

Sustainability review 2016



outokumpu
working towards a world that lasts forever



World is in a need for sustainable alternatives

Outokumpu is producing stainless steel to contribute to the well-being of the society for a world that lasts forever while making a profit, protecting the resources of the environment and taking responsibility for social community. Outokumpu's product has the potential to solutions of the world's challenges taken up by the UN SDGs. Most contribution by operations can be given to the goal 12 "Responsible consumption and production" (indicator recycled content and energy efficiency) and goal 13 "Climate action" (indicator carbon profile) and goal 9 "Innovation and Infrastructure". In 2016 Outokumpu became a member of the Science Based Targets initiative and sent its developed target for checking to the initiative. The former long-term target on carbon profile will be replaced by the science based target in 2017.

Outokumpu's stainless steel has many distinguishing properties. Outokumpu is the only company who has an integrated stainless steel production route including its own chrome mine in Kemi, Finland and ferrochrome production at its site in nearby Tornio, Finland. The liquid ferrochrome is directly input to the stainless operation without losing solidifying heat and process gas from ferrochrome production can directly be used in the stainless operation. This saves primary energy and reduces the CO₂ emissions. From life cycle

"Outokumpu produces stainless steel that contributes to a world that lasts for ever, protecting environmental resources and taking responsibility for social community."

thinking Outokumpu is an excellent stainless steel supplier.

Outokumpu operates in a competitive industry where demand and supply meet in global markets. On the other hand, our production sites are often located in relatively small cities or towns. This means that Outokumpu is significant to the economies of the small local communities, and often one of very few private-sector employers in the area. Finding a balance between global market trends and responsibility towards communities is sometimes difficult, especially in economic downturns.

Reporting on sustainability

Outokumpu publishes sustainability review as part of its Annual Report 2016. Outokumpu's sustainability reporting follows the G4 guidelines published by the Global Reporting Initiative in accordance with the Core option. Outokumpu reports in this sustainability review all essential developments in 2016. The developments in this review have been assured by an independent third party (see the Independent Assurance Report on p. 28 in the Sustainability review). Additional sustainability data and information as well as the GRI content index are available [at our website](#).

The sustainability review is structured into four sections – Nothing to hide (supply chain, safety, personnel, energy efficiency and environmental impacts), Pays for itself (product properties and R&D), Recycling maximized (resource efficiency) and Indispensable (climate change, CO₂ intensity and environmental key performance indicators).

Material issues were elaborated in 2015 and it is planned to repeat this materiality analysis after 3 years – our latest materiality analysis is available on [our web pages](#). In 2016 stakeholder engagements continued as regular discussion with investors, exchange on sustainability with several customers and in dialogue with neighbors and communities. Employees were asked to give their feedback on Organizational Health Index (OHI).

"Finding balance between global market trends and responsibility towards communities is needed."

UN Sustainable development goals

Outokumpu contributes to several United Nations' sustainable development goals either through the way we operate or through our products.



3 Working at Outokumpu is characterized by taking care of yourself and others. Several health prevention measures were organized locally in 2016. They include ultrasonic testing, glaucoma tests, skin carcinoma screening and influenza immunization. Young people are trained on the impacts of shift work, office workplaces, drugs and the prevention of addiction.

Products: Outokumpu's stainless is used for medical devices, implants and for hygienic reasons. It is a backbone for people's health; its inert behavior supports safe nutrition used in food contact materials.

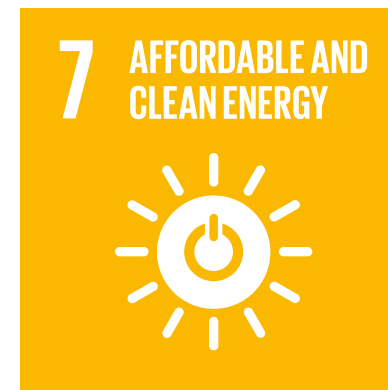


4 Outokumpu is a leading expert in stainless steel, which is why learning, expertise and talent management are very important elements in the company's performance. Outokumpu develops employees' competences, for example, through job promotion, on-the-job training as well as training programs. Cooperation with key universities, research institutes and technical colleges play a big role in the future resourcing of talent, and Outokumpu has a long tradition of offering summer jobs and traineeships in its major production locations.



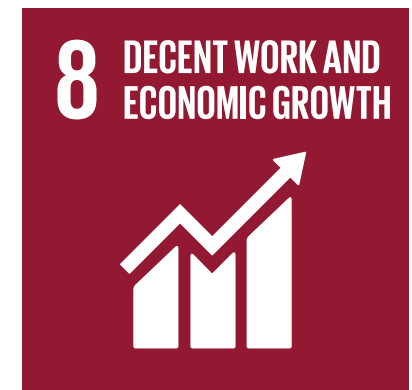
6 All production sites operate water treatment plants for the extensive use of water cycles and cascade water use. No water is discharged untreated. In Mexico, San Luis Potosí, Outokumpu's cold rolling mill is located in an arid region. The less our production consumes water, the more it can be used for drinking, farming and vegetation. It is our social responsibility to prevent potential problems in water supply.

Products: Because of its hygienic properties, Outokumpu's stainless is used for fresh water pipes and treatment plants for drinking water.



7 Outokumpu follows sustainable energy supply practices to gain a secure energy supply with stable and competitive prices. We participate in low carbon power plant technologies such as hydropower, wind mills or nuclear power plants. Process gas from our ferrochrome production site in Tornio, Finland, is used in other own production furnaces.

Products: Stainless steels are used, for instance, in desulfurization equipment of waste gas from conventional power plants and in high temperature power plants, solar farms and biofuel plants.



8 Outokumpu listens to employees' requests to constantly improve their work environment. Workplace safety is one of our top priorities. The company engages in dialogue with stakeholders regarding safety and follows measures to prevent accidents or near miss incidents to draw attention to safe behavior. We ensure that we follow our principles, which are explained in our Code of Conduct and Ethical Statement.

Products: Stainless steel is used in airbag husks or handrails. Stainless steel is also used in staff canteen kitchens or coffee machines. Population growth calls for sustainable development.



9 Outokumpu continuously assesses the environmental impact and enhances the cost efficiency of its production processes. New improved stainless steels are developed and existing materials are improved constantly. Outokumpu's R&D also closely cooperates with end users of stainless steel to further work on and find completely new applications for stainless steels.

Products: Stainless steel is an important building block for sustainable industries and infrastructure. Due to its excellent properties and long lifetime, stainless steel provides the most sustainable material solution for many applications.



11 Outokumpu's most significant impacts on local communities include direct and indirect employment as well as environmental and energy issues. Outokumpu engages community members by establishing personal contact, engaging in regular dialogue also with residents or other local stakeholders. The sustainable use of the areas in closed sites is developed in cooperation with these communities.

Products: The use of stainless in buildings extends the lifetime of these structures and substantially reduces the need for maintenance.



12 Outokumpu's business is based on recycling and is a part of the circular economy. The company focuses on resource efficiency through recycled content, the use of by-products to replace natural resources, as well as increasing the energy efficiency in production processes. This sustainable approach is supported by several key performance indicators which focus on efficiency.

Products: Stainless steel is long lasting, requires low maintenance and is 100% recyclable. The main raw material is recycled steel. This makes stainless steel products a solution for responsible consumption.



13 Following the Paris Climate Agreement, Outokumpu set a science based target following the Sectoral Decarbonization Approach for the steel industry. Outokumpu committed to further reduce the emission intensity by 7.5% by 2021 against the baseline of 2015 to decouple activity growth and emissions and to contribute to the 2-degree scenario by 2050.

Products: Stainless steel is needed in production of solar energy as well as in fermenter tanks of biofuel plants. The use of stainless steels in the structures of trains, trucks or cars helps to reduce weight, fuel consumption and traffic emissions compared to existing solutions.



17 Outokumpu has a partnership with the UN Global Compact and gave a core business example to the SDG Industry Matrix. The success of the science based target initiative relies on participation and global partnership. In our daily work, we cooperate with our stakeholders as investors, suppliers and customers in sustainability development.

Outokumpu has an extensive network of external R&D partners. The partnerships give cooperative benefits.

Products: An example from such partnership is a new battery pack specifically designed for electric vehicles.

Nothing to hide

Buildings & Infrastructure

The Goldman Sachs Tower in New York has a Leadership in Energy and Environmental Design (LEED) gold certification. Commitment to sustainability is echoed in the choice of fully recyclable stainless steel cladding.

[Read more ↗](#)

Energy & Heavy industries

For many companies, managing a more transparent supply chain is a necessity driven by demand. When Valmet wanted to prove the responsibility of its supply chain, Outokumpu was able to help.

[Read more ↗](#)

Automotive & Transportation

When it comes to gas road tankers, every ounce of weight makes a difference in terms of fuel consumption and payload capacity. With Outokumpu Forta, one-third of the weight was cut.

[Read more ↗](#)

Home appliances

Glastonbury Festival wanted to close the loop on the thousands of tonnes of waste. They chose 250,000 reusable stainless pint mugs, carrying the stamp "Love the farm, leave no trace."

[Read more ↗](#)

[#Choosestainless](#)

[for more stories on the use of stainless steel ↗](#)

Responsible supply chain

Outokumpu places the most stringent requirements on itself as a supplier and also requires the same from its own suppliers.

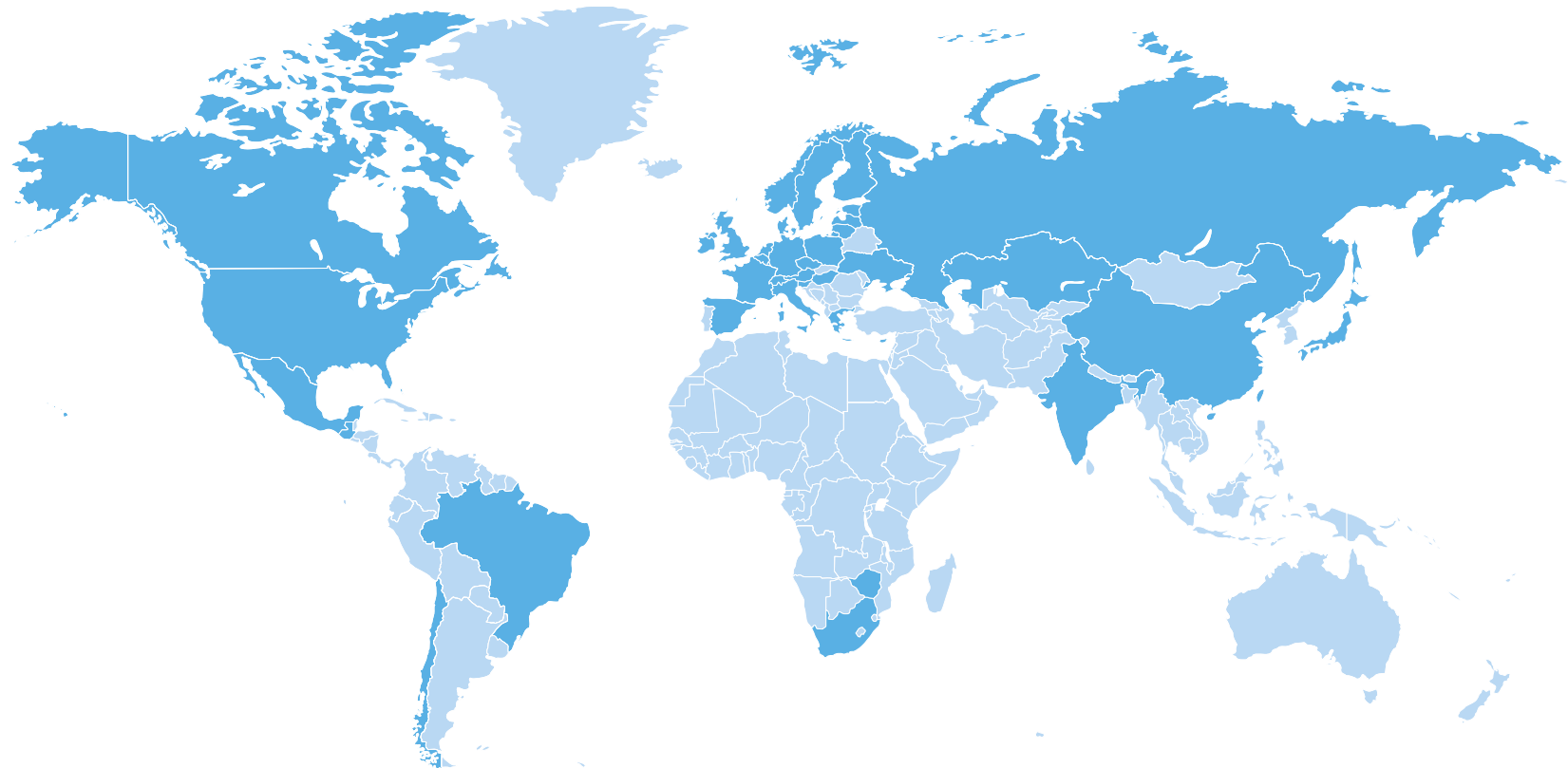
Outokumpu is a supplier to some of the most demanding industries, such as building and construction, energy production, car producers and appliance manufacturers. Traceability and quality are of the utmost importance to our customers, many of whom are leading brands in their field. Outokumpu places the most stringent requirements on itself as a supplier and also requires the same from its own suppliers.

The customers and stakeholders of our customers expect all the time a more transparent supply chain. Like Outokumpu, they put high importance on responsibility, an important part of which is of course the supply chain. They want to be assured that the materials for their applications are procured in an ethical and environmentally responsible manner. To trace the supply chain of their products through the entire chain, all the way back to the production of raw materials, customers need the cooperation of suppliers.

In 2016, Outokumpu had over 10,000 suppliers in 60 different countries. A vast majority of suppliers are located in those countries in Europe, USA, and Mexico, where Outokumpu has its production units, and there were no major supplier changes. The proportion on spending on local suppliers at significant Outokumpu locations of operation was 36% in 2016. Outokumpu started regular compliance screenings of its suppliers used in key production facilities in Europe. The target is to implement regular compliance screenings to cover the majority of Outokumpu's suppliers during 2017.

Material and service suppliers

● Outokumpu supplier countries



“The customers and stakeholders of our customers expect all the time a more transparent supply chain. Like Outokumpu, they put high importance on responsibility.”

[Read more about our suppliers](#) ↗

Includes the most important supplier countries with purchases of more than 50,000 euros.

Full traceability

Outokumpu provides its customers environmental and ethical profiles for its products. We have tracked data of sourcing and know the origin of our primary raw materials.

For instance, Outokumpu provides as the only stainless steel company environmental product declarations for all of its product groups. Environmental product declarations, EPDs, offer our customers information on all environmental impacts of our products throughout their life cycle. Using Outokumpu stainless steel allows our customers to decrease their environmental footprint, and that of their customer.

Outokumpu's work in creating transparency in the supply chain our customers and their customers to assess and manage the impacts of their own value chain and meet growing compliance demands.

Recycling and reducing environmental impacts

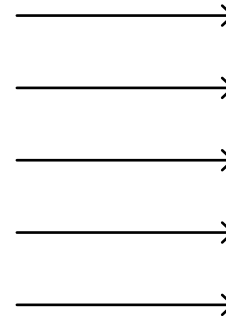
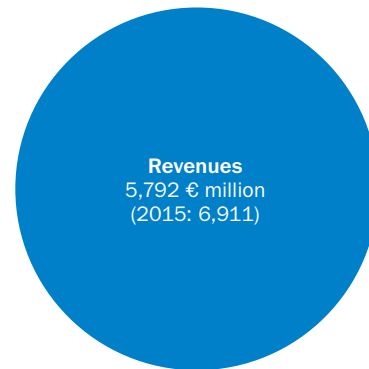
Traceability in the supply chain also gives customers the necessary data to recycle stainless steel at the end of the equipment's lifecycle. Customers can sell the material onwards instead of disposing of it as waste, gaining both environmental and cost benefits.

As Outokumpu's steel has one of the highest recycled content in the industry, using it in any applications reduces the environmental impacts of the entire value chain.

[Read more about our customers](#) ↗

Direct economic value generated and distributed

Direct economic value generated



Economic value distributed

| | |
|---|-------------------------------|
| Operating costs | 4,600 € million (2015: 5,564) |
| Employee benefit expenses | 713 € million (2015: 762) |
| Payments to providers of capital | 171 € million (2015: 156) |
| Taxes paid to government | 12 € million (2015: 35) |
| Community investments | 0 € million (2015: 0) |

Economic values retained in business
295 € million (2015: 394)

Safe and healthy working environment

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

Outokumpu believes that all accidents are preventable and therefore strives towards a goal of zero accidents. Our philosophy is to continuously improve our safety practices to ensure that Outokumpu is an industry leader in safety. Significant improvements have been made, but opportunities for further development still exist across the Group.

Safety was recognized as the first must win battle at Outokumpu in 2016. The goal is to create standardized and disciplined approach to safety that correlates with improved quality and operational efficiency, leading to a top decile position in the industry. Internal safety audits were executed at all major production sites during 2016. Detailed development plans were made at the sites based on the audit results. Yearly Outokumpu Safety

Week was held in April. Safety Week aims to raise safety awareness and highlights selected safety topic during the week. The CEO hosts a Safety Call every month and reviews every lost time injury and recognizes positive achievements. Over the year this forum has led to the development of common approaches to preventing trapping incidents and highlighting the importance of lock-out, tag-out, test-out procedures and improved acid handling methods.

Safety and health performance

Safety and health statistics were reported to a common reporting system. Leading and lagging indicators were required to be reported monthly and formed part of a company-wide Safety Pyramid. The definitions follow an internal standard, which was

Workplace accidents by region, accident and employee type

| | Outokumpu total | Europe | Americas | Asia and rest of the world | Female | Male | Employees | Contractors |
|---------------|-----------------|--------|----------|----------------------------|--------|------|-----------|-------------|
| TRIFR | 8.7 | 10.3 | 5.4 | 0.0 | 0.7 | 8.0 | 8.6 | 8.9 |
| LTIFR | 2.2 | 2.9 | 0.9 | 0.0 | 0.3 | 2.0 | 2.1 | 3.0 |
| TRI [number] | 205 | 165 | 40 | 0 | 17 | 188 | 160 | 45 |
| FA [number] | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| LTI [number] | 53 | 46 | 7 | 0 | 7 | 46 | 38 | 15 |
| RWI [number] | 49 | 32 | 17 | 0 | 3 | 46 | 39 | 10 |
| MTI [number] | 103 | 87 | 16 | 0 | 7 | 96 | 83 | 20 |
| Lost day rate | 55.1 | 61.2 | 43.5 | 0.0 | 17.7 | 65.3 | 54.0 | 63.1 |

TRIFR (total recordable incidents per million working hours) includes FA, LTI, RWI and MTI.

LTIFR (lost time injuries per million working hours) includes FA and LTI.

TRI includes FA, LTI, RWI and MTI.

FA= fatal accident, LTI= lost time incident, RWI= restrictive work incident, MTI=medically treated incident.



based on external international standards. Injury rates and the rate of proactive actions (leading indicators) were reported per million working hours.

Safety

Year 2016 started with launching a new main indicator for safety: TRIFR (total recordable incidents per million working hours). The Group LTIFR (lost time injuries per million working hours) was 2.2 (2015: 3.0) and reached the target of 2.5. In 2016, the TRIFR was 8.7 (no comparable data from previous years available). The rate for all workplace accidents (total recordable incidents and first aid treated incidents per million working hours) was 33.0. Lost day rate (more than one calendar day absence from the day after the accident per million working hours) decreased significantly being 55.1 (2015: 63.4).

The reporting of proactive safety actions continued to be a focus. The frequency of proactive safety actions (per million working hours) increased being 3,013.7 (2015: 2,989.6). The total number of preventive safety actions was 71,189 (2015: 75,600), including near-miss reports, hazard reports, safety behavioral observations and other preventive safety actions.

Health

Health activities at Outokumpu focus on improving working environment and monitoring employee health using a variety of occupational health checks and fitness tests. At the production sites, Outokumpu carries out systematic occupational hygiene measurements to monitor for instance work-related exposure to noise and impurities in the

ambient air. Additional surveys were made as well, for example biomonitoring to investigate chromium exposure in Tornio.

In improving and monitoring working environment Outokumpu cooperates with universities, specialist institutions and external associations.

The number of occupational diseases diagnosed in the Group increased. There were four occupational diseases (2015: 1), all occurred in Europe for own employees. The total absentee rate remained the same being 4.1% (2015: 4.1%), when in Europe the rate was 5.6% (2015: 5.5%), in Americas 0.9% (2015: 0.8%) and in Asia and the rest of the world 0.9% (2015: 1.6%).

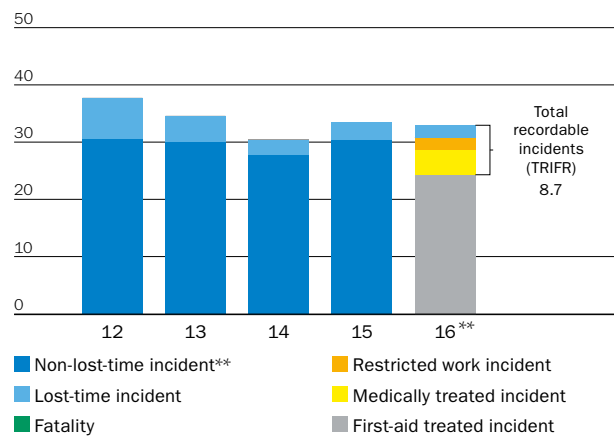
Well-being at work

Outokumpu wants every employee to return home safely after their work shift. The health of the personnel and their well-being at work are important preconditions for Outokumpu's success in day-to-day operations as well as in its long-term competitiveness. At Outokumpu, it is the responsibility of the whole workforce to foster well-being and to increase occupational health and safety.

Outokumpu's production locations promote exercise and sponsor voluntary wellness programs to ensure the health of our professionals, and offers various medical examinations and checks. In Finland, normal health examinations are done for blue-collar workers every third and for white-collar workers every fifth year. For instance Tornio, Finland arranged a project at cold rolling mill promoting healthy ways of living, doing fit tests before and after project, health examinations, information about exercise, healthy eating and so on. In local information sessions, health – shift work, stress, cardiovascular diseases and sufficient rest – is one topic for every shift in quality trainings. For example in Germany and in Americas, the company offered several preventive medical care activities such as glaucoma examinations, skin cancer examinations and influenza immunization.

Many employees from the company's sites also participated in health and well-being actions, and the company promotes and supports exercise activities. Tornio for example offers own hours in ice-skating rink and volleyball as well as campaigns in skiing, commute cycling and so on.

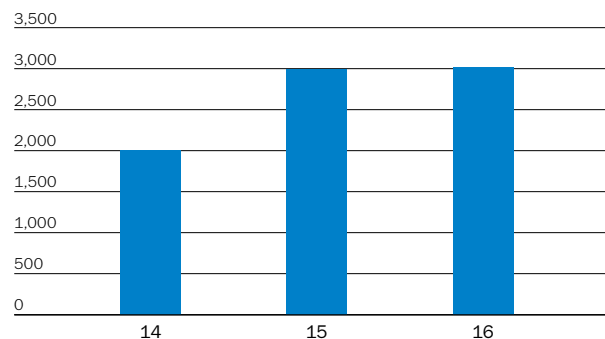
Workplace accidents*



* Per 1 million working hours.

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

Proactive safety action frequency*



* Per 1 million working hours, including near-misses, hazards, SBOs and other preventive safety actions.

Towards a high-performing organization

2016 began with a new CEO, Roeland Baan, taking the reins of the company. As one of his first tasks in January, he asked three questions of the employees – what he should change, what should not be changed and what important topics he should not overlook. People answered that the organization was too complex, involving too much internal work and too much cost. There was therefore no need to persuade anybody of the following immediate targets for 2016: to simplify the organizational set-up with fewer layers of management and a lighter cost structure and to make savings of 100 million euros in sales, general and administrative costs.

While Outokumpu was able to move from the short-term agenda to mid-term targets, these efficiency measures were still needed to allow the company to sustainably develop itself to achieve the new vision. In order to strengthen the underlying culture of our company and make the change sustainable, Outokumpu started to implement the Organizational Health Index with a survey in the final quarter of 2016. The results set a baseline for the health of our company and defined the agenda and ambition for people development for 2017.

“The vision calls for Outokumpu to be the best value creator in stainless steel by 2020 through customer orientation and efficiency, and one of the six must win battles in Outokumpu’s new strategy is high-performing organization.”

Set-up for high-performing organization

In April, the Group announced a new vision and strategy. The vision calls for Outokumpu to be the best value creator in stainless steel by 2020 through customer orientation and efficiency, and one of the six must win battles in Outokumpu’s new strategy is high-performing organization. The strategy set clear targets for 2016 for a radical shift in our business approach to reduce the debt.

The first steps in achieving the required radical change were to simplify the organization, streamlining layers of management and cost, as well as to reduce sales, general and administrative costs by 100 million euros. The new organization entered into force in June, and work is in progress to change the ways of working.

Improving organizational health

A further sense of direction from the point of view of organizational development came with Organizational Health Index, a set of behaviors which strongly influence the success of an organization. The initial survey was conducted in the autumn.

Using Organizational Health Index tool allows Outokumpu to clearly link the day-to-day behavior and mindset in the organization to its strategy and must win battles, and to benchmark its score against 1,300 other companies. The response rate was extremely high at 70%, showing that employees care about Outokumpu as their employer, and employees gave more than 15,000 open comments, recommendations and opinions. Outokumpu scored in the bottom quartile after years of restructuring, but the company has set up ambitious targets to move to



the next quartile when the next survey is carried out in 2017. Key development areas for the next 12 months were identified – role clarity, personal ownership, knowledge sharing, consequence management, rewards and recognition as well as inspirational leadership. Actions on these fronts will be closely monitored in 2017.

In cooperation with the employees

A new organization to reduce the layers of management meant that Outokumpu completed employee negotiations in Finland, Sweden and Germany in the summer and autumn of 2016 in line with the local practices in each country. The reorganization meant that 600 white-collar employees have left or are leaving Outokumpu.

Outokumpu completed its earlier announced industrial restructuring in Europe, when the Benrath site was closed in September and its operations were transferred to Krefeld, Germany. The vast majority of more than 200 employees transferred to other positions in Krefeld. Based on a local social compensation plan, the remaining employees, some 10%, moved over to a transfer company for training and new employment opportunities in accordance with German practice, or retired. There were no compulsory redundancies in Benrath.

Ongoing cooperation with personnel takes place in a joint consultative body, Personnel Forum, an information channel between management and employees. The Personnel Forum discusses issues of transnational interest, 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 ongoing cooperation between management and employees. Eight members

represent employees and three represent the management. In 2016, the Personnel Forum met once and the working committee convened four times.

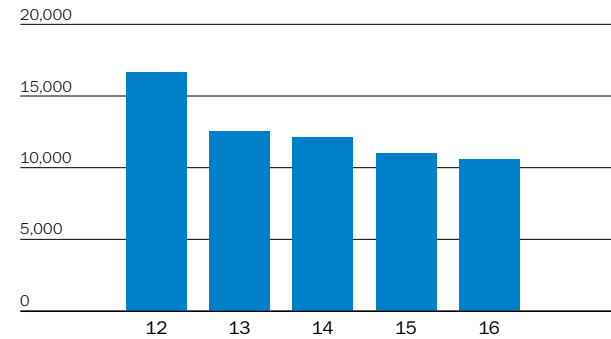
Hundreds of people trained, new talents offered new opportunities

In harmonizing business processes within the company, that has grown through acquisitions, important steps were taken in 2016. New common tools for supply chain management, procurement and customer relationship management were also taken into use. A common employee data system was built up, and it will go live in the beginning of 2017.

As Outokumpu is moving forward with new, common processes, hundreds of Outokumpu people participated in training in 2016. Training programs included an eLearning program for supply chain management and a pilot O'Leader training for leadership skills. The Outokumpu Sales Academy was launched for developing sales competences in field sales. On site, safety and on-the-job training continued. Overall, the total number of training days was 11,002 and hours 88,012, and the average number of training days was 1 and hours 8.5 during the year.

Outokumpu continued its global talent review process in the Americas and was able to promote some of the talents spotted earlier in the process in the new organization. The Outokumpu Talent Council meets quarterly. During the year, nearly a thousand Outokumpu employees were given a new challenge or opportunity through job rotation in the company in connection with the new organization for example in new global functions of sales, supply chain management, operations and human resources, where they started in a new position or in a new unit. In the process, Outokumpu promoted 27 emerging leaders that had been detected in our talent review process. Altogether 491 professionals were recruited from outside the company.

Personnel on December 31



Our people by region

| | 2016 | 2015 | 2014 |
|-------------------------------|---------------|---------------|---------------|
| Germany | 3,004 | 3,186 | 3,586 |
| Finland | 2,363 | 2,396 | 2,408 |
| Sweden | 1,656 | 1,760 | 1,969 |
| The United Kingdom | 513 | 560 | 541 |
| Other Europe | 611 | 577 | 600 |
| Europe | 8,147 | 8,479 | 9,104 |
| The United States | 1,220 | 1,216 | 1,212 |
| Mexico | 1,056 | 1,095 | 1,104 |
| South America | 88 | 92 | 94 |
| Americas | 2,364 | 2,403 | 2,410 |
| Asia/Rest of the World | 89 | 120 | 611 |
| Group total | 10,600 | 11,002 | 12,125 |

Check all employee data in our [reporting tool](#) ↗

Majority received a regular performance review

Outokumpu's clear target in performance management is that each and every employee has a regular performance and development discussion, called "My performance commitment," with their manager.

Since the Inoxum transaction, some of the employees have been outside the Group's process for performance and development discussions, but the majority of the Group's personnel received a regular performance and career development review in 2016. In 2017, once a common employee data system is taken into use in the beginning of the year, the process of performance and development discussions will be the same across the entire company and easily monitored in the system.

Outokumpu's principles and framework for salaries and incentive plans remained mostly unchanged and salary increase budgets were limited in 2016. During the year, Outokumpu launched a matching share plan in order to emphasize shareholder value creation and ownership culture and to incentivize the achievement of the 2020 vision. The participants in the top management invest 30–120% of their annual gross base salary in Outokumpu shares, and Outokumpu will match each share with two gross shares. More on remuneration on p. 14 in the Annual report's Corporate Governance section.

Zero tolerance for any kind of discrimination

Outokumpu Code 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

opportunity and diversity. Employment decisions will be based solely on business reasons and will be made according to national employment laws.

In 2016, 6 alleged incidents were recorded in Outokumpu. The Group reviews and investigates all incidents. If required, corrective actions are taken accordingly. Read more on compliance on p. 12 in the Annual report's Corporate Governance section and [at our website](#).

Outokumpu complies with 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. Outokumpu operates mainly in Europe, in the US and Mexico, where the risk related to the human rights is not considered to be high.

Outokumpu's working hours, minimum notice periods, vacation times, wages and other working conditions are consistent with applicable local laws. Outokumpu maintains a consistent policy of freedom of association. All Outokumpu employees are free to join trade unions according to local rules and regulations, and in 2016 altogether 86.5% of the Group's employees were covered by collective agreements. 18,038 hours or 2,254.8 days in 2016 were lost due to strikes (2015: 6; 2014: 170).

Outlook for 2017

2017 will be about sustaining the new ways of working set up in the past year. As negotiations in some countries ended only in the last quarter of 2016, all roles and accountabilities are not yet clear on every front, and work remains to be done on taking personal ownership and role clarity. Savings in sales, general and administration costs need to be reaped up also in 2017. But in many ways, 2017

will be about preparation for building capabilities both to sustain the ways of working established in 2016 and to further harmonize business processes in 2017–2018: training is of course training, but also common processes and infrastructure need to be in place. After the first roll-outs in 2016, a new global employee data system as well as tools and processes for performance management and learning will be built and taken into use. Secondly, Outokumpu will also follow up on the organizational health with a focus on leadership and performance. Last but not least, rewards and recognition will be a clear improvement target, with special focus on linking rewards to performance and non-financial recognition.

Goals for 2016

| Target | Status | Goals for 2017 |
|--|---|--|
| Winning behaviors | Done and evolving into a next step now that we have a new strategy and vision – mission-critical behaviors to reach our mission | Launch of mission-critical behaviors: Leadership, Sense of urgency – execution with speed, Relentless drive for improvement, Decisiveness collaboration, and Effective communication |
| First O'Leader pilot training | Done, continues in 2017 | Learning strategy and common processes for training |
| Following up a previous Group-wide personnel survey and conducting a new one | Done, actions continued based on previous survey and new Organizational Health Index survey taken in the autumn of 2016 | Follow-up on organizational health with focus on performance management and leadership |
| Employer value proposition | Work started | Continues in 2017 |
| Sales competence development with Sales Academy | This was kicked off in 2016 and pilots were done in November | Developing sales competence, supply chain and manufacturing excellence continue |
| Diversity, 50/50 in recruiting | Ambition of 50/50 men and women graduate recruitments in place | Ongoing |

Energy efficiency

Outokumpu was able to improve energy efficiency by 12.7% in 2016 compared to baseline 2007–2009 mainly by high capacity utilization. Corresponding savings amounts to 1.3 million MWh.

Outokumpu fosters responsible energy use by realizing the potential of efficiency improvement and by engaging in low-carbon electricity.

The company's energy efficiency has significantly improved in the long term. In recent years this improvement was mainly driven by the restructuring process of our operations. In 2016 Outokumpu concentrated and increased production and capacity utilization, improved energy efficiency and saved resources and money. Several energy efficiency projects supported this remarkable energy efficiency improvement, the results of which can be seen on [p. 24](#) in the Sustainability review.

At Outokumpu's ferrochrome operation in Tornio, Finland, process gas is produced in the reducing process step. This CO gas is captured, cleaned and used as furnace gas in Outokumpu's other production processes at the Tornio site. Thus, the use of primary energy in Tornio site could be further replaced in 2016 saving about 1 Million MWh of primary energy resources. A small amount is also converted into heat in the CHP plant in Tornio and the heat is sent back to Outokumpu.

“The company fosters responsible energy use by realizing the potential of efficiency improvement and by engaging in low-carbon electricity.”

Sustainable energy supply

Outokumpu centralized energy procurement to secure sufficient energy supply and to ensure predictable, competitive and stable energy prices for the Group.

The Energy and Utilities function optimizes the energy portfolio and manages Outokumpu's energy production assets which include participation in low-carbon energy projects. Outokumpu continues with its shareholdings in:

- Rajakiiri Oy wind power with a capacity of 45 MW in Outokumpu Tornio site, Finland.
- Statkraft hydro power with a capacity of 104 MW in Rana, Norway
- Fennovoima with holding of 14.1% in the nuclear project Hanhikivi 1 in Pyhäjoki, Finland, a 1,200 MW nuclear power plant expected to begin operations in 2024 and has a minor 0.3% holding in the nuclear power plant Olkiluoto 3
- A combined heat and power (CHP) plant in Tornio which produced in 2016 328.8 GWh (1,184 TJ) heat energy for Tornio works
- Manga LNG Oy with holding of 45% in building a LNG terminal in Tornio harbor, Finland, to replace fossil fuel use by LNG. The project is supported financially by the Finnish Government. The delivery is expected in 2018

Outokumpu uses a small amount of electricity from its own hydro power plant with a capacity of 330 kW in Dahlerbrück, Germany. The site gets some 10% of its electricity from this plant.

With all these measures, the aim is to lower Outokumpu's carbon profile.

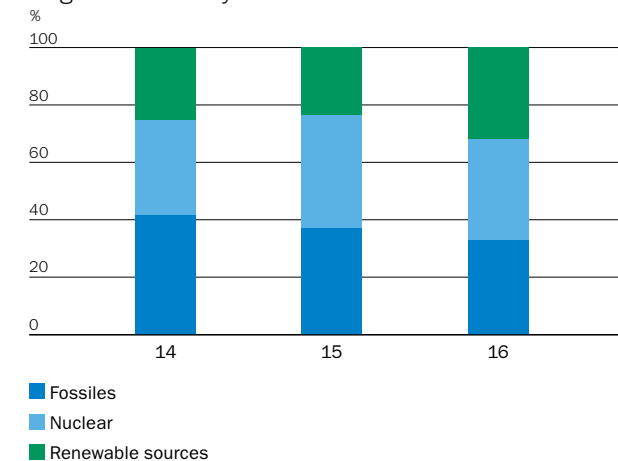
Energy used

| | 2016 | 2015 | 2014 |
|--|---------------|---------------|---------------|
| Electricity, TJ | 16,747 | 16,130 | 17,176 |
| Carbon monoxid gas, TJ | 2,405 | 2,241 | 2,272 |
| Natural gas, TJ | 4,424 | 4,259 | 5,681 |
| Propane, TJ | 4,640 | 4,467 | 4,295 |
| Diesel, Light and heavy fuel oil, other TJ | 614 | 614 | 634 |
| Energy, TJ | 28,830 | 27,712 | 30,056 |

| | | | |
|---|-----|------|------|
| Energy use in GJ per tonnes crude steel | 9.8 | 10.3 | 10.3 |
|---|-----|------|------|

Electricity of 2015 has been restated

Origin of electricity



More information on energy use in our [sustainability tool](#).

Environmental impact

Outokumpu reduces the environmental impact at its source by improving resource efficiency in material and energy use.

The main environmental impacts from stainless steel production are dust emissions into the air, water discharges from production plants, use of direct and indirect energy, and waste created in the production process.

Outokumpu manages environmental impacts according to [Outokumpu's policy on Environment, Health, Safety, Quality and Energy Efficiency](#).

Stainless steel production is a melting process of recycled steel at over 1,400°C which results in thermal driven emissions of dust mainly in melt shops. Dust filtering systems are extremely efficient, removing 99% of the particles. The total particle emissions of all production processes was 570 tonnes in 2016 (328 tonnes in 2015). The increase is caused

by higher production and the particle emissions mainly come from the ferrochrome operation.

As Outokumpu has reached a low level of specific dust emissions from melt shops and fulfills the required low dust emission concentration emitted after dedusting, no significant further reduction steps are expected. Rather, the estimation method based on measurement campaigns and the operation conditions during the campaigns influence the figures.

Water is needed in the equipment cooling as well as in several other processes. Outokumpu reuses the water as much as possible in water cycles and cascading use, but some water also evaporates or leaves the system. All discharged water is treated beforehand by the company's own treatment plants except when it

is directed to municipal water treatment systems. The main water discharges are metals and nitrates.

While the water withdrawal increased by about 4% in 2016, Outokumpu was able to improve the water withdrawal per tonne of crude steel to limit the environmental impact on bodies of water. The metal discharges decreased in 2016 compared to the previous year. A higher nitrate water emission was caused by the implementation process of the investment in the cold rolling mill in Krefeld and the ongoing modification of the municipal water treatment plant in Dillenburg. The latter will treat the site's wastewater nitrate in the future.

Despite all precautionary measures to avoid radioactive contamination in raw materials by

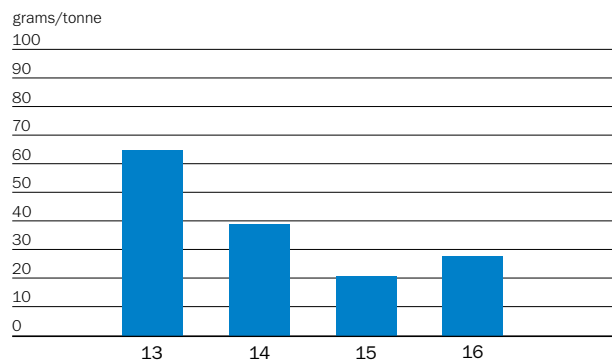
radioactive control of all input to our melt shops, one incident involving radioactive material occurred in 2016. It resulted in slightly contaminated slag which was landfilled on a special landfill site according to authority requirements.

The production of stainless steel does not employ or reserve large areas of land, or have a significant effect on biodiversity in the surrounding natural environment. However, Outokumpu has identified areas of high biodiversity value that are owned by the company or adjacent to our sites. More information on [biodiversity](#).

Costs for environment-related activities within Outokumpu totaled EUR 118 million in 2016, of which costs associated with operational environmental management totaled EUR 108 million. Operational costs include process-related treatment, disposal and remediation costs for waste and emission reduction into air and water. 35.6% of the environmental expenditures are for air and climate change, 30.3% for water protection, 12.2% for waste management, 5.4% for waste disposal and 0.5% for soil and groundwater. All others could not be sorted to one of the above mentioned groups. EUR 11 million were used to environmental investments. The biggest investments were the reconstruction of the Krefeld site and waste treatment improvement in the Kemi mine. Provisions and guarantees in connection with environmental considerations totaled EUR 64 million.

All our environmental impacts can be seen at our [sustainability reporting tool](#).

Melt shop particle emissions



Water withdrawal and discharges

| | 2016 | 2015 | 2014 |
|--|-------------|-------------|-------------|
| Surface water, million m ³ | 37.9 | 36.6 | 35.4 |
| Municipal water, million m ³ | 1.2 | 1.1 | 1.8 |
| Groundwater, million m ³ | 1.4 | 1.1 | 1.4 |
| Rainwater, million m ³ | 1.7 | 1.7 | 1.0 |
| Water withdrawal by source | 42.2 | 40.5 | 39.6 |
| Water discharges by type and destination | | | |
| Wastewater out, million m ³ | 21.6 | 21.0 | 21 |
| Discharge to surface water, million m ³ | 20.2 | 19.6 | 19.2 |
| Emissions to water, tonnes | | | |
| Metal discharges to water, t | 36 | 50 | 53 |
| Nitrogen in nitrates, t | 2,399 | 1,767 | 2,408 |

Water discharge for 2015 is restated.

Environmental legal compliance

In order to ensure legal compliance, the Environmental Network follows quarterly environmental performance, permit status and legal compliance. Internal environmental site audits continued in 2016 according to an internal risk list. During 2016, many of the production sites received new environmental permits or updates or had a permit process ongoing.

During 2016 the only administrative fine was SEK 1,000 (some EUR 100) for the late delivery of a cooling media report in Avesta, Sweden. Outokumpu units did not receive any non-monetary sanctions during 2016.

In 2016, emissions and discharges were generally at normal levels and in compliance with environmental permits, but some spills and instances of non-compliances did occur. Environmental compliance data for 2016 shows that there were a total of 15 environmental non-compliances or breaches of permitted limits (2015:18). None of them were significant. On all these occasions, the environmental authorities were reported to according to local legislation, permit conditions and Outokumpu's internal environmental reporting rules. In these cases, corrective actions were carried out immediately or cases resolved otherwise according to the guidance of the supervising authorities. Related to these, no environmental damage was reported.

Permit processes were completed in some units. For example our cold rolling mill in Krefeld, Germany, received a permit for its revised cold rolling mill and the Wildwood site in US got a new stormwater permit

and a wastewater pretreatment permit. The Kemi mine in Finland received a permit for landscaping the barren rock heaps. Permit process was ongoing in several sites. For instance, in the US the Calvert plant is waiting for the new air emission permit for NO_x and SO₂ at the melt shop. Tornio site in Finland applied for some changes regarding its environmental permit and Sheffield, UK, was undergoing a review of the permit regarding its landfill.

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

Working hard to prevent leakage and soil contamination

Soil and groundwater contamination was investigated during 2016, for example, in Sweden at the Nyby site and the closed Kloster site and in Germany at the closed Bochum and Benrath sites. Planned remediation work was ongoing at some Group sites in 2016.

Monitoring emerging legislation as a part of compliance


Many challenges in environmental initiatives and legislation were followed. In chemical and environmental areas, the challenges in 2016 were for example:

- Preparation of next phase from 2020 to 2030 of the European Emissions Trading Scheme (ETS);
- Linking other regulation to European legislation

related to chemicals (REACH) and product safety (CLP);

- Implementation of the Industrial Emissions Directive in the European Union together with binding Best Available Techniques (BAT) requirements;
- EU resource efficiency and circular economy initiatives which may have impacts on legislation and many other areas.

Non-fact based or non-comprehensive definitions in classification are causing unexpected impacts. For instance the classification of nickel as potential carcinogen automatically leads to similar classification of austenitic stainless steel. It fails to recognize that stainless steel is a material with its own inherent properties, which are not the same as those of the raw material constituents. This situation is analyzed as part of the Group's annual environmental risk rating process and has required intensive communication from Outokumpu, EUROFER and other associations.

More on compliance on p. 12 in the Annual report's Corporate Governance section and our [website](#) 

Pays for itself

Buildings & Infrastructure

Stainless steel gives Hong Kong's landmark, the Stonecutters Bridge, its striking appearance and enough integrity to last through its designated 120-year life cycle.

[Read more ↗](#)

Energy & Heavy industries

Crescent Dunes is the world's first solar plant storing sunlight in a hot nitrate tank using molten salt. Tanks are made of Outokumpu Therma stainless steel, specifically designed for high temperatures.

[Read more ↗](#)

Automotive & Transportation

Sweden upgrades X2000 trains but original stainless steel train frames continue in use. Looking both costs and environmental impact, choosing stainless steel paid off.

[Read more ↗](#)

Home appliances

Bailey of Sheffield creates beautiful jewelry in stainless steel to last more than a lifetime. It was obvious for Bailey to source local stainless steel that comes from Sheffield.

[Read more ↗](#)

Product properties

People make things from stainless steel when they need them to last. Stainless steel pays for itself in the long term, thanks to its durability, strength, low weight and resistance to corrosion.

Not all stainless steels are created equally. Outokumpu's customers have access to the best expertise in the industry, to help them identify the precise material and grade for any application. Outokumpu supports its customers by providing relevant information on the choice and use of different stainless steel grades.

Selecting Outokumpu's stainless steel means making the right choice at the beginning of the life cycle to make it long-lasting, cost-efficient and sustainable. As an example, the high-strength stainless steels in Outokumpu's portfolio offer economic benefits: less material is required for a specific level of performance and fewer resources are therefore consumed in its production. High-strength steels can also absorb

larger amounts of collision energy, improving safety levels in vehicles and other structural components and systems.

Improving product properties like corrosion resistance and strength is at the heart of our product development, and successful new products like Supra 316 Plus offer added value to our customers as the materials get stronger and more long-lasting.

Product, application and technical market development

The direction of Outokumpu's product, application and technical market development is driven by global trends like economic and population growth, mobility, urbanization, climate change and limited resources.

We work closely with customers 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. An excellent example of how the use of stainless steel extends a product's life cycle and reduces the use of natural resources is the ongoing [upgrade of X2000 trains in Sweden](#).

The X2000 train frames were manufactured from Outokumpu stainless steel in the 1990s. Today, two and a half decades later, the trains are undergoing a full technical and interior upgrade. However, the original stainless steel frames remain intact and are expected to stay in service for another two decades. Outokumpu continues to develop even more life cycle-efficient material solutions for both existing application areas, and to open completely new markets for our steels. We also continuously improve the quality and properties of our existing steel grades. In recent years, Outokumpu has launched several new-to-market steel grades. One important milestone in 2016 was that the new steel grades Outokumpu Supra 316plus and Outokumpu Core 4622 were [accepted into the European standard EN 10028-7](#).

Our Forta H-series high strength stainless steels have been developed to open completely new markets for stainless steels. These materials provide the automotive industry with a structural material that exhibits a superior combination of strength, formability and crash-resistance compared to the currently used materials. One example of a new application for H-series materials demonstrated during 2016 was vehicle seats.

New surface finishes and the optimization of surface properties of stainless steel is another key focus area of our product development. Outokumpu offers a wide range of aesthetically appealing stainless steel finishes for architectural applications. The latest case example is the [Ping An Finance Center](#), the second largest skyscraper in China, representing the largest existing stainless steel curtain wall. Outokumpu delivered 1,700 tonnes of Supra 316L/1.4404 in Deco Linen finish for this building. Due to the excellent cooperation and delivered quality, Outokumpu has been selected also as the supplier for the curtain wall material of the Ping An South Tower, currently under construction next to Ping An Tower.

Meeting the growing demand for stainless steel as curtain wall material, development activities in 2016 aimed to offer new surface finishes featuring a non-directional characteristic. The non-directionality is becoming a more popular characteristic of curtain wall materials, because it gives architects more flexibility on positioning the panels on the building. Five new non-directional patterns have been designed and developed, and are currently being evaluated by architects.

Outokumpu's R&D teams work closely together with our customers and sales organization. Our R&D experts provide our customers with technical support and advice related to material selection, fabrication and material performance in customers' applications. An excellent example of the value our R&D knowledge generates to our customers was the [cooperation with Jyväskylä Energy Group](#), where our R&D experts helped our customer in the selection and use of superaustenitic Outokumpu Ultra 254 SMO material.



“Continuous development of our stainless-steel production processes and technologies is at the core of our R&D.”

Stainless steel from Outokumpu has for several years been used in bridges. Outokumpu has recently, in collaboration with the consultancy and engineering company Arup, made an inventory of duplex stainless steel bridges that have been in use for up to more than fifteen years. The inventory confirms that duplex stainless steel is a very sustainable selection for all kinds of bridges, and that there are suitable duplex stainless steels for different corrosion environments. The bridges visited could all be used as exemplar cases of the successful structural use of stainless steel.

Process and technology development

Continuous development of our stainless steel production processes and technologies is at the core of our R&D. Process and technology development focuses on the reduction of the environmental impact and the improvement of the cost efficiency of our production processes, and on the optimization of stainless steel quality. For instance, during 2016, the improvement of the slab grinding process enabled by the results of the collaborative R&D program DIMECC SIMP (System Integrated Metals Processing) resulted in a substantial reduction in the grinding loss of ferritic grades in Tornio, without affecting product quality.

An important part of our R&D mission is to develop and share technological knowhow on stainless steel making. Therefore, the job rotation program for technical experts was continued, to facilitate the transfer of technological knowhow between our production sites. The Core Technology Competence groups, group-wide expert teams on process development, continued to deliver excellent results by sharing best practices and executing joint development projects between Outokumpu production sites.

A digitalization team was established in our Tornio R&D center to even more efficiently utilize data analysis, new measurements and process models in process optimization and process control.

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 is a member of the European Steel Technology Platform (ESTEP). 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 with the Fraunhofer Institute and the Max-Planck-Institut für Eisenforschung. Furthermore, Outokumpu has recently put more focus on the EU's research and innovation program Horizon 2020 and on other European-level programs.

An example of recent successful cooperation is the project in which Outokumpu's material experts are working on future-oriented stainless steel solutions in [cooperation with scientists from Fraunhofer Institute](#) for Laser Technology ILT, in Germany. Another good case example is the two-year collaborative project with Professor Levente Vitos from the KTH Royal Institute of Technology in Stockholm, enabled by a strategic mobility award from the Swedish Foundation for Strategic Research. The project has focused on investigating in detail the applicability and future possibilities of ab-initio calculations in our product development.



Recycling maximized

Buildings & Infrastructure

Waste for one industry can be a valuable resource for another. By-products of the melting processes of stainless steel industry find new use replacing virgin crushed rock in road foundations.

[Read more ↗](#)

Energy & Heavy industries

A next-generation bio product mill in Finland, producing tall oil, turpentine, wood fuel and bioelectricity, relies on Outokumpu stainless steel in its reactors and storage tanks, vital to the pulp mill's operations.

[Read more ↗](#)

Automotive & Transportation

Car fuel tank made in stainless steel weighs almost half of its plastic alternative, gains three liters of volume, and provides serious advantages to its crashworthiness. And it is fully recyclable.

[Read more ↗](#)

Home appliances

Stala aims to create products, like sinks, that are high quality, well-functioning and efficient at every stage of their life cycle. Since stainless steel can be recycled after use, it even exceeds Stala's requirements.

[Read more ↗](#)

#ChooseStainless

[for more stories on the use of stainless steel ↗](#)

Resource efficiency in materials

Outokumpu's business is based on recycling. The recycled content of our stainless steel is 87.1%, among the highest in the industry.

Outokumpu aims to maximize the use of secondary raw material steel scrap. 2.45 million tonnes of recycled steel was used in 2016 (2015: 2.20 million tonnes). In addition to this Outokumpu follows a circular economy approach by recycling waste metals from outside the melt shop in the steel melt as far as reasonable. The recycled content is reported as total recycled metal input to melt shops in correlation to crude steel production. It is calculated according to ISO standard 14021. Recycled content remains on a high level of 87.1% in 2016 (87.2% in 2015).

Outokumpu also aims to reduce landfill waste. In 2016 we were able to further increase the share of recycled and recovered waste. The trend of higher percentage of waste recycled and recovered continues. The landfill waste increased by 7% compared to the previous year mainly caused by higher production and by less amount of used slags. Landfilled waste could be limited by improvement in the mining process. The amount of tailings at Kemi mine has decreased in

relation to concentrate amounts due to increased recovery in the concentrator plant. Total recovery of concentrator plant has continuously increased to totally 6.6% since 2013.

The total amount of waste was 1.8 million tonnes and increased by 17% at the same time as the production increased by 12% compared to last year and the use of slag decreased.

Slags are the main by-product of Outokumpu's production, including ferrochrome production. In 2016 the company produced 1.1 million tonnes of stainless steel and ferrochrome slag (1.2 million tonnes in 2015). Our slags are, for instance, used in road construction, refractory and concrete production, or for water treatment. The use rate (use, recycling and recovery) of all slags in 2016 was 90% (92% in 2015). The use rate depends on the local market for construction materials and the acceptance of secondary mineral material instead of virgin minerals.

The new European initiative on the circular economy should support companies in utilizing by-products and recycled material. However, some definitions in the debate are counterproductive and generate the risk that the use of the secondary materials is put at a disadvantage compared to virgin materials in spite of the same, or even superior properties. If, for example, slag by-products would become waste and had to be landfilled, new deposits would be needed for the slag and at least the same amount of virgin materials would have to be mined.

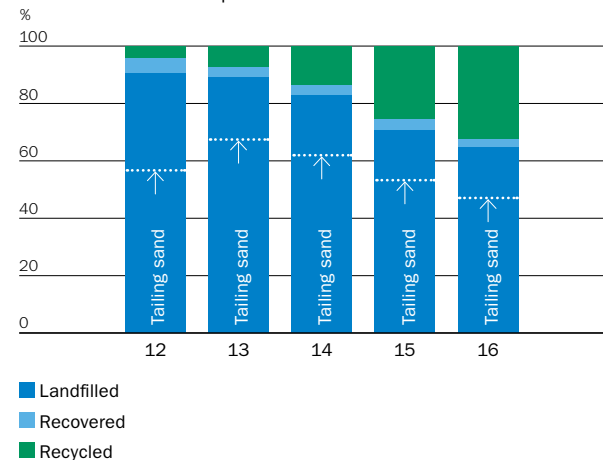
More information on raw materials and waste is in our [sustainability reporting tool](#).

“Our slags are, for instance, used in road construction, refractory and concrete production, or for water treatment.”

Total and hazardous waste in tonnes

| | 2016 | 2015 | 2014 |
|-------------------------|---------|---------|-----------|
| Tailing sand | 856,245 | 830,874 | 1,029,332 |
| Other waste | 966,281 | 732,342 | 630,182 |
| thereof hazardous waste | 139,224 | 127,007 | 147,586 |
| recycled | 13,224 | 14,337 | 16,817 |
| recovered | 43,521 | 44,900 | 48,300 |
| landfilled | 82,485 | 67,769 | 78,344 |

Total waste development



Indispensable

Buildings & Infrastructure

Thousands of bridges worldwide are in need of repair years ahead of their scheduled lifespan. Using stainless steel they can be renovated in a cost-efficient way with a long lifespan and low maintenance.

[Read more ↗](#)

Energy & Heavy industries

Can desalination fix the growing problem of water scarcity? The processes are complex and highly corrosive, calling for durable solutions.

[Read more ↗](#)

Automotive & Transportation

Metaklett is the first hook and loop fastener made of metal and used in car engines. It offers all the advantages of Velcro system combined with the strength of stainless steel.

[Read more ↗](#)

Home appliances

Creating customized laboratory equipment for a hospital environment is not simple. There are strict hygiene requirements for materials. Outokumpu stainless steel met these requirements.

[Read more ↗](#)

#Choosestainless

[for more stories on the use of stainless steel ↗](#)

Climate change

Outokumpu uses resources sustainably. The company works constantly to improve the material and energy efficiency of its own operations and aims to contribute to a low-carbon energy sector.

Outokumpu is committed to reducing the greenhouse gas (GHG) emissions from all operations. The primary GHG emitted during stainless steel production is carbon dioxide (CO₂). Our target to improve resource efficiency calls for less energy and less virgin materials. This results in lower CO₂ emissions.

Carbon profile

Since 2010 Outokumpu has been working towards its target to reduce the Group's specific carbon profile in stainless steel production by 20% by 2020, with baseline figures from the 2007–2009 period. The carbon profile is calculated thus:

- For direct CO₂ emissions, as the sum of the carbon efficiency of each process such as melting, hot rolling and cold rolling, and the weighted contribution of ferrochrome production
- For indirect CO₂ emissions, by electricity use and the weighted average CO₂ emission factor of Outokumpu's electricity suppliers
- For transport and travel emissions, by distances for material and product transportation and transportation type with the correlating emission factors and business travel emissions provided by airlines and business car leasing companies

This year the carbon profile could be reduced by 13.3% compared to baseline. The profile is on the expected track of the 2020 target. This good result was caused by an improvement in energy efficiency and a significant reduction in the electricity emission factor of Outokumpu's electricity mix.

In 2016 Outokumpu committed to a science based target on CO₂ intensity. Corresponding reporting on this science based target will replace carbon profile monitoring in 2017.

European Union Emissions Trading Scheme

Besides voluntary commitments, Outokumpu's European operation sites fall under the European Union Emissions Trading Scheme. In total almost 0.94 million tonnes of total 1.22 million tonnes of CO₂ emissions are covered by the system. The input of raw materials such as recycled steel and ferroalloys as well as the use of electrodes in the electric arc furnace in melting processes during stainless steel production contains carbon, which is followed by process-related CO₂ emissions. Further direct emissions come from the use of primary energy for process heat.

The global economic crisis at the end of the last decade resulted in very low production and therefore low emissions. As allocation is based on historical production data and benchmarks, not all allowances were needed but could be transferred to the ongoing period. By the end of the ongoing phase the total allocation for period 2013–2020 will not cover the forecasted emission needs. It is of high importance to note how the system develops in the future.

The main risk of this emissions trading system to Outokumpu involves the pass-through costs to the electricity price, which also depend on the allowance

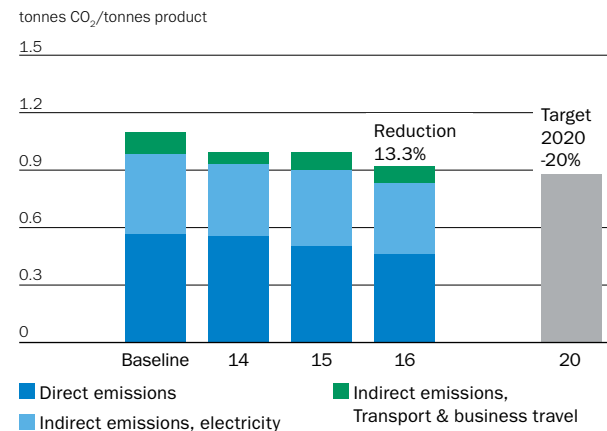
trading price. As the next trading phase intends to shorten the allowances market, a price increase in allowances is expected and intended. As Outokumpu commits to CO₂ emission reduction and contributes to reduction target of the Paris Agreement, the Group needs the emission trading scheme to establish fair conditions. This means full electricity price compensation of pass-through costs caused by allowances on a harmonized European base, free allocation at the level of real actualized benchmarks from the 10% most efficient installations without

a flat rate, and no cross sectoral correction factor to the benchmark emission amount. The company communicates this position in cooperation with various steel industry associations.

Investments in recent years in terms of restructuring have made Outokumpu's production sites highly efficient. This is also an opportunity to stay competitive under the emissions trading system.

All climate change data is available in our [reporting tool](#)

Carbon profile of Outokumpu's steel



2016 data are for continuing production sites compared to baseline, electricity profile for 2015 was restated.

“Our target to improve resource efficiency calls for less energy and less virgin material. This results in lower CO₂ emissions.”

Science based targets on CO₂ intensity

Outokumpu is committed to reducing the direct and indirect CO₂ intensity by a further 7.5% by 2021 against the baseline of 2015.

In April 2016 Outokumpu became a member of the Science Based Targets initiative. The members commit to contribute to the climate change goal of COP 21 held in Paris, November 2015. The parties set a goal to decouple growth and emissions and to limit the temperature increase in the atmosphere to 2 degrees compared to the pre-industrial era, called the 2 Degree Scenario (2DS). The most suitable method for Outokumpu to follow is the Sectoral Decarbonization Approach (SDA) for the steel industry as the long-term CO₂ target.

Greenhouse gas emissions of stainless steel production are limited to CO₂ caused by direct emissions and indirectly from electricity use. Emissions of all Outokumpu's production sites are included in the target setting. Outokumpu operates its own chromium mine and ferrochrome production in Finland; these are also enclosed. Our own generated emissions from transport and business travel are not included in the steel sector target. They count for some 9.3% of total emissions and will be monitored. According to the science based target approach, upstream emissions of input materials are counted in the corresponding sectors.

Outokumpu's scenario

To exclude restructuring changes, the scenario is developed against the baseline of 2015 under conditions of the steel SDA. To take into account the electricity driven production route, the indirect emissions from electricity was estimated on the development of the energy supply sector intensity target (90% reduction by 2050). The development of the electricity sector highly influences the result of Outokumpu's CO₂ emissions.

Steel industry approach

In the iron and steel sector, the target of direct emission intensity is a decrease by 55% to 0.891 t CO₂/t crude steel and the target of indirect emission intensity is estimated at 0.025 t CO₂/t crude steel by 2050 based on 2010. The whole sector's total emissions result is expected to decrease by 31% although an activity growth of 55% is assumed by 2050.

The steel industry approach reports the potential for efficiency increases coming from the phasing out of open hearth furnaces and improving blast furnaces as well as carbon capture, storage or use of direct CO₂ emissions from these processes. Further

improvements are correlated to increased electric arc furnace steelmaking on a scrap basis. All these reported potentials are based on processes that are not used in stainless steel production and, therefore, cannot be applied to stainless steelmaking.

Principle

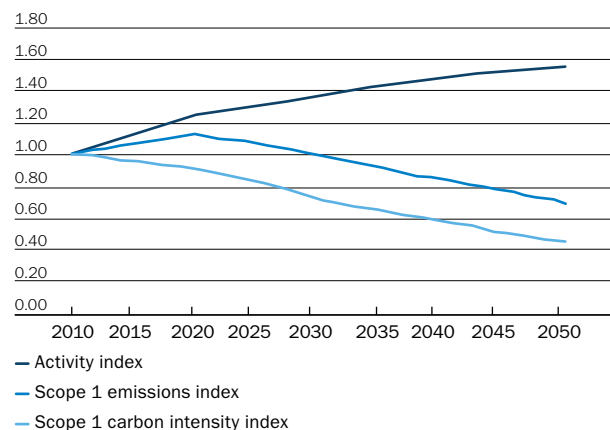
Each company in a homogeneous industry sector will converge with the sectoral intensity in 2050. SDA sets homogeneous sectors physical activity indicators. The activity indicator for the iron and steel sector and also for Outokumpu is crude steel production in tonnes. Outokumpu's forecast of direct and indirect emission intensity will end up better than the convergence criteria of steel sector.

Outokumpu's reduction in 2016

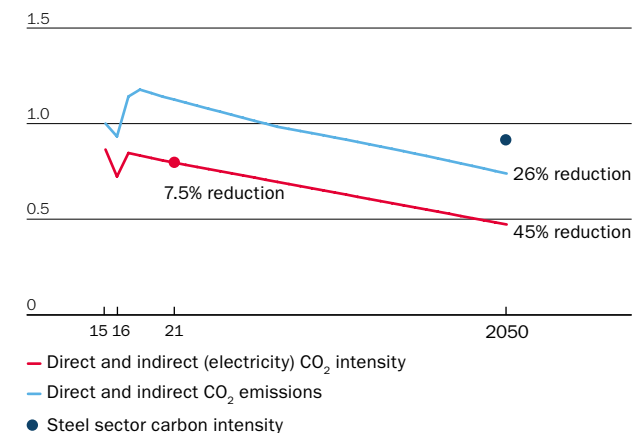
The direct and indirect CO₂ intensity could be reduced by some 16% to 0.72 tonnes CO₂ per tonne steel which corresponds to 398,000 tonnes of CO₂ savings. This high reduction is driven by the improvement of energy efficiency (see p. 13 in the Sustainability review), and by the over-proportional reduction of some 15% of emission factor for electricity in Outokumpu's electricity mix in 2016. As the capacity use was very high in 2016, and it was the first year of picking the fruits of restructuring, this result is expected to be exceptional.

All climate change data is available on our [reporting tool](#)

SDA



Science Based Target



Environmental KPIs

Outokumpu has set challenging goals and environmental key performance indicators for 2020.

Check all figures in the [sustainability reporting tool](#) ↗

Recycled content in steel

Target 2016:

88%

Result 2016:

87.1%

Outokumpu aims to raise the recycled content in stainless steel to 90% by 2020. This year the recycled content was kept on the same high level as in 2015. The 2016 target could not be reached as the decision on material input has to be in balance with economic decisions and therefore depends on the raw material market.

Decrease of Outokumpu's stainless steel direct CO₂ profile

Target 2016:

12.7%

Result 2016:

13.3%

The yearly target is embedded in the long-term carbon profile target: In 2010 Outokumpu committed to reduce the Group's specific carbon emissions in stainless steel production by 20% by 2020. This target will be replaced by science based target on direct and indirect CO₂ intensity from 2017 onward.

No significant environmental incident

Target 2016:

Zero

Result 2016:

Zero

Outokumpu has had no significant environmental incident for many years. Certified environment management systems that are implemented in all operation sites help to reduce all kinds of environmental risk.

Improved energy efficiency

Target 2016:

9.4%

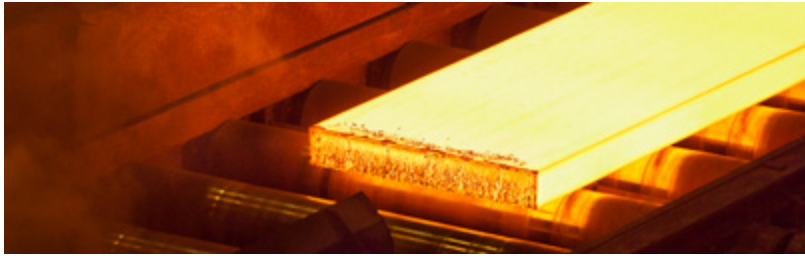
(cumulative increase)

Result 2016:

12.7%

Outokumpu aims to improve the energy efficiency of all operations by 1% yearly until 2020 compared to the baseline of 2007–2009 which adds up to a reduction of 13% in 2020. The achieved reduction corresponds to an energy saving of 4.7 million GJ. A good utilization of capacity after implementation of the investments during the restructuring process led to this positive performance.

Examples of projects



Improvement of energy use in hot rolling, Tornio

Specific energy consumption of primary energy and electricity has decreased by more than 8% at the hot rolling mill in Tornio compared to the previous year. This counts for a comparable energy savings of 35,800 MWh in 2016. This improvement was driven by a better use of production capacity, oxygen enrichment in furnaces and an increased use of Tornio Works' own CO gas, which replaced propane use. Oxygen is produced as a by-product of onsite argon manufacturing plant from air fractionation which is needed in the melt shop. CO gas is a by-product in ferrochrome production, which is further used as fuel in the processes after treatment. A more active control of CO gas delivery and furnaces support energy efficiency improvements.



Improvement of energy use in melt shop, Calvert

The specific energy consumption of the melt shop in Calvert could be improved by 13% in 2016 compared to 2015. Comparable energy savings are calculated to be over 81,000 MWh in 2016. As the use of production capacity could be significantly increased, less natural gas for heating the production facilities was needed. But main savings were achieved in electricity use for melting. This could be reached by matching the needed power to the kind of steel in the melt, and by training all employees about the new way of operation.



Improvement of neutralization wastewater treatment plant, Sheffield

The Sheffield long products rolling mill ASR instigated a program with the aim of reducing the total chromium content in the acid neutralization wastewater plant discharge. This program used daily management and monitoring techniques to measure and correct the dosing in the neutralization process. As a result of this, ASR has reduced the annual total chromium discharge by 91% in 2016 compared to last year. This is a remarkable achievement that has not only had a positive environmental benefit, but has also totally eliminated ferrous iron contamination of the Descale 1 final rinse tank. The result of which is a direct improvement of the surface quality on the finished product.

Goals for 2017

Goal 1:

No significant environmental incident

Goal 2:

Increase recycled content to 88.5%

Goal 3:

Increase long-term energy efficiency by further 1% resulting in 10.3% energy efficiency improvement compared to baseline 2007–2009

Goal 4:

Decrease CO₂ intensity of direct and indirect emissions by 1.5% to 0.845 tonnes CO₂ per ton steel compared to 2015

Scope of the report

Outokumpu has published its sustainability report as part of the Annual Report 2016 and information is also made available at www.outokumpu.com. Outokumpu's reporting follows the Global Reporting Initiative G4 Guidelines in accordance with the Core option. The materiality assessment from 2015 was the basis for the decision on material issues and relevant indicators. The [full GRI index](#) is available at Outokumpu's website. Outokumpu reports on the material developments and changes in 2016 as part of the Annual Report, and additional information is published on its [website](#). The Sustainability and Annual Reports for 2015 were published on March 7, 2016.

This independent practitioner's assurance report on the limited assurance conclusion on the Sustainability Reporting is available on [p. 28](#) in the Sustainability review. The Financial statements 2016 have been audited.

Measurement/ Estimation methods

Economic responsibility

Most figures relating to economic responsibility presented in this report are based on 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 government include income taxes. Deferred taxes are excluded from 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, that is Avesta, Calvert, Sheffield and Tornio.

Environmental responsibility

Outokumpu's climate change target of specific carbon emissions in stainless steel production will be replaced by the science based target on CO₂ intensity of direct and indirect emissions. This report includes both targets. The ambitious 7.5% reduction target by 2021 in CO₂ intensity is comparable to a 25% reduction of the climate change target on the company's carbon profile for steel.

Social responsibility

Health and safety figures

Health and safety figures reflect the scope of Outokumpu's operations as they were in 2016.

Safety indicators (accidents and preventive safety actions) are expressed per million hours worked (frequency). Safety indicators include Outokumpu employee, a person employed by a third party (contractor) or a 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 the next scheduled working day or shift. 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) didn't cause the individual to be absent, but has resulted 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.
- First aid treated incident (FTI), where the injury is very minor and is treated by a person himself/herself or by colleague trained to administer first aid.
- Total recordable incident (TRI) includes fatalities, LTIs, RWIs and MTIs, but FTIs are excluded.

Proactive safety actions

Near-miss incidents and hazards refer to events that could have led to an accident, but where no injury occurred. Preventive actions have been taken after the report. Safety behavior observations (SBOs) are safety-based discussions between an auditor and the person being audited. Other preventive safety action includes proactive measures that are not part of previously mentioned categories.

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. (Since 2013: employee figures = FTE)

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 = $\text{New Hires} / \text{total number of permanent employees by year-end}$

Average turnover rate = $(\text{Turnover} + \text{New Hires}) / (\text{total number of permanent employees by year-end} * 2)$

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.

All personnel figures of 2013 include Outokumpu personnel in the continuing operations and do not therefore include divested sites/assets, such as Terni and other remedy assets, or VDM – except for the personnel by countries of 2013, which is counted including discontinued operations. All figures from 2013 and 2014 include former Outokumpu and Innox employees, unless otherwise stated.

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 2016 presented in Outokumpu's Annual Report for the reporting period from January 1, 2016 to December 31, 2016 (hereafter Sustainability Information).

Global Reporting Initiative's Sustainability Reporting Guidelines G4 was used as the assurance criteria (hereafter GRI G4)

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 G4.

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:

Interviews with Outokumpu Senior Management;

An assessment of conformity with the reporting principles of GRI G4 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.

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 G4 in all material respects.

Helsinki, 20 February 2017

KPMG Oy Ab

Virpi Halonen
Authorised Public Accountant, KHT

Nathalie Clément
Senior Manager, Advisory

Working towards a world that lasts forever.

Outokumpu is a global leader in stainless steel. We create advanced materials that are efficient, long lasting and recyclable – thus building a world that lasts forever.

Stainless steel, invented a century ago, is an ideal material to create lasting solutions in demanding applications from cutlery to bridges, energy and medical equipment: it is 100% recyclable, corrosion-resistant, maintenance-free, durable and hygienic.

Outokumpu employs some 10,000 professionals in more than 30 countries, with headquarters in Helsinki, Finland and shares listed in Nasdaq Helsinki.

outokumpu

working towards a world that lasts forever



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