



# GASUM CORPORATE RESPONSIBILITY

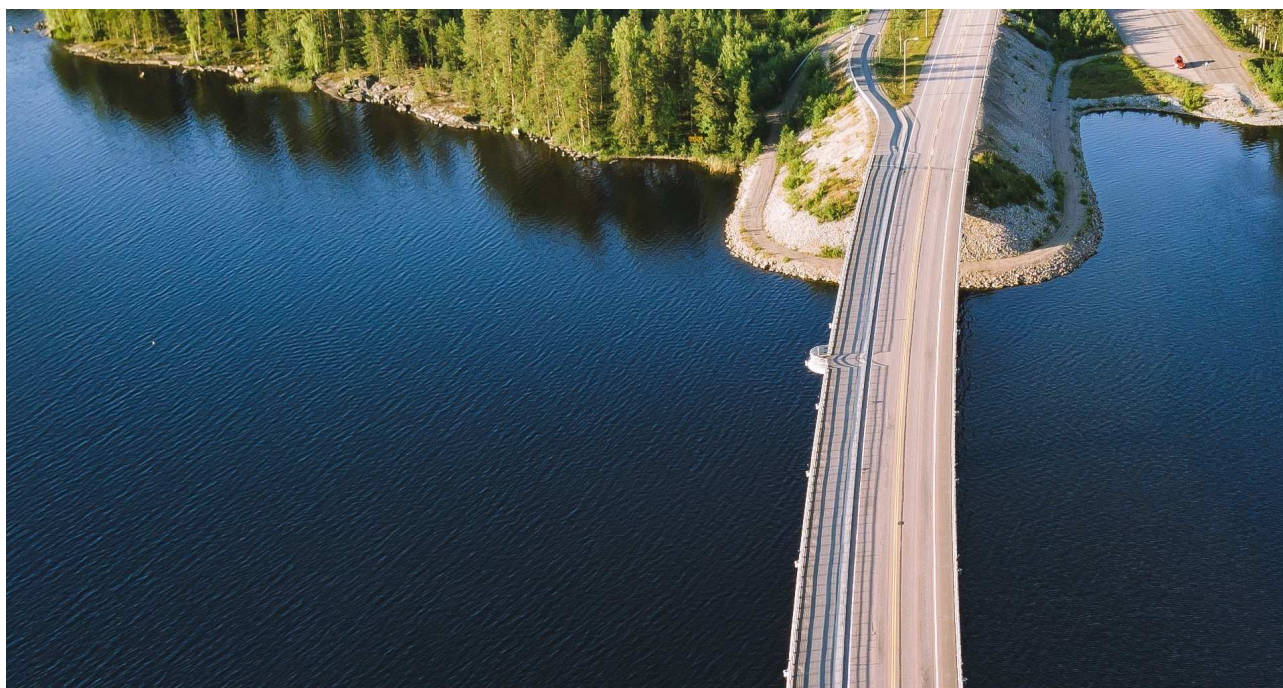
2018

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## 1 REPORTING YEAR 2018



# Annual Reporting for 2018

**Gasum's annual reporting documents for 2018 comprise the Financial Review, Governance and Remuneration and the Corporate Responsibility Report.**

The reports are available at [www.gasum.com](http://www.gasum.com) - [Key figures](#). The Corporate Responsibility Report is available online in English.

The Corporate Responsibility Report has been prepared in accordance with the Core option of the Global Reporting Initiative (GRI) Standards. The European Union Directive on non-financial reporting as well as the Finnish Government resolution concerning state ownership policy and tax reporting guidelines have also been taken into account in report development. The report covers Gasum's social, environmental and economical responsibility performance.

At Gasum, corporate responsibility is derived from the strategy. The Nordic energy company Gasum seeks to promote sustainable development through the expansion of the gas market through its operations.

In accordance with Gasum's value proposition "*Purposefully and responsibly moving towards new opportunities*", responsibility is a key value advanced through the Corporate Responsibility Program. The program summarizes the material themes relating to corporate responsibility and sets objectives for Gasum's responsibility work. The material themes are significant in terms of impacts or for the various stakeholders. Gasum monitors progress made in corporate responsibility and reports on key outcomes annually in the Corporate Responsibility Report.

Gasum uses the Verso PRO digital solution for corporate responsibility reporting.

## 1.1 Gasum in brief (102-1)



## The energy company Gasum in brief

**Gasum is the number one Nordic expert in the gas sector and in the energy market in the Nordics. Together with our partners, we promote development towards a carbon-neutral future on land and at sea.**

Our aim is clean mobility of people and goods on land and at sea. We offer for both industrial clients and combined heat and power (CHP) producers clean and cost-effective energy and raw materials in Finland, Sweden and Norway. We import natural gas to Finland.

We are the biggest distributor of liquefied natural gas (LNG) in the Nordic countries. We deliver LNG from our production plant in Norway and from sourcing partners in Europe. We strengthen the position and infrastructure of LNG and supply LNG for maritime transport, industry and heavy-duty road transport.

We promote the circular economy and are a significant supplier of renewable biogas and recycled nutrients in the Nordic countries. We supply sustainable biogas to our customers in transport, industry and energy production.

We increase the availability of cleaner energy to all transport segments by developing the filling station network and distribute low-carbon fuels for road transport.

With our energy market services, we help our customers to master the energy market throughout the chain by providing comprehensive expertise and consultancy.

## Four business units

The **Natural Gas and LNG business unit** sells natural gas and liquefied natural gas (LNG) and produces LNG for industry, energy production and transport on land and at sea.

The **Portfolio Management and Trading business unit** is responsible for the company's natural gas, LNG, biogas, electricity and other commodity sourcing and for price and volume risk management relating to supply and sales agreements. The business unit also provides portfolio management and expert services.

The **Biogas business unit** is responsible for promoting the circular economy, increasing biogas production capacity and selling recycled nutrients and biogas.

The **Traffic business unit** develops the filling station network and sells compressed and liquefied natural gas and biogas for road transport. Read more about the [Gasum Management Team](#).

## Community of dedicated people

Our work would not be possible without our dedicated and hard-working [employees](#). In 2018, the Gasum Group had around 450 employees in Finland, Norway and Sweden. Gasum is fully owned by the State of Finland. Our shares are held at 73.5% by the state-owned Gasonia Oy and 26.5% directly by the State of Finland. Read more [about our Company](#).

## 1.2 Highlights 2018

# Key responsibility highlights in 2018

**Responsibility plays an important role in our strategy and is part of our everyday work.**

Here are some of our highlights from 2018. Read more about our performance in [social](#), [environmental](#) and [economic](#) responsibility on the relevant pages of this report.



**Workplace community survey:** Positive trend in employee satisfaction.



**Updated Leadership Principles:** Strong platform for the Nordic company culture.



**Pro-active safety culture:** 400% increase in number of safety observations, risk assessments and safety walks.



**Commitment to construct** around 50 gas filling stations for heavy-duty vehicles in the Nordics and increase CNG/CBG availability in Finland.



**A full switch to renewable electricity in all operations:** Nordic hydropower utilised 100%.



**Circular economy promoted:** 12 biogas plants in Finland and Sweden processed nearly 750,000 tonnes of biomass.

## 2 GOVERNANCE



## Sustainability has a key role in Gasum's strategy

**At Gasum, our mission is cleaner energy. We are in a key position to drive the building of a carbon-neutral society on land and at sea.**

The cornerstones of our sustainability are set in our Corporate Responsibility Program. Safety, the circular economy, climate change mitigation, improving access to gas and our own people are key themes for us. We value good governance, ethicality and equal opportunities as well as responsible partners.



## 2.1 Strategy



# Step-by-step towards a cleaner tomorrow

**Our strategy provides the guidelines for our journey towards new business opportunities and a low-carbon future. We believe that the expansion of the gas market and new innovations are prerequisites for a cleaner tomorrow.**

Renewal is a key element of Gasum's strategy and we are purposefully and responsibly moving towards new opportunities.

The company strategy is to expand the gas market and build a bridge towards a carbon-neutral society on land and at sea in the changing operating environment together with our partners.

Our mission is 'Cleaner energy' and our vision is '*Leading the Nordic gas ecosystem*'. The company's values have been summed up in a single proposition 'Purposefully and responsibly moving towards new opportunities'.

The four components of our strategy form the foundation for our operations and affect everything we do from customer work and investments to advocacy and responsibility development.

- **We promote sustainability.**
- **We add value to our customers.**
- **We build a smart gas system.**
- **We develop Gasum together.**

## 2.2 Sustainability

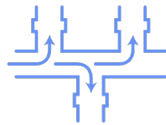
# Sustainability is a comprehensive approach

**We regard sustainability as a comprehensive approach that is closely connected to our strategy and take our social, environmental and economic responsibilities into account in our daily operations and decision-making.**

Gasum has established its Corporate Responsibility Program to promote sustainability and steer the responsibility work in all operating countries. Progress made in the work is regularly monitored at Group level and business unit level. Performance is reported on in the annual Corporate Responsibility Report, and quarterly reporting is done to the owners.

## Renewed Corporate Responsibility Program

A revision assessment of Gasum's Corporate Responsibility Program was conducted in 2018 based on a materiality analysis, and a new program was adopted by the Gasum Management Team at the beginning of 2019. The updated Corporate Responsibility Program addresses six themes identified as material to Gasum and to our stakeholders: Safety and security, Climate change, Circular economy, Access to gas, People, and Responsible business.



### Safety and security

Our target is zero injuries, environmental breaches and harm to assets, and zero unplanned disruptions in gas supply.



### Access to gas

We develop a smart, efficient and sustainable gas ecosystem and fulfill customer needs on land and at sea.



### Climate change

We enable climate change mitigation through renewable energy, low-carbon products and energy efficiency.



### Circular economy

We utilize wide feedstock base in renewable fuel production and develop market for recycled nutrient products.



### Responsible business

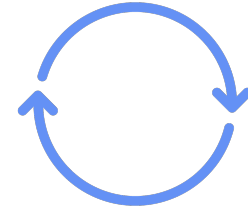
We maintain good business ethics and profitability, and ensure responsible business partnerships.



### People

We develop employee wellbeing, competence and leadership.

In our objectives, we are committed to zero injuries, zero environmental breaches, zero harm to assets and zero unplanned disruptions in gas supply. We also carry our responsibility in enabling greenhouse gas emission reductions by offering low-carbon products and increasing energy efficiency in our operations. To support the circular economy, we utilize a wide feedstock base in renewable fuel production, and develop market for recycled nutrient products. We continue to improve access to gas by building new filling stations and expanding opportunities in the marine sector. Our aim is to ensure responsible business partnerships and maintain compliance and accountability. To support the well-being and competence of our people, we are developing Gasum together. These themes and related objectives will guide our sustainability work from the beginning of 2019.



This report is structured according to the updated material themes. However, sustainability performance in 2018 is reviewed against the objectives set in the previous Corporate Responsibility Program valid in 2018.

## Corporate Responsibility Program valid during the reporting period

In 2018, our Corporate Responsibility Program was summarized in four themes and underlying aspects. Progress made in objectives is indicated by +, ++ or +++. The development steps are described in further detail in this report.

THEMES 2018	OBJECTIVES	PROGRESS
<b>Enabling low-carbon future and circular economy</b>	<ul style="list-style-type: none"> <li>• Creating new business partnerships.</li> <li>• Helping customers to find new emission-reducing solutions and production technologies.</li> <li>• Adopting low-carbon solutions in Gasum's own usage.</li> </ul>	+++
<b>Promoting responsibility together with stakeholders</b>	<ul style="list-style-type: none"> <li>• Supporting customers in making sustainable choices.</li> <li>• Developing Gasum competences in implementing our strategy.</li> </ul>	+++
<b>Ensuring safety and supply security</b>	<ul style="list-style-type: none"> <li>• Achieving zero injuries and accidents at work.</li> <li>• Achieving zero unforeseen delivery disruptions in gas supply.</li> </ul>	++
<b>Turning impact assessment into a customer value</b>	<ul style="list-style-type: none"> <li>• Reducing the GHG emissions of Gasum's own and customer operations and promoting recycling of nutrients.</li> <li>• Ensuring the realization of responsibility in the supply chain together with our suppliers.</li> </ul>	+++

## Comprehensive management of corporate responsibility

Sustainability work at Gasum is guided by our strategy and the Corporate Responsibility Program and related objectives. Sustainability is implemented through everyday operations and leadership in Gasum's business units. We report on our progress on an annual basis in this report and address the material issues and views of our stakeholders.

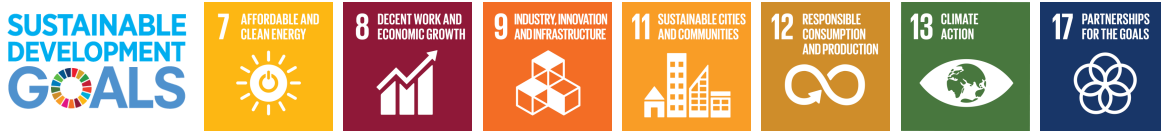
Gasum promotes sustainable development and supports the UN Sustainable Development Goals (SDGs). We have defined those goals towards which we contribute the most in our operations. A linkage between the SDGs and Gasum's sustainability themes can be seen in this report in the sections describing our social, environmental and economic responsibility themes. A key tool for Gasum in the implementation of the UN Agenda 2030 for Sustainable Development is being part of the Society's Commitment to Sustainable Development.

In day-to-day operations, we are all responsible for managing the efforts to advance Gasum's responsibility. Gasum's Health, Safety, Environment and Quality (HSEQ) unit and Human Resources (HR), Communications, IT, Finance and Legal organizations support the business units in their sustainability work.

Corporate responsibility issues are considered by the Gasum Board of Directors as well as the Gasum Management Team (GMT) and the Management Groups of the business units. The Gasum Management Team provides the strategic policies for

corporate responsibility, adopts the Corporate Responsibility Program and targets, and monitors their implementation.

The HSEQ unit is responsible for safety and security, supply security and environmental indicator monitoring and the compilation of the Corporate Responsibility Report. The financial indicators for the report are produced by the Finance organization. The HR organization is responsible for the monitoring and compilation of indicators relating to social responsibility.



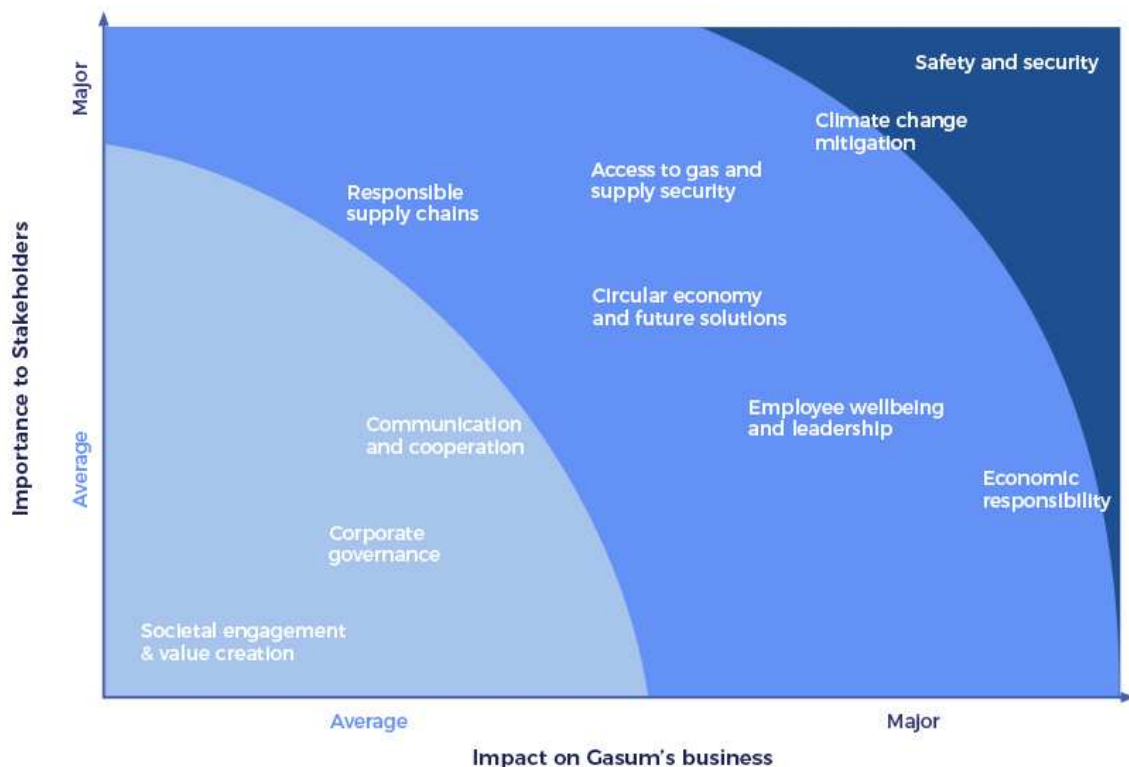
Gasum is committed to working towards the [United Nations Global Goals for Sustainable Development](#).

## Materiality and stakeholder dialogue

Themes important to our stakeholders are taken into account in our responsibility work. To support the responsibility work and in response to changes in our operating environment, we executed a stakeholder dialogue in 2018. Stakeholder views of responsibility were surveyed by conducting an extensive responsibility reflection where customers, partners and personnel were included in a dialogue.

More than 1,000 representatives of various stakeholder groups took part in the online dialogue which generated more than a thousand ideas for responsibility development. In the survey, stakeholders ranked aspects related to Gasum's corporate responsibility based on their importance, reviewed Gasum's success in taking action in the most important themes, and indicated where the company could improve. The most material issues were internally connected to business objectives and impacts.

The results of the stakeholder dialogue were utilized in the identification of material responsibility themes and the development of corporate responsibility reporting and communications. The most important themes for the stakeholders were incorporated into our new Corporate Responsibility Program. The survey provided valuable input into reviewing and focusing Gasum's sustainability work and helped to ensure that the stakeholder expectations and important topics are addressed in our Corporate Responsibility Program.



## 2.3 Governance, guiding principles and operating methods



## Guiding policies, principles and operating methods

**To fulfil the strategic goals and to safeguard the sustained generation of value at Gasum over the long term, our operations must be ethically responsible and in compliance with the requirements of good governance and adopted operating principles.**

Everyone at Gasum makes decisions relating to their work every day. Depending on their role, these decisions range from technicians following the safety checklist before starting a task to strategic policies being formulated by the Board of Directors. The need to maximize positive and minimize negative impacts is the common feature in all these situations. To achieve this, at Gasum we are continuously developing our operating methods and culture in accordance with best practices.

## Code of Conduct and Corporate Governance

As part of Gasum's corporate responsibility and strategy implementation, the company has launched an organization-wide [Code of Conduct](#) aiming to ensure the realization of Gasum's values from the economic, social and environmental perspectives. Gasum respects human rights and cooperates with suppliers whose business is in line with Gasum's ethical code. The Code of Conduct applies to all Gasum Group employees and it is included in the personnel induction program.

To support good governance, the Gasum Board of Directors had adopted the Gasum Corporate Governance Rules, the principles laid out in which the company complies with in its governance and day-to-day operations. The Group's Corporate Governance document sets forth the legal framework and decision-making powers as regards matters within the Group as well as commitments relating to external stakeholders. Accountability in decision-making has been taken close to business, and good governance is ensured by shared principles for leadership processes.

Gasum Ltd's corporate governance is based on the Articles of Association, the Limited Liability Companies Act, the rules issued by the Ownership Steering Department of the Prime Minister's Office and other legislation and regulations on the governance of limited liability companies. There were no changes in shareholding during the period under review. The State of Finland is the only shareholder of Gasum at December 31, 2018, and the shares are held at 73.5% by the state-owned Gasonia Oy and 26.5% directly by the State of Finland.

The Group's Corporate Governance system is based on the general meeting of shareholders, the Board of Directors and its two committees (the Audit Committee and the HR Committee) as well as the CEO and the [Gasum Management Team](#). The Gasum Management Team is responsible for Gasum's operational management under the leadership of the CEO. In addition to the CEO, the Gasum Management Team has seven members, with the members confirmed by the Board of Directors on the CEO's proposal. Employee-related matters are presented to the Gasum Management Team by the Vice President for HR. Read more about [Governance and Remuneration 2018](#).

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## Ethicality and equal opportunities

The Gasum Group operates in accordance with the principles of openness, transparency and equality and in full compliance with the legislative and regulatory provisions of the operating countries as well as the commitments both within Gasum and in relation to customers, public authorities and other stakeholders. Gasum's intent is to be an exemplary player from the economic, social, safety, security and environmental perspectives. The Group expects its suppliers to comply with the same principles and rules that the Group follows in its operations. Read more about our [sourcing principles](#).

Equality, fairness and non-discrimination are important principles for Gasum. We promote equal treatment and opportunities in the recruiting, remuneration, development and career advancement of employees, regardless of the employee's race, religion, political views, gender, age, nationality, language, sexual orientation, marital status or disabilities. Gasum commits to a vibrant, well-functioning working community. Any form of harassment is forbidden and addressed immediately.

## Collaborative and personnel models

Gasum's operations are developed in good collaboration with employees. Successful management of business is built on trust between management and employees. Open dialogue and free flow of information are important at Gasum. Our collaborative Development Group including HR and employee representatives is working on monthly basis.

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## Integrated management system

The Gasum Group aims to continuously improve the quality of its activities and adheres to a single integrated management system (IMS) that covers its certified quality (ISO 9001:2015), environmental (ISO 14001:2015), energy (ISO 50001:2011), and safety (OHSAS 18001:2007) management systems as well as the sustainability scheme for the transport use of biofuels.

The integrated management system consists of systematic approaches that translate decisions made by the senior management into practical operations. The system is applied to the Gasum Group companies and operations as well as products and services sold by the Group. Integrated management system will be updated due to the increase of Gasum's shareholding in former Skangas to 100%.

The key content and objective of the Gasum Group's IMS is the continuous improvement of operations. The Group's operating environment has undergone many internal as well as external changes in the past few years. The IMS is also updated and developed in response to the changing circumstances and the Group's reformed management model. Based on the Gasum strategy, this development work takes place specifically for each business, with the requirements set by the integrated management system.

System conformity is evaluated annually through internal audits as well as audits conducted by an external organization. A comprehensive internal audit program was conducted in 2018. A total of 14 internal audits were conducted on 12 different sites. The status of the integrated management system and related performance indicators as well as progress of development actions are presented in management reviews.

The integration work of the biogas plant operations in Sweden into the integrated management system is currently underway. For the time being, the former Skangas operations have their separate certified quality and environmental management systems. The energy management system was established covering 7 sites and certified together with the Gasum energy management system according to ISO 50001 in 2018.

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## Risk management

Gasum's business operations are exposed to strategic, political, operational and market and financial risks. Our risk management principles and objectives are determined in the Gasum risk management policy.

The most important of these objectives is to safeguard value creation in Gasum over the long term. The practical implementation of the objectives is determined by our Enterprise Risk Management policy, which is complemented by other risk policies, such as the Treasury Policy, Credit Risk Policy and Risk Policy for Commodities as well as more detailed instructions on risk management and risk assessment. Read more about the [risk management](#) in the Economic responsibility section.

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## Stakeholder engagement

All our stakeholders have an important role in the development of our operations. Our most important stakeholders include personnel, customers, shareholders, suppliers, partners, public authorities and policymakers, and the media.

orities and policymakers, and the media.

An open dialogue is important to successfully identify stakeholder concerns and market expectations. In addition to cooperation and interaction in the context of events and meetings, Gasum surveys topics such as customer satisfaction or [employee satisfaction](#) to find ways to obtain information and improve.

Gasum is active in various social media channels through which it interacts with its stakeholders. Social media is an important channel for collecting feedback and identifying customer expectations but it also enables Gasum to interact with its stakeholders in real time.

Gasum communicates about its operations, goals, strategies and financial position. We seek to increase the attractiveness of and awareness about the gas sector and the energy company Gasum as a reliable and modern employer.

The key principles of our communications are reliability, openness, consistency and fairness. Gasum communicates both positive and negative information consistently, clearly and comprehensively, taking all identified stakeholders into consideration.

The use of diverse communication channels ensures access by all of Gasum's stakeholders, customers and personnel to enough information about issues that are current and interesting to them.

### OUR MOST IMPORTANT STAKEHOLDER GROUPS



## Cooperation and partnerships

Gasum participates in the activities of various international organizations and industry associations. Through this cooperation, we company are involved in developing the energy and gas sector industry practices as well as influencing development in fields including marine fuels, bioenergy, climate change mitigation, circular economy, waste management and energy research.

Gasum has made commitments to a variety of programs and projects promoting sustainability. Examples of these include the Zero Accident Forum, where Gasum as a member has made a commitment to the development of health and safety at work, and the Responsible Care program of the Chemical Industry Federation of Finland. Gasum has participated in the activities of the Climate Leadership Coalition (CLC), sharing a will to promote the transition to a carbon-neutral society and the sustainable use of natural resources.

As a member of the Climate Partners network of the City of Helsinki and local businesses, Gasum promotes opportunities to utilize renewable biogas in public transport and energy production in the Helsinki Metropolitan Area and provide sustainable marine fuel solutions. In addition, Gasum has made a commitment to the Baltic Sea Action Group (BSAG), which works to restore the good ecological balance of the Baltic Sea.

An essential element of Gasum's R&D work is partnerships with research institutions and enterprises. Gasum is a member of Linköping University's Biogas Research Centre and a shareholder of CLIC Innovation Ltd. Gasum is actively involved in the development of joint research projects with other enterprises and research institutions in areas such as [biogas production](#) and [recycled nutrients](#).

Read more about our commitments to [Energy Efficiency Agreement for Industries](#) and [Nordic Ecolabel](#).

## Donations and funding

The aim of Gasum's sponsorships and support activities is to support our strategic objectives, responsible business, corporate image management and marketing.

Gasum provides grants to researchers every year through the Gas Fund, one of the special funds run and administered by the

Finnish Foundation for Technology Promotion (TES). The fund aims to respond to society's transformational challenges by developing energy solutions based on gas and producing information supporting the development of the gas sector.

In 2018, the Gasum Gas Fund gave out seven grants totalling €40,800. Grants are given to doctoral students who are pursuing their studies in the following thematic areas: gas-related circular economy and bioeconomy, gas transport and logistics, distributed energy solutions promoting gas use, and gas-based energy storage technologies (such as power-to-gas). Read more about the [Gas Fund and research funded](#).

Gasum supports programs of the Finnish Olympic Committee promoting physical activity among children and young people nationally via the Star Club activities, the joint operating model of the Olympic Committee and sport-specific associations. Cooperation between Gasum and the Finnish Olympic Committee aims to promote the wellbeing of children and young people by enabling them to take part in physical activity. In 2018, Gasum and the Olympic Committee granted 14 regional Star Club incentive awards amounting to €1,000 and one Star Club of the Year award amounting to €5,000. In addition, Gasum supported junior sports by granting awards for local sports clubs in Norway.

In 2018, Gasum's Christmas gift funds were donated to UNICEF and its work in Yemen.

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## Political contribution

To promote the use of versatile and low-emission gas, Gasum engages in an active dialogue with national policymakers and stakeholders in Finland, Sweden and Norway. Moreover, active cooperation with relevant EU bodies is needed as decision-making at the EU level is affecting Gasum's operating environment significantly.

Gasum does not provide support to political parties or contribute to election campaigns of individual candidates. In 2018, Gasum carried out advocacy work in Finland, Sweden and Brussels, Belgium, with the communications company Milton. The total value of this advocacy cooperation in Brussels was around €70,000. The amount is based on figures reported to the EU Transparency Register.



### 3 SOCIAL RESPONSIBILITY



## Safety and our people matter

**Safety first. This section outlines how we develop our pro-active safety culture. Our aims are high: zero injuries, zero environmental breaches, zero harm to assets and zero unplanned disruptions in gas supply.**

We develop Gasum together. The people section explains what we do to invest in the well-being, competence and leadership of our personnel.



Gasum is committed to working towards the [United Nations Global Goals for Sustainable Development](#).

### 3.1 People



*We develop employee wellbeing, competence and leadership.*

#### **What we achieved in 2018**

- We conducted a workplace community survey, which indicated a positive trend in employee satisfaction.
- We updated our leadership principles, which forms a strong platform for the Nordic company culture.
- We launched a new learning method, e-learning. It brings flexibility and easy access to training for all.

**Our renewed Corporate Responsibility Program includes the following objectives that will guide our work from the beginning of 2019:**

- Promoting a healthy working environment. We aim at an absence rate of <2%.
- Developing leadership and competence. We aim at a continuous positive trend in employee satisfaction.

### 3.1.1 Wellbeing



## Wellbeing at work is the key to success

**In the Gasum Group, occupational safety is an integral part of day-to-day management and preventive action plays a key role in the development of wellbeing and safety at work.**

Important focus areas in wellbeing include increasing the smoothness of work, maintaining work ability and reducing disability pensions. In addition to the internal collaboration between Gasum's management, human resources and supervisors, we have developed a cooperation model with external partners - occupational health care and insurance companies - to anticipate and respond to potential work-related problems together.

An important part of wellbeing is how people experience working at Gasum. Wellbeing entails a personal experience of feeling positive about and looking forward to coming to work, having a meaningful job with a high level of motivation, and a well-functioning organization. Our wellbeing goal is that all Gasum Group employees are able to do their work well and be productive in a good place to work. Everyone is also responsible for looking after their personal wellbeing.

Gasum conducted workplace community surveys at the beginning of 2018 and again at the end of the year. About 75% of the personnel in Finland, Sweden and Norway participated. Overall, within the year, the Group's wellbeing at work index went up from 4.4 to 4.7 on a scale of 1 to 6. The Gasum strategy and the objectives of the respondents' own work were regarded as clear.

Significant improvement was recorded in the scores given for leadership in Gasum.

### 3.1.2 Leadership



## Leadership Principles defined

**Gasum defined its Leadership Principles in 2018. The principles form a strong platform for the company culture.**

The Leadership Principles were founded on the core development areas that were defined in the workplace community survey conducted at the beginning of the year. In addition, feedback was gathered at various events and leadership training sessions. During the process, good leadership and its meaning in the Gasum Group were defined, taking into account our existing vision, values and strategy.

The Leadership Principles are tools for every Gasum employee, and they have also a crucial role in the HR processes. Each individual living by these principles daily makes good leadership a reality. Leadership matters – be it in collaboration, learning, successful performance, wellbeing at work or meaningfulness at work.

## Gasum Group Leadership Principles

- I set clear and ambitious targets, follow up and deliver results.
- I encourage people to find solutions.
- I give and take feedback constructively.
- I build trust.
- I energize and involve people.
- Together we celebrate our success.



### 3.1.3 Competence



## Managing employee competence

**Gasum focuses on personnel competence development in a target-oriented manner.**

The aim is to ensure that everyone's efforts are directed towards achieving our strategic targets and that every employee has a clear sense of purpose and understanding of what is expected of them. Gasum offers challenging tasks and opportunities to grow, and employees are encouraged to take ownership of their jobs and personal development.

Development discussions are carried out between managers and employees once or twice a year. The discussions give an opportunity to create a shared view of key issues and focus areas for the future, as well as setting targets and following up on personal development.

In 2018, the focus areas in trainings were leadership and safety. Leadership trainings concentrated on the Gasum Group Leadership Principles and on taking responsibility. The safety trainings aimed at increasing awareness, trust and engagement in improving Gasum's safety culture. The number of training days in 2018 totaled 2.4 per person.

In 2018, Gasum employed more than 30 young talents in a range of summer job duties.

## Gasum Academy

Gasum supports employees' competency development with the Gasum Academy. This is the framework and process by which all Gasum Group employees learn and develop to acquire competencies to reach the Gasum vision and strategic targets. The Academy contributes towards the foundation of our renewing working and management culture. The Gasum Academy's target is to develop capabilities in problem solving and finding solutions. It offers a platform for sharing experiences, best practices and success stories within Gasum.

During 2018, a new learning method, e-learning, was launched under the Gasum Academy. Online e-learning brings flexibility and standardizes training by providing the same level of training to everyone. E-learning is a useful way of delivering courses and helps the business units and support functions in spreading information widely and efficiently.

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## Remuneration

The remuneration of personnel within the Gasum Group is based on the Group's remuneration principles and the remuneration principles laid out by the Ownership Steering Department of the Prime Minister's Office of Finland. The company aims for a target-oriented company culture where the entire personnel understand the company's strategy and objectives, the ways in which individuals can affect results, and the connection between business performance and remuneration.

At Gasum, remuneration is based on total remuneration which may, in addition to the base salary, include short and long-term incentive programs linked to company-wide and personal targets. In addition, we operate a performance-based profit bonus scheme. The remuneration system also includes other benefits and intangible incentive methods.

The HR Committee is a committee assisting [the Board of Directors](#) with its tasks including preparing matters pertaining to personnel and remuneration for the Board of Directors and approval of any members of the boards of directors of subsidiaries.

The Committee's responsibilities include the assessment of the human resources strategy and remuneration system and of the performance of Gasum's management. The HR Committee had six meetings in 2018. Read more about [Governance and Remuneration in 2018](#).



### 3.1.4 People performance in figures 2018

## Development in number of employees

**The Gasum Group acquired the energy market services business of the energy industry expert company Enegia at the end of August 2018.**

In this acquisition, 35 new employees joined Gasum. At December 31, 2018 the Gasum Group had a total of 434 employees. At the beginning of 2019, the Gasum subsidiary Gasum Technical Services was divested, which decreased the number of Gasum employees by 100, which is not shown in the 2018 performance figures.

### Employee turnover

Gasum's exit rate of employee turnover in 2018 was 12.7% (2017: 9.9%) and the entry rate 15.8% (2017: 20.1). The entry rate excluding the business acquisitions in 2018 was 9.3% (2017: 12%). The turnover figures reflect Gasum's business acquisitions, development of operations and approaches as well as competence development through several recruitments.

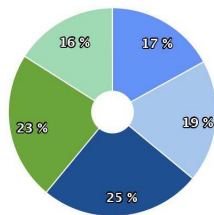
The exit rate is calculated by taking the number of permanent employees leaving the organization during the year (53) and comparing it with the number of permanent employees at year-end (417). The entry rate is calculated by taking the number of permanent employees joining the organization during the year (66) and comparing it with the number of permanent employees at year-end (417).

## Key personnel data 2018

The following key figures related to type of employment (contract type and working hours), diversity of employees (age and gender) and personnel breakdown by personnel groups, business functions and countries are presented below.

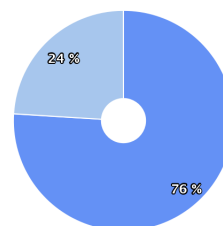
In 2018 Gasum had three business units - Natural Gas, Biogas, LNG - and the internal service unit Technical Services. The support functions comprised Strategy, Finance, Communications and HR. A total of 365 employees worked in the business units and 69 in support functions.

Employees by business function Dec 31, 2018, %



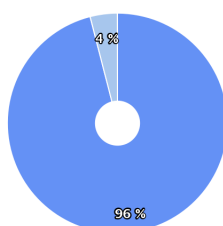
■ Natural Gas 17% ■ LNG 19% ■ Biogas 25% ■ Technical Services 23%  
■ Support Functions 16%

Gender ratio Dec 31, 2018, %



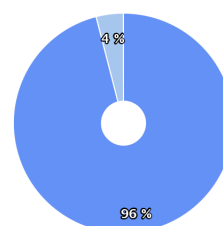
■ Men 76% ■ Women 24%

Type of employment according to working hours Dec 31 2018, %



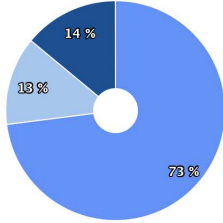
■ Full-time 96% ■ Part-time 4%

Type of employment contract Dec 31 2018, %



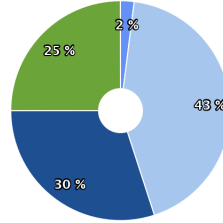
■ Permanent 96% ■ Fixed-term 4%

Total workforce by country Dec 31 2018, %



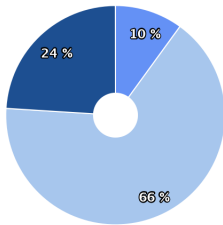
■ Finland ■ Norway ■ Sweden

Personnel breakdown by personnel group Dec 31 2018, %



■ Executive 2% ■ Managerial and expert 43% ■ White-collar 30% ■ Blue-collar 25%

Personnel by age Dec 31 2018, %



■ < 30 years 10% ■ 30-50 years 66% ■ 50+ years 24%



### 3.2 Safety and security



*Our target is zero injuries, environmental breaches and harm to assets, and zero unplanned disruptions in gas supply.*

#### **What we achieved in 2018**

- We made a major leap in our safety culture and saw a significant increase in the number of safety observations, risk assessments, safety moments and safety walks.
- The rate of injuries decreased and is now at its lowest in 10 years.
- We introduced an online safety and security training, which is mandatory for all personnel to take.
- We organised four safety campaigns under the theme 'I am safety'.

**Our renewed Corporate Responsibility Program includes the following objectives that will guide our work from the beginning of 2019:**

- Zero injuries to people
- Zero environmental breaches
- Zero harm to assets
- Zero unplanned disruptions in gas supply

### 3.2.1 Safety culture



## Safety is at the core of our strategy

**Safety is at the core of our strategy and a prerequisite Gasum's success. We continue to expand our safety-first culture and promote the safe use of gas.**

Every Gasum employee is expected to take safety and security into account in their daily work. Employees are obliged to follow the safety instructions and take part in safety and security trainings. Gasum's focus is on preventive safety work. Employees are responsible for making safety observations and eliminating hazards. Safety observations help in preventing damage, accidents and injuries and developing our operations.

Occupational health and safety issues are managed and monitored at the Group level as regards the number of accidents, lost time injury rate, safety observations reported as well as actions taken in response to them. Safety and security issues are covered monthly by the Gasum Management Team as well as the Board of Directors, and regularly communicated through internal communication channels. The business functions report on their respective safety and environmental performance on a monthly basis.



**Our corporate safety and security entails all operations and consists of the following areas:**

- information security
- premises and property security
- management of irregularities and non-conformities
- preparedness and crisis management
- rescue safety and security
- personnel security
- environmental safety and security
- occupational health and safety
- production and operational safety
- safety on the road

## Increased safety awareness

We promote safety and a safety-first culture continuously with a variety of measures. During 2018, four safety campaigns were organised under the theme "I am safety". E-learning safety training was launched for all employees and contractors. The online course covers the basics of safety and safe working methods. The platform is also used to provide basic training for cooperation partners operating close to the gas infrastructure.

In 2018, the use of the instant risk prevention tool was extended to cover all Gasum businesses in Finland and Sweden. The commonly used tool encourages to take a brief moment to think before beginning of each task. In addition, a mobile version of the safety observation system was taken into use, which made it easy to record observations.

The number of individual recorded observations, risk assessments, safety moments and safety walks increased significantly during the year, totaling 5,413 (1,309). Altogether 631 (219) corrective or preventive measures were recorded in response to them, which demonstrates our proactive safety culture.

Our safety target of zero accidents was not achieved in 2018. There were 4 accidents resulting in at least one day off work during the year. The LNG Business unit has an excellent safety track record. Since 2010, for over 3,100 days, there have been zero accidents and injuries. A strong focus on safety issues at management level in the organization has been crucial to achieve these results.

## Gasum awarded by Zero Accident Forum

The Zero Accident Forum awarded Gasum occupational safety classification for 2017 at Level II – Approaching the World's Forefront – for efforts made towards continuous improvement of health and safety at work.

## Committees monitoring health and safety at work

Gasum has Health and Safety Committees and safety representatives in each operating country.

The duties of the committees include consideration of occupational health and safety and health care action plans and relevant implementation, and reporting on health care, risks, incidents, accidents, safety rounds, inspections and environmental issues.

The safety representatives safeguard the interests of employees in matters relating to the working environment.

They ensure that employees are not exposed to hazards and that safety devices and personal protective equipment are readily accessible and in proper condition.

They also make sure that employees receive instructions, practice and training, and that work is arranged in such a way that it can be performed in a proper manner with regard to health and safety.



*"For me safety means caring about people and doing the right things. As a leader I want to set a good example, put HSE on the agenda, follow up and focus on reducing risks. Safety is a prerequisite in our business, we can't operate without it."*  
- Kenneth Olsen, Director, Supply Chain, LNG



*"Safety goes well with our values. At the end of the day everyone is responsible not only of their own safety but also for the safety of others. Setting an example is very important. I am safety."*  
- Kimmo Rahkamo, Vice President, Natural Gas and LNG

### 3.2.2 Preparedness for exceptional situations

## Development of preparedness

**Gasum monitors operational preparedness for emergency situations continuously. Emergency preparedness is practised in annual collaborative exercises.**

In 2018, the main training event was held at Kuopio Emergency Services College in Finland, with the Finnish Safety Investigation Authority participating. The focus of the exercise was on energy transport-related accidents. The results will be utilized in the development of Gasum's safety and rescue guidelines. Several smaller rescue trainings and exercises were also held at various locations during the year.

## Contributing to the safety and security of the entire gas sector

We contribute to safety and security in the entire gas sector. Gasum is an essential element of the Finnish society's energy supply and, due to its role, bears responsibility for safety and security in the entire sector all the way up to end users.

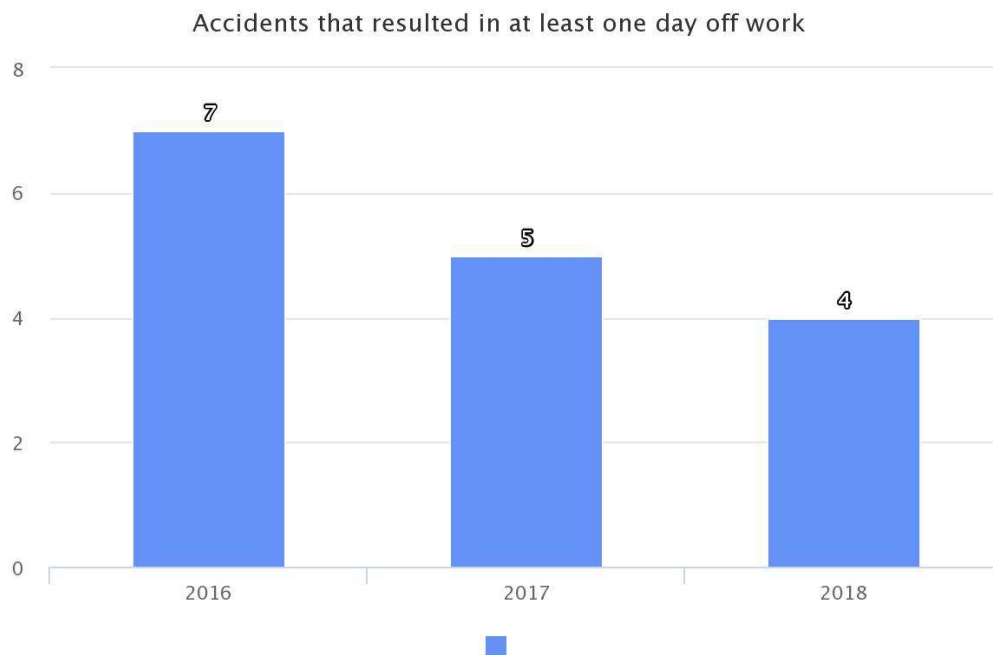
Gasum exercises this responsibility in contexts such as stakeholder advocacy, statements to authorities and many types of collaboration taking place in organizations. Gasum's contributions in 2018 included participation in the emergency supply organization of the National Emergency Supply Agency (NESA), lectures on safety at Finnish Gas Association training events, issue of statements relating to safety and security, provision of training to rescue authorities, and the organization of an accident response exercise in collaboration with stakeholders.

### 3.2.3 Safety performance in figures 2018

## Key safety and security data 2018

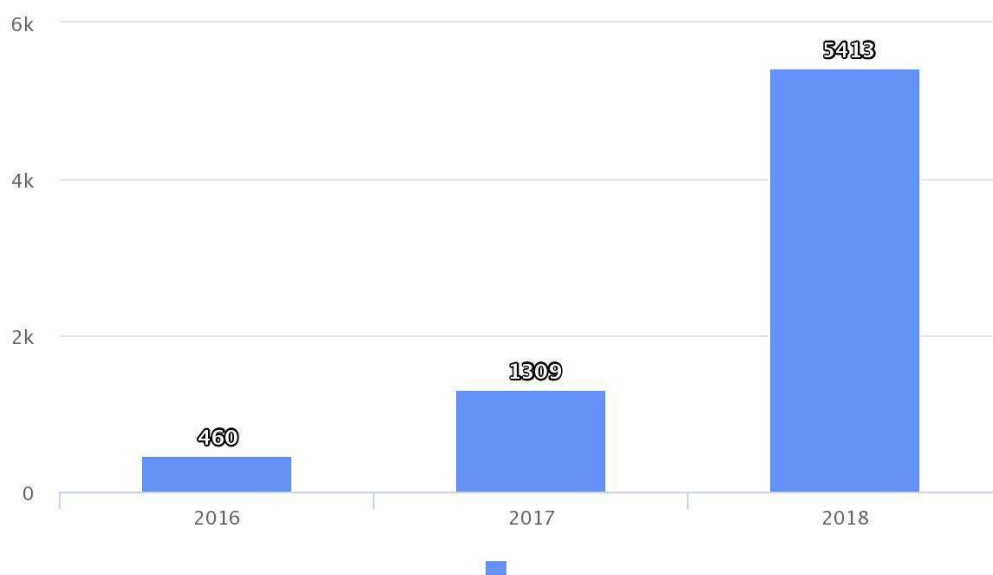
**Despite the decreasing amount of accidents resulting in at least one day off work compared to previous years, our safety target of zero accidents was not achieved in 2018. A significant increase in the number of safety observations, risk assessments, safety moments and safety walks was recorded.**

The following figures present key safety data for Gasum.

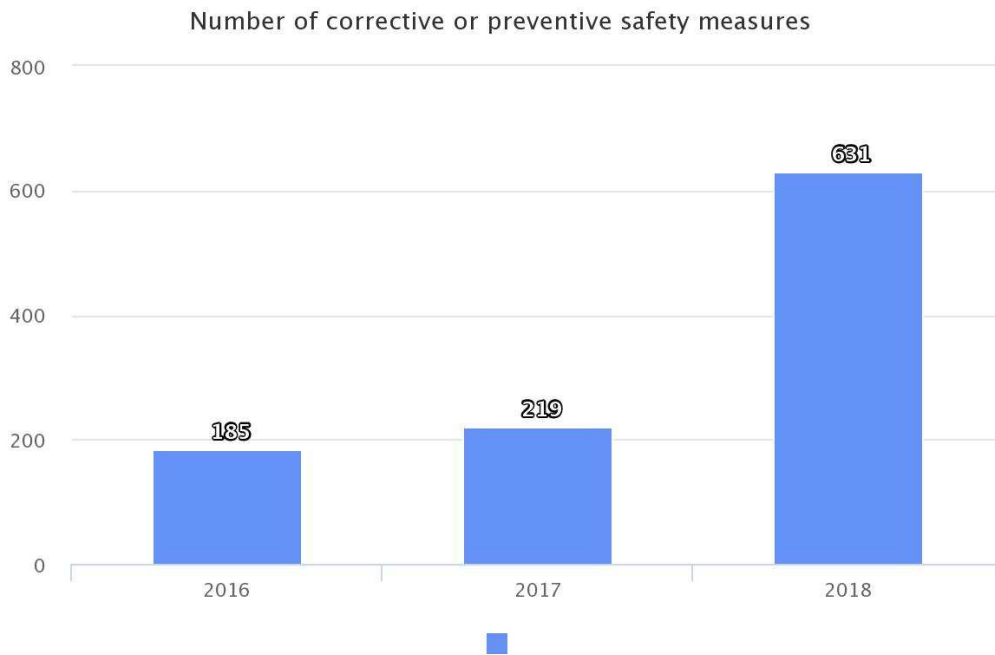


There were 4 accidents resulting in at least one day off work during the year. A strong focus on safety issues at management level in the organization has been crucial to achieve these results.

### Number of recorded safety observations, risk assessments, safety moments and safety walks



The number of individual recorded observations, risk assessments, safety moments and safety walks increased significantly during the year. The mobile version of the safety observation system was taken into use, which made it easy to record observations.



The number of corrective or preventive safety measures taken in response to registered safety observations increased in 2018, which demonstrates our proactive safety culture.

## Other important safety figures

Our other relevant safety performance figures, including absentee days and rate, occupational accidents and lost time injury frequency rate, for 2018 are shown in the table below. All figures are lower compared to 2017, and occupational accidents and injury rate in particular show decreasing trends.

<b>PERFORMANCE IN 2018</b>	2016	2017	<b>2018</b>
Absentee days due to accident/disease	1,574	3,090	<b>2,589</b>
Absentee rate	2.2	2.9	<b>2.6</b>
Occupational accidents	17	10	<b>6</b>
Lost days due to occupational accidents	286	287	<b>84</b>
Lost time injury frequency rate	32.1	11.7	<b>8.4</b>
Injury rate	0.39	0.27	<b>0.08</b>
Occupational disease rate	0	0	<b>0</b>
Work-related fatalities	0	0	<b>0</b>

**Absentee days due to accident /disease** = (Total lost days (due to occupational accident/disease) in the reporting period / Total number of hours scheduled to be worked in the reporting period) x 100

**Absentee rate** = (Number of actual absence days lost in the reporting period / Total days scheduled to be worked in the reporting period) x 100

**Occupational accidents** = Includes zero-day accidents and accidents that resulted in at least on day off work

**Lost time injury frequency rate** = (Number of occupational injuries in the reporting period / Total hours worked in the reporting period) x 1,000,000

**Injury rate** = Includes zero-day accidents and accidents that resulted in at least on day off work

**Occupational disease rate** = Number of occupational disease / Total hours worked in the reporting period

## 4 ENVIRONMENTAL RESPONSIBILITY



# Climate change mitigation and circular economy in key roles

**This section outlines what we do for climate change mitigation. In addition to offering our low-carbon solutions for road and maritime transport, industry and energy production, we work actively to reduce the impact of our own operations.**

Our network of biogas plants is a model example of circular economy implementation. It enables us to expand opportunities in the transport, energy and nutrient markets.



Gasum is committed to working towards the [United Nations Global Goals for Sustainable Development](#).



## 4.1 Climate change



*We enable climate change mitigation through renewable energy, low-carbon products and energy efficiency.*

### What we achieved in 2018

- We made a commitment to invest in expanding the gas filling station network for heavy duty vehicles in the Nordics, and continued increasing CNG/CBG availability in Finland.
- We enabled a strong growth in the amount of gas fueled vehicles in all segments in 2018 in Finland.
- We partnered with several heavy-duty transport operators and enabled emission cuts for industry and retail in their value chains.
- Greenhouse gas emission savings from our sustainability-certified biogas totaled 82 million kg, which equals removing 30,000 cars from roads. The emission reduction is up to 85-90% compared to fossil diesel.
- Our biogas continues to be the only Finnish fuel for vehicles that has received the Nordic Swan Ecolabel. Our Finnish biogas plants were evaluated with new stricter criteria of the Ecolabel.
- We increased accessibility of liquefied natural gas (LNG) at sea.
- We delivered for the first time renewable liquefied biogas (LBG) to a marine customer and increased collaboration with new shipping partners in the Nordics.
- We switched to 100% renewable electricity in all our operations.
- We reached our annual energy saving targets.

**Our renewed Corporate responsibility program includes the following objectives that will guide our work from the beginning of 2019:**

- Enabling greenhouse gas emission reductions for our customers with low-carbon products by reaching our volume targets set.
- Increasing energy efficiency in our operations. We aim at 1% annually until 2025.

### 4.1.1 Solutions for transport



## Solutions for cleaner transport

**Transport represents almost a quarter of Europe's greenhouse gas emissions. Within the transport sector, road transport accounts for more than 70% of all GHG emissions.**

In 2018, the European Commission published targets according to which carbon dioxide emissions from new heavy-duty vehicles (HDV) must be 15% lower by 2025 and 30% lower by 2030 compared with the 2019 level.

Gasum is committed to the development of a low-emission road fuel gas market in the Nordic countries. The transition to clean fuels in transport is already possible through the use of liquefied natural gas (LNG), liquefied biogas (LBG), compressed natural gas (CNG) and compressed biogas (CBG).

Our transport fuels offer a competitive low-carbon alternative and help passenger-car and heavy-duty transport customers reduce their emissions and the HDV segment to achieve the newly published targets of the European Commission.

### Towards low-carbon Nordics

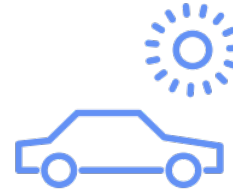
**Finland's** long term goal is a carbon-neutral society. In the National Energy and Climate Strategy for 2030, Finland has set the goal of 50,000 gas-powered vehicles on the roads by 2030. In addition, the Transport Climate Policy working group under the Finnish Ministry of Transport and Communications published in 2018 its final report on actions for eliminating greenhouse gas emissions over the longer term. The working group highlights biogas as a significant element of the solution for emissions cuts from road transport and in achieving zero-carbon transport in 2045. To reach the working group's target, the number of gas-fueled cars should be increased significantly in Finland. Their number on Finland's roads should be around 130,000 in 2030 and around 250,000 in 2045. The target set for heavy-duty vehicles is around 6,000 vehicles in 2030 and as many as 22,000 in 2045 and the target for gas-fueled vans 14,000 and 41,000, respectively.

**Sweden** aims to be fossil-free by 2045. The aim for road transport is to reduce greenhouse gas emissions by 70% from the 2010 level by 2030. Sweden's national freight transport strategy sets targets for continuously improving energy efficiency and breaking dependence on fossil fuels in order to reduce the climate impacts of the transport system. The Swedish Government has allocated almost to SEK 2 billion (around €200 million) under the Climate Leap programme for local initiatives to reduce greenhouse gas emissions. National investment support has been granted for biogas production, filling station infrastructure and buying low-emission vehicles.

In **Norway**, the target is to cut greenhouse gas emissions by at least 40% by 2030 and to become a low-emission society by 2050, with greenhouse gas emissions 80–95% lower than in the reference year of 1990. To reach these targets, national financial support is offered for initiatives that help to reduce greenhouse gas emissions and to develop new energy and climate technologies.

## Number of gas-fueled vehicles increasing

In road transport, the number of gas-fueled vehicles increased in Finland in 2018. During 2018, a total of more than 1,200 first registrations of gas cars were made, in addition to which more than 1,400 used gas cars were imported.



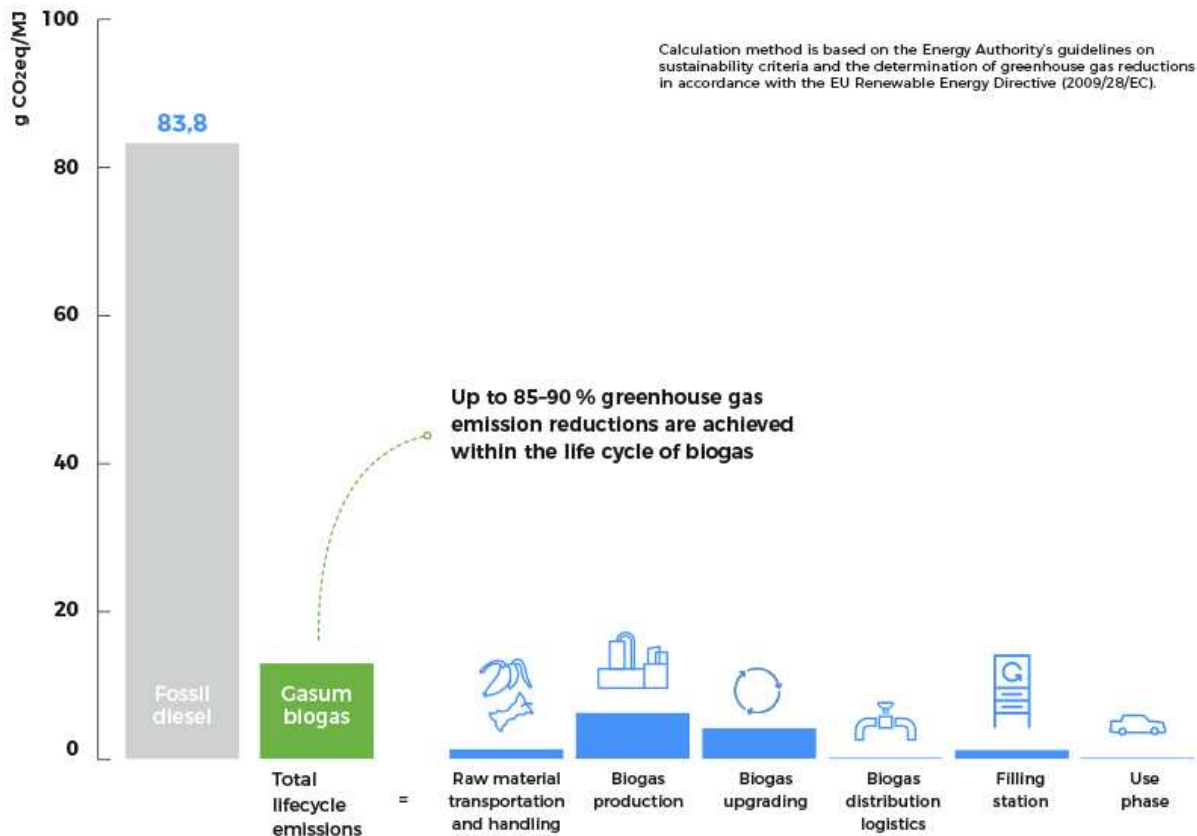
The number of gas-fueled vehicles was approximately 6,300 in the end of 2018 (3,400 in 2017).

## Biogas enables up to 85–90% emission cuts

We are proud of the [sustainability elements](#) of biogas. Fueling vehicles with our 100% renewable biogas produced from biodegradable waste and agricultural fractions makes it possible to cut the greenhouse gas emissions generated over the fuel life cycle by up to 85-90% compared with traditional fossil fuels.

In 2018, greenhouse gas emission savings from Gasum's sustainability-certified biogas totaled 82 million kg. This equals to removing 30,000 cars from the roads. Greenhouse gas reductions are determined in accordance with the Renewable Energy Directive (82009/28/EC).

Natural gas as a transport fuel enables 25% lower greenhouse gas emissions compared to gasoline.



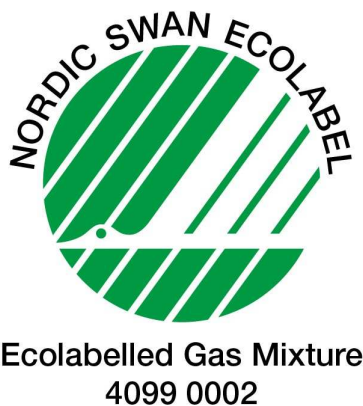
## Sustainability guaranteed

Gasum's biogas used in transport fulfils the Nordic Swan Ecolabel criteria. During 2018, Gasum's Finnish biogas plants that are covered by the scheme were evaluated with the new stricter Ecolabel criteria. The label makes it easy for consumers and professional buyers to choose the environmentally best goods and services.

### The Nordic Swan Ecolabel guarantees that:

- the emission reduction is at least 60% when using sewage sludge as the raw material and 70% if the raw material is biodegradable waste;
- palm oil, soybean oils and sugar cane are not used as a raw material; and
- genetically modified plants are not used as a raw material.

In addition, biogas sold to transport use in Finland and all biogas produced in Sweden are covered by certified sustainability systems, which ensure that biofuels released for consumption meet the sustainability criteria laid down by the Renewable Energy Directive (82009/28/EC). Compliance with the criteria is reported to the Energy Authorities in Finland and Sweden annually, and compliance is verified by an external and independent auditor.



**Biogas is the only Finnish fuel for vehicles that has received the Nordic Swan Ecolabel.**  
[Read more](#)

## Heavy-duty vehicles join the fight against climate change

There is a strong demand for low emission solutions by logistics buyers in the heavy-duty vehicle (HDV) transport segment. The newly published, EU-wide emission limits for heavy-duty vehicles set a clear direction for the segment. Carbon dioxide emissions must be taken into account in any new investments, and LNG is one of the most cost-effective ways to reduce emissions from heavy-duty vehicles.

The use of liquefied gas improves local air quality in urban areas since small particles that affect respiratory air are not produced. The use of liquefied natural gas (LNG) reduces greenhouse gas emissions by up to 20% compared with fossil diesel life-cycle emissions. Liquefied biogas (LBG) enables an emission reduction of as much as 85%, which sets up a ready path towards carbon neutral heavy-duty transport.

Renewable LBG works in the same engines as LNG, so the switch to LNG means an immediate possibility to start utilizing LBG without any special investments. Vehicles that use LNG as fuel also have significantly lower noise level compared to vehicles that use other fuels.

## Collaboration with partners

Gasum collaborates with several logistics companies and logistics buyers. Read more about our [cooperation](#) and how we enable emission cuts for industry and retail in their logistics chains.

## Gasum expands gas filling station network for heavy-duty vehicles

To enable the transformation of the heavy-duty vehicle segment and to respond to the rapidly increasing demand for gas as a road fuel, Gasum invests in the expansion of the [gas filling station network](#). The investment will multiply the size of the Nordic heavy-duty vehicle gas filling station network, enabling emission cuts from the HDV segment.

#### 4.1.2 Solutions for maritime sector

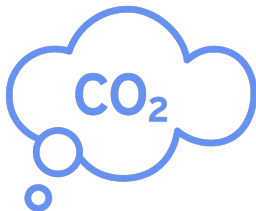
## Cleaner solutions for maritime sector

### Climate change has received more attention also in the maritime sector.

In 2018, the Marine Environment Protection Committee (MEPC) of the International Maritime Organization (IMO) adopted a strategy on the reduction of GHG emissions from ships to minimize air pollution in line with climate goals as defined in the Paris Agreement. A target was set to reduce the total annual GHG emissions by at least 50% by 2050 compared to 2008.

In addition, the IMO has set strict regulations for the emissions of nitrogen oxides (NO<sub>x</sub>) as well as the maximum sulphur content of fuels globally. Further reduction requirements will follow for NO<sub>x</sub> after 2021 when the emissions need to be reduced by 80% compared to the current emission level.

The fuel sulphur limit within the Sulphur Emission Control Areas (SECA), including the Baltic Sea, is 0.1%. The global sulphur limit will be reduced from the current 3.50% to 0.50%, effective from January 1, 2020.



Liquefied Natural Gas (LNG) is the cleanest available marine fuel. It meets all the current and forthcoming IMO and EU regulations.

LNG is suitable for all vessel types. It is rapidly becoming more common as a cost-effective alternative. Switching to LNG means the complete removal of SO<sub>x</sub> and particulates and a reduction of NO<sub>x</sub> emissions of up to 85%. The maritime use of LNG reduces the climate impact approximately by 20%.

Furthermore, the availability of 100% renewable liquefied biogas (LBG) on the market is on the rise. Gasum can utilize the same infrastructure for LBG that it has been building for LNG throughout Northern Europe. This means that LNG technology provides a bridge to low-carbon shipping by enabling also the use of renewable LBG. LBG will offer 60–75% CO<sub>2</sub> emission reductions compared to marine diesel.

### Accessibility of LNG at sea increased

Gasum offers safe and swift bunkering services in the Baltic Sea, North Sea and in the ARA region with options to deliver LNG by truck-to-ship, terminal-to-ship or bunker by ship-to-ship.

Flexibility in offering LNG at sea has improved significantly with Gasum's LNG bunker vessel Coralius, which delivers LNG through ship-to-ship bunkering at sea and in port. Coralius has increased its efficiency due to LNG bunkering operations becoming faster – they are now nearly as quick as conventional oil bunkerings, which has also increased customer satisfaction.

In early 2019, Coralius reached 100 bunkerings and a further increase is foreseen as it will perform bunkerings for shuttle tankers and other bigger vessels. Read more about our [LNG deliveries](#).



### Collaboration with maritime sector

Gasum collaborates actively with the maritime sector. Read more about our [partnerships](#) in 2018.

### 4.1.3 Solutions for energy production and industry

## Cleaner solutions for energy production and industry

**Gas offers a reliable alternative and a multitude of uses for industries. The diverse properties of natural gas and LNG come into their own particularly well in a variety of process applications.**

Gas flames and clean flue gases can be utilized in contexts such as heating, drying and cooking of products as well as a raw material in process industry. Restaurants use biogas or natural gas for heating and cooking.

In energy production, natural gases are particularly suitable for use as a fuel for heat and steam production as well as in combined heat and power (CHP) production. Liquefied natural gas (LNG) and liquefied biogas (LBG) bring the benefits of gas also to areas outside the gas pipeline network throughout the Nordic countries. Liquefied gas is a practical choice for industries operating in the fields of processing, paper and metal, for example.

Renewable biogas does not differ from natural gas in terms of its properties when used. A switch from natural gas to biogas can be made without special investments by users of natural gas.

### Natural gas reduces local air pollution



Natural gas accounts for more than 20% of the total energy consumption in Europe. Demand for gas is projected to grow by an estimated 30% over the next 20 years. The share of natural gas in Finland's energy consumption is approximately 8%.

As a diverse, clean energy source and material of industry, natural gas will still be an important part of Finland's energy consumption across future decades as well. In terms of synergies between electricity and heat, the usage of natural gas will be increasingly emphasized as a reserve fuel that is used to meet extra demand for electricity during periods of peak energy consumption.

Substituting more polluting petroleum-based fuels in industry and energy production, natural gas can contribute to improved local air quality of urban areas. Cleaner burning than other fossil fuels, the combustion of natural gas produces negligible amounts of sulfur and particulates. Natural gas produced nitrogen oxides (NO<sub>x</sub>), which are precursors to smog, at up to 85% lower levels than oil. In addition, natural gas can contribute to reducing CO<sub>2</sub> emissions by 20%.

### Enabling emission cuts for partners

Gasum is actively collaborating with partners in industry and energy production. In 2018, companies operating in sectors such as metal refining, forest as well as food and feed production chose to switch to cleaner fuels in collaboration with Gasum. Read more about our [business partnerships](#).

### Guarantees of Origin of electricity

Favoring renewable electricity is an excellent opportunity for enterprises and other actors to implement their environmental responsibility. Guarantees of Origin of electricity are certificates to verify that electricity is produced from renewable energy sources.

Gasum's Vehmaa biogas plant was registered in the Finnish Guarantee of Origin system in February 2019, enabling the issuance of Guarantees of Origin for electricity production starting from February 2018. The Vehmaa plant produces renewable energy in its combined power and heat unit which is fueled by biogas produced from biodegradable raw materials. The certificates were issued by the distribution system operator's authentication.

#### 4.1.4 Low-carbon solutions in Gasum's own operations

## Low-carbon solutions in our own operations

**As part of our commitment to climate change mitigation, we use low-carbon solutions, systematic energy management and emission reduction actions in all of our operations.**



### 100% renewable electricity

From the start of 2018, we switched to renewable electricity in all of our operations. All electricity consumed by Gasum is generated from Nordic hydropower.

A significant proportion of the electricity sourced goes to the production of liquefied natural gas (LNG) in Risavika, Norway.

### Reducing methane emissions in biogas production

Work to minimize methane emissions has been advanced for several years at Gasum's biogas plants in Sweden, where the plants have participated in the Swedish Waste Management Association's program. Methane emissions have been systematically mapped and minimized in biogas production and upgrading.

Based on experience gained in Sweden, Gasum plans to conduct similar methane emission analyses in Finland in 2019. In addition, a procedure to map gas emissions by using a thermographic camera has been taken into use in Finland.



### Systematic energy management

Gasum develops energy efficiency of operations, products and services through the certified ISO 50001 energy management system. System coverage was significantly increased in 2018, when Gasum's LNG operations (formerly Skangas) were integrated into Gasum's energy management system.

During 2018, energy efficiency work was actively advanced throughout Gasum. The LNG business worked systematically to improve the energy efficiency of LNG terminals, ships and trucks and optimize their operations. In the Biogas business in Finland, investments were made to reduce water and heat consumption as well as to increase gas production. Within the Finnish Natural Gas business, energy efficiency and reliability were improved by replacing the pressure reduction station boilers with new and more energy-efficient boilers.

In Sweden, five biogas plants (Jordberga, Katrineholm, Lidköping, Västerås and Örebro) mapped their energy consumption and sought energy savings through energy analyses. The energy analyses account for the operating principle of plants, annual waste quantities, production data, energy and water consumption data and their distribution by different departments. Comprehensive plant-specific energy balances help in finding energy savings and efficiency measures.

In December 2017, Gasum's headquarters moved to modern, energy-efficient and compact premises in Tapiola, Espoo. Through this change, the headquarters' energy and heat consumption was reduced by 70%.

## Commitment to Energy Efficiency Agreement

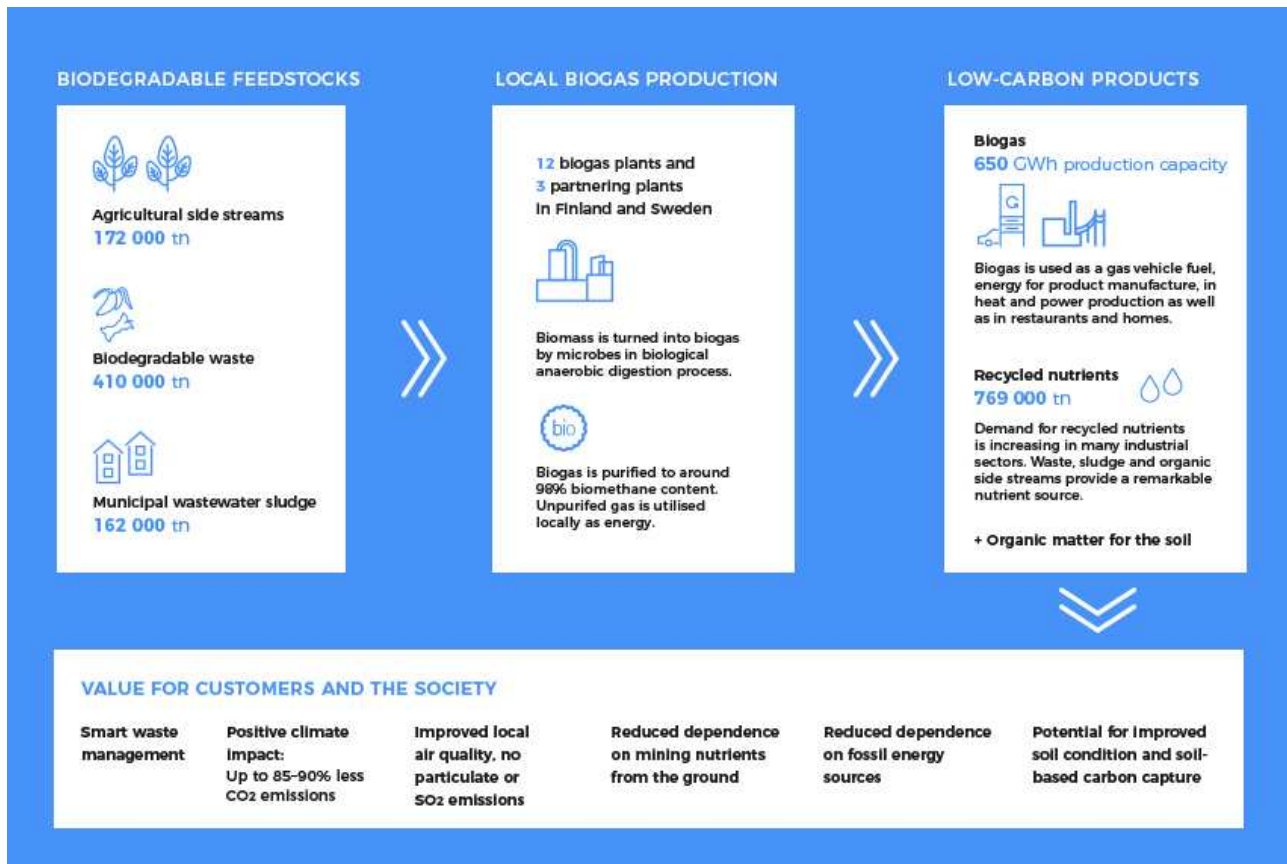
Energy Efficiency Agreements are an important part of Finland's Energy and Climate Strategy and a primary tool for the promotion of efficient energy use in Finland. At Gasum we are committed to the voluntary Energy Efficiency Agreement for industries for the period of 2017-2025 under the Energy-Intensive Industry Action Plan.

Gasum's energy saving target is 7.5% by 2025, including an intermediate target of 4% by 2020. The target applies to the use of electricity, heat and fuels.

Gasum has achieved energy savings through systematic and goal-oriented energy management and reached the annual savings target for the year 2018. With the measures implemented, the valid energy-saving effect in 2018 was 6,132 MWh. The quantitative energy-saving target is 3,200 MWh by 2020 and the total target 6,000 MWh by 2025.



## 4.2 Circular economy



*We utilize wide feedstock base in renewable fuel production and develop market for recycled nutrient products.*

### What we achieved in 2018

- We implemented a remarkable circular economy solution at our Turku plant, which aims at increased biomass processing capacity and access to biogas, as well as launching of new recycled nutrient products.
- We entered into cooperation with Algol chemicals to develop the market for recycled nutrient products.
- We started circular economy collaboration with Stora Enso and will produce liquefied biogas from the pulp and paper mill's wastewaters at Nymölla, Sweden.
- We started a project to develop ecosystems and partnerships for recycled nutrients.
- The piloting of digestate pyrolysis to produce biochar was launched.
- Our R&D was active and we participated in several research projects aiming at, for example, increasing the production of biogas and finding new feedstocks and improved processing methods.
- We were active in developing new partnerships in circular economy.

**Our renewed Corporate Responsibility Program includes the following objectives that will guide our work from the beginning of 2019:**

- Promoting the circular economy by expanding opportunities in the transport, energy and nutrient markets. We aim at increasing biogas volumes.

#### 4.2.1 Biodegradable feedstocks

## Biodegradable feedstocks

**The circular economy targets set by the EU provide increased steering towards ways of processing sludge and biowaste where the benefits obtained from side streams are fully utilized.**

According to these targets, 65% of municipal waste must be recycled by 2030. The current rate in Finland averages 30–35%.

Gasum, with its wide network of biogas plants, is a major processor of biodegradable fractions generated in the operations of enterprises or other organizations. Gasum processes biomass from agricultural side streams, crops, manure, inedible food waste from retail outlets, food industry side streams, spoiled batches, and sewage and grease trap sludge.

The total volume of processed biodegradable feedstocks in Finland and Sweden was 744,000 tonnes in 2018, consisting of 55% biodegradable waste, 23% agricultural side streams and crops and 22% municipal wastewater sludge.



### Finding new feedstocks and concepts

To increase the production of biogas, continuous research is focused on new feedstocks as well as processing methods to improve methane production from materials. In 2018, Gasum was involved in several projects related to these topics.

In Finland, the INNOFEED (2015–2018) research project led by VTT Technical Research Centre and the Natural Resources Institute aims for biorefining ensiled grass into inventive feed products and enabling the economic production of biogas from side streams of grass processing.

In Sweden, Gasum participates in projects with the Biogas Research Centre at Linköping University and also with the RISE Research institutes of Sweden, including "Residues from cereal farming" (2018–2021) aiming for improved use of agricultural residues for biogas production, "Deep litter pre-treatment" (2018–2019) developing technologies for more efficient biogas production from manure as well as in "Forest Jet II" (2018–2019) where the goal is to produce jet fuel and biogas from lignocellulosic material.

In addition to the biological biogas process, renewable methane can be produced by using gasification and methanation technologies. With partners, Gasum is involved in developing synthetic methane gas (SNG) concepts, for example in a project financed by the Swedish Energy Agency named "Biological methanation of syngas from gasification of lignocellulose".

In gasification, product gas containing hydrogen is produced from, for example, lignocellulosic biomass. Product gas can be upgraded using biological or synthetic methanation into renewable methane.

## 4.2.2 Biogas



## Amazing sustainability elements of biogas

**Biogas is a 100% renewable, locally produced fuel. It is produced by utilizing non-edible biodegradable biomass, such as waste from households and food industry, as well as from wastewater treatment.**

The organic by-product is utilized as recycled nutrients and fertilizer products in agriculture and industry. Raw biogas is either used locally as an energy source or upgraded into biomethane. When we talk about biogas, we actually mean biomethane, which has a composition equal to natural gas but is 100% renewable.

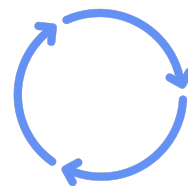
Upgraded biogas is injected into the existing natural gas pipeline network or transported in separate containers to destinations such as gas filling stations located in areas that are not covered by the pipeline network. The ability to utilize existing gas pipeline networks makes the supply chain energy- and cost-efficient. Thousands of kilograms of biogas is fed daily into the gas pipeline network, making sure that biogas is always available.

Biogas can also be liquefied. This is when it is referred to as liquefied biogas (LBG). LBG is delivered outside the gas pipeline network by trucks. Biogas can be used for all the same purposes as natural gas: as a transport fuel, in electricity and heat (CHP) production, industrial facilities, home heating and cooking.

## Biogas Certificate system ensures gas sold is renewable

The amount of biogas in the gas pipeline network is monitored by the Biogas Certificate system. In practice, when biogas is injected into the gas pipeline network, one Biogas Certificate is created for the system for each megawatt hour. When biogas is sold, a corresponding number of certificates is cancelled in the system. This ensures that the amount of biogas sold equals the amount of biogas produced and that biogas cannot be sold multiple times for different uses.

Biogas sold to for use as a road vehicle fuel in Finland and all biogas produced in Sweden is covered by certified sustainability systems which ensure that biofuels released for consumption meet the sustainability criteria laid down by the Renewable Energy Directive (82009/28/EC).



## Local value creation

We own a [nationwide network of biogas plants](#) in Finland and Sweden. The annual production capacity of the plants totals 650 GWh. Biogas production creates local jobs and enhances rural development.

In Finland, our biogas holds the Finnish Key Flag Symbol. It demonstrates that the product has been manufactured in Finland, creating Finnish jobs. The right to use the Key Flag can be awarded to products with at least 50% Finnish content, referring to the proportion of the Finnish cost of the break-event cost of the product. Gasum's biogas is made from 100% Finnish raw materials in Finland.

### 4.2.3 Fertilizer products & nutrients

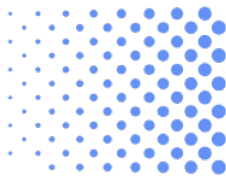
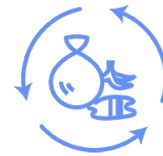
## Fertilizer products and nutrients promote circular economy

**We are expanding opportunities for the use of nutrient-rich digestate. New advances in biogas production have the potential to change the nutrient and fertilizer market in the same way that biogas is changing the transport sector.**

We produce high-quality organic fertilizer products, such as liquid and solid digestates containing recycled nutrients for agricultural and industrial use. In addition, our plants have also produced nutrient fractions for other uses, such as for forest industry wastewater treatment facilities.

Gasum nutrient products totaled 769,000 tonnes in 2018 (732,000 tonnes in 2017).

The safe and sustainable use of nutrient-rich residues from biogas production is important to Gasum. We are active in developing new products, technologies and partnerships in this area.



### High quality is important

Nutrient products are high in hygiene quality. Biodegradable fractions delivered to biogas plants go through a rigorous treatment process where they are processed into organic fertilizer products. Any pathogens, pests and weed seeds are destroyed by heating the feedstock mass to a temperature above 70 °C.

Gasum's fertilizers are produced in compliance with fertilizer product legislation, and the operations are supervised by Finnish and Swedish authorities. In Finland, our production complies with the Decree on Fertilizer Products and operations are overseen by the Finnish Food Safety Authority (Evira). The amount of metals and pathogens in fertilizer products is controlled through systematic sampling.

In Sweden, all of Gasum's fertilizers are certified through SPCR 120 and most of the volume is also certified for organic use. The quality standard includes tests and analyses throughout the process from raw material to the final product, a certified biofertilizer.

## Recycled nutrients to be recovered for industry use

Gasum is implementing a remarkable circular economy solution at its Topinoja biogas plant in Turku, Finland. Gasum processes sludge from the Turku region wastewater treatment service provider, turning the waste feedstock into biogas and recycled nutrients.

The project is one of the Finnish Government's key projects aiming at bringing the Finnish economy to a path of sustainable growth by increasing the share of renewable energy in a sustainable way to more than 50% during the 2020s.

The biomass processing capacity and access to biogas will be increased, and the market launch of new refined recycled nutrient products will be enabled. The first part of the project relating to nutrient recycling and the modernization of Gasum's Topinoja biogas plant was completed in 2018. The project will continue with plant expansion and biogas liquefaction plant investment and is due for completion in late 2019.

Following the expansion, the plant will process around 110,000 tonnes of biomass and produce an annual total of 50 GWh of liquefied and 10 GWh of compressed biogas for various transport segment needs, equating to the annual energy consumption of

around 6,000 cars. In addition to biogas, the plant will produce an annual total of around 4,000 tonnes of ammonia water, a recycled nutrient obtained from the biogas plant's reject water. In the first phase, the annual production volume of ammonia water totals 2,000 tonnes. In the future, the recycled nutrients will be recovered and supplied to its customers by Algol Chemicals.

The project boosts the growth of the Finnish biogas market and promotes the development of the heavy-duty transport gas market. The project also improves the opportunities to use local road fuel gas in the Turku region. The project will provide 170 full-time equivalents of employment during the construction phase. In addition, the solution decreases the nutrient load to the environment from waste water treatment plant serving 300,000 residents in the area, and promotes the realization of energy efficiency.

## Developing ecosystems and partnerships for recycled nutrients

In 2018, Gasum also launched a project to develop ecosystems and partnerships for recycled nutrients. The project is partly funded by the Ministry of Economic Affairs and Employment. After the initial screening and information gathering phase together with Gaia Consulting, the project has proceeded to piloting and testing phase of new technologies with partners in Finland, Sweden and Norway during 2018–2019.



At the Turku biogas plant in Finland, equipment for piloting the pyrolysis of digestate, destroying potential organic pollutants and producing biochar has been in operation. Pyrolysis char was also included in the project "Potential of sewage sludge phosphorus in plant production and impacts on environment and food chain" (2015–2018) led by Natural Resource Institute Finland (Luke), the Finnish Environment institute (Syke) and the Finnish Food Authority (Evira). Gasum's pyrolysis equipment is used also in a sludge char project launched in 2018; the project aims for the recovery of nutrients from sewage sludge. The project is implemented together with the Helsinki Region Environmental Services Authority (HSY) and Natural Resource Institute Finland (Luke).

Many of our activities regarding the circular economy related to our farm-based production plants focused on the fiber fraction in the biofertilizer. During 2018, several internal pilot tests with dewatering were performed and small-scale deliveries of fiber to soil manufacturers were made. In late 2018, the first soil consumer product using Gasum fiber was introduced on the market and sold by Hasselfors Garden (Kekkilä Group).



## Many projects ongoing in R&D

**Other examples of projects and initiatives related to the quality and development of fertilizers from biogas plants include:**

- Potential of sewage sludge phosphorus in plant production and impacts on environment and food chain. The research was led by Natural Resource Institute Finland (Luke), the Finnish Environment Institute (Syke) and the Finnish Food Authority (Evira) in 2015-2018.
- Development of national quality system for recycled nutrient products (LARA). The project is implemented in 2018–2019.
- The occurrence of Legionella in circular economy products and the effect of hygienisation on Legionella (Legisafe). Project led by the Finnish Food Authority (Evira) in 2018-2020.

### 4.3 Environmental management

## Environmental management

**There were no significant environmental nonconformities at Gasum in 2018, and the level of environmental performance remained high. Gasum's environmental management system ISO 14001 was successfully audited along with the company's integrated management system.**

The environmental objectives set for 2018 were achieved. The objectives were based on the Corporate Responsibility Program and approved by the Gasum Management Team. The objectives set a framework for the environmental management system's annual program and actions.

OBJECTIVE	PERFORMANCE IN 2018
<p><b>Reducing the GHG emissions of Gasum's own and customers' operations and promoting the recycling of nutrients</b></p>	<ul style="list-style-type: none"> <li>• Energy efficiency savings met the 1% annual target. Boiler renewals continued in pressure reduction stations. Work to minimize methane emissions leakages continued.</li> <li>• LNG life-cycle assessment was performed for various supply chains.</li> <li>• The nutrient ecosystem project received funding from the Ministry of Economic Affairs and Employment of Finland to create a biogas nutrient and fertilizer ecosystem. Potential new products, markets, legislation and customer interviews were conducted and analyzed. Piloting and lab testing with various processes and products were conducted.</li> <li>• The Nordic Swan Ecolabel was granted to biomethane with new criteria.</li> </ul>
<p><b>Ensuring the realization of responsibility in the supply chain together with our suppliers</b></p>	<ul style="list-style-type: none"> <li>• Personnel was trained to conduct supplier audits.</li> <li>• The supply audit procedure was established.</li> <li>• Critical suppliers were evaluated.</li> </ul>

## Improved chemical management

In 2018, we built a new chemical management service within our organization in Finland, Norway and Sweden. Launched at the beginning of 2019, the system improves chemical safety within Gasum by ensuring that the latest safety data sheets are in use and that the sites have the right chemicals lists.

#### 4.4 Environmental performance in 2018

(302-1, 303-3, 305-1, 305-2, 305-3, 305-7, 306-2, 307-1)



## Environmental performance in 2018

**This section outlines Gasum's environmental performance related to air emissions, energy consumption, waste generation and water withdrawal.**

During 2018, Gasum increased its shareholding in Skangas to 100%. The acquisition systematically increased our total emission and energy consumption figures compared to 2017.

### Air emissions

Gasum's greenhouse gas emissions increased to 63,921 tonnes of CO<sub>2</sub> equivalents in 2018 (44,904 in 2017). Contributing aspects to the increase include changes in company structure, higher methane emissions, higher use of compressors and flaring of gas in Risavika, Norway, and Pori, Finland. Gasum's greenhouse gas emissions consist mainly of carbon dioxide and methane emissions. The global warming potential (GWP) of methane is considered to be 28 times that of carbon dioxide based on the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

In 2018, Gasum's methane emissions totaled 388 t (244 t in 2017). The increase is mainly due to the decommissioning of a transmission gas pipeline in Eastern Finland. With proper planning and operation of the project, most of the potential emissions were, however, minimized. The decommissioning project will continue in 2019.

Biogenic carbon dioxide is emitted in the combustion of biogas at biogas plants. Biogas is a biofuel whose carbon dioxide emissions are not counted in the total emission amounts of Gasum's greenhouse gases. Gasum's indirect greenhouse gas emissions from electricity and heat procurement were determined in accordance with the Greenhouse Gas (GHG) Protocol Scope 2 Guidance based on the location-based and market-based methods. The Finnish Energy Authority updated the location-based emission factor of Finland's electricity from 175.1 g CO<sub>2</sub>e/kWh to 128.5 g CO<sub>2</sub>e/kWh based on 2017 data.

Due to the switch to using 100% renewable electricity in all operations, Gasum's carbon dioxide emission of electricity under the market-based method is zero. Emissions from purchased energy come from the use of heat and steam. Scope 3 greenhouse gas emissions include the LNG supply chain's vessels and truck transport, business travel-related train journeys and flights, and energy consumption of rented facilities. In 2017, Scope 3 also covered business travel by car.



The combustion of natural gas, LNG and biogas does not create any particulate or sulfur dioxide emissions. The total amount of Gasum's nitrogen oxides (NO<sub>x</sub>) emissions was 35 tonnes in 2018 (26 in 2017). Gasum conducted nitrogen oxides emission measurements at the Kouvola compressor unit due to automation renewal to confirm compliance with permit and legislation limits. NO<sub>x</sub> emissions were higher mainly in the gas transmission system due to cold weather and therefore higher operation hours of compressors in Finland in 2018. In addition, LNG supply-chain emissions from outsourced vessels and trucks equaled 283 tonnes of nitrogen oxides in 2018.

## Energy consumption

The impact of Gasum's increased shareholding in the subsidiary formerly named Skangas is particularly evident in the electricity and purchased energy consumption figures. The total energy consumption in 2018 was 438 GWh (317 GWh in 2017). Gasum's electricity consumption totaled 156 GWh (123 GWh in 2017) and fuel consumption 221 GWh (138 GWh in 2017). The fuel consumption includes biogas, raw gas, natural gas, light fuel oil, diesel and LNG. Fuel consumption in the Finnish operations increased due to higher operating hours of compressor stations during the cold and long winter period. The renewable energy source is mainly biogas used in the biogas plants' own processes.

In the Gasum LNG supply chain, energy consumption outside of organization includes vessels and road vehicles that transport LNG from terminals to customers or to other terminals. These are operated and owned by cooperation partners and are significant to the LNG value chain and therefore featured in a new indicator. In 2018, the total energy consumption in the supply chain was 79 GWh (66 GWh in 2017), including both diesel and LNG consumption.

## Waste generation and water withdrawal

The total amount of waste generated decreased in 2018 to 6,525 t (7,008 t in 2017). The biggest waste amounts are generated at biogas production plants and consist of sand and package materials that are removed from the process before biogas anaerobic digestion. The amount of waste generated compared to the feedstock received by the plants is very low. The Riihimäki biogas plant in Finland was able to decrease the amount of non-hazardous waste by 1,300 tonnes due to a remodification in the process. Hazardous waste consists of oil-based materials, batteries, lamps or waste chemicals.

Gasum's total water withdrawal in 2018 was 260,000 cubic meters (248,000 in 2017). The figure includes municipal water, groundwater and rainwater. Municipal water consumption decreased slightly and the use of rainwater increased. Water is used as tap water in offices and mainly as process water in biogas plants. The biogas plants recycle process water in their operations, which significantly reduces their water consumption, and after recycling, the water is delivered to customers as a fertilizer or nutrient. The amount of seawater used as ballast water in LNG supply chain vessels totaled 217,000 cubic meters (124,000 in 2017). After use, ballast water is released back to the sea unpolluted.

## Key environmental data 2018

The 2018 performance in figures is presented in the table below. The increase in the shareholding in the subsidiary formerly named Skangas systematically increased our total emission and energy consumption figures compared to 2017. Former Skangas operations are accounted for fully for the whole year of 2018.

	2018	2017	2016
<b>FEEDSTOCKS total, t</b>	<b>744,000</b>	782,000	261,000
Agricultural side streams	172,000	136,000	-
Biodegradable waste	410,000	464,000	-
Municipal wastewater sludge	162,000	182,000	-
<b>ENERGY CONSUMPTION</b>			
Fossil fuel consumption	155	91.1	145.5
Renewable fuel consumption	64.2	46.5	1.5
Electricity consumption	156.2	122.6	9.4
District heat consumption	25.9	32.8	22.6
Steam consumption	47.5	44.7	0
Steam sold	0	2.7	29.5
Heat sold	6.6	11.7	55.7
Electricity sold	4.7	6.3	0.03
<b>Total energy consumption</b>	<b>437.5</b>	<b>317</b>	<b>93.7</b>

	2018	2017	2016
<b>EMISSIONS TO AIR</b>			
CO <sub>2</sub> eq, t (Scope 1)	<b>63,920</b>	44,904	39,326
CO <sub>2</sub> eq, t (Scope 2, location based)	<b>24,270</b>	49,970	6,200
CO <sub>2</sub> eq, t (Scope 1, market based)	<b>14,270</b>	-	-
CO <sub>2</sub> eq, t (Scope 3)	<b>16,280</b>	37,560	-
CH <sub>4</sub> , t (Scope 1)	<b>388</b>	244	374
Biogenic CO <sub>2</sub> , t (Scope 1)	<b>12,960</b>	9,384	297
Nitrogen oxides, t	<b>35</b>	26	26

	2018	2017	2016
<b>NON-HAZARDOUS WASTE</b>			
Reuse	<b>0</b>	8	0
Recycling	<b>106</b>	97	16
Composting	<b>919</b>	338	1,292
Recovery	<b>2,249</b>	4,788	1,942
Incineration	<b>1,090</b>	543	641
Landfill	<b>10</b>	14	12
Other	<b>2,086</b>	1,149	1,001
<b>HAZARDOUS WASTE</b>			
Reuse	<b>64,7</b>	70	209
Recycling	<b>0</b>	0,3	5
Composting	<b>0</b>	0	0
Recovery	<b>27</b>	33	174
Incineration	<b>11</b>	14	12
Landfill	<b>0</b>	0	0
Other	26	30	16
<b>ENVIRONMENTAL FINES</b>			
Fines, €	<b>0</b>	5,700	0
Amount	<b>0</b>	2	0

	2018	2017	2016
<b>WATER WITHDRAWAL, m<sup>3</sup></b>			
Municipal water	<b>195,600</b>	207,565	164,862
Groundwater	<b>24,871</b>	27,812	0
Seawater	<b>217,188</b>	0	0
Rainwater	<b>39,998</b>	12,207	0
Surface water	<b>0</b>	451	0

## 5 ECONOMIC RESPONSIBILITY



### Responsible business

**For us, implementing economic responsibility means operating profitably, transparently and competitively. That allows us to generate economic value for shareholders and to be a reliable employer, investee and partner for stakeholders.**

This section outlines our continuous development of the Nordic gas market together with our business partners. We describe our impact on the surrounding society through the payment and collection of taxes and by being a solid payer of dividend.



Gasum is committed to working towards the [United Nations Global Goals for Sustainable Development](#).

## 5.1 Business partnerships

# Business partnerships play an important role

**We continue the active development of the Nordic gas market, in which our business partners play an important role. In 2018 we offered our partners comprehensive and diverse solutions.**

## Circular economy collaboration

Stora Enso and Gasum are starting circular economy cooperation at Stora Enso's pulp and paper mill in Nymölla, Sweden. Gasum will build and operate a biogas plant at Nymölla, providing a sustainable solution for processing the mill's wastewater effluent sludge into renewable energy.

Gasum plans to produce liquefied biogas (LBG) and sell the LBG as fuel for cars, buses, trucks and ferries. The Nymölla biogas plant project includes biogas production, upgrading and liquefaction. The expected LBG production of the plant is 220 MWh per day. The start-up of the plant is expected during 2020.



## Cooperation with IKEA Finland in circular economy

Gasum continued cooperation with IKEA Finland in 2018 and opened two gas filling stations in conjunction with the Espoo and Vantaa stores of IKEA Finland.

The filling stations are part of the circular economy cooperation of Gasum and IKEA Finland where biogas is produced from food waste from Finland's IKEA stores. In addition, the cooperation aims to increase the distribution of sustainable road fuel gas. The new gas filling stations enable the use of environmentally friendly biogas in IKEA Finland's operations and vehicles of IKEA's transport partners and employees.

## Recycled nutrients cooperation

Gasum has entered into recycled nutrients cooperation with an industrial chemical expert, Algol Chemicals. The commissioning of innovative evaporator and stripper technology at Gasum's Turku biogas plant in Finland enables the separation of nitrogen originating from sewage sludge into a novel product.

In the future, the recycled nutrients will be recovered and supplied to its customers by Algol Chemicals.





## Delivering gas to industry

Gasum delivered for the first time renewable liquefied biogas to Nornickel Harjavalta and Suomen Teollisuuden Energiapalvelut (STEP) Oy, Finland. LBG is used in Nornickel's production of biohydrogen and for energy production. Up to now, Gasum has been supporting Nornickel with LNG. LBG enables the further improvement of the environmental footprint.

In 2018, Gasum entered into an agreement with Prima Protein for the delivery of LNG to the Prima Protein factory in Egersund, Norway. Prima Protein will use LNG to generate the steam used in production. Gasum delivers LNG to a customer terminal constructed at the protein factory. Natural gas was selected as fuel as it is an available and a low-emission option.

Gasum will supply liquefied natural gas to Metsä Tissue Corporation's Mänttä tissue paper mill in Finland. At the Mänttä mill LNG will be utilized in the paper drying process. LNG will enable improved environmental performance by reducing carbon dioxide emissions from production.

## Collaboration with marine

In 2018, Gasum supplied renewable liquefied biogas (LBG) for the first time to a marine customer, the leading Swedish shipping company and LNG pioneer Furetank. The Swedish LBG was delivered to Furetank's M/T FURE VINGA from Gasum's biogas facility in Lidköping. The fueling took place at the port of Gothenburg, where the fuel was transferred directly from a tanker truck to the ship.



Gasum started collaboration with parts of the Gothia Tanker Alliance to supply LNG as a fuel for Swedish shipping companies Furetank Rederi AB, Erik Thun AB and Rederi AB Älvtank. These shipping companies have invested in a total of six new LNG fueled vessels. Together with the existing Fure West, they are all jointly operated by the Gothia Tanker Alliance.

The Swedish Shipowners' Association is actively contributing to reduce any negative environmental impact of the shipping industry. Their goal is zero emissions by 2050. Investing in LNG-fueled vessels contributes to the goal, and with the choice of cleaner fuel, Furetank is experiencing a major reduction in its CO<sub>2</sub> emissions as well as reductions in particulate matter and NO<sub>x</sub>.



## Gas infrastructure collaboration

Manga LNG Ltd's gas import terminal project is a joint venture where Gasum partners with Outokumpu, SSAB Europe and EPV Energy.

Progress was made in the construction of the terminal at Röttä Harbor of the Port of Tornio, Finland, in 2018. Once completed during the first half of 2019, the terminal will be the largest LNG import terminal in the Nordic countries.

## Partnering with heavy-duty and light-duty transport

Gasum has cooperated with Finland's leading postal and logistics service company Posti for a long time. Posti has 40 biogas-fueled delivery vehicles in its fleet. In 2018, Posti took into service two full trailer combinations powered by liquefied natural gas. Posti will be using the LNG vehicles for demanding transport operations. Posti's target is to reduce carbon dioxide emissions in proportion to net sales by 30% by 2020.

The Finnish dairy manufacturer Valio took into service its first biogas fueled delivery vehicle in the Helsinki Metropolitan Area. Waste feedstocks used in biogas production include inedible side streams from Valio's production, which means Valio also takes part in biogas production by supplying raw material to Gasum's biogas plants.



Gasum and the grocery store chain Lidl Finland are partnering to promote the circular economy. As part of the collaboration, Lidl will deliver biowaste generated at its stores to biogas plants where the biowaste is used to produce renewable biogas. Lidl is introducing a truck powered by liquefied biogas that is fueled with biogas produced from Lidl stores' own waste. The truck will help Lidl reduce its emissions by an annual total of up to 193 tonnes of CO<sub>2</sub>.

### 5.1.1 Customer satisfaction

## Customer satisfaction is studied continuously

**We conduct customer satisfaction surveys to find concrete and hands-on ways to improve the customer experience and service quality.**

In 2018, customer satisfaction was surveyed using phone interviews and online questionnaires. The surveys focused on industrial customers, waste processing customers and customers using the installation services of Technical Services. Our Net Promoter Score (NPS) is quite high, which means our current customers are prepared to recommend Gasum as a cooperation partner.

Industrial customers of the Natural Gas business appreciate service-mindedness and the supply security of energy in Gasum's operations. Respondents value good accessibility and expertise as well as active engagement in Gasum account managers' work. Industrial customers hoped to see clear pricing models and pricing.

Aspects appreciated by waste processing customers of the Biogas business include ease and smoothness of dealing with Gasum, flexible and speedy response to changing customer needs, and well-functioning reporting. Waste processing customers hoped to see more biogas filling stations and, in particular, the development of the further uses of sludge and raked-up waste.

Customer satisfaction of Technical Services installation customers is studied continuously over the year through weekly online surveys to customers who have used our services. Customers are satisfied with the professional and speedy service. As regards to other business functions, customer satisfaction is surveyed case-specifically and the respondent customer groups are selected during the current year.

Gasum's LNG business (former Skangas) commissions a customer satisfaction survey among all of the customers of its operating area every year. According to the survey the level of customer satisfaction has remained good.

Gasum account managers meet and keep in touch with customers around the year. Customer satisfaction and feedback is monitored in many ways, including through customer service and one-to-one contacts between the surveys. All customer feedback is entered into the CRM system.



### 5.1.2 Supply certainty



## Supply certainty at excellent level

**Gasum's target is that there are no unplanned disruptions in the supply of natural gas, LNG or biogas. Supply certainty is maintained in a systematic and preventive manner and disruptions are extremely rare.**

In 2018, Gasum had no unplanned supply disruptions in natural gas supply to its customers. Two planned disruptions occurred, but due to careful planning they did not affect the amount of gas deliveries. The supply certainty of Gasum's natural gas supplier has been at an extremely high level throughout the cooperation spanning more than 40 years. Key roles are also played by systematic maintenance work, continuous gas network monitoring, real-time alerts and backup system maintenance.

The supply certainty of LNG was 100% in 2018. Supply certainty was strengthened by the introduction of the world's first LNG carrier holding the Ice Class 1A Super, Coral EnergyICE. The vessel enables disruption-free deliveries in all weather conditions.

In addition, the supply certainty of biogas has been excellent over the past years and also remained at an excellent level in 2018.



## 5.2 Sourcing and supply chains

# Sourcing principles

**The Gasum Group complies with the principles of openness, transparency and non-discrimination regarding suppliers and other stakeholders in all of its operating countries. The Group expects its suppliers to comply with the same principles and rules that the Group follows in its operations.**

Our procurement guidelines describe and determine our procurement processes and principles that must be followed in sourcing. Supplier data forms, liability, material certificates and safety data sheets can be found in Gasum's systems.

By always evaluating suppliers in conjunction with procurements, we make sure cooperation with suppliers is in compliance with our adopted principles. Gasum also has a continuous focus on supplier monitoring and re-evaluation. Supplier re-evaluations are carried out to ensure supplier suitability and up-to-date quality criteria. In addition to evaluations, we conduct supplier audits of our critical suppliers based on evaluation results.

## Network for Sustainable Procurement

Gasum is a member of the Ecolabelling Network for Sustainable Procurement. We seek to look for and favor ecolabeled products whenever possible. Alternative ecolabeled products are explored in conjunction with sourcing, and decisions on products to be procured are made as cost-effectively as possible. Suppliers that show awareness of the external environment and energy consumption (compliant with ISO 14001 and ISO 50001) are preferred.

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## Natural gas, LNG and biogas supply chains

Natural gas imported to Finland from Russia originates from Western Siberia, mostly from the gas fields of Yamburg and Urengoy. The length of the gas transmission pipeline from the fields to the Finnish-Russian border totals around 3,300 km. The gas company Gazprom is in charge of natural gas production and transmission on the Russian side up to the Finnish border. Natural gas enters Finland via the Imatra Reception Station and is transmitted further to customers around Finland via the transmission network. The length of the Finnish gas transmission pipeline network totals around 1,300 km.

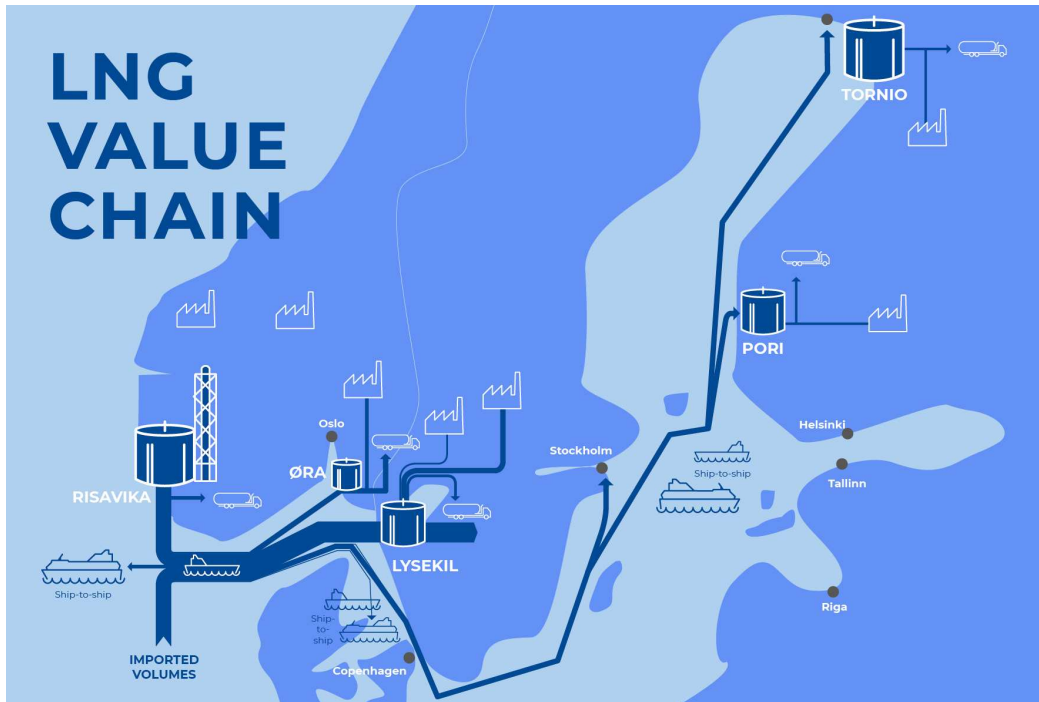
For LNG production, Gasum sources natural gas off-shore via a subsea pipeline system in Norway. The LNG production facilities are located in Risavika, Norway. LNG is also imported to the Nordic countries via terminals in Northwestern Europe. Gasum delivers LNG for fuel use to areas not covered by the gas pipeline network.

LNG is delivered using road tankers and carriers from LNG terminals to customers. The terminals are located in Øra and Risavika, Norway, Lysekil, Sweden, and in Pori and in Tornio at the joint venture Manga LNG terminal, Finland.

Feedstocks used in biogas production include biodegradable waste, such as inedible biowaste from food retail outlets, agricultural side streams, and sewage sludge, as well as agricultural biomass. Feedstocks are delivered to Gasum biogas plants by trucks.

Gasum's biogas plants provide services in waste treatment, biogas production and production and distribution of recycled fertilizers. Upgraded biogas is injected into the existing natural gas pipeline network or transported in separate containers to destinations such as gas filling stations located in areas that are not covered by the pipeline network.

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The LNG value chain show the LNG product chain from source to customer.

### 5.3 Economic performance

(102-1 , 201-1, 201-4)

## Economic responsibility

**For us, implementing economic responsibility means operating profitably, transparently and competitively. That allows us to generate economic value for shareholders and to be a reliable employer, investee and partner for stakeholders.**

In 2018, our investment focus was on fixed assets and business acquisitions. Investments increase the company's significance in society as well as economic value generation. In addition to investments, we also have an impact on the surrounding society through the payment and collection of taxes and by being a solid payer of dividend.

Financial reporting at Gasum is based on the International Financial Reporting Standards (IFRS), which ensure uniform and transparent reporting for internal performance monitoring and management within the Group as well as external reporting.

### Direct economic value generated and distributed

Gasum is a significant economic player in its operating environment in the Nordic countries. The most significant direct cash flows in our operations arise from sales revenue from customers, energy purchases including energy taxes, purchases of goods and services from suppliers, payments to providers of capital and shareholders, growth and maintenance investments, personnel expenses, and taxes paid.

No changes took place in the company's ownership structure in 2018. The State of Finland has 100% ownership of Gasum. Of the shares, 73.5% are held by the state-owned Gasonia Oy and 26.5% directly by the State of Finland. Our contributions to society include paying dividends and taxes for securing the basic functions of the welfare society. Capital expenditures as well as purchases of goods and services provide employment locally as well as outside Gasum's operating areas.

The following table presents Gasum's cash flows to various stakeholders, such as personnel, providers of capital, suppliers, shareholders and the public sector. The years are not directly comparable with each other:

- In August 2018, Gasum acquired the energy market services business of Enegia, which covered the shareholdings in Enegia Consulting Oy (currently Gasum Consulting Oy), Enegia Portfolio Services Oy (currently Gasum Portfolio Services Oy) and IntStream Oy. In addition, Gasum acquired a further holding in Skangas AS (currently Gasum AS), raising Gasum's holding in the company to 100%.
- In early 2017, Gasum sold its Finnish heat business and local distribution network gas sales to Auris Kaasunjakelu Oy. In addition, Gasum acquired a further shareholding in Skangas AS in Norway and carried out the acquisition of Swedish Biogas International, which resulted in the transfer of 100% of the shares of Swedish Biogas International AB (currently Gasum AB) and its subsidiaries to Gasum.

All of these companies are included in the figures reported for the periods during which they have been part of the Gasum Group.

### Financial assistance received from government

In 2018, Gasum received a total of €20.6 million in investment support. Financial assistance was received for current and future investments in Finland and Sweden. Support was mainly targeted at biogas plant investments and filling station construction.

The Finnish Ministry of Economic Affairs and Employment granted Gasum almost €8 million in 'Bioeconomy and clean solutions' key project support for increased biogas production capacity. The Swedish Environmental Protection Agency granted Gasum's project in Nymölla almost €13 million in investment subsidy from its Climate Leap program. The projects have been launched and some of the support granted will be received during the coming reporting periods.

Financial support from Business Finland (formerly Tekes in 2018 totaled €19,000 (2017: €67,000).

<b>DIRECT ECONOMIC VALUE CREATED AND DISTRIBUTED</b>		<b>TOTAL</b>		
Economic value generated, € thousand		<b>2018</b>	2017	2016
Customers	Earnings from sales and purchases of products and services, including energy taxes	1,177,448	924,987	843,357
<b>Total economic value generated</b>		<b>1,177,448</b>	<b>924,987</b>	<b>843,357</b>
<b>Economic value distributed</b>				
Suppliers	Purchases of products and services	886,772	660,653	591,956
Personnel	Salaries, remuneration and employer's contributions	40,117	38,452	34,059
Financial institutions	Interest and other financial costs	3,844	5,091	5,299
	Other financial institutions (finance lease)	13,474	6,002	9,174
Shareholders	Dividends*	32,902	50,000	70,000
Public sector	Taxes payable for the period and energy taxes of purchases	101,358	93,940	88,806
Community	Donations	223	6	0
<b>Total economic value distributed</b>		<b>1,078,691</b>	<b>854,144</b>	<b>778,934</b>
Economic value retained		98,757	70,843	64,424

## Development and impact of infrastructure investments and services supported

Gasum made significant investments supporting society and the environment in 2018 by investing in the increased operational efficiency of its biogas plants and in the production of organic nutrient products. The feedstocks base of the biogas plants in Sweden is being expanded from agricultural side streams to biowaste. The development of the Biogas business promotes the circular economy and improves access to renewable energy. Increased production of renewable energy promotes society's emission reduction aims. With our energy market services, we facilitate our customers' energy efficiency management and their carbon footprint reductions through Guarantees of Origin for electricity.

The Gasum Group's capital expenditure on intangible fixed assets and property, plant and equipment 2018 totaled €48.0 million (2017: €22.9 million). Most of this was to do with the construction of new filling stations and biogas plant expansion investments.

In addition to capital expenditure, Gasum has made investments through business acquisitions. In 2018, Gasum acquired Enegia's energy market services business. In addition, Gasum acquired a further holding in Skangas AS (currently Gasum AS), raising Gasum's holding in the company to 100%.

## 5.4 Tax footprint

# Gasum as a taxpayer

### **Gasum complies with country-specific legislation and regulations in tax payment, collection, remitting and reporting.**

Taxation is always a consequence of business activity and taxes are paid in compliance with legal provisions in the country where the activity is located. Gasum's tax strategy aims to ensure the realization of investments, flexibility of operations and capability to pay dividends to shareholders.

Gasum makes efforts to manage and reduce any taxation-related uncertainties, and our aim is to manage tax issues in a manner enabling timely response to future challenges. Taxation-related matters are evaluated continuously whenever changes take place in external regulation and our operations expand to new areas.

We participate continuously in the development of tax legislation and policies and want to be involved in the development of a fair, clear and consistent tax system. As part of tax issues management, in the spring of 2018 Gasum entered into an enhanced customer relationship with the Tax Office for Major Corporation in Finland.

This supports Gasum's tax strategy and intent to be a responsible taxpayer and promote smooth and interactive collaboration with the authorities. In our tax reporting, we also comply with the guidelines concerning state-owned companies issued by the Ownership Steering Department in the Prime Minister's Office.

The Group's tax matters are directed and reported to the CEO by the chief financial officer (CFO). The ultimate control of the company's tax matters lies with the Board of Directors alongside other duties relating to the control of the company's finances in accordance with the principles laid down in the Limited Liability Companies Act.

## Tax environment in 2018

Gasum's outlook improved in 2018 with regards taxation as well. In September 2018, the Finnish Government proposed that the taxation of combined heat and power (CHP) production be changed by abandoning the halving of carbon dioxide tax and replacing it with a lower energy content tax of €7.63 per megawatt hour for fuels used in CHP production. The above changes increase coal taxation in CHP by around €3 per megawatt hour and decrease the taxation of natural gas by around €0.7 per megawatt hour. The reform entered into force at the beginning of 2019.

Biogas is also an inexpensive alternative as regards taxation. Biogas does not come under the scope of application of the Act on Excise Duties and is therefore exempt from excise duty. In terms of taxation, biogas sales can in addition to being sold as physical gas, also take place as Biogas Certificates where the bio-attribute is separated from the physical biogas produced.

## Tax footprint

The tax footprint illustrates the taxes and tax-like payments, by country, received by society from the company's operations. Taxation-related responsibility is derived from Gasum's management principles. Gasum seeks to increase transparency in its tax reporting and facilitate a good understanding of its tax footprint. In our communications we wish to report transparently, consistently and reliably on taxes as well. Gasum's quantitative tax data is presented in the following table. The Group's effective tax rate is 17.2%. The effective tax rate is affected by matters including changes in tax rates taking place in operating countries and their impacts on deferred taxes and any recognition of deferred tax assets for losses.

The years are not directly comparable with each other:

- In August 2018, Gasum acquired the energy market services business of Enegia, which covered the shareholdings in Enegia Consulting Oy (currently Gasum Consulting Oy), Enegia Portfolio Services Oy (currently Gasum Portfolio Services Oy) and IntStream Oy. In addition, Gasum acquired a further holding in Skangas AS (currently Gasum AS), raising Gasum's holding in the company to 100%.
- In early 2017, Gasum sold its Finnish heat business and local distribution network gas sales to Auris Kaasunjakelu Oy. In addition, Gasum acquired a further shareholding in Skangas AS in Norway and carried out the acquisition of Swedish Biogas International, which resulted in the transfer of 100% of the shares of Swedish Biogas International AB (currently Gasum AB) and its subsidiaries to Gasum.

All of these companies are included in the figures reported for the periods during which they have been part of the Gasum Group.

TAX FOOTPRINT												
€ thousand	FINLAND			NORWAY			SWEDEN			TOTAL		
	2018	2017	2016	2018	2017	2016	2018	2017	2016	2018	2017	2016
Taxes paid												
Corporation taxes	31,435	31,454	18,952	122	549	0	-158	107	0	31,399	32,110	18,952
Asset-related taxes*	330	170	146	58	92	92	74	72	0	462	333	237
Employer's contributions	5,095	5,336	5,751	192	184	795	1,480	1,148	700	6,767	6,668	7,245
<b>Total taxes paid</b>	<b>36,860</b>	<b>36,960</b>	<b>24,849</b>	<b>371</b>	<b>825</b>	<b>886</b>	<b>1,396</b>	<b>1,327</b>	<b>700</b>	<b>38,628</b>	<b>39,112</b>	<b>26,435</b>
TAXES COLLECTED												
Value-added tax, sales	241,315	184,755	180,049	22,679	19,653	39,428	45,061	30,978	2,069	309,056	235,386	221,547
Value-added tax, purchases	38,725	26,414	32,928	38,542	33,949	29,718	33,700	18,215	405	110,968	78,578	63,051
Value-added tax, net	202,589	158,341	147,121	-15,863	-14,296	9,711	11,361	12,763	1,665	198,088	156,809	158,496
PAYE deductions from salaries	7,464	6,980	6,953	1,722	1,636	1,405	1,470	1,102	498	10,656	9,718	8,856
Employee's social security contributions	1,246	1,691	1,051	0	0	605	796	654	433	2,042	2,345	2,089
Energy taxes, sales**	67,180	59,646	66,139	6,390	607	2,451	742	835	0	74,312	61,089	68,590
Energy taxes, purchases**	68,556	60,376	69,156	896	198	460	46	923	0	69,498	61,497	69,616
Energy taxes, net	-1,376	-729	-3,017	5,494	409	1,991	697	-88	0	4,814	-408	-1,026
Taxes at source	34	30	16	0	0	0	0	0	0	34	30	16
<b>Total taxes collected</b>	<b>209,957</b>	<b>166,312</b>	<b>152,123</b>	<b>-8,648</b>	<b>-12,251</b>	<b>13,712</b>	<b>14,324</b>	<b>14,432</b>	<b>2,596</b>	<b>215,634</b>	<b>168,493</b>	<b>168,432</b>
Total taxes paid and collected	246,817	203,272	176,972	-8,276	-11,426	14,599	15,721	15,759	3,296	254,262	207,605	194,867
Revenue by country	940,839	728,470	689,274	86,102	65,434	154,077	150,507	131,083	6	1,177,448	924,987	843,357
Profit before tax	114,439	115,214	121,042	-15,132	-11,647	4,648	1,247	-3,684	-214	100,554	99,884	125,476
Personnel on average	329	292	310	62	53	44	56	50	16	446	395	370

**\*The Group companies at December 31, 2018 by country are as follows:**

- **Finland:** Gasum Ltd, Gasum Tekniikka Oy, Gasum LNG Oy, Gas Exchange Ltd, Oulun Biotehdas Oy, Riihimäen Biotehdas Oy, Gasum Consulting Oy, Gasum Portfolio Services Oy, IntStream Oy, Suomen Kaasunsiirtopalvelut Oy, Baltic Connector Oy
- **Norway:** Gasum AS, Gasum LNG Production AS, Gasum Traffic AS, Gasum Holding AS
- **Sweden:** Gasum LNG AB, Gasum AB, Gasum Jordberga AB, Gasum Västerås AB, Gasum Stigtomta AB.

## 5.5 Risk management



# Risk management policy to safeguard value creation

## Strategic and political risks

One of the elements of the Gasum strategy is expanding the Nordic gas market. Gasum aims to grow strongly in the coming years. Expanding the gas ecosystem involves investments in the gas infrastructure and partnerships in the Nordic countries. Strategic risks relate to changes in the operating environment, technology, customers and markets and to competition for talent and competence. Strategic risks are managed as part of the Group's strategic planning framework in risk assessment and management according to Gasum's strategy annual clock.

The political risk relating to the various Gasum businesses mainly relates to changes in EU and national regulation, energy subsidies and, in particular, taxation. We prepare for these risks by monitoring and actively participating in the debate concerning each of the risks to our operating environment. In addition, Gasum seeks to comprehensively draw attention to our viewpoints at various levels of decision-making, on impacts from proposed amendments to regulation or taxation and developments in the operating environment that plays a key role for Gasum.

## Operational risks

Our risk policy outlines the Enterprise Risk Management Principles and framework at Gasum. Risks as well as any opportunities brought by them are assessed at Gasum regularly once a year, and updates on risks and the status of risk management actions are reviewed quarterly and whenever necessary as changes take place in circumstances. The assessments cover maximum loss, probabilities, Gasum's current level of risk management, i.e. risk response and, on the basis of these, the expected risk value.

Enterprise Risk Management is an integral part of decision-making at all organization levels at Gasum. To achieve these objectives, Gasum ERM is continuously improved with the support of the methodology and best practices of risk management, especially ISO 31000 and ISO 9001. We have centralized the management of insurance in the Group Risk management unit of the parent company that covers the entire Group.

Due to the nature of our business, Gasum is exposed to operational risks. We distribute gas through the pipeline network or by using containers. As the company's logistics operations take place both on land and at sea, this exposes the company to the operational risk of disruption to customers' energy supply. The company monitors its operations, production and logistics on a daily basis, ensuring compliancy with environmental permits. Employee health and safety at work is a top priority in mitigating operational risks. We are prepared for disruptions in the supply of natural gas by having reserve fuel arrangements in place.



## Financial risk management

The purpose of the Gasum Group Commodity Risk Policy and Treasury Policy is to identify and analyze the Group's financial risks and establish the appropriate risk level and controls. Risk controls are employed to monitor risks and supervise that the limits set by the risk management policies is not crossed. The risk management policy is regularly assessed to ensure it responds to any changes in market conditions or Group functions.

The Group and its operations are exposed to operational as well as financial risks. Operational risks relating to our business include risks relating to the market price development of oil and gas products. In addition, business functions acquired involve risks relating to their business development. Financial risks include interest rate risk, price risk, foreign currency risk, credit risk and liquidity risk. The Group's risk management is carried out by the Group's financial unit together with business planning and business units.

## Commodity derivatives and risks

Commodity derivatives are used to hedge the Group's outstanding commodity position relating to sales activities as well as price risk relating to electricity sourcing. The Group's commodity risks are managed with a commodity risk management policy that sets the limits for commodity risks.

The policy steers towards closing all outstanding sell and buy positions. Outstanding positions might arise from imbalance in sales and procurement volumes, price index or grounds for pricing. General hedging principle at Gasum is that energy commodity price fluctuation in sales pricing is to be hedged back to back with procurement contracts.

As a general rule, the pricing of the Group's gas supply contracts reflects developments in the international market prices of gas. In the Natural Gas unit, the supply price of gas is linked to indices based on energy and cost development. In the 2018 reporting period, the indices applied to natural gas sales prices were the same as those applied to gas procurement, whereby there was no outstanding commodity risk.

In the LNG business, the sourcing of gas is mainly linked to gas indices, with the same index linkages mostly also used in the sales agreements of the LNG business. The Group has hedged the risk arising from purchase and sales contract structuring with commodity derivatives. When selling LNG under fixed-price supply agreements, we hedge outstanding price positions with commodity derivatives.

The gas businesses consume significant amounts of electricity in their processes, resulting in price risk when there are changes in the price of electricity. Electricity hedging has therefore taken place in the Group with derivatives.

## 6 ACCESS TO ENERGY



### Access to energy

**We develop a smart, efficient and sustainable gas ecosystem and fulfill customer needs on land and at sea.**

This section outlines our products and the versatile infrastructure we have in place for the sourcing, transmitting and liquefying of gas, as well as delivering the products via terminals and other logistical means. In addition, our networks of biogas plants and filling stations are presented. In 2018, we acquired Eneja energy market services, which strengthens our position as an energy company of the future.

## 6.1 About gas

**Natural gas** consists of almost pure methane and sourced from natural gas and oil deposits as well as shale rock. Natural gas is odorless, tasteless and non-toxic, and it does not contain sulfur, fine particulate matter or heavy metals. Carbon dioxide emissions from natural gas are lower than from oil or coal. Natural gas has a net calorific value (NCV) of 10 kWh/m<sup>3</sup>, which corresponds to the NCV of one liter of light fuel oil.

Natural gas has a multitude of uses. Industrial facilities utilize natural gas as a fuel as well as a raw material, and natural gas provides a high rate of efficiency in combined heat and power (CHP) production. Natural gas can be used in many industrial processes to generate, for example, heat and electricity, while in the process industry natural gas can be utilized as a raw material. Homes and restaurants use natural gas for heating and cooking. In compressed and liquefied form, natural gas is also an excellent maritime and road transport fuel.



**Liquefied natural gas (LNG)** is natural gas converted into liquid form by cooling it to -162 °C. As a fuel, the properties of LNG are equal to those of natural gas. In the liquid state, LNG only takes 1/600 of the volume of gas in the gaseous state. This is why LNG can be stored, transported and used conveniently and cost-effectively. LNG is an environmentally friendly energy source that meets the maritime transport emission limits that entered into force in the Baltic Sea in January 2015. Like natural gas, LNG is odorless, tasteless and non-toxic, and it does not contain sulfur, fine particulate matter or heavy metals. Using LNG helps cut carbon dioxide emissions by up to 25% compared with petroleum products. LNG is currently utilized in industry as well as shipping and heavy-duty road transport. LNG enables the delivery of gas outside the gas pipeline network.

**Biogas** is a 100% local and renewable energy source. The composition of raw biogas varies depending on the production method and feedstocks used. Feedstocks that can be used to produce biogas include various types of biodegradable waste, such as municipal and industrial waste as well as sewage sludge.

Raw biogas is upgraded to a composition that is equal to natural gas, and biogas can be used for all the same purposes as natural gas. The net calorific value of upgraded biogas is around 10 kWh/m<sup>3</sup>. Biogas is used in electricity and heat production, industrial facilities, home heating, cooking and as a transport fuel. The existing gas pipeline network is used to transmit biogas from production facilities to customers. Biogas can also be liquefied. This is when it is referred to as liquefied biogas (LBG). LBG can be delivered outside the gas pipeline network. The production of renewable synthetic natural gas (SNG) is also currently under development. Renewable SNG can be produced by gasifying biomass such as wood (bio-SNG) or through electrolysis from renewable electricity (e-SNG).

Biogas production also enables nutrient recycling as the nutrient residues from the process can be utilized as fertilizers for purposes such as agriculture or as nutrient components in wastewater treatment. Using recycled fertilizers reduces the need to use conventional artificial fertilizers.



## 6.2 Gas network



### Gas transmission network

Gasum owns the Finnish natural gas transmission pipeline network and is responsible for gas transmission to customers. Natural gas imported from Russia and biogas from Finnish biogas plants is injected into the pipeline network. Gasum is the Finnish transmission system operator (TSO) under the Natural Gas Market Act.

Natural gas is transmitted across the border in two transmission pipelines. There being two transmission pipelines helps ensure security of supply also during any pipeline damage. The quantity of the imported natural gas is measured and its quality inspected at the Imatra reception station.

The pipelines are laid at a depth of 1–2 m, and their location is marked with signposts. The high-pressure transmission pipeline network is 1,300 km long.

### Natural gas sourcing

Finland does not have any native natural gas reserves and all of the natural gas used in Finland is sourced under long-term supply contracts from Russia. The natural gas is transmitted from Russia to Finland via the gas pipeline network. The Western Siberian gas fields are located around 3,300 km from the Finnish-Russian border.

### Transmission network also used for biogas

In addition to natural gas, renewable biogas from four different Finnish biogas plants is also injected into the gas transmission network.

### Unbundling of transmission business

Gasum's transmission business will be unbundled by January 1, 2020 in the manner required by the Natural Gas Market Act. As part of the preparations, Gasum has founded a new subsidiary, Suomen Kaasunsiirtopalvelut Oy, which is tasked with planning transmission network business development processes for the period after the unbundling. At the end of 2018, Baltic Connector Oy, which is building a gas interconnector between Finland and Estonia, was transferred from the State of Finland to the Gasum Group. Read more about [Gas transmission opening markets](#).

### Open gas market

Finland's new Natural Gas Market Act entered into force at the beginning of 2018. In addition to the reformed Act, the market opening also requires rules and procedures agreed by the sector. Gasum is coordinating the gas market rules formulation process in cooperation with customers and other stakeholders.

### 6.3 Liquefaction plant, LNG terminals and logistics



\*Photo: Studio Timo Heikkala Ltd. Rights: Arctia Ltd, Business Finland, Gasum Ltd, Finnish Transport Infrastructure Agency.

## Liquefaction plant and LNG terminals

**Gasum is the biggest distributor of LNG in the Nordic countries and is strengthening the position of LNG in accordance with the EU strategy for LNG.**

We deliver liquefied natural gas (LNG) to all our LNG customers from our production plant in Norway as well as from sourcing partners in Europe.

Gasum's LNG production plant located in Risavika, Norway, has a production capacity of 300,000 tonnes LNG per year. LNG is produced by removing CO<sub>2</sub> and water from natural gas, and by liquefying the product by cooling it down to approximately 163 °C below zero. LNG is stored at atmospheric pressure in a large containment tank. From the storage tank, LNG is loaded on board ships or trucks for transport to customers. At Risavika there is an LNG bunkering facility for marine customers in conjunction with the plant.

LNG is delivered to our LNG terminals which are located in Øra, Norway, in Lysekil, Sweden, and Pori, Finland, by chartered vessels such as the Coral EnergiCE carrier. From the terminals, LNG is delivered by trucks to industrial facilities with customers' terminals or as in the gaseous via local gas grids to industry customers located nearby.

Gasum is also a shareholder of the Manga LNG joint venture in Tornio, Finland.

**Our ways of delivering LNG to marine and industry customers:**

- truck-to-ship;
- terminal-to-ship;
- ship-to-ship bunkering;
- to terminal by truck;
- via local gas grids to industry located nearby.

## Effective LNG deliveries

The liquefied natural gas (LNG) carrier Coral EnergiCE is the world's first direct driven dual-fuel ice-class 1A LNG carrier. The carrier delivered the first shipload LNG to Finland in 2016.

Coral EnergiCE has a direct drive dual-fuel engine. This unique engine means that the propulsion system is extremely efficient and, with LNG as marine fuel, the propulsion provides an eco-friendly ship operation. Due to her size and in-house developed innovative compatibility package, the ship is able to load LNG at world-scale terminals.

The carrier was built in 2012 and has a capacity of 15,600 m<sup>3</sup>.



## Safe ship-to-ship bunkering

Our LNG bunker vessel, Coralius, made its 100th bunkering in early 2019. Operating on behalf of Gasum (former Skangas), Coralius mainly operates in the North Sea and the Skagerrak area. Coralius delivers LNG through ship-to-ship bunkering at sea and in port.

This has significantly increased Gasum's flexibility and responsiveness to vessels that require LNG but are unable to visit a terminal or a port. By making LNG more accessible to vessels, ship-to-ship bunkering also boosts efficiency. The bunkering operations are swift and safe.

We foresee that Coralius will continue to perform an increased amount of bunkering operations. An increase in the average amount of delivered stem is expected as it will perform bunkering on shuttle tankers and other bigger vessels. Coralius has increased its efficiency due to LNG bunkering operations becoming faster – they are now nearly as quick as normal oil bunkering, which has also increased customer satisfaction.

Coralius was built in 2017 and is the first European built LNG bunker and distribution vessel. It is equipped with state-of-the-art LNG transfer equipment for bunkering and has a cargo capacity of 5,800 m<sup>3</sup>.

## 6.4 Biogas plants



## Biogas plants network

**Our Nordic network of biogas plants is a model example of circular economy implementation. Alongside energy production, biogas technology enables the recycling of nutrients and fibers contained in waste and side streams back into food production or industrial purposes, where they directly replace mineral fertilizers and fossil fibers.**

We own a nationwide network of biogas plants in Finland and Sweden. We own 12 biogas plants and have 3 partnering plants. Our local biogas plants provide services related to biodegradable waste processing, biogas production and production and distribution of recycled fertilizers.

We are the leading processor of biodegradable waste and supplier of biogas in the Nordic countries. The production capacity of the plants totals 650 GWh. In 2018 we processed a total of 744,000 tonnes of biomass at our plants. We produced fertilizer products nationwide at seven plants in Finland and at five plants in Sweden totalling around 769,000 tonnes in 2018.

Biogas production creates fertilizer products for agriculture and gardening soil production as well as nutrient concentrates (such as nitrogen and phosphorus concentrates containing organic carbon) used in agriculture and industry. Other organic nutrient products such as nitrogen nutrients containing ammoniacal nitrogen and water are used in industrial applications such as flue gas cleaning at power plants. Demand for organic nutrients is evolving rapidly in a variety of industrial sectors.

### Plants in Finland

- Huittinen
- Kuopio
- Riihimäki
- Turku
- Vehmaa
- Honkajoki
- Oulu

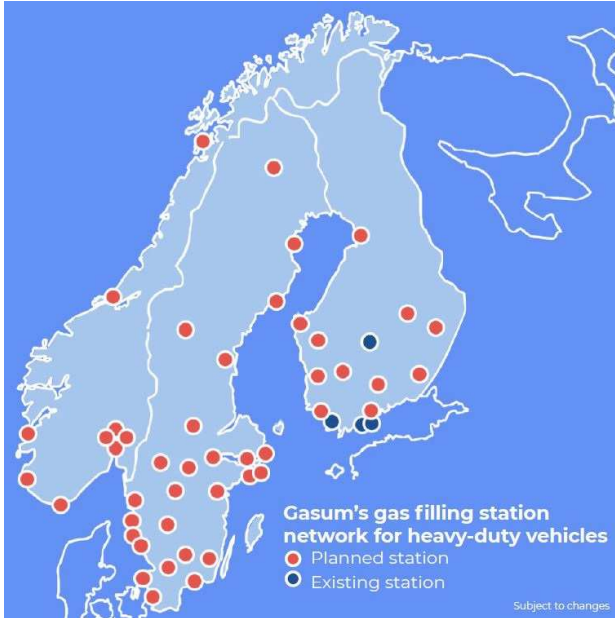
### Partner plants in Finland

- Espoo
- Kouvola
- Lahti

### Plants in Sweden

- Jordberga
- Katrineholm
- Lidköping
- Örebro
- Vadsbo (50% shareholding)
- Västerås (majority holding)

## 6.5 Gas filling station network



Read more about [the gas filling station network](#) >



## Gas filling station network

**We are actively developing the biogas and natural gas filling station network and aim to increase the number of Gasum stations by building new ones over the next ten years.**

The demand for clean and affordable road fuel gas is increasing sharply all the time, and opportunities to switch to gas as a road fuel are further improved by the growing station network. The foundation for the filling station network is provided by the current gas infrastructure, developing LNG market and regional biogas production.

The **heavy-duty vehicle filling station network** is growing in the Nordic countries. We are committed to investing in the development of the low-emission gas market. We will construct around 50 gas filling stations for heavy-duty vehicles in Finland, Sweden and Norway by the beginning of the 2020s. The investment will multiply the size of the Nordic heavy-duty vehicle gas filling station network, enabling considerable emission cuts.

The **gas filling station network** is simultaneously growing in Finland. We want to promote cleaner road transport by constructing 35 new gas filling stations. The key criteria for our filling station investments are demand, location, technical feasibility and management of operational and maintenance operating models.

## New gas filling stations were opened

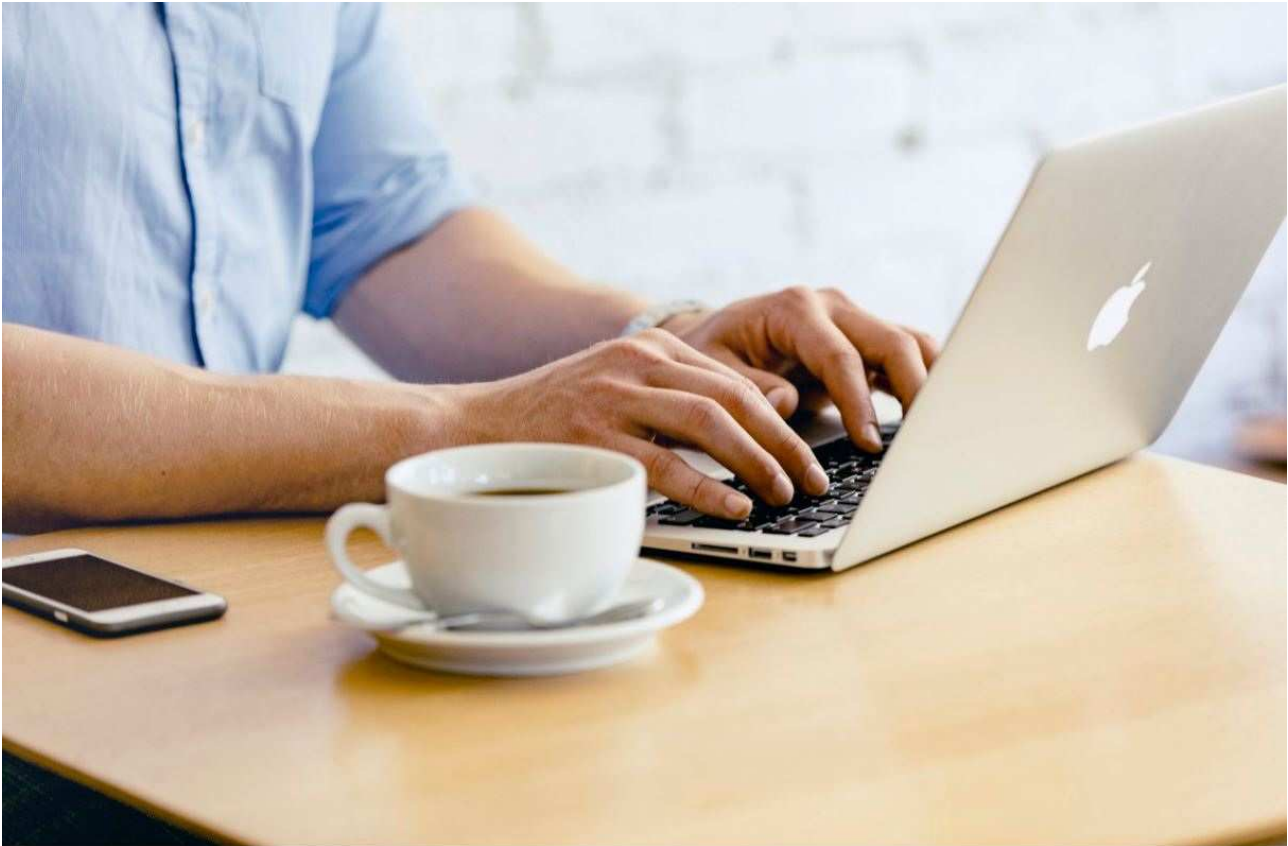
In 2018 a new filling station was opened in Salo, Finland.

In addition, we opened two new gas filling stations at the Espoo and Vantaa stores of IKEA Finland in 2018. This was part of the circular economy cooperation between Gasum and IKEA Finland, where biogas is produced from food waste from Finland's IKEA stores.

In Finland Gasum has 28 gas filling stations and all together there are 41 stations. In 2019, we will open several filling stations in Finland and in Sweden for both heavy-duty vehicles and for gas cars. Read more about [coming gas filling stations](#).



## 6.6 Energy market services



### New energy market services to customers

**As part of the Gasum strategy to develop the Nordic gas market, we made an acquisition of the Enegia energy market services business in 2018.**

The acquisition of the energy market services business enables service expansion in the energy wholesale market. Capacity to operate more broadly in the energy market strengthens Gasum's position as an energy company of the future.

Gasum enables easy operations in the energy market with partners. We offer our expert support, the latest market information and the most flexible software solutions in the market.

### We help to manage energy market risks

Gasum's energy market services assist customers to operate successfully in the energy market, providing a long-term risk management strategy and speedy response to changes in the market situation. Our services include taking care of electricity sales, sourcing and production for our customers throughout the market chain.

Our portfolio management services provide access to the best possible electricity prices for up to several years ahead. In the wholesale physical electricity market, we can participate in trading on behalf of our customers and tap into market opportunities around the clock.

We also help our customers operate responsibly by obtaining Guarantees of Origin for electricity. Favoring renewable electricity is an excellent opportunity for enterprises and other actors to implement their environmental responsibility. In addition, we act as an expert in emission allowances trading. Read more about [Gasum energy market services](#)

## 7 Reporting & Data

# Reporting principles

**Gasum reports annually on its sustainability performance at the Group level. The Corporate Responsibility Report for 2018 presents Gasum's approach to sustainability management and disclosures on significant performance topics.**

Relevant disclosures to our operations, products and stakeholders have been selected based on an assessment of the material sustainability issues for Gasum and its stakeholders.

The Corporate Responsibility Report for 2018 has been prepared according to the Global Reporting Initiative (GRI) standards (2016), Core option. Gasum has reported in accordance with the GRI Guidelines since 2010. The 2018 reporting year is the first in accordance with the GRI standards (2016).

Financial statements are prepared and disclosed in compliance with the International Financial Reporting Standards (IFRS) and governance-related reporting in compliance with Finnish legislation. Our economic performance indicators are based on audited data. Personnel and health and safety figures as well as reporting on environmental aspects are in accordance with the GRI Standard, while costs are reported in compliance with the Finnish Accounting Board's general guidelines for recording, accounting and disclosing of environmental issues as part of the financial statements. Gasum's reporting takes place under Finnish law and the guidelines issued by the Ownership Steering Department in the Prime Minister's Office.

Information concerning many of the reported disclosures can also be found in Gasum's Year 2018 news feed, Gasum Financial Review 2018, and Gasum Governance and Remuneration 2018. All of these documents can be found online at [www.gasum.com](http://www.gasum.com) - [Key figures](#).

The report was published in English on the Gasum website on March 12, 2019.

## Reporting scope and data

Our 2018 reporting covers the whole Gasum Group, including all three business units (Natural Gas, LNG, and Biogas) as well as the internal service function (Technical Services) and other support functions (Strategy, HR, IT, Communications and Finance).

During 2018, Gasum increased its shareholding in Skangas to 100%, after which Gasum has operated under a single company name and brand. The 2018 performance figures take into account former Skangas operations fully for the whole year of 2018. There are no other significant changes in reporting scope.

The reporting period of this Corporate Responsibility Report is the same as that of the Financial Statements, i.e. the financial year from January 1 to December 31, 2018. This report contains some material information for early 2019, but the figures provided in the report only relate to 2018.

Each GRI disclosure is stated in the GRI Content Index. The reporting boundaries include the entire Group unless otherwise stated in the GRI Content Index.

Gasum collects environmental and safety data from the CRM system, CSM environmental database, Generis database, weighing scales system and the Quentic accident and incident reporting system. Human resources data is from the Personec W payroll system and Sympa system. Economic indicator figures have been calculated from accounting figures obtained from the CRM system. The figures correspond to those presented in the financial statements. There are no significant changes in disclosure calculations.

## Units used in the report

1 terawatt hour (TWh)	1,000 gigawatt hours (GWh)
1 gigawatt hour (GWh)	3.6 terajoules (TJ)
1 cubic meter (m <sup>3</sup> )	1,000 liters (l)
1 tonne (t)	1,000 kilograms (kg)
1 tonne of carbon dioxide equivalent (t CO <sub>2</sub> e)	1,000 kilograms of carbon dioxide equivalent (kg CO <sub>2</sub> e)
1 tonne of LNG	49.3 gigajoules (GJ)

## 8 Contact details



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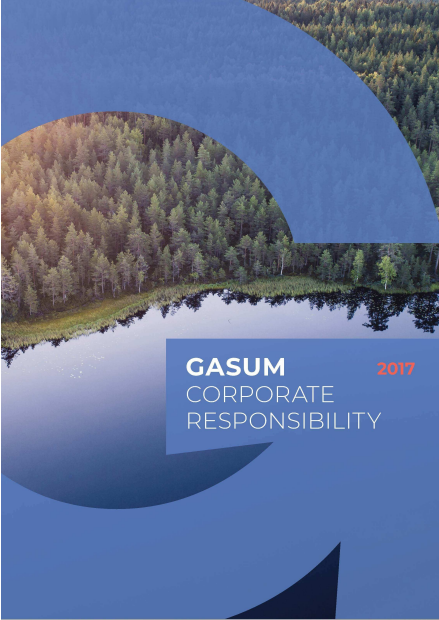
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9 ARCHIVE



**Gasum Corporate Responsibility 2017**



**Gasum Corporate Responsibility Report 2016**



**Gasum Yritysvastuuraportti 2016**



Gasum Corporate Responsibility Report 2015



Gasum Yritysvastuuraportti 2015



Gasum Corporate Responsibility Report 2014



Gasum Yritysvastuuraportti 2014



Gasum Corporate Responsibility Report 2013



Gasum Yritysvastuuraportti 2013

## In Accordance - Core

Gri Indicator	Topic	Page	Notes	Assurance	Location
<b>GRI 102: GENERAL DISCLOSURES</b>					
Organizational Profile					
102-1	Name of the organization		<a href="#">Gasum in brief</a>		
102-2	Activities, brands, products, and services		<a href="#">Access to gas</a>		
102-3	Location of headquarters		<a href="#">Contact details</a>		
102-4	Location of operations		<a href="#">Gasum in brief</a>		
102-5	Ownership and legal form		<a href="#">Gasum in brief</a> <a href="#">GOVERNANCE</a>		
102-6	Markets served		<a href="#">Business partnerships</a>		
102-7	Scale of the organization		<a href="#">Gasum in brief</a>		
102-8	Information on employees and other workers		<a href="#">People</a>		
102-9	Supply Chain		<a href="#">Sourcing and supply chains</a>		
102-10	Significant changes to the organization and its supply chain		<a href="#">Economic Responsibility</a> <a href="#">Reporting &amp; Data</a>		
102-11	Precautionary principle or approach		<a href="#">GRI content Index</a>		In line with the precautionary principle, Gasum acts with care and diligence to prevent environmental degradation and takes into account the probability or the risk of degradation, accident risk and opportunities to prevent accidents and mitigate their impacts.

102-12	External initiatives	GOVERNANCE	
	Strategy		
102-14	Statement from senior decision maker		
102-15	Key impacts, risks, and opportunities	Risk management	
	Ethics and integrity		
102-16	Values, principles, standards, and norms of behavior	GOVERNANCE	
	Governance		
102-18	Governance structure	GOVERNANCE	
102-20	Executive level responsibility for economic, environmental, and social topics	GOVERNANCE	
102-26	Role of highest governance body in setting purpose, values, and strategy	GOVERNANCE	
102-31	Review of economic, environmental, and social topics	GOVERNANCE	
	Stakeholder engagement		
102-40	List of stakeholder groups	GOVERNANCE	
102-43	Approach to stakeholder engagement	GOVERNANCE	
102-44go	Key topics and concerns raised	GOVERNANCE Business partnerships	
	Reporting practice		
102-46	Defining report content and topic boundaries	GOVERNANCE Reporting & Data	
102-47	List of material topics	GOVERNANCE	
102-49	Changes in reporting	GOVERNANCE	
102-50	Reporting period	Reporting & Data	January 1 to December 31, 2018
102-51	Date of most recent report		March 13, 2018
102-52	Reporting cycle	Reporting & Data	Annual

102-53	Contact point for questions regarding the report	Contact details
102-54	Claims of reporting in accordance with the GRI Standards	Reporting & Data
102-55	GRI content index	GRI content Index

## GRI 200: ECONOMIC TOPICS

### GRI 201: Economic Performance

GRI 103: Management Approach

103-2	The management approach and its components	GOVERNANCE
201-1	Direct economic value generated and distributed	ECONOMIC RESPONSIBILITY
201-4	Financial assistance received from government	ECONOMIC RESPONSIBILITY

### GRI 203: Indirect Economic Impacts

203-1	Infrastructure investments and services supported	ECONOMIC RESPONSIBILITY
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## GRI 300: ENVIRONMENTAL TOPICS

### GRI 301: Materials

GRI 103: Management Approach

103-2	The management approach and its components	GOVERNANCE		
301-1	Materials used by weight or volume	ENVIRONMENTAL RESPONSIBILITY	4.4. Environmental performance in 2018	Environmental performance in 2018

### GRI 302: Energy

GRI 103: Management Approach

302-1	Energy consumption within the organization	ENVIRONMENTAL RESPONSIBILITY	4.4. Environmental performance in 2018	Environmental performance in 2018
302-2	Energy consumption outside of the organization	ENVIRONMENTAL RESPONSIBILITY	4.4. Environmental performance in 2018	



302-4	Reduction of energy consumption	ENVIRONMENTAL RESPONSIBILITY	4.4. Environmental performance in 2018
GRI 303: Water			
GRI 103: Management Approach			
303-1	Water withdrawal by source	ENVIRONMENTAL RESPONSIBILITY	4.4. Environmental performance in 2018
GRI 305: Emissions			
GRI 103: Management Approach			
305-1	Direct (Scope 1) GHG emissions	ENVIRONMENTAL RESPONSIBILITY	4.4. Environmental performance in 2018
305-2	Energy indirect (Scope 2) GHG emissions	ENVIRONMENTAL RESPONSIBILITY	4.4. Environmental performance in 2018
305-3	Other indirect (Scope 3) GHG emissions	ENVIRONMENTAL RESPONSIBILITY	4.4. Environmental performance in 2018
305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	ENVIRONMENTAL RESPONSIBILITY	4.4. Environmental performance in 2018. SOx, VOC and PM emissions are not significant in our operations.
GRI 306: Effluents and Waste			
GRI 103: Management Approach			
306-2	Waste by type and disposal method	ENVIRONMENTAL RESPONSIBILITY	4.4. Environmental performance in 2018
GRI 307: Environmental Compliance			
GRI 103: Management Approach			

307-1	Non-compliance with environmental laws and regulations	<a href="#">GRI content Index</a>	Gasum didn't receive any fines during 2018. In 2018, the Company had minor environmental disturbances such as waste or chemical spills and gas leakages. Incidents are reported to the authorities and investigated to find corrective actions.	GRI Index
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## GRI 400: SOCIAL TOPICS

### GRI 401: Employment

#### GRI 103: Management Approach

103-2	The management approach and its components	<b>GOVERNANCE</b>		
401-1	New employee hires and employee turnover	<b>People</b>	3.1.4. People performance in figures 2018	Performance in figures 2018

### GRI 403: Occupational Health and Safety

#### GRI 103: Management Approach

103-2	The management approach and its components	<b>SOCIAL RESPONSIBILITY GOVERNANCE</b>	3.2. Safety and security	
403-1	Workers representation in formal joint management-worker health and safety committees	<b>People</b>	3.2.1. Safety culture	People
403-2	Types of injury and rates of injury, occupational diseases, lost days, and absenteeism, and number of work-related fatalities	<b>SOCIAL RESPONSIBILITY</b>	3.2.3. Safety performance in figures 2019	

### GRI 404: Training and Education

404-1	Average hours of training per year per employee	<b>SOCIAL RESPONSIBILITY</b>	3.1.3. Competence. Training days reported. One day is 6 hours.	
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404-2 Programs for upgrading employee skills and transition assistance programs **SOCIAL RESPONSIBILITY**

3.1.3. Competence

GRI 405: Diversity and Inclusion

405-1 Diversity of governance bodies and employees **SOCIAL RESPONSIBILITY**

3.1.4. People performance in figures 2018. Gasum does not collect employee data broken down by minority group membership. The data is not regarded as material.

GRI 415: Public Policy

415-1 Political contributions **GOVERNANCE**

2.3. Guiding policies, principles and operating methods