Sustainable steel

Indicators 2020 and steel applications

worldsteel ASSOCIATION

Steel industry materiality assessment

During the most recent materiality assessment of the steel industry, it was identified that that a number of areas including 'Product applications' need to be further addressed in our communications.

This publication features key information on the topic with a focus on three steel product applications: automotive, construction and packaging.

Innovative and advanced steels are extensively used in these applications. The pyramid infographic on the next page illustrates the steel industry's goals and actions for these sectors along with interesting facts and information.

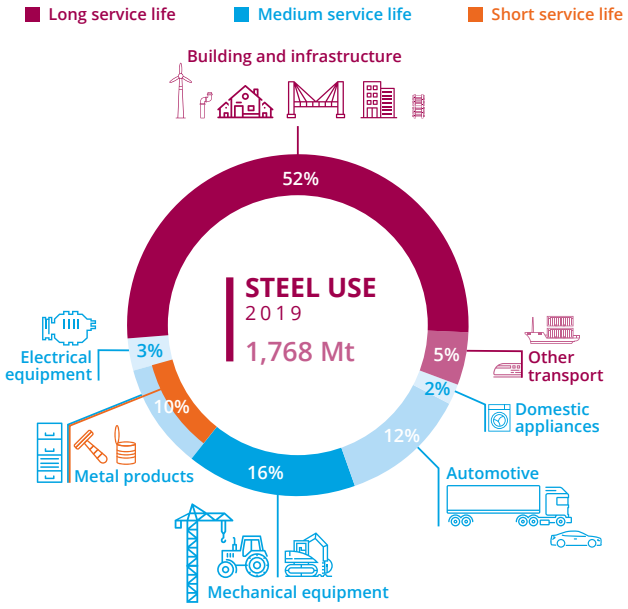
Steel markets and applications

Steel plays a critical role in virtually every aspect of our lives. The rails, vehicles and ships that make up our modern transport systems use steel. Steel provides the supporting structure as well as connections, roofs, walls, windows, doors and rails for the buildings where we work, learn and live. It protects and delivers our water and food supply. Steel is ideal for hygiene medical devices and is vital in technologies that generate and transmit energy.

Steel is vital in our lives and our society simply because no other material has the same unique combination of strength, formability and versatility.

New generations of steel continue to be developed that enable steel users to implement more durable, lightweight, safe and carbon-lean designs, enabling them to be more sustainable.

Steel applications can help us to meet challenges such as climate change, poverty, population growth, water distribution and renewable energy generation.



Life cycle thinking: key to every aspect of sustainability

To understand the environmental performance of a product, its entire life cycle needs to be considered. A life cycle assessment (LCA) of a steel product looks at resource and energy consumption and emissions to air, water and land. This is assessed from the raw material extraction stage to its end-of-life stage, including reuse and recycling.

worldsteel provides global and regional LCI data for 17 steel products, from hot rolled coil to plate, rebar, sections and coated steels. This data enables product designers to make informed material choices. worldsteel's buildLCA and autoLCA tools help determine the environmental performance of steel in the construction and automotive sectors compared to alternative materials.

An LCA approach must be considered for the development of appropriate legislation to ensure that the true environmental impact of products is assessed correctly and consistently, avoiding unintended consequences.

Construction, automotive and packaging are examples of just three market sectors where life cycle thinking is being incorporated into regulations and standards, but a more widespread application is crucial.

The LCI data quantifies 'cradle to gate' inputs (resources, energy) and outputs (environmental emissions) of steel production from:

the extraction of resources and use of recycled materials,

production of steel products to the steelworks' gate,

reuse and remanufacturing, and

end-of-life recovery and recycling of steel.

	AUTOMOTIVE	CONSTRUCTION	PACKAGING
AROUND THE WORLD	**1 billion cars** are currently in use on earth **Electric vehicles, autonomous cars, and car sharing** are the key future mobility trends The first electric car was invented nearly **200 years ago** The average car contains **over 30,000 unique parts** A typical passenger vehicle emits **about 4.6 metric tonnes of CO_2** per year	Nearly **70% of the global population** will live in cities by 2050 Buildings account for about **30% of final energy use** and more than **55% of global electricity consumption** In 2019, the total number of **buildings over 200 metres high was 1,603** The number of **LEED-certified projects** in the United States rose from 296 certifications in 2006 to over 67,200 in 2018	More than **25% of all food** produced globally for human consumption is **lost or wasted** Containers and packaging make up **one third of global waste** Most common packaging materials are **paper, plastic, aluminum, glass and steel** Today more than **70% of global soft drinks** are sold in PET bottles
OUR COMMITMENT	Provide steel solutions that meet the automotive industry's needs and challenges in a sustainable and environmentally responsible way	Provide steel solutions that enable more energy-efficient and carbon neutral buildings	Provide steel products that enable the packaging industry and its value chain to be more sustainable and cost effective
OUR ACTIONS	Develop high performing steel solutions **to reduce weight while maintaining safety levels** Continue a legacy of steel innovation that **addresses the evolving demands of vehicle design and manufacture** Demonstrate applications that will **shape the future of sustainable mobility** through steel innovation **Promote the use of autoLCA**	Rethink and reinvent the use of steel in construction via our **Zero Energy Building initiative** **Collaborate with other construction materials** to provide optimal solutions **Proactive communications** with the value chain of the constuction industry **Promote the use of buildLCA**	Continue to develop **steel grades** that are **thinner but stronger** Develop further **technologies** that can meet the needs for **flexible design and shape** Demonstrate **benefits of steel packaging solutions** in an unequivocal and engaging way
THE STEEL INDUSTRY	New grades of **Advanced High-Strength Steels (AHSS) can reduce total vehicle weight** by 8-10% compared to conventional steel **Today vehicle body** structures can contain **more than 50% AHSS** **Electric steel is an essential** material in the construction of generators and motors **for electric vehicles** **Lightweighting, safety, battery protection and cost reduction** are the main reasons for automakers **to select steel for the body of electric cars** **The future of steel** is expected to enable even lighter yet stronger vehicle structural designs, thereby **further minimizing a vehicle's carbon footprint from a life cycle perspective**	Global **steel demand for construction** is expected **to rise by 2.1% every year** for the next 15 years **Steel offers the highest strength-to-weight ratio** of any building material Use of Advanced High-Strength Steel enables **high rise buildings to be built with 50% less steel** Steel buildings are increasingly designed to be reused. **CO_2 emissions savings from reusing steel within buildings** are estimated at **1 to 1.5 kg CO_2 /kg steel**	**Steel** is **the most recycled material** in the world. **82.5%** of steel packaging is currently **recycled in the EU** A **recycled steel can be** back on the shelf as **a new can within 60 days** Each steel can recycled **saves about 1.5 times its weight in CO_2** **The weight of steel cans has been reduced on average by 33%** in the last 20 years Steel packaging is an unrivalled **solution for shelf life, transport, storage, use and recycling**

Sustainability performance of the steel industry

The World Steel Association has been reporting on the sustainability performance of the global steel industry since 2004. Steel companies report up to 8 sustainability indicators every year via worldsteel's sustainability indicators data collection project.

In 2020, 104 steel companies and associations contributed to the data collection. Crude steel produced by companies who reported on one or more indicators for fiscal year 2019 was 1.1 billion tonnes, representing 59% of global crude steel production.

		Indicator	Unit	2017	2018	2019
Environmental Performance	1	CO_2 intensity	tonnes CO_2 / tonne crude steel cast	1.84	1.81	1.83
	2	Energy intensity	GJ / tonne crude steel cast	19.85	19.54	19.84
	3	Material efficiency	% of materials converted to products and co-products	96.49	96.33	97.49
	4	Environmental management systems	% of employees and contractors working in registered production facilites	96.55	97.08	97.15
Social Performance	5	Lost time injury frequency rate	injuries / million hours worked	0.97	0.84	0.83
	6	Employee training	training days / employee	6.26	6.36	6.89
Economic Performance	7	Investment in new processes and products	% of revenue	5.76	6.10	7.07
	8	Economic value distributed	% of revenue	95.36	93.84	98.02

Steel Sustainability Champions

Sustainability is a core business requirement, vital to a company's continuing license to operate. An ethical and socially responsible approach can act as a competitive advantage for forward-thinking steel companies.

worldsteel member companies who are leading the way to create a truly sustainable steel industry and society and who clearly demonstrate their commitment to sustainable development and the circular economy are recognised annually as Steel Sustainability Champions.

The 2019 Steel Sustainability Champions are:

ArcelorMittal

BLUESCOPE

CHINASTEEL

JSW Steel

NIPPON STEEL

TATA STEEL
Tata Steel Europe

TATA STEEL
WeAlsoMakeTomorrow
Tata Steel Limited

Tenaris

Ternium

Sustainability CHAMPIONS
worldsteel ASSOCIATION

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