fortum

Join the change

CEO’s Business Review 2019

Highlights 2019

Comparable operating profit

EUR 1,191

million, +21%

Decarbonisation continues

- Decommissioning of Inkoo
- Meri-Pori to capacity reserve
- Exiting the use of coal in Espoo district heating in 2025
- Stockholm Exergi to close last coal-fired unit
- TSE to close coal-fired Naantali 2

Agreement on increase of Uniper ownership to more than

70%

Financial targets achieved

ROCE

10.0%

Comparable net debt/EBITDA around 2.5x (Jan 2020)

300 MW

of solar and wind commissioned in 2019

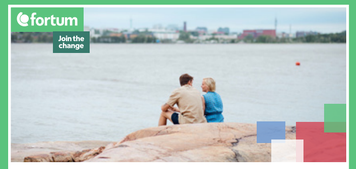
Projects of 2,326 MW (including associates)

Fortum's 2019 reporting entity

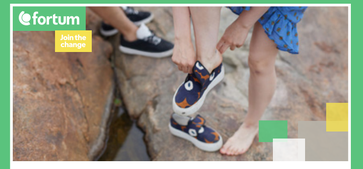
CEO's Business Review 2019

Financials 2019

Governance 2019



Remuneration 2019



Tax Footprint 2019

Sustainability 2019

Sustainability to be published in week 10 at the latest

CEO's Business Review 2019

Dear stakeholders,

2019 was a successful year for Fortum. Our results developed clearly positively and our cash flow increased substantially, both supported by our investment in Uniper and continued focus on strengthening of the balance sheet. We also achieved our long-term financial targets as our return on capital employed was 10% and the comparable net debt-to-EBITDA ratio was around 2.5x when adjusting our year-end net debt with the impact of the divestment of the Joensuu district heating business in January 2020 and the announced sale of a 80% share of our Nordic wind portfolio.

Solid and consistent strategy implementation

Driving the change for a cleaner world is at the heart of Fortum's strategy and our ambition is to accelerate this change by reshaping the energy system, improving resource efficiency, and providing smart solutions.

During 2019, we continued our determined efforts to implement Fortum's strategy. We focused on operational excellence in all our operations, assessed parts of our district heating business, continued to build solar and wind power, reached an agreement to increase our shareholding in Uniper, and improved our financial results substantially. At year-end, we reached our long-term 10% target for return on capital employed.

In June, we announced our intention to assess the strategic options for the district heating and cooling business in Estonia and in Joensuu, Finland. The assessment concluded in the divestment of the Joensuu operations, for approximately EUR 530 million, which released cash, strengthened our balance sheet, and unlocked value. In February 2020, we announced our intention to extend the strategic assessment to include our district heating and cooling businesses in all Baltic countries, in Poland, and in Järvenpää, Finland.

The operating environment in 2019

During the fall of 2019 there was some progress in regulation and policies regarding climate policy. We warmly welcome the firm climate-orientation of the new EU Commission and the initiative for a European Green Deal. We strongly advocate for the EU carbon-neutrality target for 2050 which provides an excellent opportunity to push forward our strategy "For a cleaner world". Strengthening and broadening the scope of the EU Emission Trading Scheme to also include the heating, cooling, and transport sectors, should be a key tool to drive decarbonisation. Fortum also supports the UN Global Compact and Caring for Climate initiatives, and is committed to the principles of these initiatives.

After three years of clearly increasing power prices, the forward contracts for Nordic power turned downwards in 2019. The decrease in spot prices was somewhat larger for the system price, which decreased by 12% from the previous year. The price of CO_2 emission allowances showed some volatility during the year, mainly due to uncertainty regarding Brexit, but stabilised and ended close to the level of the previous year, around 25 euros/tCO_2. The European commodity markets experienced clear weakness in 2019 due to high LNG supply and low Chinese coal demand, resulting in both coal and gas prices declining by more than 30%. The Nordic water reservoirs started the year at a slight deficit, but stayed close to the long-term average for the rest of 2019.

Decarbonisation

We have continued our decarbonisation efforts during 2019 and will do so in the future. We therefore decided to tighten our climate target for specific CO_2 emissions by 10% to 180 g/kWh, applicable to Fortum's stand-alone fleet for the year 2020. In wind and solar power we regard building of new carbon-free power production capacities as more important than owning the capacity once it has been commissioned.

Therefore, we build solar and wind power while utilising our 'capital recycling' business model to release cash. Once commissioned, we divest a stake in the portfolio by taking on external investors, which enables us to invest more while at the same time having a limited equity exposure. Another major effort is our commitment to carbon-neutral district heating in Espoo, Finland, in the 2020s, accelerated by our goal to discontinue the use of coal in Espoo in 2025. Other examples of work for a cleaner energy system in Finland include the decommissioning of the one-gigawatt Inkoo coal-fired power plant showing a recycling rate of 92% of the material, placing the Meri-Pori coal-fired power plant into the Finnish national peak-load reserve capacity system from July 2020, as well as the recent decisions of Fortum's associated company Turun Seudun Energiantuotanto to close down the coal-fired unit Naantali 2 during 2019. In Sweden, Fortum's joint venture Stockholm Exergi decided to decommission its last coal-fired unit after the 2019–2020 heating season.

Strong operational performance – financial targets achieved

The comparable operating profit for 2019 increased by more than EUR 200 million to EUR 1.2 billion, mainly driven by a clear result improvement in the Generation segment, supported by improved results in the Consumer Solutions and Russia segments. In addition, our share of profits from associated companies and joint ventures increased to almost EUR 750 million, largely thanks to our share of Uniper's profits. Our focus on cash flow measures, in combination with the strong results in 2019, increased our cash flow to more than EUR 2 billion at year-end. Our comparable net debt-to-EBITDA ratio at year-end was 3.0x. When adjusting the net debt with the impact of the divestment of the Joensuu district heating business in January 2020 and the announced sale of a 80% share of our Nordic wind portfolio, I am happy to say that we also achieved our other long-term financial target of a comparable net debt-to-EBITDA ratio of around 2.5x. Maintaining strong cash flow and consistent deleveraging are central for our credit rating. Fortum's key objective is to have a solid investment-grade rating of at least BBB to preserve financial flexibility and good access to capital markets.

Based on Fortum's 2019 results, our financial position and the outlook for the coming years, Fortum's Board of Directors proposes an unchanged dividend of EUR 1.10 per share for the calendar year 2019. With an earnings per share of EUR 1.67, the proposal corresponds to a pay-out ratio of 66%, which is within the 50%-80% pay-out range as defined in our dividend policy.

The Uniper investment

Fortum currently owns 49.99% of the shares in Uniper, a global energy company that generates, trades and markets energy on a large scale. Uniper operates power plants in Europe and Russia, with a total generating capacity of around 34 gigawatts. Approximately 20% of the generating capacity is CO_2-free hydro and nuclear power, approximately 50% is gas-fired and the remaining is based on coal. Uniper also runs an extensive energy trading business and has sizeable natural gas storage sites, which play an important role in ensuring a secure and flexible gas supply.

In October 2019, our investment in Uniper took a leap forward with our agreement to buy an additional stake, in excess of 20%, in the company. In November, we received approval from the Russian Government Commission to close the transaction, subject to certain conditions. The clarification of these conditions is somewhat delayed, due to the recent change of the Russian Government. In December, we received regulatory approval from the United States. We expect to be able to close the transaction during the first quarter of 2020. As announced previously, with closing we will seek adequate board representation, including the chairmanship, in Uniper's Supervisory Board.

As the majority owner, Fortum will focus on cooperation and strategic alignment with Uniper to the benefit of both companies. Our two companies are already well-positioned to drive forward the European energy transition to enable a carbon-neutral Europe by 2050. During the transition, Europeans expect their energy companies to execute ambitious climate policies while continuing to provide electricity and heat at all times and at an affordable cost. The German Government's coal exit law, presented at the end of January 2020, reflects these requirements – coal-fired generation will be phased out by the end of 2038 at the latest. Fortum stands for a strategy of decarbonisation, which of course also applies to our investments, and supports Uniper's decision to close down the company's old coal-fired units as the company's new coal-fired CHP plant Datteln 4 is taken into use. As long as coal has to be used to provide for security of supply in Germany, it makes sense to use it in the most efficient and clean units.

At Fortum's Annual General Meeting last year we announced that we will start reporting according to the Task Force on Climate-related Financial Disclosures (TCFD) recommendations in 2019. Fortum's TCFD report will be included in the Sustainability 2019 report to be published in week 10.

Finally, I would like to thank all our employees for their commitment and hard work during the year and our customers and all other stakeholders for their good cooperation and continued trust in us.

Pekka Lundmark
President and CEO

Three main drivers are shaping the future electricity markets

The world we live in is changing at an ever-increasing pace. Staying competitive requires companies to be aware of the underlying drivers and to take an active role in driving the change for a better future.

Looking forward, Fortum is well positioned for the ongoing transition in the energy sector towards a decarbonised world, both in terms of asset base and performance. The main drivers influencing the ongoing energy sector transformation are regarded to be:

Climate and environment

Climate change and global warming is inevitably among the most pressing and profound challenges facing mankind. Limiting its impacts requires global efforts, yet the commitments made by nation states so far are insufficent to limit warming in line with the ambition of the Paris Agreement.

The need to limit the climate impact of operations affects all industries today. The energy sector has the responsibility to transition towards carbon-neutral energy production while ensuring that energy is available at all times at an affordable cost. The primary means to enable the transition within electricity production include increasing the share of renewable and CO_2-free production technologies. As fossil fuels are still needed, fuel-switching to more environmentally benign fuels and improved fuel efficiency are means to reduce climate impacts. In the European Union the effects of the substantial increase in the CO_2 emission allowance price in 2018 can be seen in the clear increase in the switching from coal-fired to gas-based power generation. In 2019, this coal-to-gas switch is estimated to correspond to a reduction of emissions of approximately 80 million tons of CO_2.

Equally important, but less discussed areas requiring decarbonisation are heating and traffic. In both, clean electricity and over-time decarbonising gas can be part of the solution. Fortum has been a staunch advocate for establishing carbon pricing for all sectors as a basis for the decarbonisation of the European society.

During the fall of 2019 there was some progress in regulation and policies regarding climate policy. We warmly welcome the firm climate-

orientation of the new EU Commission and their initiative for a European Green Deal. We strongly advocate for the EU carbon-neutrality target for 2050 and consider that it provides an excellent opportunity to push forward our strategy “For a cleaner world”. However, Europe alone cannot solve the climate challenge as it represents only 9% of the global greenhouse gas emissions. In this context, we welcomed the Russian ratification of the Paris Agreement in September. All parts of the world have to contribute. The ultimate goal should be for the most comprehensive global carbon pricing.

Politics and regulation

The increasing fragmentation in the international political scene increases the regulatory uncertainty. Companies have to be prepared for a possible future where national rather than international market-based mechanisms drive the development of our operating environment.

The energy sector is heavily influenced by national and EU-level energy policies and regulations. Fortum’s strategy has been developed based on scenarios for the future development of the regulatory environment in both existing and potential new businesses and market areas. The overall complexity and possible regulatory changes in the various operating countries pose a risk if Fortum is not able to anticipate, identify, and manage those changes efficiently.

Fortum maintains an active dialogue with the bodies involved in the development of laws and regulations in order to manage these risks and proactively contribute to the development of the energy policy and regulatory framework.

Technology development

Technology development is an important driver for change.

In the energy sector the cost of wind and solar power is decreasing. This development leads to an increasing share of intermittent power production and fewer running hours for traditional baseload power. This challenges the way the energy system has been functioning, where production has been able to adapt to the changing power demand of customers.

Another development area, with potential to revolutionise the energy industry is hydrogen. With the increase of intermittent power production we will see more hours with very low or even negative prices. This cheap power can be used to produce synthetic hydrogen, which can be converted into ‘green gas’, that can use the same storage and transportation infrastructure as natural gas and can be burned in the current gas-fired power plants. If made commercially viable, this would enable transforming the current fossil-based gas-fired power plants into ‘green gas’ -based power plants.

Digitalisation opens up for new storage and demand response solutions, which will change the way the customer interacts with the market. There will be new ways to produce, market, sell, and deliver products and services offered by utilities, start-ups, and new market entrants. Through these services, customers can take an active part in balancing a future power system that is heavily dependent on intermittent power production. In addition to power generation and usage, the technology development is also rapid within the field of transportation. Electric mobility is fast gaining ground as a result of the development of battery technology and processing power. The increasing production volumes are creating economies of scale and reducing production costs of electrical vehicles. Smart charging solutions for the growing amount of electrical vehicles create an opportunity for substantial demand response solutions.

Looking forward, Fortum is well positioned for the ongoing transition in the energy sector towards a decarbonised world

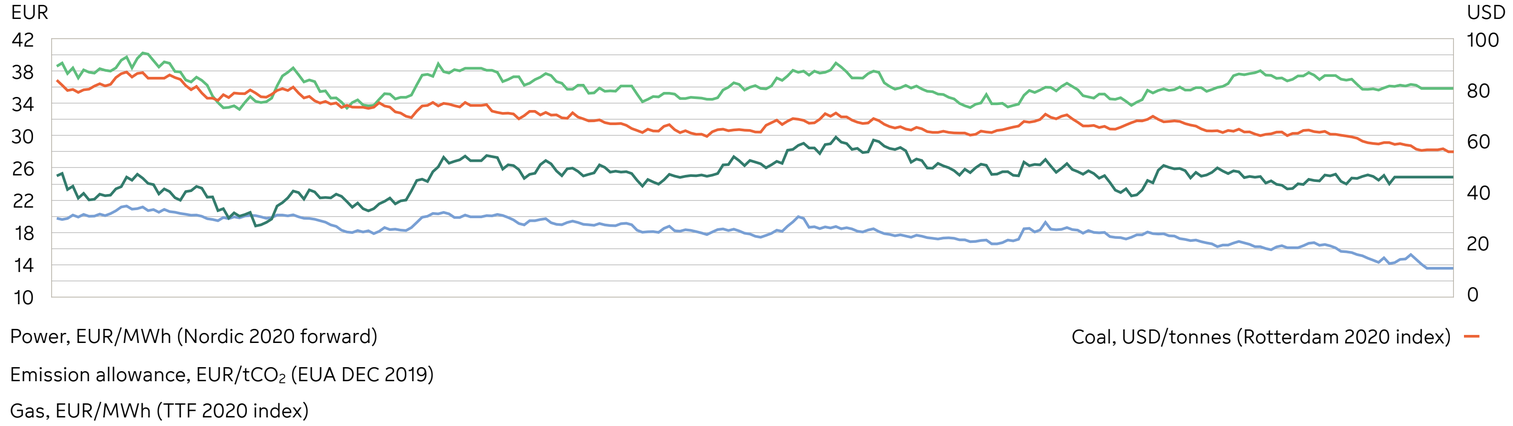
Market Development

After three years of clearly increasing power prices the forward contracts for Nordic power turned downwards in 2019. The decrease in spot prices was somewhat larger for the system price, which decreased by 12% from the previous year. The price of CO_2 emission allowances, which was the main driver for the rapid increase in power prices in 2018, showed some volatility during the year, but ended close to the level of the previous year, around 25 euros/tCO_2.

High amounts of LNG on the global gas market pushed down the European gas prices, with the TTF index for 2020 dropping by 33%. In the coal market the weaker Chinese coal demand was the main driver for declining coal prices, causing the Rotterdam index for 2020 to decline by 31% during the year.

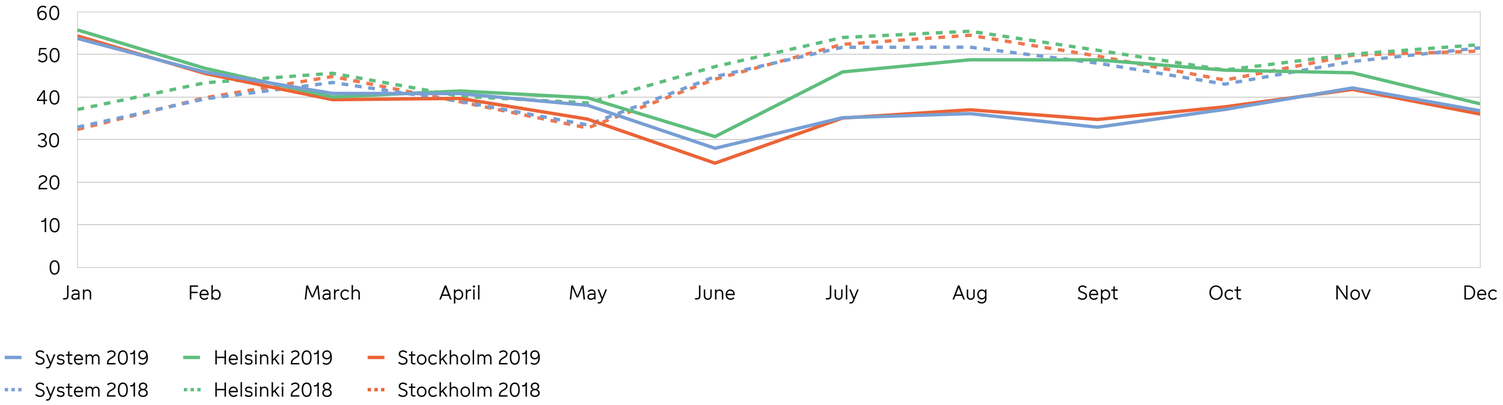
The Nordic power prices declined during 2019, but resisted well compared to the heavy drop in European coal and gas prices

Power and commodity prices 2019



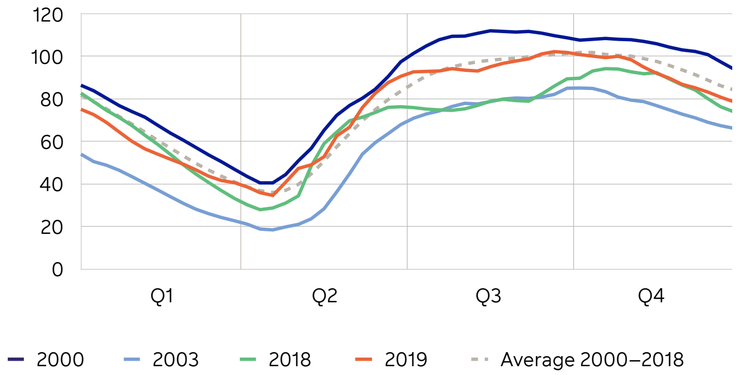
Source: Bloomberg

Spot price development 2018 & 2019, EUR/MWh



Source: Nord Pool

Nordic water reservoirs, energy content, TWh



Source: Nord Pool

The Nordic water reservoirs started the year at a deficit, but stayed close to the long-term average for the remainder of 2019. At the beginning of 2019, the Nordic water reservoirs were at 74 TWh, which is 10 TWh lower than the long-term average and 8 TWh lower than one year earlier. At the end of the year, the reservoirs were at 79 TWh, which is 5 TWh below the long-term average and 5 TWh higher than one year earlier.

The average system spot price in Nord Pool for the year 2019 was EUR 38.9 (44.0) per MWh, a decrease of 12%. The average area price in Finland was EUR 44.0 (46.8) per MWh and in Sweden (SE3, Stockholm) EUR 38.4 (44.5) per MWh.

According to preliminary statistics, electricity consumption in the Nordic countries was 392 (399) TWh during 2019, due to milder weather during the first quarter and slightly lower industrial demand.

Strategy

The transition towards a cleaner world

The entire energy sector is undergoing significant transformation.

Our vision is “For a cleaner world” and reflects our ambition to drive this transformation towards a low-emissions energy system with clean energy and optimal resource efficiency built on sustainable materials.

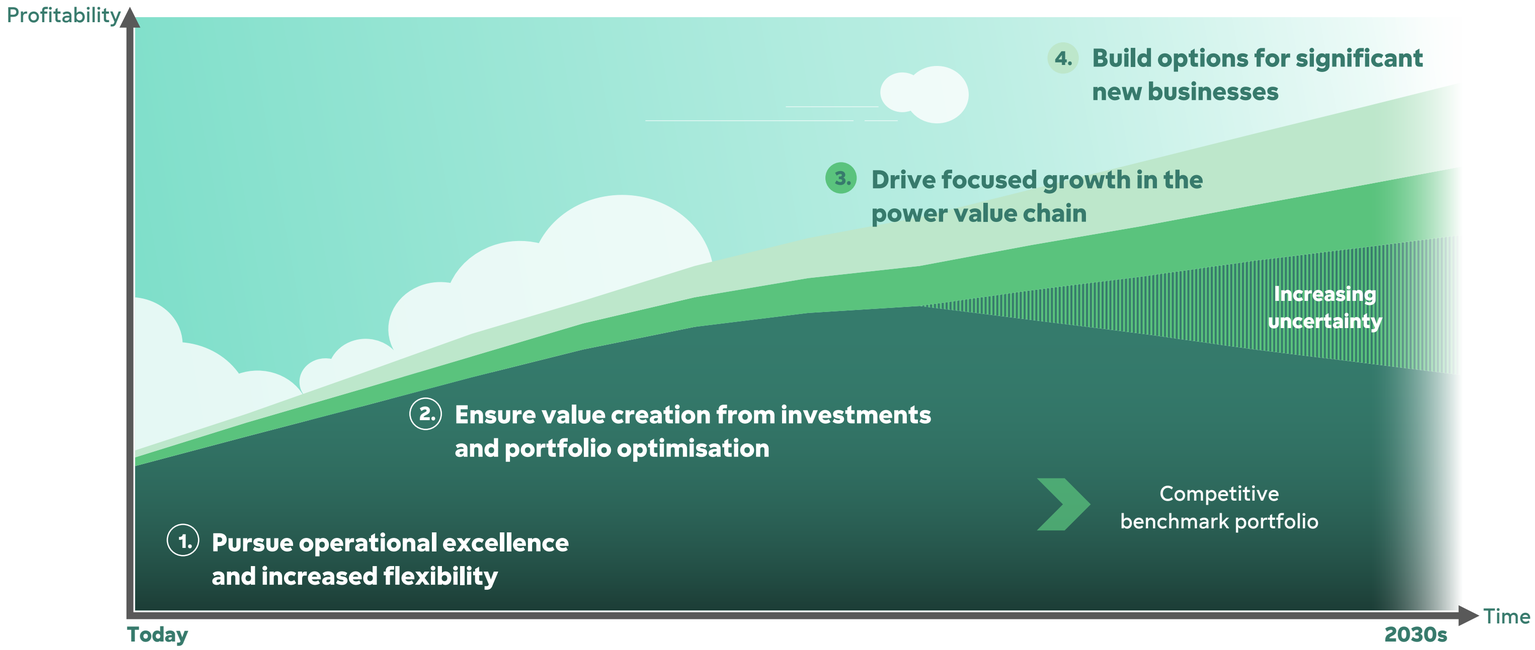
Our mission is to engage our customers and society to drive the change towards a cleaner world. Our role is to accelerate this change by reshaping the energy system, improving resource efficiency, and providing smart solutions. This way we deliver excellent shareholder value.

Sustainability is at the core of Fortum’s strategy and our values – curiosity, responsibility, integrity, and respect – form the foundation for all our activities. We assess our impacts and address sustainability throughout the value chain. We see sustainable energy and circular economy solutions as today’s competitive advantage and a prerequisite for business growth and success.

Fortum’s strategy

The ongoing transition towards CO_2-free energy, driven by climate change concerns, politics and regulation, as well as technology development, brings significant opportunities for a company with competences in clean energy. Fortum is well positioned for this transition while the future market environment is increasingly uncertain. As a response to this development, Fortum’s strategy is based on four strategic priorities:

1. Pursue operational excellence and increased flexibility
2. Ensure value creation from investments and portfolio optimisation
3. Drive focused growth in the power value chain
4. Build options for significant new businesses



Pursue operational excellence and increased flexibility

Benchmark performance is essential for the long-term competitiveness and is one of Fortum’s main strategic priorities in the short-term. For the coming 2–3 years, Fortum prioritises value creation from its current business portfolio. This is achieved through operational excellence and increased flexibility. All sources of flexibility, both flexible generation assets and demand response of large customers and consumers, will be needed to balance the high degree of volatile renewable generation.

Operational excellence and increased flexibility contributes to improving Fortum’s financial performance and cash flows to secure sufficient financial headroom. Fortum continues to prioritise and scrutinize capital expenditure.

Fortum’s key objective is to have a solid investment-grade rating of at least BBB, to preserve financial flexibility and good access to capital markets, and to strengthen its financial profile longer term. This will provide appropriate financial stability and support to the enlarged group.

Ensure value creation from investments and portfolio optimisation

Over the recent years Fortum has made several sizeable investments and aims to further improve its financial performance by ensuring value creation from them. The investment in Uniper, currently accounted for as an associated company, contributes to Fortum's financial performance both through Fortum's share of Uniper's result and its dividend. Fortum will fully consolidate Uniper as a subsidiary in its financial statements from closing of the acquisition of an additional 20% stake in Uniper, expected by the end of the first quarter of 2020. As Uniper's largest shareholder, Fortum's ambition is to increase value for both companies and their stakeholders.

In addition, Fortum continues to review its business portfolio in line with its strategic priorities emphasising CO_2-free assets, flexibility, and low operating cost to fit the changing business environment.

Drive focused growth in the power value chain

In the medium term, Fortum will build on its long-standing expertise to grow in CO_2-free power generation. When it comes to solar and wind investments, Fortum aims to grow by utilising partnerships and other forms of co-operation to enable a more asset-light structure. The future utility will be increasingly relying on technology, digitalisation, software, and services. Consequently Fortum will continue to develop value-adding offerings and services for customers both in the consumer and industrial sectors.

Build options for significant new businesses

Foreseeing the development of the power markets and regulatory environment will be increasingly challenging towards the end of the 2020s. However, the uncertainty will create new business opportunities. In the longer term, Fortum aims to build on existing expertise and emerging technologies to create new businesses, independent of power prices, with potential for sizeable profit contribution. Circular economy meets these criteria, especially in the areas of waste and recycling as well as bio economy. Furthermore, Fortum will focus on investments in start-up ventures with disruptive potential.

Value-creating strategy

Input

Human and intellectual capital
- More than 8,000 energy sector professionals, focus on diversity
- Certified environment, health and safety management
- Corporate culture that encourages innovation and R&D investments totalling EUR 67 million in 2019
- Robust corporate governance and ethical business conduct
- Brand and reputation

Supply chain
- Purchase EUR 3.8 billion, including investments
- Relationships with ~14,000 suppliers, over 60% of procurement from Europe

Sources of energy
- Hydro, solar, wind
- Natural gas, uranium, coal, biofuels, waste-derived fuels, peat

Assets
- Core operations in 10 countries
- ~14,200 MW power generation supply
- ~13,200 MW heat production capacity
- Some 130 own hydro power plants and 26 own CHP, condensing and nuclear power plants; growing in solar and wind
- Supplying heat in 24 cities and towns
- 5 waste-to-energy plants

Financial
- Capital employed EUR 19,929 million
- Net debt EUR 5,260 million
- Total assets EUR 23,364 million

Fortum

Vision
For a cleaner world

Mission
We encage our customers and society to drive the change towards a cleaner world. Our role is to accelerate this change by reshaping the energy system, improving resource eifficiency and providing smart solutions.
This way we deliver excellent shareholder value.

Strategy
- Pursue operational excellence and increased flexibility
- Ensure value creation from investments and portfolio optimisation
- Drive focused growth in the power value chain
- Build options for significant new businesses

Output

Products
- 76 TWh electricity
- 26 TWh heat
- 96% of electricity production CO_2 free in Europe, 59% in all operations
- 2.2 million tonnes of waste received from our customers

Services and solutions
- Power and heat sales
- Electricity retail sales
- District heating and cooling
- Power solutions, e.g. energy-efficiency services
- Electricity trading services
- Nuclear expert services
- E-mobility charging solutions
- Environmental management and material-efficiency services, incl. plastic recycling and refining, metals recycling, and ash treatment

Emissions
- CO_2: 19.1 million tonnes, 189 g CO_2 /kWh
- SO_2: 14,900 tonnes
- NO_x: 24,900 tonnes
- Particles: 11,700 tonnes
- 22 tonnes of spent high-level radioactive fuel in an interim storage

Impact

Economic impact
- Profitability
- Increased shareholder value
- Dividends to shareholders
- Investments
- Taxes to the public sector
- Wages and benefits to employees
- Payments to suppliers and partners
- Interest to creditors

Social impact
- Reliable supply of electricity and heat
- New, smart energy solutions for customers
- More active customer participation
- New partnership opportunities for cities, start-ups, research institutions
- Safe work environment and wellbeing for employees, contractors and suppliers
- Opportunities in career development for employees

Environmental impact
- Energy and resource efficiency
- Contribution to climate change mitigation and circular economy
- Investments in renewable energy production
- Flexible generation enabling increasing use of intermittent renewable energy sources
- Improved resource efficiency, recycling and recovery through circular economy services
- Removing hazardous waste from circulation, treatment and safe final disposal
- Improving air quality through advanced nitrogen oxide reduction solutions

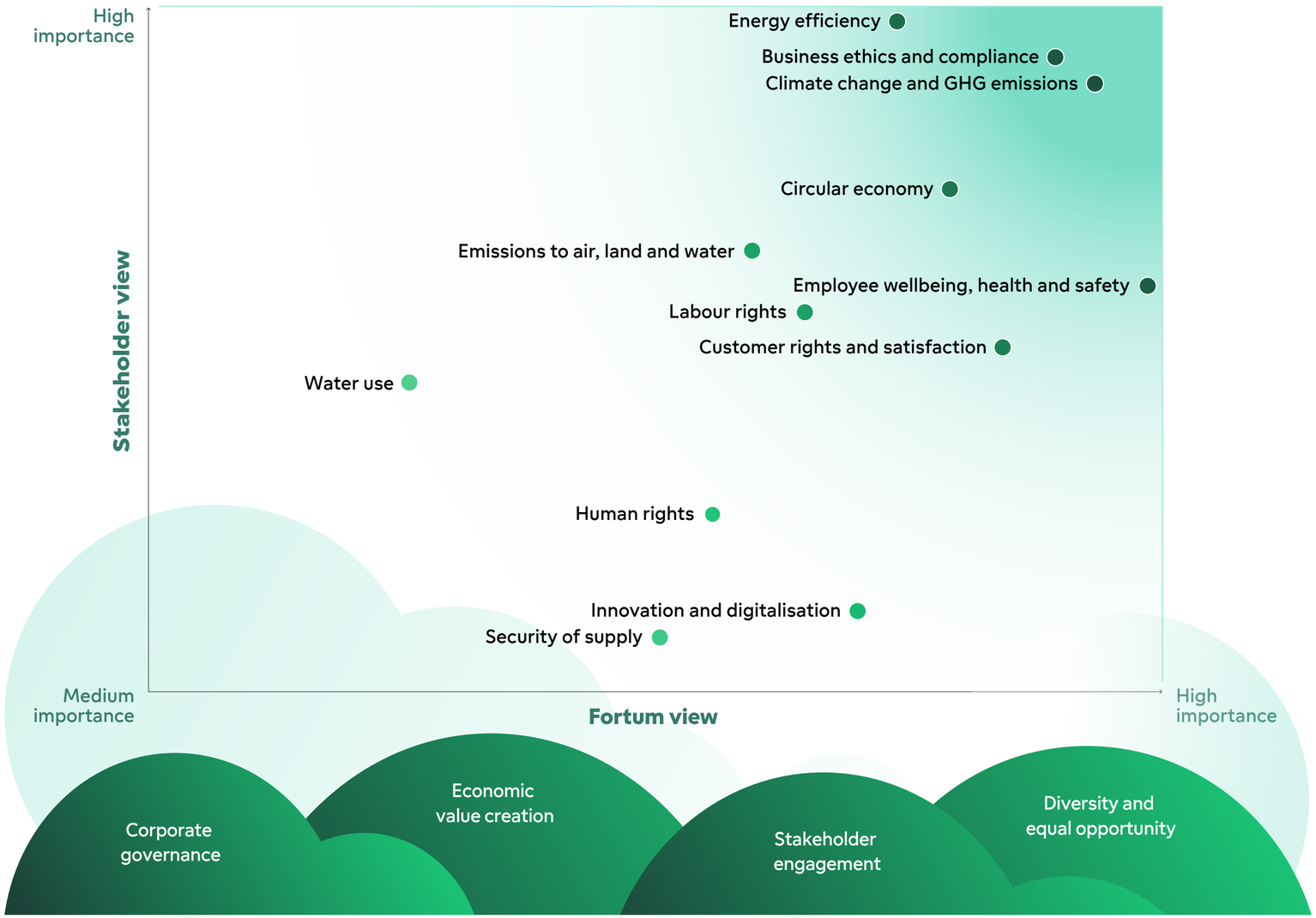
Sustainability at Fortum

2019 was the year of climate, which was also reflected in a stakeholder study on our sustainability priorities. These priorities represent risks and opportunities for Fortum, and on the other hand, our operations have an impact on them. The study revealed that climate change and greenhouse gas emissions are the most important sustainability priorities for Fortum. In late 2019, Fortum's Board of Directors approved a new target for specific CO_2 emissions from total energy production for 2020: ≤180 gCO_2/kWh. Additionally, the Board approved total CO_2 emissions from energy production as part of the earnings criteria for the 2020–2022 long-term incentive plan for key employees and executives. We are publishing our first Task Force on Climate-related Financial Disclosures (TCFD) report as part of our 2019 Sustainability Report. In 2019, our investments in hydro, wind and solar power, as well as bioenergy nearly doubled, and our total investments in CO_2-free production increased to EUR 401 million, an increase of more than EUR 100 million from the previous year.

Energy efficiency and circular economy are among Fortum's most important sustainability priorities. We annually improve the energy efficiency of our power and heat production. By the end of 2019, we had improved the cumulative energy efficiency of our production by 1,707 GWh/year compared to year 2012. We promote the circular economy by receiving and treating large volumes of customer waste. As much of the waste stream as possible is recycled, reused, or recovered as material. At the same time we safely remove hazardous waste from circulation. Fortum's plastic refinery processes all the plastic packaging waste recycled by Finnish households. The growing electrification of transportation increases the need for battery recycling. To tackle this in the future, the innovation developed by Fortum will increase the battery recycling rate to over 80%.

In 2019, we achieved significant improvements in contractor safety, and the Lost Workday Injury Frequency (LWIF) of contractors decreased. The safety of our own employees remained at a good level.

Fortum Sustainability priorities



During the year, our employees were offered an opportunity to participate in a new Employee Share Savings programme, and more than 40% signed up for the first savings period. We maintained our ranking (50th) in the Equileap Gender Equality Top 100 assessment. Additionally, we improved the confidential reporting of suspected misconduct by adopting the new SpeakUp channel for employees and partners.

To advance Fortum's social responsibility, we developed a new sustainability programme for the company. Sustainability projects, sponsorships, donations, as well as local and university collaboration, are grouped under the programme's three themes: climate, people, and materials. Implementation of the programme will begin in 2020.

Fortum's Board of Directors approved a new target for specific CO_2 emissions from total energy production for 2020: ≤180 gCO_2/kWh

Business model

Fortum's business activities cover the production and sales of electricity and heat, waste-to-energy and circular economy solutions, as well as energy-sector expert services and various consumer solutions. Fortum is the third largest power generator and the largest electricity retailer in the Nordic countries. Globally, the company is one of the leading heat producers. As two thirds of Fortum's power production is hydro and nuclear, the company is also among the lowest-emitting generators in Europe.

Fortum's organisation consists of four business divisions: Generation, City Solutions, Consumer Solutions, and Russia. With core operations in 10 countries, Fortum employs a diverse team of more than 8,000 energy-sector professionals. At the end of 2019, Fortum had some 130 hydro power plants, 26 combined heat and power (CHP), condensing, and nuclear power plants, as well as four wind power parks and four solar power plants. Globally, the company supplied heat in 24 cities and towns and had five waste-to-energy plants. Fortum's key markets are the Nordic and Baltic countries, Russia, Poland, and India.

Generation

Generation is responsible for Nordic power production. The division comprises nuclear, hydro, wind, and thermal power production, as well as power portfolio optimisation, trading, industrial intelligence, and global nuclear services.

City Solutions

City Solutions is responsible for developing sustainable solutions for urban areas into a growing business for Fortum. The division comprises heating, cooling, waste-to-energy, biomass, and other circular economy solutions as well as solar power production.

The business operations are located in the Nordics, the Baltic countries, Poland, and India. The division also includes Fortum's 50% holding in Stockholm Exergi, which is a joint venture and is accounted for using the equity method.

Consumer Solutions

Consumer Solutions is responsible for the electricity and gas retail businesses in the Nordics and Poland, including the customer service, invoicing, and debt collection business. Fortum is the largest electricity retail business in the Nordics, with approximately 2.4 million customers across different brands in Finland, Sweden, Norway, and Poland. The business provides electricity as well as related value-added and digital services.

Russia

The Russia division comprises power and heat generation and sales in Russia. The division also includes Fortum's over 29% holding in TGC-1, which is an associated company and is accounted for using the equity method.

Future challenges and opportunities

Climate change

We believe that the growing awareness and concern about climate change will increase the demand for low-carbon and resource- and energy-efficient energy products and services. We are leveraging our know how in CO_2-free hydro, nuclear, wind, and solar power as well as in energy-efficient CHP production by offering our customers low-carbon energy solutions. We also believe that the electrification of transportation, industry and services will increase the consumption of low-carbon electricity in particular. Our strategy is targeting a multi-gigawatt wind and solar portfolio.

Our circular economy services also respond to this demand by utilising waste stream materials as efficiently as possible and by reducing the formation of greenhouse gases generated from biodegradable waste at landfills. Additionally, the use of non-recyclable and non-recoverable waste in energy production replaces fossil fuel.

Our operations are exposed to the physical risks caused by climate change, including changes in weather patterns that could alter energy production volumes and energy demand. Fluctuating precipitation, flooding, and extreme temperatures may affect e.g. hydropower production, dam safety, availability of cooling water, and the price and availability of biofuels.

Hydrological conditions, precipitation, temperatures, and wind conditions also affect the short-term electricity price in the Nordic power market. In addition to climate change mitigation, we also aim to adapt our operations and we take climate change into consideration in, among other things, the assessment of growth projects and investments as well as in operation and maintenance planning.

Power price development

One of the key factors influencing Fortum's business performance is the Nordic electricity wholesale price. The key short-term drivers behind the electricity wholesale price development in the Nordic region are commodity prices, such as coal and gas, European electricity wholesale prices, prices for CO_2 emission allowances, the hydrological situation, temperatures, and the electricity import-export balance. In the longer term, global economic growth and changes to energy policy and regulations impact commodity and CO_2 emission allowance prices, which, in turn, impact the Nordic wholesale price of electricity.

Regulatory environment

Changes in the regulatory and fiscal environment create risks and opportunities for the energy and environmental management business. The main strategic risk is that the regulatory and market environment develops in a way that we have not been able to foresee and prepare for. In response to these uncertainties, Fortum analyses and assesses a number of future market and regulation scenarios, including the impact of these on different generation forms and technologies. As a result, Fortum's strategy includes broadening of the revenue base and diversification into new businesses, technologies, and markets. The environmental management business is based on the framework and opportunities created by environmental regulation. Being able to respond to customer needs created by the tightening regulation is a key success factor.

Research and development

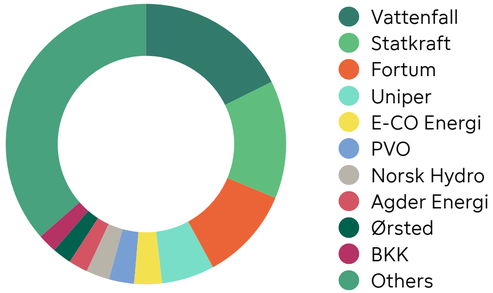
Fortum's goal is to be at the forefront of energy technology and application development. To accelerate innovation and the commercialisation of new offerings, Fortum is strengthening its in-house innovation and digitalisation efforts and building partnerships with leading global suppliers, promising technology and service companies, as well as research institutions. Fortum makes direct and indirect investments in start-ups that have promising new innovations focused on connectivity, have disruptive potential, and accelerate the transition towards a circular economy. Fortum also invests in technologies that support better utilisation of the current asset base and that can create new markets and products for Fortum. The company is continuously looking for emerging clean energy solutions and for solutions that increase resource and system efficiency.

Fortum has committed to invest EUR 150 million in Valo Ventures over a period of 10 years. In 2019, the investments in Valo Ventures and the related costs totalled EUR 23 million. Valo Ventures is an independent fund investing in digital and cloud-scale technology start-ups in North America and Europe. Valo Ventures is aligned with Fortum's strategy and vision "For a cleaner world". Fortum launched Valo Ventures together with Scott Tierney, former Google Capital co-founder.

Market position

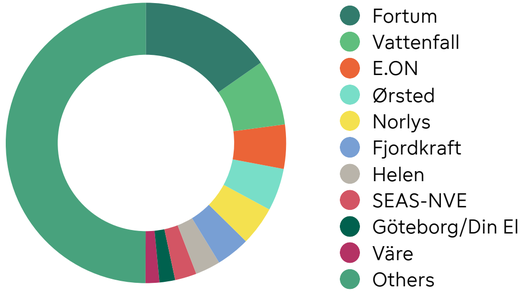
Fortum is the third largest power generator and the largest electricity retailer in the Nordic countries. Globally, we are one of the leading heat producers. As two thirds of our power production is hydro and nuclear, Fortum is also among the lowest-emitting generators in Europe.

Nordic power generation, 400 TWh, over 350 companies



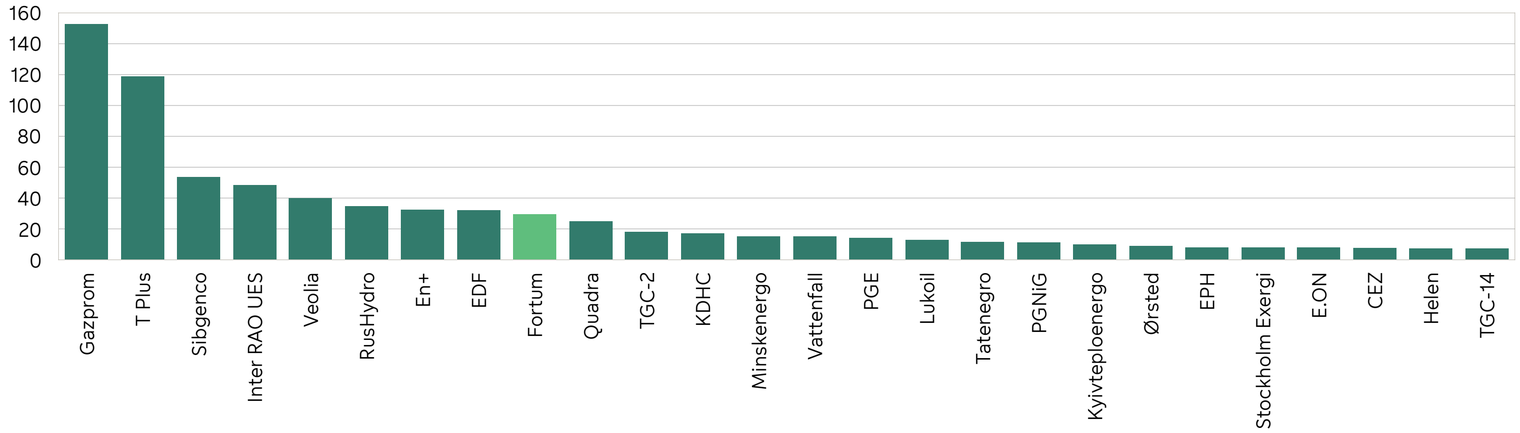
Source: Fortum. company information. 2018 figures pro forma

Nordic electricity retail, 16 million customers, ~350 companies



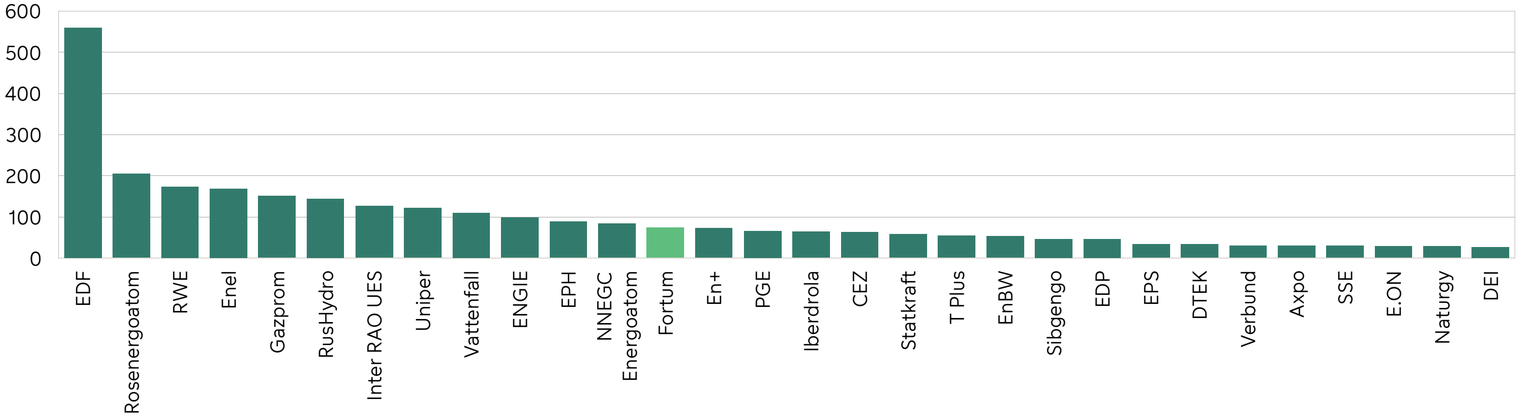
Source: Fortum. company information. 2018 figures pro forma

Largest heat producers globally, TWh



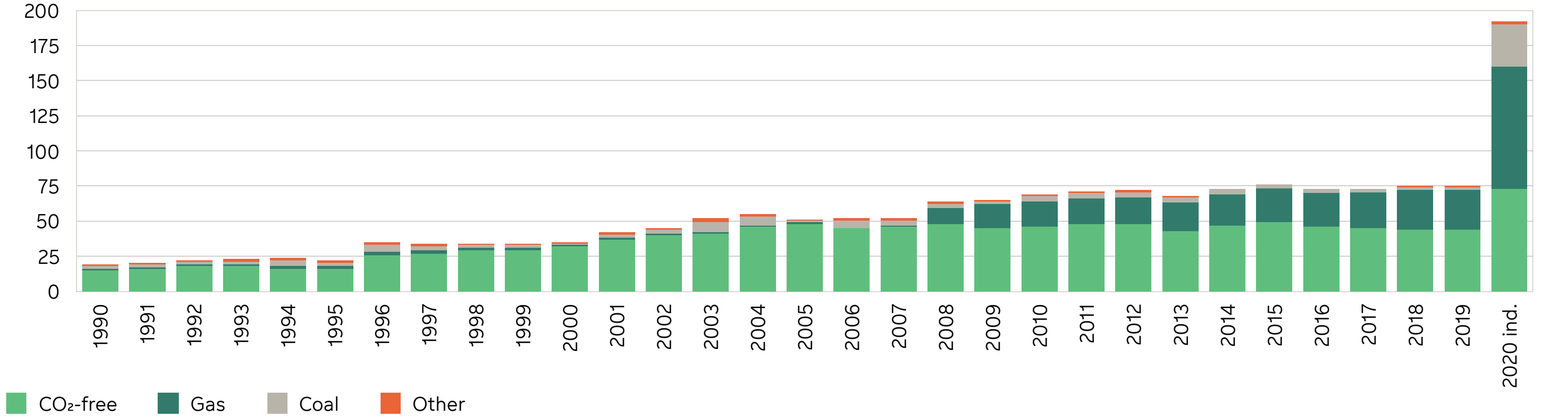
Source: Fortum, company information, 2018 figures pro forma. EPH incl. LEAG. No data from China.

Largest power generators in Europe and Russia, TWh



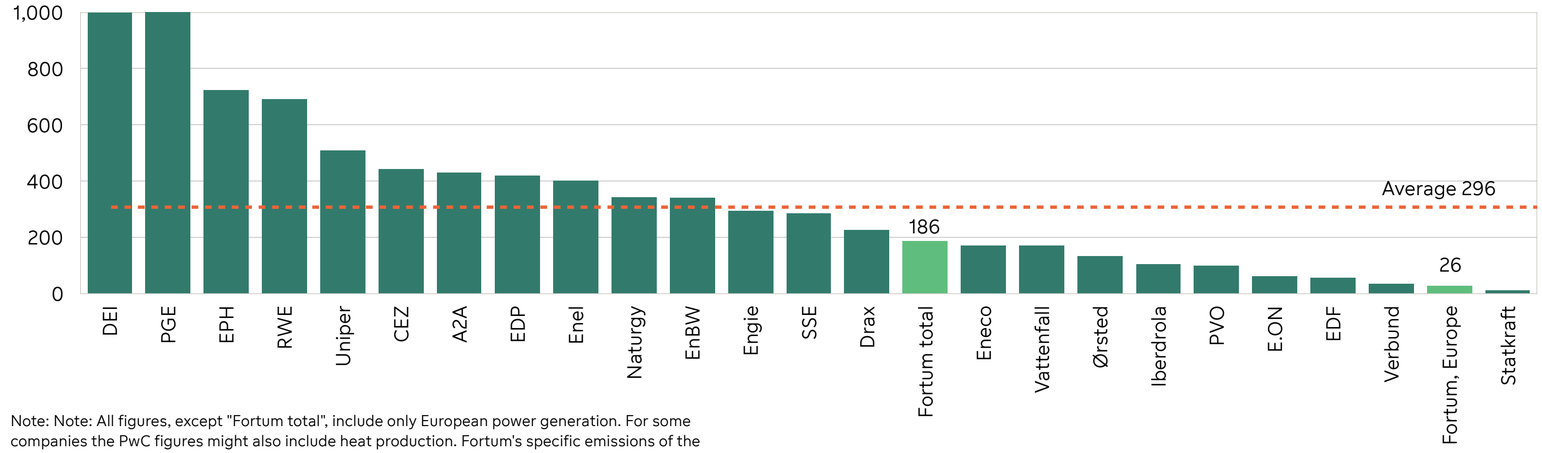
Source: Fortum, company information, 2018 figures pro forma, EPH incl. LEAG

Fortum's power generation, TWh



Note: Fortum actuals 1990–2019 excluding associated company Stockholm Exergi. 2020 indicative figures adjusted for Nordic wind and Joensuu CHP assets sold in 2020. Uniper's disclosed 2018 numbers used for indicative consolidation 2020 with the following corrections/assumptions: normal hydrological year, accounting view adjusted to pro forma, French coal assets sold, Datteln 4 approximately 2.2 TWh in 2020, no net increase in generation from Beresovskaya 3, coal-to-gas switch 2 TWh, Ringhals 2 closed on 31 Dec 2019.

Specific CO_2 emissions of major utilities in Europe, gCO_2/kWh electricity, 2018



Note: Note: All figures, except "Fortum total", include only European power generation. For some companies the PwC figures might also include heat production. Fortum's specific emissions of the power generation in 2019 in Europe were 28 g/kWh and in total 183 g/kWh.
Source: PwC, December 2019, Climate change and Electricity, Fortum

Long-term focus on no- or low-CO_2 power production

Sustainability and CO_2-free power generation have been part of Fortum's strategy for several decades. We believe that the energy system needs to transform to a system with substantially lower emissions, higher resource efficiency, and a higher share of power generation based on renewables. The transformation will not happen overnight and we must provide customers with a secure energy supply at a competitive price during the transition towards lower emissions. In our strategy implementation we have worked to increase our CO_2-free power generation.

Our generation capacity based on fossil fuels, is mainly located in Russia. Our efforts are to constantly increase its efficiency and reduce its specific emissions. In recent years, our investments in Russia have been in renewables in order to increase our solar and wind power capacity while targeting a multi-gigawatt solar and wind portfolio.

Increasing the CO_2-free and low-CO_2 power generation

Over the past decades Fortum has strived to contribute to a more sustainable world. We have increased our annual CO_2-free power generation from around 15 TWh in 1990 to 44 TWh in 2019. The development has not always been linear, as annual variations in hydropower production have a significant impact. With approximately 20% of Uniper's production capacity being hydro and nuclear power, Fortum's CO_2-free power generation will increase by approximately 60% through the consolidation of Uniper, which will happen after the closing of the acquisition of an additional 20% stake, expected during the first quarter of 2020. Around 50% of Uniper's production capacity is gas-based, and will play an important role as a low-CO_2 and flexible source of electricity during the ongoing energy transition.

On 30 January 2020, Uniper announced an ambitious phase-out plan for its German hard-coal-fired power production. Pending approval of the German coal-exit law, the company plans to shut down a total of 1,500 MW of hard-coal capacity by the end of 2022 and a further 1,400 MW by the end of 2025. The last remaining hard-coal-fired power plant would be the 1,100-MW Datteln 4 power plant that must

be decommissioned in 2038, at the latest, according to the draft law on coal phase-outs in Germany.

Among the lowest specific emissions

Fortum was among the early proponents for a market-based price on CO_2 and is advocating for market-based solutions and a strong EU Emission Trading Scheme to drive the necessary change in the energy system. In our own operations we have invested in CO_2-free power generation, and the carbon exposure of our production in Europe is among the lowest at 28 gCO_2/kWh in 2019. The respective figure for Fortum overall was 183 gCO_2/kWh in 2019.

Grow in solar and wind

In addition to CO_2-free hydro and nuclear power production, solar and wind power play an essential role. During 2019, we commissioned the 250-MW Pavagada 2 solar power plant in India, and started the construction of the 250-MW Rajasthan solar power plant, with commissioning expected during the fourth quarter of 2020.

The market conditions in the Nord Pool area and in Russia are more suitable for wind power, and Fortum is continuously investing in these areas. In Russia, Fortum has a wind and solar portfolio of around 2 GW, together with the joint venture with Rusnano. 120 MW is already operational and another 550 MW is under construction. In 2019, Fortum agreed to expand the shareholder base of its Nordic wind portfolio, keeping a 20% ownership stake to manage the construction and serve as a long-term asset manager for the wind portfolio.

Although our solar and wind capacity still is rather small compared to Fortum's total power generation capacity of more than 14 GW, our total wind and solar portfolio has grown substantially during recent years. Together with our associated companies, we have a portfolio of close to three GW (Fortum's share 2,024 MW) of solar and wind parks and development projects in the Nordics, Russia, and India.

Wind and solar capacity	Capacity (including associates), MW	Fortum share, MW
Operational	713	584
Under construction	987	712
Under development	1,339	728
Total	**3,039**	**2,024**

Fortum's CO_2-free power generation will increase by approximately 60% as we start consolidating Uniper