

STEELIE AWARDS 2016

Introduction



The Steelie Awards recognise member companies or individuals for their contribution to the steel industry over a one-year period.

This year's winners were announced at the 7th Steelie Awards ceremony at the 50th worldsteel conference in Dubai, UAE on 10 October 2016. The trophies, known as Steelies, were awarded in seven categories. The nominated projects are detailed in this document.

The selection process for nominations varies between awards. In most cases, nominations are requested via the appropriate membership committee and the worldsteel extranet. Entries are then judged by selected expert panels using agreed performance criteria. Journalist of the year and Industry communicator of the year are selected by direct vote.

STEELIE AWARDS 2016 CATEGORIES

Nominations and winners

1. Steel industry website of the year

- [thyssenkrupp AG \(www.thyssenkrupp-steel-europe.com/en\)](http://www.thyssenkrupp-steel-europe.com/en)
- POSCO (www.posco.com)
- Salzgitter AG Stahl und Technologie (www.salzgitter-ag.com)
- Tata Steel Europe (www.tatasteeleurope.com)
- voestalpine AG (www.voestalpine.com/group/en)

2. Innovation of the year

- **JSW Steel Limited for the development of advanced high strength automotive steels with speed and innovation**
- JSW Steel Limited for converting granulated blast furnace slag into sand
- Hesteel Group Co., Ltd. for R&D of high carbon tool steel thin slab continuous casting and rolling process

3. Excellence in sustainability

- **Hesteel Group Co., Ltd. (Tangsteel) for urban recycled water as the only water source in iron and steel production**
- ArcelorMittal for extending the lifecycle of steel – sheet piles in a circular economy
- Ternium for the development of a sustainable industrial centre in Pesquería, Mexico

4. Excellence in Life Cycle Assessment

- **thyssenkrupp Steel Europe for the implementation of LCA to assess the potential environmental performance and recyclability in their product development process**
- Erdemir Group for the use of LCA to develop the greenhouse gas emissions monitoring system in Turkey
- POSCO for using LCA with customers to identify the environmental and business benefits of their advanced product portfolio in Korea
- Tata Steel India for the use of LCA to demonstrate the environmental benefits of having a high resource efficiency mining process

5. Excellence in education and training

- **Tenaris for their 'Development Maintenance Programme'**
- ArcelorMittal for their 'Safety Training Programme' including safety leadership training and take care programme
- Nucor Corporation for their leadership in financial management training
- Tata Steel Europe for their 'Graduate Development' programme
- Ternium for their 'Fundamentals of Supervisor's Role' programme

6. Journalist of the year

- **Vera Blei, Metal Bulletin**
- Henry Cooke, Platts
- David Fickling, Bloomberg
- Yang Kai, China Metallurgical News
- Michael Pooler, Financial Times

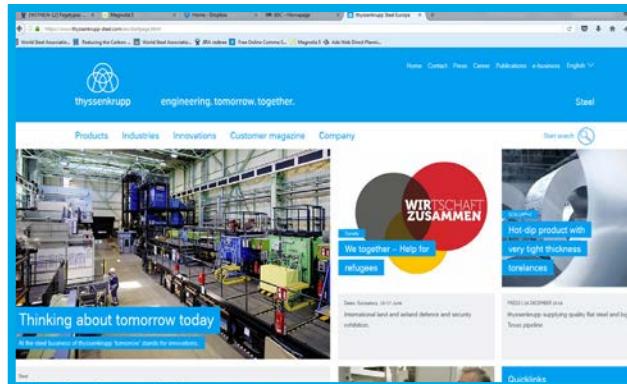
7. Industry communicator of the year

- **Naveen Jindal, Chairman, Jindal Steel and Power Limited (JSPL)**
- Wolfgang Eder, Chairman & CEO, voestalpine AG
- Ohjoon Kwon, CEO, POSCO
- Zhenjiang Liu, Secretary General, China Iron & Steel Association (CISA)
- Alexander Mohr, Secretary General, APEAL

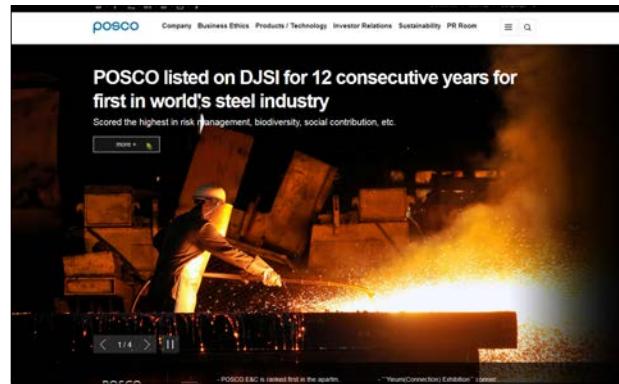
The 2016 Steelie Award Winners are highlighted in blue.

INDUSTRY WEBSITE OF THE YEAR

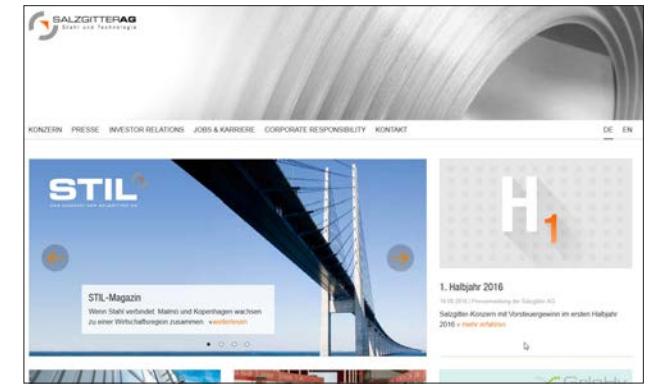
Nominations and winner



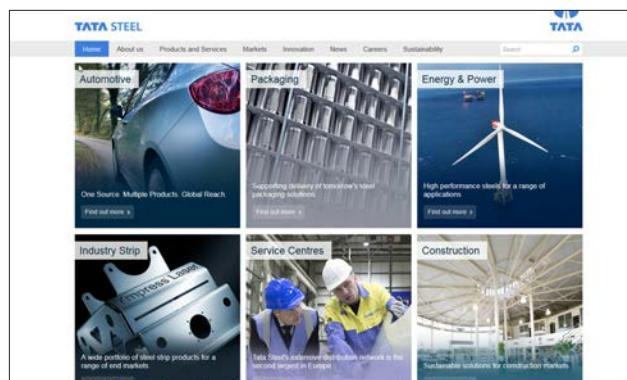
WINNER: thyssenkrupp AG
www.thyssenkrupp-steel-europe.com/en



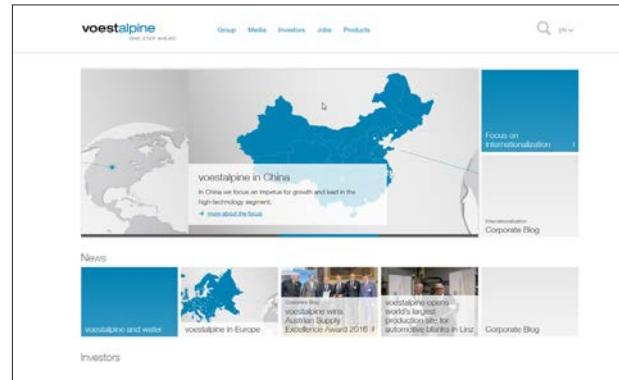
NOMINATED: POSCO
www.posco.com



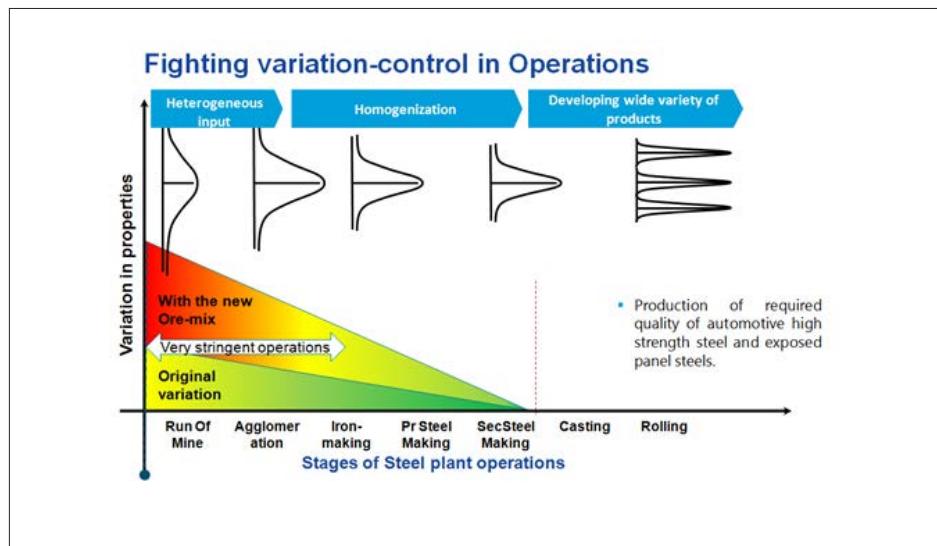
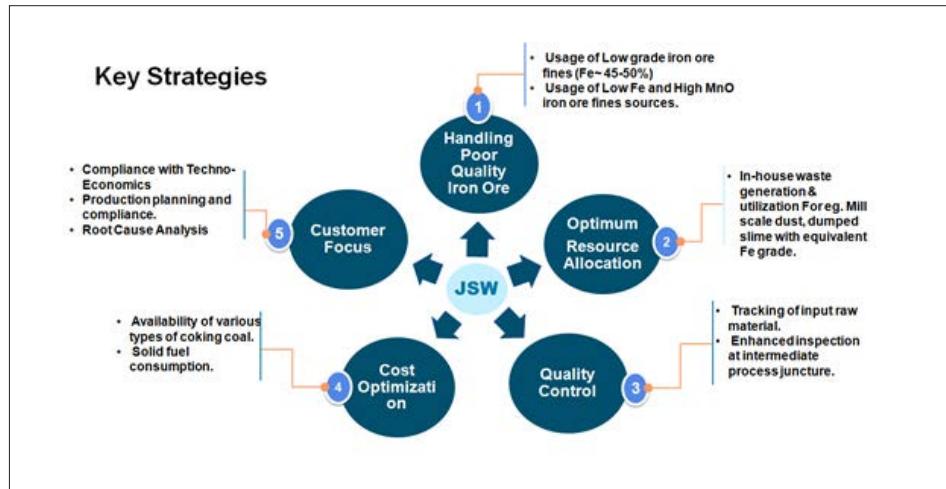
NOMINATED: Salzgitter AG Stahl und Technologie
www.salzgitter-ag.com



NOMINATED: Tata Steel Europe
www.tatasteeurope.com



NOMINATED: voestalpine
www.voestalpine.com/group/en



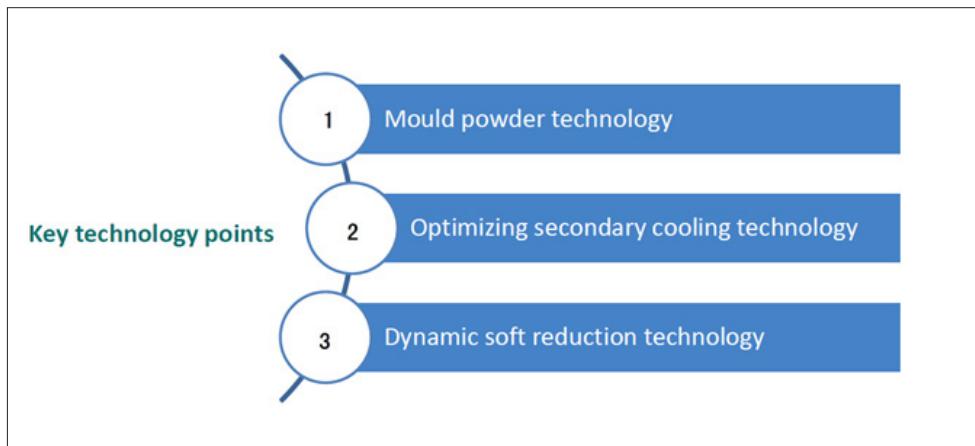
JSW Steel Limited for the development of advanced high strength automotive steels with speed and innovation

In line with the market requirement for high strength automotive steel, a new cold rolling mill with an annual capacity of 2.3 Mt was commissioned in June 2014 at JSW Steel Ltd, Vijayanagar Works. Over the span of just two years (completion FY16), JSW was able to develop the following AHSS (Advanced High Strength Steels) grades:

- Through the continuous annealing line (CAL) route: grades with strengths up to 980 MPa (590Y, 590R, 780Y & 980Y).
- Through the galvanized GA/GI route: grades with strengths up to 590MPa.
- Through the hot rolled flat product route: grades with strengths up to 780 Mpa.

Dual phase grade steels are best suited for automotive body parts such as structural parts, pillars and rails. The average lead time for the development of AHSS grades was 75 days. The second line of grade is the SPFH590 grade with improvements in forming and spot welding. JSW is the first Indian company approved by Toyota and Nissan for this grade. The new line of hot rolled grade with 780MPa UTS is the first of its kind developed in India with high elongation. These grades have a potential application in wheel discs, chassis part and other structural parts.

The biggest challenge was to solve the problem of the variability in quality. This variation was studied and suitable measures were taken to control it within the secondary steelmaking process.

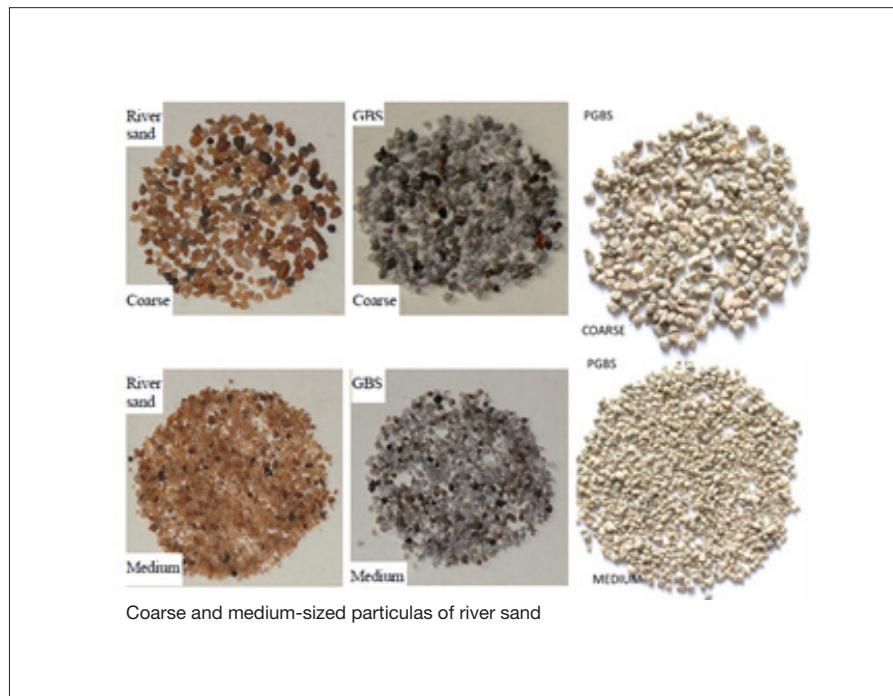


Hesteel Group Co., Ltd. for R&D of high carbon tool steel thin slab continuous casting and rolling process

After three years of R&D in high carbon steel thin slab continuous casting and rolling technology, a series of technical problems were solved and production improvements achieved in the areas of internal quality, surface quality, strip shape quality, as well as stability. The new technology obtained two patents and was implemented on Tangsteel and Hansteel thin slab lines. The thinnest specification of the slab was reduced from 2.0 mm in the traditional process to 1.5 mm.

The advantages of the innovative development of high carbon thin slab casting and rolling process are as follows:

- Enriched product mix and added value to products;
- Decarbonization, hardenability, hardness after quenching and flatness of high carbon steel;
- Thin gauge high carbon strip replacing some of the cold rolled products thus eliminating the cold rolling phase and intermediate annealing and as a consequence: process costs reduced by 80-150¥/tonne, electricity consumption by 145-272kW·h, and user operation time by three days;
- Environmental benefits through energy savings and material efficiency.



Coarse and medium-sized particulas of river sand

JSW Steel Limited for converting granulated blast furnace slag (GBS) into sand

The demand for concrete in India will increase in the coming years. Approximately three-fourths of the concrete market consists of coarse and fine aggregates. Coarse aggregates are currently sourced from breaking large rocks and mountains with long-term environmental impacts. It is estimated that India will consume 3,330 Mt of total aggregates (coarse and fine) in 2015 and 5,075 Mt of aggregates by 2020. With restrictions on mining of river sand and stone crushing, there has been a growing need to identify alternative aggregates. JSW Steel has taken the lead on this environmental concern and developed processed granulated blast furnace slag as an eco-friendly alternative to river sand. This initiative is the first of its kind in India.

Several tests had been carried out which confirmed that granulated blast furnace slag is inert, non-toxic, free from traditional impurities (i.e. organic impurities, shells, clay) and is similar to an aggregate, chemically. JSW steel has now started working on developing a processing technology for converting GBS into acceptable fine aggregate.

The process started from a simple comparison of a fine aggregate standard requirement and the existing properties of granulated blast furnace slag. Several brainstorming sessions were conducted among researchers, ironmaking, civil and environmental engineers. This led to the development of an innovative processing plan for improving the physical properties of granulated blast furnace slag in two steps: 1/ Altering granulation parameters and 2/ Shaping and screening.



Hesteel Group Co., Ltd. (Tangsteel) for urban recycled water as the only water source in iron and steel production

Tangsteel, the largest water consumer located in an area of water scarcity, has developed the biggest industrial waste water and urban water recycling and treatment centre in northern China.

The capacity of each pre-treatment system is 3,000 m³/h and is now the only source of water for the steel plant. Thanks to this investment, surface and deep well water no longer need to be extracted, the plant achieves zero water discharge and all urban waste water is treated and recycled.



ArcelorMittal for extending the lifecycle of steel – sheet piles in a circular economy

ArcelorMittal has implemented a rental business model for its steel sheet piles portfolio that allows both customer and the environment to benefit from renting and reusing these products, thereby reducing project costs as well as emissions from production.

This enables the promotion of steel as the material of choice for earth and water retention in sustainable construction projects in a circular economy.

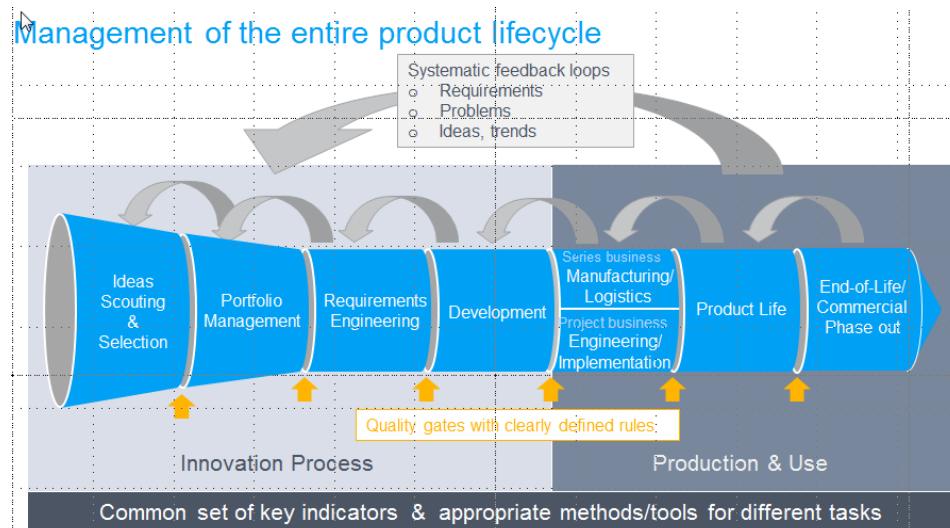


Ternium for the development of a sustainable industrial centre in Pesquería, Mexico

Ternium has made a fully sustainable concept reality with an industrial centre in Pesquería (50 km from Monterrey, Mexico). To ensure the balance between industrial development, the environment and society, Ternium developed an ecological conservation and wildlife management programme from inception in 2009, implemented Best-Available-Technologies to meet ambitious emission goals, and created a new technical school for the local community. It has also stimulated the building of new roads, infrastructure and further economic development – including automotive and railway manufacturing.

EXCELLENCE IN LIFE CYCLE ASSESSMENT

Steelie Award winner



thyssenkrupp Steel Europe for the implementation of LCA to assess the potential environmental performance and recyclability in their product development process

Steel is an innovative and sustainable material and its recyclability is one of its core properties. Novel innovative steel grades facilitate new and advanced applications. thyssenkrupp Steel Europe implemented an LCA approach into their new stage-gate procedure in the product development process. Working with customers and/or internal colleagues, LCA has been used in the product development phase to ensure that all new innovations are assessed regarding their environmental impacts and their recyclability. Hereby, it is ensured that the advantages of steel in new products are maintained and environmental risks minimised.

Integrating environmental criteria into a stage-gate process is an important step for thyssenkrupp. All new products now undergo an environmental screening phase. Products which have specific attributes that might cause higher environmental impacts or limit the recyclability are identified and can be further analysed and improved. A procedure in the form of a decision tree was developed to enable project managers who are not familiar with the concept of LCA to identify whether a detailed LCA is necessary. Core criteria for the decision tree were identified as the critical alloying content for thyssenkrupp products and relevant steel product categories with average values.

EXCELLENCE IN LIFE CYCLE ASSESSMENT

Nominated project



Erdemir Group for the use of LCA to develop the greenhouse gas emissions monitoring system in Turkey

The monitoring and reporting of greenhouse gas emissions has started in Turkey according to the Regulation on Monitoring of Greenhouse Gas Emissions. The Greenhouse Monitoring Plan of Erdemir and Isdemir were approved by the Ministry; and reporting and verification of greenhouse gases are ongoing.

Erdemir Group has been using LCA as the method to evaluate the environmental footprint of their products, which includes assessing all the impacts associated with producing the steel from raw materials stage. The project helps to identify hidden saving potentials (raw materials, water, energy, cost, recycling of waste, CO₂ emissions etc.).

By using the life cycle approach for calculating CO₂ emissions, the project also provides a different perspective on CO₂ monitoring. The findings of the project can be used to advocate a life cycle approach in up and coming regulation and there is also an advantage to align with the regulation that is already applied in some regions (EU, USA etc.).

EXCELLENCE IN LIFE CYCLE ASSESSMENT

Nominated project



POSCO for using LCA with customers to identify the environmental and business benefits of their advanced product portfolio in Korea

Vehicles and household appliances – renowned as the most widely used energy-based products – claim a significant portion of the total global energy consumption, therefore, POSCO collaborated with domestic manufacturers to improve energy efficiency of gasoline vehicles and household refrigerators. The project aimed to identify both the environmental and economic benefits of using POSCO's high-grade steel and increase the demand for eco-friendly steel.

By using POSCO's AHSS, it was identified that a 130kg weight saving could be achieved per vehicle, which corresponds to an 8.5% reduction of a total vehicle weight. In the case of worldwide sales of POSCO's AHSS in 2015, it would have the potential to save 1.47 billion litres of gasoline, \$1.86 billion of driving cost and 3.16 million tonnes of CO₂ eq. per year. In another case, the compressor motor with Hyper Non-Oriented steel can reduce a refrigerator's electrical consumption by more than 1.2%.

Taking into account product lifetime and sales volumes, this could result in total potential savings of 200 GWh of electricity and more than 90,000 tonnes CO₂ eq., along with significant economic savings.

The project has also helped to create marketing solutions to increase sales of high-grade steels in automobiles and home appliances by about 6-7 %.

EXCELLENCE IN LIFE CYCLE ASSESSMENT

Nominated project



Tata Steel India for the use of LCA to demonstrate the environmental benefits of having a high resource efficiency mining process

Tata Steel Limited, India, implemented a project to evaluate the environmental footprint of their captive mines for both iron ore and coal, from a life cycle perspective. An LCA approach was used to model the iron-ore and coal mining processes, using system expansion to estimate the benefits of useful by-products.

The coal mining process produces clean coal used for coke making. There are 3 major by-products from the coal washing process: middlings, tailings and rejects. These are high ash content (ranging from 40% to 65% dry mineral matter free) carbonaceous materials. Tata Steel's mining operations have high resource efficiency in terms of value added utilization of all the by-products/waste produced (for power generation in the above cases).



The project demonstrates a solid case for evaluating the major processes upstream of steel-making and helps to incorporate the process improvements in the life cycle stages to the end product. Over the full product life cycle, a 2-3% improvement (compared to using average upstream datasets) in Global Warming Potential has been identified as a result of high resource efficiency in the captive coal mines.

EXCELLENCE IN EDUCATION AND TRAINING

Steelie Award winner



Tenaris for their 'Development Maintenance Programme'

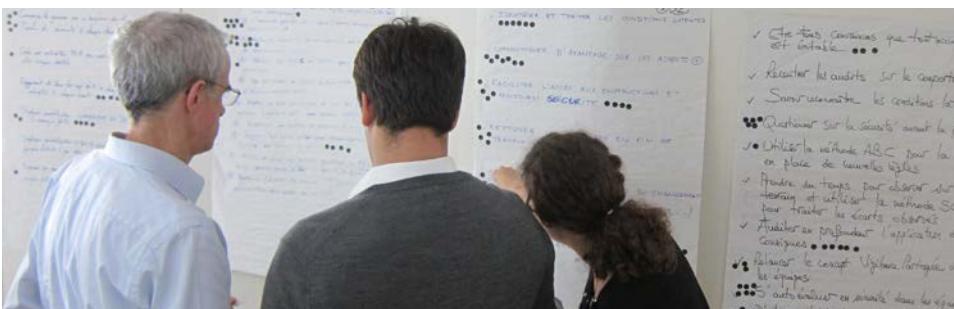
This is a three-year training programme created as part of a long-term development plan for maintenance engineers' new hires.

There are three stages during which all participants gather at a Tenaris mill in Argentina, Mexico and in Italy, attending classroom courses and on-the-job trainings, leading to an international certification by the University of Manchester.



EXCELLENCE IN EDUCATION AND TRAINING

Nominated project



ArcelorMittal for their 'Safety Training Programme', including safety leadership training and take care programme

The safety training programme was created specifically for ArcelorMittal Europe and has two main components:

- Safety Leadership Training for the 11,000 line-managers, a top down approach with a focus on leadership
- Take Care Training for the 60,000 workforce up to supervisory level, a bottom-up approach with the key objectives of following the golden rules of risk recognition, speaking-up and ownership.

The main learning outcome is a stronger safety culture at all levels, which also directly links to a better global business performance.





1 Site Navigation: access to each building

2 Financial Statements: balance sheet, income statement, break even chart and ratios

3 Task List: check tasks to complete each month

4 Main Game Area: the avatar guides the user through the game

5 Business Indicator Bar: These indicators present a quick view of the company's financial status

Nucor Corporation for their leadership in financial management training

An online business game that supports leadership development and business acumen while providing easy access by all worldsteel members to an education and training program based on the following concepts:

- Balance Sheet (Cash, Working Capital, etc.)
- Income Statement (Revenue, Fixed and Variable Costs)
- Depreciation (Strategies for measuring this critical Fixed Cost)
- Cash Flow (Understand the difference between Cash Flow and profit)
- Managing Working Capital
- Margin and Metal Margin

EXCELLENCE IN EDUCATION AND TRAINING

Nominated project



Tata Steel Europe for their 'Graduate Development' programme

Recognising the challenges faced by graduates transitioning from academic to work life, Tata Steel Europe have successfully designed and implemented an effective blended programme, to support current and future graduate populations.

The mix contains several innovative tools and approaches and is integrated within a 70:20:10 framework that really does work. We collaborate with steeluniversity to deliver core knowledge training and provide a mindset shifting 'Transition to Work' course that positions young graduates for their future performance and development challenges.

EXCELLENCE IN EDUCATION AND TRAINING

Nominated project



Ternium for their 'Fundamentals of Supervisor's Role' programme

The "Fundamentals of Supervisor's Role" programme was implemented at a global scale with the aim of transforming the supervisors' mindset through confronting their day-to-day reality with a business vision.

This 40-hour activity is led by the Industrial Director in each region with the participation of Ternium's top management as internal instructors, and emphasizes the expected role of supervisors on the shop floor.

This programme contains some unique learning methodologies that contribute to the application of the contents learnt on the Supervisors' job and creates a culture of change, empowerment and lifelong learning.

JOURNALIST OF THE YEAR

Nominated journalists and Steelie Award winner



- Vera Blei, Metal Bulletin
- Henry Cooke, Platts
- David Fickling, Bloomberg
- Yang Kai, China Metallurgical News
- Michael Pooler, Financial Times

Winner 2016: Vera Blei, Metal Bulletin

INDUSTRY COMMUNICATOR OF THE YEAR

Nominations and winner



Wolfgang Eder
Chairman & CEO
voestalpine



Ohjoon Kwon
CEO
POSCO



Naveen Jindal
Chairman
Jindal Steel and Power
Limited (JSPL)



Zhenjiang Liu
Secretary General
China Iron and Steel
Association (CISA)



Alexander Mohr
Secretary General
Appeal



Winner 2016:
Naveen Jindal, JSPL

worldsteel
ASSOCIATION