2024 Retrospective

by Amanda Woods

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By all accounts, AISTech 2024 marked a momentous week for the steel industry. A record 8,377 attendees traveled to Columbus, Ohio, USA, for the largest event in AIST's history.

"For many years, the AIST membership has represented a barometer for the overall health of the steel industry," AIST's executive director Ron Ashburn said.

"Our membership is at record levels, and I would translate that to imply the health of the steel industry is better than ever."

The Technology Conference also saw record attendance at 2,298, and the program offered 462 presentations across 111 sessions.

The Iron & Steel Exposition smashed previous records, with 662 booths and 687 total exhibiting companies. The total exhibit space was a staggering 123,650 net ft^2 (11,487 net m^2) — nearly 20,000 net ft^2 more than any previous AISTech!

"The growth of events like AISTech underscores the importance of technological innovation for the steel industry today," Ashburn added.

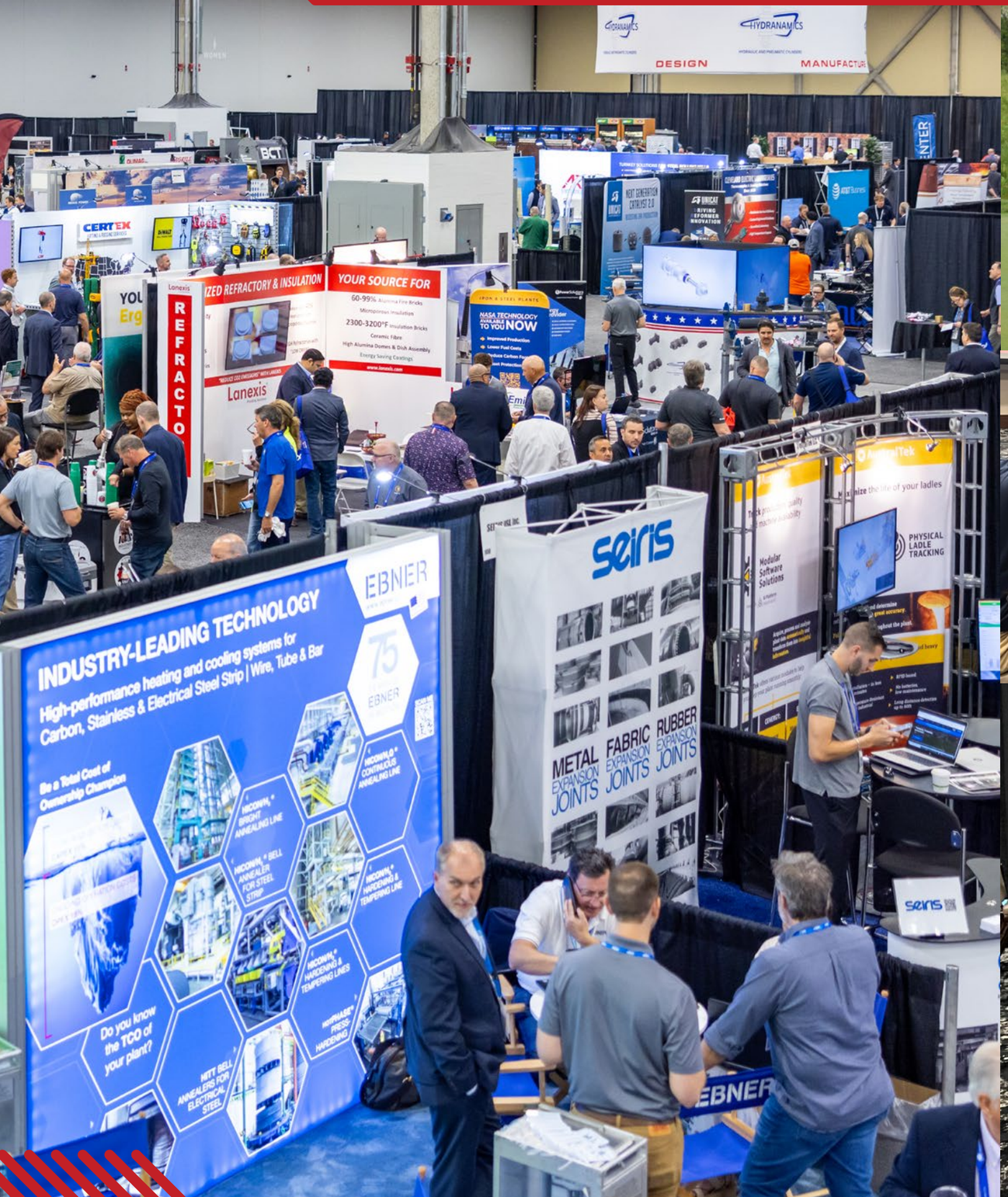
Record-Breaking Numbers!

8,377
steel professionals

687
steel exhibitors

462
steel presentations

AIST ASSOCIATION FOR IRON & STEEL TECHNOLOGY



Each year, AISTech kicks off one day prior to the start of the conference with the AIST Foundation Golf Classic. This year, 136 golfers enjoyed a day at New Albany Links Golf Club on Sunday, 5 May. These individuals helped raise over US$30,000 for the AIST Foundation.

That afternoon, roundtable discussions were held for AIST's Women in Steel and Young Professionals initiatives. In these sessions, AIST members came together to brainstorm ways to bolster membership, share ideas for programming and make new connections. The Women in Steel Roundtable had a record 85 attendees, and the Young Professionals Roundtable was sold out at 50.

The Technology Conference began the following morning with the J. Keith Brimacombe Memorial Lecture, given this year by Sunday Abraham, director R&D at SSAB Americas. Abraham presented his lecture, "Integrating Physics-Based Modeling and Artificial Intelligence for Smart Manufacturing," to an audience of 400 attendees.

This year marked the 25th anniversary of the J. Keith Brimacombe Memorial Lecture.

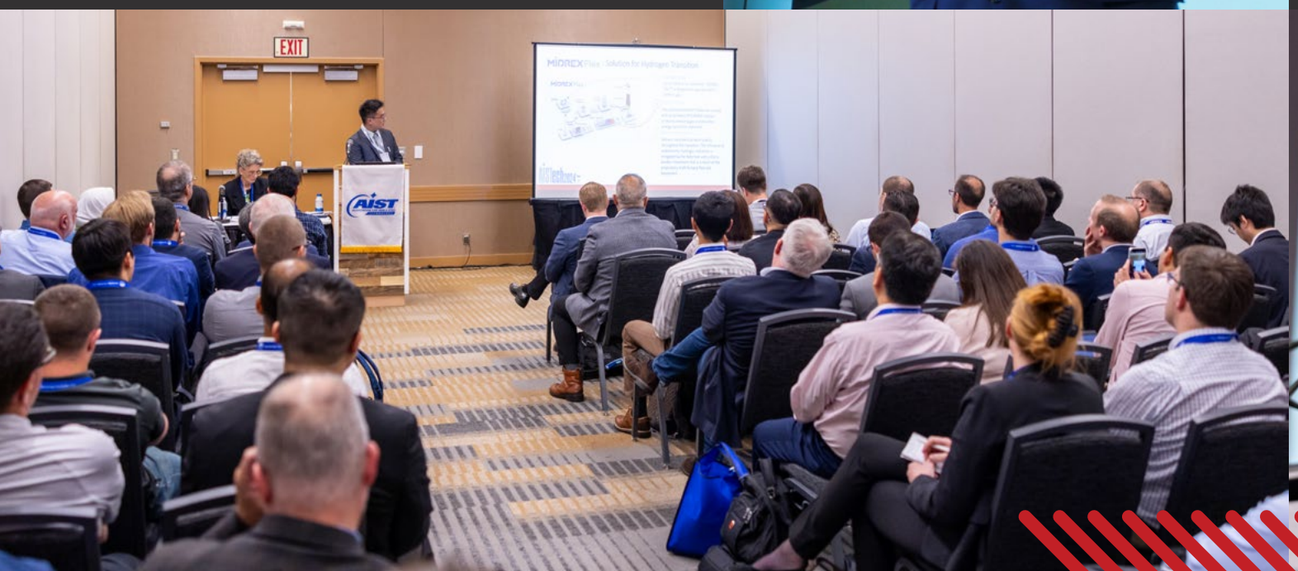
The topic of Abraham's lecture was faithful to the work Brimacombe was famously known for: the use of models for training and knowledge transfer onto the shop floor to optimize processes, improve efficiency and quality, and enhance worker safety. Abraham gave detailed examples of physics-based models using artificial intelligence; for example, electric arc furnace energy and material balance, prediction of bath temperature and chemistry, and estimating ladle slag chemistry.

Throughout the rest of the week, attendees of the Technology Conference had the opportunity to listen to presentations and panel discussions across all areas of the steelmaking process. Following the trend of recent years, much of the discussion focused on sustainability and decarbonization.

"The steel industry is committed to and invested in a sustainable future," Ashburn said. "To achieve this fundamental objective, we must understand and leverage the best technology available, which is the reason AISTech exists.

"Specifically for AISTech, we've seen a dramatic rise in decarbonization technologies presented across the last four years. The number of individual papers presented at this benchmark event is up 270% in that time."

AIST 2023–2024 president Barry Schneider noted, "if you look at the papers being presented at this conference, it's amazing how many of them are sustainability related. And it's not just theoretically, these are papers demonstrating technologies [that are currently being trialed]."



"And when you walk by a room and you see it's standing room only, that's because everybody wants to know those ideas," Schneider continued. "AIST is that common ground where it doesn't matter what technology people have, it doesn't matter about political solutions. It's a technical exchange for people to get together and talk about how we get where we need to go."

On the second morning of the conference, Schneider had the opportunity to hand out this year's Board of Directors Awards at the President's Award Breakfast. This year 1,300 conferencegoers attended the breakfast to recognize excellence in steelmaking and the dedication to the industry exemplified by this year's group of award recipients.

In honor of AIST's 20th anniversary, four individuals known as the "AIST pioneers" — William Barker, Ian Sadler, Joseph Rutkowski and Thomas Goettge (posthumously) — were collectively named AIST Distinguished Members and Fellows.

These gentlemen received the award in recognition of their exemplary leadership, courage and wisdom during a time of peril in the North American steel industry. With over 40 steel producers bankrupt or insolvent in the early 2000s, the dire situation depleted the resources of the Iron & Steel Society and the Association of Iron and Steel Engineers such that neither was able to adequately fulfill its independent mission of service. Recognizing the utmost importance of technical and professional development for all within the industry, particularly and especially in times of significant change, the "pioneers" envisioned a singular association with industrywide appeal and global reach. Despite skepticism, Barker, Goettge, Rutkowski and Sadler built support for what would become AIST among key stakeholders — producers, suppliers, academics and staff — and in 2004 united these formerly independent groups under a shared purpose: to advance the technical development, production, processing and application of iron and steel.

Receiving the award, Bill Barker said, "We would like to recognize Tom Goettge, who was part of our group, and we miss him and his contributions to the organization."

Ian Sadler added, "When I look back over 20 years, two words kept coming back to my mind, and I realized that the four of us always held a high degree of respect and trust — not only with each other, but also in interacting with all the other stakeholders. With respect and trust, things get accomplished more easily — and much, much faster. So AIST came into being built on the foundation of respect and trust — and has gone on to be more successful than we ever dared to imagine back in 2004."

For a complete list of the Board of Directors award recipients, see pages 96–102.

(L–R) Barry Schneider, Joseph Rutkowski, William Barker, Ian Sadler, and Ron Ashburn

Capping off the breakfast, Ternium chief executive officer Máximo Vedoya delivered the keynote address, titled “Shaping the Future: The Steel Industry Challenges.” Vedoya addressed two challenges that he considers to be the top priorities for the industry: decarbonization and China.

While the steel industry contributes 8% of global CO_2 emissions, Vedoya said he believes the industry is a core part of the solution. To grow as an industry, to secure capital to invest in new technologies and to attract the best talent, he said the industry should loudly deliver this message: “Steel is an infinitely recyclable material, and there is currently no substitute with fewer emissions. Globally, more steel is recycled than twice the combined total of all other recyclable materials. Steel also plays a fundamental role in the energy transition, serving as the material for structures in renewable energy projects such as solar panels, wind energy towers, thermal power plants, and hydroelectric stations.”

Concerning China, Vedoya addressed the “China Shock” and newer “China Shock 2.0” caused by the country’s overcapacity.

“We cannot allow China to continue taking away quality production and jobs, driven by unfair imports, and to the detriment of our industry,” he said. “We need to strongly address unfair trade, from dumping to transshipment in all its forms. Countries that fail to grasp this threat will face a tsunami that will impact employment and economic development.”

Concluding his presentation, Vedoya said, “Together as a region, by fostering a spirit of cooperation and solidarity, we can navigate the complexities of the global economy and emerge stronger, more resilient, and better equipped to shape our future.”

You can read the transcript of Vedoya’s lecture on pages 80–89.

The final plenary session, AIST's Town Hall Forum, was held the following day. Five panelists took to the stage to discuss the "sustainable optimism" that colors the industry today. Daniel Brown of Big River Steel – A U. S. Steel Co., Wendell Carter of Cleveland-Cliffs Inc., Christopher Graham of Steel Dynamics Inc., Prasanna Joshi of ExxonMobil and David Sumoski of Nucor Corp. served as this year's panel of experts.

Chaired by George Koenig of Hatch and moderated by KDKA-TV (CBS)'s Jon Delano, the discussion explored key opportunities and concerns impacting the entire industry.

The Town Hall Forum traditionally features executives from leading steel-producing companies as well as an industry supplier. This year, Prasanna Joshi joined the panel, representing a customer of the steel industry: ExxonMobil.

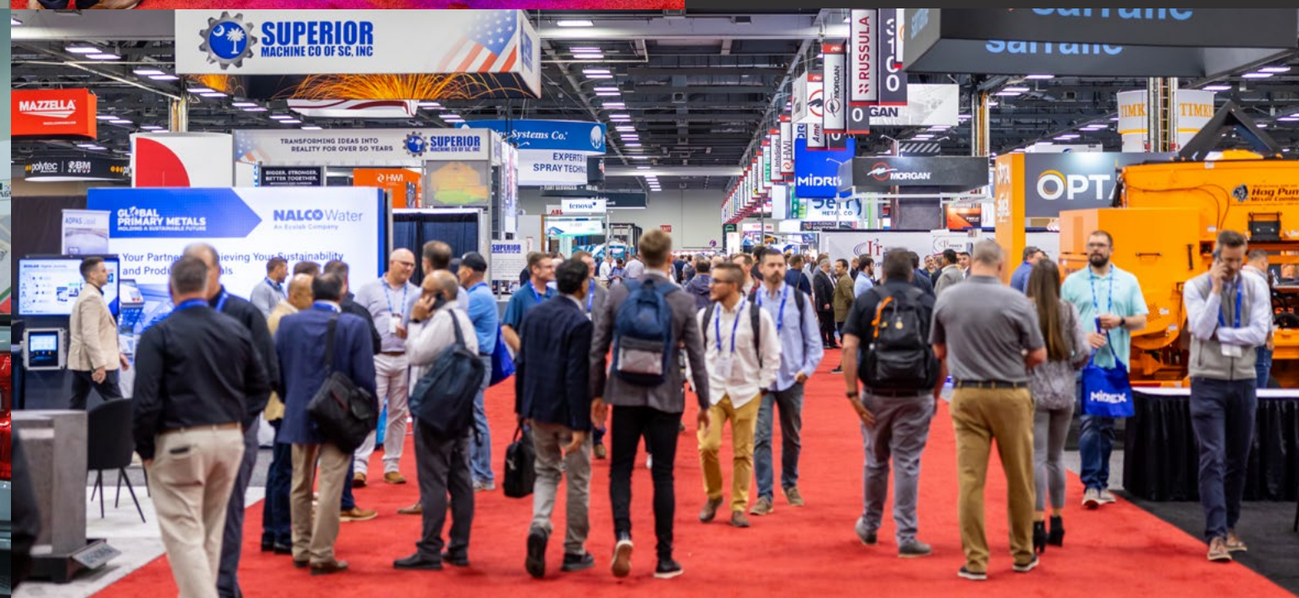
"The first ingredient in being a sustainable industry is profit," Ashburn said. "Without profit, we have no hope at being energy-efficient, environmentally conscious, people-focused or safe, which are all critical ingredients when speaking about sustainability. To be profitable, we need customers for whom we can provide sustainable solutions. Listening to our customers and understanding their concerns is always a good thing."

You can read a synopsis of the forum on pages 56–57. In addition, all three plenary sessions are available to watch on AIST's YouTube channel.

Throughout the week, student members of AIST had the opportunity to showcase their work, meet with industry professionals and learn from the experts. Eighty-nine students from 12 countries attended AISTech this year. Students also had the opportunity to tour Cleveland-Cliffs Middletown Works to see steelmaking processes up close.

At the University-Industry Relations Roundtable (UIRR), which is held each year at both AISTech and MS&T, 70 representatives from industry, industry human resources/ talent acquisition and academia gathered to share updates from their respective companies/ universities. The objectives of the UIRR are to increase the number of professors teaching a steel-related curriculum and to increase the number of students interested in a career in the steel industry. The group heard reports from Colorado School of Mines, The University of Alabama and AM/NS Calvert LLC.

Over in the Exhibit Hall, industry suppliers and technology providers turned out in force to be a part of the largest exposition in AIST history. Features, refreshments and contests kept attendees busy while making their way through the expansive exhibit space. The Exhibit



Hall was buzzing with excitement on Wednesday afternoon as Josh Dunlap of Hyster Co. drew the winning number for the Chevy™ Silverado truck.

First-time exhibitors and veterans alike found the expansive Exhibit Hall a place to make important connections and get in front of their customers.

Michael Hobden, TML Group, has been coming to AISTech (and the annual conferences of AIST's predecessor societies) since 1995, making this year his 29th appearance. Hobden said, "What I like most about AISTech is meeting up with new people, getting to know people, networking and meeting old friends as well — and, of course, the technology exchange is marvelous."

Jeff Keeling, vice president of sales and marketing at Brokk Inc., said his company saw a great turnout at AISTech. "Customers throughout the industry continue to seek methods to increase safety and automate dangerous, manual processes. Our booth was popular because that's what we strive to provide to all facilities. We're looking forward to attending AISTech next year." ✦

AISTech 2024 Town Hall Forum: Sustainable Optimism

by Sam Kusic

Let's consider, for a moment, steel produced by processes that emit significantly less CO2 than steel produced via the classic blast furnace-basic oxygen furnace (BOF) route. What's a handy way to refer to such steel?

Yes, the industry has largely settled on green steel. But what about blue steel? Or turquoise steel? Or pink steel? Those are fine colors, after all, quipped Prasanna Joshi, ExxonMobil's vice president of low-carbon solutions technology, while speaking during the 2024 Town Hall Forum.

But, as he said, why not ditch the color nomenclature altogether?

"We like the phrase low-emission or low-carbon-intensity instead of using colors. In our minds, colors have a connotation of picking winners and losers. One of the things that is becoming clearer, at least in oil and gas, and I think it's the same thing for the steel industry, is all solutions are going to be needed (to decarbonize)," he told the audience.

"It is a transition. It's not a switch you can flip tomorrow to suddenly get to a much different world. All solutions are going to be needed, and that's why the real objective is to reduce emissions while continuing to produce all the products that the society needs."

The Town Hall Forum is AISTech's annual conversation with industry leaders. On the panel this year were Joshi;

Daniel R. Brown, senior vice president of advanced technology steelmaking and chief operating officer, Big River Steel – A U. S. Steel Co.; Wendell Carter, executive vice president, technology, Cleveland-Cliffs Inc.; Christopher A. Graham, senior vice president of Steel Dynamics Inc.'s (SDI) flat roll steel group; and Dave Sumoski, chief operating officer of Nucor Corp.

The industry's decarbonization effort dominated the two-hour conversation, with panelists trading views on a number of aspects related to decarbonization, such as green steel standards and market demand for the product. They also shared updates on the progress being made by their respective companies toward decarbonization.

Brown, for example, pointed out that the Big River 2 project will utilize a 2,000-acre solar farm capable of producing 250 MW of electricity, 40% of the plant's electricity needs. Considering that and the fact that the local utility's generation portfolio is shifting to solar, nuclear and hydroelectric, the electric arc furnace (EAF) plant will operate with unmatched sustainability.

"The complex will be the most sustainable plant in Arkansas and North America when we get it started up in the second half of this year," he said.

If that is in fact the case, then Big River will be taking the title from Nucor's Sedalia, Mo., rebar micro-mill, according to Nucor's Sumoski. Sumoski said the mill runs entirely on wind-generated electricity and relies on induction reheating rather than gas-fired reheating.

"So I would argue that right now that plant is the greenest in the world," he said.

Nucor has a suite of decarbonization initiatives on the drawing board, including a partnership with ExxonMobil that will bring carbon capture to the steelmaker's Louisiana direct reduction plant. It also is establishing a purchasing collective with Google and Microsoft, electricity-hungry companies that will need to provide for data centers.

Sumoski said data centers are approaching the power needs of an EAF mill, and given that, the idea is to leverage their combined purchasing power to drive development of new green electricity projects.

So far, he said, they've received more than 200 expressions of interest.

In addition, Nucor late last year revised its interim 2030 greenhouse gas emissions target and adopted a 2050 net-zero goal.

"Anyone sitting in this chair can say that in 2050 we're going to be using zero carbon and then not have to be here to account for it. We absolutely didn't want to do that. We made sure that we did our homework and our research. We looked at science-based methods and technologies that are out there, and we really do feel that we can be zero emissions by 2050," Sumoski said.

Meanwhile, Cleveland-Cliffs Inc. is accelerating toward its long-term decarbonization goals, enabled in part by hot briquetted iron from its Toledo, Ohio, plant. With access to that product, Cliffs has shut down its highest CO2-emitting blast furnace and its highest emitting coke plant, Carter said.

And now, he said, the company is looking at its next opportunity: A cokeless blast furnace, a project that is receiving support from the U.S. Department of Energy.

"In this case, we're using the DRI technology identical to what we have at Toledo on a slightly larger scale. We will put it through two electric melting furnaces, and from there, we will refine it into synthetic iron where we will continue through with the BOF. When we introduce hydrogen, we would be at a near-net-zero opportunity with this technology."

For its part, Steel Dynamics is investing in a plant to produce biocoal, a product that will support its carbon needs without introducing new volumes of CO2 into circulation. The Columbus, Miss., plant is a multimillion-dollar investment, but it has a wide variety of smaller projects on the table.

Graham said that given SDI's operating culture, it is natural for its teams to seek out projects that don't just check boxes but actually provide a return for to stakeholders.

"Our teams continue to find good investments to make that will move the ball and that also provide a return."

Although decarbonization dominated the conversation, panelists shared thoughts on a number of other topics, including workforce development and safety. ✦