EU market.

Turkey joined in considering trade protection measures in late April by starting an investigation into imports of flat, long and stainless steel, along with steel tube & pipe products.

The investigations in the EU and Turkey will add pressure on the CIS steel exporters.

In 2017, Russia exported around 4 million tonnes of HRC, almost 40% of which was accounted for by Turkey as the destination, and 9% for the EU, Metal Bulletin estimated on the basis of International Steel Statistics Bureau (ISSB) data. Over the same period, Ukraine exported around 1 million tonnes of HRC, 24% of which was shipped to the EU and 14% to Turkey.

Total finished steel and semi-finished product exports from Russia were around 28.7 million tonnes in 2017, Metal Bulletin Research estimated, based on Worldsteel data. In 2016, Russia exported 31.2 million tonnes and became the world’s third largest exporter. In 2017, steel production began to decrease in the CIS. Russia produced 16.6 million tonnes in January-March, which was a decline from 17.7 million tonnes last year.

The rest of the 8 million tonnes of steel in the CIS were produced by Byelorussia, Kazakhstan, Moldova and Uzbekistan.

In 2018, steel production strengthened in the second half of 2017 on the back of higher raw material costs, the recovery of international coil market prices, and positive effects from anti-dumping measures in Europe. The EC imposed definitive anti-dumping measures on HRC from China in April 2017, as well as from Russia, Brazil, Iran and Ukraine in October 2017.

Total steel imports into the EU fell by 1.8% in 2017, reflecting a 7.9% year-on-year rise in the first half of the year and an 11% year-on-year drop in the

Marina Shulga

EUROPE

Support from trade defense measures and increased demand led to higher prices, boosting European steelmakers over the second half of 2017 and in the first half of 2018. But concerns about the increasing threat of protectionism amid the US Section 232 tariffs on steel imports and the potential redirection of steel from the US to the EU market have led to uncertainty in the market ahead of the second half of 2018.

In late April, US authorities postponed until June 1 the imposition of import tariffs on steel and aluminium from the EU, Canada and Mexico. The threatened 25% tariff on steel arises from the country’s Section 232 trade investigation, but the final outcome is still awaited at the time of writing.

The EC started its own safeguard investigation into 26 steel products on March 26 this year, with the intention of shielding the region’s steel industry from the effects of a possible surge in import volumes that could come from material being redirected from the US. Crude steel production in the EU rose by 4.11% to 168.68 million tonnes in 2017, according to Worldsteel, as EU steelmakers took advantage of stronger market conditions.

EU flat steel prices strengthened in the second half of 2017 on the back of higher raw material costs, the recovery of international coil market prices, and positive effects from anti-dumping measures in Europe. The EC imposed definitive anti-dumping measures on HRC from China in April 2017, as well as from Russia, Brazil, Iran and Ukraine in October 2017.

Total steel imports into the EU fell by 1.8% in 2017, reflecting a 7.9% year-on-year rise in the first half of the year and an 11% year-on-year drop in the
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Top steelmakers in 2017

second half, according to regional steel association Eurofer. Metal Bulletin’s assessment of prices for Northern European domestic HRC gradually rose to €570-590 per tonne on March 7, 2018, up gradually from €485-510 per tonne on July 12, 2017.

ArcelorMittal, retaining its position as the world’s largest steelmaker in 2017, was at the forefront of driving price increases for both flat and long steel products. The Luxembourg-based producer reported an operating income of $2.36 billion for its European operations in 2017, up sharply from $1.27 billion in 2017. ArcelorMittal’s acquisition of Italian steel producer Ilva received conditional approval from the EC on May 7, after it proposed to sell a number of flat steel plants throughout Europe to one or more buyers to preserve effective competition in the European steel market.

Elsewhere, the proposed flat steel merger between Germany’s ThyssenKrupp and the European subsidiary of India’s Tata Steel is expected to be agreed by the end of June this year. The venture is expected to generate annual revenues estimated at €15 billion and to ship about 21 million tpy of steel.

Concerns remain over the ambitious fourth phase of the EU’s Emissions Trading System (ETS), which will run from 2021 to 2030. Eurofer has said that the plan still fails to secure a global level playing field for the region’s steel industry. Negotiations on the reform of the EU ETS were concluded to reach a provisional agreement between the European Parliament and Council in November 2017, after a legislative process which lasted more than two years.

Market participants will also continue to watch UK’s Brexit negotiations with the EU closely, with a continued lack of clarity.

Viral Shah

ASIA

Of all the recent developments in the Asia steel industry, none has garnered quite as much attention as the supply-side reforms in China, where the government has mandated strict industrial policies to control pollution levels.

This included the cutting of at least 120 million tonnes of blast-furnace-based steelmaking capacity in 2016-2017, and another 140 million tonnes of induction-furnace-based steelmaking capacity in the same period. Another, additional, planned 30 million tonnes of capacity cuts is to be completed in 2018.

This has come as a surprise to market participants, who have expected China’s production capacity to drop because of these reforms. However, almost all of China’s major steel producers saw steel production increasing on a year-on-year basis in 2017. This was due to these steel producers increasing their run rates and steel output to fill the gaps vacated by smaller, older and obsolete mills, as well as the induction furnaces producing substandard steel.

China’s largest producer, Baowu Iron & Steel, increased its steel output to 65.39 million tonnes, or by about 2.48%. The percentage increase in steel output at the world’s second-largest steel producer is just about on par with world No. 1 steel producer ArcelorMittal’s 2.53% increase on a year-on-year basis, although the Luxembourg-based steelmaker continues to be the single largest steel producer in terms of production output at 93.1 million tonnes.

Japan’s Nippon Steel & Sumitomo Metal Corp (NSSMC) increased its steel output by 3.65% to 46.82 million tonnes in 2017, up from 45.17 million tonnes in 2016. China’s Hebei Iron & Steel (Hesteel) reduced its steel output by 11.41% to 20.15 million tonnes in 2017.

As the Chinese government continues to encourage the orderly development of the domestic steelmaking industry, it is likely that more mergers and acquisitions will occur. The steelmaking world is watching with interest as to how the central and provincial governments negotiate mergers as China works to reduce the fragmented steel market and increase industry consolidation.

Once these “mega-mergers” are confirmed, more mega producers are expected to emerge and move their way up the output ladder.

Paul Lim

LATIN AMERICA

The Brazilian steel industry spent 2017 trying to recover from its worst crisis ever, experienced in 2016, when several mills cut production levels to adapt themselves to weak market demand. Last year’s crude steel output, local sales and apparent consumption figures improved, but on a poor basis of comparison.

Consumption in Brazil, for instance, increased by 5.30% year-on-year in 2017, to 19.18 million tonnes, according to national steel institute Aço
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Top steelmakers in 2017

Brasil. This growth, however, was in part driven by higher import volumes, which rose by 23.90% over the same period, to 2.33 million tonnes, against an increase of only 2.30% in domestic sales, reaching 16.90 million tonnes.

Stronger signs of a rebound in the Brazilian steel sector are only being recorded now in 2018. As a result, Aço Brasil had revised upward its forecast for the country’s steel consumption, sales and output this year, due to recovering market conditions. Apparent steel use in Brazil is now expected to rise by 6.9% year on year in 2018, to 20.50 million tonnes, the group said. It also predicts Brazilian domestic steel sales to increase by 6.6%, to 18.01 million tonnes, while the country’s crude steel output is expected to grow by 8.6%, to 37.31 million tonnes.

Gerdau, ranked 20th in Metal Bulletin’s Top Steelmakers list, restarted in March operations at its steel mill at Mogi das Cruzes, Brazil’s south-eastern São Paulo state, due to improved conditions in the local car market. Also, flat steel producer Usiminas, ranked further down the list, resumed activities at its No. 1 blast furnace at its Ipatinga works, in the country’s south-eastern Minas Gerais state, in April, to align output with steel demand now.

But the Brazilian market will return to 2013’s peak level only in 2028, according to optimistic estimates, Aço Brasil noted.

The Mexican steel industry reported positive results in 2017, despite the uncertainties involving the country’s commercial relationship with major trade partner, the US, after President Trump took office. Mexico’s crude steel output increased by 6.20% in 2017 compared with the previous year, to 20 million tonnes, according to national steel association Canacero, with the sector operating at 68% utilization of its installed capacity.

Meanwhile, increased demand from the domestic automotive industry continued to stimulate investments in steel production. In the past couple of years, steelmakers such as Ahmsa, Voestalpine, Tenigal and Grupo Simec have announced investments in Mexico to meet demand from the growing local sector. The car sector in Mexico accounts for around 10.6% of steel consumed in the country, according to Canacero.

Besides being the two largest steel markets in Latin America, Brazil and Mexico have something else in common: concern about the effects of the US Section 232 Investigation into steel imports in their local industry. At the beginning of March, the US government imposed a 25% tariff on steel from several countries, as a result of the Section 232 probe.

Brazil was among the nations temporarily exempted from the tariffs until May 1, while negotiations between Brazil and the US about introducing a quota system were taking place. Early in May, the Brazilian steel sector agreed to the US government’s offer to set quotas for steel shipments into that country, thus avoiding a 25% tariff. Producers have agreed to limit their exports to 70% of the 2015-17 average for finished steel products and 100% of the three-year average for semi-finished steel products, although the final details about the measure have yet to be defined, according to Aço Brasil. The quotas should mostly affect Brazil-origin slab exports, whose annual volumes allowed to enter the US market is set at 3.50 million tonnes, to begin retroactively on January 1, 2018.

Meanwhile, Canacero welcomed the decision by the US government to temporarily exclude Mexico-origin steel from its new Section 232 import tariffs, but has voiced concerns about the growth of redirected import flows. The announced US import tariffs of 25% on steel and 10% on aluminium will exclude North American Free Trade Agreement members Canada and Mexico — at least temporarily, while renegotiations of the Nafta treaty continue, according to Trump.

Canacero urged the Mexican government to prevent the local market from being used as a “trade triangulation” environment by exporters intent on redirecting steel volumes previously destined for the US, as well as to defend the national industry from unfair steel imports. In the meantime, uncertainties involving the trade relationship between Mexico and the US remain.

Ana Camargo

MIDDLE EAST

Middle East crude steel production increased by 11.80% in 2017, with a total output of 32.45 million tonnes, compared with 29.03 million tonnes in 2016, according to Worldsteel data. The countries in the total include the United Arab Emirates (UAE), Iran, Saudi Arabia and Qatar.

Steel demand in the Middle East will keep growing in 2018 and beyond, but the region needs trade protection measures to support local producers, according to UAE-based flat steel re-roller and coater Al Ghurair Iron & Steel (AGIS) CEO Abu Bucker Husain.

In an interview on the sidelines of the 21st Middle East Iron & Steel (MEIS) conference in Dubai in December 2017, Husain told Metal Bulletin that because the Middle East (and especially the UAE) has historically been seen as a trading hub, the focus of governments in the region has been on promoting trade and logistics and they have not yet turned to nurturing their domestic manufacturing industries.

He also said the issues of unfair trade practices and dumping by foreign mills had been raised with the local chambers of commerce and the ministry of economy several times since 2009, but that he was still waiting for concrete actions to be taken.

Gulf Co-operation Council (GCC) countries are finding common ground over the threat from steel being redirected as a result of the US decision to impose tariffs on imports following the Section 232 trade investigation.
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Saeed Al-Romaithi, CEO of the UAE’s biggest steelmaker, Emirates Steel, said that GCC countries were acutely aware of the issue and are keen to limit the impact of steel being redirected from the US. The GCC countries are Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE.

“We see positive support from the authorities in the UAE and also in Saudi Arabia in moving to this direction — everybody is seeing what damage is being done and what’s happening to the steel industry in the region,” Al-Romaithi said at Metal Bulletin’s 6th World DRI & Pellet Congress in Dubai in late April 2018. “It’s a bit slow because the whole GCC is linked together [in terms of anti-dumping legislation] but something is definitely happening — the region is lacking the rules and regulations that we need to give us freedom to compete fairly in the market,” he said.

“From our point of view, the demand outlook for rebar [for] 2018-19 looks stable — we have the 2020 Dubai Expo and related infrastructure construction currently going on in the UAE,” Al-Romaithi said. “Right now, the market is still resilient and demand is still there - [and even] if there is not an increase, it will still be stable,” he added.

In March 2018, Saudi Arabia’s National Committee for the Steel Industry (NCSI) called for urgent action to be taken against imports being dumped in the country, specifically by raising import duties. “A report published in June 2016, by the Economic Policies Research Centre in London, points out that, among the G20 [group of industrialized] countries, Saudi Arabia has the fewest legal protection measures implemented,” the NCSI said.

The GCC ministerial committee announced a safeguard duty on imports of pre-painted galvanized coil (PPGI), or color-coated coil of over 600 mm in width in April 2018. The duty will not be applied on products from developing countries whose share of imports in the region accounts for less than 3% individually and less than 9% collectively.

UAE

Crude steel production in the UAE totaled 3.309 million tonnes in 2017, up by 5.08% on an annual basis from 3.149 million tonnes in 2016. Abu Bucker Husain expects steel demand to improve in 2018 and in the years ahead in the UAE and the rest of the Middle East. “[The full] 2018 should definitely be better than 2017 for a few reasons,” he said at MEIS 2017.

“Gross domestic product (GDP) growth should be an overall benefit for all businesses, and getting closer to the 2020 Expo [in Dubai] should be particularly beneficial for our galvanized sector because [increased] demand for galvanized [steel only] comes towards the completion of construction projects,” he added.

Husain also said that there was potential in the Middle East for automotive manufacturing. “If the industrial environment is made more appealing to auto manufacturers, then the big auto makers of the world will come here,” he said.

The country has almost stopped importing rebar since the second half of 2017, while billet imports continue, mostly from Iran. There are several new investments in the country, meaning it will be less dependent on imports in the coming years.

Conares Steel started construction of a new line to produce color-coated coil, or pre-painted galvanized iron (PPGI), early in January. It is being built in the Jebel Ali Free Zone, with equipment supplied by CMI Belgium. Conares Steel also started production at its 250,000 tonnes per year pipe mill in April 2018.

Dana Steel is adding 400,000 tonnes per year to the United Arab Emirates’ coated steel output with the installation of an HDG line and PPGI line in Dubai. United Iron & Steel started to produce HDG in January 2018. Its capacity is 250,000 tpy.

Iran

Iran recorded the highest crude steel output in the region, with 21.726 million tonnes of output, up by 21.41% from 17.895 million tonnes in 2016. The country ranked as the 13th largest steel producing nation in 2017.

However, US President Donald Trump announced his country’s withdrawal from the nuclear deal on May 8 and that the sanctions on Iran will be reimposed. “If Iran has to cut its steel export volumes [because it is] unable to finance deals, it will have to reduce steel output because the domestic market will not be able to consume it, despite recent demand improvements,” an Iranian producer source told Metal Bulletin on May 11.

The Iranian government set a target for steel production of 55 million tonnes per year by 2025. Iran has steelmaking capacity for around 30 million tpy of steel at present, of which 75% would be from direct-reduced-iron-consuming electric-arc furnaces (EAFs). DRI-based steel production is the preferred method in Iran because the country has extensive reserves of both iron ore and natural gas.

Saudi Arabia and Qatar

Saudi Arabia produced 4.77 million tonnes of crude steel in 2017, a 12.65% increase compared with 5.461 million tonnes a year earlier, according to Worldsteel data.

Demand for rebar imports remained weak in 2017, and so far in 2018, as local material was sufficient. In addition, the country removed the ban on rebar exports in late 2017 and the country started to export its products, mainly to East Asian countries. However, local demand for steel is not strong in Saudi Arabia, whose economy is also having hard times.

Qatar produced 2.644 million tonnes of crude steel in 2017, a rise of 4.88% from 2.521 million tonnes a year earlier.

Serife Durmus
Iron ore pricing explained

Multiple factors have a bearing on the price of iron ore. Metal Bulletin index manager Peter Hannah and price development manager Jon Mulcahy explain how price indicators, indices and differentials provide transparency and opportunities for risk management.

As an international PRA, Metal Bulletin has developed a comprehensive suite of iron ore price indicators, indices and differentials. They are referenced globally throughout the steel supply chain.

In the early days of iron ore’s derivatives market development, SMX was one of the first exchanges to offer a futures contract, based on Metal Bulletin’s 62% Fe index in 2011. SGX also launched a low-grade iron ore contract settled against Metal Bulletin’s 58% Fe Premium Index in 2015 to complement its established mid-grade offering. Major Brazilian iron ore miner Vale recently announced that it would move to base 100% of its Carajas fines exports on Metal Bulletin’s 65% Fe fines index, having already been pricing the majority of its volume in this way for several years. The company is also a key user of Metal Bulletin’s 62% Fe Index for its mid-grade products.

The days of the annual ‘mating season’, when steelmakers and major iron ore miners would play brinkmanship over who would give way first over setting an annual iron ore price are long over. New spot market indices that reflect the ‘price of the day’ are the new reality, and have also opened up the opportunity for price risk management through exchange-based, and sometimes over-the-counter, contracts and swaps.

A full list of Metal Bulletin’s daily, weekly, monthly and value-in-use indices, as published in Metal Bulletin’s Daily Market Report (see table) may appear daunting to those new to the market, but they can be relatively simply explained.

For example, daily, weekly and monthly indices are listed because of the varied liquidity displayed by different parts of the market. Sinter fines and lump make up the bulk of the seaborne iron ore market, and are the products most frequently traded on spot basis, so daily pricing is used for the key 62% Fe, 58% Fe and 65% Fe fines, and lump premium references. By contrast, the beneficiated ore segment, comprising pellet and concentrate, is smaller in terms of both volume and liquidity, and weekly indices are therefore more appropriate.

Value-In-Use

Iron ore is a non-fungible commodity, and its quality varies. To help facilitate price adjustment for differences between expected and delivered product specifications, PRAs have developed Value-In-Use indices for the key price-affecting chemical components of iron ore – iron, silica, alumina and phosphorus. Metal Bulletin’s VIU indices are calculated by analysing price and specification data of spot market transactions over the course of a month, so they are published on a monthly basis.

Metal Bulletin’s iron ore indices are all tonnage-weighted average calculations of observed and reported market activity within a specified data collection window (e.g. 24 hours, 5 days, 1 month). Being a variable commodity, prices are normalized back to index base specifications by using coefficients derived from statistical analysis of prior index data. Metal Bulletin incorporates a unique sub-index approach in its iron ore indices, which mathematically ensures a balanced impact from all parts of the market (producers,
Iron ore also differs in physical form. Fines require sintering (agglomeration into crude pellets) prior to use in the blast furnace. Lump ore can bypass this process and be charged directly into the furnace, as can pellets, and both command an associated price premium. Most steel mills use a blend of different grade ores, and a mix of sinter, lump and fines, but the quality requirements depend on the circumstances and availability. For example, ore used in the direct reduction process to make direct reduced iron (DRI) or hot briquetted iron (HBI) destined for melting in an electric arc furnace (EAF) needs to be of much higher grade than that fed into a blast furnace. Prices vary accordingly.

**Dynamic markets**

Relative preference for different ore types depends on market conditions, and the differentials between the various iron ore indices are very dynamic. Perhaps the biggest driver of all is the profit margin that steelmakers are achieving – defined by the price at which they sell their steel minus the costs of their raw material inputs. When margins are high and mills are profitting from each tonne they produce, they prefer to use high-purity ores to maximise their blast furnace yield. Inter-grade price spreads tend to expand during these times, and high-grade indices such as the MBIOI-65 and MBIOI-66 usually extend their premiums to the MBIOI-62 and MBIOI-58. Conversely, when margins fall away mills look to the cheaper low-grade ores to reduce costs and minimise their production rate. Blast furnaces cannot easily be switched on and off, so a shrewd approach to iron ore purchasing is needed to optimize for different market conditions.

Consumption of iron ore products can also be constrained to the end-use application that the steel producer is designing its product for. Typically, higher-grade flat steel products require higher quality raw material inputs with lower impurities to ensure that they are applicable to the end-product they are used in. Therefore although some steel mills have become experienced in adapting their melt mix to accommodate for volatility in raw materials markets, others are more constrained by their customers as to how much they can mitigate for severe market volatility.

More recently, at least in China, environmental policy has become a key driver of prices across the iron-ore grade spectrum. Again, as a rule of thumb, lower grade ores with higher fractions of impurities such as silica and alumina require increased consumption of coke, which can raise emissions of controlled gases and particulates. The sintering of fine ores can also be a polluting process, and mills under environmental constraints may favour higher usage rates of direct charge ore such as lump or pellet. China’s 2016 update to its Environmental Protection Law enforces stricter caps on industrial pollution, and has increased appetite for higher purity ores.

To put these drivers into perspective, the higher mill profit margins and increased environmental restrictions that have come with China’s recent industrial reforms have driven a fourfold expansion between the MBIOI-62 and the MBIOI-58 indices in percentage terms (sevenfold in dollar terms) between the start of 2016 and the start of 2018. Over the same period, the premiums commanded by the 65% and 66% Fe indices over the MBIOI-62 have also risen to record highs.

China’s aforementioned industrial reforms post-2016
As a leading ferrous and non-ferrous processor and mill services provider, Scrap Metal Services LLC (SMS) partners with each one of our customers to optimize scrap prices and efficiencies for their scrap commodities and scrap handling services. Our experienced team is available to service our customers providing individualized and customized scrap handling requirements.

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Iron ore

have encompassed capacity reductions, elimination of illegal substandard steel and tougher restrictions on pollution. The result has seen much wider and more volatile differentials between iron ore indices of different grades, and companies exposed to prices such as the high-grade MBIOI-65 and MBIOI-66 are now calling for exchanges to list contracts settled against those indices to help manage price risk, with the basis risk to the 62% Fe financial benchmark deemed unmanageable.

The shift to indexation following the final demise of the annual benchmark pricing system in 2010 came with an implicit expectation that iron ore might be able to become a more commoditized traded product – represented by the composite 62% Fe index as a market mid-point. But it soon became obvious that the 62% Fe Index could not serve to reflect the incredibly varied range of products. Negotiating premiums and discounts to this benchmark mid-grade index was like aiming at a moving target, as spot prices for different grade segments marched to the beat of their own drums. One after another, indices for lower grades, higher grades, concentrates, pellets etc. were launched to facilitate product-aligned pricing. Today’s iron ore market participants trade their products using a wider array of indices than ever before, and this trend in index diversification is still progressing.

Though Metal Bulletin published indices for several grades of iron ore, the real-life variability is such that virtually all ores differ in some respect to the base specification of the index they settle against. Where actual iron ore grades do not match the index specifications exactly, counterparties typically agree premiums or discounts based either on bilateral negotiation or using the Value-In-Use indices published by PRAs. Metal Bulletin’s VIU indices, calculated and published monthly, help companies agree upon appropriate price adjustments based on the iron, silica, alumina and phosphorus content of their specific products.

**Differentials**

In a more recent innovation aimed at facilitating simpler, more accurate valuation of individual products relative to indices, Metal Bulletin is looking to publish differentials that represent the value that particular iron ore brands achieve relative to the MBIOI-62 on a daily basis.

The implementation of product differentials depends on the frequency that each product trades on the spot market on a transparent basis. Metal Bulletin considers transparent trades to be those done on the GlobalOre Trading Center Corporation (COREX) or by tender. Based on the number of transparent transactions seen in the spot market, Metal Bulletin has decided to start publishing the differential that 62% Fe Pilbara Blend Fines achieves on a spot basis relative to the MBIOI-62, but will also seek to replicate this for other more liquid spot market products.

The calculation of the differential is the tonnage-weighted average of transparent transactions of the particular product on a given day, minus the MBIOI-62 on that day.

The MBIOI-62, with the published differential, would represent the actual value of products traded in the spot market on that day.

In the absence of trade, the product differential is maintained until another transparent trade is observed. When the differential remains unchanged, the implied product value will continue to move with the underlying movement in the MBIOI-62.

Looking forward, Metal Bulletin aims to continue providing the market with the necessary tools to achieve fair and transparent iron ore valuation, and to link long-term contract volumes to spot market price demonstration. As market forces have driven wider spreads and lower correlation between prices for different iron ore grades, Metal Bulletin expects that the trend towards increased granularity and product-aligned pricing will continue – particularly at the high end of the grade spectrum.

Metal Bulletin recognises that the evolution of the iron ore market’s pricing mechanisms following the end of the annual benchmark system are still ongoing, and remains committed to its role providing price transparency where possible in response to market demand.
Iron ore

Tough times for India’s iron ore miners

Central government policies, environmental considerations and the influence of India's steelmakers are just three of the key factors impinging on the nation's iron ore industry. Kunal Bose outlines its dynamics and outlook

There is a dark cloud on the horizon for the Indian iron ore industry. Iron ore producers are facing a myriad of problems because of government policies restricting exports, and court orders stalling or limiting production in some states. Under a Supreme Court order, iron ore mining in Goa was stopped on March 16, as the local government was found “unduly hasty” in renewing mine leases that were not “in the interest of mineral development” of the state.

The blanket ban on mining in Goa, until the state government is able to grant fresh mining leases in accordance with the Mines & Minerals (Development and Regulation) Act (MMDR), meaning by way of highly time-consuming auction, is a major blow to India’s already diminished iron ore exports.

Iron ore found in Goa has iron content of 58% or less, for which there is no local demand. Taking account of the reality that the survival of the industry depends on its ability to sell the low-grade mineral on the world market, particularly to China, New Delhi in February 2016 removed the 10% export duty on iron ore fines with iron content of less than 58%. More significantly, exports of lump ore bearing iron of less than 58% were also spared the duty of 30%. The much-demanded concession gave a breather to the state’s iron ore mines.

But as Goa’s iron ore mines ramped up production, a court ruling put fetters on the Goan industry by limiting annual production to 20 million tonnes to alleviate previously identified concerns about damage to the environment. With severe restrictions placed on the production of iron ore in Goa, a market that had traditionally been Goa’s was scooped up by others.

Nevertheless, leading miners in Goa, such as Vedanta, Chowgule and VM Salgaocar, went enthusiastically about the job of retrieving the ground they had lost in China and elsewhere as far as possible. The recent court order cancelling all operating leases in Goa came as the miners were once again meeting with export success.

Before the cancellation of leases in March 2018, a court-appointed expert committee tasked with making a “macro environmental-impact assessment study” relating to annual ore extraction in Goa found the state to be ready to support over 30 million tonnes per year of production. According to the Goa department of mines and geology, between August 2015 and mining discontinuance in mid-March this year, the state’s production was only 37.11 million tonnes. Prior to 2012, Goa had annually exported around 50 million tonnes of ore. In its most productive times, Goa alone would account for half of India’s iron ore exports.

The only relief for the state’s miners regarding the recent ruling has been the court allowing the export of iron ore that was mined before March 16 on which royalties have been paid, subject to confirmation by the state government. Soon after the cancellation of leases, London-listed Vedanta Resources said it would likely record an impairment charge of up to $600 million. As the mines remain shut, the coastal state is facing an “economic and social disaster”, according to the Goa Mineral Ore Exporters Association.

Direct and indirect job losses are an estimated 65,000. A few thousand trucks, earlier engaged in ferrying iron ore from mines to jetties, remain idle. Even at a highly truncated level of operation, Goa’s mining industry had a share of around 12% of state gross domestic product. Iron ore mining and tourism are the backbone of the state’s economy.

“The cancellation came out of the blue coinciding with our attempts to regain the market we lost to competition. China, which has excellent beneficiation and agglomeration facilities, has been the mainstay for our exports. The import focus of China is, however, moving towards better grades of ore to cut greenhouse gas emissions and improve mill productivity, and that started working to our
Why should NMDC, which is India’s largest producer of iron ore, say in its mission statement that as it grows its mining capacity it should also emerge as “a quality” producer of steel?

NMDC chairman N. Baijendra Kumar argues that “unlike their peers in other countries, more and more Indian steel groups are inclined to acquire iron ore deposits. Captive mines for steelmakers would invariably mean shrinking of business for merchant miners. In a situation like that, merchant miner NMDC should have a major alternative outlet for its growing production of iron ore. Our building of steelmaking capacity is an assurance against any contraction in merchant ore business.”

Traditionally, Tata Steel and Steel Authority of India Limited — the country’s two leading producers of steel — have drawn all their requirements for iron ore from their captive mines in Orissa and Jharkhand. JSW Steel, a long-standing buyer of ore from NMDC, acquired five deposits in Karnataka with estimated reserves of 110 million tonnes last year through the auction route. Once all the five mines start production and reach rated capacity, JSW, which has 18 million tonne per year crude steel capacity, with 12 million tonnes per year alone in Karnataka, hopes to get iron ore supply of 5 million tonnes per year from its own mines. The caveat, however, is that production of JSW’s captive mines will be part of a court-decreed iron ore output cap of 35 million tonnes per year for Karnataka.

Kumar said: “Steelmakers’ backward integration by acquiring mines at auctions is a major threat to the business of merchant miners, including NMDC.” In support, FIMI director general RK Sharma said: “Leading steel groups have the financial clout to outbid merchant miners at auctions. This was seen at auctions in Karnataka last year when a steel group paid very large premiums over reserve prices.” Kumar will not also rule out the possibility of NMDC facing serious “competition” at some stage from large iron ore imports at “low global prices.”

NMDC was early to see the threats from domestic steelmakers’ captive iron ore supplies and India’s potential future iron ore imports, so it built a 3 million tonne per year mill for hot-rolled coil, plate and sheet, and automotive and silicon steel, at Nagarnar in Chhattisgarh. The Nagarnar mill is no exception to projects of this scale, and bigger, suffering from time and cost escalation. “Yes, we had problems in the past. But all these are behind us. We are to commission the plant at some point later this year,” said Kumar.

Distinguishing features of the steel venture are a 140 km slurry pipeline, with sufficient annual capacity to transfer 15 million tonnes per year of ore from the mines, where beneficiation facilities have been created, to Nagarnar, where a 2 million tonne per year pellet plant will operate, and beyond. The pipeline will travel another 315 km to Vizag, where another pellet plant will operate. “Our objective is to make the Nagarnar operation from the point of despatch of ore to steelmaking among the most environment friendly in the industry,” said Kumar. The Nagarnar plant will go on stream when the local demand for steel is to remain firm. According to the World Steel Association, Indian steel demand will be up by 5.5% in 2018, and then 6% in 2019, which should work to NMDC advantage.

Kumar is also heralding the formation of special purpose vehicles (SPVs), with support from the steel ministry and state governments, for doing the groundwork for construction of steel mills in Karnataka and Jharkhand. The SPVs, with the backing of government agencies, will be ideally placed to “facilitate land acquisition, get water and electricity allocations and ensure critical iron ore linkages for building the proposed steel plants,” said a company official. Once all these are in place, the joint ventures will invite strategic partners to set up steel mills.

Kumar said that company forays into steelmaking will not be a distraction from NMDC’s progressive raising of iron ore mining capacity and securing of new deposits both through government dispensation and the auction route. “We are targeting iron ore production capacity of 67 million tpy by 2021-22,” says Kumar. The company’s present capacity is 48 million tonnes per year. Expect NMDC to participate actively in auctions when bids will be invited for a good number of privately held mines in Orissa and Jharkhand whose leases will compulsorily expire in March 2020. It seems appropriate that the biggest miner seeks opportunities beyond Chhattisgarh and Karnataka in the eastern states, which are the biggest repositories of the country’s 31.32 billion tonne resources.

Since assuming charge as chairman in September 2017, Kumar has seen to it that NMDC makes the right kind of investment in satellite-based exploration for geological mapping of minerals, particularly for iron ore in various parts of the country. Exploration work will create many opportunities for NMDC to grow its mining activities.

Southern state in July 2011. The ban was selectively lifted in April 2013, but with a 30 million tonne per year production cap. Subsequently, in December 2017, based on an expert committee recommendation that the state’s ore handling capacity had significantly improved since 2011, the court raised the production ceiling to 35 million tonnes per year.

Unlike in Goa, where ore extraction is destined for exports, steel mills in Karnataka prefer using locally produced iron ore to spare
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them the cost of hauling the material from the distant eastern states. According to JSW Steel vice-president (mines) BP Pandey, compared with the total annual requirement of 42.60 million tonnes of iron ore by steel and sponge iron plants in Karnataka and its adjacent regions, the state’s production in 2016-17 was 27.89 million tonnes. As iron ore production in Karnataka since the court intervention is falling short of local requirements, steelmakers are left with no option but to procure some of their requirements from distant Orissa and also from abroad.

The ambitious capacity expansion programme of JSW Steel’s 12 million tonne per year Vijaynagar complex in Karnataka took a knock because of iron ore supply uncertainty. Short of ore, some mills remained shut for some time. While the ore production cap is causing pain to steelmakers in and around Karnataka, a court-ordered blanket ban on exports from the state continues, causing problems for all agencies involved in selling the mineral in the world market.

In better times for production before court intervention, Karnataka had produced over 60 million tonnes of ore, of which as much as 47 million tonnes were exported in 2009-10. According to the Indian Bureau of Mines, Karnataka has iron ore resources of 2.269 billion tonnes and Goa 1.019 billion tonnes.

**Orissa’s stock problems**

Former president of the Federation of Indian Mineral Industries (FIMI), HC Daga said: “Iron ore mines in Orissa too suffered the ordeal of production suspension because of court intervention. Back in production, they now have to contend with insufficient availability of railway wagons for making delivery of ore to steel mills and to ports for exports. As a result, the state saw ore stocks at mine heads rising to around 100 million tonnes, mostly constituting fines. The stocks are of alarming proportions disturbing the environment.”

Daga says that pithead stocks are rising because: “We are getting only around 28 rakes of 58 wagons each a day, against our minimum daily requirement of 60 rakes.” According to the MMDR Act, the tenure of privately owned mining leases, except for the ones marked for captive use by steel companies, will expire in 2020 March end. Then these mines will once again be put up for auction. It is, therefore, only natural that the leaseholders will try to extract the maximum from the mines before the lease tenure ends. But rake shortages crimping their capacity to despatch the material they are extracting from mines are seeing pithead stocks grow bigger by the day. A railway ministry official said that iron ore miners are experiencing rake shortages because of the decision to move greater quantities of coal to thermal power stations during the summer.

**Local value addition**

India’s steel secretary, Aruna Sharma, believes that there is considerable scope for local value addition to iron ore fines lying at mine sites by way of agglomeration for conversion into sinter and pellet. Her immediate task, therefore, is to create conditions that will give a major boost to the nearly 90 million tonne per year pellet industry’s capacity use, which is now only around 35%. At the same time, pellet makers will have to give up the practice of restricting their use of ore with iron content of over 62%.

Miners contend that India’s iron ore resources, now estimated at 31.32 billion tonnes, will get greatly enhanced if thrust is given to greater levels of exploration. But exploration should not be left to government agencies only. Though late, the National Mineral Exploration Policy 2016 has allowed the private sector to be involved in exploration work. Domestic and foreign agencies are not enthused to bid for exploration work as the rewards promised in the policy are found to be inadequate.

FIMI says that, even at the current resources level, there is room for a more liberal approach to iron ore exports. But a duty of 30% on ore with iron content of 58% and more, mining restrictions on Goa and Karnataka, and poor transport logistics, restricted Indian exports to 40 million tonnes in 2017-18, compared with the record 117 million tonnes in 2009-10.

In order to keep iron ore prices low, the powerful steel lobby goes on pleading with the government to enforce a highly restrictive ore export policy. Aruna Sharma has, therefore, the difficult task of finding a middle policy ground after considering the conflicting viewpoints of mining and steelmaking groups.

In the meantime, her incentives for the construction of slurry pipelines between mines and pellet making units, which will significantly reduce carbon emissions involved in ore transportation by road and rail, has been much appreciated by environmentalists. The move will also help in decongesting transportation infrastructure in mining areas.

Another major challenge for India’s steel secretory is to create a policy environment that will lead to the creation of additional mining capacity at a fast pace. Against the 2017-18 production of 210 million tonnes, the national steel policy anticipates that domestic iron ore demand will jump to 437 million tonnes by 2030-31. There will also be exports, mostly of fines. To meet the combined domestic and export demand, the government “will have to quickly identify deposits for auctions and also speed up the process of giving all the sanctions needed for starting iron ore excavation,” says Daga.
Challenges for Turkish steel

With its prominent role as a ferrous scrap importing country and as an important player in global steel markets, Turkey has wrestled with several challenges this year. Şerife Durmuş and Cem Türken review the developments affecting the country’s steel industry.

The Turkish steel industry had quite a positive year in 2017, but 2018 started with several challenges, including the US Section 232 trade investigation, a sharp decline in the country’s local currency, a trade investigation from Europe and the surprise of early elections. While Turkish steel output has been increasing in 2018, the market worries about the loss of export markets persist.

**LONG PRODUCTS**

Turkish rebar and billet markets have been heavily affected so far this year by political and economic problems within and around the country, in addition to the Section 232 tariffs against Turkish exports into the US.

Many of the internal political issues in Turkey caused sharp decreases of the Turkish lira against the US dollar, which constantly increased raw material costs for the mills selling finished steel into local markets in lira but buying scrap and billet in dollars.

The automotive industry is one of the biggest steel-consuming sectors for Turkey’s steelmakers.

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The major issues that caused the lira to weaken were the state of emergency declared in 2016, off-border operations in Syria, and the decision to run elections early.

On July 15, 2016, some members of the Turkish army attempted a military coup but failed to take control of the country’s government. Following this attempt, the Turkish government declared a state of emergency, which is still in force.

Market participants have been surprised by the decision to run early elections, announced on April 18. The ruling Justice and Development Party and the Nationalist Movement Party have agreed to hold parliamentary and presidential elections on June 24, 2018, which is 17 months earlier than the scheduled date.

Following these political issues, which has been taking place since the beginning of the year, the lira constantly lost weight. The currency was trading at TRY1 to $0.2630 on January 1, and had fallen to TRY1 to $0.2222 by May 21.

As mills’ raw material costs increased, local rebar and wire rod prices have also increased persistently since the beginning of the year. Domestic rebar prices in Turkey were around TRY2,200 ($490) per tonne ex-works levels, including 18% VAT, at the beginning of the year, which reached to around TRY3,000 ($669) per tonne in late May.

Increasing long steel prices started to impact the construction sector in the country and Turkey’s ministry of economy first reduced the import tax on rebar and then completely removed it.

The ministry of economy had decreased the country’s import duty on rebar to 10%, from a previous 30%, with immediate effect in July 2017. The ministry subsequently removed the country’s import duty on January 1.

The Turkish Steel Exporters’ Association (ÇIB) did not expect the removal of the duty to result in a fall in steel prices in 2018, however. Rather, it expected prices to continue to rise due to increasing raw material costs. “Increasing electrode, ferro-alloys, refractories, scrap and coal prices are pushing up...”
production costs," Namik Ekinci, ÇİB’s former board chairman, had said.

“The contractors, who complain about high rebar prices, do not want to sacrifice their high profits... The cost of rebar is only 1.5-4.6% of construction costs, according to our research. The rising rebar price in the past year only affected building prices by 0.3-1%,” Ekinci said. “At the end of the day, contractors’ profit margins are still 45-70%,” a level not seen in any other part of the world, he added.

The removal of the import tax on rebar has also left Turkey unprotected against dumped and non-standard material, and will not help domestic rebar prices to fall, Ekinci said. “Steel prices are set in the global markets and Turkish contractors are using the cheapest and highest quality material, even if they complain. It is unacceptable to protect one industry while another is harmed,” he added.

As Ekinci predicted, the rebar prices in Turkey continued to increase so far in 2018.

Exports and trade measures
In the export markets, the situation was even worse due to protectionist measures against the country’s long steel exports.

The US imposed a global 25% duty on steel imports and 10% on aluminium imports after concluding its Section 232 trade investigation of imports with a bearing on the country’s national security, but then announced temporary exemptions for countries and regions including the EU, Australia, Brazil, South Korea, Mexico and Canada.

The economy minister Nihat Zeybekçi said on May 12 that Turkey may take counter-measures against the Section 232 import tariffs. Turkey is not on the exemption list, Zeybekçi said, even though the country has a trade deficit with the US. It exported steel worth $1.2 billion to the US in 2017, but the value of its imports from the US totaled $1.3 billion, he said. Turkey is the sixth-biggest steel exporter to the US, he added.

“We told [the US government] very clearly that Turkey should be kept out of the Section 232 process. We also made attempts [to gain exclusion] by applying to the World Trade Organization [WTO]. Very recently, we told them that we will take counter-steps,” Zeybekçi continued.

“Our arguments regarding counter-steps will be similar to those of the US. We can do this very quickly. After that, we can enter a period that will negatively affect the US more [than it will affect Turkey] in terms of the trade between [the countries]. We are leaving all the doors open,” he said. The Turkish ministry of economy started an investigation into the effects of steel imports on the country’s domestic steelmaking industry in April.

Turkey exported 6.4 million tonnes of steel products in January-April 2018, down by 6.3% year-on-year, while the value of the exports rose by 19.3% year-on-year to $4.7 billion, according to the ÇIB. The biggest portion of Turkish exports was rebar with 2 million tonnes.

Turkey exported 1 million tonnes of hot-rolled coil, 617,000 tonnes of welded steel pipes, 574,000 tonnes of sections and 561,000 tonnes of wire rod in January-April 2018.

“The main reason for falling steel exports is the Section 232 decision, which sharply reduced our exports into USA’

Q1 statistics
Turkey exported 1.61 million tonnes of rebar in the first three months of the year, which was 14.88% lower than the same period of last year, according to the Turkish Statistical Institute (TÜİK). But the value of the country’s total rebar exports were 11.58% higher than the corresponding period of 2017.

Yemen was the biggest buyer of Turkish rebar in the January-March period, importing 248,904 tonnes, down by 2.11% year-on-year. Turkey’s exports to the US in the same period fell by 41.59% year-on-year to 189,115 tonnes, while its exports to Israel rose by 4.90% year-on-year to 171,703 tonnes.

In the same period, Turkey’s exports into Canada and Netherlands have increased significantly, according to TÜİK data. Turkey exported 131,079 tonnes of rebar to Canada, compared with the 29,205 tonnes exported during January-March 2017, while the country’s exports into the Netherlands totaled 75,744 tonnes, up from last year’s 14,593 tonnes.

Turkey produced 9.54 million tonnes of crude steel in January-March 2018, a 7.92% increase over the corresponding period in 2017, according to the Turkish Steel Producers’ Association (TÇÜD). Crude steel production was 3.37 million tonnes in March alone, a 7.60% increase year-on-year.

Billet production reached 6.50 million tonnes in the first three months of 2018, up by 8.45% from 5.99 million tonnes.

The volume of steel produced in Turkey by using electric-arc furnaces increased by 10.81% to 6.58 million tonnes in January-March 2018, up from 5.94 million tonnes in January-March 2017. Output from blast furnaces rose by 2% to 2.96 million tonnes, from 2.90 million tonnes in the same comparison.

The flat steel market is also slow in the country, because the Islamic holy month of Ramadan started in May and will be followed by the seasonally slow months of June and July.

FLAT PRODUCTS
Turkish flat steel producers are looking for more trade protection as their traditional export markets take more protective measures themselves, and as local production capacity increases.

The country produced 3.043 million tonnes of slab in
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January-March 2018, up by 6.81% year-on-year from 2.85 million tonnes. Beyond the US trade measures already mentioned for long products, on March 26 the European Commission (EC) launched a safeguard case into 26 carbon and stainless steel products that are imported into the EU. This investigation is likely to result in quotas being applied instead of tariffs, according to an announcement by the International Rebar Producers & Exporters Association (Irepas) in April 2018.

The US and Europe are both important export destinations for Turkish steel products, the TCUD noted in April 2018. But it added that countries which will no longer be able to sell their steel to these areas will instead target countries that do not have strong trade protection, such as Turkey.

These developments mean that 2018 will be a difficult year for the Turkish steel sector, and the advances that the sector achieved in production and export volumes in 2017 will be hard to match in 2018, TCUD said. The steel-consuming sectors in Turkey should target increased use of domestic products, while the country needs to conduct countervailing duty investigations to protect local production, the association said.

Production and trade
Turkey produced 11,684,000 tonnes of slab in 2017, up by 15.15% on the 10,147,000 tonnes produced in 2016. Turkey’s domestic hot-rolled coil (HRC) price, which was $540-550 per tonne ex-works on January 6, 2017, fell to as low as $485-495 per tonne in June 2017, but had recovered to $585-610 per tonne by late December 2017.

Turkey reduced the import duty applied to incoming shipments of HRC intended for re-rollers to 3.5% from the previous 5%, with effect from January 1, 2018. The duty remains at 9% for other HRC imports. The Turkish ministry of economy also imposed import duties on some hot-rolled steel plates, cold-rolled coil (CRC) and tinplate products with effect from January 1, 2018.

According to the ministry, plates with certain Harmonized System (HS) classification codes for traded products are now subject to import duty at 9%. Some CRCs have become subject to 10% import duty. With this decision, all imports grouped under HS code 7209 are subject to 10% import duty because all other such products were already subject to that level of duty. Tinplate with HS codes 721240201921 and 721250201011 are now subject to 15% import duty. Coated coils with nine different HS codes are also subject to 15% import duty. All these products had been subject to no duty until 2018.

In addition, the ministry of economy started an investigation into the impact of steel imports on the country’s domestic steelmaking industry on April 27, 2018. The probe includes hot-rolled flat steel imports with HS codes 7208 and 7211, cold-rolled flat steel with HS code 7209, coated flat steel with HS codes 7210 and 7212, and alloy flat steel with HS codes 7225 and 7226.

The long steel products under investigation are wire rod under HS codes 7213 and 7227, steel bar under HS codes 7214 and 7215, sections under HS code 7216, steel wire under HS code 7217, and bars and sections under HS code 7228. Railway or tramway track iron or steel under HS code 7302, and tube & pipe under HS codes 7303, 7304, 7305 and 7306, are also under investigation, along with stainless flat steel under HS codes 7219 and 7220.

The probe will be finalized in nine months’ time, but may be extended by another six months if required, the ministry said.

**Automotive industry**

The automotive industry is one of the biggest steel-consuming sectors for Turkey’s steelmakers, and as the country exports most of its output to Europe, production increased in 2017 thanks to strong demand in that region’s export markets. Turkey produced a record-breaking 1,695,731 vehicles in 2017, 14.12% more than the 1,485,927 units produced in 2016, the Turkish Automotive Manufacturers Association (OSD) reported.

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The country’s vehicle exports increased by 16.78% to 1,332,794 vehicles, compared with 1,141,382 in 2016, according to OSD data. In January–April 2018, Turkey produced 563,695 vehicles, down by 1.67% from the 573,246 made in the first four months of 2017. Exports decreased by 2.36% year-on-year in January–April to 461,495 vehicles, compared with 472,626 vehicles exported in the same period last year.

Export volumes
Turkey’s flat steel exports have been increasing, especially since early 2017, thanks to strong demand in Europe. However, the EC’s safeguard investigation into 26 steel product types could prevent the redirection of steel in the global export markets from the US to the EU market.

Turkey exported 4.18 million tonnes of flat steel products in 2017, an increase of 40.22% compared with 2016’s 2.98 million tonnes, according to the TÜİK. The country exported 1.215 million tonnes of flat steel products in January–March 2018. This volume was up by 22.68% from the 990,172 tonnes exported in January–March 2017, the institute reported.

Movements in the pricing of steel and steel commodities in 2018 will not be sharp, according to Gökhan Demiruz, chairman of Turkey’s Flat Steel Importers, Exporters & Industrialists Association (Yisad). Price movements will continue in 2018, but will not change prices by more than 20-25%, he said.

Turkey consumed about 16.50 million tonnes of flat steel in 2017, while imports totalled about 8 million tonnes, he added. Flat steel exports out of Turkey reached about 4.50 million tonnes in 2017, compared with 3 million tonnes in 2016.

Consumption and exports of flat steel were both expected to increase in 2018, Demiruz said, because local demand is strong and positive, and new flat steel producers will start production domestically. The over-riding topic in the global steel trade now is protectionism, he added. This gave Turkey an advantage because it has found strong demand in the markets in Europe and the US due to competitive pricing, he said.

But the accuracy of any predictions depends on China’s next move, Demiruz also said, reminding that the country produces 50% of the world’s total steel output.

Uğur Dalbeler, chief executive officer of Turkish steelmaker Çelik Metalurji, agreed with Demiruz. China’s steel exports decreased to 5 million tonnes per month in 2017 from 10 million tonnes per month in 2015, he noted. This allowed steel producers to develop a strong presence in global markets, and 2017 was the best year for the steel sector since 2008, he said.

Dalbeler expected flat steel demand to remain strong in Turkey in 2018, but believed that prices will rise because raw material and slab prices are increasing.

New capacity
Turkey’s Yıldız Demir Çelik, part of Yıldızlar Holding, ordered a 1.5 million tpy mill to produce cold rolled, galvanized, annealed and skin-passed coils from Danieli in 2016 and started production of 150,000 tpy of pre-painted galvanized coil (PPGI) at its facility in Kocaeli, in April 2018. The company will start producing 400,000 tpy of hot-dipped galvanized coil in June this year and production of CRC at a rate of 1.5 million tpy will start in September.

In a second phase, Yıldız Demir Çelik also plans to invest in crude steel and flat steel production, potentially in Romania or Russia.

Turkey’s Tosyali is planning to invest in an integrated steel plant in Osmaniye, southern Turkey. The plant, fully owned by Tosyali Holding, will use local iron ore, and the investment will be completed in seven years’ time, with an investment of $7 billion. It will have crude steel production capacity of 2 million tonnes per year, and will replace imports now made by the company to produce flat steel. Tosyali has a total crude steel production capacity of 5 million tpy, using electric-arc furnaces. The company also has plans to invest in iron mining. Turkey has three existing integrated steel producers: Erdemir, Isdemir, and Kardemir. Tosyali Holding produces steel profiles, tubes & pipe and flat and long products in Turkey and Algeria.

Russia’s Magnitogorsk Iron & Steel Works (MMK) may restart the melt shop at its MMK Metalurji unit in Turkey this year. But there may be delays due to the uncertainty in the market created by the Section 232 investigation in the United States and the EU safeguard investigation.

“The US imposed the duty on imports of steel products after we had taken the decision [to restart the melt shop],” Andrey Eremin, MMK’s director for economics, said during a presentation of the company’s operational and financial results for the first quarter of the year in May 2018.

“Europe has also started an investigation into steel imports to prevent the redirection of [steel product shipments into Europe] from the US,” he added. The EU trade case will in principle be concluded within nine months, around late November 2018. Eremin said that MMK had made the decision to restart the equipment in late February or early March.

Trade restrictions in the US and the EU could lead to “potential growth of competition in the [Turkish] domestic market,” the company said in its first-quarter report. MMK is currently doing maintenance work on the equipment at its Turkish asset, and making agreements for supplies of scrap and electrodes, as well as gas and energy, Eremin said.

MMK stopped operations at its melt shop and compact strip mill, which have capacity for 2.3 million tonnes per year, in late 2012 because HRC prices had fallen while scrap and energy costs had gone up.

‘Consumption and exports of flat steel were both expected to increase in 2018’
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Technology spotlight: Industry 4.0

Digital technologies increase momentum

Step-by-step, steel producers are embracing the concepts and technologies encompassed by Industry 4.0. Myra Pinkham reviews progress.

While it might be doing so cautiously, the steel industry is slowly embracing Industry 4.0, which has been described as the newest industrial revolution, driven by data, data analytics and digitalization.

The steel industry has already been automated and collecting data via sensors for many years. Digitalization technologies and automation have also been part of the steel industry for a long time.

Franck Adjogble, chief engineer for process control and production planning systems at SMS Group Inc, agrees that many of the technologies supporting Industry 4.0 are not new. For example, algorithms for machine learning, which enhance the ability to understand data patterns and to use those patterns in the decision-making process, have been around for several years. But now it is easier to collect more data than was possible in the past and to analyze and correlate that data in a way on which it is easier to understand what is going on in the steel plant. “You can even create an active, digital version of the coil which could contribute to decision-making efforts,” he notes.

What is new is a change in the mindset, including that by the steel industry, concerning Industry 4.0 concepts. “I think that more and more steel producers are becoming aware that the data they are collecting at their plants is a very valuable asset that they could use to improve their production processes,” Kurt Herzog, head of Industry 4.0 for Primetals Technologies says.

Antonio Catalano, head of digital transformation process for Tenova Metals, agrees. He explains that given that Industry 4.0 lets companies use data in a more effective, more mobile way, it could be very valuable to the steel industry. “Steel plants are very complex facilities where people in the different sections of the plant don’t necessarily talk with each other.”

But while the steel industry is now starting to implement Industry 4.0 concepts, it is doing so in very small steps, Adjogble says, with those steps largely being driven by the market itself. He explains that steelmakers are constantly being required to produce higher quality products with shorter lead times. “Also, the supply chain is changing. Producers need to use these digital technologies to ensure that they can survive in this market.”

There continues to be a perception that the steel sector might have been slower to move toward Industry 4.0 than some...
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other industries. But while he says that might be the case, Simon Riley, leader of the performance manufacturing and distribution practice of Crowe Horwath LLP, says he does not believe that is because it has a fear of technology, but rather because it is very much a relationship-based industry— one that is much more of a business-to-business (B2B) market while it is more the business-to-consumer companies that have been at the leading edge of this technology revolution. “Given their deep relationships with their customers, steel and other metals companies tend to be nervous about their current voice-to-voice communications with customers being replaced with technology,” Riley explains.

Still, Herzog says that he believes that steel companies have been less likely to pursue typical Internet of Things (IoT) activities. “That is partly because a lot of IoT platforms are still not very mature, but mainly because steelmakers are reluctant to share data or to let data leave their premises,” he explains.

There has been some progress in these areas. For example, Tenova is partnering with Microsoft to set up an IoT-related architecture platform that will allow communication not only between the different pieces of equipment in the plant, but also between people inside and outside of the plant. Catalano says that in the future this platform will not only give workers and managers throughout the plant the information that they need through an electronic dashboard, but it will enable Tenova to support its customers remotely.

Catalano says that perhaps the hardest part about the acceptance of Industry 4.0 is not the technology, but the need for companies to engage day by day with its material and technology suppliers and its end-use customers in a stronger, collaborative way.

“A big concern is the security of data, including how much data a company wants to expose to the external world or how much they want to keep inside,” Stefan Koch, Global Lead for Metals, Industry Business Unit Mill Products, SAP, points out. Steve Pillsbury, digital operations leader for Pricewaterhouse Coopers (PwC), agrees, noting that while he does not view it as a major roadblock at this time, these security issues could slow down the rate at which the industry adopts Industry 4.0.

“But that slowing is not necessarily a bad thing as it means that companies are asking the right questions,” he says. “Cyber risk, while real, is adjustable.”

“Nevertheless, there could be a big benefit if steel producers did share some of their data with their customers, suppliers and the companies that build their plants and equipment,” Herzog says. “But even though secure data sharing methodologies are available, many steelmakers are still worried about the risk and aren’t willing to take the chance,” he adds. They need to be assured that there is a clear benefit to sharing data and they will be able to do so in a secure way, he explains.

According to Crowe Horwath’s Riley, the level of fear about security issues has actually eased somewhat in the past year or two, helped along by a higher level of comfort with the use of Cloud computing. In what he describes as a 180-degree change, Riley says that a recent survey indicates that the industry is now more comfortable using Cloud computer than on-premise software solutions. In fact, he says that many companies already have their entire core system on the Cloud, including their production systems.

Primetals’ Herzog says that the steel industry is currently at a point where most producers know that they need to do something to incorporate Industry 4.0 into their operations, but many do not know which way to go or what they need to do first.

“There isn’t just one clear path to Industry 4.0,” observes Andrea Nardone, chief operations officer for Danieli Automation SpA. There is, however, a general progression that companies go through, PwC’s Pillsbury says, with the initial awareness of the Industry 4.0 concepts and then a brief period of paralysis when the company finds the necessary transformations somewhat overwhelming. That period is followed by an experimentation and testing phase, a proof-of-concept adoption phase, and then ultimately an integration phase in which the company actually updates its legacy system with new capabilities, innovations and business processes. This, he says, is with the aim for steelmakers to maximize advantage through using data to both create a perfect plan and to execute it perfectly—or at least as perfectly as possible.

PwC has forecast that through a drive to increase productivity gains through automation, wireless technologies, data and analytics, the metals sector could see a 3.2% reduction in costs—approximately $56 billion—from 2015 through 2020.

Progress made
While the ultimate goal is to make steel mills fully learning factories—facilities that could automatically correct things are not going well and to learn how to prevent similar problems in the future—SMS group’s Adjogble says that the industry will continue to move towards that goal in very small steps.
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A number of those steps have already begun to be made. SAP’s Koch notes that as opposed to just using programmable logic controllers in certain areas of their plants, now companies are going beyond that, utilizing more sensors, including smart sensors, and trying to connect different sources of data and different inputs to a business process in a more sophisticated manner than in the past.

Now they have a big data repository and need to analyze that data to provide solutions to improve certain process steps, Koch explains. “I wouldn’t say that everyone is reinventing their whole business and business processes, but they are driving forward.”

What most steel companies are currently doing is to look where they could find some quick wins, Andrew Zoryk, managing director in Accenture’s metals practice, points out. This includes finding out what the easy potential areas are where they could leverage such things as artificial intelligence, machine learning and modeling to actually drive extra value.

He notes that they are doing many proof-of-concept and pilot projects within their plants, looking at such things as how they can utilize data better, how they could reinvent some of their business processes and how they could rethink the ways they collaborate between humans and machines using the data that they have.

At present, there is a big gap between the Industry 4.0 technologies that are available and those that are implemented and, despite increased interest from the steel industry, some think that gap could continue to get wider with technology development growing faster than the steel industry’s implementation.

Very few companies, especially metals companies, have been able to bring all of the Industry 4.0 concepts together in one single approach. Zoryk says that, according to Accenture’s research, only about 5% percent of metals companies have been able to achieve this so far, compared with about 10% of all industrial companies.

“Still, I don’t know of any major steel company that isn’t at least dabbling in this area with some bigger name companies making some major investments,” Zoryk says. “They are waking up to the fact that they need to do something to be more digital so that they can be more competitive. But the challenge for many companies is how to do this effectively, in a holistic way.”

While each company is approaching Industry 4.0 differently, Herzog says it is widely recognized that digitalization is not a project, but rather a journey that must be taken step by step.

The Industry 4.0 revolution actually has the ability to be implemented in an easier fashion than the previous industrial revolution — the automation revolution — which required major upgrading of steel plants’ infrastructure, Carlo Travaglini, director of technology at Gerdau Long Steel America, maintains. “Now it is more about what kind of technologies make sense and that we can apply to our operations.”

Implementation and integration of those technologies, especially into existing operations could, however, be challenging. Given that mechanical production equipment can last as long as 50 to 60 years and many automation systems at steel plants are 15-25 years old, it can be difficult to integrate Industry 4.0 technologies into existing operations, especially without the necessary technical interfaces. The fact that there are no unified semantic standards in the steel industry to allow data to be interpreted makes it even more challenging.

Probably the most common thing that steel companies are looking at now is predictive maintenance, according to Danieli’s Nardone. He says this is because steelmakers believe that it could give them a more tangible return on investment.
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Tangible progress

While admitting that they are still in early stages, some steel mills — both new and long-established companies — have started to incorporate Industry 4.0 concepts into their operations.

One example is Big River Steel LLC in Osceola, Arkansas, Andrew Zoryk, managing director in Accenture’s metals practice, points out. BRS installed the very latest technology in a green-field situation, but Zoryk notes that it is rather more challenging to integrate these principles into existing steel plants that have decades-old manufacturing execution systems that were not designed with Industry 4.0 in mind. But while it might be a bit more challenging, at least from a technology point of view, it is still quite achievable, Franck Adjogble, chief engineer for process control and production planning systems at SMS group Inc, asserts. “The challenge is to be sure that it is done in a way that it doesn’t breakdown the systems that are already in place.”

Right from the period when it was first being designed, BRS had the goal of becoming the world’s first learning steel mill, says David Stickler, the steelmaker’s chief executive officer. The company is not quite there yet, but Stickler says that he believes that it is just a matter of time, especially with certain tools that are just being opened up to it through its artificial intelligence and machine learning partners, Noodle.ai and EFT Analytics, to crunch in real time the close to 850 million data points that it has already collected, using what they call “The Beast” — an extremely high-power computing facility — in order to know as much as it can moment-by-moment about the mill’s operations. EFT Analytics is a unit of Koch Industries, a 40% owner of Big River.

Ultimately, possibly within the next two to three years, Stickler is hopeful that as the steelmaker continues to mine and analyze data for any indications of an adverse event and/or to improve its production process, BRS equipment might be able to self-correct even without operator intervention.

“If the most challenging part of this is knowing how to analyze and utilize the large volumes of data that we collect, which is something that we are still learning to do,” says Stickler. He says that he knew from the start that this would be a gradual process, marked, at least first, by a very steep learning curve. He notes that when the mill first started up in January 2017 it had yet to become very smart. But by December 2017 it was a lot smarter and by the end of this year, and beyond, it will be smarter still. “We knew that first we had to crawl and then walk and then run before we could sprint.”

Even though BRS is not all the way “dialed in” yet, Stickler says that early results have given him full confidence that it is on the right track to eventually achieve an all-out sprint. For example, the plant’s thin slab caster recently went 141 days without a breakout.

Stickler says that he hopes that other steelmakers take actions to move in a similar direction. He believes that “a smarter, more data analytics-driven industry will be good for all participants and will lift the entire domestic steel industry.”

Since BRS was commissioned, there have been some other real-life examples of how a new digital steel factory might look like from a green-field standpoint, notes Carlo Travaglini, director of technology for Gerdau Long Steel North America. He says that strategy is not one that his company or other steelmakers with existing plants could take. Instead, Gerdau is engaging in several smaller, more targeted Industry 4.0 related projects. “We aren’t just carpet bombing the whole thing. We are selectively identifying opportunities in areas that we could expect to see actual, tangible improvements that we could measure.”

For example, starting in 2016, Gerdau started working with GE Digital on the use of advanced data analytics and remote monitoring technologies at several of its operations in Brazil to predict and proactively prevent equipment failures at those plants.

Travaglini says that, in addition, over the past year Gerdau has also implemented about seven robotic/smart-robot applications — robots with artificial features that allow each to position itself without additional instruction — just in its North American operations. He says the steelmaker is also in the midst of an initiative to develop a hybrid robotic and machine-learning application that will not only be able to take continuous measurements of hot metal, but will take advantage of analytic models to learn what parameters are necessary to achieve the best-quality product and will be able to interact with the mill’s production process to suggest how the required quality levels could be sustained. Travaglini says this R&D project has already gone through the proof-of-concept state and is now in the early implementation phase.

Another steelmaker making some headway into Industry 4.0 technologies is Russia’s NLMK Group, which, says Stefan Koch, Global Lead for Metals, Industry Business Unit Mill Products, SAP, is developing a connected worker safety program that involves real-time tracking of workers to ensure that they do not go into dangerous areas of the plant, by setting off alarms regarding such potential dangers as hot machines, a gaseous environment or crane movements.
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Catalano says that through the use of the data they are collecting from their plants’ sensors, companies are able to know when to do maintenance even before equipment breaks down, which is more efficient than having to shut down when there is a problem.

In addition, Catalano says that machine learning and artificial intelligence will give the steel industry great benefits, although it won’t do so immediately. First, data needs to be collected and stored properly. That data then needs to be structured properly to enable it to be used for decision-making purposes.

There is still some reluctance in the steel industry when it comes to artificial intelligence and machine learning, Herzog says, explaining that while they are willing to use such data analytics and machine learning to help them to better understand their production processes, steel companies want it to be them, not the machine, that decide what needs to be done to make the necessary corrections. “They are reluctant to have that done on an artificial intelligence basis.” Nardone says that part of this resistance is because of a need for the industry to have a better understanding of what artificial intelligence is and what its benefits could be.

PwC’s Pillsbury describes artificial intelligence as a way to allow machines, through data analytics, to learn the same things that an experienced worker or supervisor knows, plus perhaps a little more, which could be very beneficial. This is not just because of the potential loss of knowhow when workers retire or move to other companies, but as steelmaking becomes more complex it becomes increasingly important for the company to have a better understanding of all the factors that go into making steel, which Pillsbury says is probably total more than a human can process.

“People won’t be replaced by machines, but these technologies will rather be used to support people in the decision-making process,” Catalano says. He also notes that robots can replace people to guarantee the highest level of safety in the plant by keeping people away from potentially dangerous tapping operations.

“Thanks to these technologies, workers will be able to collaborate with the robots from safe zones.”

Pillsbury agrees, although he envisages that it is possible that sometime in the future the equipment will begin to automatically make certain decisions, freeing up workers to engage in other tasks. “There will always be a role for humans in the steel mill, it just might not look like today’s role,” he says. In the future, people in the metals industry will be spending more of their time engaging in such activities as determining how to be a better supplier or better customer and how to optimize their operations.

“There is no doubt that Industry 4.0 will continue to be more and more accepted by the steel industry given its potential benefits,” SMS’ Adjogble says. “It isn’t hype. It isn’t just a new technology. It will have a big impact on how steel companies can be managed in the future to ensure that they are profitable and competitive.”

SAP’s Koch says that the tricky part will be to get everyone to understand what is behind Industry 4.0 and how it could be used to establish a better connected supply chain. “Already we are seeing more capabilities to use data to track and trace products and to harmonize companies’ processes,” he says. “And over time there should be more sophisticated collaboration with the different parties in the supply chain. There has already been some movement in this direction and there will likely be more in the not that distant future.”

That said, Catalano says that steelmakers will only embrace Industry 4.0 if they are given valuable insights and if they get valuable results, including lower production cost, improved flexibility and the ability to be more competitive. He is optimistic that they could achieve such benefits.
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Robots on the rise

The use of robots has become ever more widespread. Nat Rudarakanchana visits Steel of West Virginia to see that mill’s robots in action and notes their spread in other areas of steel business too.

At Steel of West Virginia, a compact 340,000 tons-per-year mini-mill in Huntington, West Virginia, robots are becoming an increasingly important part of production. They are a sophisticated and integral part of the workings of this 49-acre steelworks, which is a subsidiary of 7,635-employee-strong Steel Dynamics Inc (SDI).

Twenty-six robots, mostly acting as welders or material handlers — are scattered throughout the 770,000 square foot campus, in downtown Huntington — just metres away from Marshall University’s engineering complex. Robots inject oxygen through lances, weld pieces of steel, and stack countless piles of beams per year. The oldest robots on site were installed in 1994.

Even these relatively old robots, installed when Industry 4.0 had yet to be coined as a term, can weld about 1.2 million beams per year, Steel of West Virginia’s operational and commercial executives told Metal Market Magazine during an April 27 mill tour.

Each beam weighs as little as 30 lbs and is commonly used in industrial and automotive applications. Many typically form a cross-member section for industrial trucks and trailers, sold nationwide from Steel of West Virginia. Sheer productivity and consistency are two key drivers of the robots deployed. “On our weld lines, we’re welding a beam approximately every ten seconds,” said Scott Boggs, the mill’s fabrication superintendent. “Those robots are doing the same weld patterns every ten seconds,” he stressed.

“The repeatability on a robot welder is obviously a lot better than any human could do,” added Boggs, who oversees the facility’s robotics. Robots, of course, do not suffer from human fatigue or illness. But extensive automation here does not mean that the mill is a ‘ghost town’ run entirely by machines. Human welders have been retrained to learn how to operate and supervise these expensive robots, which can cost tens or hundreds of thousands of dollars per unit. For example, the works’ latest tranche of 10 robots, for material handling, was installed at a collective cost of $3.75 million, with Traverse City, Michigan-based TranTek Automation Corp credited for the technology and equipment.

Displaced workers tend to get re-absorbed into the plant workforce, in other areas of the steelworks, said the mill’s vice-president and general manager Mark Gilliam. In fact the mill is hiring now because it’s better for employees as it’s safer, since employees are not now doing so many repetitive tasks,” added the company’s vice-president of administration and financial controller, John O’Connor.

Welding, then waxing

Welding is not the only application for robots at Steel of West Virginia. The newest line of robots, housed in their own separate building, are material handlers. They shepherd yet more steel cross-members, as these run through a mass wax-coating process. These robots — in the form of whirring, colorful arms — grab the short cross-members from a hanger, flip and return the steel, as appropriate, and finally stack them, after the wax is applied.

Although the ten material-handling robots are outnumbered by their welding associates — 16 in total — this wax coating process represents a significant slice of the 26% of floor space that the Huntington mill devotes to finishing and value-added services. The mill’s ability to process, fabricate, and otherwise finish raw steel long products — thanks in no small part to its use of robotics — contributes value directly to the mill’s traditional customers, who are often technically demanding original equipment manufacturers (OEMs).

In this case, a wax coating was preferred over traditional steel coats like zinc because wax protects these automotive parts from chipping and all the debris that roads throw up. These wax-coated beams, destined
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To see these modern machines at work is a marvel. Even from behind a welding screen, or housed in a wide cage, their precision and efficiency is striking. On the waxing side, where several robots work in the style of an assembly line, robots later in the line can sense what earlier robots earlier have done and can note imprecision or make corrections. In other words, these machines digitally communicate with one another.

“Some of our core OEM customers have interest in us doing more value-added fabrications that could also be galvanized,” Gilliam later added, noting the potential for further robotics at the company.

“Where there is enough volume to justify the investment, we would capitalize on our experience with robotics and automate these welding and fabrication processes... Plans are in place to add more robotic fabrication cells.”

**Robots in construction**

Beyond the Steel of West Virginia mill — self-described as “artisans of steel” on their parent company’s website — robots are hard at work in other areas of the US steel industry too.

For example, on trade floor shows like the one at the American Institute of Steel Construction’s major annual conference, held in Baltimore in April 2018, big robots could be seen at work on large structural sections. Robots were a theme at the AISC show, with an exhibition floor that included Lincoln Electric’s PythonX robotic fabricator and a giant Peddinghaus Corp PeddiBot installation.

One seminar at the show, aimed at structural fabricators who cut, bend and process steel for construction projects was even entitled: “Robotic Welding for Unique Parts, or: ‘How you can weld structural steel beams with a donut and a coffee.’” AGT Robotics’ general manager Louis Dicaire explained there how robots could, with sufficient software and sophistication, weld unique parts — a challenge in steel construction, where special customized shapes are required that are unique to the building and the steel’s role in the building.

Dicaire also discussed the wider use of robotics within steel and within industrial manufacturing. Some 150,000 robots now actively work in heavy industry globally, but most work on high-volume production of parts, where many identical components are produced, he told a diverse audience of structural engineers, architects and steel fabricators.

Robotic welding is “quite new” in structural steel as it is a relatively “low-volume” business with a highly specialized mix of products, he said. Fitting and welding can represent 50% of a steel fabrication shop’s operations, with the latter alone taking up 25% of a shop’s operational time, estimated Dicaire.

Done manually, a human welder usually welds between 10 and 20% of their shift, in on-arc time. The rest of a shift is often spent examining welds, repositioning steel, and so on. With a robot, the rate achievable is 50-65% of arc-on time. In other words, robots will weld “more often” though not necessarily “faster” than human welders, Dicaire explained.

AGT Robotics has deployed hundreds of robotic welding systems in North America, often dealing with pallet rack beams and upright frames, while it’s BeamMaster Weld has four deployments in Canada, the company’s marketing director Denis Dumas told *Metal Market Magazine*.

Robotic welders are starting to be adopted by structural steel fabricators, and the market could move in coming months and years, said Dumas. “A lot more fabricators are really thinking about robotics right now,” he reported. “A couple of years ago, few were the ones ready to make an immediate move. Now we feel that the market is ready,” he concluded.

**Welding a plasma torch**

At the Peddinghaus stand on the Baltimore Convention Center’s show floor, structural fabricators and steel engineers flocked to watch a PeddiBot in action.

An imposing module, the raised PeddiBot-1200 — a “robotic thermal processor” — anchored a corner of Bradley, Illinois-based Peddinghaus’ space. In a demonstration of the equipment, a robotic arm wields a plasma torch behind a screen to cut beams, tube, channels, and angles, fitting them out to specification, sparks flying.

Peddinghaus states that one PeddiBot might easily save a company $250,000 per year, and can do the work of five workers. A six-axis robotic arm allows for dexterous handling, while the robot itself can deal with steel profiles of up to 12 tons in weight. Released last year, the machine is now gaining in popularity, with a number of US deployments to date.

While all the robots described amply demonstrated their value, there are still situations in which only human welders can do the job. For example, robotic welders sometimes cannot access the steel to be welded at the right angles to do the work. In other words, in confined or awkward spaces inaccessible by robot only human welders can do the job.
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Market spotlight: High-performance metals

High-performance alloy markets gather speed

It is a time of great import for the high-performance light metals alloys market. The breakneck speed of development in this arena raises numerous issues at the easiest of times, but the stakes are higher now. Aluminium alloys are competing with other materials to keep or earn their share in a more sophisticated and increasingly differentiated market where buyers are demanding greater performance from a more specialized product. And at a time when security of supply is crucial to maintaining the image of a preferred supplier to aerospace and other high-value industries, the underlying primary aluminium market has become more uncertain than ever.

Investment decisions are already fraught with risk in this area. Millions of dollars could be spent on research and development, and millions more on bringing a new alloy to market, only for that product to be swiftly rendered obsolete by the latest advance in carbon fibre production or additive manufacturing (3D printing). There is no standardized product at the frontier of high-performance alloys and there are many companies creating new types of stronger, lighter alloys all the time, while their marketing departments scramble to ensure that their particular alloy is the one to be chosen for the body of the next big-brand automobile model or structural part of the next generation of aircraft.

Major rewards

The rewards for coming out on top can be lucrative. The decision by Ford to switch the body of its F-150 pickup truck to aluminium alloy from steel for its 2017 model was a major boon to the 60 million-plus-tonne global primary aluminium market and has shown the impact of such decisions among the major car manufacturers. All of them are looking at ways to make their cars more efficient to meet increasingly stringent environmental regulations, and light-weighting remains the most practical way of doing that. Every time a major auto manufacturer updates one of its models to become more efficient it provides an opportunity to producers of high-performance light metal alloys, as Mercedes-Benz did when it chose Constellium’s Surfalex alloy for the body of its new CLS model launched this year.

In the aerospace sector, many companies are developing new alloys to provide stronger, lighter parts to aircraft manufacturers, and the prospects are good. The International Air Transport Association (IATA) forecast in October last year that the number of annual air passengers will almost double to 7.8 billion by 2036 from about 4 billion in 2017, based on an average compound annual growth rate (CAGR) of 3.6%. More than half of the new passengers will come from China. Routes to, from and within that region will see more than 2 billion more annual passengers by 2036, up from about 1.5 billion last year. That region’s annual average growth rate of 4.6% will only be the third-highest however, behind Africa and the Middle East.

“All indicators lead to growing demand for global connectivity. The world needs to prepare for a doubling of passengers in the next 20 years. It’s fantastic news for innovation and prosperity, which is driven by air links. It is also a huge challenge for governments and industry to ensure we can successfully meet this essential demand,” Alexandre de Juniac, IATA’s CEO, said in a statement.

That will mean a lot of new planes. The world’s commercial aircraft fleet grew by 4% in 2017, to more than 31,000, while the backlog of orders for new aircraft reached more than half of that over nearly ten years. While much of that backlog will probably only sparingly feature new high-performance alloys, such as aluminium-scandium compounds, the future beyond is more open.

For more established aerospace alloys the immediate forecast is rosy. Titanium alloys manufacturers are seeing very good demand levels, having grown rapidly over the last ten years with the increase in air travel. While titanium alloys and carbon-fibre usage is expected to grow further, from their current levels of about 14% and 6% of the average commercial aircraft’s weight, respectively, the use of aluminium alloys is expected to dip slightly from about 48% today.

“Titanium is seeing strong growth that has correlated closely with the growth in carbon fibre,” noted Bill Bihlman, president of US aerospace consultancy Aerolytics. Materials research house Roskill has forecast that magnesium demand will grow at a CAGR of 3.6% to 2020, citing the long-term potential for the development of magnesium metal alloys with denser, more uniform structure, leading to lighter and stronger parts.

But the cost of developing these new alloys and products is formidable, and price will be a crucial factor in which materials the aerospace and other industries decide to adopt. How best then to harness this opportunity? In the fightback against carbon fibre, how do high-performance aluminium, magnesium, titanium and...
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Market spotlight: High-performance metals

scandium alloy producers create affordable products that nevertheless justify the huge capital costs of development over the lifecycle of their application?

Collaboration and partnership

One answer may lie in collaboration with their industry peers on research and development — a growing trend in high-performance alloys, particularly with a view to supplying the aerospace industry’s expected growth. The ripest area for such development is the manufacture of alloy powders to be used in 3D printing processes, or additive manufacturing. This technology has swiftly advanced from the prototype stage to becoming a viable production method. In September last year the alloys producer Arconic, spun off from Alcoa in 2016, produced its first 3D printed titanium part to be installed on a commercial aircraft, produced at its additive manufacturing plant in Austin, Texas. BMW also recently printed components for a motorbike.

In April this year, a group of companies led by aerospace components manufacturer Aeromet, and including Rolls-Royce, secured funding from the National Aerospace Technology Exploitation Programme to develop advanced aluminium powders for additive manufacturing. Such partnerships are becoming common. UK-based LPW Technology, another powder producer, formed a strategic partnership in November with 3D printer Airbus APWorks, to supply aluminium-magnesium-scandium alloys to the aerospace sector. Metal powders manufacturer Metalysis has launched research and development programmes with international partners at its research centre in Sheffield, UK, since that facility opened in March last year. The programmes will focus on creating high-value aluminium-scandium alloys to offer light-weighting and strength solutions to the aerospace and automotive industries.

In some markets the trend towards partnerships is not confined to the top of the value chain. In the current quarter, Scandium International, owner of the Nyngan scandium project in New South Wales, Australia, has signed letters of intent for the testing of scandium alloys with casting specialists Eck Industries in the USA and Grainger & Worall in the UK. Earlier this year the miner also signed similar agreements with a host of other alloys producers, including Gränges AB in Sweden and OHM & Hainer in Germany. The point is to show the benefits of aluminium-scandium alloys, create the demand, and lower the costs for everyone involved.

Scandium has not generally been mined historically — rather it has been extracted mainly as a by-product in the mining of iron and other metals, mostly in Russia and China. It is very much a high-value, low-volume product, with a market size of less than 50 tonnes per year. The benefits of small quantities of the metal in an aluminium alloy are high, providing among the biggest increases in tensile strength per atomic percent of all alloying metals.

But the supply picture is changing with the development of Scandium International’s Nyngan project, as well as the Syerston mine owned by Clean Teq, and the Owendale project being developed by Platina Resources. These three projects have the potential to supply several times the current world demand for scandium, so proving the worth of aluminium-scandium alloys as an essential material for the future of aerospace and automobile manufacturing is crucial. There is a great deal of enthusiasm over these new types of alloy, but there is still plenty of scope for potential consumers to show more interest in their adoption.

Multiple challenges

Collaboration between companies in the value chain for such a specialised metal can help to keep costs under control, but it is also very useful in maintaining the technological edge. Many of the partnerships mentioned have the specific intent not just of lowering costs, but of finding the right alloys to stand above the competition, both within the alloys market and among competing materials industries.

“There has been a lot of work done on qualifying new alloys, but these companies cannot rest on their laurels,” Bihlmann said. “Aluminium-lithium alloys, for example, are now a viable alternative to carbon fibre, for selected applications, but they are still considered too expensive.”

The challenges are numerous, and not confined in source to the competition. High-performance alloy producers also have to deal with the problems that they inherit from their raw material suppliers, caused by unpredictable base prices and sweeping government trade action.

Security of affordable supply may become among the biggest challenges for alloys producers should the current trend in government trade action continue. The global aluminium market is facing huge uncertainty following the United States’ Section 232 import tariffs on the light metal and sanctions affecting UC Rusal.

“The 232 tariffs in the US may not have had a huge impact, but sanctions would be a different matter,” Chris Bayliss, deputy secretary-general of the International Aluminium Institute, said.

Aluminium prices reached a six-month high following the imposition of the US sanctions in April. European diecasting aluminium alloy prices rose at the same time, to their highest prices since March last year. A curious impact of the current uncertainty over trade action is that primary aluminium and aluminium alloy prices are moving in unison, which has rarely been the case in recent years. The 232 tariffs could well have further implications though, with Turkey’s economy minister, Nihat Zeybekçi, hinting at measures to counter the tariffs earlier in May, and some now suggesting that China’s export tariff on aluminium could be removed in response.

All of this will threaten the security of affordable supply levels for high-performance aluminium alloy producers at a time when no new primary production is being built in western markets and much of what there is has been earmarked for more high-volume industries.

“For a low-volume, high-value product, where do you come in the queue?” Bayliss said. “The resilience of the supply chain has become limited. This was unforeseen, and customers are becoming wary. We will see the automotive companies asking more questions.”

“The industry is concerned. Those with exemptions could take advantage — potentially some Gulf producers — but it would still be damaging to the market in the long term.”

The CAFE standards governing automobile efficiency in the USA could also come under the scrutiny of the Trump administration. Should they be relaxed, cheaper and heavier steel might rob much of the light metal alloys’ forecast demand in that market.

Conclusively, then, the price and supply of raw materials for high-performance light metal alloys producers, as well as the demand for their products, are all being threatened by an increasingly unpredictable political system.

But through all the present market murkiness, the future for high-performance light metal alloys is bright. Convincing major producers with few competitors to adopt new and expensive materials is hard, and so is getting them to adopt your particular new and expensive material. But as the number of people using planes and cars around the world continues to rise, so will the pressure to find more environmentally friendly solutions. If producers can develop the right alloys and control costs sufficiently to entice their further adoption, the coming generations of planes and cars could transform this industry.
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End-user spotlight: heavy equipment

Heavy equipment is poised for recovery

While rising mineral demand is filling the order books for heavy equipment suppliers, higher steel prices are less encouraging news for yellow goods manufacturers, reports Gregory DL Morris

The fact that global demand is rising for commodity minerals — and hence the mining activity needed to satisfy it — is certainly a tonic to the makers of heavy equipment such as construction, mining and other machinery. But on the flipside of the coin, as their order books refill, they face rising prices for steel. In its first-quarter analyst call, Caterpillar, the large international manufacturer of yellow goods, specifically noted the price of steel as a "headwind" to profitability.

Mechanical and heavy equipment is the second largest segment of the global market for steel, according to the World Steel Association (see piechart), accounting for 16% of demand. Given that last year’s global crude steel production was 1.69 billion metric tons, that means about 270.56 million metric tons of steel went into heavy equipment manufacture in 2017. The segment is a little smaller in the United States: 10% of domestic steel shipments go into the category machinery and equipment there, according to Timothy Gill, chief economist of the American Iron & Steel Institute. That includes mining and agricultural equipment, and also electrical and industrial machinery, and has been at a consistent level over the past few years.

Don Johnson, president of Precision Economics and former chief economist at Caterpillar, sifted through government statistics and noted that there were $17.4 billion worth of shipments from the construction machinery sector in 2016. There was another $3.5 billion worth of small machinery as well as $2.4 billion on parts. At the same time, US companies spent $30 billion on construction equipment, including imports, Johnson noted. A further $12 billion was spent on mining and oilfield equipment. “Commodity prices peaked in 2011,” he said, “and machinery investment peaked in 2012. The recovery we are seeing now started last year.” Based on sales, he estimates that from peak to trough there was a decline of about 40% in the sector in the US and 60-70% worldwide. “It was a huge decline.” Even with a strong recovery in sales of 30-60% in first quarter of 2018 over 2017, sales are still well below the peak. Part of the problem is the long cycle. “Large units, especially in mining, tend to have a very long life,” said Johnson. “Heavy maintenance and field rebuilds make new orders more volatile than construction. Australia is often a good proxy for the global mining sector. Machinery purchases peaked in 2012 and bottomed in 2016 after a 70% decline,” he added.

Consolidation and relocation

It may seem surprising that the portion of steel made in the US going into heavy equipment is significantly smaller than the global portion, especially given the ubiquity of American brands such as Caterpillar, Manitowoc, Joy Global and Bucyrus. But Komatsu bought Joy Global in 2017, and Caterpillar acquired Bucyrus in 2011. Both of those big firms have been shifting some of their North American production to Mexico, according to industry sources. “Caterpillar is already there, in Monterrey, and Komatsu is moving there,” one source said. Imported steel from South Korea is also said to feature in some US yellow goods manufacturing.

Caterpillar referred inquiries about its business to its quarterly statements. In the first-quarter call, Bradley M. Halverson, Caterpillar’s CFO, said: “Manufacturing costs were about flat in the quarter on a 31% sales and revenue growth. Lower warranty expense and a favorable impact from cost absorption were about offset by higher material and freight cost as well as higher short-term incentive compensation expense. The increase in material cost was driven largely by steel. We expect steel and other commodity cost to be a headwind all year.” That said, Halverson added: “However, at the end of the day, higher commodity cost benefit many of our customers, and they are one of the reasons we have seen several of our end-markets begin to recover. We’ve recently received lots of questions from investors about potential impacts from higher commodity prices, especially steel. The revised
outlook does reflect an assumption for higher material cost. However, we have also increased our estimate for price realization, partially due to a mid-year price increase. We expect this upward revision to price realization to more than offset material cost increases.”

Halverson reiterated: “We believe higher commodity prices drive improved market conditions for many of our end markets.”

Amy A. Campbell, Caterpillar’s director of investor relations added: “We started off the year expecting material cost to be higher. We started to see some material cost increases in the back half of 2017. For the industry, steel prices, I think, were up about 40% last year. I think they were up about 15% for the industry in the first quarter. We have not seen that type of cost increase flow through to our results, but we have seen material cost increases most notably for steel continue to increase. And as we said, we now expect material cost increases to be higher for the full year than we thought they would be in the fourth-quarter outlook, and that is primarily driven by steel.”

She elaborated on the point that the company is still on the positive side of the balance between rising costs for raw materials, and the rising order books that come from the same minerals demand growth. “There are a lot of factors driving those steel cost increases,” said Campbell, “but we continue to expect price realization to offset those material cost increases. And in fact, from the fourth quarter outlook to this outlook, we now expect the price realization increase was actually larger than the material cost increase so that gap grew a little bit – not a significant amount, but it did grow a little bit favorable versus what we had in the fourth quarter outlook.”

China’s demand

Since Caterpillar is a giant in the yellow goods sector, with an estimated market share of somewhere between a quarter and a third, the company is a bellwether, especially in terms of sales to China. “We started the year expecting industry demand [in China] to be up about 8%,” said Campbell. “We tend to focus on the 10-ton-and-above excavator as we talk about specific numbers for industry demand. China continues to be higher than we expected. We now expect the China 10-ton-and-above excavator demand to be up 30% this year. At that level, that’s about 88,000 excavators for the industry. “That is about 20% to 25% above where we think normal replacement demand and the macro environment in China support,” Campbell elaborated. “But we do at this point continue to expect China to be very strong for the rest of the year. That said, we expect normal sales patterns in China. So we expect about 60% of end-user demand to come in the first half of the year and about 40% of end-user demand to be in the back half of the year.”

Material developments

The types and grades of steel generally used in heavy equipment equipment often include small additions of boron to increase toughness and “hardenability,” said David Anderson, senior director of long products at the Steel Market Development Institute. “Typically these long products are in the [ASTM] 1000 type of plain-carbon, induction-hardened, shallow-case steel for torsional strength.”

There are also alloys in the ASTM 8620 and 4320 range, he added: “Those have more internal toughness for things like gear teeth.”

An interesting trend is that the idea of lighter weight that is so prevalent in on-road vehicles is also moving into heavy equipment. It might seem counterintuitive that weight would be a concern in this sector, but in all heavy equipment — from common street-legal dump trucks to the monster drag lines for mining — performance, reliability and durability are all essential characteristics. The larger and more expensive the machine, the more critical down-time becomes. The less of its own weight the machine has to move, the more payload can handle. Several sources noted that end-users and equipment-makers are asking for lighter, stronger grades.

“Agricultural applications started to look at fuel efficiency years ago,” said Anderson. “Operators want more rows for the same amount of fuel. Mining haul trucks are also going to lighter weights.” New materials are “a lot more power dense,” Anderson added. “We have done some work with the University of Toledo [Ohio] on improving steelmaking in general, but especially forging. It used to be that the design safety factor used to have to be as much as 70%. In some cases that can be reduced to 10% and still stay well within safety and performance parameters.”

Good outlook

Broadly speaking “the outlook for the sector is good,” said Gill at AISI. “Mining as well as oil and gas are benefiting from price rebounds. So far that is strong enough to draw investments into those sectors, but not so strong as to undermine profitability. For US companies there has also been a modest decline in the value of the dollar, which helps exports.”

The global recovery in mineral commodities and the incipient recovery in heavy equipment is all the more dramatic given how bad the decline was. “The segment just fell off the table in 2012,” said Daniel Carroll, national sales manager for JSW Steel USA. At the time he was with ArcelorMittal supplying service centers that concentrated on the heavy-equipment segment. The timing could not have been worse for all. Caterpillar had spent about $8 billion in 2011 to acquire Bucyrus, maker of huge mining machines. “ArcelorMittal, Nucor, and SSAB all made significant additions to their quench-and-temper lines,” said Carroll. “ArcelorMittal spent $65 million on heat treating,” he added. To this day the industry has about twice the quench-and-temper capacity needed, he said.

Carroll also noted that each major equipment manufacturer has its own specific grades, but broadly they are similar to common construction steels. “We can produce heavy plate up to six inches,” he said. “We ship raw plate to our customers, who cut them and supply to the heavy-equipment manufacturers.” He added that not much is shipped assembled anymore: “The manufacturers engineer, assemble, and test, then disassemble and ship.”

As reported by American Metal Market on May 8, India’s JSW Steel Ltd has agreed to buy US flat-rolled steelmaker Acero Junction Inc for $80.85 million. For its own part, JSW USA announced in March that it will build a new electric-arc furnace and upgrade the plate line at its mill complex in Baytown, Texas. The millshop is expected to be in service in two years.

“There has been a quantum leap in the ability to develop better steels,” said Carroll. “As long ago as the late 1990s the major crane makers like Link-Belt and Manitowoc were moving from 100 KSI steel for booms to 130-140 KSI. Now they are working on 160 and are looking at 180. Anything 130 and higher is quench-and-temper, that is a separate heat treating.”
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Walt Bednarz - Solution Architect, Quintiq (speaker)

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Lou Pahountis - Senior Executive Partner, Venetia Partners (speaker)

Lou is Senior Executive Partner at Venetia Partners, a firm specializing in simplifying business operations and strengthening supply chains in relation to the time-critical outcomes. Lou has spent much of his 33 year career in the Ferrous and Non-Ferrous Metals Industry, as well as in upstream/downstream industries such as Aerospace, Automotive, and Construction. Previous to Venetia Partners, Lou was Vice President Global Supply Chain for Novelis, a world leader of Aluminum FRP.

Jethro Wookey - Contributing Editor (moderator)

Contributing Editor Journalist Jethro Wookey began his journalistic career in 2007 at Euromoney Magazine, writing about corporate bond markets. He moved to Metal Bulletin in 2009, and spent two years covering ferro-alloys markets before becoming the magazine’s aluminium correspondent. For almost seven years he was responsible for assessing Metal Bulletin’s European aluminium premiums, as well as reporting on both upstream and downstream aluminium markets and speaking at numerous conferences. In 2017, he left Metal Bulletin to work as a freelance commodities journalist.

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