Sustainable development and the steel industry

The global steel industry shares society's challenges and concerns – from climate change and urbanisation, to ensuring long-term economic growth and responsible management and sourcing of resources. We, as an industry and as individual steel companies, are being pro-active in addressing these challenges on many different fronts. This report highlights for you:

1. The steel value chain: what we need to make steel and how society uses it
2. Industry level challenges, commitments and actions related to: climate change, responsible sourcing and co-products
3. Sustainability performance: continued reporting on our 8 global economic, social and environmental indicators
4. Steel solutions: how steel is being applied in versatile and innovative ways to provide sustainable (and sometimes surprising) solutions for our everyday lives
5. Member actions and initiatives: what our member companies are doing individually to address our global industry and societal challenges.

We do not yet have all the answers, but we are committed to engaging and collaborating with our stakeholders to find the right solutions to help meet society’s needs in a sustainable way. We welcome you to join the conversation at worldsteel.org.

### SUSTAINABILITY EFFORTS OF WORLDSTEEL MEMBERS IN 2018

<table>
<thead>
<tr>
<th>Sustainable Development Charter</th>
<th>71 steel companies signed the worldsteel Sustainable Development Charter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sustainability Indicators</td>
<td>97 steel organisations provided data to our reporting</td>
</tr>
<tr>
<td>Climate Action</td>
<td>53 steel companies reported their CO₂ emissions intensity</td>
</tr>
<tr>
<td>Steel Safety Day</td>
<td>47 steel companies carried out a safety audit</td>
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</tbody>
</table>

### Sustainability Champions

6 steel companies were recognised as Steel Sustainability Champions 2017

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### Steel Value Chain

#### Iron Ore
- 2,381 Mt of iron ore were mined in 2016 of which about 95% was used by the steel industry.
- All steel is made of iron. Iron is the 4th most common element in the earth’s crust.
- Iron ore is the 3rd largest commodity in terms of production volume after crude oil and coal – and the second most traded commodity – after crude oil.

#### Metallurgical coal
- Metallurgical coal is mainly found in Australia, North America, Russia, and China.
- Metallurgical coal is treated and turns into coke.
- Coke is the primary reducing agent for iron ore. It also provides the needed temperature for the melting of iron ore to hot metal.
- 75% of steel produced today uses metallurgical coal.

#### Scrap
- Steel is the most recycled material in the world.
- 433 Mt of scrap are recycled every year, avoiding nearly 930 Mt of CO₂ annually.

#### Alloys
- There are more than 3,500 different grades of steel using various combinations of alloys.
- Alloys can make steel stronger, more malleable, shinier and more rust-resistant.

#### Aggregates
- Essential, carbon content and magnetics are added to make steel slag better quality.
- Large-scale recycling opportunities in the iron ore.

#### Energy
- The steel industry uses about 2.6 GJ of energy to produce a tonne of crude steel.
- Energy consumption per tonne of steel has been reduced by 61% since 1960, which has contributed to a significant decrease in CO₂ intensity.

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### Sustainability Champions 2017

- **Climate Action**: Steel Solutions
- **Alloys**: Steel Safety Day
- **Energy**: Sustainability Champions

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### ERGONOMICS

#### Buildings and infrastructure
- About 50% of steel produced is used in buildings and infrastructure.
- Buildings and other structures made from steel can last from 40 to 110 years and longer if proper maintenance is carried out.
- Steel offers the most economic and the highest strength to weight ratio of any building material.
- 53,000 tonnes of steel were needed to make the Eiffel Tower. Only half of that would be needed today.

#### Domestic appliances
- Approximately 75% of all major household appliances are comprised of steel.
- Global consumption of household appliances is forecast to reach $588 billion USD by 2020.

#### Other transport
- About 1.7 million shipping containers are currently in use across the world and the majority are made from steel.
- Today the length of the worldwide rail network spans 1,051,767km.
- Steel is a key material used for aircraft engines and landing gear.

#### Electrical equipment
- Electrical steel is a special steel tailored to produce specific magnetic properties.
- Electrical steels are essential to building high-speed motors for electric and hybrid vehicles.
- Electrical steels are used throughout the entire energy value chain from power generation, transfer, distribution to consumption.

#### Metal products
- Canned foods are the most tamper resistant food packaging option available today.
- Steel furniture is far more resilient to everyday wear and tear and is pet resistant.
- Steel is a key material for mechanical equipment.
- If a product is not made of steel, it is likely that it has been produced from machine made steel.
- Steel makes applications easier and more efficient: used in basic items, alloys and tools, yellow goods, irrigation systems and grain storage silos.
Tom takes a high-speed train to the office every morning. Travel by train is the most energy efficient way. It consumes about 10% and 30% less energy per person compared to planes and cars respectively.

Tom works in a repurposed steel structured building on its 3rd cycle of reuse. His open plan office had been used as a laboratory, a cafeteria and a technical museum before.

There is always a good reason to choose steel.

Tom uses a reusable steel cup throughout the day in the office. It’s made from 90% recycled material and he got it from Glastonbury festival last year.

Tom waters the trees and plants in his garden by using the rainwater collected by his steel guttering system. This saves him many litres of clean water.

Tom drives to the 3D printing factory outside of the city. Made of Advanced High-Strength Steel, his electric car is lighter and thus reduces fuel consumption and greenhouse gas emissions by up to 70% over the total life cycle of the car.

He recently changed his energy supplier to one who offers energy generated from wind farms using remanufactured steel turbines.

Tom is training for the Tour de France this year and recently bought a new steel race bike because it is more durable and responsive than other materials but is still lightweight. He also likes the fact that the steel in his bike is 100% recyclable.

A more detailed interactive ‘Steel life’ is available at worldsteel.org.
Selected initiatives and actions taken by forward-thinking worldsteel members to address our global industry and societal challenges. More details on the initiatives are available at worldsteel.org.
Steel companies from around the world have been reporting to worldsteel on sustainability indicators since 2004. These indicators provide a systematic way of measuring key aspects of our economic, environmental and social performance on a yearly basis. The indicators are aligned to the commitments outlined in our sustainable development policy and to the UN Sustainable Development goals.

Steel companies report voluntarily on up to 8 sustainability indicators every year. In 2018, 97 steel organisations contributed data for fiscal year 2017. Crude steel produced by companies who reported on one or more indicators was 960.8 MT, representing 56.9% of global crude steel production. The average indicator results, participation by indicator, as well as performance trends of the steel industry over a decade, are provided in the sustainability section on our website. To supplement these indicators, we provide additional information, facts and figures on 7 focus areas – three of which are shown on the next page. For further information, please visit worldsteel.org.

### ENVIROMENTAL PERFORMANCE

<table>
<thead>
<tr>
<th>INDICATOR</th>
<th>UNIT</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Greenhouse gas emissions</td>
<td>tonnes CO$_2$ / tonne crude steel cast</td>
<td>1.87</td>
<td>1.88</td>
<td>1.83 (p)</td>
</tr>
<tr>
<td>2. Energy intensity</td>
<td>GJ / tonne crude steel cast</td>
<td>20.3</td>
<td>20.3</td>
<td>20.0 (p)</td>
</tr>
<tr>
<td>3. Material efficiency</td>
<td>% of materials converted to products and by-products</td>
<td>96.8</td>
<td>97.5</td>
<td>96.3</td>
</tr>
<tr>
<td>4. Environmental management systems</td>
<td>% of employees and contractors working in registered production facilities</td>
<td>93.6</td>
<td>97.1</td>
<td>96.8</td>
</tr>
</tbody>
</table>

### SOCIAL PERFORMANCE

<table>
<thead>
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<th>UNIT</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>5. Lost time injury frequency rate</td>
<td>injuries / million hours worked</td>
<td>1.17</td>
<td>1.01</td>
<td>0.97</td>
</tr>
<tr>
<td>6. Employee training</td>
<td>training days / employee</td>
<td>6.8</td>
<td>7.0</td>
<td>6.1</td>
</tr>
</tbody>
</table>

### ECONOMIC PERFORMANCE

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<tbody>
<tr>
<td>7. Investment in new processes and products</td>
<td>% of revenue</td>
<td>12.6</td>
<td>13.0</td>
<td>5.9</td>
</tr>
<tr>
<td>8. Economic value distributed</td>
<td>% of revenue</td>
<td>96.7</td>
<td>96.8</td>
<td>97.0</td>
</tr>
</tbody>
</table>

Notes:
(p) = preliminary; data collection in progress

Indicators 1 & 2: These indicators are calculated using route-specific energy and CO$_2$ intensity for the basic oxygen furnace and electric arc furnace. The indicators are also weighted based on the production share of each route. Indicator 1 includes CO$_2$ emissions only as these make up approximately 93% of all steel industry greenhouse gas emissions. Indicator 5: Lost time injury frequency rate includes fatalities and is calculated based on figures including contractors and employees. Indicator 7: Investment in new processes and products includes capital expenditure and R&D investment.

### THE STEEL INDUSTRY

#### AROUND THE WORLD

- **ECONOMIC PERFORMANCE**
  - Employee training days / employee
  - Investment in new processes and products

#### THE STEEL INDUSTRY

- **ENVIRONMENTAL PERFORMANCE**
  - Greenhouse gas emissions
  - Energy intensity
  - Material efficiency
  - Environmental management systems

#### SOCIAL PERFORMANCE

- Lost time injury frequency rate
- Employee training

#### ECONOMIC PERFORMANCE

- Investment in new processes and products
- Economic value distributed

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### TRACKING OUR SUSTAINABILITY PERFORMANCE

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Excellence in Sustainability Steele Award

worldsteel’s Excellence in Sustainability Steele Award seeks to recognise an initiative that has made a positive impact, or provided benefits in all three areas of sustainability: economic, environmental and social performance.

The sustainability initiatives presented below are the 2018 finalists, and demonstrate actions being taken by worldsteel members to respond to sustainability challenges in their region. More details are available on worldsteel.org.

ArcelorMittal Brasil - Water Master Plan (WMP)
ArcelorMittal Brasil has developed and successfully implemented a holistic approach to water management (WMP) including:
1) diversifying its water sources;
2) improving efficiency e.g. increased water reuse and recirculation; and
3) engaging their stakeholders on water-related issues. Their efforts are helping the company to achieve their sustainability goals - “Global Outcome #5” to be a trusted user of air, land and water - and the UN SDG #6 - which aims “to ensure water availability and sustainable management of fresh water to all and everyone”.

As producers of steel, we know that a sustainable steel industry is crucial for the long-term health of our economy, our society and our planet. And every steel company has a responsibility to help achieve this.

Many members of the World Steel Association have already demonstrated their commitment to sustainable development and made extensive efforts in their sustainability programmes. As an industry, we have made progress. But we need to do more and go further.

worldsteel has therefore launched an industry-wide sustainability recognition programme to encourage steel companies to increase their efforts, set higher standards and make further progress.

In 2018, this Sustainability Champions recognition was given to the 6 steel companies who have: clearly demonstrated their commitment to sustainable development and the circular economy; evidently made measurable and tangible impacts in their activities; and led the way to create a truly sustainable steel industry and society. They are ArcelorMittal, Tata Steel Europe, Tata Steel Limited, Tenaris, thyssenkrupp AG and voestalpine AG.

This recognition does not mean that champion companies do not need to do more. Instead, the recognition strongly encourages champion companies to aim higher by setting goals and targets and progress further.

Our contribution to a sustainable society and planet is our responsibility

Steel Sustainability Champions

ArcelorMittal Europe and HBIS Group turning “waste” heat into urban heating
What used to be “waste” heat at one of ArcelorMittal’s steelmaking sites in France is now being recuperated for use both internally, to heat the halls of the plant, and externally distributed to the heating network of the town of Saint-Chély d’Apcher, heating the equivalent of 1,150 homes. This has resulted in the carbon footprint reduction of both the plant and the town by more than 4,000 tonnes of CO2 per year, equivalent to taking 2,000 vehicles off the road. Hansteel Company (HBIS Group), located close to Handan City, China, has also developed a technology that allows it to utilise and distribute “waste” heat from its operations to heat 5.5 million m² of building space for Handan residents, reducing the use of small coal burning boilers in Handan City, and improving local air quality.

Tata Steel Limited – Reduces Supply Chain Carbon Footprint
Tata Steel Limited’s (TSL) shipping and logistics team initiated a project to reduce the Green House Gas (GHG) emissions from its shipping operations by increasingly deploying energy efficient vessels for ocean transportation which carries its raw materials and finished products. Given TSL’s growth strategy, vessels under operations are expected to go up from 200 to 500 by 2025. Through implementation of this initiative, they will achieve CO2 emission reductions in their shipping operations of 64% by 2025.