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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 — Advanced Technology Steelmaking, United States Steel Corporation; Chief Operating Officer, Big River Steel – A U. S. Steel Co.



Prasanna V. Joshi, Vice President, Technology — Low Carbon Solutions, ExxonMobil





*Christopher A. Graham, Senior Vice President,
Flat Roll Steel Group, Steel Dynamics Inc.*



*Wendell L. Carter, Executive Vice President,
Technology, Cleveland-Cliffs Inc.*



*David A. Sumoski, Chief Operating Officer,
Nucor Corp.*

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. ♦

You can watch the recording of the Town Hall online at AIST's YouTube channel.

Steel 2024: Sustainable Optimism

One Word to Describe the STEEL INDUSTRY TODAY

