

2023

Developments in the North American Iron and Steel Industry

by Sam Kusic

Let's wind the clock back to the late 1990s and early 2000s.

Back then, surging imports of less expensive, overseas steel were taking market share from domestic producers, some of whom were saddled by aging production equipment and legacy costs. Thousands of well-experienced workers, particularly union workers, were being laid off. And more than 30 steel producers had declared bankruptcy.

It was a time of great uncertainty, and hopes for a full, long-term recovery were difficult to summon. As the Congressional Research Service noted at the time: "While the industry should survive, both changing technology and international competition have contributed to a tougher and more competitive environment for American steelmaking."

In hindsight, the researchers got it right on two fronts: technology has indeed changed and international competition, fueled by global overcapacity, remains. But what they didn't foresee is the position of strength North American producers now find themselves in.

That position is underscored by the fact that producers are coming off record years of revenue and profitability, and that the pipeline of capital investments remains incredibly strong. In AIST's annual capital expenditures report of publicly announced North American investments, we count more than US\$23 billion in new investment, either recently completed, underway or on the drawing board.

These investments are up and down the value chain, from iron ore mines to finishing lines, and across the entire range of steel products, from sheet to bar to specialty alloys, and in one case, into an altogether different product: aluminum.

The projects are equipping North American mills with the means to produce more efficiently, more autonomously and recapture market share from imports. They also are advancing decarbonization goals.

For instance, Nucor Corp. at the end of 2022 saw the first plate rolled at its US\$1.7 billion Brandenburg, Ky.,

plate mill, and has spent the past year ramping up the greenfield facility. The mill can produce nearly all plate products consumed domestically. The company also broke ground on its West Virginia sheet mill, the single largest economic development project in West Virginia history.

Meanwhile, on the other side of the country, CMC started a technologically advanced rebar and merchant bar mill and then later broke ground on an additional rebar mill in West Virginia.

To the north, Algoma progressed on its electric arc furnace installation, a process conversion that will end its reliance on coal and coke, and the blast furnace. And in the south, Ternium announced its intention to build a direct reduction furnace and electric meltshop at its Pesquería facility, securing a source of U.S.-Mexico-Canada-Agreement (USMCA)-compliant slab for the company.

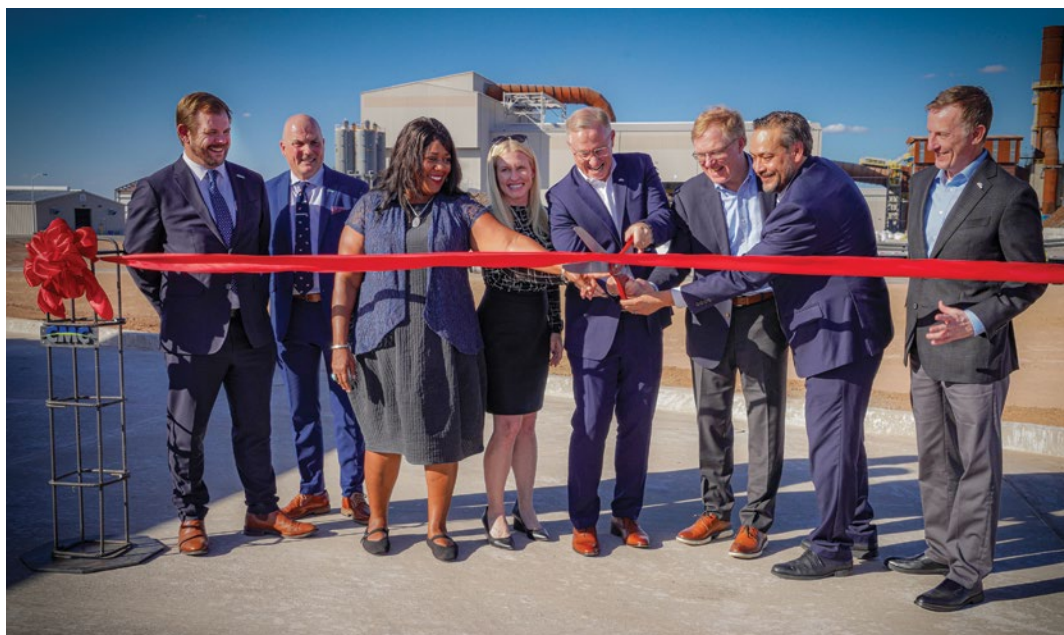
All told, the industry has seen a remarkable level of investment, says industry consultant and AIST member Becky Hites.

According to Hites, publicly traded U.S. producers invested US\$26.1 billion between 2000 and 2010, or about US\$2.6 billion per year, on average. Between 2010 and 2020, that average grew to US\$3.5 billion. But in the last two years alone, they've sunk an additional US\$15 billion into their mills, and that's up 82% over the 2020 and 2021, she said.

The capacity to invest, Hites said, is in part attributable to surge in revenue during the early '20s.

"The strong earnings in the post-pandemic period generated extraordinary cash flows that allowed the leaders in the industry to consolidate, to reinvest in existing assets and to invest in new technologically advanced mills targeting underserved markets; with all three initiatives strengthening the competitive position of the U.S. steel industry," she said.

Hites said that not unlike productivity gains realized through the turmoil of the early aughts, the global steel industry emerged from the COVID-19 pandemic with a



CMC held its official ribbon cutting for the dedication for their new micro-mill (Steel Arizona 2) in Mesa, Ariz., on 25 October 2023. Participating in the ribbon cutting were CMC leadership and state and local representatives.

new emphasis on reducing the risk of the global supply chain, exerting greater local control over crude steel production and lowering global carbon emissions.

“The ‘shortage’ of steel during the global economic reboot drove prices and profits higher, improved balance sheets, and primed the Wall Street financing sources (both equity and debt) to move forward projects previously considered ‘inconceivable.’”

This reboot also coincides with the passage of three key pieces of legislation — the Infrastructure Investment and Jobs Act, the CHIPS and Science Act and the Inflation Reduction Act — all of which are ushering in the green economy, rebuilding infrastructure and reinvigorating advanced American manufacturing.

These programs represent a nearly US\$1.9 trillion investment in the U.S., and, by extension, steel. According to one estimate, every US\$20 billion in new infrastructure spending drives 1 million tons of new steel demand.

Producers are gearing up to meet that demand by modernizing capacity, but they’re also investing in a decarbonized future.

To be sure, North American producers are already among the cleanest in the world, but they’re aiming to do better, having pledged to reduce Scope I and II emissions in the range of 20% to 35% by 2030. Some are already there today.

“The rest of the world is actually trying to make their steel industry look like ours,” said Philip Bell, president of the Steel Manufacturers Association.

Many of the greenfield projects include an associated, third-party development in renewables. For instance, EVRAZ North America is building a Colorado rail mill that has an associated US\$285 million solar farm capable of generating 300 MW.

Similarly, CMC’s Arizona micro-mill is receiving electricity from the nearby 100-MW Saint Solar solar farm.

Other companies, however, are laying direct investments in energy projects. Nucor, for instance, is making a US\$35 million investment in commercial fusion technology and aims to power one of its mill with a fusion reactor by the end of the decade.

“Nucor continues to position itself as a leader in developing clean energy solutions to decarbonize the industrial sector. This agreement with Helion, along with recent investments in clean energy, can change the entire energy landscape and forever change the world, embracing a clean energy future we could have hardly imagined a few years ago,” said Nucor chair, president and chief executive officer Leon Topalian.

Meanwhile, Cleveland-Cliffs Inc. is looking to hydrogen as a path to decarbonization. The company last year conducted successful hydrogen injection trials on its No. 7 Indiana Harbor blast furnace, which followed an earlier successful trial at its No. 3 furnace at its Middletown Works.

If there is a common takeaway from these decarbonization investments, it’s that there is no common solution, said AIST executive director Ron Ashburn.

“There is no one single road to follow to reach carbon neutrality, and there is no one single technology that will convey us that end. It will take a variety of solutions utilizing a variety of technologies, many of which need further commercial development. It’s the ideal problem for AIST members to tackle and solve,” he said.

What’s clear, though, he said, is that the level of capital investment is without precedence in the past 40 years.

“We are experiencing a multi-generational renaissance in the North American steel industry,” he said.

The following is a look at recent North American investments.

Algoma Steel



Installation of Algoma's transformative EAF meltshop has surpassed its budgetary midpoint, and the Canadian steelmaker is looking to start up its new furnaces later this year.

As of December 2023, Algoma had poured more than 22,000 m³ of concrete and installed 11,000 tons of structural steel. Two meltshop charging cranes have been installed, and the meltshop building's roof was 40% complete. Foundations for the fume treatment plant were mostly completed, and the No. 2 baghouse equipment was a third of the way to being fully installed.

Furnace equipment is being delivered by oceangoing ships from Danieli workshops in Italy and Asia.

"The bulk of the steelmaking equipment and the new steel shop is sitting here in Sault Ste. Marie awaiting installation (this year)," Algoma chief executive Michael Garcia told a local newspaper in December.

Through the ~CA\$825–875 million (US\$611–648 million) decarbonization project, the sheet and plate producer will replace its existing blast furnace and basic oxygen steelmaking operations with two independent, 250-ton electric arc furnaces. The EAFs will eventually end Algoma's reliance on coal, boost its steelmaking capacity and reduce carbon emissions by approximately 70%.

The new furnaces are expected to align Algoma's liquid steel capacity with rolling capacity, increasing by roughly 33%, taking it from 2.8 million metric tons to 3.7 million metric tons.

"The higher output will match our expanded downstream finishing capacity as we increase throughput at our plate mill. Importantly, this will improve overall product mix while simultaneously lowering our carbon emissions," Garcia said recently. "When factoring in the

makeup of our power supply when we switch to EAF operations, we expect to be one of the greenest producers of steel in North America."

Algoma plans to phase in EAF production, running the furnaces on a rotating basis as it waits for electrical capacity to be added to the grid. But even with the EAFs set to begin at year's end, Algoma won't dial back blast furnace output for up to another year and half. During that time, the furnaces will ramp up and conduct product certification.

The company hopes to operate the furnaces in tandem once full power is available by 2029.

As work continues on the EAFs, Algoma is looking to complete a two-stage upgrade to its discrete plate mill this year. Algoma already has commissioned an in-line, high-capacity shear, which replaced a smaller, under-sized unit.

Ahead, however, is the replacement of drives on a 4-high stand at the hot mill. The work will necessitate two 20-day outages, the first of which is scheduled for this month. The other will occur later in the year.

AM/NS Calvert LLC



AM/NS Calvert, the ArcelorMittal-Nippon Steel joint venture, is aiming to start its new US\$1 billion EAF and caster in the second half of this year. It will provide a source of USMCA and U.S.-Made-and-Melt-compliant slab for what is currently a re-rolling facility. Spain's Sarralle is supplying the 180-metric-ton DC furnace, a 180-metric-ton twin-ladle furnace, a material handling plant and offgas treatment system. Primetals Technologies was contracted to supply the 180-metric-ton twin RH degasser and single-strand caster. The

Construction progresses on Algoma's electric arc furnace meltshop.



caster will produce slab in thicknesses of 235 mm to 255 mm and in widths from 950 mm to 2,050 mm.

Whereas AM/NS Calvert currently relies on overseas and third-party slabs, the meltshop will allow AM/NS Calvert to “cast on demand,” offering competitive lead times for customers and increase energy efficiency and productivity with plans to hot charge EAF slabs into the hot strip mill.

AM/NS has said it is weighing the potential for a second 1.5-million-ton furnace, a follow-on project that would give the Alabama facility the capability to produce 3 million tons of crude steel. The finishing facility has the capacity to produce 5.3 million tons.

ArcelorMittal



As ArcelorMittal expects its Texas hot briquetted iron (HBI) plant to play a key role in its decarbonization efforts, the company is considering building a new 2-million-metric-ton direct reduction facility that would both increase production and capture carbon emitted by both the new and existing plants. “This is a world-class plant, making a high-quality feedstock that allows us to produce high-quality, low-carbon steels at Calvert’s new EAF and other ArcelorMittal facilities,” the company said in a statement.

Meanwhile, at Dofasco, the company is making headway on the front-end engineering and design work for major steelmaking process conversion to achieve a significant reduction of the Hamilton mill’s carbon dioxide emissions. The conversion targets a reduction of approximately 3 million metric tons annually by 2030.

The Hamilton site is also embarking on two additional steelmaking capital investments this year, including the installation of a new 550-ton overhead crane that feeds No. 1 Continuous Caster, and the replacement of the existing electric arc furnace shells and cradles, and redesigned slag door. The existing electric arc furnace was commissioned in 1996.

These projects are a part of ArcelorMittal’s broader North American decarbonization strategy, which also includes a CA\$205 million (US\$152 million) investment in ArcelorMittal Mining Canada’s Port-Cartier pellet plant in Quebec. Set for completion in 2025, the project will shift production to produce only pellets suitable for direct reduction furnaces. The plant currently produces approximately 10 million metric tons annually, with about 70% of the output directed toward blast furnaces. The company is also investing in its Las Truchas iron ore mine in Mexico, allocating US\$150 million to increase pellet feed capacity. The plan is to take capacity from 1.3 million metric tons annually to 2.3 million metric tons. It also is being equipped to produce direct reduced iron (DRI)-grade concentrate. The project is scheduled for completion in the second half of 2025.

California Steel Industries



The Nucor Corp. and JFE Steel joint venture is advancing plans for a 400,000-ton galvanizing line at its Fontana, Calif., USA, facility.

A US\$370 million investment, the line will be geared to meet demand in the western U.S. construction markets. Work is expected to take two-and-a-half years. Once completed, California Steel Industries (CSI) will have the capacity to produce 1.2 million tons of galvanized sheet annually.

“With recent closures of galvanizing capacity in the western region, CSI is seizing an opportunity to provide the high-quality value-added products that our customers have requested,” Nucor Corp. chair and chief executive Leon Topalian said. “This investment continues the strong partnership we have cultivated with JFE Steel of growing together in North America.”

CSI produces hot-rolled, pickled and oiled, cold-rolled, galvanized, and electric resistance welded (ERW) pipe for the construction, service center and energy markets. Nucor acquired a 51% stake in CSI in February 2022. It is the company’s second partnership with JFE Steel.

Cleveland-Cliffs Inc.



Cleveland-Cliffs last year made a variety of reinvestments in existing assets and expects to do more of the same in 2024, budgeting for US\$675 million to US\$725 million in capital expenditures.

“This is, by far, the lowest amongst our peers, with our equipment in very good shape and no plans to add any capacity,” chairman and chief executive officer Lourenco Goncalves said recently.

Cleveland-Cliffs characterized its 2023 maintenance capital and operating expense as normalized, especially relative to 2022, when spending was increased as it undertook overdue maintenance work at the facilities acquired as part of its ArcelorMittal USA and AK Steel acquisitions.

“The necessary resources that we have invested in our footprint are expected to keep our assets at an automotive-grade level of quality and reliability for years to come,” the company said.

Nevertheless, normalized investment is not the equivalent to no investment. The company, for example, recently completed a US\$10 million pipeline to bring hydrogen to its Indiana Harbor plant. The pipeline will carry the reducing gas from a hydrogen hub being developed with funding from the U.S. Department of Energy. The pipeline was used to facilitate successful hydrogen trials at Indiana Harbor’s No. 7 blast furnace.

“This successful commissioning marks another significant achievement toward Cliffs’ future GHG reduction efforts, completing the pipeline in advance of schedule, below budget and without incident. Cliffs’ hydrogen gas

Member of CMC's executive team and senior management officially break ground on CMC Steel West Virginia.



supplier, Linde, was a critical partner in the successful execution of this major trial,” the company said.

CMC

CMC broke ground in July 2023 on its US\$450 million rebar micro-mill in West Virginia, marking the start of work on what will be its fourth such facility.

Located in the state's eastern panhandle, the Danieli-equipped mill will produce 500,000 tons of straight length and spooled rebar when it opens late next year.

“Civil work is nearly complete, after which we will begin setting foundations,” CMC chief executive officer

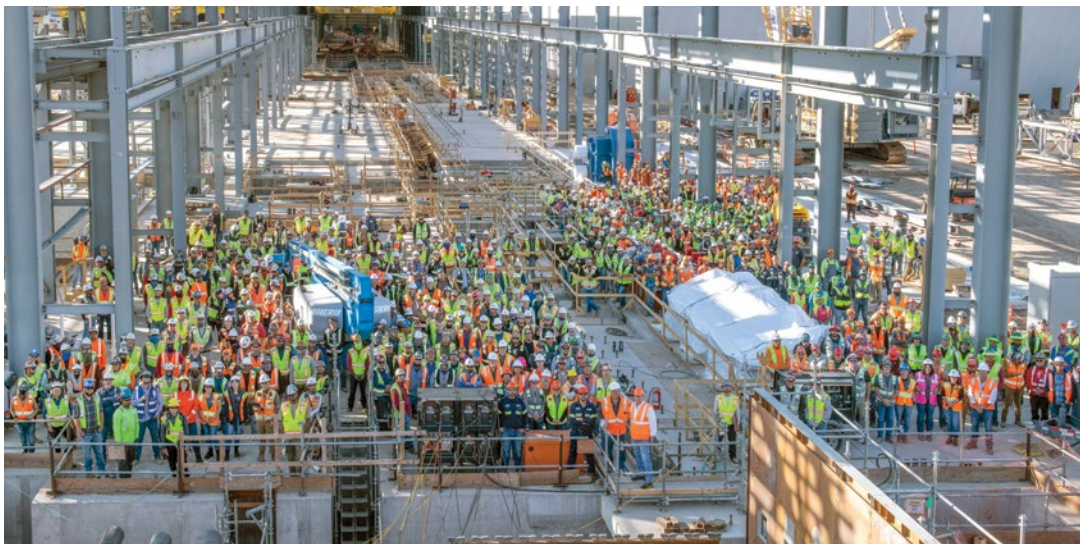
Peter Matt told investors during the company's first-quarter earnings call in January.

The mill will feature a Danieli Digimelter furnace set up with continuous scrap charging. The mill's single-strand caster will feed a rolling mill with cantilever and housingless stands. The mill will be able to operate in endless rolling mode.

Dubbed MM4, the mill is meant to serve metropolitan markets in the Mid-Atlantic and Northeast, as well as the Midwest.

Meanwhile, on the other side of the country, CMC is ramping up its third micro-mill. Located in Mesa, Ariz., the mill is a world-first, capable of producing both rebar

The new rail welding line at EVRAZ North America was commissioned in August 2023.





The new electric arc furnace at Gerdau Long Steel North America's Whitby, Ont., Canada, bar and structural mill was commissioned in December 2023.

and quality merchant bar in an endless casting-rolling mode.

The mill entered service last year and is reporting month-over-month production increases and routinely exceeding daily high-water production marks, Matt said.

"The team has done an exceptional job commissioning a very technologically advanced operation," Matt said.

Still, the company has had to pull back on what it first thought possible, saying the mill is now expected to produce 250,000 tons in fiscal 2024. The company previously had said it hoped to make 400,000 tons.

"The learning curve has been more extended than we originally anticipated," Matt said.

The mill was designed with the capacity to annually produce 500,000 tons — 350,000 tons of rebar and 150,000 tons of merchant products. Production has so far been focused on rebar, but it is looking to commission merchant production early this year.

It is located next to the first CMC AZ1 plant in operation at Mesa, Ariz., since 2009. Arizona 2 is replacing higher-cost and less-efficient capacity associated with CMC's former Rancho Cucamonga plant in California. CMC has closed that plant and sold the site.

EVRAZ North America



The company has shipped the first lengths of long rail produced on its new rail welding line in Pueblo, Colo., USA.

According to EVRAZ North America, the line produced 1,533 tons of rail, more than 15 miles, in 1,600-foot lengths.

"We've come a long way over the last nine months. From taking a mill that never ran a single rail through it to completing 80,000 feet of welded rail. All the teams responsible for this project have stepped up their game

and have taken a lot of pride in what they're doing," said Hudson Trent, the plant's rail welding manager.

Construction of EVRAZ North America's new rail mill continues, and the completion of the rail weld line marks an important milestone in the journey, the company said.

Gerdau



Gerdau last year commissioned a new Danieli-built electric arc furnace at its Whitby, Ont., Canada, bar and structural mill.

The Danieli UHP FastArc furnace has a tap weight of 137 tons and features a 6,500-mm-diameter lower shell. A new material handling system to support the ladle furnace also was installed, and the fume treatment plant was upgraded.

The US\$63.3 million project took the mill's capacity from 700,000 tons to 1.2 million tons.

Also last year, Gerdau commissioned a new heat treatment facility in Midlothian, Texas. Called Gerdau Midlothian Steel Processing (GMSP), the facility is next to its Midlothian bar mill.

"GMSP is the newest and most technologically advanced heat treatment operation in North America. Its location next to our Midlothian mill will support efficiencies in our process and in the supply of world-class products to our customers," Bernardo Marzana, Gerdau Long Steel North America's downstream director, said in a statement.

According to Gerdau, the facility is the only one in North America producing stretched and stress-relieved A722 bars, which provide improved stress relaxation properties for fasteners as well as post-tensioned and pre-stressed applications. The plant is designed to produce heat-treated bars in a wide range of sizes. Also unique to GMSP is the location's ability to produce lengths up

to 65 feet long in both quench-and-tempered as well as stretched and stress-relieved products.

“With the global push for sustainable energy solutions, the need for reliable, high-quality steel has never been greater. GMSP is uniquely positioned to provide specialized products to support the wind energy market,” added Marzana.

The facility is among the more than US\$100 million in investments Gerdau is making to its Texas and Tennessee mills.

At its Jackson, Tenn., USA, facility, Gerdau recently completed US\$67 million in improvements that expanded its merchant bar product range and boost operational competitiveness. The project entails a number of upgrades to the rolling mill, roll shop, warehouse and warehouse conveyor, Gerdau said.

“This marks the next step in Gerdau’s North American investment strategy, as we continue to modernize our operations to compete and grow in attractive markets,” said Gerdau Long Steel North America president Chia Yuan Wang.

On another front, Gerdau is installing a 69 kV static synchronous compensator at its Petersburg, Va., USA, plant. The unit will ensure continuity of current plant operations, double dynamic reactive power support and sustain production volume without any impact on the local power grid.

Primetals Technologies has been contracted to build the unit.

Grupo Deacero



Mexico’s largest long products producer has ordered a 1.5-million-metric-ton sections mill for its

Ramos Arizpe facility.

The mill is being designed to produce large sections up to 27 inches and will sit close to an existing facility that produces 1.5 million tons of small sections.

The new plant will feature a 150-ton Danieli furnace with automatic raw material handling and endless scrap charging; a twin-ladle furnace refining station; and a 6-strand continuous casting machine. The caster will produce 180-mm square and 280 x 220-mm rectangular billets, 480 x 150-mm mini-slabs, and 280 x 220 x 90-mm and 480 x 380 x 90-mm beam blanks.

The heavy-duty sections mill, fed by a 180-tons-per-hour walking beam reheating furnace, will consist of a breakdown mill and an ultraflexible reversing mill equipped with four universal-type stands, followed by complete straightening and finishing services for sections up to 27 inches.

Start-up is planned for the first quarter of 2026.

Deacero, which celebrated its 70th anniversary in 2022, has said it will invest the equivalent of US\$590 million in its operations as part of an effort to boost production by 1 million metric tons.

Hybar



Led by Big River Steel co-founder David Stickler, the startup rebar manufacturer announced in August 2023 that it had successfully raised US\$700 million in debt and equity financing to build and operate its first mill in Osceola, Ark., USA.

Of the US\$700 million raised, US\$470 million will be spent on construction. The remainder will be used to start up and operate the mill and pay certain debt service costs during construction.

The mill, which is expected to take 22 months to construct, broke ground in July 2023 and is being built on a 1,300-acre greenfield site with direct access to barge, rail and truck transportation options. The mill will produce a full complement of high-yielding rebar that will primarily be used in large infrastructure projects, including projects supported by the Infrastructure Investment and Jobs Act and the Inflation Reduction Act.

SMS group has been contracted to supply the mill equipment. It will outfit the mill with its continuous mini-mill technology, which links melting, casting and rolling, making it a single, unified process.

The scope of a supply includes a DC electric arc furnace, single-strand caster and a 14-housingless-stand rolling mill with an 8-pass, high-speed finishing block. The mill will be tied directly to an adjacent solar field and will largely forgo the use of natural gas in production.

“This will allow the company to know with certainty that during certain periods of the day the electricity being used to run the mill is being generated from 100% renewable sources. No other steel mill in North America is directly connected to a solar field that can supply 100% of its power needs,” the company said.

An electrical substation is being supplied by Primetals Technologies.

The plant is being designed to produce 630,000 tons of rebar annually with approximately 154 employees, or about 4,090 tons of rebar production per year per employee.

“Hybar expects to be the most labor-efficient steel rebar producer in the world,” it said.

JSW Steel USA



JSW Steel USA is upgrading refining and casting equipment at its Mingo Junction, Ohio, USA, slab and coil mill, revealing in January that it will build what will be North America’s largest twin-station vacuum tank degasser.

JSW has contracted Primetals Technologies for the project, which will allow the facility to produce a wider range of sophisticated slabs, diversifying its product portfolio.

The project entails installation of a 230-metric-ton vacuum tank degasser (VTD) with a dry mechanical



Mike Williams (center), Metallus president and chief executive, rang the opening bell at the New York Stock Exchange on 4 March 2024.

vacuum pump system and extensive upgrades of the facility's 2-strand caster.

"We look forward to the successful completion of these upgrades to strengthen our service capabilities and meet the growing needs of the renewable energy and infrastructure markets while in line with the Build America-Buy America Act (BABAA)," said Jonathan Shank, chief operating officer of JSW Steel USA-Mingo Junction. "The project will strengthen our commitment to sustainability while providing additional momentum for growth by widening our product portfolio."

The scope of work includes all the mechanical and electrical equipment for the vacuum tank degasser, including the mechanical dry pumps, vacuum filters, and dust catcher. It also includes new material handling technologies, associated auxiliary systems, a metallurgical process model, and complete level 1 and level 2 automation systems.

The caster improvements include level 1 automation for the No. 2 strand, a complete level 2 automation system and a mold monitoring system.

Work is already underway, and the project is to conclude in the second half of 2025.

Metallus Inc. (formerly known as TimkenSteel Corp.)



During 2023, Metallus made a variety of investments to its existing assets and plans to do more in 2024. Spending in excess of US\$50 million in 2023, last year's investments focused on safety

improvements, upgrades to electrical infrastructure, modernizing assets, new state-of-the-art assets that improve the ability to measure product quality, and additional machining capacity for automotive manufactured components. In addition, an ongoing larger capital project includes an automated grinding and finishing line with an anticipated commissioning at the end of 2024.

"The team did an excellent job strategically allocating the company's capital and delivering important safety, asset reliability, and high-return automation projects. In 2024, we are excited to deploy US\$60 million to further reinvest in our existing assets, wrapping up projects started in 2023 and launching new investments. Additionally, we recently announced a new multi-year US\$90 million continuous bloom reheat furnace investment aimed at bolstering the U.S. Army's mission of ramping up artillery shell production in the coming years. Metallus is honored to expand our commitment to the defense sector, reliably providing high-quality specialty metals for critical applications," said Kris Westbrook, executive vice president and chief financial officer.

On 10 January 2024, TimkenSteel announced the name change to Metallus Inc. The new name honors the company's century-long legacy as an industry-leading producer of strong, sustainable steel and reflects its vision to harness the enduring power of high-performance metals to make the world a better place. The company's common stock is now trading under its new ticker symbol (NYSE: MTUS), effective 27 February 2024.

"We are extremely proud of the company we have built over the past decade since becoming an independent company," said Mike Williams, president and chief executive officer. "Our long history as a leading producer of

high-quality steel products has been a testament to the dedication and hard work of our employees, working together to serve our customers and benefit our local communities. As we continue to build on this legacy, we are excited to announce that we are rebranding ourselves as Metallus, marking a pivotal milestone in our evolution.”

North American Stainless



North American Stainless is progressing on a US\$244 million expansion of its Ghent, Ky., USA, facility.

Announced in early 2023, the project includes installation of a new cold rolling mill and temper mill as well an expansion of its meltshop building, allowing for the addition of a 400-metric-ton crane. Work also will include an extensive upgrade of its annealing and pickling lines.

All told, the project will add 200,000 tons of annual capacity, a 20% increase that will help meet increasing demand for top-of-the-line stainless products.

The company in January 2024 said all of the major equipment — the meltshop crane, the cold rolling mill, roll grinders and a skinpass mill — have been contracted with the equipment in fabrication.

Construction of the meltshop building foundation is underway, as is excavation for the cold rolling mill foundations. Also, site preparation for the skinpass mill has been completed, it said.

The investment represents the 13th major expansion of the facility since 1990. The company said the continued importation of subsidized stainless steel — and the accompanying national security threats — make the expansion a pressing priority.

“We are proud to lead America’s stainless steel economy, support our national security with our production and create great jobs for our region. Our latest expansion will bring more clean, sustainable, and American-made stainless to consumers and directly compete with the subsidized imports of stainless,” said North American Stainless chief executive officer Cristobal Fuentes.

North Star BlueScope Steel



BlueScope Steel Ltd. is studying whether to expand its North American value-add capabilities, weighing a potential 550,000-ton cold rolling and coil coating project in the Midwest.

“The U.S. remains an exciting growth region for BlueScope, where we see strong demand for steel, particularly for large-scale infrastructure investments, steel-intensive renewable energy systems and the build-out of e-commerce buildings over the coming decade,” the company said.

Announcing the project during its first-half fiscal 2024 earnings, BlueScope said the project would initially include a cold rolling line, a pickling line and a galvanizing/Galvalume® line. A second coil coating line could be added later. The project would be carried out in phases over the next seven years, BlueScope said.

Ohio, Indiana, Michigan and Tennessee are on the list of states in which it might build such a project, it said.

BlueScope estimates the project would represent an investment of US\$1.2 billion over the next seven years, if fully implemented as designed.

BlueScope managing director and chief executive officer Mark Vassella said that the plan is not yet cemented, and with a phased approach, the company ultimately could wind up buying an asset to fulfill the plan.

“Given some of the moves that are going on in North America, who knows, Stage 2 of this process might not necessarily be a build. It might be the potential for us to pick up an asset from somewhere else, if someone has an asset that they think is surplus to their needs,” he said.

Meanwhile, the company is continuing to assess a potential US\$229.5 million potential debottlenecking project at its North Star sheet mill in Ohio. The project could unlock more than 500,000 tons of annual capacity. Projects include cooling and downcoiler upgrades, slab temperature upgrades and a ladle aisle flow upgrade.

Nucor Corp.



Nucor Corp. broke ground last year on its planned West Virginia sheet mill, a US\$3.1 billion project that represents the largest economic investment in West Virginia’s history and is Nucor’s single-largest investment ever.

“Nucor’s decision to invest in West Virginia represents a true vote of confidence in our state’s strength, resilience, and readiness to seize opportunities,” West Virginia Gov. Jim Justice has said. “This is more than just a construction project. It’s a symbol of progress and the promise of a brighter future for our communities and families for generations to come.”

The company plans to employ up to 2,000 workers for construction and hire around 800 full-time employees to operate the state-of-the-art plant. It will annually produce 3 million tons of sheet in widths of up to 84 inches for the automotive, appliance, construction and heavy equipment industries.

It will include a 76-inch tandem cold mill and two galvanizing lines, one producing construction-grade steel and the other producing high-end automotive steel.

Nucor has said work so far has included the setting of piles and installation of underground utilities. Foundation installation and building erection are ahead.

As Nucor ramps up construction on the mill, it also is gearing up production at its new plate mill in Brandenburg, Ky. The plant rolled its first plate at the

end of 2022, and Nucor has been throttling up the facility since then.

Nucor executives said they expect the facility's production to reach 500,000 tons this year, achieving break-even profitability by the year's midpoint.

With a capacity of 1.2 million tons annually, the mill will produce most of the plate products consumed in the United States. It also will be among only a few mills globally — and the only mill in the United States — capable of manufacturing at scale the heavy-gauge plate used in monopile foundations for offshore wind towers.

Also last year, Nucor's board of directors approved a US\$280 million to modernize its plate mill in Tuscaloosa, Ala. The work will include installation of a new mill stand and overall will improve its ability to serve key market segments. More specifically, the project will allow the mill to produce thinner, stronger, higher-quality plate and to add a new product line.

"We continuously invest in our teammates and facilities where we see opportunities to create value for our customers. This modernization project will bolster the plate group's position as the most diverse and comprehensive product mix in the industry," said Al Behr, Nucor executive vice president for plate and structural products.

Work is scheduled to wrap up in 2027.

On another front, Nucor is looking to expand its fleet of micro-mills, announcing in October 2023 that it is exploring Pacific Northwest sites for a 650,000-ton rebar facility. If built, it would be Nucor's fourth such facility. It will manufacture a full range of rebar sizes and have spooling capabilities.

Nucor already has micro-mills in Missouri and Florida, and it is building a third in North Carolina. The North Carolina mill is a US\$350 million investment that will be capable of producing 430,000 tons. Nucor broke ground on that facility in 2023.

"We have had great success with our rebar micro-mills in Florida and Missouri and are on schedule to begin operating our third micro-mill in the first

quarter of 2025, which we are currently building in North Carolina," said Nucor chair and chief executive officer Leon Topalian. "Locating a new rebar micro-mill in the Pacific Northwest provides us with an excellent opportunity to better serve our customers in the region and continue to build our modern economy with some of the most sustainable steel in the world."

Aside from greenfield mills, Nucor has announced additions and upgrades to several facilities. Among the plants in line for investment are its Crawfordsville, Ind., and Huger, S.C., sheet mills, each of which will receive new galvanizing lines.

The Crawfordsville line is a US\$290 million investment meant to serve the construction markets. It will be capable of producing 300,000 tons annually. The investment also provides for a paint line able to coat 250,000 tons annually.

"Investing in Nucor Steel-Indiana will allow us to grow our profitability in the Midwest construction region and expand Nucor's pre-paint footprint," said Rex Query, executive vice president of Sheet and Tubular Products for Nucor Corp.

Construction is expected to take two years.

The Berkeley galvanizing line is a US\$425 million investment targeting the automotive and consumer durables markets. Scheduled to enter service in 2025, the 72-inch line will be able to produce 500,000 tons annually.

It comes amid a broader, US\$200 million modernization project at Berkeley, which Nucor also announced last year. The five-year project includes construction of an air separation unit to support steelmaking operations. The unit will be operated by Nucor subsidiary UIG, which specializes in industrial gas supply.

In the West, Nucor announced a US\$100 million meltshop for its Kingman, Ariz., bar mill. The re-rolling facility doesn't have melt capacity, but with the addition will be able to produce 600,000 tons annually.



Computer rendering of Nucor Steel West Virginia.

Computer rendering of Pacific Steel's future Mojave mill.



Nucor-Yamato Steel



The joint-venture beam producer is installing a walking beam furnace along with new automation and material handling equipment in an effort to reduce its environmental footprint and enable high repeatability of optimized reheating profiles.

The hydrogen-capable reheat furnace will have a capacity of 180 tons per hour and will feature Danieli's Hydro-Mab burner technology. The upgrades will be integrated with existing plant operations, utilizing level 1 and level 2 Danieli Automation control systems.

The furnace is expected to be operational by the spring of 2025.

Optimus Steel



The Beaumont, Texas, long products maker last year commissioned a new rebar outlet and began shipping straight lengths to customers.

The project is part of a broader upgrade to the facility, which ultimately will see its capacity grow to 1.6 million tons.

"This is a doubling of rolling capacity," a company representative told price reporting agency Fastmarkets. "When everything is complete, we will have one wire rod mill capable of 800,000 tons and one rebar mill capable of 800,000 tons."

In addition, the mill is receiving a new reheating furnace and a new twin rolling mill.

The 140-tons-per-hour Danieli Centro Combustion walking beam furnace will feed two independent rolling lines, a 2-strand wire rod line for special steel and an

HTC bar line. The new mill will feature cantilever roll stands, an induction heater and automation. The project also entails an upgrade of the existing water treatment plant and the addition of a second plant.

Full rolling mill modernization is expected to be completed late this year.

Pacific Steel Group



PACIFIC STEEL
GROUP

Pacific Steel Group, a contractor specializing in rebar fabrication and installation was, at presstime, waiting for local officials in Mojave, Calif., USA, to sign off on its planned 380,000-ton rebar micro-mill.

The mill will allow the company to vertically integrate, eliminating the need to truck in rebar from outside the state. A net investment of US\$540 million, the mill will incorporate Danieli's micro-mill technology. The mill, which will produce both straight and spooled rebar, features a continuous scrap charging system, automated overhead cranes, melting platform robotics, a single-strand caster and adjacent solar field.

According to Danieli, the mill will be able to convert melted steel into finished bars in 10 minutes.

Steel Dynamics Inc.



Steel Dynamics, Inc.

Steel Dynamics Inc. (SDI) has started up four new coil processing lines, a US\$600 million investment that gives the steelmaker an additional 1.1 million tons of coating capacity.

Announced in 2021, the project entailed the installation of two galvanizing lines and two paint lines, a set of



Ternium's facility in Pesquería, N.L., Mexico.

each for its Heartland facility in Terre Haute, Ind., and its new Sinton, Texas, USA, flat-rolled mill. The paint lines each have a capacity of 240,000 tons, and each of the 300,000-ton galvanizing lines are equipped to produce Galvalume®.

With the additional lines, SDI now has more than 7 million tons of coating capacity.

On another front, SDI is continuing to ramp up the Sinton mill, which entered service in 2022. SDI executives in January said the mill was averaging a 65% capability utilization rate in November and December and was besting that mark in January. The company was planning to fully unchain certain transformers by the end of March, allowing the mill to access its full potential.

Meanwhile, in Columbus, Miss., SDI is preparing to open a US\$260 million biocarbon plant it is building in partnership with Minnesota-based Aymium, which produces an alternative to fossilized carbon.

Under a joint venture, SDI and Aymium are building a 160,000-ton plant. SDI has said it believes that use of the plant's offtake can reduce the company's Scope 1 greenhouse gas emissions by as much as 35%.

"We also believe Aymium's process can provide a renewable fossil fuel carbon alternative for Iron Dynamics, our proprietary ironmaking operations," SDI chairman and chief executive Mark Millett said when the project was announced. "This investment represents a significant step forward on our path to carbon neutrality, and our continued commitment to reduce our environmental footprint," he added.

Also in Columbus, SDI is building a 650,000-ton aluminum flat-rolled mill as part of a plan to enter the aluminum business. SDI said it aims to fill what it sees as

a growing North American aluminum supply deficit of about 2 million metric tons.

"Our aluminum growth strategy is especially compelling; responses from existing and new customers across all markets remain incredible, only strengthening as we move forward. Many customers have already indicated they would like to build facilities on our rolling mill site in Columbus, Miss., and this core location strategy provides a sustainably competitive model for all of us, conserving time, money, and reducing emissions across the supply chain," Millett said.

The project represents an investment of US\$2.7 billion and includes the rolling mill and two satellite aluminum slab casting facilities in Mexico and Arizona.

Millett said virtually all of the mill equipment and construction contracts have been finalized. The Mexico slab facility is to come on-line this year, and the Arizona slab facility and the rolling mill are to start operations in 2025.

Ternium



Ternium announced in June 2023 that it would build its planned 2.1-million-ton direct reduction furnace and 2.6-million-ton electric arc furnace meltshop at its Pesquería, N.L., Mexico, facility.

The US\$2.2 billion project, which also includes construction of a raw materials port, is intended to capture increasing North American demand for steel that is made in member countries of the USMCA.

"The implementation of the USMCA trade agreement and recent trends of nearshoring manufacturing capacity

in the steel value chain have made the USMCA region an attractive destination for continued investment,” said Ternium chief executive Máximo Vedoya.

“In a market that is increasingly demanding differentiated products and services, this new project will advance the continued integration of our industrial system and reinforce Ternium’s position as a leading steel supplier in the region,” he added.

Vedoya said the facility’s emission intensity will be almost 70% lower than the world’s average for blast furnace-basic oxygen furnace shops and will be able to produce automotive-quality steels.

The mill will include a 300-ton Tenova Consteel EAF, two secondary metallurgy furnaces with a capacity of 300 tons of liquid steel, one RH vacuum degasser system, and one continuous casting machine with two lines. It will be highly automated and allow operators to work fully remote.

Regarding environmental protection, the facility incorporates the carbon capture technology developed by Tenova and will be the fourth module in Ternium’s entire operation to use this methodology. The mill will also be ready to run off green hydrogen when this becomes viable and will work entirely with treated water.

Meanwhile, Ternium is progressing on a US\$1 billion, downstream investment package at Pesquería. The package includes a 1.6-million-metric-ton cold rolling mill, a 600,000 metric ton hot-dip galvanizing line, a 550,000-metric-ton push-pull pickling line and other new finishing lines.

The lines are to start up this year and in 2025.

Across the border, Ternium is nearing completion of a US\$98 million paint line at its Shreveport, La., USA, facility The line, which will be the facility’s second paint line, will be able to process 120,000 metric tons annually. The project also includes improvements in other parts of the facility.

United States Steel Corporation



U. S. Steel

United States Steel Corporation in October 2023 produced the first industrial-grade coils on its new non-oriented electrical steel line at its Big River Steel Works.

The US\$450 million project was completed on time and on budget, and its commissioning is a milestone in the company’s history, U. S. Steel has said.

The line is capable of producing 200,000 tons annually and will be used to produce the company’s InduX steel, a very wide, ultrathin and lightweight product that has all of the magnetic properties necessary for use in electric vehicles, generators and transformers.

“The American manufacturing renaissance continues in Osceola, Ark., thanks to the innovative minds and hard work of our employees,” said U. S. Steel president and chief executive officer David B. Burritt.

“This investment will enable us to serve our customers as they address growing markets, like electric vehicles, with the knowledge that the steel they are receiving is not only sustainable, but also mined, melted and made in America.”

Separately, U. S. Steel is ramping up a US\$150 million investment in the Keetac iron ore mine in Minnesota. U. S. Steel has equipped the facility to produce DR-grade pellets. Work was completed in December 2023.

Looking ahead, U. S. Steel is expecting to complete construction on its US\$3.2 billion Arkansas mini-mill in the second half of this year. Adjacent to its original Big River mill, the new mill features dual EAFs, a state-of-the-art endless casting and rolling line, and advanced finishing facilities.

Once complete, the Big River mills collectively will be able to produce more than 6 million tons annually. It is the single largest economic development project in Arkansas history.

U. S. Steel had expected to spend US\$3 billion on the mill but has increased the budget by an additional US\$200 million to account for inflation, supply chain challenges and impacts from severe weather.

As work progresses on BR2, U. S. Steel also is looking to complete a 325,000-ton coating line at Big River. A US\$280 million investment, the line will produce both galvanized sheet and Galvalume®, with Galvalume representing approximately 75% of total output. Galvalume output would be geared toward exposed building panels and other high-end applications.

U. S. Steel has said the line will expand Big River’s finishing capabilities and product mix, allowing it to offer value-added construction products. The line is to enter service in this quarter.

Zekelman Industries



Zekelman Industries

The Canadian and American pipe and tube maker commissioned an in-line tube galvanizing plant last year.

Located on its Atlas Tube campus in Blytheville, Ark., USA, the latest project is a 200,000-ton plant that will serve the fencing, solar and mechanical markets.

“Beyond expanding our current capacity, this new factory enables our Wheatland Tube brand to bring new products and services to the market,” said Zekelman chairman and chief executive Barry Zekelman. ♦