



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

The selection process for nominations varies between awards. In most cases, nominations are requested through the appropriate membership committee and worldsteel's 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.

This publication lists the companies or individuals shortlisted for the Steelie Awards 2017 and the winners. It also provides a summary of the projects.

The winners were announced at the 8th Steelie Awards ceremony during the worldsteel General Assembly in Brussels, Belgium on 16 October 2017. The trophies, known as Steelies, were awarded in seven categories.

STEELIE AWARDS 2017

Nominations and winners

Steel industry website of the year 3

- British Steel (britishsteel.co.uk)
- Qatar Steel Company (Q.S.C.) (qatarsteel.com.qa)
- **Tata Steel Limited (tatasteel.com)**
- thyssenkrupp AG (thyssenkrupp.com/en)
- voestalpine AG (voestalpine.com/group/en)

Innovation of the year 4

- HBIS Group Co., Ltd.: Research and application of waste heat on-line water quenching technology on 100-metre rail
- **POSCO: Deep learning technology for innovating steel manufacturing processes**
- Jindal Steel and Power Limited: Conversion of an existing electric arc furnace to a Neo Electric oxy furnace
- JSW Steel Limited: Development of Advanced High-Strength Steel (AHSS) for automotive steels and superior grade of electrical steel
- voestalpine: Highly efficient inline bonded electric motor cores for e-mobility

Excellence in sustainability 9

- Acindar Grupo ArcelorMittal and Techint Group: Steel reuse for the conservation of jaguars
- **ArcelorMittal Tubarão and Usiminas: Paving rural roads in Brazil with steel by-products**
- China Baowu Steel Group Corporation Limited: Renewable energy in steelmaking

The 2017 winners are highlighted in bold.

Excellence in Life Cycle Assessment 12

- Baotou Iron & Steel (Group) Co., Ltd: Use of LCA to support eco-design and environmental improvement throughout its supply chain
- JSW Steel Limited: Use of LCA to reduce the carbon and water footprints of its operations
- **Tata Steel Europe: Creation of an Environmental Product Declaration Programme**
- Tata Steel India: Using LCA to support its customer on their new product's LCA study

Excellence in education and training 16

- HBIS Group Co., Ltd.: Online training platform
- **Nucor Corporation: Training to eliminate serious injuries and fatalities**
- Tata Steel Europe: Learning on project, change and safety management
- Ternium: Collaboration with The University of Sheffield to deliver the degree programme 'Master in Advanced Metallurgy' in a blended learning format

Journalist of the year 20

- Thomas BIESHEUVEL, Bloomberg
- Diana KINCH, Platts
- Tomoya ONISHI, Nikkei Asian Review
- **Michael POOLER, Financial Times**

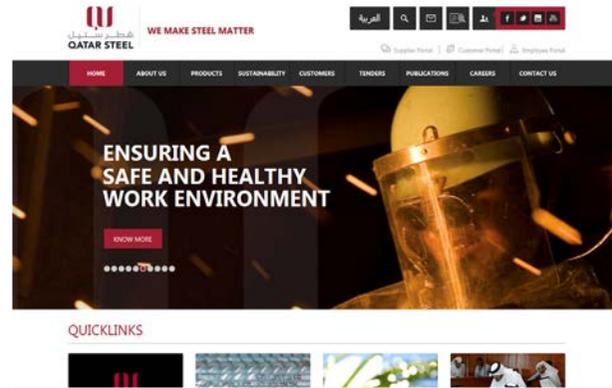
Industry communicator of the year 21

- Naveen JINDAL, Chairman, Jindal Steel and Power Limited
- Ohjoon KWON, CEO, POSCO
- **MA Guoqiang, Chairman, China Baowu Steel Group Corporation Ltd.**
- Daniel NOVEGIL, CEO, Ternium

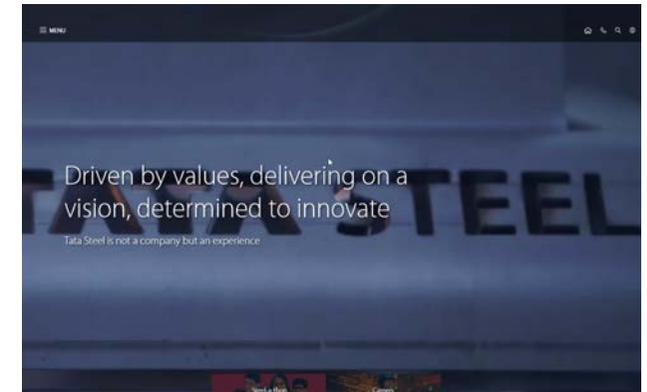
STEEL INDUSTRY WEBSITE OF THE YEAR



British Steel
britishsteel.co.uk



Qatar Steel Copmany (Q.S.C.)
qatarsteel.com.qa



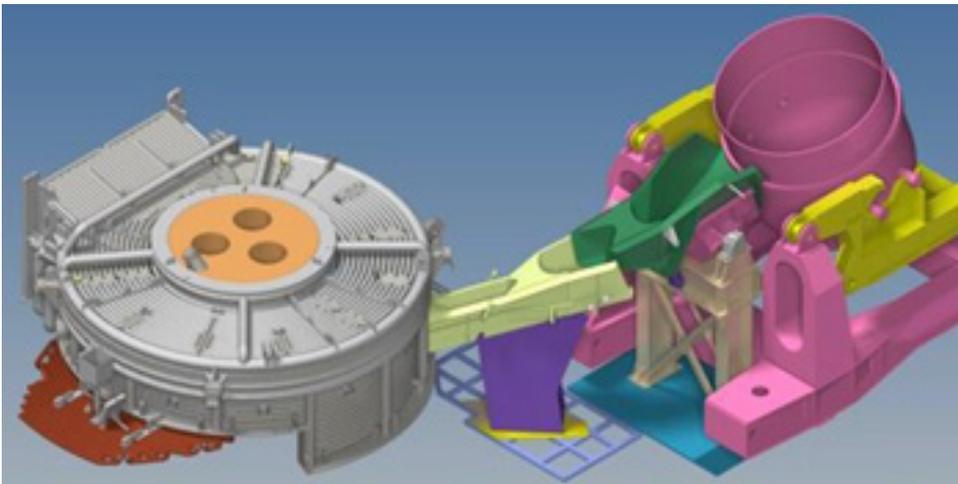
Tata Steel Limited (winner)
tatasteel.com



thyssenkrupp AG
thyssenkrupp.com/en



voestalpine AG
voestalpine.com/group/en



Jindal Steel and Power: Conversion of an existing Electric Arc Furnace to a Neo Electric oxy furnace (NEOF)

At Jindal Steel and Power, the conversion of an existing Electric Arc Furnace to a Neo Electric Oxy Furnace (NEOF) resulted in the saving of huge amounts of energy (0.161 Gcal/t CS) and corresponding emissions reduction.

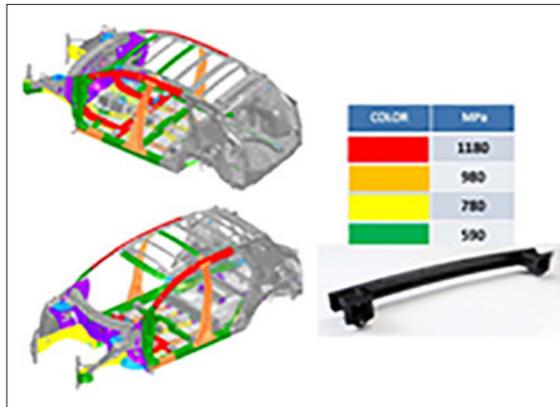
The advantages of NEOF are as follows:

- Low capital as well as time investment in comparison to BOF
- High productivity
- High yield
- Zero power for melting
- Zero electrode consumption
- Less refractory and flux consumption
- Less slag generation

These advantages result in lower conversion cost of steel and ultimately reduce steelmaking cost substantially. Compared with the ordinary EAF steelmaking route, a difference in cost of 1200 Rs/tonne (approx.) has been achieved, which corresponds to approx. 6 – 7 % of the total steel price.

Key highlights of the project:

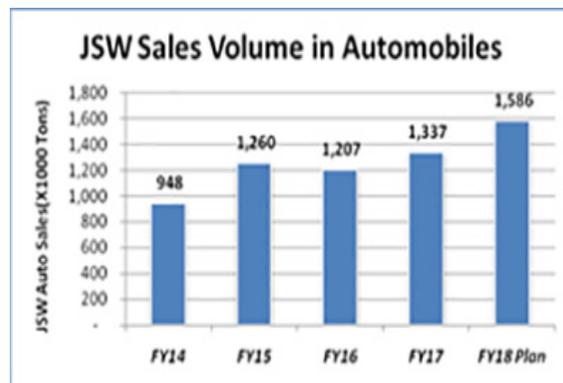
- Record commissioning time of 10 days only
- Benchmarking production of 42 heats in a day
- Record average tap-to-tap time of 34 minutes
- Excellent yield (LM) figures: 89.5 – 90 %.



JSW Vijayanagar: Development of AHSS for automotive steels and superior grade of electrical steel

JSW Steel Vijayanagar Works already had the capability to supply high strength DP grades of up to 980 MPa. The major challenge was to develop, stabilise and scale up these grades with shorter lead time and consistent quality to become the first choice for the Indian automotive market. The design and development of AHSS 1200 MPa and TRIP assisted 800 MPa grades available for the first time in India had the following restrictions:

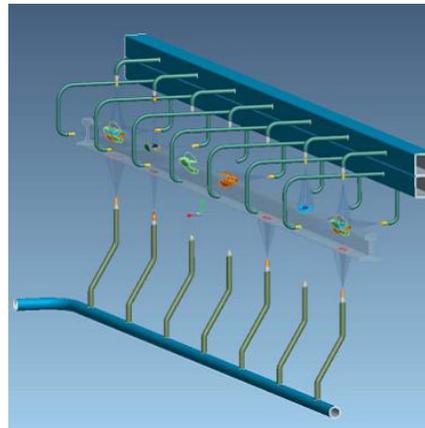
1. Reducing Sulphur (S) level ≤ 30 ppm in final product
2. For TRIP steel, difficulty associated with casting high C-Mn-Si grades
3. Controlling the high rolling load at hot and Cold rolling stage for AHSS material
4. Stabilising the welding parameters for joining AHSS coils due to high carbon levels
5. Achieving high cooling rate at the existing Continuous Annealing Line to achieve desired low-temperature transformation phase.



To develop superior electrical steel grades, there were also many challenges to overcome.

Innovation:

- Design and Development of AHSS 1200 MPa steel grade with consistent quality & shorter lead time.
- Development of TRIP assisted 800 MPa grade with excellent drawability and surface property
- Development of AHSS Dual Phase Coated Steel with yield strength > 780 MPa.
- Development of high end electrical steel grades like, 35C270 and 50C350 with reduced watt loss of < 2.7 W/kg.
- These grades are produced for the first time in India, from an integrated steel plant with the shortest lead time.



HBIS: Research and application of waste heat on-line water quenching technology on 100 metre-rail

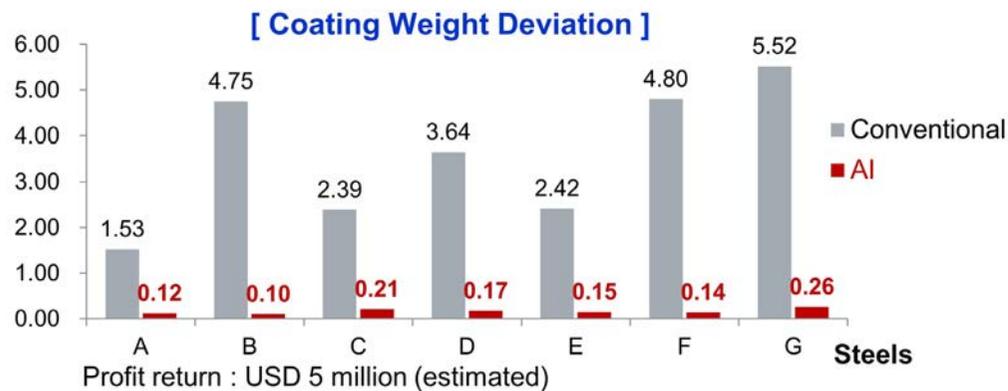
HBIS Hansteel has developed a waste heat treatment process combining rail line facility characteristics and standard requirements. The technology focuses both on rail performance and the straightening process. The product, a 100-metre rail, meets Chinese, European and U.S. standards.

Without changing the chemical composition of the rail, a technological method is adopted to improve the strength and plasticity performance and achieve good overall performance. Using a waste heat online quenching instead of reheating process, it greatly saves on fuel consumption, reduces the production period by at least 2 days and increases productivity.

Compared with off-line heat treatment technology, the online heat treatment technology eliminates the reheating process, which directly saves the cost of energy consumption of 83.63 CNY per tonne of steel rail. It saves 121.2 kg CO₂ emissions per tonne of steel rail; 71.45 kwh power per tonne of steel rail; 0.13 tonne of softened water per tonne of steel rail and 97 m³ of compressed air per tonne of steel rail.

The project was completed in June 2017 and can mass-produce heat treated rail. With the technology of waste heat on-line quenching, HBIS have already produced the following types of steel grades: 54E1, 60E1, 60E2, R350HT, R350LHT, 50kg/m, 60kg/m, 75kg/m, U71Mn, U75V, 115RE, and so on.

Results Performance of coating control is improved
84% → **99% (AI)**

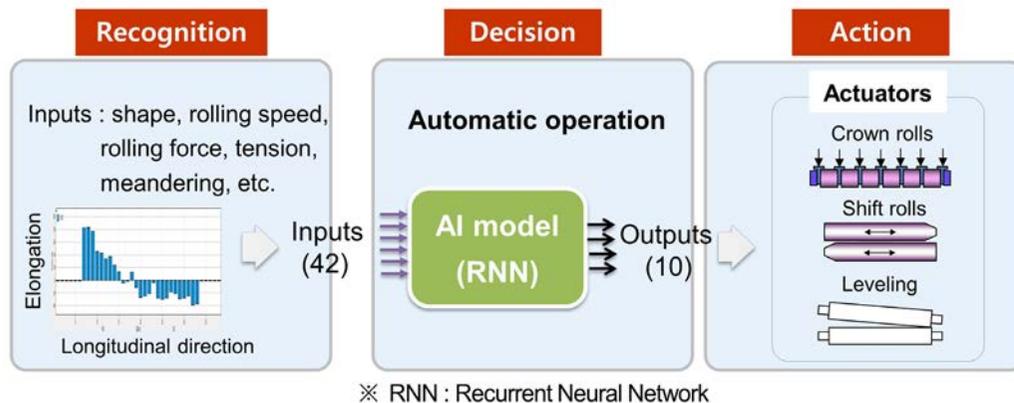


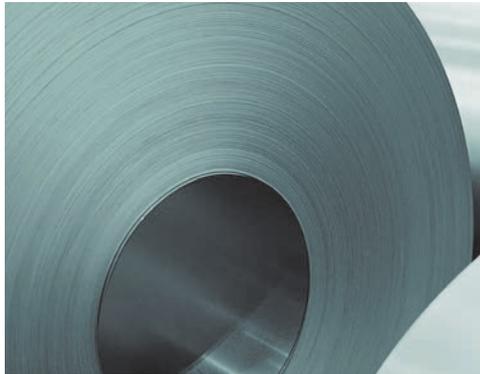
POSCO: Deep learning technology for innovating steel manufacturing processes

A new approach of Artificial Intelligence (AI) has been applied on various steel manufacturing processes by combining AI with long-term experience and know-how accumulated in human operators. As a result, POSCO has successfully developed three Deep Learning Technology for Steel Works:

- Coating Weight Control on Continuous Galvanising Line (CGL):** The deviation of coating weight has been drastically reduced by using AI to precisely control the CGL (Continuous Galvanizing Line), the primary technology used in automotive steel sheet production. The automated control technology with AI predicts the coating weight in real time and accurately meets the target coating weight by controlling the variables for the air-knife Zn cutting system.
- ZRM Operation:** Human operators can bring about large deviations of strip quality. AI has imitated human operating skill on the ZRM (Sendzimir Rolling mill) using datasets consisting of process status variables and operator action data. The model used is the RNN (Recurrent Neural Network), a technique primarily used to recognise time series data.
- Hot Metal Temperature Prediction in Blast Furnace:** Blast furnaces have been operated manually by human operators with more than 20 years working experience, working in 4 shifts. As a result, there are variations depending on the operators and the method of operation. To acquire meaningful data, POSCO has developed smart devices that indicate the particle size of coke and ore, their moisture ratio, and tuyere combustion state by using deep learning. With this solution, the one-hour ahead prediction accuracy of hot metal temperature achieved is 99%.

Automatic rolling concept based on AI for ZRM





voestalpine: Highly efficient inline bonded electric motor cores for e-mobility

It has long been known in the steel industry that bonding is the optimal joining process for electrical steel. Yet due to the large manual effort involved in the conventional baking process (such as manual finishing of punched laminations in a baking rig and then removing them), high cost, and inability to handle large volumes, this technology was not widely used (except for prototypes).

voestalpine addressed this problem by developing an innovative organic insulation coating designed for large-scale production of lamination stacks. In combination with an inline-bonding production process, this resulted in a technology that was previously unimaginable. The critical success factor of the technology was the perfect interaction between coating and process—one does not work without the other.

The core aspects of the innovation were developed by utilizing the expertise of both the Steel and the Metal Forming Divisions.

compacore® offers the following benefits:

- Increased efficiency of electric motors. Higher efficiency means less energy will be consumed and carbon emissions will be lowered.
- Full-faced bonding also results in acoustic benefits in the motor. In addition, heat can be better dissipated, which leads to better thermal management.
- Construction advantages make it possible to develop completely new motor designs.
- Mechanical safety elements can be eliminated, saving cost and weight.





Acindar Grupo ArcelorMittal and Techint Group: Steel reuse for the conservation of jaguars

These companies have teamed up with NGOs and local authorities to promote biodiversity and reintroduce the native jaguar, declared a National Natural Monument, in a 35-hectare Breeding Centre in Argentina's Iberá reserve.

The Centre, including 4 steel pens, was constructed using 400 tonnes of steel, 75% of which was recovered steel, avoiding the use of new materials. The creation of a world-class eco-tourism destination is benefiting 200,000 people in 20 districts in the Iberá area.





ArcelorMittal Tubarão and Usiminas: Paving rural roads in Brazil with steel by-products

ArcelorMittal Tubarão has developed road paving products, REVSOL and REVSOL Plus® using steelmaking slag. These products are a mixture of approximately 70% slag and 30% local soil – and are used as the primary paving layer. Using slag avoids the extraction of natural aggregate and is an effective, low-cost alternative to asphalt. Environmental and human health risk assessments have proven the products to be safe and environmentally sound. Since development began 11 years ago, they have been used to coat 650 km of previously unpaved roads in the state of Espírito Santo, benefiting 30 municipalities.

USIMINAS has also developed a slag road-coating product, SIDERBRITA, to pave 750 km of rural and urban roads in the state of Minas Gerais, benefiting 650,000 residents in 26 municipalities. In addition, this product has been used to recover 684 river springs and to protect 35 slopes that were in danger of degradation.

Increased mobility through the application of these slag road-coating products has improved the quality of life for people living in the affected communities considerably, as they now have access to basic services such as transportation, garbage collection, schools, ambulances, and police. It has also had significant positive effects on local livelihoods, allowing reliable transportation of farming and other rural goods.





China Baowu: Renewable energy in steelmaking

China Baowu has created the world's largest roof-top solar energy installation covering 25 steelmaking buildings at two urban sites in the Shanghai and Nanjing areas.

The installation includes 1.3 million m² of photovoltaic panels, producing 80 million kWh per year - enough to power 59,000 average Chinese households.

All of this energy is being used in their steelmaking operations, reducing energy costs and improving air quality for society.

EXCELLENCE IN LIFE CYCLE ASSESSMENT (LCA)

Shortlisted project



Baotou Iron and Steel (Group) Co., Ltd: Using LCA to support eco-design and environmental improvement throughout its supply chain

Baogang participated in the first industrial products eco-design pilot project run by the China Ministry of Industry and Information Technology. The purpose of this project was to use LCA to support eco-design and to provide environmental performance data and accounting tools to promote a green development strategy (including procurement transportation and marketing) for the company and throughout its supply chain.

In order to achieve this, Baogang developed an LCA model and methodology for their iron ore products, rare earth steel products and rare earth products, covering 62 processes. They created Product Category Rules (PCRs) and Environmental Product Declarations (EPDs) to support green marketing. The model, methodology, PCR and EPD have all undergone a third party critical review.

LCA has been used to find the improvement potential of the product's full value chain, through resource consumption, energy consumption and environmental emissions, and will be used in procurement for green supply chain management. As well as working with upstream suppliers, Baogang has also been using LCA as a key tool to evaluate the environmental benefits of different ways of using their by-products such as iron ore tailings and slags in order to promote high value-added and high environmental benefits of their applications. Baogang has carried out training and lectures within the company to raise awareness in their organisation.

Baogang's comprehensive utilisation of solid waste resources, the circular economy industrial supply chain, energy-saving emissions reductions and environmental protection are at the forefront of China's steel industry.

EXCELLENCE IN LIFE CYCLE ASSESSMENT (LCA)

Shortlisted project



JSW Steel Limited: Using LCA to reduce the carbon and water footprints of its operations

The steel industry is capital intensive and therefore the impact of GHG emissions ideally needs to be factored in for major capital-intensive projects to minimise the environmental footprint and also reduce the future burden of carbon taxation. JSW Steel Ltd has been using LCA to evaluate the environmental impact of its steel plant operations during its recent expansion projects. Their first LCA study was used as a starting point and they were the first Indian steel company to get an Environmental Product Declaration (EPD). Subsequent LCI studies will help reduce the carbon and water footprint of JSW's operations to make improvements in the following areas:

- Installing a 54km pipe conveyor to transport iron ore from its mines
- Improving the beneficiation process of lower grade iron ores
- Retrofitting state-of-the-art energy recovery systems in existing projects and installing them in all new projects
- Estimating the impact on cost of production of steel with shadow pricing for GHG emissions to avoid future risk
- Understanding the environmental performance of the company's 3 different production routes: DRI-EAF, BF-BOF and COREX-BOF
- Achieving zero liquid discharge, a mandatory requirement in India, whereby all blow-down water is reused after recovery through reverse osmosis and evaporation. This has been achieved through the management/reduction of dissolved salts in the fresh water and blow-down water.



Using an LCA based approach benefits the organisation in terms of brand value and investor interest. It also offers the best and holistic understanding of the implications of every step in the operations, in turn leading to heightened preparedness for new regulations and dampening of effects of variation in raw material quality.

EXCELLENCE IN LIFE CYCLE ASSESSMENT (LCA)

Winner

Tata Steel Europe for creating an Environmental Product Declaration Programme

An LCA approach is critical for optimum resource decisions to be made, and such approaches demonstrate that steel is an extremely sustainable product. A critical part of ensuring that the sustainability of steel is understood, and its use maximised, is an approach that delivers both transparency and clear reporting of the sustainability of steel. It is for that reason that Tata Steel embarked on the somewhat unique journey to become an Environmental Product Declaration Programme Operator.

In many sectors, Environmental Product Declarations (EPDs) are increasingly being used for communicating the LCA attributes of products. This is particularly the case in the construction sector where EPDs are used to assess the environmental performance of buildings.

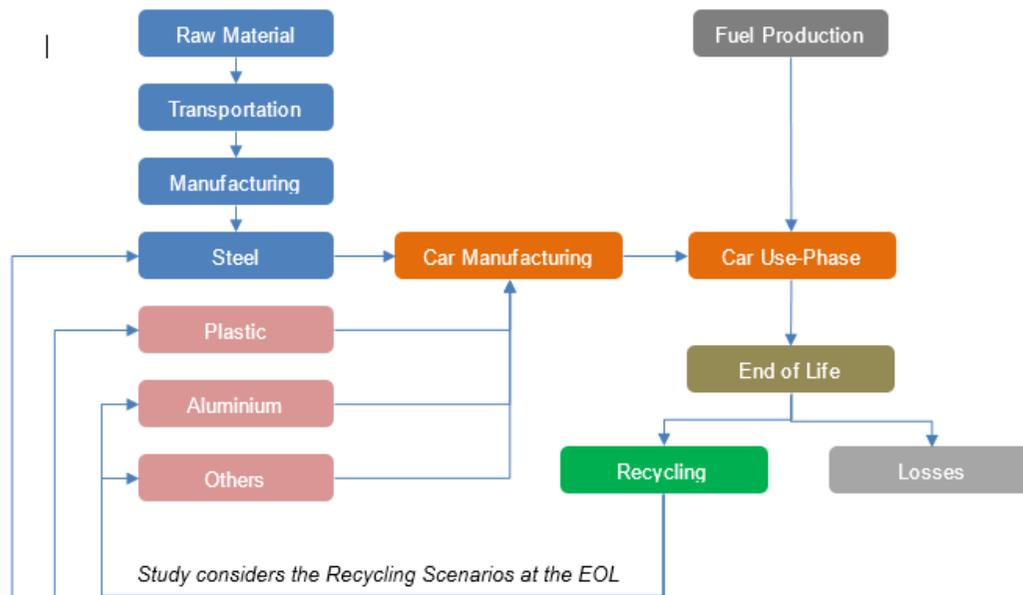
Tata Steel now have the ability to provide their customers (and wider stakeholders) with both 'supply chain' and 'product' specific (Type III externally verified) EPDs that comply with EN15804 and ISO14025 standards. In addition to this, Tata Steel is developing the programme to provide EPDs for specific customer requirements, for the project based construction sector. This combination of transparent reporting and customer focus is key to enhancing both steel use and its sustainability credentials.

Tata Steel are also talking to other parts of the steel supply chain regarding the use of the Tata Steel Programme for the production of their own EPDs. In this way, the Tata Steel scheme can be utilised to increase the provision of steel EPDs in the market thereby furthering the transparency and reporting of steel based products.



EXCELLENCE IN LIFE CYCLE ASSESSMENT (LCA)

Shortlisted project



Process Flow Illustration: 62% of Steel LCI data is primary industry data supplied by TSL which includes the cradle to gate part whereas 38% of steel LCI and LCI of other materials is from GaBi database.

Tata Steel India: Using LCA to support its customer on their new product's LCA study

Tata Steel Limited in India (TSL) has carried out an LCA study for some of its steel products manufactured at its Jamshedpur facility. These studies were confined to "Cradle to Gate" level including the end of life. TSL is expanding its LCA beyond its boundary to include and understand the "use phase" impact of its products and to provide site-specific environmental information about its products to customers who are carrying out their own LCA studies.

In order to make a start in the "use phase", Tata Steel partnered with its customer Tata Motors Limited (TML) in India, a leading global automobile manufacturer of cars, utility vehicles, buses, trucks and defence vehicles. TML decided to do an LCA study for one of its SUV models and as Tata Steel is a key supplier to TML for the new SUV, primarily for "Tata Galvano" (hot dip galvanised steel), it was agreed to carry out a joint LCA study. TSL provided LCI data for Tata Galvano as well as other major TSL products used in the SUV (to have site-specific industry data).

The study considered the end of life performance of different materials used in the vehicle. Since the study connected the entire value chain of steel along with its application in the vehicle, both TSL and TML met their objectives of identifying the true environmental impact of their products from a complete cradle-to-cradle scope.

This study promotes the use of site-specific product life cycle data and the end of life benefits of different materials. This will help customers in making informed decisions about materials considering their environmental footprint. This assessment supports the "circular economy" approach in the vehicle's life cycle.

EXCELLENCE IN EDUCATION AND TRAINING

Shortlisted project



HBIS Group: online training platform

HBIS has developed an online training platform for all its employees. The platform supports multiple devices, computers, tablets, smartphones and is accessible via multiple channels, WeChat and Apps, for example. The training covers 61 professions and 150 position standardisations. More than 300,000 employees are using the platform.

EXCELLENCE IN EDUCATION AND TRAINING

Winner



Nucor: Training to eliminate serious injuries and fatalities

The programme utilises lessons learned from planning and preparation for outages and non-routine work to drive the safe execution of routine or frequent tasks.

The programme is comprised of both lectures and break-out collaboration between teams of employees, supervisors and/or managers.

EXCELLENCE IN EDUCATION AND TRAINING

Shortlisted project



Tata Steel Europe: learning on project, change and safety management

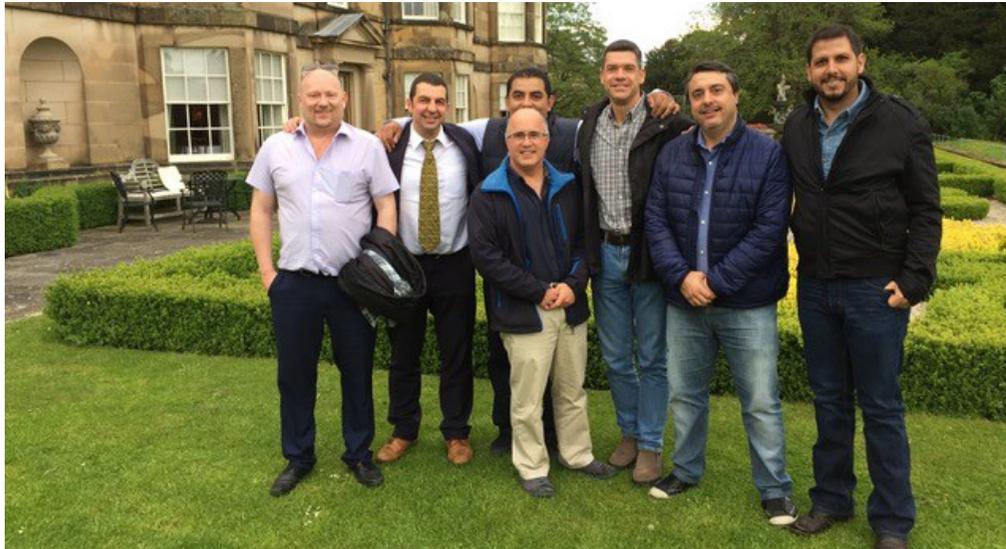
An innovative learning product that combines elements of project, change and safety management using agile visible tools. This is skills training for staff without project in their job title, filling a gap in the market that brings structure and systematic thinking to a large group of everyday employees who would otherwise be overwhelmed by branded project management training.

Project & Change Thinking

From	To
One size fits all for project management	Segmenting project types, requirements and solutions
Project Management as a specialism	Project thinking integrated into everyday activity
Learning to manage projects	Learning to deliver project outcomes through people
Focus exclusively on project deliverables - that 'what'	Equal consideration to the 'how' – delivering a safe and sustainable and accepted solution
Projects deliver performance outcomes	Projects change things and create safety risk
Projects are delivered when your action list is complete	Projects are delivered when user acceptance is fully demonstrated
Understands that change can fail.	Understands resistance to change and how to deal with that effectively.

EXCELLENCE IN EDUCATION AND TRAINING

Shortlisted project



Ternium: Collaboration with The University of Sheffield to deliver the degree programme 'Master in Advanced Metallurgy' in a blended learning format

The Master in Advanced Metallurgy (MMet Advanced Metallurgy) was implemented by Ternium, in association with the globally renowned University of Sheffield (England). The leading distinction of this cutting-edge innovative programme has to do with the definition of a blended format; classroom lectures in Sheffield and in Ternium facilities, online courses and virtual synchronous sessions by Lync/Skype, long distance exams and a Final Research Project dissertation.

This is the first Master in the Metallurgy Industry with this original layout and is a completely new learning-delivery model taught exclusively by Ternium, where participants obtain the same degree as the traditional one that is held in Sheffield.



JOURNALIST OF THE YEAR

Shortlist



- Thomas BIESHEUVEL, Bloomberg
- Diana KINCH, Platts
- [Michael POOLER, The Financial Times](#) (winner)
- Tomoya ONISHI, Nikkei Asian Review

INDUSTRY COMMUNICATOR OF THE YEAR

Shortlist



Naveen JINDAL
Chairman
Jindal Steel and Power
Limited



Ohjoon KWON
CEO
POSCO



MA Guoqiang
Chairman
China Baowu Steel Group
Corporation Limited
(Winner)



Daniel NOVEGIL
CEO
Ternium

The logo features the number '50' in a large, bold, dark blue font. To its right, the word 'worldsteel' is written in a smaller, dark blue, lowercase sans-serif font. Below 'worldsteel', the word 'ASSOCIATION' is written in a very small, dark blue, uppercase sans-serif font, with wide letter spacing. A decorative graphic of several curved, overlapping lines in shades of blue and grey arches over the text. Below this graphic, the years '1967 - 2017' are written in a dark blue, sans-serif font.

50 worldsteel
ASSOCIATION
1967 - 2017