





AISTech 2021: A Retrospective

Although AIST's annual conference and exposition saw reduced attendance due to the COVID-19 pandemic, the event was no less diminished in spirit.

By Sam Kusic

First, the bad news: Approximately 4,000 people attended AISTech 2021, AIST's annual conference and exposition.

But now, the good news: Approximately 4,000 people attended AISTech 2021, AIST's annual conference and exposition.

Paradoxical? Perhaps.

Yes, attendance was down by half at what is the world's largest annual steelmaking conference and exposition, but considering the COVID-19 travel precautions and restrictions, the showing exceeded expectations for this year's event, held 29 June to 1 July in Nashville, Tenn., USA.

And by many other measures, AISTech 2021 proved to be one of the most successful yet.

It is believed to be the global steel industry's first in-person gathering since the beginning of the pandemic; it represented a pivot to future AIST programming that allows both in-person and virtual attendance; and it provided a multi-disciplinary technical platform to discuss the industry's decarbonization, an effort that is gaining significant momentum.

At the very least, the show was a break from the isolation of the previous year.

"I am really enjoying my time here," said Primetals Technologies consulting systems engineer Ramesh Khajjayam while on the sidelines of the event. "I was bored sitting on the computer and just watching all day," he added. "After a year of conference calls and web meetings, it was wonderful to see old friends and clients as well as industry peers who shared their technical know-how during the technical sessions."

> Decarbonization

AIST is dedicated to being a leader on understanding and evaluating emerging energy efficiencies, decarbonization, and carbon capture and utilization technologies for the global iron and steel industry. In light of the growing attention decarbonization is garnering across the industry, this year's Technology Conference featured 22 papers focused on this important issue. The Howe Memorial Lecture, "Why Both Hydrogen and Carbon Are Key for Net-Zero Steelmaking," focused on the false narrative that companies must go all-hydrogen or all-carbon to achieve their targets.* Other presentations covered topics such as top gas recycling, using waste metallics as charge materials, greenhouse gas abatement and, of course, hydrogen technologies.

*The Howe Memorial Lecture is published on pages 49–66 of this issue.



Outgoing AIST president Ron O'Malley said the 2021 installment of AISTech wouldn't have been possible without the hard work and dedication of AIST members and staff, as well as the continued support from exhibitors and sponsors.

And, for many, it was just a relief to once again meet face to face.

"Perseverance and persistence, mixed with a bit of obstinance, have brought us to this day... together in person here in Nashville for AISTech, with many more streaming the program virtually from around the world," he said, delivering the president's annual address to the membership during the President's Award Breakfast.

This year's event coincided with what is proving to be a historic economic rebound for the steel industry, which, just a year ago, saw millions of tons of capacity production capacity come off-line after demand collapsed.

Now, mills can't make steel fast enough.

"We're living through a time they'll be talking about in 20 years," said Brian Bishop, Cleveland-Cliffs Inc.'s senior vice president of commercial. "It's a special time in our industry," he said.

AWARD BREAKFAST

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> Virtual Program

For the first time in its history, AIST offered a virtual component to AISTech. The platform had more than 1,000 virtual attendees, who watched over 2,100 hours of virtual technical presentations. The virtual program was broken up into eight tracks that covered the entire steelmaking process: Cokemaking & Ironmaking, Steelmaking, Refining & Casting, Rolling & Processing, Environmental, Digitalization, Decarbonization and Metallurgy.

His comment came as part of the annual AISTech Town Hall Forum panel discussion with industry executives. He and other panelists said they expect to remain busy through the end of the year and deep into 2022. That's especially so, he said, as a persistent microchip shortage has slowed auto production. As a result, car dealer lots are thin, and the time vehicles are sitting in lots is at a record low.

This, he said, points to strong sales ahead.

"There's more demand to come."

The growth isn't limited to steel producers. Mill suppliers, too, are benefiting from a raft of new investment, as Lee Morgan, president and co-owner of The Systems Group, said during the Town Hall Forum.

"The CAPEX going on throughout the steel industry is, from what we've seen, unprecedented."

Morgan told attendees his company, which makes electric arc furnace (EAF) equipment, has been so busy that it has added 250 people in the past three months and may soon add another 250 people.



➤ Young Professionals

Hats off to another successful AISTech Young Professionals' Roundtable! The theme for discussion this year was "Transition and Growth — Navigating Your Way With AIST." Young Professionals discussed the support they need to triumph through change and establish the foundation for successful careers. The attendees were split into six groups, allowing for opportunities to actively engage in conversations, share feedback and connect with their peers. Each table was asked to reflect on a specific point within the early stages of their career, brainstorm resources that would have better supported them through that time and capture tactics they used to progress during that period. At the end of the group discussion, a representative from each group shared the team's ideas and suggestions. While the main goal of the roundtable is always to provide an opportunity for Young Professionals to connect and network with one another, a unique goal of this session was to assist AIST in developing a guide complete with tips and best practices for Young Professionals to use as they join the industry. The group conversation was encouraging and filled with unique insights that will lead to the development of new AIST tools to support the evolution of the Young Professionals Program.



He also said that, based on inquiries to the company, it appears there will be plenty of work in the future.

Much of that work will no doubt rise from investments meant to advance the industry's decarbonization goals. It's an effort that will require new technologies and innovative solutions, some of which were highlighted in approximately two dozen technical papers and presentations included in the AISTech 2021 Technology Conference.

From a technical standpoint, much of the decarbonization conversation is focused on using hydrogen-reduced iron in an EAF, the process path that SSAB is developing.

SSAB Americas chief commercial officer Jeffery Moskaluk recalled that when SSAB in 2016 announced its intention to pursue hydrogen reduction, the industry response was, "Well, that's impossible."

And when SSAB built its pilot sponge plant, the label changed to "improbable." And as that pilot began to have successful results, improbable gave way to impractical, he said.





“Well, every new technology is impractical early in the adoption. Every company is going to have to choose a path, and we chose the hydrogen route,” he said.

“I think there are technologies for all of us to invest in and explore,” Moskaluk added.

Cleveland-Cliffs is investing in natural gas-based reduction, and company chairman and chief executive Lourenco Goncalves, who accepted the 2021 Steelmaker of the Year Award and delivered the William T. Hogan, S.J. Memorial Lecture, predicted that steelmaking throughout the world will evolve into something more akin to the U.S. model.

Goncalves also predicted that prime scrap will over the next decade become a precious metal, arguing that growing EAF capacity in China and the U.S. will outstrip supply. China is building a scrap reservoir, he said, but it won't be ready to be tapped for years. This, he said, will set up a tug of war between the countries.

He also said he believes natural gas will emerge as the key to clean steelmaking. Natural gas is rich in hydrogen, and is available in industrial quantities, unlike renewably electrolyzed hydrogen, for which the infrastructure to produce and distribute it doesn't yet exist.

Goncalves said that although the European hydrogen effort tends to dominate the decarbonization discussion, he is skeptical of making steel via that route.

It's more practical to use natural gas as a hydrogen source, and if European steelmakers had access to affordable supplies of it, they'd be using it, he said. But they don't, and importing it from Russia isn't feasible.



“Imagine a pipeline starting in Moscow with a shutoff valve operated by Vladimir Putin,” he said.

Goncalves said all eight of Cleveland-Cliffs’ blast furnaces are consuming natural gas injected through the tuyeres, which already has allowed the company to reduce its coke rate by 750,000 tons annually, equivalent to taking an entire coke battery off-line.

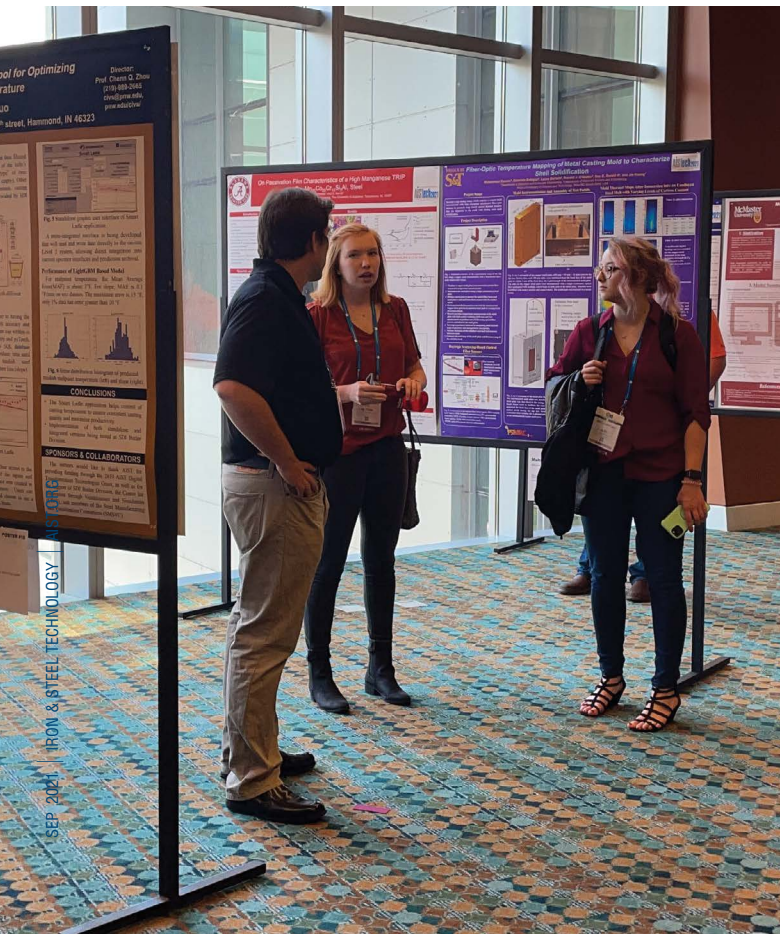
In delivering the Howe Memorial Lecture, noted steelmaking technologist and industry consultant Carl De Maré argued that the global steel industry’s transition to carbon neutrality is being hindered by an either-or fallacy that is wrongly pitting two technologies against each other.

De Maré said that current thinking about steelmaking decarbonization offers two false choices: that hydrogen can — and must — replace all coal, coke and natural gas; or that coal, coke and natural gas cannot be replaced and carbon capture therefore presents the only solution.



And that, he said, is the wrong way to approach the problem.

“Such a conflict is paralyzing all investments because as long as the end game is not clear, it is very hard to decide on the first steps,” he said.



➤ Students Activities at AISTech 2021

Thanks to this year’s virtual component, AISTech 2021 boasted 136 student attendees across eight countries! AIST modified the usual student contest formats this year to accommodate all attendees. The new formats proved successful, as eight students were chosen to participate virtually in the Undergraduate Student Project Presentation Contest* and 18 posters were submitted for the Graduate Student Poster Contest. In-person student attendees also had the opportunity to attend the Steel to Students Recruiting Reception to network with peers, professors and hiring personnel from SSAB Americas, Cleveland-Cliffs Inc., Commercial Metals Company, Nucor Corp., Danieli Corp. and Gerdau. Thank you to all students for your participation.

*The recording of the AISTech 2021 Undergraduate Student Project Presentation Contest is free to view on AIST’s YouTube Channel.

> Women in Steel

The second Women in Steel Roundtable was held at AISTech 2021 on Monday, 28 June, with 36 steel industry professionals in attendance. The roundtable kicked off with a report on AIST's current progress with the Women in Steel initiative. Next, Karin Lund of G-Power Global Enterprises shared an update on her book, *Women in Steel, Women of Steel: Yesterday, Today and Tomorrow*. The non-fiction book will share stories, experiences and interviews with women in the industry over a 50-year period. It's expected to be complete for AISTech 2022 in Pittsburgh, Pa., USA.

The Roundtable concluded with breakout groups, and attendees were assigned five different scenarios to discuss how to support women during various stages of their careers. Those topics were: women's first year in the industry, women with five or more years in the industry, women working toward promotions, supporting women in the workplace, and encouraging the next generation of women in the industry. The groups discussed the importance of representation and advocating for women within the steel industry, how to prepare women coming into the industry and continue supporting them throughout their careers, keeping them involved, and how valuable it is to encourage more formal mentorship programs. The brainstorming led to key discussions about how to not only support the women coming into the industry, but also retaining those who are already a part of it.

But at least in the U.S., the industry arguably already has taken the first steps through the broad adoption of the EAF process route.

"We all have to be passionate about finding new technology, ... but one technology that works today is (electric arc furnace) steelmaking," said Nucor

executive vice president MaryEmily Slate during the Town Hall Forum.

But she also reminded the industry that it has another challenge that must be met — recruiting the workforce of tomorrow.

"As an industry, that's a place we need to join together and do more," she said.

Slate said that the steel industry offers a unique opportunity for all young people seeking a career, regardless of educational background.

"You can have a very rewarding career."

During the show, AIST recognized a group of undergraduate students who seem to be off to a promising start in their careers, announcing them as the winners of the Undergraduate Student Project Presentation Contest.

Many of the students were unable to attend AISTech in person, but the winners were revealed during the Steel to Students Recruiting Reception.

Second place went to Purdue University Northwest students Joseph Madrigal and Jose Martinez, who looked at wire coil annealing racks and suggested changes to extend their service lives and reduce maintenance costs.

"Winning second place in a competition alongside other innovative and motivated teams with incredibly intricate projects meant a lot to me," Madrigal said.





For their work, they shared a US\$1,000 cash prize, but they weren't the only ones who came away with something to celebrate.

During the show, the AIST Board of Directors met and approved the association's 22nd Member Chapter, the Middle East/North Africa (MENA)

Chapter. The approval is the capstone of a multi-year effort to create a group for steel professionals in Middle Eastern and North African countries.

"We are excited about AIST's growth in this region, which has a proud history of iron- and steelmaking, and we have much to learn from one another," O'Malley said.

Much credit for this effort is due to Mohamed Saied of EZZ Steel in Egypt and Karim Alshurafa of SMS group Inc. Through their

persistence, what started as general conversations about a new Member Chapter became formal in-depth discussions, which led to a three-day virtual forum in November 2020, the first formal programming AIST has conducted which was focused on the MENA region.

Nearly 170 people attended that event, many of whom had never heard of AIST. But for those that hadn't, they will soon hear more as the chapter builds up its technical programming agenda.

The approval of the MENA Member Chapter came at the tail end of the conference and helped cap off what, for many, had been an eventful and productive week in Nashville.

Scott Docherty, president of CID Associates Inc., a U.S.-based maker of pre-fabricated modular buildings, called AISTech 2021 the best show he's been to in the last 10 years, based on the number of leads his company generated and the number of influential people they were able to meet.

"If you have anything to do with the steel industry, you have to be at this show," he said. ♦