



Sustainability review 2017

RECYCLING MAXIMIZED ■ Stainless steel is 100% recyclable. It is one of the most recycled material in the world, and its quality is preserved in the process.

Our stainless steel contains a very high proportion of recycled materials, and we keep increasing this further to conserve virgin raw materials. Increasing the share of recycled material is the single most effective way to reduce our environmental impact.

Sustainability at Outokumpu

In Outokumpu's view, sustainability is a precondition for competitiveness in the long run. Outokumpu's biggest contribution to a world that lasts forever is the stainless steel that we produce.



But it is not only what we produce, but how we produce it: Outokumpu produces stainless steel through a sustainable production chain in a responsible manner. Our business is based on the circular economy, as our most important raw material is recycled steel.

Policies and UN sustainable development goals

Sustainability is integrated into all our operations, activities and decision making, from purchasing of the materials to production and logistics. Outokumpu's operations are guided by our Code of Conduct, Ethical Principles (human rights and dignity, corporate responsibility, good corporate citizenship and safe and healthy workplace), Environment, Health & Safety and Quality Policy and Policy on Sustainable Development. We expect our business partners, subcontractors and suppliers to follow similar standards.

All our policies on sustainable development are available on outokumpu.com. 

Outokumpu is part of the United Nation's sustainable development goals. We contribute to several of these goals either through the way we operate or through our products.

Materiality analysis

Outokumpu has evaluated the most material topics in sustainability together with its stakeholders. The main material topics are: safe and healthy workplace, resource efficiency in energy and materials, environmental impacts and climate change. The developments in material aspects are presented in this sustainability review.

The results of the latest materiality analysis 

Certified management systems

All Outokumpu's sites are certified according to ISO 9001 and ISO 14001 management systems. Sustainability issues are built into these and safety management systems. The functioning of the systems is monitored by both internal and external audits. Outokumpu is also implementing an integrated management system through ISO 18001 standard for occupational health and safety.

Our business is based on the circular economy, as our most important raw material is recycled steel. Sustainability is integrated in all our operations.

Sustainable performance in 2017

Outokumpu has set challenging goals and environmental key performance indicators for 2020. The company also follows up and measures other selected economic, social and environmental indicators.

Workplace accidents decreased significantly

Target 2017:	Result 2017:
<8.0	4.4

Outokumpu believes that all accidents are preventable and therefore strives towards a goal of zero accidents. We overachieved our target for 2017, and our total recordable incident frequency rate (TRIFR, per million working hours) was 4.4 compared to the target of less than 8.0, which in absolute terms marks a 52% improvement from the previous year.

[More on safety and health](#)

100% of administrative employees had a regular discussion with their manager

Target 2017:	Result 2017:
100%	100%

Outokumpu's clear target is that each employee has a regular performance and development discussion with their manager. In 2017, the discussion process was unified within the Group, and we reached the target of 100% of administrative employees in applicable countries having these discussions. Of all employees, 53% had a performance and development discussion with their supervisors.

[More on personnel and organization](#)

Specific CO₂ emissions reduced

Target 2017:	Result 2017:
-0.7%	-0.2%

As a result of further development in target setting according to the Science Based Target initiative, we revised our commitment to reduce CO₂ emissions: Outokumpu targets to reduce the direct, indirect, upstream and downstream transport emission intensity by 14% by 2023 compared to the baseline 2014–2016.

In 2017, Outokumpu maintained its CO₂ intensity at the level of the baseline 2014–2016. As some ferrochrome was bought externally because of production issues, the upstream emissions increased. This was compensated by our own excellent energy efficiency and recycled content.

Before following a target on CO₂ emission intensity, Outokumpu set an ambitious low carbon program in 2010 to reduce its carbon profile (including electricity and transport) by 20% until 2020. In 2017, Outokumpu reached this target three years ahead of schedule.

[More on climate change](#)

Energy efficiency improved

Target 2017:	Result 2017:
10.3%	10.4%

(cumulative increase)

Outokumpu aims to improve the energy efficiency of its operations by 1% each year until 2020 and compares the cumulated efficiency increase to the baseline of 2007–2009. In 2017, Outokumpu further improved its energy efficiency by 2% from the previous year for the current operations. This corresponds to a saving of about 1.1 million MWh this year compared to the baseline.

[More on energy efficiency](#)

High recycled content in stainless steel production

Target 2017:	Result 2017:
88.5%	87.0%

Outokumpu aims to raise the recycled content in its stainless steel to 90% by 2020 from the already highest content in the industry.

In 2017, the recycled content stayed at the level of the previous year. The target was not reached as our Calvert site had scrap delivery problems caused by the hurricanes in the Gulf of Mexico in the third quarter.

[More on resource efficiency](#)

No significant environmental incidents

Target 2017:	Result 2017:
Zero	Zero

Outokumpu's target is to have no significant environmental incidents, and the company has had no such incidents for many years. Certified management systems in all sites and global policies and processes help to reduce all kinds of environmental risks.

[More on environmental compliance](#)

All sustainability figures 

Sustainability highlights in 2017



What if goods could be transported electrically?

In Sweden, Outokumpu is participating in an electric road project, the first of its kind in the world. The project aims to reduce the use of fossil fuels with the help of electrification in road transport. Outokumpu is committed to reducing emissions throughout its entire supply chain, including transport, and therefore we are proud to take part in this project along with other industrial companies.

An electric road has been built for part of the way from the industrial area where our mill is located in Avesta towards the harbor. The aim is to build more electric roads to cover the entire way. In 2017, Outokumpu received a Sustainability Award from International Stainless Steel Forum (ISSF) for its participation in this project and for efforts to decrease emissions from the transportation by using, for instance, biofueled trucks. ■



First ever shipment of LNG to Northern Finland

Outokumpu is part of a joint venture to diversify the gas and fuel market in Northern Finland with local liquefied natural gas i.e. LNG supply. The terminal was built in our production site in Tornio, and the first shipment for the new terminal arrived in November. The commercial distribution of LNG will begin in 2018.

Overall, liquefied natural gas is an environmentally friendly fuel that can replace petroleum-based fuels in industry, energy production and heavy transport, and it can help reduce shipping emissions as it meets the Sulphur Directive regulations. For Outokumpu, the new LNG terminal means being able to switch from propane to LNG. The change will increase our competitiveness, reduce our production costs thanks to more stable energy prices and decrease direct carbon dioxide emissions. ■



When renewable meets unbreakable

Building an offshore wind farm is a feat of human engineering, but building one in the North Sea takes this challenge to another level. In an environment where freezing temperatures, strong currents and corrosive sea spray are the norm, there is no room for failure.

Under these extreme conditions, only the best materials are able to perform: Outokumpu provided Merkur offshore wind farm Forta DX 2205 duplex stainless steel, which delivers extraordinary mechanical properties and superior resistance to corrosion. Stainless steel is used in transition pieces built by industrial equipment manufacturers Idesa and Windar Renewable. Once completed in 2019, the wind farm is expected to generate 1,750 gigawatt-hours per year, enough to cover the energy needs of about half a million homes. ■



Game-changing LNG tanker

Finnish tank manufacturer LNGTainer launched a new game-changing liquefied natural gas (LNG) tank. The most revolutionary aspect of LNGTainer's new tank container is that the structure includes a light, flexible inside tank and outside pressure vessel. For the light inside tank, LNGTainer chose Outokumpu's Supra 316plus steel grade.

With the new patented structure, the customer could decrease the weight of the tank by 30% and increase its capacity by 15%. By having excellent low temperature properties, Supra 316plus enables thinner gauges, which translates into savings in weight, fuel, energy costs, as well as a lower carbon footprint. LNGTainer's new tank container is a real breakthrough, and it demonstrates the best use of stainless steel properties in extreme conditions. ■



Ecosystem review in Avesta

Outokumpu's Avesta mill in Sweden participated in a one-year ecosystem review (ESR) arranged by Jernkontoret, the Swedish steel producers' association. The ESR presents a broader perspective on how Outokumpu connects with the world outside and on our dependences and impacts.

The review highlighted the importance of clean water available to Outokumpu, essential in stainless steel making, and the importance of sand ridges and their filtering capacity under threat by digging out large volumes of sand. For instance, steel slag can be used to replace sand in various applications, like concrete-making. By promoting slag utilization, high-volume uses of these sand ridges can be minimized, and they can be preserved. ■

Safe and healthy working environment

At Outokumpu, safety is the number one priority. Everyone who works or visits the company's premises – employees, contractors, and visitors – has the right to a safe and healthy environment.



Outokumpu's safety philosophy is based on our strong belief that all accidents are preventable. Safety takes priority over all other activities at Outokumpu, and we strive towards our ultimate goal of zero accidents through continuous improvements in safe working practices.

Outokumpu has defined six must-win battles, focus areas that will help us reach our vision 2020. Safety remains our first must-win battle, and we aim to reach a position among the top industry leaders in safety through a standardized and disciplined approach that also correlates with improved quality and operational efficiency.

Safety first

Training our employees to recognize risks and potentially hazardous behaviors is a fundamental part of preventive safety work at Outokumpu. In 2017, we started the behavioral safety training program SafeStart at

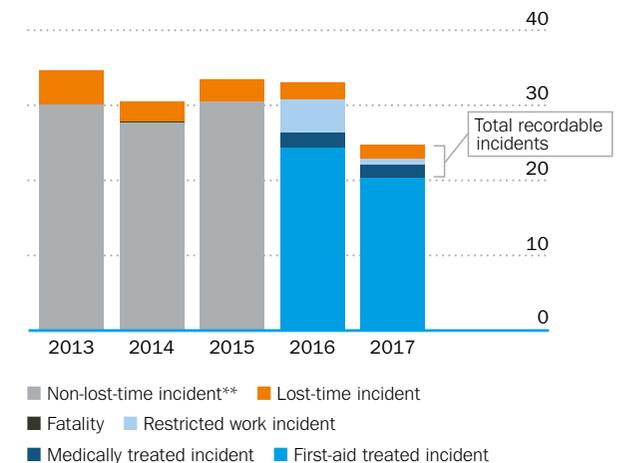
selected production sites in Europe and the Americas, with plans to train all Outokumpu employees in 2018. New training for conducting Safety Behavior Observations, an important safety leadership tool, was also introduced.

In 2017, Outokumpu established group-wide Cardinal Safety Rules – ten fundamental rules set to ensure the safety of everyone at Outokumpu. Covering the most severe breaches of safety behavior, these common rules form the foundation of safety for all Outokumpu employees, contractors, and visitors.

Monthly Safety Calls hosted by the CEO continued with a focus on the past month's safety performance, lost-time incidents, and sharing best safety practices across all Outokumpu sites. The annual Outokumpu Safety Week was held again in April with a focus on improving risk assessments and hazard observations.

Safety statistics were reported to a common reporting system on a monthly basis. The definitions of both leading and lagging safety performance indicators are based on international standards. Incident rates and the rate

Workplace accidents*



* Per 1 million working hours.

** Split between non-lost-time incident types is not available before 2016.

of proactive actions (leading indicators) were reported per million working hours.

In May, a fatal accident involving an Outokumpu contractor occurred in Degerfors, Sweden. Full measures were taken to thoroughly investigate the incident together with the authorities. Following the incident, comprehensive improvements have been implemented across all Outokumpu sites to avoid similar risks in the future.

Outokumpu uses total recordable incidents per million working hours (TRIFR) as the main safety performance indicator. Group TRIFR improved significantly from 2016 and was 4.4 against the target of < 8.0 (2016: 8.7). Group LTIFR (lost-time incidents per million working hours) was 1.8 against the target of < 1.7 (2016: 2.2). The rate for all workplace accidents (total recordable incidents and first aid treated incidents per million working hours) was 24.7. The lost-day rate (more than one calendar day absence from the day after the accident per million working hours) was 71.2 (2016: 55.1). The frequency of

proactive safety actions (per million working hours) increased to 3,240.6 (2016: 3,013.7).

Occupational health

Health activities at Outokumpu focus on continuously improving the working environment and occupational health and safety to promote the well-being of our employees and prevent occupational diseases. In improving and monitoring the working environment, Outokumpu cooperates with universities, specialist institutions, external associations as well as our suppliers. For example, in Tornio, Finland, Outokumpu has cooperated with a supplier to develop personal protective equipment for melting shop conditions.

Systematic occupational hygiene measurements and health checks are carried out at sites according to standards and legislation. For example, to protect the health and hearing of employees in the US, audiometric testing and hearing conservation training is conducted for all employees working in

areas where noise exposure meets or exceeds 85 dBA (8-hour weighted average). In Tornio, Finland, 1,088 occupational hygiene measurements were conducted to measure the noise, vibration, and impurities in the ambient air.

The number of occupational diseases diagnosed in the Group decreased. In 2017, there were no occupational diseases (2016: 4). The total absentee rate was 4.0% (2016: 4.1%); in Europe, the rate was 5.6%, in the Americas 0.5%, and in the rest of the world 1.0%.

Well-being at work

Outokumpu wants to ensure that every employee can return home after their working day in good health, both physically and mentally. The health and well-being of our personnel is an important asset in our day-to-day operations as well as a driver for our success in the long term.

We offer various health examinations and preventive checks to support the health of our employees. For example, in the Netherlands, Outokumpu provides regular occupational health checks for employees every three years. In Sweden, voluntary blood pressure and blood sugar checks as well as fitness tests were offered to employees during a wellness awareness week. In the US, Outokumpu arranged voluntary medical tests such as free cancer screenings. A campaign was launched to raise awareness of breast cancer. Other preventive medical care activities, such as influenza immunization, were offered at various Outokumpu sites.

Outokumpu sponsors employees' recreational activities and voluntary wellness programs in many ways. To encourage activity during the work day, a hiking trail has been set up close to our facilities in the Netherlands so that employees can take short walks and enjoy the fresh air during their breaks. In Germany, Outokumpu apprentices had the possibility of participating in a five-day preventive wellness program including topics such as ergonomics, nutrition, and exercise. Healthy lifestyles were also promoted in the US with a non-sugar campaign and guidance from a nutritionist. ■

Workplace accidents by region, accident and employee type

	Group	Europe	Americas	Asia and rest of the world	Female	Male	Employees	Contractors
TRIFR ¹⁾	4.4	5.0	3.0	0.0	0.3	4.1	3.8	6.4
LTIFR ²⁾	1.8	1.9	1.4	0.0	0.1	1.7	1.5	2.9
Total recordable incidents ³⁾	100	79	21	0	7	93	69	31
Fatalities	1	1	0	0	0	1	0	1
Lost-time incidents	40	30	10	0	3	37	27	13
Restrictive work incidents	21	17	4	0	4	17	15	6
Medically treated incidents	38	31	7	0	0	38	27	11
Lost-day rate	71.2	65.4	85.5	0.0	2.7	67.9	71.7	69.2

¹⁾ Total recordable incident frequency includes fatalities, lost-time incidents, restrictive work incidents and medically treated incidents, per million working hours.

²⁾ Lost-time incident frequency including fatalities and lost-time incidents, per million working hours.

³⁾ Includes fatalities, lost-time incidents, restrictive work incidents and medically treated incidents.

A year of learning and boosting organizational health

At Outokumpu, 2017 was a year of rolling out a new, common performance management process, a year of capability building, and a year of learning how to work together in the new organization.



Becoming a healthier organization

During 2017, Outokumpu conducted its second annual Organizational Health Index (OHI) survey among all the employees. The survey is one element of becoming a “high-performing organization”, one of Outokumpu’s six must-win battles. To succeed long-term, high-performing organizations need to measure and manage organizational health with the same consistency as performance itself. OHI is a tool that allows Outokumpu to clearly link the day-to-day behaviors and mindsets of employees to its strategy and must-win battles, and to benchmark its score against 1,300 other companies. The results of the second annual OHI survey serve as the main building block for future people development.

The 2017 survey response rate was 80.4% (2016: 70%), which is an extremely good result for any company but particularly high in manufacturing. Employees provided more than 14,400 open comments, recommendations

and opinions. The overall score landed Outokumpu in the third quartile, leading to an improvement of one quartile up versus the previous year, as targeted. Based on the survey, leadership and empowerment were identified as key development areas for 2018. The progress with action plans for these areas will be closely monitored throughout 2018. The company target is again to move one quartile up in the next OHI survey in autumn 2018. This would move Outokumpu to the top half among all companies using the OHI methodology.

Striving toward cost competitiveness

The vision of Outokumpu is to be the best value creator in stainless steel by 2020 through customer orientation and efficiency. For reaching the vision, Outokumpu defines a mission for each year and, in 2017, the mission was to secure cost competitiveness by the end of 2017. One of the key initiatives to reach that goal was setting up the new, simplified organization to achieve a lighter cost base and help in bringing in EUR 100 million in total savings in sales, general and administrative costs.

In 2017, the simplified organizational setup with fewer layers of management proceeded as the implementation of personnel reductions negotiated in 2016 continued further with 100 German administrative employees leaving the company during the year. For the coming years, there are already fixed contracts in place that will further help reduce the headcount in Germany. Overall, the number of employees decreased by 4% or 459 persons globally during 2017 due to the sale of two plants in the US and the continued restructuring measures and previously agreed site closures.

Collaboration towards goals

Ongoing cooperation with personnel takes place in a joint consultative body, the Personnel Forum, as an information channel between management and employees. The Personnel Forum discusses issues concerning transnational interests, such as financial performance, employment issues, reorganization, health and safety, and technology and research. The forum has 33 representatives from European countries and it appoints the Group Working Committee, which is responsible for the ongoing cooperation between management and employees. Eight members represent employees and three represent the management. In 2017, the Personnel Forum met once and the Working Committee convened four times.

A year of capability building

Following the new, common processes throughout the company, hundreds of Outokumpu employees participated in training programs during 2017. Both face-to-face classroom training sessions and virtual e-learning courses were held. Sales Academy activities continued, to enhance sales competences. Manufacturing Excellence initiatives were kicked off during 2017, including training sessions and development projects for employees in Operations. In the SafeStart program, focusing on behavioral safety awareness aimed at reducing accidents, rollouts at the Outokumpu sites around the globe started during the summer 2017 and continue also in 2018. The License to Lead training program for building leadership skills for first-line managers was initiated in May and continued throughout the year. During 2017, the overall company learning landscape and strategy were reviewed and, in 2018, the new plans will be taken into practice.

Overall, the average number of training and development days was 14,500 (2016: 10,990) and 103,218 hours (2016: 87,916) during the year.

The global talent management work in 2017 focused on organizational development and succession planning. To this end, the career development of 54 young talents was assessed using a method where the talents participated in group exercises, case studies and interviews. Each participant received concise feedback and a report about their strengths and development areas afterwards. Furthermore, the succession plans for each of the main functions were reviewed. The talent management system for the Outokumpu Group was updated and is now owned by the Outokumpu Leadership Team, who regularly reviews the process.

Common performance review tool and process for everyone

A common, global employee data platform was taken into use in 2017 and it is available for all employees. Building the

infrastructure and the processes behind the tool and providing training for all employees was a big effort for the company, as this is the first time all production and administrative employees are included in the same system globally. The tool includes all the basic HR processes and helps every employee in managing their learning curriculum and performance management process. The new HR platform also supports managing the compensation processes effectively, and managers have clear visibility to the compensation details of their team members. Each employee can also check their own data. Furthermore, all internal and external recruitments go through the platform, helping both HR and recruiting managers with a well-structured process.

The new HR platform enabled the rolling out of a global performance management process for all employees globally. The target is that everyone at Outokumpu, both production and administrative employees, has a regular performance and development discussion with their respective managers in 2018. In 2017, 53% of all employees and 100% of administrative employees in applicable countries had a regular performance development discussion with their manager. In those countries where local contracts or regulations do not make it possible to have performance development discussions, Outokumpu follows a different local procedure.

Outokumpu's principles and framework for salaries and incentive plans remained mostly unchanged and salary increase budgets were limited in 2017. [More on remuneration](#)

Zero tolerance for any discrimination

Outokumpu Code of Conduct sets the way of operating in the Group, built on the equal treatment of all people: there is zero tolerance for any kind of discrimination, whether it is based on ethnic origin, nationality, religion, political views, gender, sexual orientation, or age. Outokumpu fosters equal opportunities and diversity. Employment decisions will be based solely on business reasons and will be made according to the national employment laws.

Our people by region

	2017	2016	2015
Germany	2,744	3,004	3,186
Finland	2,377	2,363	2,396
Sweden	1,619	1,656	1,760
The United Kingdom	538	513	560
Other Europe	624	611	577
Europe	7,902	8,147	8,479
The United States	1,077	1,220	1,216
Mexico	1,000	1,058	1,095
South America	85	88	92
Americas	2,162	2,364	2,403
Asia/Rest of the world	77	89	120
Group total	10,141	10,600	11,002

In 2017, nine alleged incidents were recorded in Outokumpu (2016: 6). The Group reviews and investigates all incidents. When required, corrective actions are taken accordingly.

[Read more on compliance](#)

Outokumpu complies with the international, national, and local laws and regulations and respects international agreements concerning human and labor rights, such as the United Nations' Universal Declaration of Human rights, and condemns the use of forced and child labor. The majority of Outokumpu operations are located in Europe, in the US, and Mexico, where the risk related to the human rights in our operations is not considered to be high.

Outokumpu's working hours, minimum notice periods, vacation times, wages, and other working conditions are consistent with the applicable local laws. Outokumpu maintains a consistent policy of freedom of association. Employees are free to join trade unions according to the local rules and regulations, and in 2017 altogether 82% of the Group's employees were covered by collective agreements (2016: 86.5%). In 2017, 408 days were lost due to strikes (2016: 2,254.8).

Focus areas for 2018

Year 2018 provides a significant milestone for the development of the organization and for leadership growth within Outokumpu. The whole company will be working toward further improving business capabilities through various learning and development initiatives for employees and, at the same time, positively impacting the organizational health.

Leadership will stay as one of the most important areas of competence development and, therefore, the leadership program for shift leaders continues in 2018 and the program is extended to include the foremen working at our service centers in Europe. Other managerial levels will also be included into the development landscape in 2018.

The implementation phase of the Outokumpu business transformation program will substantially increase the training needs for the employees. The first rollouts of the program will take place in 2018, and linked to that, more than 90 different training courses will be offered to 1,400 employees. In addition to the need to learn how to use the new tools, the business

transformation will introduce new processes and ways of working throughout the company.

The performance management process will be developed further with evaluation calibrations to ensure consistent and transparent evaluation process throughout the global teams and functions. A similar approach will be used in talent management, where the process will be enhanced with management audits prior to management appointments.

There is a new graduate program planned to recruit new, young talents in the house. Graduates will be hired to entry-level positions and the target is to develop an international, versatile group of professionals. On-the-job development is enriched by an onboarding program as well as network and training activities.

The new HR platform launched in 2017 will be fine-tuned for further optimization. Processes managed through the tool will get more self-service features so that processes such as recruiting can be managed more by the recruiting organization itself, instead of relying heavily on the HR organization.

Preparations were made for the European Union's upcoming General Data Protection Regulation (GDPR), taking effect in May 2018. As the potential sanctions are sizeable, all companies need to be well-prepared for this change. ■

Outokumpu and society 

Goals for 2017 and 2018

Goals for 2017

Status

Goals for 2018

Goals for 2017	Status	Goals for 2018
Mission critical behaviors	Launched to support the company in reaching our vision: leadership, sense of urgency – execution with speed, relentless drive for improvement, decisiveness, collaboration, and effective communication	Further strengthening the mission critical behaviors within the company to support the Outokumpu strategy and business targets.
O'Leader training program	Continued in 2017.	Evaluate the success of the program and define the next steps.
Employee engagement survey (Organizational Health Index, OHI)	Second annual OHI survey conducted in the autumn 2017, targeted improvement achieved by moving one quartile up.	Moving one quartile up, to the top half of companies using the OHI methodology. Improvements throughout the functions planned, follow-up survey in the autumn 2018.
Employer branding and employer value proposition	Planning and definition work continued.	Employer value proposition to be defined and communicated. Employer branding action plan for 2018 to be implemented.
Competence development activities in functions (Sales Academy, Manufacturing Excellence, Supply Chain Excellence initiatives)	Training sessions held throughout 2017.	Developing sales competences, supply chain and manufacturing excellence continue.

Responsible sourcing, responsible supplier

As a producer of stainless steel, Outokumpu is a supplier to the leading brands in the most demanding industries. Our customers operate in building and construction, produce energy and manufacture appliances and cars.



Our customers need a fully traceable and transparent supply chain: they want to be assured that the materials for their applications are produced and procured in an ethically responsible manner.

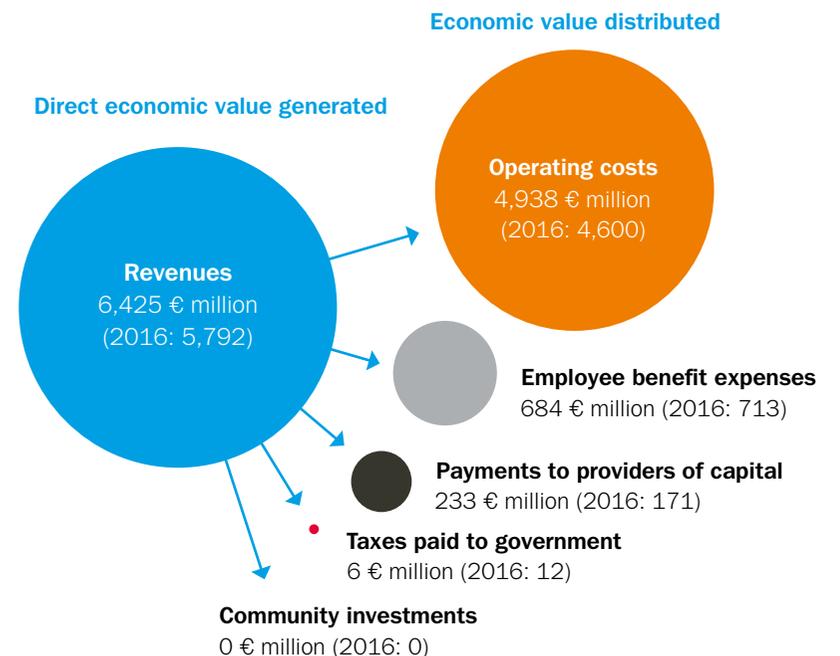
Recycled steel is the most important raw material

Outokumpu's business is based on recycling. The most important raw material for Outokumpu is recycled steel. With the use of recycled steel and recycled metal from the process, only 13% of steel came from primary sources in 2017.

We require a lot from ourselves and our suppliers

As the only company in stainless steel with fully integrated production – covering the production from mining of chrome and ferrochrome production to the melting, hot rolling, cold rolling and finishing of stainless steel – means that we know and control this supply chain to the fullest extent.

Direct economic value generated and distributed
Economic values retained in business
 565 € million (2015: 295 € million)



As our customers require a lot from us as a supplier, we place the most stringent requirements on ourselves, and require the same from our suppliers. All suppliers and subcontractors must comply with our Code of Conduct and meet our [supplier requirements](#), which expect our suppliers to act according to applicable laws and regulations, maintain a quality management system, sign general terms and conditions and be able to clearly define, document and share their supply and production control processes including material traceability.

We assess our new and existing suppliers and if there is evidence of any kind of violation of our requirements, the suppliers are requested to provide an improvement plan and evidence of improvement. If the situation continues and there has been no improvement, Outokumpu will discontinue purchasing from the supplier. Outokumpu has declined business opportunities in cases where it has been established that the business partner is not following the principles of our Code of Conduct.

Suppliers in 2017

Outokumpu monitors its suppliers through self-assessment, screenings and audits. Outokumpu has a regular compliance screening in place that covers the majority of the suppliers. In addition, 60% of the suppliers are going through a monthly compliance screening for sanctions. Outokumpu renewed and enhanced its supplier requirements and the related supplier assessment approach in 2017. The new approach was piloted with six suppliers, who completed self-assessment, and two on-site audits including environmental and social aspects. No misconducts were identified in the assessments. Approximately 40 suppliers completed the previous version of the self-assessment, which was less comprehensive.

In 2017, Outokumpu had 10,173 suppliers in 60 different countries. 87% of the suppliers are located in Finland, Germany,

Sweden, the United Kingdom, the US and Mexico, where Outokumpu has production. In those locations where we have significant production sites with melt shops, local suppliers account for 12% of purchases. There were no major changes in the supplier base during the year.

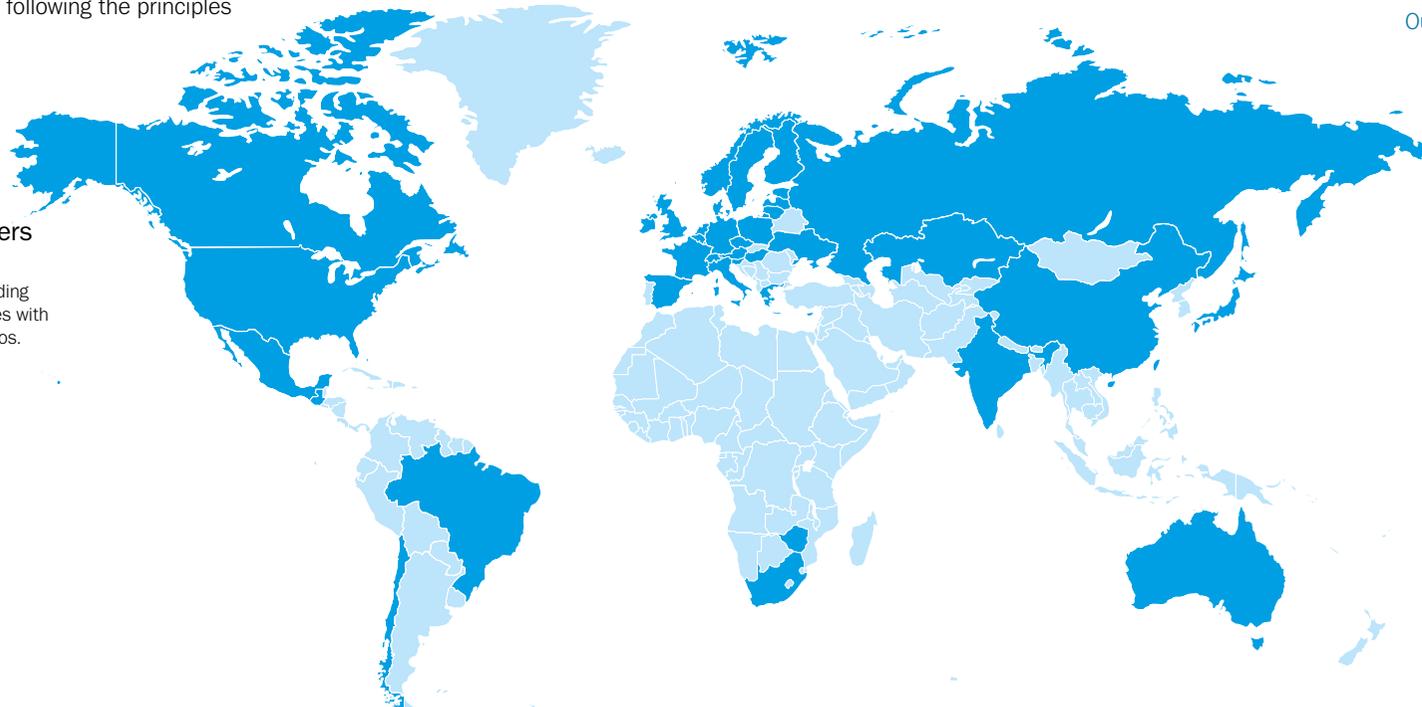
Moving to rail and ships

Outokumpu's target is to transport as much of its products by rail and ship as possible. In 2017, 55% of our product transports was done by trains and ships and 45% by trucks. Our mills have various programs and targets to make transportation more environmentally friendly. Although the total shipments increased by over 50% in 2017, the emissions of transport increased only by 12%. For example, our mill in Avesta is participating in a local electric road project and switching to biofueled trucks. ■

Outokumpu and society 

Material and service suppliers

■ Outokumpu supplier countries, including the most important supplier countries with purchases of more than 50,000 euros.



Resource efficiency and the circular economy

Outokumpu operates in the circular economy. Stainless steel is one of the most recycled materials in the world.



Our recycled content is already very high. To produce stainless steel we have used about 87% of recycled materials, while according to the estimates, recycled content of all steel production is around 35% and about 78% for stainless steel in the Western world*. Outokumpu follows the ambitious target to reach 90% recycled content by 2020.

In addition to metals, other raw materials, such as slag formers, acids and gases, are needed in the production process although they do not become part of the stainless steel products. As far as reasonable, these are also recovered and recycled in the process. Some of these additives are used to minimize or prevent emissions to the environment.

[All materials used](#)

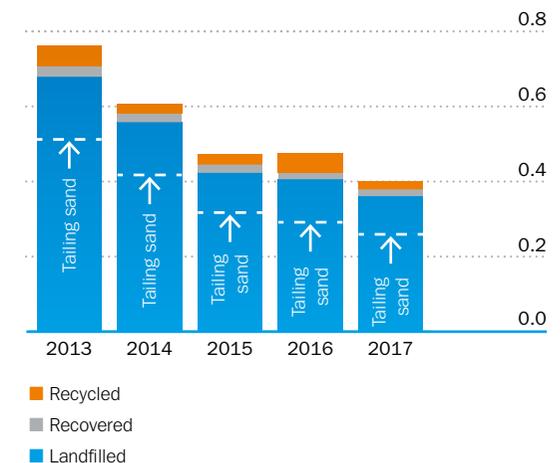
*Source: For global steel production Bureau of International Recycling: Ferrous report 2017 and World Steel Association, and for stainless steel ISSF 2015.

Our stainless steel mills are in fact giant recycling facilities, producing new products out of scrap, recovering and recycling everything reasonable in our own production and finally selling by-products from the manufacturing process to replace natural resources. Our approach is two-fold: we aim to both reduce the total volume of landfill waste from our own operations and increase the proportion of materials sold as by-products.

Very high recycled content

84.1% of our raw material in 2017 was recycled steel, both stainless and carbon steel. The entire recycled content of our stainless steel is even higher, at 87.0%, since we recover and recycle metals from the production processes, for instance from dust. Dust recovery is either carried out on the site or by an external facility.

Total waste development, tonnes per tonne steel



Waste to landfill decreased

The biggest waste items at Outokumpu are slag that cannot be reused, tailing sand from the mining operations and dust and scales from the stainless steel production. While waste is recycled whenever possible in our own production, our production still generates landfill waste. We strive further to reduce landfill waste, and we follow a strategy towards zero landfill waste.

The amount of tailing sands from the mining operations was lower in 2017 compared to the previous year, as the production of chrome concentrate decreased. Tailing sands are deposited in tailing ponds in the mine area.

In 2017, Outokumpu was able to reduce landfill waste by more than 8% even if our production increased by 3%. The total amount of waste was 1.2 million tonnes. Slags which are utilized are not reported as waste. 65% of waste was tailing sand deposited in the pond of mining area itself and further 25% was landfilled waste. 5.4% of waste could be recycled and 4.4% recovered. However, Outokumpu was not able to increase the share of recycled waste because one of our suppliers for dust processing ran into production issues. Recycled metals from dust, scales or sludges are used for steel making. Other recovered material like lime, bricks and some sludges are

Our slag use rate is 91.1%. Using slag saves virgin resources and reduces the amount of waste.

mostly used in our melting shops to substitute virgin additive materials like slag formers.

Total waste development [↗](#)

Turning slag into by-products

Outokumpu produced 2.3 million tonnes of slag as main by-product of operations. Slag is essential material in the steel melting process, and it is made from limestone or other natural minerals. One of the most important ways to reduce the amount of waste of steel production is to turn slag into products for useful use. Outokumpu has developed slag-based mineral products for road construction, refractory and concrete production and for water treatment. By using our slag by-products, not only does the amount of waste reduce, but virgin materials can be saved and CO₂ emissions reduced. For example, in road construction, slag saves both environment and money.

In 2017, the use rate (including use, end-of-waste and recycling) of all slag was 91.1%. Remaining 8.9% was sent to landfill. The use rate depends on the local market for construction materials and on the acceptance of secondary material instead of virgin materials. ■

Total and hazardous waste

Tonnes	2017	2016	2015
Tailing sand	784,585	856,245	830,874
Other waste	423,383	540,150	407,996
of which hazardous waste	144,617	139,224	127,007
recycled	14,506	13,224	14,337
recovered	41,171	43,521	44,900
landfilled	88,939	82,485	67,769

Data has been restated for the current sites.

Energy efficiency

Outokumpu operates in an energy intensive industry. For the recycled steel to melt, it is heated up to 1,400°C. The best available technique for melting recycled steel is to use electric arc furnaces.



It is our responsibility to make the energy consumption as efficient as possible. Outokumpu is minimizing the total energy usage and its environmental impact. Although the melting of recycled steel and the production of stainless steel use a lot of energy, stainless steel enables more energy efficient solutions from a life-cycle perspective by saving energy during its use phase.

Efficient production

Outokumpu continuously strives to make its production operations more energy efficient. Our target is a yearly 1% improvement in energy efficiency. The most important remaining energy-saving potential lies in the high utilization rate of facilities and recovery of waste heat. Energy reduction and efficiency plans are included in our environmental management systems. Over the past years, we have restructured production sites and optimized the internal supply chain and have increased our global capacity utilization. This has improved the overall energy efficiency of our operations.

The biggest item in our energy consumption is electricity but Outokumpu also uses natural gas, propane and other fuels, such as diesel. Fossil fuels cover about 83% of our total fuel consumption. In Tornio, we are recovering and reusing carbon monoxide process gas from ferrochrome production in our operations. Process gases and their heat are also used to heat buildings on the site.

In 2017, Outokumpu prepared for the use of liquefied natural gas (LNG) to replace propane at its Tornio mill. The first LNG shipment arrived at the end of the year. With LNG, we improve our competitiveness and cut our direct CO₂ emissions.

The energy intensity per tonne stainless steel has continuously reduced during the past years. In 2017, we improved our energy efficiency by 2% compared to 2016. Cumulative improvement in the past eight years, against the baseline of 2007–2009, was 10.4%, corresponding to the savings of 1.1 million MWh of energy during 2017. Several energy efficiency initiatives contributed to the savings. In 2017, Outokumpu focused on improving implemented energy efficiency projects.

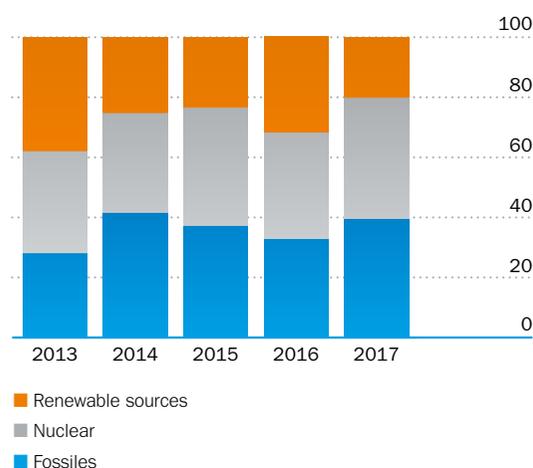
Towards low-carbon energy

Outokumpu's energy procurement is centralized. Its aim is to secure sufficient energy supply; to ensure predictable, competitive and stable energy prices and to optimize the energy portfolio.

Outokumpu has participated in low-carbon energy programs in wind power, hydropower, combined heat and power as well as nuclear power. For example, we are a shareholder in a wind power park located in our Tornio mill area, Finland; LNG terminal in our Tornio harbor as well as in a hydropower plant in Norway. A combined heat and power plant in Tornio produces heat for the Tornio site out of recovered process gases, and in Dahlerbrück, Germany we have our own hydro power plant to generate some 10% of the electricity needed in the production. Outokumpu is a shareholder in the nuclear power plant to be built by Finnish Fennovoima.

The aim of all these measures is ensure our energy supply and to reduce our CO₂ emissions. In 2017, 60% of our electricity sources came from low-carbon (renewable and nuclear) sources. ■

Origin of electricity, %



Energy used

Terajoules, TJ	2017	2016	2015
Electricity	16,326	16,733	16,116
Carbon monoxide gas	2,003	2,405	2,241
Natural gas	4,241	4,307	4,139
Propane	5,016	4,639	4,466
Diesel, light and heavy fuel oil and other	580	613	613
Energy	28,164	28,697	27,576
Energy use in GJ per tonne crude steel	9.3	9.8	10.5

Data for the current sites.

Environmental impacts to a minimum

Outokumpu's target is to keep the environmental impacts to a minimum as much as economically and technically possible.



Water ponds at our Kemi mine are nesting or feeding habitats for waterfowl, birds and wildlife. The mine cooperates with the local ornithological society to monitor the local biodiversity.

The biggest environmental impacts of stainless steel production are dust emissions into the air, water discharges from production, use of direct and indirect energy, and waste created in the production process. We reduce the impact on the environment by proactively developing our production processes, energy and material efficiency and solutions for by-products of our operations.

Dust emissions kept at low levels

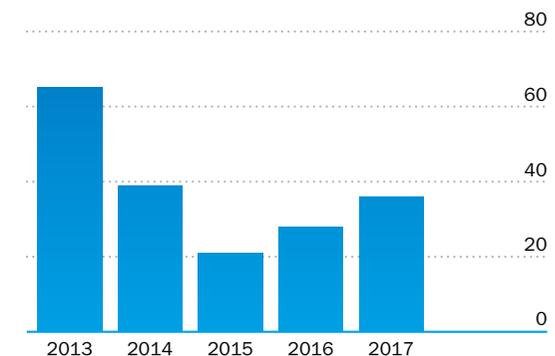
Dust and scales are generated in our operations by steel melting and rolling processes. Dust and scales are collected, treated and, whenever possible, recycled at our own production or elsewhere. For example, raw material metals (chromium, nickel and molybdenum) are recovered from dust and scales through specialist recovery equipment.

Our dust filtering systems are extremely efficient and remove 99% of the particles. With the production of 3,022,000 tonnes of stainless steel, the measured particle emissions from all of our production processes was 366 tonnes in 2017 (2016: 569 tonnes). The majority of particles were emitted from the ferrochrome production process where the emissions were 95 tonnes lower than in 2016. But emission measurement results in this process include high uncertainty causing remarkable fluctuation in results year by year. On the other hand, specific particle emissions from melt shops increased as the estimation of high efficiency dust abatement is varying based on the operation and measurement conditions.

The level of dust emissions from the melt shops is well within the limits of environmental permits. Therefore, no significant further reduction is expected.

As our main raw material is recycled steel, we take all possible precautionary measures to check the input material for any unwanted content, such as mercury and radioactive contaminated material. Despite these precautionary measures, mercury or radioactive material is sometimes noted only when the steel is melted. There was one incident involving radioactive material in 2017. The mercury emissions measured at our plants and their surroundings in 2017 were minor and amounted to less than 200 kilograms from all European melt shops. We work together with our suppliers to decrease the amount of unwanted materials in our production processes.

Melt shop particle emissions, grams/tonne



Water is reused in production

Water is needed in stainless steel production for cooling, pickling and cleaning. Outokumpu reuses water as much as possible in its own operations. Naturally some water also evaporates and leaves the system. All wastewater is treated in the company's own treatment plants before it is discharged or in municipal water treatment systems. The main discharges into water are metals and nitrates.

Water used in the production is mainly surface water. Withdrawal of water increased, as the stainless steel production increased. The decrease in water discharges was driven by the Kemi mine, as the mine is expanding further underground and one of the tailings ponds has been raised. At the same time, the metal discharge could be reduced.

Not all reported nitrate emissions are discharged to the environment. The nitrate increase is caused by the production increase at the cold rolling mill in Krefeld, Germany. But the

wastewater from Krefeld is sent to be treated in a municipal water treatment plant before discharging to surface water. Nitrate discharge to surface water stayed on the same level as during the previous three years.

Outokumpu operates a cold rolling mill in San Luis Potosí, Mexico, in a dry, arid area, where groundwater is a scarce resource for people. Water is used in our production process in annealing, pickling and cooling. Water is undergoing an exceptional treatment and recycled as much as possible, and only a few cubic meters are discharged to municipal water system. Small amounts of cleaned water percolates to groundwater again.

Impacts of the mining operations are limited

The environmental impacts of our mining operations in Kemi, Finland are very limited due to the nature of the process, as the minerals are very stable, and chemicals are not used in the

beneficiation process. There were no major changes in 2017, and the emissions have remained stable at very low levels. Dust emissions are minimal due to the underground mining. The biggest impact on environment from the mine are nitrates in the wastewater which originates from explosives. However, nitrates are efficiently reduced in the internal water recycling of the mine. Only small amounts of water is conducted to local water recipient. Tailing sand basins are landscaped as forests when full.

Cost of actions related to environment

Costs for environmental-related activities for 2017 amounted to EUR 114 million. Operational costs were EUR 104 million and include process-related treatment, disposal and remediation costs of waste and emission reduction into air and water. In 2017, some EUR 2 million was invested in the on-going capacity upgrade of one tailing sand area in Kemi mine. Also, EUR 4.2 million was invested in the joint venture of a liquefied natural gas (LNG) terminal, where Outokumpu's share is 45%.

Environmental provisions

Biodiversity

The production of stainless steel does not occupy or reserve large areas of land, or have a significant effect on the biodiversity of the surrounding natural environment. Outokumpu's production sites are not located in sensitive areas listed for example by UNESCO, and none of our sites have been found to disturb biodiversity in any way. However, Outokumpu has identified areas of high biodiversity value that are owned by the company or adjacent to our sites in Dahlerbrück, Germany, Kemi and Tornio, Finland, and Calvert, Alabama, the US.

Outokumpu regularly monitors the environment of its production sites together with authorities and other third parties. Areas once utilized by production are remediated for further use. ■

[More on biodiversity](#) 

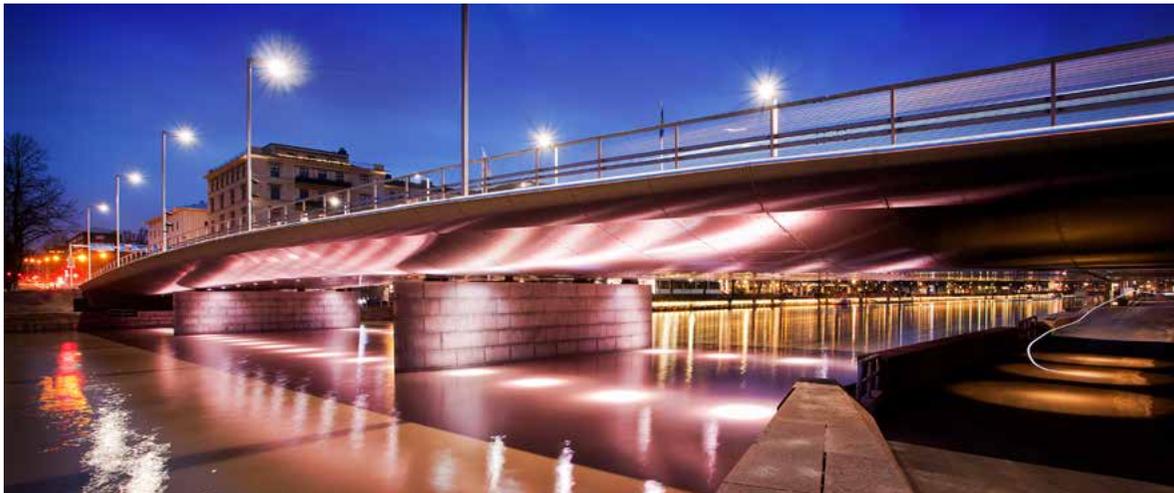
Water withdrawal and discharges

Million m ³	2017	2016	2015
Surface water	38.2	37.9	36.6
Municipal water	1.2	1.2	1.1
Groundwater	1.2	1.4	1.1
Rainwater	2.4	1.7	1.7
Water withdrawal by source	43.1	42.2	40.5
Water discharges by type and destination			
Wastewater out	20.5	21.6	21.0
Discharge to surface water	19.2	20.2	19.6
Emissions to water			
Metal discharges to water, tonnes	24	36	50
Nitrogen in nitrates, tonnes	2,478	2,258	1,767

Part of the nitrates is treated in a municipal treatment plant.

Protecting the climate

Climate change is one of the major challenges in today's world. For Outokumpu, it means both the reduction of our carbon footprint and the possibility that our products can reduce the carbon footprint of our customers and their customers in turn.



Reducing carbon footprint by using stainless steel

Using Outokumpu cold rolled stainless steel products diminishes the carbon footprint of our customers' products. For instance, when comparing the life-cycle impacts of Outokumpu stainless steel and painted carbon steel in Myllysilta bridge project in Finland, the global warming potential in terms of carbon dioxide emissions of our stainless steel is 38% of that of carbon steel*. The manufacturing of stainless steel causes greater environmental impacts than carbon steel, but these are offset by the higher need of maintenance and eventual replacement of the carbon steel cladding. The environmental effects of the use of stainless steel, that requires no painting or maintenance on the environment are considerably lower – for example the creation potential of photochemical ozone is only a fraction (around 1%) of that of carbon steel.

Our environmental product declarations or EPDs offer life-cycle inventory data of our main products, making it possible for our customers to calculate sustainability performance over their products' life cycle. EPDs are standardized and verified externally.

* International Molybdenum Association's case study on the use of molybdenum in 2015.

Where does carbon come from?

The major greenhouse gas emissions from Outokumpu operations are limited to CO₂ emissions. These emissions come both directly from the production (scope 1), indirectly from the use of electricity (scope 2) and mainly from upstream emissions of the use of materials (scope 3). More than half of our emissions come from upstream emissions from our supply chain, and the other half is split to direct emissions of the production and indirect emissions from the use of electricity.

Direct emissions originate from the carbon content of our raw materials – recycled steel, ferroalloys and graphite electrodes, which are used in the electric arc furnace in the melting process. The use of these materials cause process-related CO₂ emissions, which cover about 20% of our direct CO₂ emissions. The other direct emissions come from the use of fossil fuels as the energy source for the process heat.

Indirect emissions are caused by the use of electricity. These emissions are followed by market-based emission factors of Outokumpu's electricity mix. Electricity emissions are also published on a location-based factor for the first time.

Other indirect emissions for steel productions are mainly upstream emissions of material use and to a lesser extent from product transportation. At the moment, there are no estimation methods for downstream emissions of stainless steel available.

Towards less carbon

Improving our [energy efficiency](#) directly reduces the need of primary energy and CO₂ emissions. Our efforts towards a [circular economy](#) reduce emissions by replacing raw materials and emissions from their productions processes.

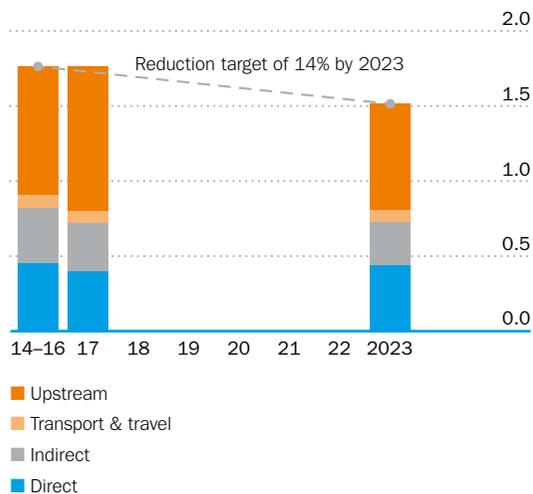
Outokumpu follows the Science Based Targets initiative. In 2017, the target setting was further developed. Outokumpu follows the steel industry's

decarbonization approach: to reduce emission intensity by 55% by 2050. Specific electricity emissions follow the electricity decarbonization approach, where the specific emission reduction target is 95% by 2050.

The company commits to contribute to the 2°C-scenario and to decouple growth from emissions on the level required to keep global temperature increase below 2°C compared to pre-industrial temperatures. According to the steel industry approach, Outokumpu aims to reduce the direct (scope 1), indirect from electricity (scope 2), upstream and transport (scope 3) emission intensity by 14% by 2023 compared to the baseline of 2014–2016. The baseline of the three years was chosen to get the most recent baseline after the restructuring of the company and to avoid influence of yearly fluctuations. Emission intensity refers to emissions per tonne produced steel.

Target for science based target criteria

Outokumpu's CO₂ emission intensity, tonnes of CO₂ per tonne steel



Outokumpu's reduction targets include our direct CO₂ emissions, indirect emissions from the use of electricity and upstream emissions from the production of raw materials, use of other inputs and from the transportation and business travel.

CO₂ emission intensity remained on the baseline level

In 2017, Outokumpu reduced the total energy consumption by about 500 TJ compared to the last year, although the production increased by 3%. This reduction was mainly driven by electricity efficiency improvement. Total specific energy factors dropped down from 9.8 GJ/tonnes stainless steel in 2016 to 9.3 GJ/tonnes stainless steel in 2017. The high recycled content is our main contribution also to the reduction of scope 3 emissions. In 2017, Outokumpu sourced ferrochrome also

externally because of own production issues, which increased upstream emissions. For the whole year the total specific CO₂ emissions remained on the level of baseline 2014–2016, as the higher upstream emissions could be compensated by high energy efficiency and recycled content.

Investments in productivity during the past few years have made Outokumpu's production sites highly efficient in their use of energy and other resources. This is also an opportunity to stay competitive under the emissions trading system.

[All data on CO₂ emissions](#)

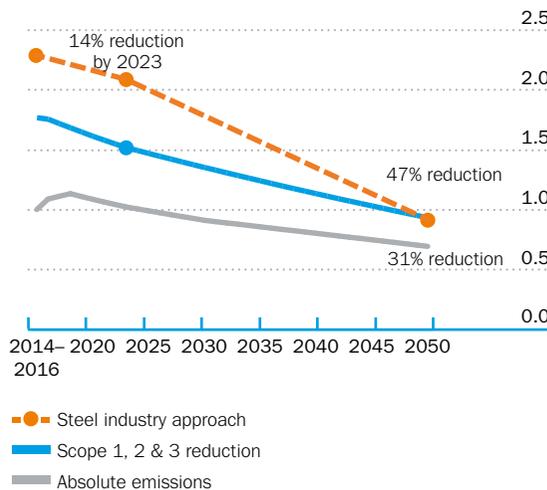
Emissions trading and fair competition

Besides voluntary commitments, Outokumpu's European mills fall under the European Union Emissions Trading Scheme. In total, almost 0.95 million tonnes of total 1.2 million tonnes of CO₂ emissions are covered by the system.

The EU Emissions Trading Scheme (ETS) is continuing by the third trading period 2013–2020. Outokumpu's European operations under the EU ETS will continue to receive free emissions allocations according to efficiency-based benchmarks and historical activity. The total phase allocation will be sufficient for the European operations during the rest of the trading period 2018–2020, although individual plants are in deficit.

The main risk of the emissions trading system to Outokumpu involves the pass-through costs of allowances to the electricity price, which also depend on the allowance trading price. Therefore, national electricity price compensations are important for energy intensive European industry also in the future. These small compensations are supporting producers in the intense international competition against non-European competitors who do not have additional carbon costs in their product prices. Outokumpu collaborates with the industry associations to determine and promote this position. ■

Outokumpu's emissions forecast under SBT conditions, tonnes of CO₂ per tonne steel



Environmental compliance

Our environmental network follows closely the quarterly environmental performance of our operations, their permit status and legal compliance.



The company's environmental network conducts internal site audits in the production units according to risk screening. In 2017, emissions and discharges were generally at normal levels within our environmental permits. There were 18 incidents of non-compliance or breach, but all were temporary and insignificant. Outokumpu reported each incident to environmental authorities, carried out corrective actions immediately or resolved the incidents together with the authorities. No environmental damage was reported, and there were no significant environmental incidents.

Environmental permits

All Outokumpu production sites have environmental permits and certified ISO 14001 environment management systems. During 2017, some local environmental permits were renewed or updated. The local supervising environment authority and independent ISO certification body are both auditing our production sites, environment permit conditions and compliance.

Outokumpu is not a party to any significant judicial or administrative proceeding concerning environmental issues, nor is it aware of any realized environmental risks that could have a material adverse effect on the company's financial position.

Outokumpu did not receive any monetary or non-monetary sanctions in 2017.

Closed sites

During recent years, Outokumpu has completed restructuring and closures of its Kloster production site in Långshyttan, Sweden and production sites in Benrath and Bochum and the melt shop in Krefeld, Germany. These areas have been examined or are under examination in close cooperation with the authorities and communities. In Krefeld, some areas of the melt shop site are being revegetated to exclude the potential exposure route of soil to humans. Development on the future use of closed sites is ongoing.

Emerging legislation

Outokumpu follows emerging environmental initiatives and legislation closely to prepare for future changes. In 2017, we studied the following initiatives:

- EU CO₂ emission trading rules post 2020
- EU Resource efficiency & Circular economy initiatives
- EU Non-toxic environment initiative
- Cobalt hazard classification proposal in the EU
- Ambient air standards in the US.

In case there are impacts from emerging legislation, Outokumpu analyzes the situation and takes action through industry associations and federations, such as EUROFER. ■

Outokumpu and society 

Sustainable stainless

As a material, stainless steel is strong, corrosion resistant, durable, safe and hygienic. It is also fully recyclable and its quality does not degrade during reprocessing.



In many ways, stainless steel is the perfect answer to the challenges the world is now facing – limited resources, urbanization, climate change, and clean water.

Recycling, durability, and improved performance

Due to its recycling characteristics, stainless steel is well poised to meet the demands of a future sustainable society: the possibility of recycling a product saves resources, as it reduces the need to extract new minerals from the ground. Stainless steel is 100% recyclable and Outokumpu stainless steel has one of the highest contents of recycled materials in the industry.

Durability is also important. Manufacturing an application only once, instead of several times during a certain time period due to breakdowns and repair, naturally consumes a lower amount of resources. Stainless steel helps to prolong the lifetime of applications, for example in bridges because they are susceptible to corrosion or in components like a car's exhaust pipe system.

Outokumpu strives to improve the properties of stainless steel even further and support customers to utilize them in their applications. An example is the new Outokumpu stainless grade, Supra 316plus, which was chosen for tanks carrying liquefied natural gas (LNG). Supra 316plus was selected due to its strength and excellent properties at extremely low temperatures of -164°C at which LNG is transported. Thanks to this material choice, the weight of the tanks could be decreased by 30% and the capacity increased by 15%.

[Read more](#) 

The durability of stainless steel also has a cost-effective impact from a life cycle perspective. Requiring only minimal maintenance, stainless steel is both economical and good for the environment and society. The combination of corrosion resistance and durability increases product lifetimes and saves money. When Outokumpu Forta LDX2404 stainless steel was chosen for the renovation of railway bridges in central Stockholm it was considered the best economical choice, paying for itself within 30 years. [Read more](#) 

Outokumpu has made environmental assessments on its steel and provides Environmental Product Declarations for its main products. EDPs describe the main environmental effects and energy needs of our stainless steel throughout their supply chain, and help our customers to calculate sustainability performance over their products' life cycle. EDPs are standardized and verified externally.

Safe stainless

Stainless steel in its manufactured forms – as delivered by Outokumpu to our customers – is inert, non-reactive, and non-toxic. The industrial processes of reprocessing stainless steel by, for instance, welding and pickling, can release substances or fumes. Outokumpu provides customers with a safety information sheet or safety data sheets that cover all of our products. This safety information helps our customers to process our stainless steel products in a safe manner. Outokumpu also complies fully with European regulations on REACH and RoHS requirements.

Product, application, and technical market development

The direction of Outokumpu's product, application, and technical market development is driven by global trends, such as economic and population growth, mobility, urbanization, climate change, and limited resources. We work closely together with customers in order to align our activities with our

customers' current and future needs. The key focus is the development of long-lasting, sustainable material solutions providing advantages over the entire product life cycle.

In 2017, Outokumpu extended its product portfolio by introducing the austenitic, nickel-based alloy Outokumpu Ultra Alloy 825. It is primarily used for processing equipment in the chemical and oil&gas industries due to its exceptional corrosion resistance. Outokumpu stands out as the only major stainless steel company that can offer this nickel-based alloy in coils up to a width of 1,500 mm. [Read more](#) 

The recent stainless steel product innovations, Outokumpu Core 4622 and Supra 316plus, were granted European patents in March 2017. These grades satisfy the customer demand for products with enhanced properties and a stable raw material cost. [Read more](#) 

An example of our recent solution development is the weldable sandwich technology, which was awarded this year's prize in the Material category in the 15th Materialica Design and Technology Awards 2017, presented at the eMove360 materials and electromobility trade fair in Munich, Germany. The weldable sandwich is the first directly weldable steel-polymer compound (sandwich) structure for car body manufacture. The weldable sandwich can make a decisive contribution in the automotive industry toward fulfilling lightweight construction and CO₂ emission goals, while providing a high level of safety and component rigidity at the same time. [Read more](#) 

Furthermore, the bionic lightweight structure for battery vehicles, constructed using Outokumpu Forta H1000 2H high strength steel, received the Gold Award in the Awards for the Best New Applications featuring New Technology by the International Stainless Steel Forum (ISSF).

Our German R&D team moved to new premises in Krefeld in 2017. During a one year construction phase, a competence center with new laboratory facilities including state-of-the-art equipment was built. The new competence center will guarantee the optimum quality of R&D support.

Process and technology development

Continuous development of our production processes and technologies is at the core of our R&D. Process and technology development focuses on the reduction of the environmental impacts and improvement of the cost

efficiency of our production processes as well as on the optimization of product quality.

The process development actively leverages our R&D collaboration networks. In October 2017, the project Morse, which was funded by the European Commission, was started. In this project, European companies and research organizations join forces to renew the steel industry by developing new enhanced software tools for the improvement of steel quality and the management of complex processes. The project is looking for new ways to manage the entire production chain and to reduce the consumption of energy and raw materials and to reduce yield losses. The project aims at developing new models and process management tools to improve the capacity utilization and product quality, and to reduce energy consumption and carbon dioxide emissions. [Read more](#) 

External R&D collaboration

Outokumpu has an extensive network of external R&D partners and participates in both national and international research programs to supplement Outokumpu's own R&D capabilities. Outokumpu collaborates with various top-class universities and research institutes. Examples of collaboration forums in which Outokumpu is involved include the Finnish Digital, Internet, Materials & Engineering Co-Creation platform (DIMECC), Research Fund for Coal and Steel (RFCS), and Jernkontoret (the Swedish Steel Producers' Association). In Germany, we collaborate, among others, with the Fraunhofer Institute and the Max-Planck-Institut für Eisenforschung. Outokumpu is also a member of the European Steel Technology Platform (ESTEP) and actively involved in European R&D projects, such as the project Morse described in the Process and technology development section. ■

Scope of the report

Outokumpu has published its sustainability review as part of the Annual Report 2017. Sustainability information is also available at www.outokumpu.com/sustainability.

Outokumpu reports on the material developments of continuing sites and changes in 2017 as part of the Annual Report. Additional information is published on the company's website. The Annual Report 2016, including Sustainability Review, were published in February 2017.

Outokumpu's reporting follows the Global Reporting Initiative standard in accordance with the GRI standards' Core option. The materiality assessment from 2015 and continuous communication with stakeholders were the basis for the decision on material topics and relevant disclosures.

[Full GRI disclosure](#) 

The independent practitioner's assurance report on the limited assurance conclusion on and checking the consistency of the sustainability reporting in the Sustainability review and Review by the Board of Directors is available on p. 25 in the Sustainability review. The Financial statements 2017 have been audited, and the auditor's report is available on p. 68 in the Review by the Board of Directors and Financial statements section.

Measurement and estimation methods

Economic responsibility

Most figures relating to economic responsibility presented in this report are based on the consolidated financial statements issued by the Outokumpu Group and collected through Outokumpu's internal consolidation system. Financial data has been prepared in accordance with International Financial

Reporting Standards (IFRS). Outokumpu's accounting principles for the Group's consolidated financial statements are available in [note 2](#) to the consolidated financial statements.

All financial figures presented have been rounded, and consequently the sum of individual figures may deviate from the presented aggregate figure. Key figures have been calculated using exact figures. Using the GRI guidelines as a basis, economic responsibility figures have been calculated as follows:

Direct economic value generated

Direct economic value generated includes all revenues received by Outokumpu during the financial year. The sources of revenue include sales invoiced to customers, net of discounts and indirect taxes, revenues reported as other operating income (including gains from the disposal of Group assets), and revenues reported as financial income, mainly dividend and interest income.

Economic value distributed

Operating costs include the cost of goods and services purchased by Outokumpu during the financial year. Employee benefit expenses include wages and salaries, termination benefits, social security expenses, pension and other post-employment and long-term employee benefits, expenses from share-based payments and other personnel expenses. Taxes paid to the government include income taxes. Deferred taxes are excluded from the figure. Payments to providers of capital include interest costs on debt and other financial expenses during the financial year. Capitalized interest is deducted from this figure. The dividend payout is included in the payments to

providers of capital according to the proposal by Outokumpu's Board of Directors.

Community investments consist of donations to and investments in beneficiaries external to the company.

Local suppliers

In this report, vendors are defined as local if they are located in the same city or municipality as the Outokumpu location. Significant locations for suppliers are production units that have a melt shop, ie. Avesta, Calvert, Sheffield and Tornio.

Environmental responsibility

Outokumpu's climate change target of the carbon profile of stainless steel is replaced by the science-based target proposal on CO₂ intensity of direct and indirect emissions of electricity and upstream emissions. Emissions are consolidated on production control.

CO₂ emissions of electricity are calculated and monitored by the emissions factor of Outokumpu's electricity mix of 216 kg CO₂/MWh (2016: 194 kg CO₂/MWh), given by the electricity supplier for the used electricity. In addition, the location-based electricity emissions are disclosed for the first time. They are calculated by the country-specific emissions factors of the electricity generation of 2016.

CO₂ emissions outside the company (scope 3), except electricity, are covered by more than 96%. They are calculated as follows:

- For alloys: by emissions factors of the life-cycle assessment of relevant association.
- For used gases, lime and dolomite, electrodes and coke: by emissions factors of ISO 14404.
- For upstream emissions of coke and oil: by emissions factors of World Steel Association.

- For internal and product transport: by typical distances and type of transport with the corresponding emissions factors.
- For business travel: by estimated driven kilometers with emissions factors for a car, and for flights by CO₂ reports of the flight companies.

Upstream transport was assessed on data of environmental product declaration of 2014 but excluded from scope 3 emissions

The recycled content is calculated as the sum of all recycled steel and metals entering the melt shop compared to stainless steel production.

Energy efficiency is defined as the sum of specific energy of all processes calculated as energy consumption compared to the product output of that process. It covers ferrochrome, melt shop, hot rolling and cold rolling processes..

Social responsibility

Health and safety figures

Health and safety figures reflect the scope of Outokumpu's operations as they were in 2017.

Safety indicators (accidents and preventive safety actions) are expressed per million hours worked (frequency). Safety indicators include Outokumpu employees, persons employed by a third party (contractor) or visitor accidents and preventive safety actions. A workplace accident is the direct result of a work-related activity and it has taken place during working hours at the workplace.

Accident types

- Lost-time incident (LTI) is an accident that caused at least one day of sick leave (excluding the day of the injury or accident), as the World Steel Association defines it. One day of sick leave means that the injured person has not been able to return to work on their next scheduled period of working or any future working day if caused by an outcome of

the original accident. Lost-day rate is defined as more than one calendar day absence from the day after the accident per million working hours.

- Restrictive work incident (RWI) does not cause the individual to be absent, but results in that person being restricted in their capabilities so that they are unable to undertake their normal duties.
- Medically treated incident (MTI) has to be treated by a medical professional (doctor or nurse).
- First-aid treated incident (FTI), where the injury did not require medical care and was treated by a person himself/herself or by first aid trained colleague.
- Total recordable incident (TRI) includes fatalities, LTIs, RWIs and MTIs, but FTIs are excluded.
- All workplace accidents include total recordable incidents (TRI) and first aid treated incidents (FTI)

Proactive safety actions

Near-miss incidents and hazards refer to events, situations or actions that could have led to an accident, but where no injury occurred. Safety behavior observations (SBOs) are safety-based discussions between an observer and the person being observed. Other preventive safety action includes proactive measures.

Sick-leave hours and absentee rate

Sick-leave hours reported are total sick leave hours during a reporting period. Reporting units provide data on absence due to illness, injury and occupational diseases on a monthly basis. The absentee rate (%) includes the actual absentee hours lost expressed as a percentage of total hours scheduled.

Total personnel costs

This figure includes wages, salaries, bonuses, social costs or other personnel expenses, as well as fringe benefits paid and/or accrued during the reporting period.

Training costs

Training costs include external training-related expenses such as participation fees. Wages, salaries and daily allowances for participants in training activities are not included, but the salaries of internal trainers are included.

Training days per employee

The number of days spent by an employee in training when each training day is counted as lasting eight hours.

Bonuses

A bonus is an additional payment for good performance. These figures are reported without social costs or fringe benefits.

Personnel figures

Rates are calculated using the total employee numbers at the end of the reporting period. The calculations follow the requirements of GRI G4 Guidelines. The following calculation has been applied e.g.

Hiring rate = New Hires / total number of permanent employees by year-end

Average turnover rate = (Turnover + New Hires) / (total number of permanent employees by year-end × 2)

Days lost due to strikes

The number of days lost due to strikes is calculated by multiplying the number of Outokumpu employees who have been on strike by the number of scheduled working days lost. The day on which a strike starts is included. ■

Independent assurance report

To the Management of Outokumpu Oyj

We have been engaged by the Management of Outokumpu Oyj (hereafter Outokumpu) to provide limited assurance on Outokumpu's Sustainability Review 2017 presented in Outokumpu's Annual Report for the reporting period from January 1, 2017 to December 31, 2017 (hereafter Sustainability Information).

Global Reporting Initiative's Sustainability Reporting Standards as listed in the GRI Standards Content Index were used as the assurance criteria (hereafter GRI Standards).

Inherent limitations on the engagement

The inherent limitations on accuracy and completeness of data related to the Sustainability Information are to be taken into account when reading our assurance report. The presented Sustainability Information is to be considered in connection with the explanatory information on data collection, consolidation and assessments provided by Outokumpu.

The Management of Outokumpu is responsible for the measuring, preparation and presentation of the Sustainability Information in accordance with the GRI Standards.

Our responsibility is to express an independent conclusion on the Sustainability Information. We have conducted the engagement in accordance with ISAE 3000 (Revised). To the fullest extent permitted by law, we accept no responsibility to any party other than Outokumpu for our work, for this assurance report, or for the conclusions we have reached.

We are independent from the company according to the ethical requirements in Finland and we have complied with other ethical requirements, which apply to the engagement conducted.

We apply the International Standard on Quality Control 1 (ISQC 1) and accordingly maintain a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Summary of the work performed

A limited assurance engagement consists primarily of making inquiries of persons responsible for the preparation of the Sustainability Information presented, and applying analytical and other appropriate evidence gathering procedures. The procedures performed in a limited assurance engagement vary in nature and timing from and are less in extent than for a reasonable assurance engagement and consequently the level of assurance obtained in a limited assurance engagement is substantially lower.

In our engagement we have performed the following procedures:

- Interview with Outokumpu Senior Management;
- An assessment of conformity with the reporting principles of GRI 101: Foundation (2016) in the presentation of the Sustainability Information;
- An assessment of coverage of the material aspects selected for the Sustainability Information and the definition of reporting boundaries in the context of Outokumpu's business operations and sector;
- An assessment of data management processes, information systems and working methods used to gather and consolidate the Sustainability Information;
- A review of the presented Sustainability Information with an assessment of information quality and reporting boundary definitions;
- An assessment of data accuracy and completeness through a review of the original documents and systems on a sample basis;
- One site visit and two video conferences conducted to Outokumpu subsidiaries.
- A consistency check of the non-financial information presented according to the Finnish Accounting Act Chapter 3a in a separate section in Outokumpu's Review by the Board of Directors ("Non-financial development at Outokumpu") with Outokumpu's Sustainability Review 2017.

Conclusions

Based on the assurance procedures performed, nothing has come to our attention that causes us to believe that the information subject to the assurance engagement is not prepared in accordance with the GRI Standards in all material respects.

Helsinki, 16 February 2018

KPMG Oy Ab

Tomas Otterström
Partner, Advisory

Petri Kettunen
Authorised Public Accountant, KHT

A world that lasts forever

We believe in a world that is efficient, sustainable, and designed to last forever. The world deserves innovations that can stand the test of time and are ready to be born again at the end of their life cycle. Stainless steel is vital in enabling a sustainable world with economic prosperity.

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