



# AIST<sup>®</sup>tech 2016

The Iron & Steel Technology Conference and Exposition

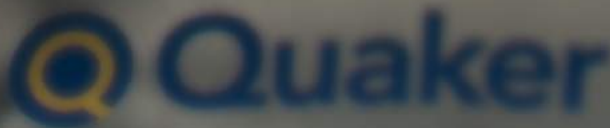
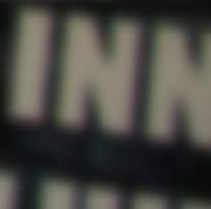
## RETROSPECTIVE

Despite downturn, steelmakers  
see better times ahead



As Steel Dynamics Inc. (SDI) senior vice president Glenn Pushis put it, the math on China's steelmaking ability goes something like this:

The country is capable of producing approximately 1.2 billion metric tons of the material, and of that capacity, about 800 million tons was put to use last year. Of that, he said, approximately 600 million tons was directed toward China's domestic markets; the rest was shipped into foreign markets, much of it finding its way into the United States.

The Quaker logo consists of a stylized 'Q' icon followed by the word 'Quaker' in a blue, serif font.The INN logo is partially visible, showing the letters 'INN' in a bold, sans-serif font.



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It is, he said, a mind-bogglingly large amount of steel. “They pretty much spill more every day than (the U.S.) makes,” said Pushis, who oversees SDI’s long products group. “If they were running at 100%, they could fill our entire market within four to five weeks of running.”


Given its ability to make a lot of steel, its alleged unwillingness to play by international trade rules and the resulting impact on the rest of the world, China and its steel output, not surprisingly, commanded a proportionately large amount of attention during AISTech, AIST’s annual conference and exposition, which was held 16–19 May in Pittsburgh, Pa., USA.

It was the show’s 13th installment under AIST management. This year, it brought together 7,764 industry participants who spent the week catching up with colleagues, meeting new associates, exchanging ideas and learning about the latest advancements in iron and steel technology.

The show recorded its third-best turnout, which came in spite of industry’s current economics and tightened budgets.

“I don’t think we could have hoped for a better turnout,” said AIST executive director Ronald Ashburn.

**7,764**   
industry participants

**542**   
exhibiting companies

“AISTech has something for everyone working today in the steel industry. Even in the most challenging economic climate, this event still represents the best value for steel industry networking and education.”

## Strong Attendance

The show likely benefitted from a bit of fortunate timing — AISTech is held in Pittsburgh every third year, and the shows there tend to draw larger audiences than those held elsewhere. Pittsburgh, after all, is North America’s Steel City.

“Pittsburgh remains a strong supplier base, and so many producer members are tied into the area through family, friends and prior employment,” said AIST board treasurer Joseph Dzierzawski, who is also president and chief executive officer (CEO) of Pittsburgh-based SMS USA LLC.

In fact, the show saw its best exhibitor attendance ever, with 542 companies represented on the exhibit hall floor.

“Suppliers clearly see AISTech as the place to get quality contacts even during difficult times. We are very appreciative of their support,” said AIST president Wendell Carter, whose term officially began upon conclusion of the show.



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Carter is vice president and general manager of ArcelorMittal Indiana Harbor.

The exhibitors accounted for 96,800 square feet (9,000 square meters) of floor space, making it the largest AISTech exhibit hall on record.

"It was very exciting to see the level of activity and interest at AISTech. Obviously, the current conventional wisdom is that the market is facing a number of challenges because of the current market price of steel, but opportunities remain to support upgrade efforts to improve efficiency and reliability at many locations," said Paul Barlow, vice president of coupling technologies at Voith Turbo Inc.

"From the interaction and engagement we witnessed at the event, the industry seems very focused on looking ahead and moving forward."

## The China Question

Over morning coffee, during the plenary sessions and in evening receptions, the discussion often turned to China, its excess capacity and the problems arising from it.

In fact, during the show's annual Town Hall Forum panel discussion, the six participants, which included Pushis, agreed that the U.S. had entered a trade war with China. And, they said, it is not a war of America's making.

"They declared war, not us," said Lourenco Goncalves, chairman and CEO of Cliffs Natural Resources, North America's top iron ore producer. More coverage of the Town Hall Forum can be found beginning on page 52.

Tensions between the two countries have been heightened by United States Steel Corporation's Section 337 complaint, which was filed about two weeks before the show. It alleges that China conspired to fix prices, stole trade secrets and evaded trade duties by mislabeling products. The filing is a step above typical anti-dumping cases in that it is laying broad accusations against numerous companies.

**96,800** sq. ft.  
exhibit hall floor space

And if it prevails in the case, one potential outcome could be that the U.S. International Trade Commission bars imports of Chinese-made carbon and alloy steel from entering the U.S. market. China, along with some U.S. steel buyers, has said the move is raw protectionism.

However, U. S. Steel chief executive Mario Longhi said the company has nothing to apologize for.

"The law entitles us to a level playing field, and we will continue to use every tool at our disposal to pursue our rights under the law," he said, delivering the William T. Hogan, S.J. Lecture during AISTech's annual President's Award Breakfast.

"The bottom line is we cannot allow non-market-based foreign steel companies using illegal actions to seize this critical part of our nation's health and welfare. We must preserve and defend our way of life by ensuring

Mario Longhi, president and chief executive officer, United States Steel Corporation, delivered the William T. Hogan, S.J. Lecture at AISTech 2016.





that all American industries can compete vigorously and unencumbered by harmful and illegal foreign practices,” he told the audience.

Aside from defending the company’s action, Longhi used his speech to urge the industry to embrace innovation at all levels. Otherwise, he said, steel and the businesses that make a profit from it risk being displaced.

“There is a revolution underway in advanced materials — a race to discover and commercialize materials that are lighter, stronger, more energy-efficient or more versatile,” he said. “Make no mistake: We need to create the next generation of solutions to ensure steel remains the material of choice in a variety of applications.”

His message came with an implied urgency.

“The steel industry cannot accept the status quo. I’m sure none of the industries we compete against are sitting around waiting to see what we do next. Their sole focus is on meeting the needs of the markets they already serve, as well as the ones they want to begin serving.”

He also said that while innovation certainly has to include new products, steelmakers must apply it more broadly.

“We need to foster innovative relationships with our stakeholders, including our customers, suppliers and employees. And we need to develop new approaches to everything we can control in our day-to-day business.”

## Finding Tomorrow’s Steelmakers

One area in need of some creative solutions is the ongoing effort to recruit tomorrow’s steelmakers, a subject of much focus during the show’s University-Industry Relations Roundtable (UIRR) discussion.

UIRR chairwoman Kelly Dallas, a principal engineer at ArcelorMittal USA, said that over the past several years, the industry has been focusing on those with engineering backgrounds. And although there continues to be a need for engineers, especially electrical engineers, who seem to be in



short supply throughout all industries, the real issue is with the crafts, she said.

“The last couple of years we have been talking about the skills gap. Getting people trained and qualified to do the operational and maintenance functions is a big concern,” she said.

The good news, though, is that there is alignment between industry and academia on that point, and there is an active effort being made to address the problem.

For instance, she said, ArcelorMittal runs a program called Steel Workers of the Future, which is specifically for craft personnel. And AIST, she said, is always looking at ways to communicate the training courses that are offered.

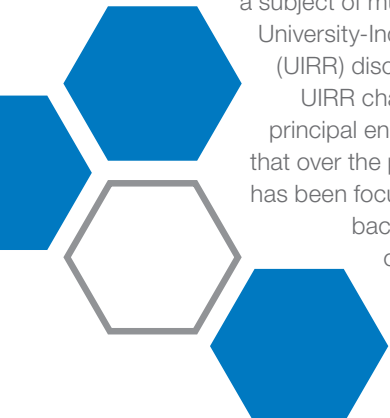
“As an industry, we not only have to think of ways to engage our employees and attract future employees, but we also have to make sure to take advantage of programs that are already in place,” she said.

## Record Student Attendance

Students this year were taking advantage of the show. More than 180 attended, which is a record.

Among them was Brian Jamieson, a graduate student at Canada’s McMaster University, where he is pursuing a master’s degree in materials science.

By appearances, this may not seem to be the best of times to enter the industry, but Jamieson said that he is intrigued by steel as a material. After all he said, iron ore is plentiful, steel is easily and commonly recycled, and the world makes more of it than anything else, except for concrete.





Peter D. Hodgson, ARC Laureate Fellow, Alfred Deakin Professor, Pro Vice Chancellor (Strategic Partnerships), Deakin University, delivered the J. Keith Brimacombe Memorial Lecture.

“Steel is just such an amazing tool for the modern world; I can’t really imagine myself wanting to work elsewhere,” he said. “As far as I am concerned, steel is a miracle material and I would love to be connected to an industry with ties that span the globe.”

To that end, he is writing a thesis related to advanced high-strength steel (AHSS). He said he hopes production improvements over the next 10 years in third-generation AHSS will help to keep the industry relevant and competitive into the foreseeable future.

He also said he believes North American producers will have to move further into higher-end products to remain competitive with steelmakers in other parts of the world.

“When compared to producers in China and India, labor costs become substantial burdens on the North American industry. In order to continue competing without sacrificing worker safety or wages, I believe the North American industry will need to produce higher-margin products that require stringent quality controls, while moving away from low-end products.”

## Steel Research

Some Chinese producers are already doing just that, according to materials science professor Peter D. Hodgson, who delivered the J. Keith Brimacombe Memorial Lecture during AISTech.

Hodgson, the interim deputy vice chancellor of research at Australia’s Deakin University, said the Chinese, at least

until recently, have been investing in steel research and development.

“The Chinese government gives a lot of what could be called offsets to fund research inside companies — much more so than you see anywhere else in the world. But with the overcapacity issue in China and other issues, the government’s priorities have changed more toward advanced manufacturing as well as information and communications technology. Hence, support for the steel industry is a bit lower than five years ago. Having said that, there are by far more academic steel researchers in China than anywhere else in the world, and the link between academia and industry is also very strong.”

He also said that given China’s capacity and slowing domestic demand, producers there are looking for every advantage over other producers to stay afloat. So the





nearly **500** technical presentations

drive to differentiate themselves is steering dollars toward research and development.

Elsewhere, though, producers have been putting dollars into cost reduction. But cost reduction isn't a sexy research question, he said, and the differing interests between industry and academia could lead to some friction.

And the shame of it, Hodgson said, is that research tools are giving a greater understanding of the molecular structures that give rise to steel properties. That has helped to explain why certain, already developed steels behave the way they do and is opening doors to making new products.

He added that the only area where he still sees some significant work being done is in automotive lightweighting.

Of course, that's not to say research has come to virtual halt. Much work is ongoing, as the response to the AISTech's Technology Conference suggests.

More than 1,550 authors gave approximately 500 technical presentations on a wide variety of topics on a wider variety of operational aspects in the mills.

For example, Big River Steel presented on its universal annealing and galvanizing line, which is being designed to allow for flexible production

of annealed and hot-dipped galvanized cold strip. Also, Steel Dynamics offered a paper characterizing the air quality hazards faced by ladle crane operators working over electric arc furnaces.

Primetals Technologies discussed how variable roll geometries and automated continuous rolling can be incorporated into existing cold rolling equipment to meet AHSS market demands.

## Automotive Opportunity

Automotive steel has been a bright spot for the distressed industry. Demand is healthy, driven by high auto sales and new safety and emissions standards necessitating lighter vehicles. The demand is prompting new investments in auto steel, the most notable of which is, perhaps, the Big River Steel project in Arkansas.

Set to come on-line later this year, the so-called flex mill is designed to produce the steels of an integrated mill, but operate with the nimbleness of a mini-mill.

And there have been other investments. Steel Dynamics and ArcelorMittal, for instance, are making significant upgrades to mills to expand capacity.

But there have been questions as to whether steel can compete with other materials in the automotive lightweighting arena. The answer, though, is: Absolutely, said ArcelorMittal USA CEO John Brett, who spoke during the Town Hall Forum.

"From what we've seen, steel is winning. We can lightweight with the best of them," he said.



# US\$30,000

## raised for AIST Foundation

### Big Prizes

Of course, the show wasn't all business.

AISTech 2016 unofficially opened with the annual AIST Foundation golf outing, held this year at Chartiers Country Club, about 10 miles southwest of the city. Despite soggy weather, approximately 260 golfers attended. The event raised almost US\$30,000 to continue the Foundation's mission to ensure the iron and steel industry of tomorrow will have a sufficient number of qualified professionals.

There also were several giveaways at the exposition, including the annual grand prize drawing for a new pickup truck.

This year, Bobby Price, a sales representative with Bi-State Rubber Inc., rode home to Missouri in a brand-new Chevy™ Silverado.

Price joked that he had made the mistake of reading the contest fine print prior to the announcement, and so when he learned that he had won, his thoughts turned to the details — the taxes, the new travel plans, the paperwork — instead of on the fact that he had won a new vehicle.

However, friends, family and co-workers were excited for him. In a span of 30 minutes, he received 90 text messages and 30 congratulatory phone calls, he said.

"Back home, they were all freaking out. Everybody was in shock," he said.

### Optimism Ahead

Entering the second half of the year, the steel industry had a little something of its own to be excited about — prices were on the rise, and producers generally were forecasting an improved latter half, giving rise to cautious optimism.

It's optimism that is widely shared, Carter said.

"I believe most are optimistic about the remainder of the second quarter and into the third quarter. After that, with

new competition emerging, there is some concern going forward if demand does not improve," Carter said.

Of course, China will continue to shape the industry's fortunes. And at the recent U.S.-China Strategic and Economic Dialogue, the country promised to undertake measures limiting new capacity, reducing net capacity and eliminating old and inefficient mills.

Those promises are to be applauded, said Thomas J. Gibson, president and chief executive of the American Iron and Steel Institute.

"We appreciate the continued efforts of our government to engage China at the highest levels on the steel overcapacity issue and welcome the new commitments by Chinese leaders to adopt measures to strictly contain steel capacity expansion, reduce net steel capacity, eliminate outdated steel capacity, and dispose of 'zombie enterprises' through restructuring, bankruptcy and liquidation, as appropriate," he said.

"These commitments will only be meaningful if they lead to real results that produce a significant net reduction in excess steel capacity in China. We appreciate U.S. Treasury Secretary Jack Lew's commitment to keep the pressure on to ensure that progress is made in addressing this crisis." ♦



# STEEL'S RESOLVE: OVERCOMING THE EXCESS

The AISTech 2016 Town Hall Forum



Six of the American steel industry's top executives are in agreement: China has engaged in economic warfare, and the U.S. must take defensive action or risk losing a nationally critical industry.

"The Chinese and others have brought the war to our shores. This is survival. We have to fight this. We don't have a choice as an industry," said Glenn Pushis, senior vice president of Steel Dynamics Inc.'s long products unit, speaking during the AISTech 2016 Town Hall Forum.

The panel discussion, an annual event at the show, is meant to give attendees an opportunity to hear from senior executives on the state of the industry.

On the panel this year were Pushis; ArcelorMittal USA president and chief executive officer John Brett; TMK IPSCO chairman and chief executive Piotr Galitzine; Cliffs Natural Resources Inc. chairman, president and chief executive officer Lourenco Goncalves; Doug Matthews, senior vice president of United States Steel Corporation's Industrial, Service Center and Mining unit; and John Bass, Nucor Corp.'s general manager of public affairs.

Although the six touched on a variety of subjects during the two-hour conversation, the discussion often turned to competition from unfairly traded imports and the damage that has been inflicted upon the North American industry.

The panelists, in fact, said they believe the U.S. has entered a trade war with China.

"And they're winning at this time," Pushis said.

Goncalves added that the war is unprovoked. "They declared war. Not us," he said.

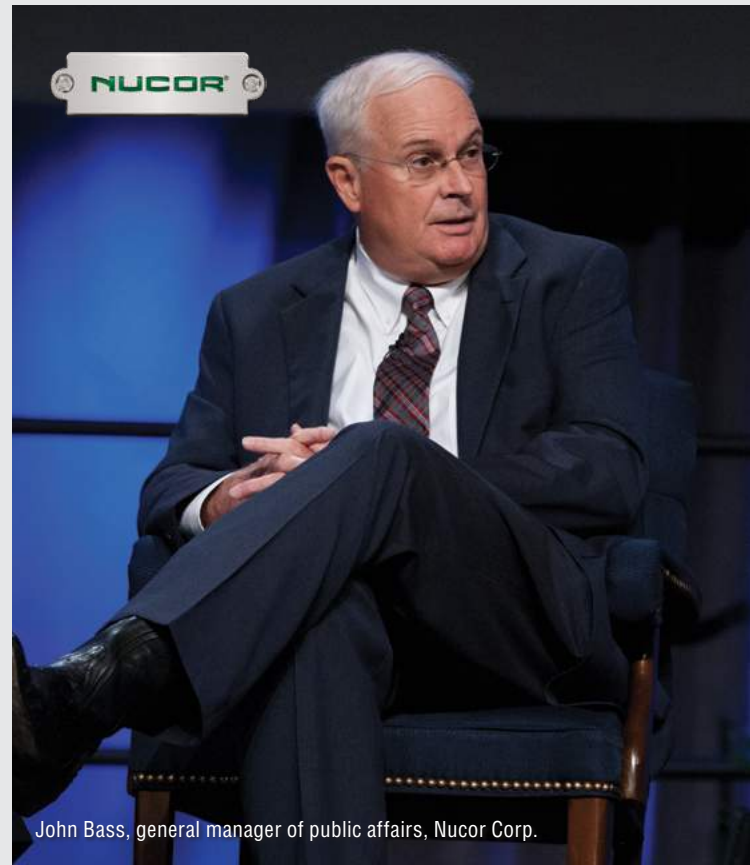
The result, he said, is that the U.S. has begun to aggressively enforce its trade laws.

"We need to continue to fight China intelligently in this war," he said, adding that the U.S. should hit between the eyes and oppose China's effort to obtain market economy status.

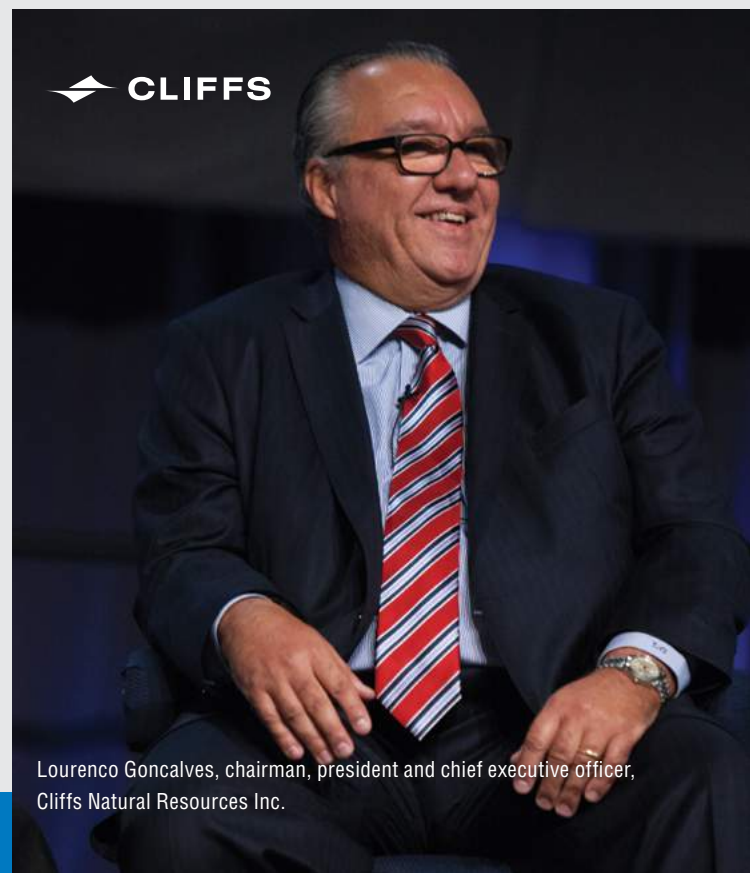
In spite of the tough talk on China, the panelists were careful to say that they are not opposed to imports, only those that are unfairly traded.

Matthews in particular said that the word "protectionist" is often used to describe the U.S. steel industry's action. There is, however, nothing protectionist about demanding a level playing field, he said.

And as it is, the field is unfairly tilted toward Chinese producers, whose inefficiencies are being covered by the Chinese government, the panelists said. And in the meantime, domestic producers, who are seeing their prices undercut, are being forced to curtail production and close mills.



John Bass, general manager of public affairs, Nucor Corp.



Lourenco Goncalves, chairman, president and chief executive officer, Cliffs Natural Resources Inc.



U. S. Steel



Doug Matthews, senior vice president, Industrial, Service Center and Mining Solutions, United States Steel Corporation



Piotr Galitzine, chairman and chief executive officer, TMK IPSCO

The situation is all the more infuriating, the panelists said, considering that the overall economy and steel demand, is in generally healthy shape.

As an example, they pointed out that non-residential construction has continued to see healthy growth, as has demand for automotive steel, particularly advanced high-strength steels (AHSS). And that's in spite of competition from alternate materials, such as composites and aluminum.

"What we're seeing is that steel is winning. We're able to demonstrate that we can lightweight with the best of them," said Brett. "We are getting the weight out and making sure that the car is still safe."

Brett also said there appear to be market opportunities for AHSS beyond carmaking. For instance, there may be opportunities for AHSS in transportation, maybe even in aviation, where light and strong materials could allow for greater cargo weights. There also may be opportunities for AHSS in agriculture, he said, where the talk has been of preventing soil compaction and boosting crop efficiency.

But as for the auto market as a whole, Pushis said he doesn't share the same level of enthusiasm for its future growth as others.

Pushis said he believes vehicle financing costs and a wave of leased vehicles that will be entering the used market will cap new-car sales, holding them to between 16.5 million and 17 million units annually over the next few years.

"There are too many leased vehicles that are going to be coming back out onto the market that aren't being accounted for," Pushis said.

Automakers sold nearly 17.5 million light vehicles in the U.S. during 2015, a record year for the industry.

On the opposite end of the steel-demand spectrum is the energy market, which has suffered as excess supply, low profits and untenable debt have wiped out profits and forced producers to curtail drilling. That has significantly reduced their pipe requirements and causing plenty of pain among tubemakers.

However, the panelists said they believe the market eventually will rebound.

"We shouldn't allow the momentary disturbances in the market to cloud our (long-term) view on the market," Galitzine said.

"We are truly in the middle of a revolution. Few are the people who could have predicted that the United States would double its oil production from 5 million barrels per day to 9.7 million (in eight years) as of May last year.

Galitzine said that, yes, there is pain in the oil fields now, but there has been pain before when new production technologies came along.

“When we went from percussion drilling to rotary drilling, not all the companies made it. The ones that seized on it early enough are the names we know today,” he said. “The same thing is happening with the horizontal drilling.”

He added that the oil patch companies are extremely innovative in finding ways to lower the point at which wells break even. And whereas it once took them 28 days to drill and construct a shale well, they can now do the task in seven.

“They’re working really hard out there every day to be more competitive to extract shale gas and shale oil. I’m betting they’re going to be successful in the medium term. It’s going to be a challenging market, but, ultimately, it recovers and becomes a thriving market,” said Matthews.

In addition to the downstream markets, the panel looked upstream and weighed in on iron ore and scrap markets.

Brett said there obviously is a direct correlation between steel production and iron ore demand. So when steelmakers aren’t making steel, they aren’t demanding pellets.

“We’ll have to wait and see what happens with the final determinations (in the U.S. trade cases). But we’re cautiously optimistic that we’ll see improved demand over the next several years.”

The discussion on iron ore prompted Pushis, whose company is a scrap consumer, to quip, “What’s iron ore?”

To which Goncalves responded: “Iron ore is the raw material that Glenn Pushis will be using very soon as he grows in participation in the automotive industry.”

Goncalves went on to say that he sees growing demand for scrap substitutes in the coming years.

He explained that China will eventually have to address its pollution issues, and as a result, producers there will have no choice but to shutter inefficient blast furnaces that use sinter fines.

As those furnaces come off-line, more electric arc furnaces will be built, and China will increasingly consume more of the world’s scrap supply, much of which will come from the U.S.

As that happens, scrap prices will rise, pushing up steel prices. And that, he said, will create an opportunity in the U.S. for scrap substitutes. Cliffs, he said, is positioning itself to take advantage.

“Cliffs is working on that to bring HBI and DRI production to the Great Lakes,” he said. ♦



Glenn Pushis, senior vice president, Long Products Steel Group, Steel Dynamics Inc.



John Brett, president and chief executive officer, ArcelorMittal USA