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# *AIST Italy* Steel Forum 2015

by Sam Kusic

AIST's annual Euro-NAFTA steel forum was held at the TenarisDalmine seamless tube mill in Dalmine. The conference brought together industry executives and technology experts who shared their insights into a diverse array of socio-economic issues and technical perspectives. Here's what they had to say.

To be sure, the flood of low-cost exports China has let loose upon the international markets is a problem — a big problem.

Just how big?

As Jay Henderson, chief operating officer of Duferdofin – Nucor, Nucor Corp.'s long products joint venture in Italy, pointed out, China was on pace to export more than 100 million tons in 2015, an amount that exceeds the overall demand of the United States.

"This is an imminent threat to the steel industry. It's a foe that we've got to deal with. It's a very critical situation," Henderson said.

But these days, this is merely one of several critical situations the steel industry finds itself contending with. Among them: evolving carbon emissions policies; loss of market share to competing materials, especially aluminum; a broad perception that steel is antiquated; and the need to maintain high-quality production under non-steady-state conditions.

Those challenges are daunting, but they are not insurmountable, said Henderson and others during AIST's annual Italy Steel Forum, held 22–23 October 2015 at the TenarisDalmine seamless tube mill in Dalmine within the Province of Bergamo in northern Italy.

The forum drew 115 attendees from Europe and North America. In addition to Henderson, attendees heard from a dozen industry executives and technical experts, including United States Steel Corporation president and chief executive officer, Mario Longhi; Tenova Thermprocess managing director, Roberto Pancaldi; Johannes Schade,

corporate manager of research for AK Steel Corp.; and Giorgio Romanelli, production manager at Acciaierie Venete.

They touched on a variety of issues related to the economics of and engineering behind steelmaking, but the abundance of Chinese exports was at the forefront. Speaking during the forum's town hall discussion, executives said China absolutely must curtail production, sooner rather than later.

Vigorous enforcement of trade laws already on the books could help drive home that message, Longhi told the audience.

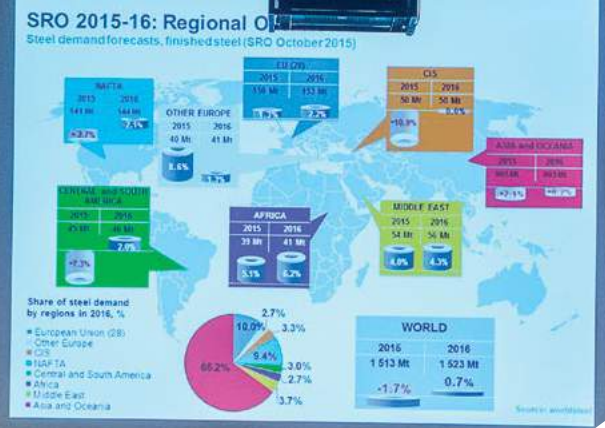
Longhi stated that with exports impacting domestic markets throughout the world, not just in Europe and the U.S., there is much shared pain and, therefore, an opportunity for the world to take a stance that, if well-coordinated, could help the situation.

However, while Europe is certainly feeling the pressure, the European Union is considering granting market economy status to China, said Robert Jan Jeekel, head of European Affairs for ArcelorMittal.

China, under its WTO ascension agreement, argues that it is due market economy status upon the agreement's expiration in December 2016.

Others don't see it that way, including Jan Jeekel, who cautioned that, were the EU to recognize China as a market economy, it would embolden Chinese producers to dump even more of their excess production in the EU. And, he added, the status would make it virtually impossible to impose meaningful trade actions against China.

AIST's executive director, **Ronald Ashburn**, provided attendees with a global steel industry overview.



Longhi told attendees that he believes a date shouldn't determine when a country attains market economy status; rather, it should be based on economic behavior. And clearly, he said, China hasn't acted as a free market economy. Many of its steelmakers are state-owned and are motivated by things other than revenue, Longhi added.

The situation is particularly infuriating, given that underlying demand is, more or less, healthy in Europe and the U.S., the executives said. Domestic steelmakers should be seeing some benefit. Instead, they're idling capacity and laying off workers.



"We do see growth, not only in Italy but throughout Europe," Henderson said. "There's certainly growth this year, and we're seeing continued growth in 2016. But I have to tell you, we're a little nervous about if we're going to see (the benefit) of any of that growth."

Andrea Rocca, CEO, Metals Division, Tenova S.p.A.; Mario Longhi, president and CEO, United States Steel Corporation; and Sergio Tosato, vice president and managing director, TenarisDalmine

Some of the growth in demand is being driven by a backlog in public infrastructure projects. Longhi observed that in the U.S. alone, there's a US\$3-trillion tab to be paid if the country is to improve its infrastructure from a D- to a B+.

"The market eventually will come. The business and projects will come, but who's going to be able to take it if the present condition of unfair trade remains? We may just see a bigger repeat of what we're seeing now," Longhi said.

China aside, panelists stated that carbon emissions, and the public policies being created to manage them, are another overarching problem, especially for an industry that collectively generates as much carbon dioxide as all of



Industry Leader Town Hall Forum panelists (left to right): George Koenig, director — global iron and steel business and technology development, Hatch Associates Inc., and president, AIST; Jay Henderson, general manager and chief operating officer, Duferdofin – Nucor S.r.l.; Robert Jan Jeekel, head of EU Institutional Affairs, ArcelorMittal; Mario Longhi, president and CEO, United States Steel Corporation; Roberto Pançaldi, managing director, Tenova Thermprocess, and COO, Tenova Metals; and Ronald Ashburn, executive director, AIST (moderator).



Robert Jan Jeekel (speaking), head of European Affairs for ArcelorMittal, responded to a question during the Industry Leader Town Hall Forum.

France on an annual basis, as noted by Jean-Pierre Birat, a researcher and president of the IF Steelman consultancy.

Delivering the forum's keynote address, Birat said a consortium of nearly 50 European companies and organizations from 15 European countries has been working on the problem.

The consortium, named Ultra-Low Carbon Dioxide Steelmaking (UCLOS), has been exploring four sets of steelmaking technologies and processes, looking at their potential for reducing carbon output.

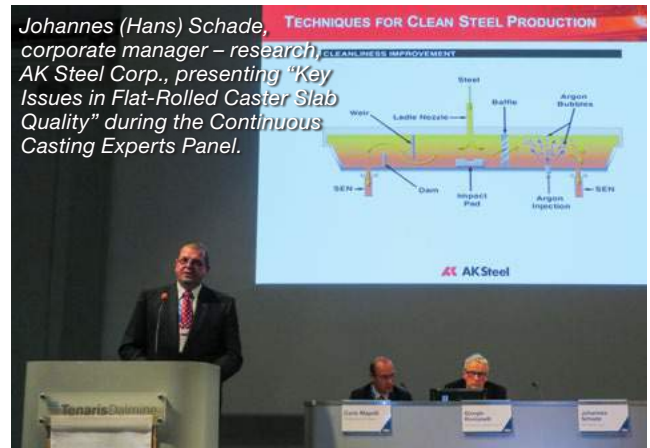
Of those, the one that has advanced the farthest is a process that involves recycling blast furnace top gas during steelmaking, Birat said. Lab results have been encouraging, he said, noting not only that they were able to achieve significant reductions in CO<sub>2</sub> emissions through recycling, but also that the process requires less coking coal.

According to Birat, the consortium was preparing to move into real-world trials by modifying a small, but operating blast furnace in France. The furnace, however, was mothballed before the project was carried to fruition.

Birat reported their early findings show that the technology works. The problem, however, is that it is cost-prohibitive.

"It costs more than the margin that steelmakers make today. We cannot run this technology; otherwise we would go bankrupt in a short time," he commented.

On the energy side of the equation, Birat said that blast furnaces are, thermally, highly efficient, even though they consume a great deal of energy. He said there is room for the



Johannes (Hans) Schade, corporate manager – research, AK Steel Corp., presenting “Key Issues in Flat-Rolled Caster Slab Quality” during the Continuous Casting Experts Panel.

Continuous Casting Experts Panel presenters (left to right): Carlo Mapelli, Politecnico di Milano, and president, AIM (moderator); Giorgio Romanelli, production director, Acciaierie Venete S.p.A.; George Koenig, director – global iron and steel business and technology development, Hatch Associates Inc., and president, AIST; Johannes (Hans) Schade, corporate manager – research, AK Steel Corp.; Cristiano Tercelli, head of metallurgy, SMS Concast; Pietro Traini, industry process senior technologist, TenarisDalmine; and Ronald Ashburn, executive director, AIST.



AIST Italy Steel Forum attendees visited the TenarisDalmine facility.



industry to improve collectively on that front, simply by bringing the plants lagging in efficiency more in line with others. That could lead to a 10–15% decrease in consumption.

But as time goes on, the industry will likely need to undertake other efforts, such as harvesting renewable energy on a massive scale at steel production sites and employing new production methods, such as making steel through electrolysis.

Ensuring that there are people around who can help develop those new methods is yet another problem. Executives said the industry's recruiting efforts are hindered by perceptions that steelmaking is an antiquated industry and out of pace with the 21st century.

And the industry hasn't helped itself much in that regard, Longhi said.

"Our industry in general has not marketed itself as a truly, profoundly scientific organization. It starts with the images that we still use today. The first thing people see is a crucible spitting fire," he said.

Roberto Pancaldi agreed.

"Young people don't perceive our industry as something sexy," said Pancaldi. Yet, he said, there is an enormous amount of technology behind steelmaking.

"There is a lot of technology in our industry. Probably people cannot see it. It is our duty to show people how much there is."

For that to happen, the industry must change its messaging, Longhi commented.

He recalled that when he first came to U. S. Steel, there was an effort under way to hire 400 engineers. The effort struggled — hiring officials barely received 400 applications, he said.

As a result, the company set about to change its message and worked to have it delivered by people who understand social media and speak the language of the younger generation. The effort was successful, Longhi reported.

It was so successful that when the company undertook a second round of hiring, looking to bring aboard another 400 engineers, the company received 6,000 applications.

To help encourage people to consider the opportunities in steel, AIST this year established the T.C. Graham Prize,

Pipe and Tube Experts Panel presenters (left to right): Massimiliano Fantuzzi, research and development manager, Tenova Italimpianti (moderator); Fabio Lacapruccia, senior technical sales, SMS Innse; George Koenig, director — global iron and steel business and technology development, Hatch Associates Inc., and president, AIST; Dave Rintoul, senior vice president — Tubular Business, United States Steel Corporation; Renato Spelgatti, regional quality director, TenarisDalmine; and Ronald Ashburn, executive director, AIST.





*Sergio Tosato, vice president and managing director, TenarisDalmine, presented an overview of TenarisDalmine.*

made possible by a donation from longtime steel executive Thomas C. Graham Sr.

A team of government and university researchers in Canada, led by newly minted Ph.D. Elisa Cantergiani, who is from Italy, won the inaugural T.C. Graham Prize. Cantergiani attended the forum and was on hand to accept the team's US\$20,000 prize.

Cantergiani opined both universities and the industry need to do more to demonstrate that there remains plenty of room for innovation in steel. In fact, she said that in Canada, some researchers are having trouble securing funding for steel-related research because the perception is that there isn't much left to explore.

"Apparently most people think steel has already reached its maximum (in terms of development)," she said. "I was very happy that we won this award so we can say, 'Look, we did a good job, and there is room for improvement.'"

One area that producers have been working to improve is the quality of steel being cast. They have certainly made big strides, but as Giorgio Romanelli, production manager at Italy's Acciaierie Venete, told the audience, continuous casting requires diligence to achieve good results.

Romanelli was one of four technical experts who provided insights during the continuous casting experts panel, moderated by Carlo Mapelli, AIM president.

Recalling his company's experience with its newest caster, which is capable of making 420-, 500- and 600-mm rounds, Romanelli said it was able to produce almost immediately a deliverable product, but only through proper setup.

He told attendees that proper steelmaking practice — which includes the right measures and right choice of materials — is essential when fulfilling orders with demanding expectations.

Johannes Schade, corporate manager of research for U.S.-based AK Steel Corp., echoed those comments, reminding the audience that there are a number of things that can spur the formation of inclusions. Among them are turbulent mixing, leaky gas lines, unintended reactions with refractories and misaligned ladle shrouds.

"The point I want to make here is it would be great if you could wave a magic wand...and make (these issues) disappear. But there is no single solution that addresses all of the issues that you have to fight in terms of keeping the steel

*(Left to right): Bill Albaugh, general manager — sales, AIST; Stacy Varnecky, general manager — membership services, AIST; Rossana Maffioletti, communications Europe, Tenaris; Lydia Stromel, general manager, Pomini Tenova; Francesca Pisa, communications Europe manager, Tenaris; and Ronald Ashburn, executive director, AIST.*



AIST Steel Forum attendees visited the TenarisDalmine facility.



clean,” he said. “It is only through attention to detail in many areas that clean steel can be produced.”

Of course, cleanliness isn’t the only consideration in continuous casting.

Cristiano Tercelli, head of metallurgy for SMS Concast, reminded the audience that there are other factors, such as thermal imbalances, which can lead to the formation of internal cracks, and high casting speeds, which can cause material segregation.

He said that Asian steelmakers, particularly those in China, have been leading the way in recent years in investing in new casters for large blooms and rounds. Equivalent investments from European steelmakers have lagged, he said, adding that his company has seen none from American steelmakers.

Having invested in some of the best and most modern casters, Asian steelmakers now have a distinct quality advantage, he stated.

While arguments can be made that those steelmakers don’t have the experience or process knowledge to make the most of them, those producers, at the end of the day, are in possession of some of the most modern machines. Therefore, Tercelli said, they have an advantage.

He also said SMS has noted an evolution toward combined-section casters for billets, blooms, rounds and beam blanks.

“I think this is because of a quest for quality and flexibility, especially here in Europe,” he said. “A lot of steelmakers are under pressure from cheap imports, and there is the move toward occupying higher niches in production, so our customers need to be able to change between beam blanks, billets and blooms within the same week of production,” he said.

The need for greater flexibility is prompting U. S. Steel to change the way it makes steel. The company historically has been an integrated producer, but it is now installing an electric arc furnace at its Fairfield Works in Alabama. The US\$230-million furnace is to come on-line later this year. Some of its production will help support the company’s tubular operations.

Speaking during a panel discussion focusing on pipe and tube production, David Rintoul, senior vice president of U. S. Steel’s tubular business, said the technology behind electric arc furnaces has improved dramatically and can produce a product that meets tubular market demands.

“The technologies associated with electric steelmaking are very significant and have evolved dramatically, especially in the last 10–15 years. The degree of automation and robotics involved is really quite impressive.”

In producing tubular goods for the deep shale wells in the U.S., it is especially important to have a product that can withstand harsh environments, Rintoul said. Not only are those wells usually more than a kilometer deep, but they bend and then run out horizontally for another one to two kilometers, he said.

“The last thing anyone wants to have happen is to get near the end of that (string) and have a problem.”

He said the U.S. uses more electric resistance welded (ERW) pipe in downhole applications than do other countries. So, to ensure that the pipe performs, U. S. Steel heat treats it through a process called full-body normalization.

Through the process, a full length of welded pipe is heated, ensuring a homogenous microstructure 360° around the tube.

Rintoul said the EAF and full-body normalization are just two of many technologies the company is working with.

“There is no shortage of things in our industry to look at and try to improve,” he said.

With that in mind, making investments that improve technology and efficiency is a way to survive the downturn, Fabio Lacapruccia, sales manager for SMS Innse, told attendees during the pipe and tube panel discussion.

“With the right investment, you can be the first out,” he said.

AIST would like to extend a special thank you to all of our event supporters: TenarisDalmine, AIM, Tenova, Tamini Group and Berry Metal Company. ◆