Sustainability Indicators Report 2025

Sustainability performance of the steel industry

worldsteel ASSOCIATION

Introduction

As the world faces the escalating challenges of climate change, biodiversity loss, pollution, and the increasing call for a more inclusive and resilient global economy, sustainability has become far more than an ambition — it is now an imperative shaping how we live, work, and build the future.

The steel industry, as a cornerstone of modern society, recognises its vital role in enabling sustainable progress. From the infrastructure that connects communities to the innovations that power a low-carbon economy, steel continues to be the backbone of transformation — and with that comes the responsibility to lead with purpose.

Guided by global frameworks such as the United Nations Sustainable Development Goals (SDGs) and the Paris Agreement, this Sustainability Indicators report 2025 reaffirms the industry's long-standing commitment to transparency, accountability, and continuous improvement. It showcases how the sector continues to measure, manage, and advance its performance across the issues that matter most, underscoring our shared determination to meet society's evolving expectations and to contribute meaningfully to a sustainable future.

Together, we continue to forge a path towards a more sustainable, resilient, and inclusive steel industry — one that not only supports the needs of today but also safeguards the possibilities of tomorrow.

> The steel industry acknowledges its critical role in advancing progress towards a more sustainable world.

Key sustainability programmes in 2025

Sustainability Indicators

Expanded from 8 to 19 indicators, covering a broader range of material topics relevant to the steel industry, bridging the gap between the Sustainability Principles and performance reporting.

In 2025, data were collected from 93 steel companies and associations around the world, representing 959.5 million tonnes, or 51% of global crude steel production.

Among these companies, 75 organisations voluntarily reported on one or more of the 19 indicators.

The following 17 worldsteel members provided complete data across all 19 indicators:

- ACERINOX S.A
- Aço Verde do Brasil (AVB)
- elmarakbysteel
- EMSTEEL
- EZZ Steel
- Gerdau S.A.
- JFE Steel Corporation
- Liberty Speciality Steel (GFG Alliance)
- Mobarakeh Steel Company
- Qatar Steel Company (Q.P.S.C.)
- Saudi Iron and Steel Company (Hadeed)
- SeAH Besteel Corporation
- SeAH Changwon Integrated Special Steel Corp.
- Tata Steel
- Tenaris
- Ternium
- Usinas Siderúrgicas de Minas Gerais S.A. (USIMINAS)

Sustainability CHARTER worldsteel ASSOCIATION

Sustainability Charter Member

The new Sustainability Charter 2025–2027 was published, with 34 steel organisations recognised as Charter Members. Visit worldsteel.org for more details on our Charter Members.

Sustainability CHAMPIONS worldsteel ASSOCIATION

Sustainability Champions

14 steel organisations were recognised as Sustainability Champions in 2025. Tata Steel and Tenaris have achieved this recognition for eight consecutive years since the programme's launch in 2018.

Our Sustainability Indicators

Recognising the interconnected nature of sustainability challenges, the industry has expanded its monitoring framework from 8 to 19 indicators, providing a more comprehensive perspective on environmental, social, and governance performance. This evolution reinforces our collective drive to understand our impact more fully and to translate that understanding into measurable, lasting progress.

The Indicators highlighted in **bold** are new in 2024.

For more details on our Sustainability Principles, visit worldsteel.org.

Our Sustainability Indicators

The Indicators highlighted in **bold** are new in 2024.

	Indicator	Unit	2022	2023	2024
ENVIRONMENTAL PERFORMANCE					
1a	**GHG emissions intensity**	**tonnes of CO_2e per tonne of crude steel**			**2.18**
1b	CO_2 emissions intensity	tonnes CO_2 per tonne of crude steel	1.92	1.92	1.92
2	Energy intensity	GJ per tonne of crude steel	21.01	21.30	20.95
3	Material efficiency	% of solid materials converted to products and co-products	97.60	93.14	92.79
4	Environmental management systems (EMS)	% of employees and contractors working in EMS-registered production facilities	97.19	90.82	96.08
5	**Renewable energy consumption**	**% of total energy consumption**			**1.94**
6	**SOx emissions intensity**	**kg SOx per tonne of crude steel**			**0.64**
7	**NOx emissions intensity**	**kg NOx per tonne of crude steel**			**0.66**
8	**Dust emissions intensity**	**kg PM per tonne of crude steel**			**0.32**
9	**Fresh water withdrawal**	**m^3 per tonne of crude steel**			**8.50**
10	**Fresh water consumption**	**m^3 per tonne of crude steel**			**2.30**
SOCIAL PERFORMANCE					
11	Lost time injury frequency rate (LTIFR)	injuries per million hours worked	0.85	0.76	0.72
12	Employee training	training days per employee	8.22	8.98	6.77
13	**Women in workforce**	**% of total employees**			**11.44**
14	**Women on the board**	**% of total board members**			**14.06**
15	**Community investment**	**% of revenue**			**0.08**
ECONOMIC PERFORMANCE					
16	Investment in new processes and products	% of revenue	6.37	7.27	8.31
17	Economic value distributed (EVD)	% of revenue	96.57	98.83	100.68
GOVERNANCE PERFORMANCE					
18	**Supply chain assessment**	**% of total active input-material suppliers**			**79.72**
19	**Employee education on business ethics**	**% of total employees**			**88.07**

The performance figures presented in the table above represent a weighted average of the organisations reporting data for each indicator.

CO_2, GHG, and energy emissions intensity

Updating worldsteel's CO_2 emissions reporting - expanded scope, now greenhouse gas emissions (GHG) reporting

For the first time, our published industry and route-level CO_2 intensity indicators go beyond carbon dioxide (CO_2) to also cover methane (CH_4) and nitrous oxide (N_2O), as well as emissions from upstream mining activities. We are also updating our emission factors.

These changes are implemented to better align our reporting with the GHG Protocol, ISO standards, worldsteel's own life cycle assessment (LCA) framework, and the expectations set out in SBTi guidance. They represent an important step forward in transparency and credibility.

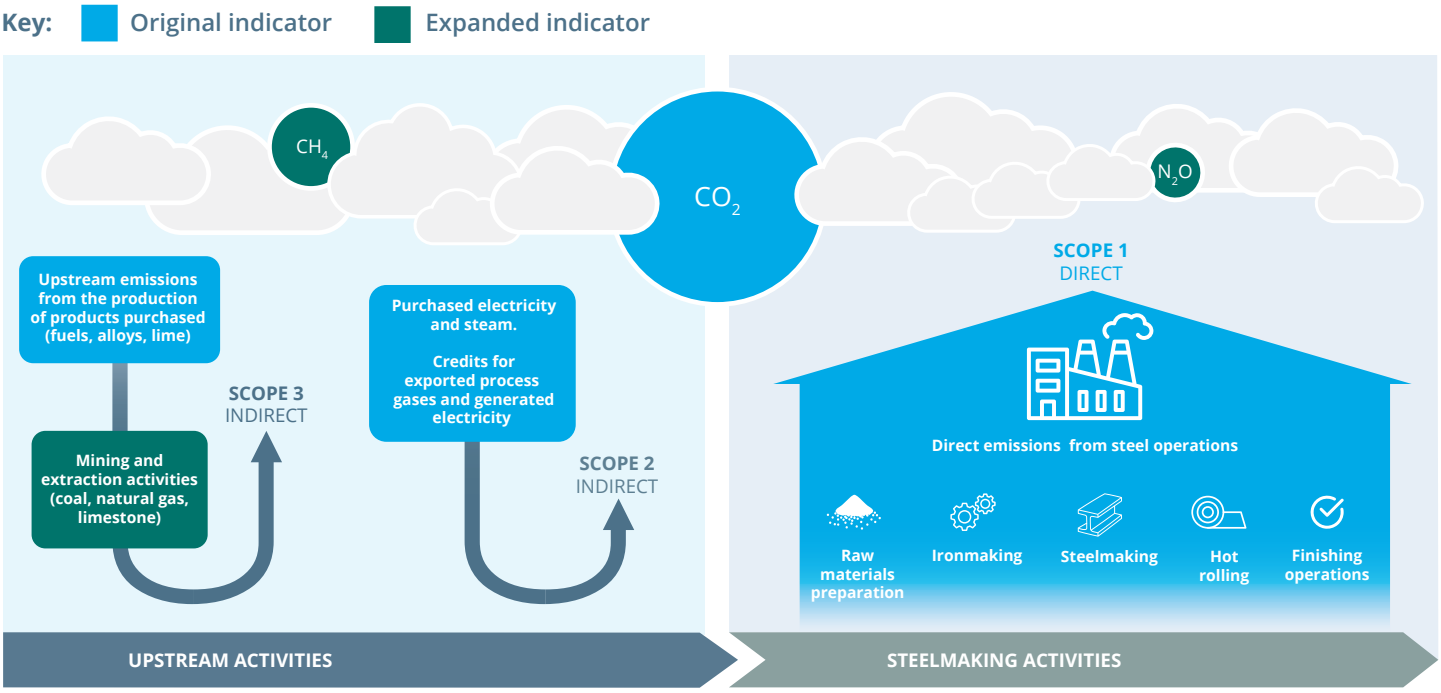
Impact on reported data

The effect of these improvements is that reported emissions per tonne of steel is higher. This is not an actual increase in emissions, but a reflection of the improved accounting approach and increased coverage. Importantly, applying these revised factors across the entire time series does not alter the industry's long-term trajectory. Our historical performance trend remains unchanged.

For more details on our updated calculation, please refer to our policy paper 'Climate change and the production of iron and steel" on worldsteel.org.

GHG emissions intensity in 2024

	BF-BOF (Scrap use ~ 10%)	Scrap-EAF (Scrap use >70%)	DRI-EAF (Scrap use <30%)	Global
Original indicator (CO_2 emissions intensity)	2.34	0.69	1.47	1.92
Direct CH_4 and N_2O (GWP 100)	0.09	<0.01	<0.01	-
Upstream mining CO_2 only	<0.01	<0.01	0.01	-
Upstream mining CH_4 and N_2O (GWP 100)	0.23	0.03	0.18	-
Expanded indicator (GHG emissions intensity)	2.66	0.71	1.66	2.18



Transportation and downstream activities are not included in our scope 3 calculation.

This publication was updated in February 2026 to include CO_2 and GHG emissions intensity data for the 2022–2024 period. You can access this data on worldsteel.org.

Indicator trends

Historical performance indicators

	Environmental					Social		Economic	
	1a	1b	2	3	4	5	6	7	8
	GHG emissions intensity	CO_2 emissions intensity	Energy intensity	Material efficiency	Environmental management systems (EMS)	Lost time injury frequency rate (LTIFR)	Employee training	Investment in new processes and products	Economic value distributed (EVD)
	tonnes CO_2e/ tonne of crude steel	tonnes CO_2/ tonne of crude steel	GJ/tonne of crude steel	% of solid materials converted to products & co-products	% of employees & contractors working in EMS-registered production facilities	injuries/ million hours worked	training days/ employee	% of revenue	% of revenue
2024	2.18*	1.92	20.95	92.79	96.08	0.72	6.77	8.31	100.68
2023		1.92	21.30	93.14	90.82	0.76	8.98	7.27	98.83
2022		1.92	21.01	97.60	97.19	0.85	8.22	6.37	96.57
2021		1.92	21.03	97.47	95.67	0.85	7.63	6.34	92.80
2020		1.89	20.43	97.96	96.21	0.77	7.20	8.03	97.79
2019		1.83	19.86	97.49	97.16	0.83	6.90	7.05	98.27
2018		1.81	19.53	96.33	97.07	0.84	6.48	6.12	94.18
2017		1.83	19.93	96.49	96.49	0.97	6.26	5.79	95.43
2016		1.87	20.32	97.64	96.85	1.01	7.11	7.71	96.64
2015		1.87	20.25	97.36	93.59	1.17	6.75	8.22	100.09
2014		1.80	19.76	97.47	94.05	1.39	6.27	7.32	96.31
2013		1.82	20.08	98.00	90.18	1.60	7.80	8.53	96.83
2012		1.75	19.63	96.48	89.53	1.45	7.88	10.05	99.77
2011		1.76	19.81	96.11	89.93	1.91	7.74	8.28	95.65
2010		1.80	20.13	97.48	87.60	2.29	6.95	8.80	93.46
2009		1.81	20.49	97.94	88.89	2.46	8.47	10.22	90.52
2008		1.79	20.13	98.03	86.62	3.09	8.02	8.24	78.30
2007		1.80	20.10	97.94	85.07	4.44	11.10	7.76	78.18
2006				96.49	84.78	4.55	10.52	7.90	
2005				96.96	82.69	4.15	12.28	6.91	
2004				96.78	92.40	4.81	11.62	6.96	
2003				96.09	90.92		7.46	6.37	

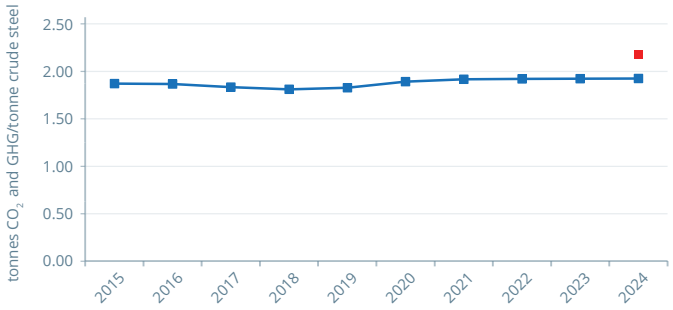
* The data collection for the indicator GHG emissions per tonne of crude steel (scope 1, 2, and 3 - category 1) started in 2024.

New performance indicators for 2024

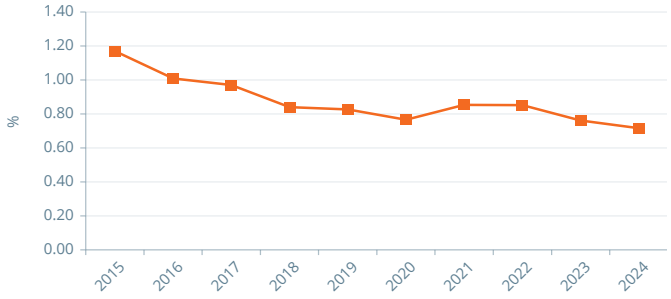
	Environmental						Social			Governance	
	1	2	3	4	5	6	7	8	9	10	11
	Renewable energy consumption	SOx emissions intensity	NOx emissions intensity	Dust emissions intensity	Fresh water withdrawal	Fresh water consumption	Women in workforce	Women on the board	Community investment	Supply chain assessment	Employee education on business ethics
	% of total energy consumption	kg SOx/ tonne of crude steel	kg NOx/ tonne of crude steel	kg PM/ tonne of crude steel	m^3/tonne of crude steel	m^3/tonne of crude steel	% of total employees	% of total board members	% of revenue	% of total active input-material suppliers	% of total employees
2024	1.94	0.64	0.66	0.32	8.50	2.30	11.44	14.06	0.08	79.72	88.07

Indicator trends 2014 - 2024

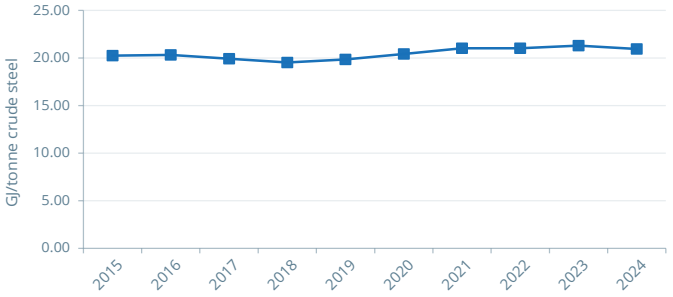
CO_2 and GHG emissions intensity (in red)[1]



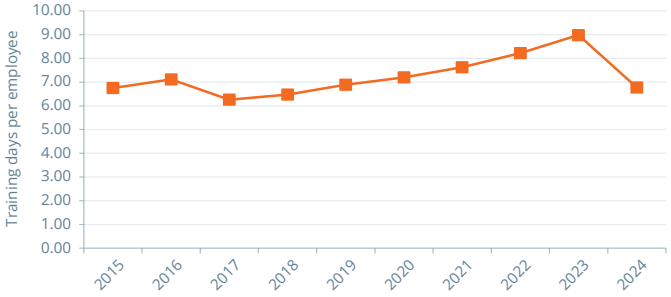
Lost time injury frequency rate (LTIFR)[1]



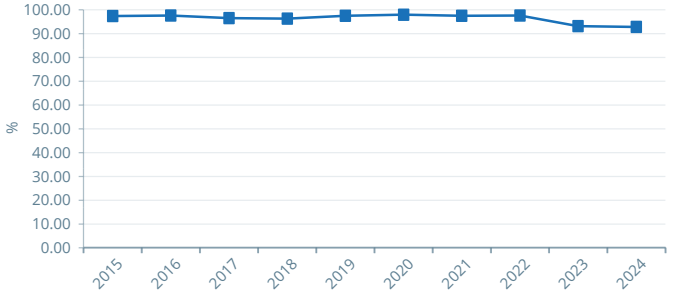
Energy intensity[1]



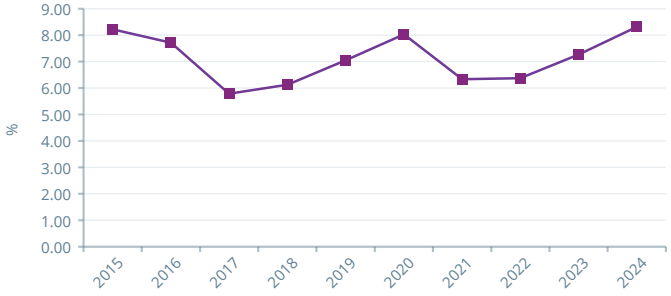
Employee training[2]



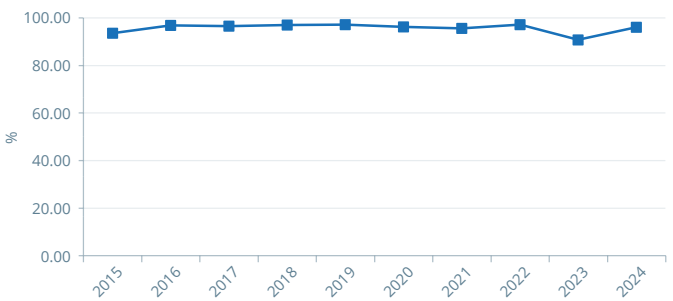
Material efficiency[2]



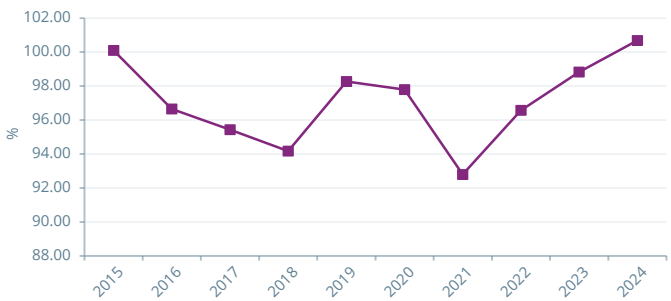
Investment in new processes and products[2]



Environmental management systems (EMS)[2]



Economic value distributed (EVD)[2]



Notes:

[1] A descending curve demonstrates sustainability progress.
[2] An ascending curve demonstrates sustainability progress.

Contributing organisations - 2025 data collection

75 steel companies and associations listed below contributed data for one or more of the 19 indicators. 17 companies (**in bold**) provided data for all 19 indicators.

1 Acciaierie Bertoli Safau S.p.A.
2 **ACERINOX S.A.**
3 Aceros AZA S.A.
4 **Aço Verde do Brasil (AVB)**
5 Aichi Steel Corporation
6 Ansteel Group Corporation Limited
7 Aperam
8 ArcelorMittal
9 Badische Stahlwerke GmbH
10 Baotou Iron & Steel (Group) Co., Ltd
11 BlueScope Steel Limited
12 Böllinghaus Steel GmbH
13 CELSA Group
14 China Baowu Steel Group Corporation Limited
15 China Steel Corporation (CSC)
16 CITIC PACIFIC Special Steel Group Co., Ltd
17 Cogne Acciai Speciali Spa
18 Çolakoğlu Metalurji A.Ş.
19 Daehan Steel Co., LTD
20 Daido Steel Co., Ltd.
21 Diler Iron and Steel Co., Inc.
22 Duferco Participations Holding S/A
23 **elmarakbysteel**
24 **EMSTEEL**
25 **EZZ Steel**
26 Feng Hsin Steel Co., Ltd.
27 **Gerdau S.A**.
28 HBIS Group Co., Ltd.
29 HYUNDAI Steel Company
30 InfraBuild
31 **JFE Steel Corporation**
32 Jindal Shadeed Iron & Steel LLC
33 Jindal Steel Limited
34 Jingye Group
35 JSW Steel Limited
36 Kaptan Demir Çelik Endustrisi ve Tecaret A.S.
37 Kobe Steel, Ltd
38 Kroman Çelik Sanayii A.Ş.
39 **Liberty Speciality Steel (GFG Alliance)**
40 Maghreb Steel
41 Metinvest Holding LLC
42 **Mobarakeh Steel Company**
43 NatSteel Holdings Pte Ltd
44 Nippon Kinzoku Co., Ltd.
45 Nippon Steel Corporation
46 Nippon Yakin Kogyo Co., Ltd.
47 Nucor Corporation
48 Onesteel
49 Ovako AB
50 POSCO Holdings
51 PT Gunung Raja Paksi Tbk
52 **Qatar Steel Company (Q.P.S.C.)**
53 **Saudi Iron and Steel Company (Hadeed)**
54 **SeAH Besteel Corporation**
55 **SeAH Changwon Integrated Special Steel Corp.**
56 Shougang Group
57 Siam Yamato Steel Company Corporation (SYS)
58 SIDENOR S.A.
59 SIJ (Slovenian Steel Group)
60 Steel Authority of India Ltd. (SAIL)
61 SteelAsia Manufacturing Corporation
62 ŠTORE STEEL d.o.o.
63 SULB Company
64 Swiss Steel Holding AG
65 Tang Eng Iron Works Co. Ltd.
66 **Tata Steel**
67 **Tenaris**
68 **Ternium**
69 The Japan Iron and Steel Federation (JISF)
70 thyssenkrupp Steel Europe AG
71 Tung Ho Steel Enterprise Corporation
72 United States Steel Corporation
73 **Usinas Siderúrgicas de Minas Gerais S.A. (USIMINAS)**
74 voestalpine AG
75 Wei Chih Steel Industrial Co., Ltd.

Publicly available data was used for 18 companies, including non-members, listed below:

1 Anyang Steel
2 Eregli Demir ve Çelik Fabrikalari TAS (Eregli Iron and Steel Works, Co.)
3 Fangda Steel
4 Hoa Phat Steel
5 Hunan Steel Group
6 Jinxi steel
7 Jiuquan steel
8 Lingyuan steel
9 Liuzhou Steel
10 Metalloinvest Management Company LLC
11 Nanjing Steel
12 Outokumpu Oyj
13 p.t. Krakatau Steel
14 Salzgitter AG Stahl und Technologie
15 Sanming Steel
16 Shagang Group
17 Shandong Steel Group
18 SSAB AB

Definitions and calculation

Environmental performance			
Indicator		Definition	Calculation
1a	**GHG emissions intensity**	This indicator calculates GHG emissions (CO_2, CH_4, N_2O) per tonne of crude steel. It is calculated with the worldsteel CO_2 data collection methodology, which includes all scopes (1, 2, and scope 3 - category 1). This represents the weighted average for the BF-BOF, scrap-EAF, and DRI-EAF routes, scaled by the share of global steel production they represent.	Tonnes of CO_2e emitted / tonne of crude steel
1b	**CO_2 emissions intensity**	This 'original' indicator measure tonnes of CO_2 emissions per tonne of crude steel. It is calculated with the worldsteel CO_2 data collection methodology, which includes all Scopes (1, 2, and some scope 3). This represents the weighted average for the BF-BOF, scrap-EAF, and DRI-EAF routes, scaled by the share of global steel production they represent.	Tonnes of CO_2 emitted / tonne of crude steel
2	**Energy intensity**	This indicator measures the energy used to process the crude steel volume in GJ/tCS (tonne of crude steel as cast). Global Energy intensity represents a weighted average between EAF and BOF routes.	GJ of energy used / tonne of crude steel
3	**Material efficiency**	This indicator calculates the percentage of crude steel and co-products compared to total solid output material (i.e. crude steel, co-products and waste landfilled or incinerated).	(crude steel + co-products) / (crude steel + co-products + waste)
4	**Environmental management systems (EMS)**	This indicator measures the percentage of employees and contractors working in registered steel production facilities.	Number of employees and contractors working in registered production facilities / total number of employees and contractors working in production facilities
5	**Renewable energy consumption**	This indicator measures the share of renewable energy in total energy consumption.	Total renewable energy consumption (GJ) / total energy consumption (GJ)
6	**SOx emissions intensity**	This indicator measures SOx emissions per tonne of crude steel	kg of SOx emitted / tonne of crude steel
7	**NOx emissions intensity**	This indicator measures NOx emissions per tonne of crude steel	kg of NOx emitted / tonne of crude steel
8	**Dust emissions intensity**	This indicator measures total dust emissions per tonne of crude steel	kg of particulate matter (PM) emitted / tonne of crude steel
9	**Fresh water withdrawal**	This indicator measures the total amount of fresh water withdrawn	m^3 of fresh water withdrawn / tonne of crude steel
10	**Fresh water consumption**	This indicator measures the portion of fresh water that is not returned to the original water source after being withdrawn	(m^3 of fresh water withdrawn – m^3 of fresh water discharged) / tonne of crude steel
Social performance			
Indicator		Definition	Calculation
11	**Lost time injury frequency rate (LTIFR)**	This indicator measures the number of lost time injuries per million man-hours, including fatalities.	(lost time injuries + fatalities) / million hours worked
12	**Employee training**	This indicator measures the total days of training per employee per year.	Total days of training/ total number of employees
13	**Women in workforce**	This indicator measures total percentage of women in the workforce	Number of women employees / total number of employees
14	**Women on the board**	This indicator measures the total women members of the Board who have been elected to represent the shareholders	Number of women board members / total number of board members
15	**Community investment**	This indicator measures total percentage of revenue spent on community activities	Amount of money spent on community activities / revenue
Economic performance			
Indicator		Definition	Calculation
16	**Investment in new processes and products**	This indicator measures the value of investments made on capital expenditure, and research and development	(capital expenditure + research & development expenditure) / annual revenue
17	**Economic value distributed (EVD)**	This indicator measures the economic value distributed to society by the steel industry, including direct and indirect contributions	(Operating costs + employee wages and benefits + dividends paid + interest payments + payments to government + community investments) / annual revenue
Governance performance			
Indicator		Definition	Calculation
18	**Supply chain assessment**	This indicator measures the total percentage of active input-material suppliers that are covered by a valid supply chain assessment	Total number of active input-material suppliers covered by valid supplier assessment / total number of active input-material suppliers
19	**Employee education on business ethics**	This indicator measures the proportion of the workforce with valid education on the business code or ethics	Total number of employees who received education on any aspect of business code or ethics / total number of employees

* United Nations Sustainable Development Goals

Relevance

Environmental performance					
Indicator		Relevance	Our Sustainability Principles		Relevant UNSDG*
1	**GHG emissions intensity**	The production of steel is a carbon-intensive activity. Emissions from the steel industry, the majority of which come from carbon dioxide (CO2) represent 7% - 8% of global anthropogenic GHG emissions. Nonetheless, the steel industry is committed to continuing to reduce the carbon footprint from its operations Achieving the drastic emissions reductions required will demand a fundamental transformation in how iron and steel are produced.	Climate action	Proactively address climate change and take effective actions to minimise the industry's GHG emissions.	7. Affordable & clean energy 13. Climate Action
2	**Energy intensity**	Steel production remains energy-intensive. The steel industry is focusing on increasing the energy effciency of its operations and the proportion of low-carbon resources used.			
3	**Renewable energy consumption**	The transition to renewable energy sources is essential to reduce the carbon footprint of steel production. Increasing the share of renewable energy in operations supports decarbonisation and enhances long-term energy security.			
4	**Material efficiency**	The recovery and use of co-products within and outside the steel industry combined with the responsible management of natural resources contribute to material efficiency and a circular economy.	Circular economy	Maximise the efficient use of resources throughout the life cycle of steel products and support society to achieve a circular economy.	12. Responsible consumption & production
5	**Environmental management system (EMS)**	Registered environmental management systems are an effective way to manage environmental performance and to ensure legal compliance.	Environmental care	Conduct operations in an environmentally responsible manner.	3. Good health & well-being 6. Clean water & sanitation 11. Sustainable cities & communities 12. Responsible consumption & production 14. Life below water 15. Life on land
6	**SOx emissions intensity**	Monitoring and reducing SOx emissions are essential to minimise environmental impact and protect human health and ecosystems.			
7	**NOx emissions intensity**	Monitoring and reducing NOx emissions are essential to minimise environmental impact and protect human health and ecosystems.			
8	**Dust emissions intensity**	Controlling and reducing dust emissions helps create a cleaner working environment and reduces the impact on surrounding communities.			
9	**Fresh water withdrawal**	Water is a vital resource for steel production. Monitoring and managing fresh water withdrawal levels ensures responsible water use and minimises the impact on local water sources and ecosystems.			
10	**Fresh water consumption**	Reducing freshwater consumption through recycling and efficient water management contributes to sustainable operations and helps protect water availability for local communities and ecosystems.			
Social performance					
Indicator		Relevance	Our Sustainability Principles		Relevant UNSDG*
11	**Lost time injury frequency rate (LTIFR)**	All injuries and work-related illnesses can and must be prevented. Measuring safety performance is one aspect of achieving good safety and health standards.	Safety and health	Maintain a safe and healthy workplace and act on health and safety incidents, risks and opportunities.	3. Good health & well-being 8. Decent work & economic growth
12	**Employee training**	Human capital is a key asset for all organisations and a main driver for the creation of value. Training programmes aim to expand the knowledge and skills of employees and help them to make the best use of their talents.	Our people	Enable our people to realise their potential while providing them with an inclusive and fair working environment.	4. Quality education 5. Gender equality 8. Decent work & economic growth
13	**Women in workforce**	Diversity in the workforce strengthens organisational performance and innovation. Increasing the representation of women in all areas of the business promotes inclusivity and gender equality.			
14	**Women on the board**	Balanced representation in leadership fosters better decision-making and reflects the company's commitment to diversity and equality at all levels of governance.			
15	**Community investment**	Steel operations are closely linked to the well-being of local communities. Investing in community development supports social inclusion, local economies, and long-term shared value creation.	Local communities	Build trust and create constructive relationships with local communities.	11. Sustainable cities & communities

* United Nations Sustainable Development Goals

Relevance

Economic performance					
Indicator		Relevance	Our Sustainability Principles		Relevant UNSDG*
16	**Investment in new processes and products**	Investments in new processes and R&D contribute to a sustainable steel industry.	Innovation and prosperity	Pursue innovations for technologies and products to achieve sustainable economic development.	1. No poverty 8. Decent work & economic growth 9. Industry, innovation & infrastructure
17	**Economic value distributed (EVD)**	Steel is critical to economic growth. It is important to quantify the value companies create and to establish how much of this wealth is distributed to society.			
Governance performance					
Indicator		Relevance	Our Sustainability Principles		Relevant UNSDG*
18	**Supply chain assessment**	Responsible sourcing practices help ensure that suppliers adhere to environmental, social, and ethical standards, strengthening sustainability across the entire value chain.	Responsible value chains	Lead responsible business practices through the value chain.	12. Responsible consumption & production
19	**Employee education on business ethics**	Ethical awareness and responsible behaviour are key to maintaining trust and integrity. Education on business ethics helps employees uphold high standards of transparency and accountability.	Ethical and transparent operations	Conduct operations with high standards and transparent processes.	17. Peace, justice and strong institutions

* United Nations Sustainable Development Goals

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ASSOCIATION