

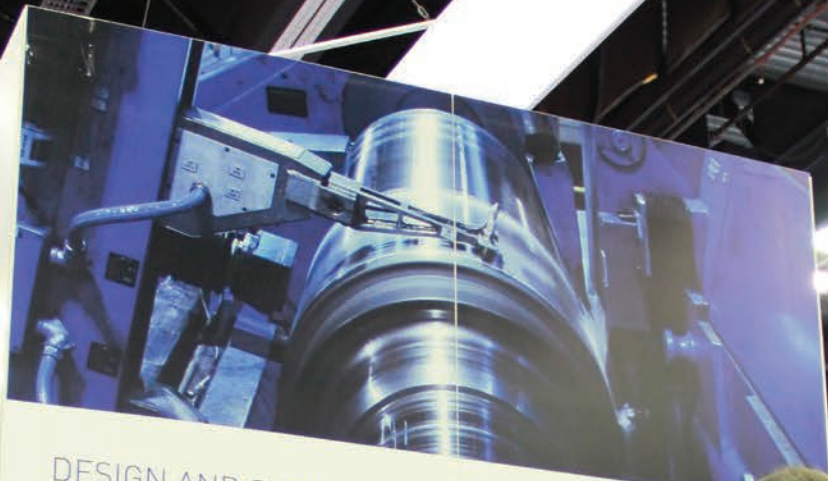
AISTech[®] 2014

The Iron & Steel Technology Conference and Exposition
Indiana Convention Center • Indianapolis, Ind., USA

RETROSPECTIVE

5-8 MAY





DESIGN AND SUPPLY
OF ROLL GRINDERS AND
ROLL SHOP EQUIPMENT

Pomina
TENNOVA





Technology Moving Forward

AISTech 2014 — The Iron & Steel Technology Conference and Exposition was yet another record-breaking event for AIST, topping the numbers from the two prior years. Nearly 7,000 steel producers, suppliers, executives, academics and students from 44 countries convened at the Indiana Convention Center, Indianapolis, Ind., USA, for the

world's largest annual steel industry event.

The event set all-time records with 531 companies in the exhibit hall and 515 technical presentations, both of which indicate exciting growth and global awareness for AISTech. Truly, AISTech represents how iron- and steelmaking technology is moving forward.



Golf Classic

AISTech kicks off each year with the AIST Foundation's Golf Classic. The Foundation sponsors various programs and scholarships that help to ensure the steel industry of the future has a sufficient number of qualified professionals.

Eight corporate sponsors and 280 golfers participated in the sold-out event on Sunday, 4 May. A special treat was in store for those who golfed this year: the Brickyard Crossing golf course has four holes inside the Indianapolis Motor Speedway!

The AIST Foundation wishes to thank

all the sponsoring companies, as well as **Steve Hansen** of SSAB Americas, who served as the Golf Committee chair. See page 130 of this issue of *Iron & Steel Technology* for a complete list of sponsors and contest winners. Don't miss the next Golf Classic in Cleveland, Ohio, USA, in 2015!





AISLE 1000

MIDREX
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LISMAR

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Technology Conference

If you haven't been to AISTech, you are missing out! This event represents the world's largest annual iron- and steel-related technology conference, and it keeps growing every year. The program now comprises 100 sessions and more than 500 individual presentations delivered across three days. More than 1,500 authors and presenters from over 40 countries participated in 2014.

On Monday morning, 5 May, the conference began with a plenary session that included the Brimacombe Memorial Lecture and the International Alliance Lecture.

The 2014 AIME Keynote and AIST J. Keith Brimacombe Memorial lecturer was **David K. Matlock**, professor emeritus of the Colorado School of Mines. Dr. Matlock's lecture was titled "**Perspectives on Industry/University Partnerships to Support Innovations in the Steel Industry.**" Approximately 315 people attended the lecture, which discussed both domestic and international efforts between steel companies and academia to research new grades and applications of steel. Dr. Matlock pointed out that cultural differences in various regions also play a role in these efforts. The full lecture appears on pages 75–89 of this issue of *Iron & Steel Technology*.

Following the Brimacombe Lecture, **Jiang Li**, chief market analyst for Baosteel, China, presented the International Alliance Lecture to 250 people. Her lecture, titled "**The Challenges of the Chinese Steel Industry,**" outlined the recent history and achievements of the industry in that country; the issues that are arising in the industry, including overcapacity and pollution; as well as the efforts



Baosteel is making to combat those issues. The full lecture appears on pages 91–97 of this issue of *Iron & Steel Technology*.



The conference included three sold-out plant tours to steel producers in the region on Thursday, 8 May: Nucor Steel—Indiana, Crawfordsville, Ind., USA; ArcelorMittal Burns Harbor, Burns Harbor, Ind., USA; and Steel Dynamics Inc. – Engineered Bar Products Div., Pittsboro, Ind., USA.

All conference registrants also received a CD-ROM containing the full conference proceedings. The 2014 proceedings contained more papers than any prior AISTech — comprising more than 3,800 pages!





Total Attendance

6,982



Student Attendees

160



J. Keith Brimacombe Memorial
Lecture Attendees

315



International Alliance
Lecture Attendees

250



President's Award Breakfast Attendees

1,200



Authors

1,430



KEY STATISTICS



Countries Represented

44



Technical Sessions

100



Exhibiting Companies

531



Technical Presentations

515



Exposition

The AISTech exposition gains momentum each year. In fact, AISTech 2013 made it into the “Fastest 50 Trade Shows” in the United States and did so in *three* categories: net square feet of exhibit space, number of exhibitors and attendance. Out of 11,000 trade shows in North America, only 13 were named in all three metrics. More information about this achievement can be found on page 133.

show was actually expanded twice! Plus, there were 105 new exhibitors.

In addition to the 531 exhibiting companies, displaying products and services geared toward making the steel industry more sustainable and profitable, the highlight in the exhibit hall was a Chevy™ Silverado Truck Giveaway. Preliminary drawings took place on Monday, Tuesday and Wednesday, with the final winner drawn at 11:45 a.m. on Wednesday after the Town Hall Forum. The winner of the Chevy Silverado was **Sam Stoner**, product manager for Spin-Works, North East, Pa., USA. AIST congratulates Mr. Stoner on his win!

Many other prizes were awarded during AISTech 2014, including a set of golf clubs and bag, a large-screen TV, a laptop computer, an iPad and tickets to the Indy 500. The AIST Service Center carried the *AISTech 2014 Conference Proceedings*, as well as event T-shirts and additional publications for sale. Visitors to the Service Center also signed up for AIST membership and entered raffles. All AISTech prize winners are recognized on page 131 of this issue.

AISTech 2014’s exhibit built on this success. The 2014 hall covered 93,100 ft² (8,650 m²) net exhibit space, or 253,200 ft² (23,500 m²) of exhibit floor space. Just as AISTech 2013 surpassed AISTech 2012’s records, this year’s show floor beat out last year’s by 8,000 ft² (743 m²), with a growth of 9.0%. The original exhibit space allotted for this



President’s Award Breakfast

The 2013–2014 AIST president, **Terry G. Fedor II**, hosted the annual President’s Award Breakfast on Tuesday, 6 May in the Sagamore Ballroom of the Indiana Convention Center. In his opening message to the sold-out room, Fedor described the various achievements and initiatives of AIST during his term:

- A peak of 11,600 professional members at the end of 2013, representing a 5% increase over the previous year.
- A corporate bulk dues renewal option as an alternative to the individual member renewal process, saving time, paperwork and money.
- An expanded Young Professionals discount program, to include those 30 years of age and younger.



- Technology initiatives like the AIST Process Benchmarker® (APB®), which now has 11 process modules.
- A brand-new, comprehensive website at AIST.org, which debuted in October 2013.
- The completion of the Flat Products Volume of *The Making, Shaping and Treating of Steel*® 11th edition.
- Continuing chapter-building efforts in Brazil, India, Italy and Mexico.
- The establishment of the T.C. Graham Fund for Innovation in Steel Application.



The 2014 AIST Steelmaker of the Year, **Mark D. Millett**, president and chief executive officer of Steel Dynamics Inc., was recognized for his entrepreneurial spirit, relentless work ethic and pioneering leadership style. While accepting the award, Mr. Millett said, “It is both gratifying and humbling to receive such an award when it is at the discretion of one’s peers....I have been blessed, since my life has been full of opportunity, from a wonderful family, to wonderful friends and partners, and a fulfilling career. On behalf of my colleagues at Steel Dynamics,

and all of you, I graciously accept this award.” An interview with Mr. Millett starts on page 124.

Mark Millett also had the honor of giving the key-note address during the breakfast. The address, titled **“Making Money in the Steel Industry Is Not a Mystery,”** is reprinted on pages 62–72 of this issue of *I&ST*.

Other AIST Board of Directors Award winners announced during the President’s Award Breakfast, including the Distinguished Member and Fellow Award and Hunt-Kelly Outstanding Paper Award, appear on pages 98–103 of this issue of *I&ST*. The Technology Division-Level Award winners are listed on pages 104–123.

AIST would like to thank the breakfast sponsors: Danieli, SunCoke Energy and Tenova.



President’s Welcome Reception and Dinner

On Tuesday evening, the AIST President’s Welcome Reception and Dinner brought together 190 invited guests at the Indiana Roof Ballroom in Indianapolis. Each year, the event recognizes

the outgoing members of the board of directors and the AIST Foundation board of trustees for their service to the association.





During the evening, recognition was given to the numerous leaders of AIST's international Member Chapters, as well as the individuals receiving Presidential Citations: **Jürgen Cappel** of Cappel Stahl Consulting for his dedication to the development of the AIST International Steel Academy, **Kelly Dallas** of ArcelorMittal for her outreach to students and young professionals, and **Joseph Stratman** of Nucor for his leadership during the transition period after the passing of Kent Peaslee.

Dale Heinz, the current president of AIME, also presented the following awards:

- The AIME Rossiter Raymond Memorial Award to **Pallava Kaushik** and **Hongbin Yin**, for the best paper published in which the

lead author is a member under the age of 35.

- AIME Honorary Membership to **Roderick Guthrie** for his work in the development and optimization of steelmaking processes through the application of heat, mass and fluid flow theories, and also to **Bill Barker** for his collaborative efforts while serving as chairman of AIME's Overarching Programs and for his leadership during the formation of AIST, a member society of AIME.

Finally, **Glenn Pushis**, the incoming AIST president, was given the opportunity to thank Mr. Fedor for his service over the past year and to speak about what lies ahead for the organization during his own term of office.

AIST would like to thank the dinner sponsors: Sarralle, Quaker and Tenova.



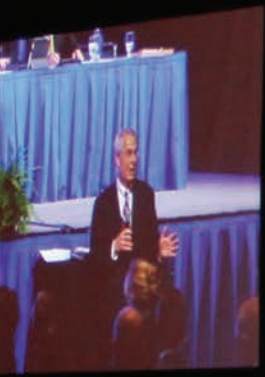
Town Hall Forum

The 2014 Town Hall Forum was held on Wednesday, 7 May in the Sagamore Ballroom, where industry leaders discussed an array of topics before a crowd of 750 attendees.

The Town Hall discussion was led by **Jon Delano**, money and politics editor for KDKA-TV (CBS), Pittsburgh. The panelists included **John C. Farris**, vice president and general

manager, Nucor Steel-Texas; **Dieter Hoeppli**, managing director and head of Metals & Mining, Americas, Deutsche Bank Securities; **Douglas R. Matthews**, senior vice president, North American Flat-Rolled Operations, United States Steel Corporation; **S.S. Mohanty**, director (technical), Steel Authority of India Ltd.; **Tracy L. Porter**, president, CMC Americas; **Michael Rippey**, president and chief executive officer,





ArcelorMittal USA; and **P. Kelly Tompkins**, executive vice president, external affairs and president, global commercial, Cliffs Natural Resources. **George J. Koenig**, president, Berry Metal Co., chaired the event.

Delano led the panelists in a discussion on “Building a pipeline to the future,” with topics ranging from growth markets and fighting for market share, to regulatory issues, leveraging the natural gas renaissance, steel vs. aluminum in the auto market, safety initiatives, diversity and attracting a skilled workforce.

Regarding growth markets for steel, the panelists discussed how the automotive industry continues to be a critically important end market. The increasing use of aluminum in automobiles has been sensationalized, Matthews said, but it has prompted the steel industry to increase research activities, with new grades being produced, demonstrating that steel can be a solution and the material of choice.

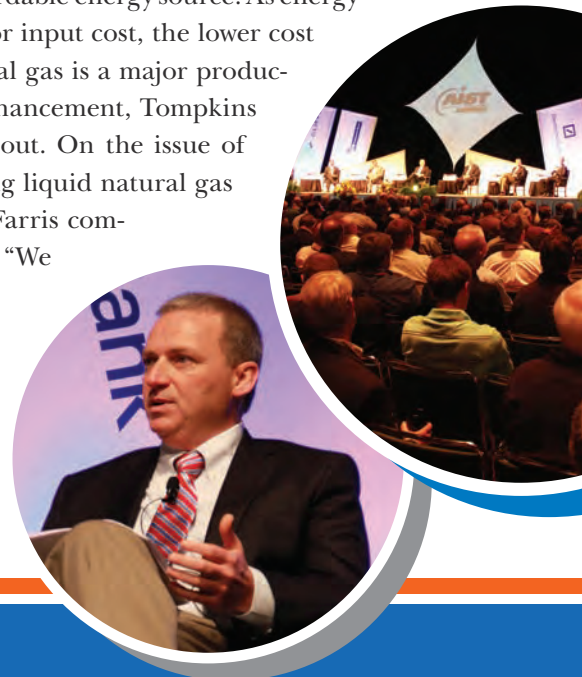
Mohanty provided an international perspective, noting that all Indian producers are in expansion mode as the country looks to increase its per-capita steel consumption, with the automotive industry an area of excitement abroad as well.

On the issue of steelmaking overcapacity, estimated at roughly 500 million tons globally, Hoeppli predicted that we will see capacity shut down in the future, as companies are simply losing too much money. The overcapacity discussion transitioned into a discussion on trade, as the two are inevitably linked. Tompkins commented that a collection of industries, including the supply chain, need to collaborate more on trade issues. U. S. Steel, realizing the importance of the entire supply chain on the trade front, has been educating its customers on the impact of a negative ruling

in a trade case against OCTG imports, Matthews noted.

The trade discussion shifted to a conversation on challenges and issues in the current regulatory environment. Rippey, as the new chairman of the American Iron and Steel Institute, noted that the industry is being vocal, but not quite vocal enough. The industry needs to band together to educate elected officials, as well as the public, Matthews said, on how trade impacts jobs, the economy and communities.

The executives then discussed how their companies are leveraging the incredible opportunity that natural gas is providing in the United States, including making huge investments in premium connections to serve the oil and gas industry, as well as DRI, to take advantage of the abundant and affordable energy source. As energy is a major input cost, the lower cost of natural gas is a major productivity enhancement, Tompkins pointed out. On the issue of exporting liquid natural gas (LNG), Farris commented, “We have a





talent, as well as diversity within the workforce, from the shop floor all the way up. Rippey said steel companies need to be sure that all their newer employees — regardless of gender, race, etc. — are being challenged and developing professionally in order to keep them in the industry and to allow them to move up in the workplace.

once-in-a-generation opportunity to see manufacturing grow. A tempered approach to investing in LNG will help with reshoring manufacturing into this country.”

As the conversation turned to safety initiatives, Mohanty encouraged the steel industry to produce “accident-free steel,” and Porter said the industry cannot rest until the goal of zero incidents is attained.

The last major area of discussion for the leaders was on the workforce: recruiting and retaining

The Town Hall webcast is available online by visiting AIST.org.

AIST thanks each of the Town Hall panelists for their participation and helping to create an ongoing dialogue on issues of utmost importance to the steel industry.

Immediately following the Forum, a Town Hall Lunch, sponsored by AmericanAirFilter®, Berry Metal Co., CBMM North America Inc., Herr-Voss Stamco and SGM Magnetics, was held in the exhibit hall.



Member Chapter Meetings

Over the course of AISTech 2014, leaders from AIST’s Brazil and India Member Chapters and the proposed Italy Member Chapter met with AIST representatives to discuss advances within each chapter and future programming opportunities within each region.

On Sunday, 4 May 2014, the India Member Chapter officers and representatives met with AIST staff members. In 2013, a formal

executive committee was established, which leads the new chapter as it continues to grow alongside the Indian steel market. During the meeting, chapter growth ideas were discussed, as well as the planning of AIST’s 2015 International Steel Academy (ISA). The ISA is proposed for 14–18 January 2015 at SAIL in Bhilai, Chhattisgarh, India.

On Tuesday, 6 May, AIST staff members met with representatives from the AIST Brazil Member Chapter and Associação Brasileira de Metalurgia e Materiais e Mineração (ABM) to discuss the current cooperation agreement between AIST and ABM, as well as future joint programming opportunities in Brazil.



AIST staff members met with representatives from the proposed AIST Italy Member Chapter on Wednesday, 7 May 2014. The discussion focused primarily on the Italy Steel Forum, which was held in 2012 and 2013, and is scheduled for October 2014. The program features an Industry Leader Town Hall Forum, a panel discussion

with steelmaking experts and two keynote presentations. Another topic of conversation included the formal establishment of the Italy Member Chapter and its executive committee.



Students and Young Professionals at AISTech

Special programming for students was held during AISTech 2014, thanks to the AIST Foundation and the support of eight sponsoring companies. A record total of 160 students from 30 universities participated in the student-centered programs

during the week. For complete details on the student and young professional activities at AISTech, including plant tours, receptions and various contests, see pages 280–282.



Acknowledgments

AIST's executive committee and board of directors recognize the work and dedication of the AISTech 2014 Conference Planning Committee chair, **James O. Finley**, ArcelorMittal Indiana Harbor; and the Exhibitor Committee chair, **Christopher J. Carr**, Heraeus Electro-Nite. Thanks also go to the Town Hall Forum session chair, **George Koenig**, Berry Metal Co.; AIST

Foundation president, **Fred Harnack**, United States Steel Corporation; the Technology Committee members who volunteered their time to create the technical program; as well those who chaired sessions and presented papers. AIST also thanks the membership and steel industry for their tremendous support.



AISTech 2015: Cleveland, Ohio, USA

Join us on 4–7 May for AISTech 2015 at the Cleveland Convention Center, Cleveland, Ohio, USA. More than 275 companies have already reserved space for the next exposition. Space is limited for 2015, and it's sure to be a sell-out! Contact the AIST Sales Team at sales@aist.org to reserve your space today. Also check out numerous sponsorship opportunities — a great way to amp up your presence at AISTech 2015!

Finally, don't miss the chance to put your company's latest project or research in front of the steel community as part of the premier steel event of the year. Submit an abstract by **15 August 2014** for a technical presentation. Visit AISTech.org for the most up-to-date information. ♦





Making Money in the \$TEEL INDUSTRY Is Not a Mystery



AISTech 2014 President's Award Breakfast Keynote Address

Presented by Mark D. Millett, president and chief executive officer, Steel Dynamics Inc., AIST 2014 Steelmaker of the Year and AIST 2014 William T. Hogan, S.J. Lecture Awardee. Mr. Millett spoke before a gathering of more than 1,200 people at the AISTech 2014 President's Award Breakfast in Indianapolis, Ind., USA.



We're all invested in the steel industry in some way. So let's take a look at how we're doing, including the challenges, the opportunities and where we might be headed.

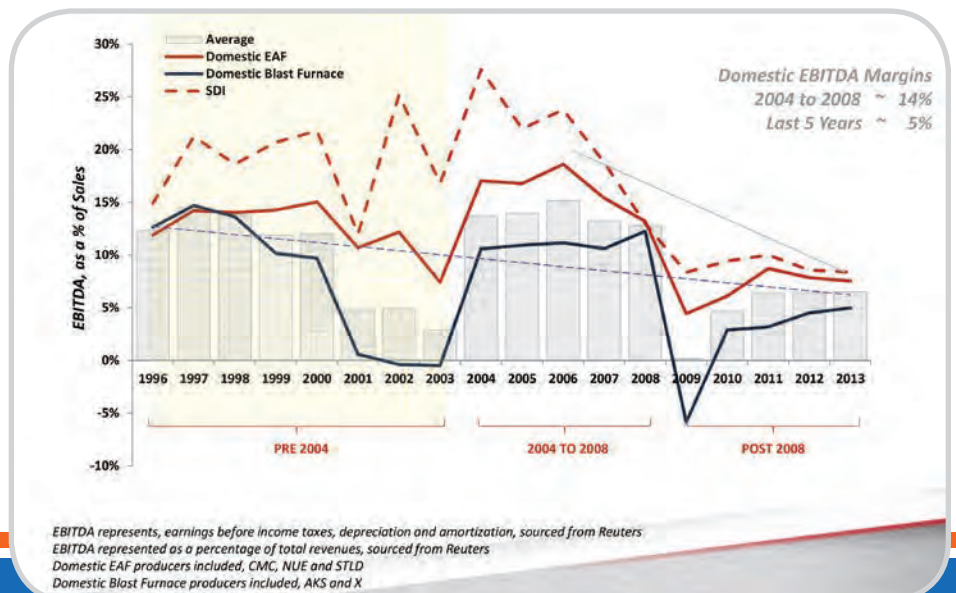
The steel industry's history of profitability is not without blemish (Figure 1). It has not been easy to make money in steel — for mills or suppliers — but it is definitely not impossible, and certainly not a mystery!

It is also evident that certain companies maintain financial metrics significantly above others — fortunately, Steel Dynamics Inc. (SDI) is one — and hopefully I can add some color as to how a company can position itself to achieve a more prosperous future.

But just “making money” isn't the key issue. You need to make enough to reinvest in your business, create opportunities for your employees and have the capacity to grow. Through the cycle, we need to generate returns in excess of our cost of capital to do these things.

History has shown the devastating effects when we don't. We saw it in the period leading up to 2002, when downward price spirals and a less operationally efficient industry drove more than 45% of steel producers into some form of insolvency. This was the catalyst of considerable rationalization and consolidation that has continued through today.

Figure 1
The industry's track record: U.S. EBITDA margins declining.



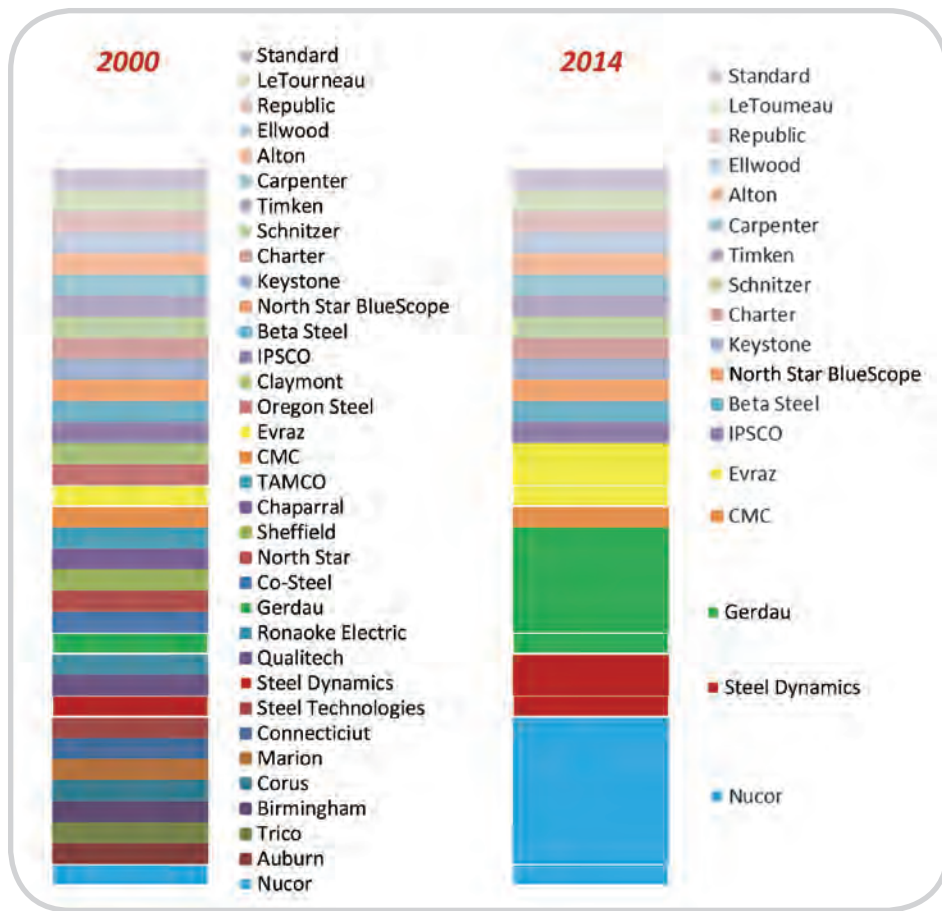


Figure 2
EAF consolidation, while a fragmented base remains.

Many of the less efficient electric arc furnace producers have been acquired (Figure 2). It surprises me how quickly we forget their names. Much of the capacity remains intact today — just under new ownership. Some things we recognize: EAF producers are the beneficiaries of lower fixed costs. They have the ability to quickly adapt

production volume to meet demand. They also have performance-driven labor costs tied to production, and in some cases profitability. The resulting high variability within their cost structure — 85% at SDI — sustains financial viability even in the toughest of times.

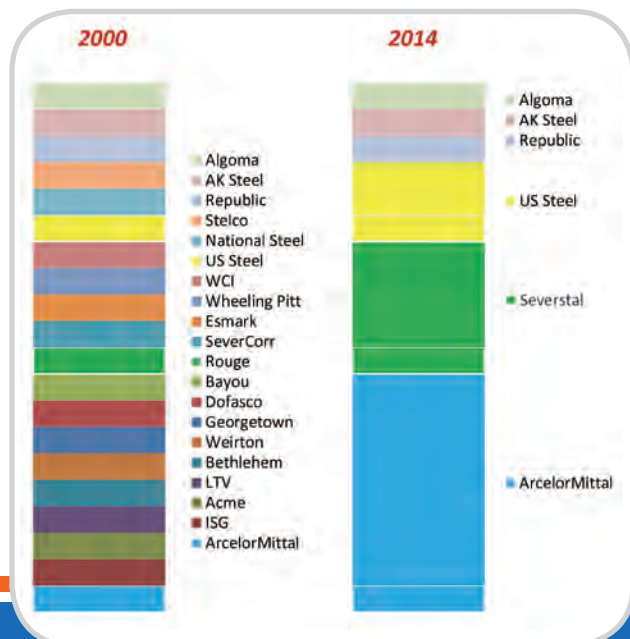
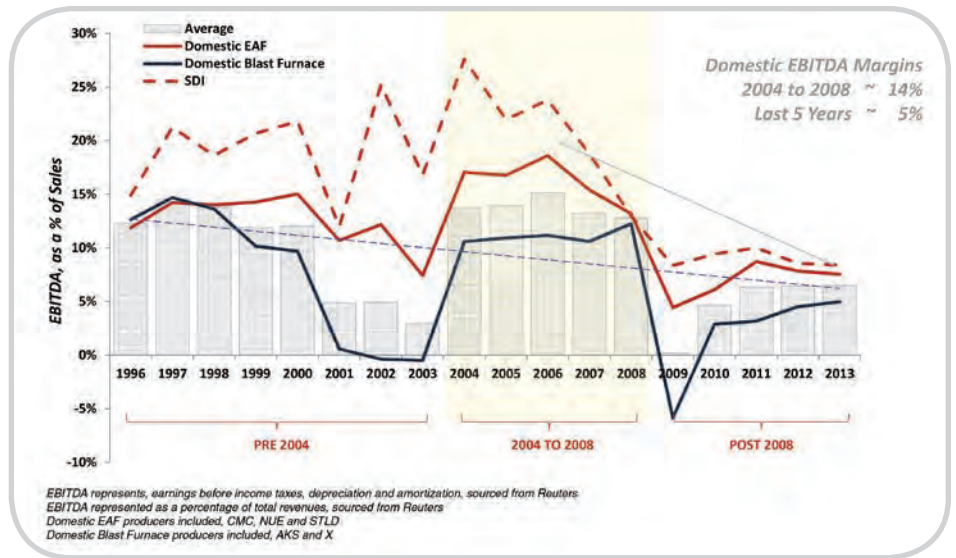


Figure 3
Blast furnace consolidation. Half of the top 10 steel producers today are international with global networks, compared to only one producer in 2000.

Figure 4
A strong market environment existed in the U.S. from 2004 to 2008.



Integrated Consolidation and Rationalization

Integrated producers have a more difficult situation. They carry the burden of very high fixed costs. Equipment constraints don't allow them to as effectively match production to demand. They just don't have the same flexibility within their current cost structures — and as a result, have shouldered the brunt of the most turbulent time in our collective history. Fewer names remain in this pool.

When we founded SDI in 1993, there were some 55 steel producers. Today, in total, we number just 24 — over half are gone.

During this time, ownership has changed such that half of the top 10 producers have international ownership with global networks (Figure 3). Today, the top three producers collectively represent 70% of the nation's capacity — yet the base

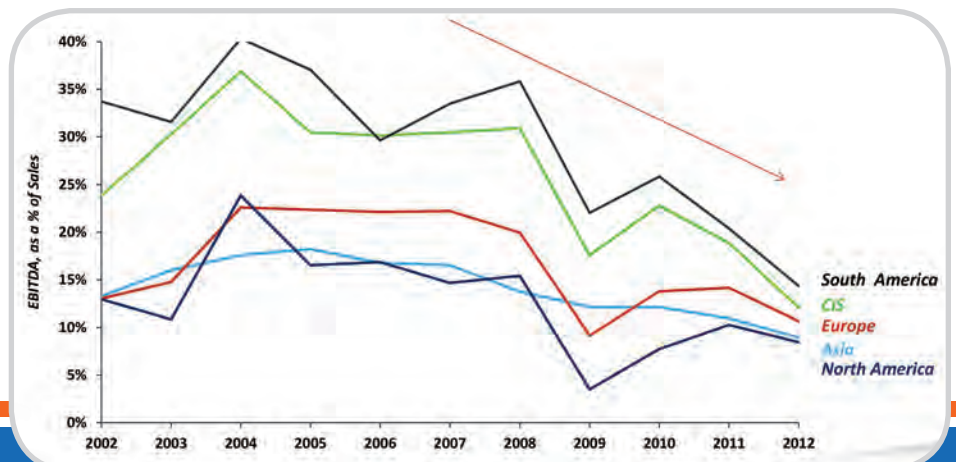
still remains highly fragmented. Further consolidation is inevitable. However, cultural differences between integrated and EAF companies may delay meaningful consolidation.

Industry Track Record

With the explosive growth of China in the mid-2000s, a stronger industry was well-positioned to capitalize on the high levels of utilization and strong market environment from 2004 to 2008 (Figure 4). Profitability levels rebounded, balance sheets improved, further consolidation occurred, stock prices improved.

As we all know, this exuberance screeched to an abrupt halt at the end of 2008 as the financial crisis took hold in America — soon to be followed by world economies. Since that time, although we've recovered from the depths of 2009, steel industry profitability as a whole has not recovered to a sustainable level. For some companies, their

Figure 5
Global EBITDA margins have been declining since the middle of the last decade.



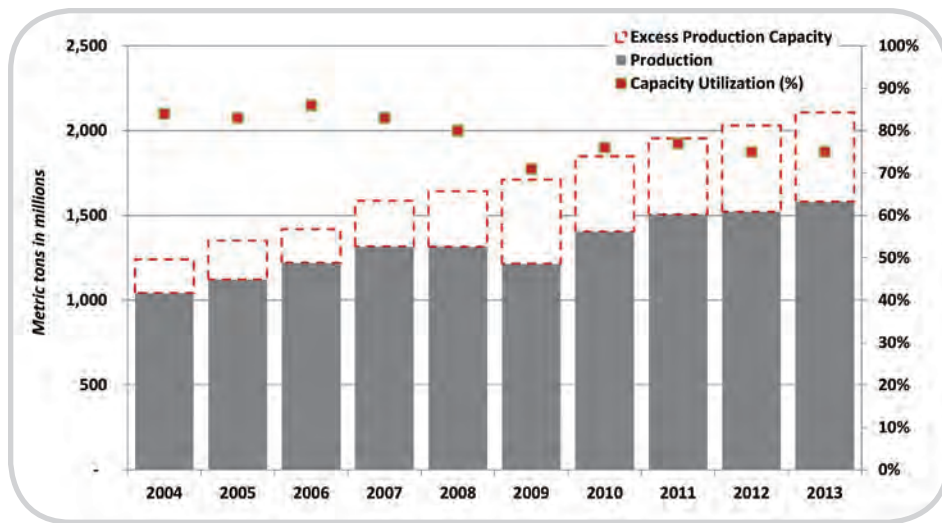


Figure 6
Global overcapacity.

margins are in fact at levels similar to those that drove bankruptcies during the early 2002–2003 timeframe.

Global Margins

Declining margins have not only been a reality for U.S. steel companies. As you can see, global industry margins have also been steadily declining since the last decade (Figure 5).

Our domestic markets are certainly recovering, but there remain a number of market drivers that are creating a headwind to greater profitability — market fragmentation, continued global overcapacity, industry utilization rates and margin spread volatility.

Global Overcapacity

Globally, steel production capacity has been growing exponentially in recent years — driven

principally by China (Figure 6). Capacity growth has outpaced demand for many years. With the more recent deceleration of economic growth in China, and other world economic weakness, some 400 million tons or more of overcapacity exists. To put it in perspective, this overcapacity represents about four times the American industry’s total production capability, and it will take some time to be absorbed.

Imports

This obviously promotes an environment of import pressure for America — a specter that has been with us for some time.

Some steel products are impacted more than others, but historically, imports have structurally remained at around 23% of domestic consumption, and I would not expect a significant change going forward (Figure 7).

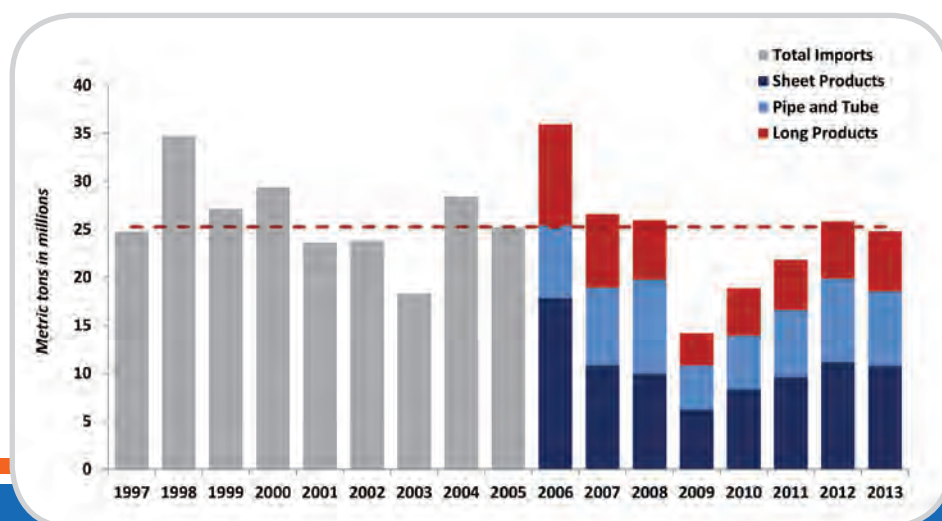


Figure 7
U.S. steel imports, excluding semi-finished products.

Figure 8
Reduced domestic utilization
combined with reduced
demand.

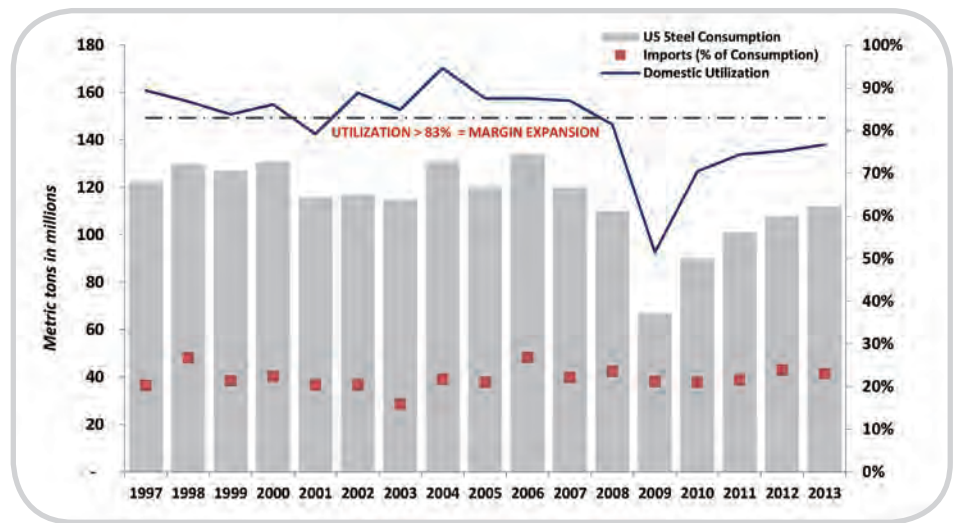
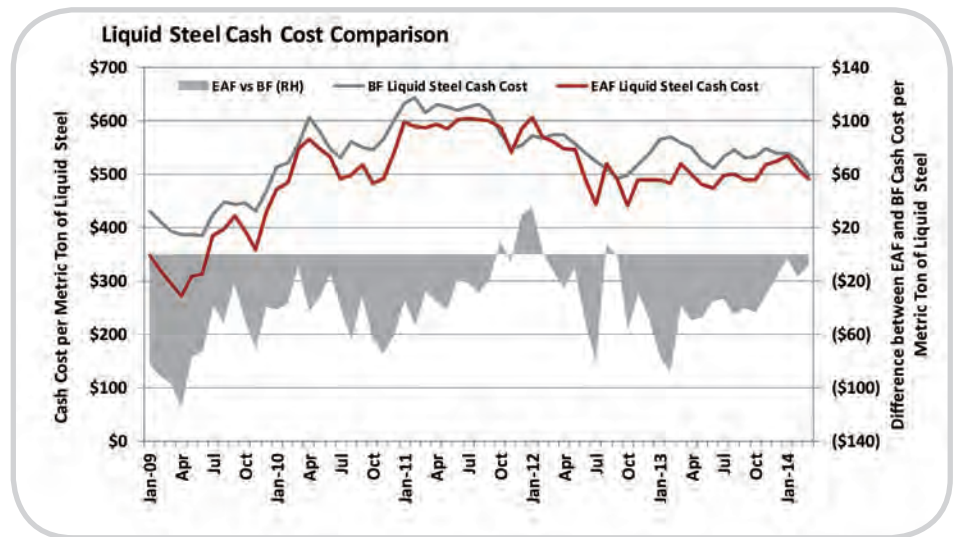


Figure 9
EAF vs. blast furnace raw
material balance.



We seem to be in a cycle. Domestic steel prices rise, the spread to global pricing expands, imports spike and domestic pricing turns over. Not a dramatic change from the past, but a cycle that has become more frequent and will be a pricing headwind for the near future.

Although perhaps beyond our individual influence, we still compete against unfairly traded products facilitated by foreign subsidies, currency manipulation and unfair trade practices. The playing field should be level for all participants. The current and past administrations have been reluctant to take needed, timely action to ensure global competitors adhere to well-established trade laws. We all need to make our voices heard!

Utilization

Imports are also inhibiting the expansion of domestic production utilization — which has recently been stalled around 76–78% (Figure 8).

Although improving, a much stronger residential and non-residential construction recovery is needed to drive utilization toward 85% — a level at which lead times start to “stretch out” and appreciable margin expansion occurs.

EAF vs. BOF Cost Competitiveness

More recently, movements in certain raw material prices have reduced the competitive cost positions of the electric furnace producers relative to the integrated route. Blast furnace raw material

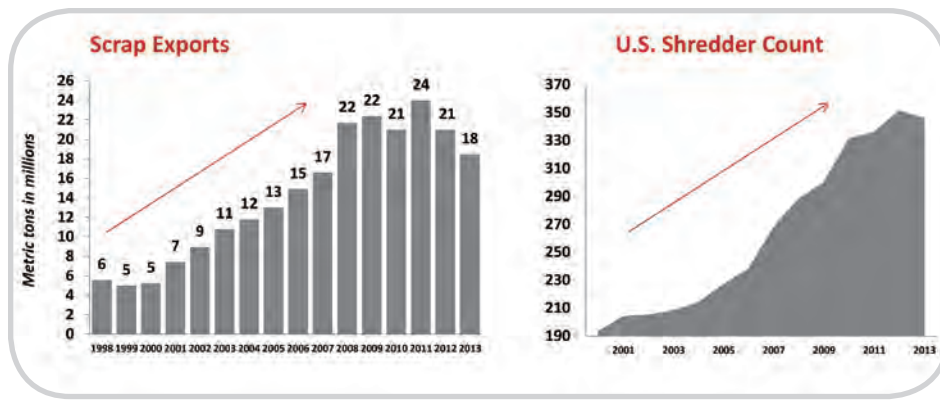


Figure 10
U.S. scrap market dynamics.

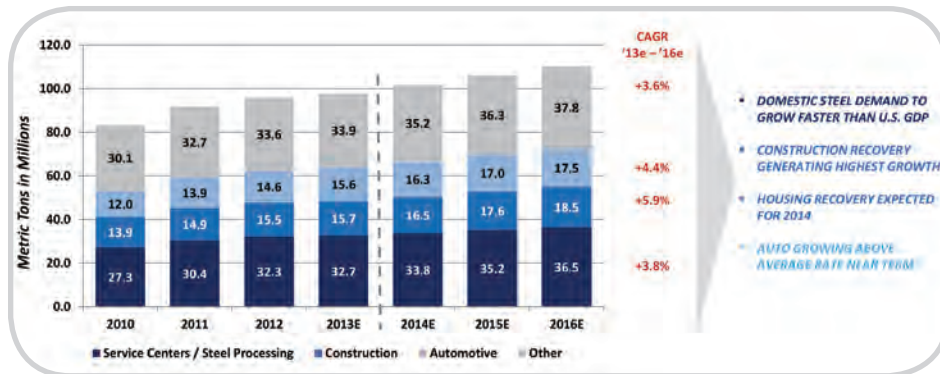


Figure 11
Steel demand positioning for growth: major U.S. end market steady growth.

costs — iron concentrate and coking coal — have decreased at a sharper rate than scrap, momentarily compressing the EAF advantage in hot metal cost (Figure 9). However, I believe this is short-lived because of an expected reduction in scrap prices over the longer term. The efficiency of the EAF producer’s downstream operating costs for value-added products still remains significantly more competitive.

Scrap Market

The metals recycling industry has been challenging. A prolific growth in U.S. shredder capacity competes with the export market for a limited reservoir of unprocessed, obsolete scrap (Figure 10).

This fierce competition drives up procurement costs and compresses profitability margin for recyclers. It is probable that, with time, there will be some rationalization in this industry because many of the smaller shredders currently lack sustainable cash flows. Also, a strengthening dollar will give resistance to the export market and, coupled with the introduction of forecasted DRI supply, scrap prices should experience downward

pricing pressure. This will bring the historical correlation between scrap and iron ore back in line — re-establishing the strong hot metal cost advantage to the EAF producer.

So, there are plenty of challenges, but despite these headwinds, I am confident our industry is positioned for growth.

Steel Demand

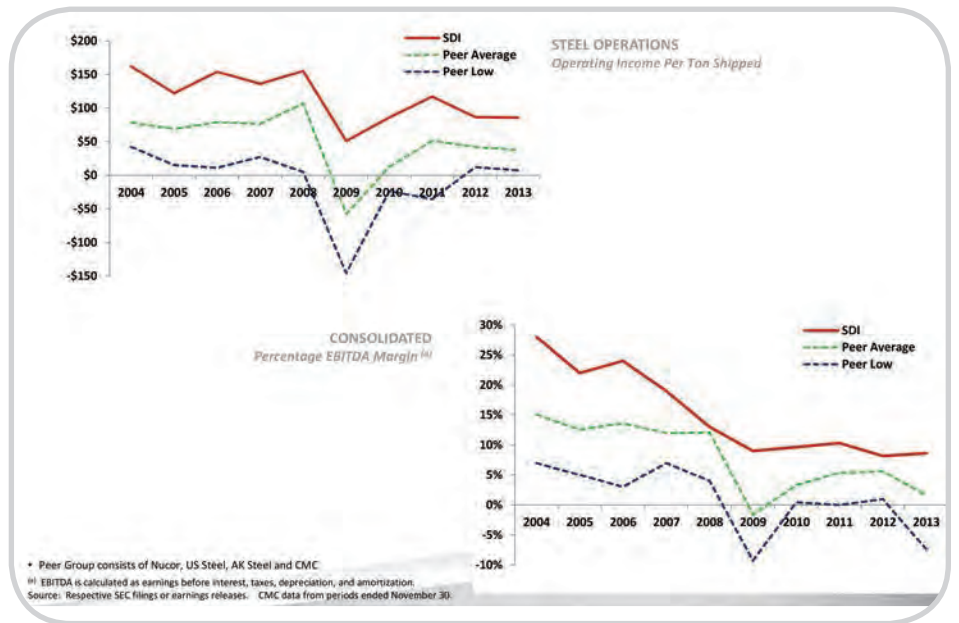
Fortunately, America is leading the world out of the financial doldrums, and our economy is recovering (Figure 11).

Presently, automotive is very strong and will be for some time to come. Manufacturing has regained strength.

Residential and non-residential construction is improving and is the key to driving industry utilization higher — to provide much-needed margin expansion.

Longer term, I believe our future has great opportunity.

Figure 12
Steel Dynamics Inc. culture
differentiated: steel operations
(left) and consolidated (right).



Non-service GDP is anticipated to grow at 5%, stronger than the 2.5–3% projected for the overall economy.

As economies improve, the cloud of uncertainty will lift and companies will put their considerable cash reserves to work, capitalizing on the low interest rate climate. This will drive fixed asset investment, which is a fundamental driver of the steel industry.

The shale gas phenomena will drive America toward energy independence — once again creating a robust economy that will expand steel demand as companies relocate and create new opportunities in the U.S., necessitating fixed asset investment, including the rebuilding of our nation’s infrastructure.

The U.S. is the only mature economy that is actually “steel short” — meaning, when this growth occurs and steel is needed, we do not have enough domestic steel capacity to meet the need.

It’s reasonable to expect production utilization to be higher in this environment. This will drive increased profit margins — great news for all of us in the long term.

However, we must remember, the steel industry is still — and will continue to be — cyclical. So how does a company navigate rough times?

When many of the mentioned challenges may be out of our direct control, what’s left? When the playing field is much the same for all of us, why then is there such a disparity in financial performance between companies? What steps are needed for companies to “thrive?”

Well, one should not just manage to hope, but take destiny into your own hands!

SDI Differentiated

Certainly, specific circumstances are different for each company, but I can speak for what has worked at Steel Dynamics.

I believe many of the things we do can be applied to many companies, in many industries — not just steel.

I tell our team that it’s easy to make money and outperform our peers in the steel business — we just need to do three things right:

- First, average raw material input costs need to be lower than the competition’s. The symbiotic relationship and strategic positioning between our steel and scrap operations helps accomplish this (Figure 12).
- Second, average selling prices for our products need to be higher than the competition’s. Over the years, we have intentionally grown

- **SAFE**
- **STRATEGIC**
- **ENTREPRENEURIAL & INNOVATIVE**
- **ADAPTIVE & RESPONSIVE**
- **PASSIONATE & LOYAL**
- **ETHICAL & SOCIALLY RESPONSIBLE**
- **PERFORMANCE-BASED COMPENSATION DRIVEN**
- **EMPLOYEE OWNERSHIP, EQUITY COMPENSATION**

a diverse portfolio of value-added products across different market sectors. We focus on creating value for our customers, developing market niche opportunities that insulate us from imports and exploring new markets. This has allowed us to sustain higher production utilization rates throughout market cycles, and generate greater profitability.

- And third — centric to all we do — and the key driver of our success, we must have the lowest cost operating culture. Having state-of-the-art facilities producing quality products is important.

But it's not technology alone that drives success — you need a passionate culture in which to exploit it. The right people in the right place will be your greatest asset. They are the backbone of a quality organization and are the force that creates and sustains value for the company, the customer and the shareholder alike.

A clear example is our purchase of the former Qualitec SBQ mill. We purchased the comparatively new mill out of insolvency for US\$45 million. They had invested some US\$400+ million in the facility. It had continually lost money and had never come close to reaching half of its designed capacity.

We had a team in place in six months, the mill became profitable shortly thereafter and has become one of the most efficient engineered bar mills' in the country. Same bricks and mortar... just different culture.

Figure 13

Steel Dynamics Inc. culture: ownership, accountability, purpose, impact.

A passionate, safe culture in which each employee is invested with a sense of ownership, accountability, loyalty and purpose — with the ability to make contributions that have an impact. This is essential. Such a culture will drive efficiency, productivity and success.

I know — easily said!

You can read how to do it in myriad business books. *Good to Great* is an excellent one. Even *The Art of War*, in which Sun Tzu, a famous military tactician, describes his strategy to motivate his armies in 500 B.C. — is impactful. He knew how to motivate his men and build a conquering army, catering to their needs, sharing in the spoils of war — probably the earliest form of profit sharing!

There is nothing new to building a great team. Human needs and motivations have gone essentially unchanged for centuries.

It amazes me how so many companies still don't get it! Their prime focus is on the business, not on their people. People drive success. A passionate culture has the potential to provide the greatest financial return — and it is free — no CAPEX required.

But it does take quality time and attention of leadership, from the very top down, because the right culture does not just happen. Culture needs to be woven into the fabric of the company, and needs to be reinforced every day.

Figure 14
Open communication led to SDI's foray into the paint line business.



Philosophy

Our philosophy is simple. But execution is critical, and is reliant on our leadership at all levels. They must appreciate it, breathe it and live it.

- Build a mutual respect and trust for each other, a respect and trust among employees, and between employees and management.
- Treat people fairly and equitably.
- Listen to them.
- Include them.
- Empower them.
- Minimize management and bureaucracy. Having layers of management suffocates clear communication, builds barriers and slows decision-making.
- Drive decision-making down to those who know what is really going on. It empowers the individual, evoking a sense of ownership and pride. While allowing autonomy, one must allow for mistakes while fostering accountability.
- Communicate.
- Share information openly. If they don't know the cost of specific materials or the relative profitability of the products, how can they make great decisions?
- Listen to their concerns and ideas, and respond quickly to them.

Paint Line

Several years ago, the open employee dialogue born of building respect, listening and empowering led us into the paint business — one of our most profitable product lines.

An exit-end galvanizing line operator asked, “What happens to the steel we are consistently — month after month — shipping to two certain customers?” It initiated a trip — a very profitable trip to a certain toll coater!

Upon entering the parking lot of this company, I knew we would get into the business. I counted 83 cars in the parking lot — and that was just day shift. Incidentally, that company doesn't exist today.

Drive Innovation — “Continually Challenge the Status Quo”

A perfect example is our diversification into rail. Dick Teets was the primary architect. We differentiated ourselves by producing 320-foot lengths, compared to 80-foot lengths produced by our domestic competition. We further weld these into 1,600-foot strings, creating great value for our customer. A further step was the innovation of new technology by one of our young engineers to produce head-hardened rail that will appreciably grow our market share (Figure 15).

Without the right culture, the creativity and ingenuity of an otherwise talented team cannot be harnessed.



Figure 15
Innovation: Premium, long rail.

So, What Do We Do?

- We pledge a safe work environment and strive toward zero incidents — no accidents, no lost work days, no injuries.
- We expect superior performance, rather than being surprised by it. We strive for excellence in all we do. My personal preferred definition of a great leader is “one who leads others to places they would not otherwise go alone.”
- It is amazing what can be accomplished by a team of positive, passionate people when the bar is set high enough.
- We reward people in lockstep with the prosperity of the company.
- Strong performance-driven incentives.
- Profit sharing/equity grants to build ownership.
- We care — compensation aside, you must show that you care for your people. It’s essential to provide for their welfare and security. Often, it’s the smallest detail that will turn an employee into your most faithful advocate or your eternal critic.

Culture + Strategy = Prosperity

Some say “Culture eats strategy for lunch.” Well, I’m not sure I totally agree, but I am sure of one thing: a healthy culture that creates a passionate team with an incredible esprit de corps, coupled with sound strategy, is invincible...and will drive prosperity for all.

Thank you. ◆

