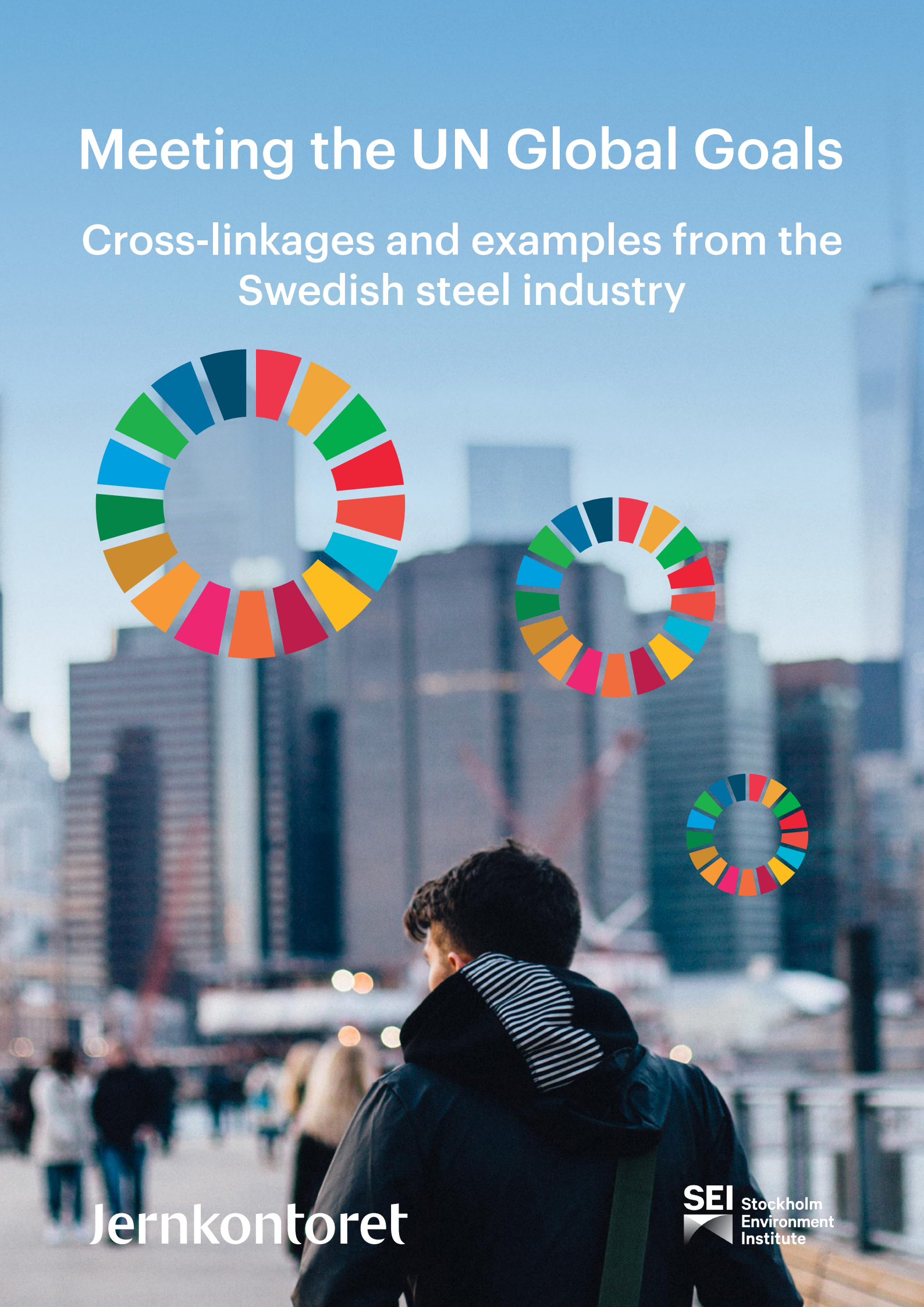
Meeting the UN Global Goals

Cross-linkages and examples from the Swedish steel industry



Jernkontoret

SEI Stockholm Environment Institute

The steel industry 2050 vision:

Steel Shapes a Better Future

We lead technical development

Our research and innovation revolutionise technology for tomorrow's society. Our steel constantly challenges the frontiers of engineering.

We nurture creative individuals

Our working environment fosters new solutions for communities through global collaboration. Our creativity constantly challenges the limits of contemporary thinking.

We create environmental benefits

Our production uses resources so efficiently that only products of societal value leave our plants. Our ambition constantly challenges the limits of the possible.

Stockholm, November 2017

Introduction

What do the UN Global Goals mean for the Swedish steel industry and vice versa? Do the goals represent an existential challenge given the industry's considerable emissions, or do they offer opportunities for an innovative sector to develop the full societal potential of a recyclable and permanent material?

The Swedish steel industry have a positive impact on many more of the Global Goals than what first comes to mind – particularly when cross-linkages between the goals are considered. The steel industry contributes to ***1 No Poverty*** and ***2 Zero Hunger*** and strengthens ***3 Good Health and Well-Being*** through job creation and sustainable infrastructure, and also by providing stainless steel used in health care. The steel industry have a positive impact on ***4 Quality Education*** and ***5 Gender Equality*** by supporting technical and industrial education. Iron powder is used for ***6 Clean Water and Sanitation***.

Specialized steel applications for wind mills, stronger and lighter vessels and safer buildings, contribute to ***7 Affordable and Clean Energy, 9 Industry, Innovation and Infrastructure***, as well as ***11 Sustainable Cities and Communities***. Steel plants can generate ***8 Decent Work and Economic Growth*** and provide regional development that can help achieve ***10 Reduced Inequalities***.

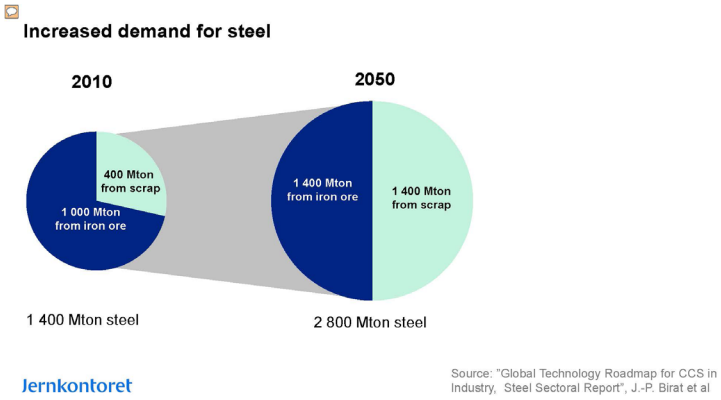
If the 2050 vision *Steel shapes a better future* is successful, industry would also provide support to ***12 Responsible Consumption and Production*** and ***13 Climate Action***. The steel industry integrates along value chains and private–public platforms, which contributes to ***17 Partnerships for the Goals*** and ***16 Peace, Justice and Strong Institutions***.

Still, steelmaking has negative impacts on ***13 Climate Action, 14 Life below Water*** and ***15 Life on Land***, which indicates areas for improvements. By-products from steel-making could be further utilized, reducing the need for virgin materials, which, in turn, will have a positive ecosystem effect. If new hydrogen ironmaking technology succeeds, major CO_2 emissions will be eliminated.

The potentials for contributing to the Global Goals represent business opportunities. At the same time there are negative impacts requiring continuous attention and improvement. A methodology for gauging the societal value of products and processes is currently being developed to assist the industry to meet its 2050 vision. A fundamental point of departure has been to regard the Global Goals as a set of parameters that has to be seen as a whole, and where the impacts from products or processes are assessed across all the goals and targets.[1]

The following pages illustrate examples of interlinkages between the Global Goals and the Swedish steel industry focusing opportunities for ”smart steel” to contribute to achieving the Global Goals. As such, smart steel, in this context, is advanced, high performance materials designed to be optimal for a certain application could offer unique qualities that allows for e.g. lighter and stronger constructions, longer life spans and efficient recycling.

[1] ”How can Swedish steel deliver on the Global Goals?” https://www.sei-international.org/-news-archive/3646



1 No Poverty

1 No poverty contributes to ***2 Zero Hunger***, ***3 Good Health and Well-Being***, ***4 Quality Education*** and ***10 Reduced Inequalities***. However, if ***12 Responsible Consumption and Production*** is not achieved, ending poverty for all will be a challenge and will also make it difficult to succeed on ***13 Climate Action***, ***14 Life below Water*** and ***15 Life on Land***. Smart steel can contribute to innovative solutions to meet these goals. Through careful assessment of material and processing choices, involving both virgin and recycled materials, solutions involving steel can support ***1 No Poverty*** through considerable contributions to ***13 Climate Action*** and ***9 Industry, Innovation and Infrastructure***. CO_2 free steel-making from virgin materials, smart steels for construction and transport, and for ***7 Clean Energy*** are all important pieces of the puzzle.

2 Zero Hunger

2 Zero Hunger contributes to ***1 No Poverty*** and ***3 Good Health and Well-Being***. Smart steel can contribute to ***2 Zero Hunger*** by providing solutions that make it easier to reach several of the underlying targets, such as doubling productivity and income in agriculture, ensuring safe food, and cutting food-chain losses in half. Steel applications can be designed to build better machinery and infrastructure for harvesting, transport, storage and food processing.

3 Good Health and Well-Being

3 Good Health and Well-Being affects all goals positively, but ***12 Responsible Consumption and Production*** targets will have to be fulfilled to ensure that targets for ***13 Climate Action, 14 Life below Water*** and ***15 Life on Land*** can be met. Smart steels offer already today the vehicle industry considerable opportunities to make lighter cars that use less energy, with lower emissions and better health as a result. Modal shifts of transportation can draw on unique steel qualities to leapfrog in safe and efficient solutions. Stainless steels have considerable health improving qualities for medical appliances and health care facilities. Iron (Fe+) is a necessary mineral and is used in food, e. g. cereal, as a mineral supplement in the form of iron powder. Currently, air pollution from steel production have considerable negative health impacts that need to be addressed through continuous improvement and more efficient technologies.

4 Quality Education

4 Quality Education contributes to ***1 No Poverty, 8 Decent Work and Economic Growth,*** and ***10 Reduced Inequalities***, as lack of education and formal skills hinders progress. This goal is also a prerequisite for the second commitment – We nurture creative individuals – in the steel industry's 2050 vision. The industry contributes to several high-level education facilities, education programmes, research opportunities, and to many regional high schools. Swedish steel companies also provide employees with training, thus contributing to building human capital.

5 Gender Equality

5 Gender Equality contributes to the **first four goals.** Being a male dominated sector Swedish steel industry works actively to improve women's participation in all parts and levels of the industry. With women accounting for an increasingly higher share of graduates from higher education the steel industry wants and needs to become more gender balanced. As such ***5 Gender Equality*** represents a core aspect of the second commitment – We nurture creative individuals – in the steel industry's 2050 vision.

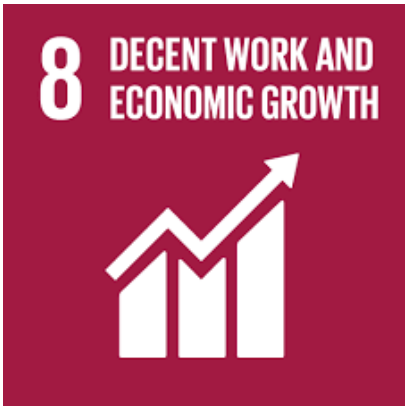

Cleanit® EC for industrial wastewater

6 Clean Water and Sanitation

6 Clean Water and Sanitation contributes to ***2 No Hunger, 3 Good Health and Wellbeing, 14 Life below Water*** and ***15 Life on Land***. Use of industry made minerals, slags, and iron powder applications can be used for water purification. Smart steel applications have considerable opportunities to contribute to ***6 Clean Water and Sanitation*** in areas that are also covered by ***9 Industry, Innovation and Infrastructure, 11 Sustainable Cities and Communities*** and ***11 Responsible Consumption and Production***. However, steel production still has negative impacts on water quality, directly and through its supply chain, which, in turn, have negative repercussions on ***2 Zero Hunger, 3 Good Health and Well-Being, 14 Life below Water*** and ***15 Life on Land***.

7 Affordable and Clean Energy

7 Affordable and Clean Energy has a considerable impact on **most of the goals** but in particular on ***13 Climate Action***. Smart steel applications have enormous potential to contribute across the entire renewable energy revolution, ranging from solar, wind, hydropower, geothermal, wave/tidal, and fuel cells, as well as in the storage and transmission of energy and electricity. At the same time, steel production is energy intensive causing possible negative trade-offs with other demands for energy. With its ample renewable energy potential Sweden is an ideal country for steel making.



8 Decent Work and Economic Growth

8 Decent Work and Economic Growth contributes to ***1 No Poverty*** and has strong impacts on the opportunities to reach most of the other goals. Smart steel's capability for increased circularity of materials, and its capacity to deliver substantial efficiency and productivity gains translates into a substantial potential for contributing to sustainable growth and better working conditions.

9 Industry, Innovation and Infrastructure

9 Industry, Innovation and Infrastructure contributes to ***6 Clean Water and Sanitation, 7 Affordable and Clean Energy, 8 Decent Work and Economic Growth*** and ***11 Sustainable Cities and Communities***. Genuinely sustainable development of industry and infrastructure, in accordance with ***12 Responsible Consumption and Production*** goals, also has the capacity to strengthen ***13 Climate Action***. Smart steel brings huge potentials for less resource intensive infrastructure solutions and does also provide possibilities for transforming other industrial sectors, making them more efficient, circular and sustainable, thus contributing to growth, high-value technology, innovation and resource efficiency. To deliver research and innovation that revolutionise technology for tomorrow's society is the first commitment – We lead technical development – in the Swedish steel industry's 2050 vision.

10 Reduced Inequalities

10 Reduced Inequalities contributes to ***5 Gender Equality*** and ***8 Decent Work and Economic Growth***. While steel is likely to have only minor direct influence on ***10 Reduced Inequalities***, smart steel could contribute indirectly by, e.g. providing components and solutions for affordable, accessible, reliable and resilient water and sanitation, communication, energy, public transportation and other infrastructural features.

11 Sustainable Cities and Communities

11 Sustainable Cities and Communities contributes to ***3 Good Health and Well-Being*** and ***6 Clean Water and Sanitation***. Reaching the goal requires interactions with ***7 Affordable and Clean Energy***, ***9 Industry, Innovation and Infrastructure*** and ***12 Responsible Consumption and Production***. Smart steel provides essential components and solutions in renewable energy systems, technologies for new modes of transportation, such as fuel cells using hydrogen, resource efficient and recyclable construction materials.

12 Responsible Consumption and Production

12 Responsible Consumption and Production is an essential goal for making it possible to achieve all the Global Goals. Being a circular and permanent material, smart steel has potential to constitute a cornerstone in a circular economy that drives responsible consumption and production patterns. Steel scrap is possible to recycle again and again, without losing its properties, steel even gets better properties every time it is re-produced. In the Swedish steel industry's 2050 vision, the third commitment is – steel production uses resources so efficiently that only products of societal value leave our plants.

13 Climate Action

13 Climate Action contributes to ***3 Good Health and Well-Being, 6 Clean Water and Sanitation, 14 Life below Water*** and ***15 Life on Land***. As iterated under previous goals, smart steel has unique qualities that makes it well-placed to contribute to ***13 Climate Action*** essentially by increasing efficiencies, productivity and reuse along the entire supply chain. Still, steelmaking constitutes a considerable source of global as well as Swedish CO_2 emissions. A Swedish initiative – HYBRIT (Hydrogen Breakthrough Iron-making Technology) – is therefore in the process of researching a solution to eliminate CO_2 emissions by replacing coking coal with hydrogen in the process of turning iron ore into iron. If successful, the hydrogen based steel production have potential to generate integration cycles with systems for ***7 Affordable and Clean Energy***, where hydrogen plays a central role for energy storage and for feeding fuel cells that would also contribute to ***11 Sustainable Cities and Communities*** and ***12 Responsible Consumption and Production.***

14 Life below Water

14 Life below Water contributes to ***1 No Poverty*** and ***2 Zero Hunger.*** Metallurgic slags from steel production has considerable potential to be used for reduction of phosphorus and unwanted metals in industrial and agricultural effluents. Smart steel could reduce pressures on ocean resources by providing components for better engines and more efficient solutions for ship-building. Technology breakthroughs such as HYBRIT (see Goal no. 13) has the potential to lower CO_2 emissions also contributing to curb the ongoing ocean acidification. However, although emissions to water from steel production have continuously decreased and are regulated in the plant permits, the remaining emissions still affect life below water and need to be minimized.

15 Life on Land

15 Life on Land contributes to ***1 No Poverty, 2 Zero Hunger, 3 Good Health and Well-Being, 6 Clean Water and Sanitation*** and ***13 Climate Action***. Smart steel offers important solutions for addressing ecosystem degradation. By improving resource efficiencies, steel has potential to reduce pressures on natural resources and ecosystems. Companies are working in partnership with municipalities, local authorities, and researchers to increase biodiversity and strengthen resilience in land-sea areas on site. Some have integrated ecosystem services in the operations of the steel companies taking on a broader perspective as to how they affect life on land. Still, the steel industry's remaining negative impact on the water cycle, ***14 Life below Water***, and the carbon cycle, ***13 Climate Action,*** also affect land-based ecosystems that need to be addressed.

16 Peace, Justice and Strong Institutions

16 Peace, Justice and Strong Institutions contributes to the **first three goals**, which in turn help achieving other goals, e.g. ***5 Gender Equality, 8 Decent Work and Economic Growth*** and ***10 Reduced Inequalities***. Internal policies and behaviour within the steel industry can combat corruption and contribute towards transparency, which in turn facilitates meeting other targets concerning fighting crime and illegal flow of arms. Steel applications in the right hands can protect society through peace-keeping and promoting e.g. justice. Still, by the same token, in wrong hands, it could undermine this goal.

17 Partnership for the Goals

17 Partnerships for the Goals contributes to **all other goals**, particularly in the least developed countries, where international cooperation and well-functioning partnerships are crucial for making progress. As the Swedish steel industry is active in more than 150 countries, already established partnerships with e.g. suppliers, customers, product development partners, other sectors, government agencies and civil society actors at home and abroad can be mobilised to help meeting targets associated with several of the goals concerning investments, technological transfers and public-private partnerships. Working together with a range of different actors the Swedish steel industry has potential to take a leading role in the transformation that is necessary for delivering on the Global Goals.

Swedish steel production and its steel applications can make an important contribution to achieving the UN Agenda 2030 Global Goals. Since the seventeen goals are all connected and interlinked, actions contributing to one goal can also help society to fulfill other goals. Steel applications enable most high-technology supply chains in one way or another, and this means that steel is also connected and interlinked to many of the solutions that can help the world to achieve the seventeen Global Goals.

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