

Annual and Sustainability Report 2019



VATTENFALL

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- Administration report and financial statements
- Statutory sustainability report

Vattenfall is driving the transition to fossil-free living

At Vattenfall we are determined to enable fossil-free living within one generation. To succeed we must become fossil free ourselves. But that's not enough. We are looking beyond our own industry to see where we can really make a difference. Together with our partners, we are taking on the responsibility to find new and sustainable ways to electrify transportation, industries and heating.



About the report

The 2019 Annual and Sustainability Report for Vattenfall AB (publ) is submitted by the Board of Directors and describes the company's overall targets and strategy as well as the year's results. The administration report and accounts are found on pages 4-5, 8-13, 62-150 and are assured by our auditors. Pages 13, 16-18, 58-59, 63-67, 77-79, and 156-167 include Vattenfall's statutory sustainability report according to the Swedish Annual Accounts Act. Vattenfall has been reporting in accordance with the Global Reporting Initiative's (GRI) Guidelines annually since 2003 and for 2019 has applied the GRI Standards, "Core" option.

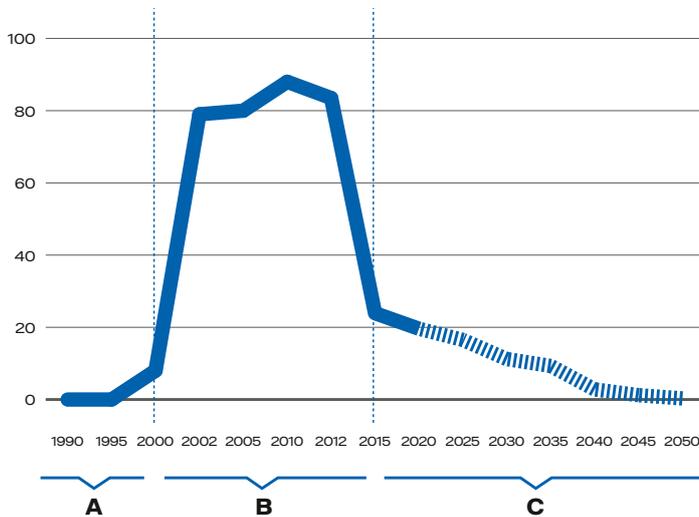
Vattenfall uses the GRI framework as a basis for reporting and is inspired by the Integrated Reporting Framework with the ambition that the report will reflect how sustainability is embedded in the overall strategy as well as in the daily work. Vattenfall uses the Annual and Sustainability Report as its Communication on Progress for the UN Global Compact (UNGC).

Further information about Vattenfall's operations and sustainability work can be found at: vattenfall.com/sustainability.

This is how Vattenfall is driving the transition

Fossil-free electricity generation

To make fossil-free living a reality, we are transforming our production portfolio and helping our customers power their lives in climate smarter ways. We are phasing out fossil-based generation and growing in renewables. By bringing fossil-free electricity to new sectors and contexts, we can contribute to economic growth and social progress while minimising climate impact.



Vattenfall's CO₂ emissions

Mtonnes, 1990-2050 (forecast)

The graph shows how Vattenfall's CO₂ emissions have changed over time, as well as our forecast for the future.

- A** - Deregulation of Europe's energy markets begins
- B** - Vattenfall grows internationally. Acquisitions in Europe including the German lignite operations and Nuon in the Netherlands
- C** - Ongoing transition to enable fossil-free living within one generation

Our milestones towards fossil-free living within one generation

Vattenfall is committed to continually accelerating and powering the transition to further electrification and renewable energy. Our customer promise is that we will provide sustainable and fit-for-purpose energy solutions and that we ourselves are taking steps towards a fossil-free future.

These milestones are intended to show our contribution and commitment to fossil-free living within one generation, and as our journey unfolds, more proof points will be added along the way.



Electrification of transport

We believe that e-mobility will play a key role in realising a climate-smarter life. Easily accessible charging infrastructure is a prerequisite for the transition to electric vehicles. We develop and offer charging solutions for electric cars, buses and trucks. Together with our partners we have built one of Europe's largest charging networks - InCharge - which is currently available in Sweden, Germany, the Netherlands, the UK and Norway.

Partnerships to reduce carbon emissions from industry

Vattenfall is making large investments in renewable energy and phasing out fossil energy sources, but we are also looking beyond our own production to see how we can enable fossil freedom in other sectors. Together with our industrial partners in industries like steel, cement and refining, we are taking electricity from a power source to a source of innovation, paving the way for a new generation of industries and materials, free from the constraints of a carbon-heavy past.



➔
2020

Fossil-free energy solutions available for all our customers
Our operations in the Netherlands are coal-free

➔
2023

We provide electric charging for half a million cars
10 GW of third-party renewables capacity under management
600 MW of additional, flexible hydro capacity enables more renewable generation

➔
2025

We generate fossil-free electricity to power 30 million homes
We pilot 100 MW of green hydrogen gas production from fossil-free electricity
The Nordic production fleet is free from fossil fuels



Smart decentralised energy solutions

We offer a variety of decentralised energy solutions in most of our markets, including electric vehicle charging, local power generation such as rooftop solar panels, and heating solutions including heat pumps and storage solutions. Vattenfall also offers customised and integrated energy solutions to property owners.

Read more about the path to fossil-free living at vattenfall.com

2030

Coal is phased out from all our heat operations

Our emissions are reduced by ~40%, in line with required level to limit global warming to below 2°C

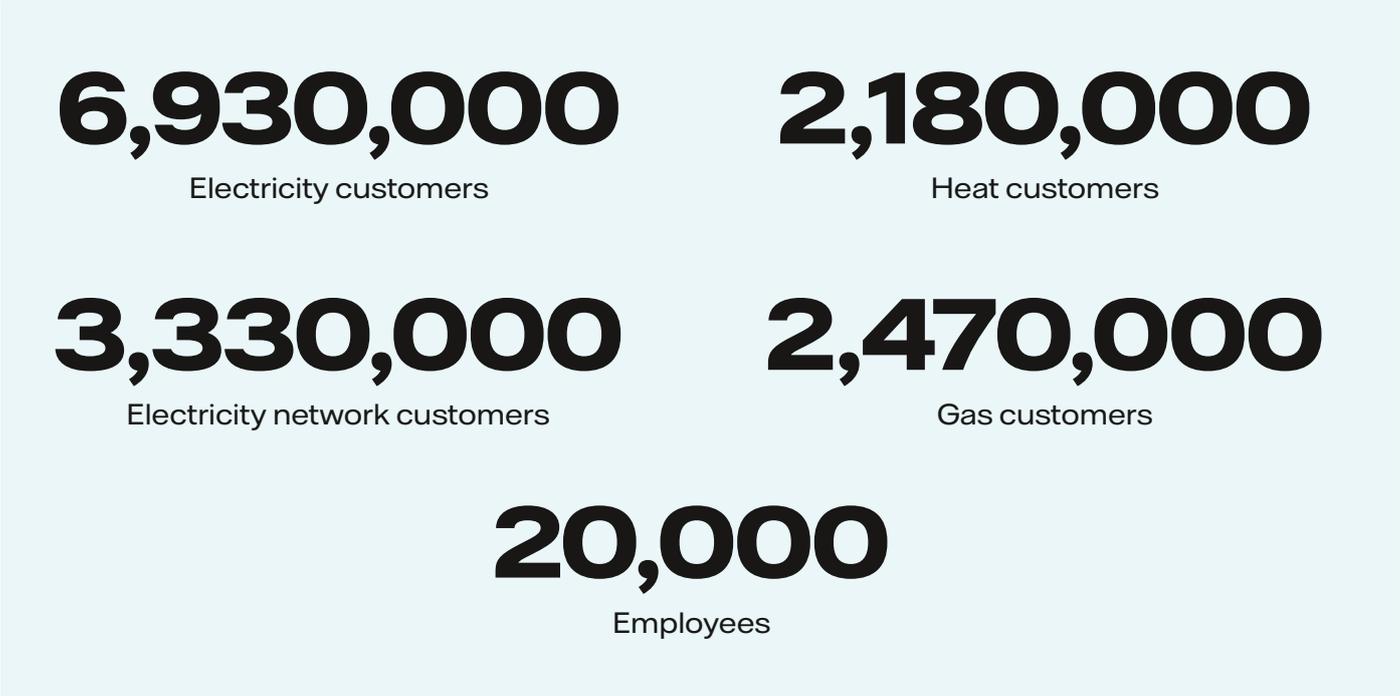
2035

We are not done, more to come...

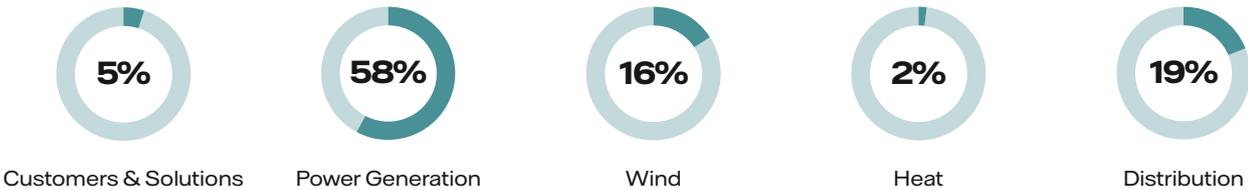
Read more about our strategy on page 20

This is Vattenfall

We are one of Europe’s largest producers and retailers of electricity and heat. Vattenfall’s main markets are Sweden, Germany, the Netherlands, Denmark, and the UK. The Group has approximately 20,000 employees. The Parent Company, Vattenfall AB, is 100%-owned by the Swedish state, and its headquarters are in Solna, Sweden.



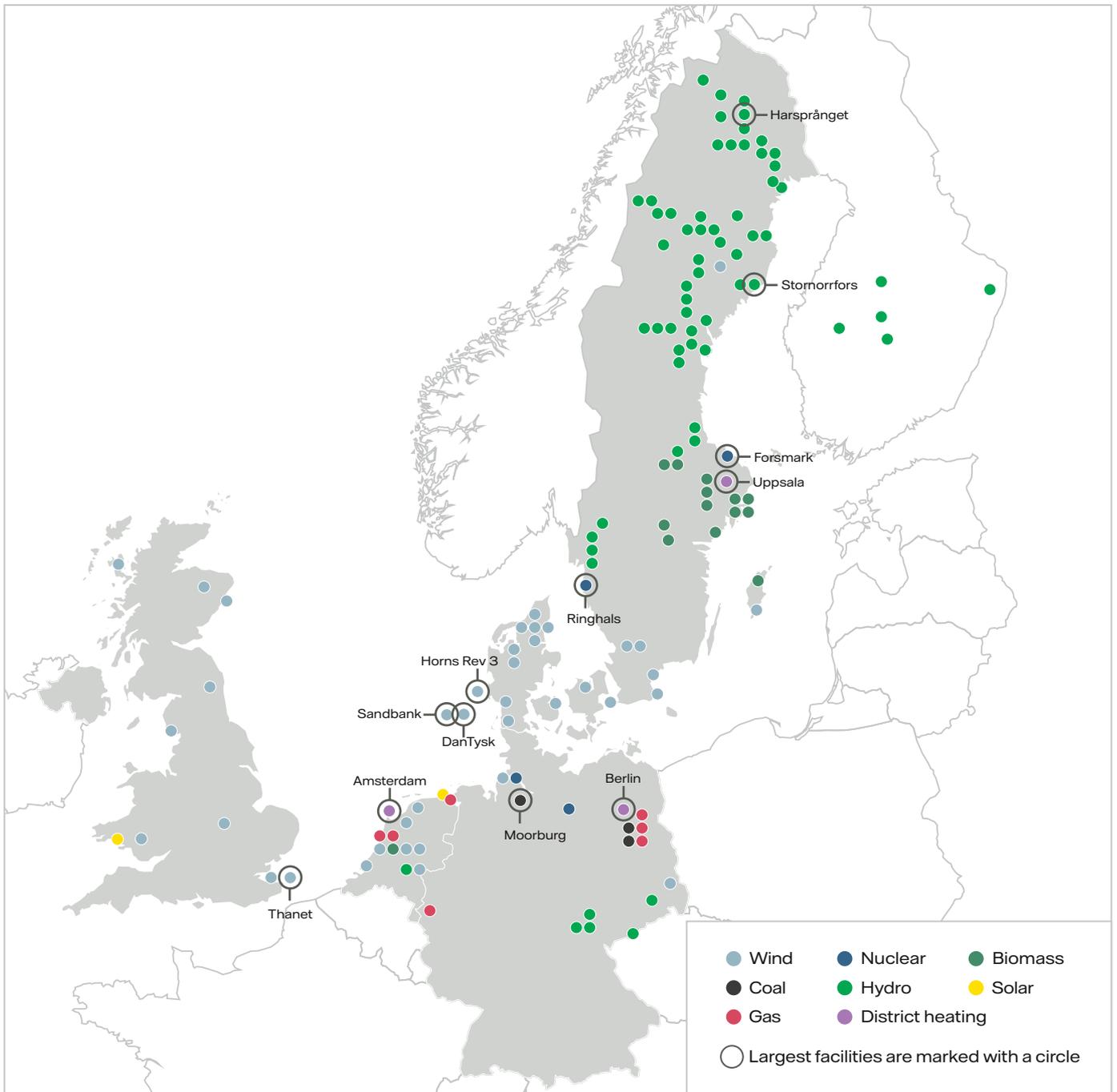
Operating segments - percentage share of underlying operating profit¹ 2019



SEK 25,095 million

¹ Operating profit excluding items affecting comparability.

Overview of Vattenfall's assets and production plants



Largest plants

Wind farms

Horns Rev 3 offshore wind farm, 407 MW
Thanet offshore wind farm, 300 MW
DanTysk offshore wind farm, 288 MW
Sandbank offshore wind farm, 288 MW

Power plants

Ringhals nuclear power plant, 3,952 MW
Forsmark nuclear power plant, 3,271 MW
Moorburg CHP plant: electricity capacity 1,654 MW, heat capacity 30 MW

Hydro power

Harsprånget, 871 MW
Stornorrfors, 599 MW

District heating

Vattenfall's largest district heating networks are in **Amsterdam**, **Berlin** and **Uppsala**

Offices

Vattenfall also has offices in Belgium, Finland, France, Norway and Poland

Other operations

Distribution

Operations in Sweden and Germany

Sales

B2B and/or B2C customers in Sweden, Germany, the Netherlands, Denmark, the UK, France, Finland and Norway

E-mobility

Vattenfall operates 14,900 charging points throughout Sweden, Germany, the UK, Norway and the Netherlands



Dear readers,

I want to begin by saying that Vattenfall is taking the COVID-19 outbreak with the utmost seriousness. We are closely following the authorities' recommendations and have taken steps to lower the risk for contagion among our employees and make sure that the impact on our operations will be as small as possible.

As for developments in the electricity and heat markets in Europe, we find ourselves in a dynamic time. Driven by the need to gain control over the climate issue through lower carbon emissions, a transition is imperative, and one of the most important solutions is electrification of the areas in which fossil fuels today dominate. This applies for transports, for heating of homes on the continent, and for a number of important industrial processes in which fossil-free electricity – directly or indirectly – is replacing coal, gas or oil. In district heating, fossil-free or low-fossil fuel solutions will increasingly dominate development in pace with the successive closure of coal-based production.

Vattenfall sees great opportunities to develop our business in the coming decade. Our strategy is to expand the supply of fossil-free electricity and heat at the same time that we develop and sell solutions to facilitate electrification for our various customer groups.

2019 was a year that validated our strategy in several ways. The downward trend in costs for both solar energy and wind power led to decisions on investments without subsidy support. We received confirmation in the form of a higher customer inflow, greater employee engagement and a steadily rising number of industrial partners seeking collaborations with us.

Earnings improved over 2018

Following a period of strained market conditions and large impairment losses, we have seen a gradual improvement in our earnings performance. Net profit for the year totalled SEK 14.9 billion, an increase of SEK 2.9 billion compared with the preceding year. The underlying operating profit increased by SEK 5.2 billion to SEK 25.1 billion. We can also note that 2019 was a year in which Vattenfall returned to achieving its financial targets. Return on capital employed was 8.5%, and we maintained a stable balance sheet, with funds from operations/adjusted net debt at 26.5%. The Board of Directors proposes a dividend to the owner of SEK 7.2 billion.

The path to fossil freedom requires extensive financial resources, which are derived both from our continuous work in the operating activities and from external sources of funding. Vattenfall's

first green bond, which was issued last summer, met great interest among our investors, and we are funding ourselves at a very competitive cost.

Major investments in renewable energy

In 2019 the Horns Rev 3 offshore wind farm (407 MW) off the Danish west coast of Jutland was commissioned. We also started construction of Kriegers Flak (605 MW) in the Baltic Sea. Together, generation from these wind farms will correspond to the consumption of roughly a million households.

We have a strong project pipeline, which was further strengthened by our winning tender for Hollandse Kust Zuid (HKZ) 3 & 4 in the Netherlands (~750 MW). Together with the first stage, HKZ 1 & 2, which we are also developing, these projects will measure 1,500 MW. They make up the world's first fully commercial offshore wind farm, which means that their production will be sold at market price, entirely without subsidy systems. The power they generate will correspond to the electricity consumption of more than 2 million households.

Solar energy was previously considered to be too costly and small-scale for Vattenfall's business model, but in recent years the cost level has changed dramatically, and in 2019 we began building our

first free-standing large-scale facility, Coevorden (7 MW) in the Netherlands. There we also initiated a hybrid project, Haringvliet, where we are combining wind power (22 MW), solar energy (38 MW) and energy storage (12 MW) at one and the same facility. The project is an example of the breadth of engineering competence we have in Vattenfall. Our business model for solar energy in other respects is based on us developing and building solar farms that are then sold to other investors.

Closing plants to reduce CO₂ emissions

Germany's decision to phase out coal for power generation by 2038 marked a major milestone in its energy transition. As for Vattenfall's position in Berlin, we have completed a feasibility study which shows that it will be possible to phase out coal from the district heating operations by 2030. In line with this ambition, last autumn we closed our coal-fired Reuter C combined heat and power station and have now connected Europe's largest power-to-heat facility to the district heating network. This new solution generates heat from excess electricity produced by renewable energy sources. In Hamburg we would have preferred to continue working in the same way to transform the heating system. However, we have now completed the transaction for the city's repurchase of the district heating operations after the city opted to exercise its option to take over Vattenfall's previous stake of 74.9%.

Coal is also being phased out in the Netherlands, where Vattenfall closed its last remaining coal-fired power plant, Hemweg 8, at the end of the year. This has reduced annual CO₂ emissions by more than 2 million tonnes. We also plan to invest more than SEK 4 billion in the district heating network in Amsterdam during the period up to 2022 to accelerate the pace of the city's shift to heating without natural gas.

Vattenfall's goal to achieve gradually lower emissions has been approved by the Science Based Targets initiative, which is proof that our goal is in line with the Paris Agreement's CO₂ reduction targets going forward.

Working with customers and partners for a fossil-free future

We want to contribute to the work on phasing out fossil fuels in key industrial processes, including steel and cement production, and refining. In September our partner-project for fossil-free steel, HYBRIT, was recognised at the UN climate summit in New York as one of the world's four most ambitious climate initiatives. The owner-companies - Vattenfall, SSAB and LKAB - are part of the Leadership Group for Industry Transition that was launched by

the prime ministers of Sweden and India. Vattenfall is working very actively for a development in which electrification is creating a new generation of industries. We see a future business opportunity in being a part of these industrial processes and being able to integrate them in an increasingly volatile electricity market.

Electricity network at centre of energy transition

In order for us to succeed with the energy transition, growth of renewable forms of energy as well as energy efficiency improvements and greater electrification of industries, transports and heat are decisive. Sweden is in an exceptionally good position to succeed with this shift, not least owing to its ample access to fossil-free electricity. But this puts high demands on the energy system. In parts of Sweden, capacity shortages in the electricity network are a fact already today. This is a historically unique situation that is very problematic for our customers. The market is in need of fundamentally new rules for permitting processes and better conditions for future investments. This is to ensure that the network is modernised and expanded at the pace required for continued growth and achievement of the country's climate goals.

Owing to Storm Alfrida, we began the year with a very tough situation for our customers in Roslagen and the Stockholm archipelago. Vattenfall led the intensive work on repairing the electricity network, deploying hundreds of people out in the field without any serious incidents. Costs for disruption compensation and repairs weighed heavily on profit for the full year.

In Berlin we are securing electricity supply to the city's inhabitants by modernising the electricity network via our subsidiary Stromnetz Berlin, which is well-positioned to continue as the electricity network operator. We will continue to point this out in the appeal process for the concession that was initially granted to the city's own company, Berlin Energie.

A customer-oriented, safe and reliable operation

Vattenfall can once again look back on a very stable year of production for its Swedish nuclear power and hydro power operations. Owing to a focus on safety, cost-cutting and efficiency improvement, the operations have upheld their competitiveness and also made the greatest contribution to the favourable earnings performance for 2019. The work on shutting down Ringhals 2 at year-end has gone according to plan. We are now preparing for the closure of Ringhals 1 at the end of this year at the same time that we are also working to ensure that the issue of final

storage of spent nuclear fuel will come closer to a necessary approval.

The margin for the electricity sales business is being affected by high competition and growth investments at the same time that we are increasing deliveries of fossil-free solutions and are seeing continued customer growth. During the year the sales company DELTA Energie in the Netherlands was acquired. We have also expanded in e-vehicle charging solutions, including a new and innovative charging network that we launched together with partners in Amsterdam.

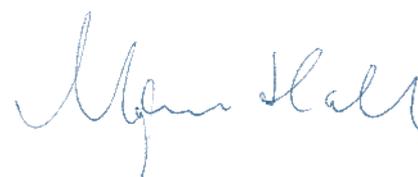
Responsibility to respect human rights

Vattenfall supports the UN's 17 Sustainable Development Goals and is working to ensure sustainability along the entire value chain. Respect for human rights is an important part of this. By providing training to our buyers and other internal key persons and by collaborating with existing suppliers in human rights matters, we continue to strengthen our ability to identify and reduce risks in the entire value chain. Beyond our supply chain we have also laid the foundation for broadening our sustainability assessment of potential partners to ensure that they also show they are committed to respecting human rights.

Our employees enable us to continue playing a leading role in the energy transition

Finally, I want to thank our employees for their exceptional work. In our annual employee survey we can see that engagement in our company is increasing. This is highly inspiring and I look forward to now bringing Vattenfall into the 2020s where we will build upon our 110-year history as a pioneer in the energy industry.

The challenges in today's energy landscape are not likely to decrease given the prevailing market conditions. However, the capacity to solve problems and achieve change is part of our identity as a company. Vattenfall continues to drive the electrification of society with investments in technology and projects that are making a difference in the energy transition. The goal is clearer than ever: fossil-free living within one generation. Together with our customers and partners we are making this possible.



Magnus Hall, President and CEO



The year in numbers

Financial

SEK million

166,360 (152,091)
Net sales

25,095 (19,883)
Underlying operating profit¹

22,141 (17,619)
Operating profit

14,861 (12,007)
Profit for the year

¹ Operating profit excluding items affecting comparability.

Social

69% (64)
Employee Engagement Index

2.1 (1.9)
LTIF (Lost Time Injury Frequency)

26% (24)
Share of female managers

+1 (+1)
Net Promoter Score (NPS)¹

¹ NPS is a tool for measuring customer loyalty.

Environmental

19.3 Mtonnes (22.0)
CO₂ emissions¹

894 GWh (694)
Energy efficiency improvements²

474 MW (101)
Added renewables capacity

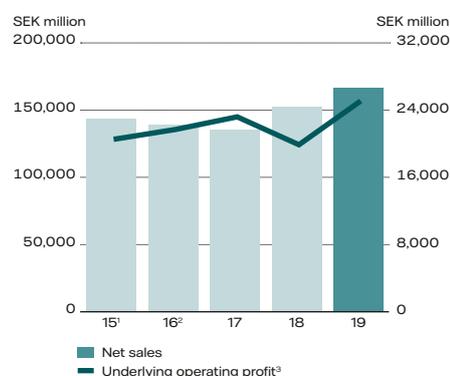
76% (75)
Share of fossil-free electricity generation

¹ Including the heat operations in Hamburg, which have been sold and where emissions amounted to 11 Mtonnes during the period January-September.

² Cumulative energy efficiency improvements since 2016.

Performance trends

Net sales and underlying operating profit

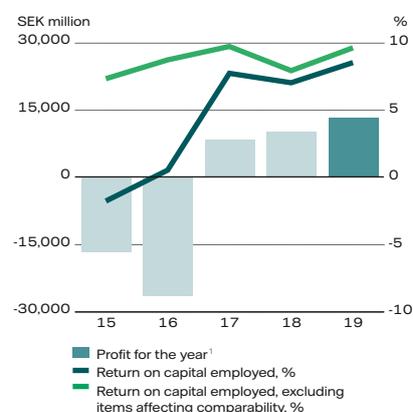


¹ The value for 2015 has been recalculated compared with information published in Vattenfall's 2015 Annual and Sustainability Report. This is because the lignite operations have been divested and are reported as a discontinued operation in accordance with IFRS 5.

² The value pertains to continuing operations.

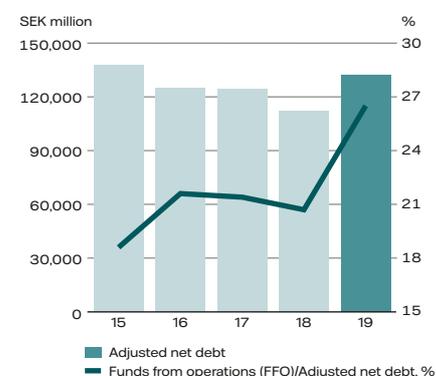
³ Operating profit excluding items affecting comparability.

Earnings and return

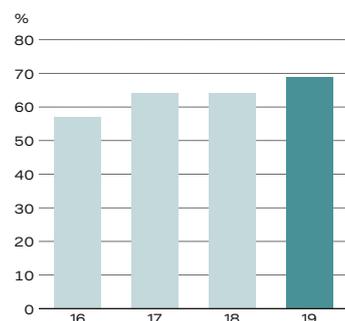


¹ Profit for the year attributable to owners of the Parent Company.

Adjusted net debt and funds from operations

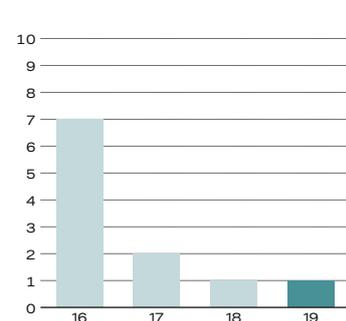


Employee engagement index¹



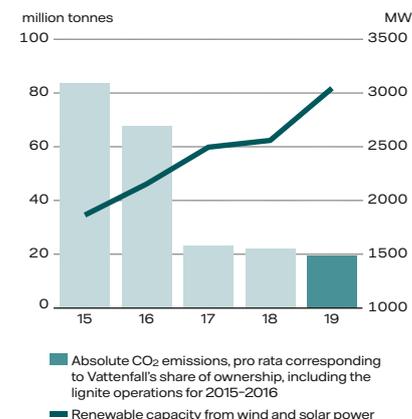
¹ Documentation for measurement of target achievement is derived from the results of an employee survey, which is conducted on an annual basis.

Net Promoter Score relative to peers¹



¹ NPS is a tool for measuring customer loyalty and for gaining an understanding of customers' perceptions of Vattenfall's products and services.

CO₂ exposure and installed renewable capacity



Important events

Q1 2019

Major disruptions following Storm Alfrida in Sweden – Storm Alfrida hit Sweden on 2 January with winds of upwards of 38 metres per second and caused major disruptions in electricity supply. Some 100,000 people were left without electricity across Sweden, of whom about 65,000 were Vattenfall customers.

Acquisition of sales company DELTA Energie in the Netherlands

– DELTA Energie supplies renewable electricity and gas to private customers and small and medium-sized companies, primarily in the Zeeland province of the Netherlands. The company has 120 employees and 170,000 customers.

New power purchase agreement with Marguerite – European infrastructure investor Marguerite and Vattenfall entered into a long-term power purchase agreement (PPA) for renewable electricity from the Brännliden (42 MW) wind farm in northern Sweden. Vattenfall will purchase the generated electricity and provide balancing services as well as market access and management of green electricity certificates (Guarantees of Origin).

Expansion of e-mobility charging network to the Norwegian market – Vattenfall's e-mobility charging network, InCharge, expanded to Norway. InCharge will offer charging solutions to private customers and companies while also working to establish more public charging points.

Inauguration of repowered Slufterdam onshore wind farm in the Netherlands – The Slufterdam onshore wind farm (29 MW) was inaugurated in February. The original turbines installed in 2002 have been replaced with a more efficient and modern model, thereby also doubling the wind farm's capacity.



Slufterdam onshore wind farm in the Netherlands.

Acquisition of Dutch energy services company Senfal – The acquisition will add new services for large industrial customers with the aim of unlocking value through flexibility and optimisation of renewable generation. Through its services, Senfal is able to substantially reduce the energy bill for large industrial companies and realise substantial improvements in power trading profits for wind and solar farms as well as battery owners.

Q2 2019

Construction of the Kriegers Flak (605 MW) offshore wind farm in Denmark started – Construction began of the first foundations for one of Vattenfall's largest offshore wind farms. In all, 72 8.4 MW wind turbines will be installed, and the wind farm's future electricity generation will meet the annual electricity consumption of 600,000 Danish households.

Launch of smart charging solutions for e-vehicles in Amsterdam

– In cooperation with the city of Amsterdam, Vattenfall launched Flexpower, a public smart charging network for e-vehicles. A total of 456 charging stations with 912 charging points, representing a third of all charging stations in the city, have been upgraded and connected. Flexpower tailors charging speeds to the prevailing electricity consumption and renewable electricity generation.

Issuance of Vattenfall's first green bond – In June, Vattenfall issued its first green bond of EUR 500 million. The funds are earmarked for investments in renewable energy, energy efficiency, industry projects and climate-smart solutions.

EUR 500 m

Size of Vattenfall's first green bond

Long-term power purchase agreement (PPA) with Dutch wind farm – Vattenfall signed a 15-year power purchase agreement for renewable electricity from the Zeewolde onshore wind farm in the Netherlands. Vattenfall will purchase power from 83 of the turbines, in total approximately 300 MW, making this Vattenfall's largest PPA to date in the Netherlands.

Final investment decision for installation of solar power and battery storage in the Netherlands – Vattenfall took the final investment decision on the installation of solar power (38 MW) and battery storage (12 MW) at the Haringvliet (22 MW) onshore wind farm that is being built in the Netherlands. This is Vattenfall's largest solar project so far. Read more on page 45.

Vattenfall selected as preferred partner for a district heating project in the UK – Vattenfall was selected as the preferred partner to deliver infrastructure for a district heating project in Brent Cross South in north London. This is part of a major urban regeneration scheme in which the planned district heating network will serve 6,700 homes using a mix of low-carbon technologies, including the UK's largest installation of heat pumps.

Pilot plant for energy storage in salt – Together with the Swedish company SaltX Technology, Vattenfall will test whether renewable energy can be stored in salt. A pilot plant with storage capacity of 10 MWh has been commissioned at the Reuter combined heat and power (CHP) plant in Berlin.

Q3 2019

Winning tender for the Hollandse Kust Zuid 3 & 4 offshore wind farm in the Netherlands - Vattenfall won the tender for the non-subsidised Hollandse Kust Zuid (HKZ) 3 & 4 offshore wind farm in the Netherlands. Vattenfall already holds the permit to build the first stage, HKZ 1 & 2. Together these projects will have installed capacity of approximately 1.5 GW, which corresponds to the annual electricity consumption for over 2 million Dutch households.

1.5 GW

planned capacity for Hollandse Kust Zuid 1-4

Inauguration of Horns Rev 3 offshore wind farm in Denmark -

The Horns Rev 3 offshore wind farm was inaugurated in August. The wind farm has total installed capacity of 407 MW, which makes it the largest offshore wind farm in Scandinavia. The generated electricity will cover the annual consumption of approximately 425,000 Danish households.

Transfer of production rights to E.ON's subsidiary Preussen-Elektra in Germany - Vattenfall and E.ON's subsidiary Preussen-Elektra agreed on the transfer of 10 TWh of production rights from the co-owned Krümmel nuclear power plant. Vattenfall's share of the purchase price amounted to SEK 1.5 billion. The legal proceedings regarding PreussenElektra's lawsuit on the free transfer of 44 TWh of production rights (including the 10 TWh already transferred) are ongoing.

Power-to-heat facility connected to district heating network in Berlin, enabling the closure of a coal-fired power plant -

Europe's largest power-to-heat facility was connected to the district heating network in Berlin, making it possible to take the coal-fired Reuter C unit out of operation. The new plant, with a capacity of 120 MWth, will produce and store heat from excess electricity generated by renewable energy sources.

Feasibility study conducted by Vattenfall and the City of Berlin shows that a coal phase-out in Berlin is feasible by 2030 -

The study shows that by replacing hard coal, annual CO₂ emissions can be reduced by more than 2 million tonnes. This means that the coal phase-out in Vattenfall's district heating operations in the city would be the single largest contribution to Berlin's path to climate neutrality by 2050.

Transfer of district heating operations in Hamburg completed

- The transfer of the district heating operations to the City of Hamburg was completed on 2 September. The city exercised its call option to purchase Vattenfall's share (74.9%) in the district heating company for EUR 625 million (SEK 6.6 billion), generating a capital gain of SEK 3.1 billion.

Q4 2019

Name change from Nuon to Vattenfall in the Netherlands completed - The change of Vattenfall's Dutch subsidiary's name from Nuon to Vattenfall was completed. The Nuon brand has also been changed to Vattenfall in the B2C market.

Sharply reduced allowable return for distribution operations in Sweden during the period 2020-2023 -

The Swedish Energy Markets Inspectorate issued its decision on the new revenue frames for the coming regulatory period (2020-2023), with an allowed return (WACC) of 2.16% for Vattenfall's electricity distribution operations. This is a considerably lower level than in the 2016-2019 regulatory period (5.85%) and results in a reduced scope for investments, which is problematic from a societal and climate perspective.

Award decision for electricity network concession in Berlin seen as unlawful -

The City of Berlin announced at the beginning of 2019 that Vattenfall, through its electricity network company Stromnetz Berlin, had not been awarded the renewed concession rights to operate the city's electricity network. Vattenfall appealed the decision, and the first court instance has ruled the city's decision to award the concession to a city-owned entity was unlawful. The legal process is expected to continue in 2020.



Ringhals nuclear power plant.

Closure of Ringhals 2 nuclear reactor - Ringhals 2 went into a so-called coast-down phase in September, gradually reducing power as the fuel burnt out. The last electricity was generated on 30 December, and cold shutdown was reached on 31 December after 44 years in operation.

Closure of the Hemweg 8 coal-fired power plant - The Hemweg 8 coal-fired power plant in the Netherlands closed at the end of 2019. The plant site is under development into a facility where fossil-free electricity and heat can be produced for Vattenfall's customers.

Pilot with Microsoft to track consumption of renewable electricity in real time -

Vattenfall and Microsoft have jointly developed a solution that enables companies to track their use of renewable electricity in real time. The new solution connects information from renewable electricity generation with smart meters in office buildings. The solution is being piloted at Vattenfall and Microsoft headquarters in Sweden.



At Vattenfall we aspire to contribute to a sustainable energy system in all parts of the value chain. Our goal is to be a truly customer-centric company as we transition towards a long-term sustainable production portfolio.

Vattenfall's Board of Directors has set six strategic targets, and Vattenfall's owner has set three financial targets for the Group.

Strategic targets

In 2015 the Board of Directors decided that Vattenfall's four strategic objectives should be 1) Leading towards Sustainable Consumption and 2) Leading towards Sustainable Production, with 3) High Performing Operations and 4) Empowered and Engaged People. Effective 1 January 2016 Vattenfall's Board of Directors adopted six strategic long-term targets for 2020 linked to these four strategic objectives as displayed on the following page. Though our strategy remains directionally the same, in 2019 we added a fifth element to reflect the importance of a connected and optimised energy system to enable fossil-free living. The updated strategy is explained in more detail on page 20.

Financial targets

The financial targets pertain to profitability, capital structure and the dividend policy, and were set by Vattenfall's owner at an extraordinary general meeting in December 2017. These targets are intended to ensure that Vattenfall creates value and generates a market rate of return, that the capital structure is efficient, and that financial risk is kept at a reasonable level.

Strategic targets

Strategic objective	Strategic targets for 2020	Outcome 2019	Outcome 2018	Comment	
Leading towards Sustainable Consumption	Customer engagement, Net Promoter Score (NPS) relative ¹ (customer satisfaction relative to competitors):	+2	+1	+1	Improved performance for Vattenfall as well as for competitors. The Customers & Solutions operating segment achieved an NPS of +1 (+1) relative to competitors.
Leading towards Sustainable Production	Commissioned new renewables capacity 2016-2020:	≥ 2,300 MW	1,226 MW²	752 MW	A total of 474 MW (101) of new renewable capacity was installed in 2019. Two wind farms have been commissioned, Horns Rev 3 (407 MW) in Denmark and Slufterdam (29 MW) in the Netherlands. See pages 24-25 for more information about planned investments.
	Absolute CO ₂ emissions pro rata:	≤ 21 Mtonnes	19.3³ Mtonnes	22.0 Mtonnes	Absolute CO ₂ emissions decreased in 2019 to 19.3 Mtonnes (22.0). The reduction is mainly explained by lower coal-fired generation.
High Performing Operations	Return On Capital Employed (ROCE):	≥ 8%	8.5%⁴	7.0%⁴	Return on capital employed was 8.5% (7.0%). A higher gross margin in the Power Generation operating segment and the capital gain from the divestment of the district heating operations in Hamburg made a positive contribution.
Empowered and Engaged People	Lost Time Injury Frequency (LTIF): ⁵	≤ 1.25	2.1	1.9	Lost Time Injury Frequency (LTIF) was 2.1 (1.9). Improvement measures are ongoing.
	Employee Engagement Index: ⁶	≥ 70%	69%	64%	The Employee Engagement Index improved considerably and amounted to 69% (64).

Financial targets

Financial targets	Targets over a business cycle ⁷	Outcome 2019	Outcome 2018	Comment	
Profitability	Return On Capital Employed (ROCE):	≥ 8%	8.5%⁸	7.0%⁸	Return on capital employed was 8.5% (7.0%). A higher gross margin in the Power Generation operating segment and the capital gain from the divestment of the district heating operations in Hamburg made a positive contribution.
Capital structure	Funds from operations (FFO)/adjusted net debt:	22%-27%	26.5%	20.7%	FFO/adjusted net debt increased compared with 2018, to 26.5% (20.7%). The increase is mainly attributable to higher EBITDA as a result of higher achieved prices in the Power Generation operating segment and lower paid tax.
Dividend policy	Dividend, share of the year's profit after tax:	40%-70%	7.2 SEK billion⁹	2 SEK billion	The Board of Directors proposes a dividend of SEK 7.2 billion, corresponding to 55% of profit for the year attributable to the owner of the Parent Company.

Notes to strategic targets

¹ NPS is a tool for measuring customer loyalty and for gaining an understanding of customers' perceptions of Vattenfall's products and services. The target is a positive NPS in absolute terms +2 compared to Vattenfall's peer competitors.

² Pertains only to wind and solar farms completed and commissioned between 1 January 2016 and 31 December 2019.

³ Including the heat operations in Hamburg, which have been sold and where emissions amounted to 1.1 Mtonnes during the period January-September.

⁴ The key ratio is based on average capital employed.

⁵ Lost Time Injury Frequency (LTIF) is expressed in terms of the number of lost time work injuries (per 1 million hours worked), i.e. work-related accidents resulting in absence longer than one day, and accidents resulting in fatality. The ratio pertains only to Vattenfall employees.

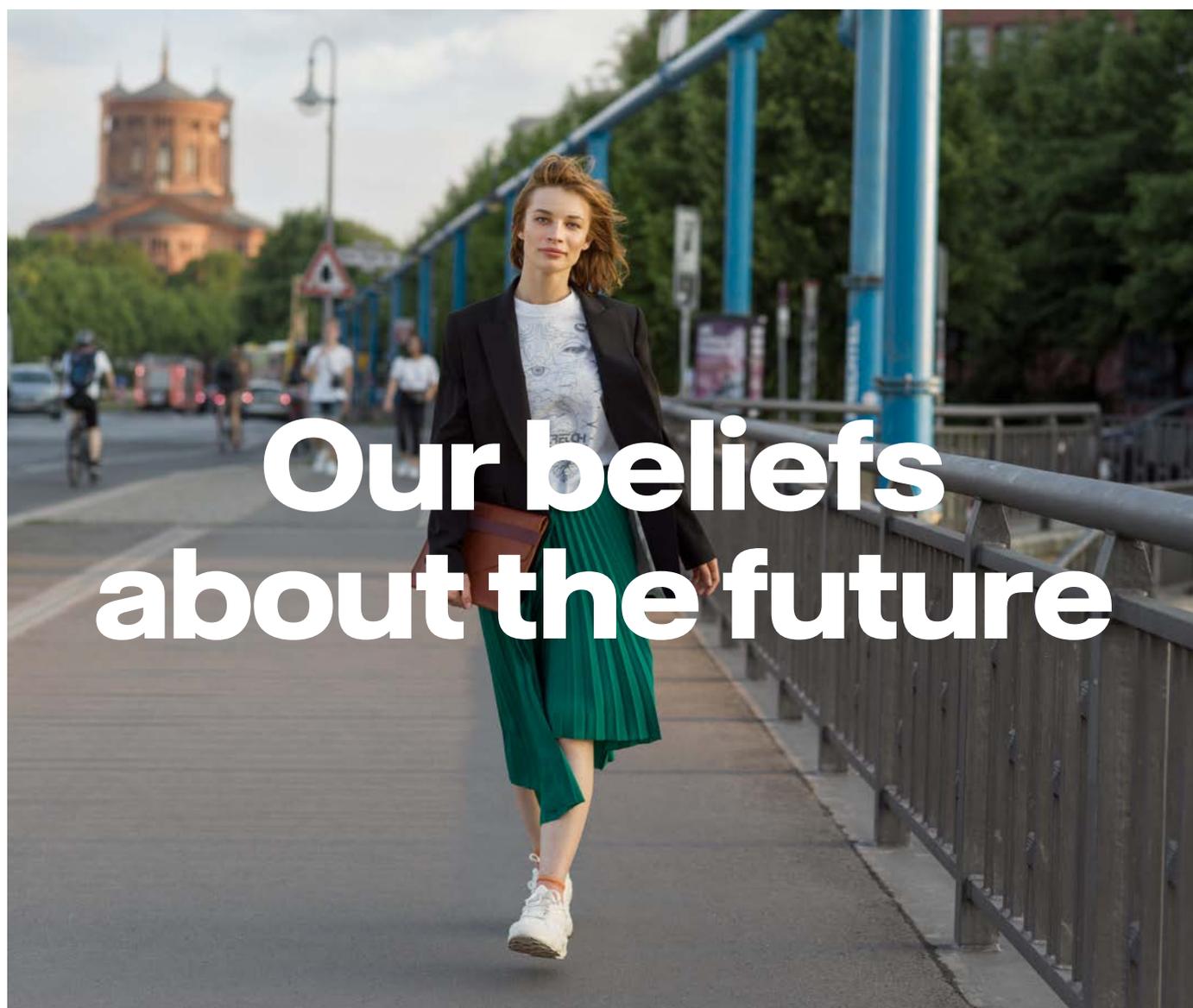
⁶ Documentation for measurement of target achievement is derived from the results of the My Opinion employee survey, which is conducted on an annual basis.

Notes to financial targets

⁷ 5-7 years.

⁸ The key ratio is based on average capital employed.

⁹ The proposed dividend will be voted on at the Annual General Meeting on 28 April 2020.



Our beliefs about the future

Our beliefs underpin our strategy and represent our view of what is necessary to ensure Vattenfall's success given the overall context in which we operate.

Sustainability is the business - and a prerequisite for access to customers, competence and investors

Customers want to reduce their carbon footprint and seek to do so by engaging with companies with similar values of environmental and social responsibility. Employees are driven more than ever to seek companies with strong values where they feel they can have a positive impact on society. Likewise, investors are increasingly integrating sustainability into their decision-making and moving away from investments that link them to fossil fuels. Businesses viewed as forward-thinking and sustainable will be able to leverage stakeholder expectations to their benefit, gaining an edge in the competition for talent, easier access to capital, and more opportunities to form strategic partnerships.

To best serve the needs of customers, a total energy perspective is necessary

Customers are becoming increasingly sophisticated as they progressively adopt decentralised solutions like heat pumps, solar power, e-mobility, energy storage, and smart devices. However, customers are not always equipped to optimise the interplay between the various technologies and thus seek simple, integrated solutions that do not require them to be experts. Companies that can provide simple solutions that truly focus on customer needs by effectively leveraging their expertise across the full energy value chain will have a strong competitive advantage.

Electrification is a key enabler of fossil-free living and, given the pace required, demand for fossil-free electricity and distribution infrastructure will increase significantly

Electrification represents an opportunity to reduce carbon emissions in the transportation, heating and industrial sectors. The key driver for electrification is a combination of cost efficiency and sustainability, and demand for low-cost, fossil-free electricity will increase as a result. This will also place additional demand on electricity networks, creating the need for further investments in expansion and modernisation of networks. Suppliers of fossil-free electricity and heat, as well as the respective network operators, will play an increasingly important role in the work to combat climate change.

Digitalisation of the entire energy value chain is required to leverage flexibility and serve customers in a fossil-free, robust and cost-efficient energy system

As renewable resources increase and industries electrify, it is necessary to better leverage existing infrastructure and the potential for flexibility in order to continue to deliver a fossil-free, robust and cost-efficient energy system. In addition, customers expect instant information and access as smartphone applications and internet-based solutions are the main interface for customer service and interaction. This means that further digitalisation of the energy value chain is needed, including the ability to gather and make sense of large amounts of real-time data to forecast demand, to perform predictive maintenance and remotely steer devices, along with sound data management practices and smooth customer interfaces.

New competences, speed in learning and diverse and inclusive teams are critical in the energy transition

New skill sets and competences will constantly be required as our industry transitions into new ways of interacting with customers, technology and society. Speed in learning and the ability to adapt to new ways of working will be important competitive advantages and enable the delivery of new products and more efficient processes. Company cultures that are inclusive to diverse points of view will be critical to foster this learning environment and attract and retain talent.

Cost efficiency and competitiveness are prerequisites for value creation and growth

Increased competition in both core and new businesses puts pressure on margins, necessitating a focus on both cost efficiency and competitiveness in order to deliver value. Improving efficiency throughout the value chain will play a significant role. Efficient operations require high utilisation of people and assets, lean and digital processes and high cost awareness.



Business model

Vattenfall is an integrated energy company with the customer at the centre. Sustainable growth is guiding us into the future. The following section describes our business model and the value we generate for our stakeholders by applying the six capital inputs of the International Integrated Reporting (IR) Framework. On pages 18 and 19 we describe our total impacts and our contributions to the UN's Global Sustainable Development Goals.

Vattenfall's business activities

Power generation

Vattenfall generates electricity from many types of energy sources, including hydro, nuclear, coal, natural gas, wind, solar, biomass, and waste. We are actively phasing out fossil fuels and investing in a greater share of renewable generation.

Electricity distribution

Being able to guarantee secure supply requires well-functioning distribution networks and development of smart network solutions. Vattenfall enables customers to feed self-generated electricity into the grid, thereby becoming so-called prosumers who both buy and sell electricity. Vattenfall conducts electricity network operations in Sweden and Germany. Electricity distribution is a regulated monopoly business that is supervised by national grid authorities.

Sales of electricity, heat and gas

Vattenfall sells electricity, heat and gas to consumers and business customers. We focus on optimising the customer experience by offering various price and service models and by giving customers opportunities to reduce their environmental impact.

District heating

Vattenfall is one of Europe's largest producers and distributors of district heating, supplying households and industries in metropolitan areas. In partnership with cities and regions we are driving the transition to fossil-free heating solutions, such as by integrating surplus or waste heat from third parties in our district heating networks.

Energy services and decentralised generation

Vattenfall offers energy services, including battery storage, network services, e-vehicle charging solutions, solar panels, heat pumps and smart meters. We also provide market services and access to marketplaces where customers can buy and sell electricity, as well as solutions for customers to optimise their energy use and gain access to convenient and smart energy solutions.



Customers & Markets

Inputs

Natural capital	Financial capital	Human capital	Manufactured capital	Social and relationship capital	Intellectual capital
<ul style="list-style-type: none"> Hydro, wind and solar power Coal and gas Uranium Biomass and waste 	<ul style="list-style-type: none"> Growth investments in renewables Maintenance investments (e.g., in safety) Investments in energy transition and smart grids 	<ul style="list-style-type: none"> Engineering and service skills Market analysis, trading, and commodities market knowledge Digital competence and technical innovation Business development 	<ul style="list-style-type: none"> Renewable, thermal and nuclear power plants Electricity networks Decentralised solutions (e.g., solar panels, heat pumps, batteries and smart appliances) 	<ul style="list-style-type: none"> Customer relationships Values and brand recognition Credibility and trust as partner and driver of the energy transition Responsible relationships with suppliers Active dialogue with local communities, stakeholder organisations, investors, etc. 	<ul style="list-style-type: none"> Meteorology (weather-dependent sources) Sustainability framework and integration in operations New ways of working, structures and processes Research and development



Vattenfall's business activities



Outputs

For customers	For partners	For society	For Vattenfall's owner and employees
<ul style="list-style-type: none"> Supply of safe, stable, affordable and low-CO₂ energy to a large number of customers in seven countries Enabling our customers to participate in the energy transition by offering decentralised solutions, such as solar power and heat pumps Leading the electrification of transport and operating approximately 14,900 charging points 	<ul style="list-style-type: none"> Powering energy-intensive industries with fossil-free electricity and promoting electrification of industry, such as through collaborations with companies in the steel, cement and refinery industries Partnering with cities and regions to develop and implement climate neutrality plans 	<ul style="list-style-type: none"> Approximately 100 TWh of fossil-free electricity generated SEK 8.2 billion in paid taxes Support and encouragement to local suppliers by organising supplier education and encouraging participation in tenders Providing expertise to drive the energy transition and sustainability issues Participation in local environmental and biodiversity conservation projects, and in other local projects and activities 	<ul style="list-style-type: none"> Providing a livelihood for nearly 20,000 employees with an emphasis on inclusion, diversity and safety Dividend of SEK 7.2 billion proposed by the Board of Directors to our owner for 2019

Values

~10 million customers in distribution, electricity, gas, heat and energy solutions

~100 TWh of fossil-free electricity generated

~20% decrease in CO₂ emissions since 2015

20,000 employees and SEK 20.2 billion in personnel costs

Outcomes

Vattenfall's total value creation

Calculating total value creation is a way of describing the full impact of Vattenfall's operations and for improving decision-making by raising awareness of the risks and opportunities related to impacts from social and environmental perspectives. It is not intended as a statement of reported financial development.

In 2017 we made a first attempt to quantify our full impacts on people and society – both positive and negative – from economic, social, and environmental perspectives. We have since refined our methodology to include "other" emissions, consisting of NOx, SOx, and particulates. We will continuously review our approach as it is increasingly integrated into the company's decision-making processes and influences how we contribute towards various sustainability initiatives, such as the UN's Global Sustainable Development Goals.

Value creation increased from SEK 26.2 billion in 2018 to SEK 37.4 billion in 2019.

Economic

Our economic calculation follows standard accounting procedures and is based on net sales with remaining items deducted. Vattenfall's net economic contribution recorded here is equal to the company's profit. Higher earnings from our operating activities drove an improvement in profit for the year.

Economic value: SEK 14.9 billion
Change from 2018: SEK +2.9 billion
 Profit for the year

Social

We strive to identify our impacts on people and society, although much of the social value we create – e.g., investments in community improvements – and the costs we incur – e.g., impacts on people's health – can be difficult to quantify. We have included taxes and wages¹ from the financial reporting as well as costs for accidents in the calculation and have quantified the cost of an employee or contractor involved in an accident².

The value generated increased in 2019. Both personnel costs and taxes paid

increased. Though there were no fatalities in 2019, unfortunately LTI³ still increased. See page 57 for more information on how we intend to reverse this trend.

Social value: SEK 28.3 billion
Change from 2018⁴: SEK +2.5 billion
 Taxes + wages – (Number of accidents (LTI) x cost per accident) – (Number of fatalities x cost of fatality)

Environmental

Direct (Scope 1) emissions continue to be our most material environmental impact. We have calculated the negative costs related to our emissions based on the CO₂ price in the EU and the ETS. The value given here is an additional negative value⁵. Though we place great focus on our full value chain and have set a science-based target on Scope 3 emissions (see page 49), we have not included them in the value calculation, as we cannot yet accurately represent both value and costs at the Group level. However, we are integrating the value creation approach in some of our projects, leading to reduced material use and Scope 3 emissions. See page 160

for more details. The quantification of certain benefits, such as renewable electricity generation or contributions to biodiversity and ecosystem research, remains under review, as do potential negative impacts including land use, ecosystem alterations, and others.

The amount of value generated in 2019 increased by SEK 6 billion, driven largely by the decrease in CO₂ emissions. As Vattenfall decarbonises on its path to make fossil-free living possible within one generation, the costs associated with CO₂ and other emissions will decrease in tandem. The effects of this will be gradual. Meanwhile, we are implementing best available technologies and ensuring that our power plants emit less than the legal limits for non-CO₂ emissions.

Environmental value: SEK -5.7 billion
Change from 2018: SEK +6.0 billion
 Cost of purchased emission allowances – (Cost of CO₂ x emissions) – (Cost of other emissions⁶ x emissions)

¹ For more information on taxes and wages, see page 158 and Note 42 to the consolidated accounts. Number of employees and personnel costs, respectively.

² SEK 1 million per accident and SEK 25.4 million per fatality (based on figures from the Swedish National Traffic Authority).

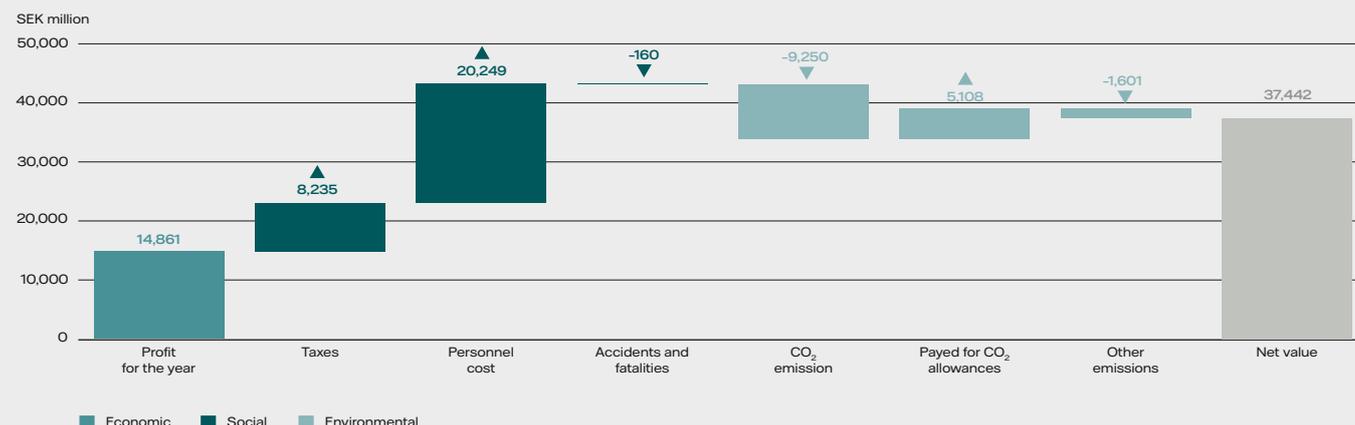
³ LTI: Lost Time Injury. See page 159 for more information.

⁴ Training data not available for 2019. 2018 numbers updated for comparison.

⁵ Typical costs are estimated to be in the range of SEK 200–1,000/tonne. Ecofys, "Subsidies and costs of EU energy", 2014. SEK 500/tonne is used as the baseline value.

⁶ European Energy Agency, "Revealing the cost of air pollution from industrial facilities in Europe", 2011. Country-specific values applied.

Value creation



The UN's Global Sustainable Development Goals (SDGs)



Vattenfall's activities contribute to the achievement of the UN's Global Sustainable Development Goals (SDGs), which are a collection of 17 global goals that were adopted in 2015 by more than 150 countries. Though adopted by governments, our strong belief is that businesses and industries play a decisive role in the extent to which these goals are achieved. In 2016 we identified six SDGs that are most relevant for Vattenfall and where we can have the greatest global impact, and these remain valid internally, as reflected in our strategy, as well as for our stakeholders, as confirmed by our 2018 materiality analysis. Our contribution to these six goals is described below. Vattenfall also contributes to many other SDGs, including those in support of human rights, at the local level and indirectly through our supply chain.¹

SDG	Target	Examples	Page
	7.2 By 2030, increase substantially the share of renewable energy in the global energy mix.	In 2019 we commissioned 474 MW of new renewable capacity. Further, we expect to commission 7 GW of capacity by 2023, and have 3-5 GW in the pipeline to be built after that.	43
	9.4 By 2030, upgrade infrastructure and retrofit industries to make them sustainable.	We collaborate with other stakeholders to test and develop the infrastructure required to integrate more renewables while keeping the grid stable. We have further invested in HYBRIT to enable fossil-free steel production and continue to explore ways to electrify industrial processes to reduce emissions.	51, 25
	11.6 By 2030, reduce the adverse per capita environmental impact of cities.	In addition to operating more than 14,900 charging points, we have also partnered with a number of ride- and car-sharing services to improve access to mobility while reducing the total number of cars and their emissions.	33
	12.2 By 2030, achieve sustainable management and efficient use of natural resources. 12.5 By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.	In our hydro power business, we have undertaken a great number of initiatives to maximise ecological benefit while minimising the impact on operations. We sell over 90% of our industrial waste to be reused in other industries.	37, 164-167
	13.1 Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters.	Climate risks are part of our ERM. Some examples of climate adaptation measures include strengthening our hydro power dams and weatherproofing our network infrastructure against anticipated future climate risks.	67
	17.17 Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships.	We collaborated with the city of Berlin on a feasibility study which determined that a coal exit by 2030 was possible. Moreover, our collaboration with the city of Amsterdam on helping identify families in need of assistance has been expanded to other cities in the Netherlands as well.	47

¹ See the website [vattenfall.com/sustainability/un-sustainable-development-goals/](https://www.vattenfall.com/sustainability/un-sustainable-development-goals/).



Strategy

Vattenfall has formulated a strategy with the purpose to Power Climate Smarter Living and enable fossil-free living within one generation. This commitment to our customers, stakeholders and employees provides clear direction, engagement and focus as well as significant business opportunities.

Fossil-free living within one generation remains our compass

Fossil-free living within one generation continues to be a powerful and relevant message that provides a clear direction for Vattenfall. This bold statement also sets us apart as leaders in the energy transition, and it is increasingly clear that customers as well as potential employees and investors are responding to this. Our B2B customers in Sweden have ranked us as the most sustainable energy company, and among the general public we see a gradual increase in the value of our brand in many markets. Investors are also taking concrete action, as demonstrated by the high interest in the issuance of our first green bond.

While the goal is clear, the path to get there is still being uncovered, and we know it will not be an easy road. It starts with the coal phase-out, but regulatory uncertainty remains on how this will occur leading up to the prescribed end dates, as well as which technologies are viable replacements. Similarly, we know natural gas will be phased out next, though there is even greater uncertainty around the timing and replacement technologies. Meanwhile, growth of renewables and the proliferation of new and decentralised energy solutions are accompanied by investment challenges and risk exposures which require new business models and competences to properly manage. As we adapt our plan to the evolving landscape, transparency with our stakeholders will ensure that we remain a trusted partner and a leader in the transition.

Wave of opportunity

The continuing energy transition will create many new opportunities. Installed offshore wind capacity is expected to quadruple in Europe from ~20 GW to ~80 GW within ten years, with similar or even more ambitious growth trajectories expected for onshore wind and solar. Likewise, it is estimated that sales of electric vehicles must increase from 300,000 per year in 2018 to over 6 million per year in 2030¹ in order to achieve transport sector climate targets across Europe. To decarbonise industry, major industrials will need to replace hundreds of gigawatts of boilers as they transition to fossil-free production processes. And in the built environment, decarbonisation will drive demand for low-carbon heating options like district heating or decentralised heating solutions.

This will result in significant and growing needs – both from customers and electricity grid and network system operators – for solutions and flexibility. Whether it be in the form of e.g., flexible



fossil-free production, energy storage, demand response systems, or peak shaving methodologies, the flexibility market will see strong growth for many years to come. Managing the complexity of the solutions, regardless of which customer type, will create opportunities in this future landscape.

These trends will drive an even greater need for a high rate of investment in distribution and transmission networks over the coming decade, as the grid enables us to cope with demands from increasingly electrified customers, connect new energy intensive industries such as data centres, and integrate the growing fossil-free electricity production that feeds them.

Our strategy

In 2015, the Board of Directors decided on Vattenfall's four strategic objectives which have since guided our strategic direction. Though our strategy remains directionally the same, we have updated our strategy wheel to better show how we are creating traction given the context we operate in, and how we are capturing business opportunities to support our purpose to Power Climate Smarter Living and our goal of enabling fossil-free living within one generation. We have introduced a new focus area to reflect the importance of a connected and optimised energy system to achieving this goal.

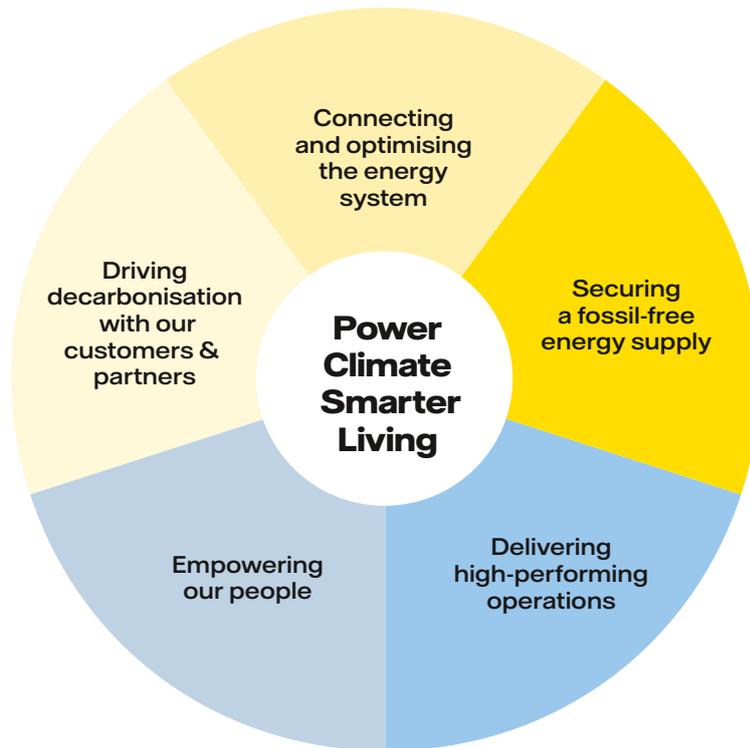
¹ McKinsey: RACE 2050 - A vision for the European automotive industry.

Vattenfall's strategy is driving our contribution to the UN's Global Sustainable Development Goals



Our strategy and our purpose reflect the UN's Agenda 2030, in particular the Sustainable Development Goals for Affordable and clean energy (#7), Industry, innovation and infrastructure (#9), Sustainable cities and communities (#11), Responsible consumption and production (#12), Climate action (#13), and Partnerships for the goals (#17).

Our five strategic focus areas



- Driving decarbonisation with our customers & partners** with focus on increasing customer centricity and promoting electrification and climate smart energy solutions in areas where we have a competitive advantage. *(Formerly: Leading towards sustainable consumption)*
- Connecting and optimising the energy system** with focus on maximising the value of flexibility and promoting stable and cost-efficient grid infrastructure. *(New)*
- Securing a fossil-free energy supply** with focus on growing in renewables, maximising the value of our existing fossil-free assets, and implementing our CO₂ roadmap. *(Formerly: Leading towards sustainable production)*
- Delivering high-performing operations** with focus on being both competitive and cost-effective, leveraging opportunities in digitalisation and taking social and environmental responsibility throughout the value chain. *(Formerly: High-performing operations)*
- Empowering our people** with focus on securing necessary competence while improving the employee journey and providing a safe working environment. *(Formerly: Empowered and engaged people)*

Supporting innovation through research and development

Through research and development (R&D) Vattenfall is supporting the strategy with the goal to enable fossil-free living for our customers and society within one generation. R&D is conducted in different parts of Vattenfall. A significant part is managed by Vattenfall's dedicated R&D organisation, whose 129 experts collaborate with colleagues in Vattenfall's operations, but also with stakeholders including customers, suppliers, partners and academia, to ensure successful innovation and end-to-end process thinking. During 2019 Vattenfall spent the equivalent of SEK 626 million on R&D.

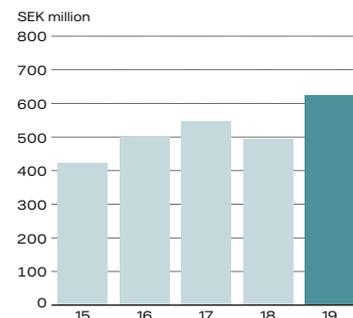
Vattenfall's R&D activities span across the full range of the business. Together with our customers we are for example

looking into demand response solutions by investigating the possibility of using local assets and equipment to provide grid stabilisation services. We are using emerging technologies such as machine learning tools to provide, among other things, predictive maintenance for our assets, forecasts of the energy needs in buildings, and optimised control of energy storage.

Other initiatives include testing so-called microgrids to secure power supply for local communities and developing solutions for the smart control of heating systems in buildings, in order to minimise our customers' energy bills. At our lab in Älvkarleby in Sweden, we are testing the safety of hydro power dams using

scale models and we are researching fish migration patterns to ensure stable local ecosystems at our hydro power plants. Everything with the mindset of data-driven innovation.

Costs for research and development





Digital inspections with drones

Vattenfall owns and operates a range of physical assets, from power lines and wind turbines to hydro power stations and nuclear power plants. To guarantee safe and efficient operation of these assets, inspections are performed on a regular basis. We work with emerging technologies in R&D such as augmented and virtual reality together with 3D modelling to develop new ways of evaluating assets and train colleagues to use new tools.

To provide a safe work environment, we are also testing drone solutions that can carry out tasks under human supervision. Instead of conducting manual inspections, a drone can be sent up to scan the asset for abnormalities. Not only does this provide a safer work environment for our employees, it also improves fault detection by allowing a whole team of employees to sit in a safe environment to evaluate collected data after the inspection.

New digital solutions for boiler inspection

During 2019 we tested new drone systems for boiler inspections. Boilers are traditionally inspected manually, by

building scaffolds to climb inside of the boiler to inspect deposits, damage and air leaks. In Uppsala, a test was conducted where a 30-metre high combined heat and power boiler with a 15 by 15-metre cross section was digitally inspected by a drone. The test was successful, and the inspection of the boiler was completed in a couple of hours compared to several days required for building a scaffold and conducting a manual inspection. The widespread use of new drone technology will make inspections more cost-efficient and shorten the time needed to perform an inspection as well as immensely reduce the risk for technicians.

Technology Centre as enabler

Secure handling of information is core in Vattenfall, to not expose our customers' data and to protect critical infrastructure. To explore how to best handle data collected from digital inspections, a Technology Centre is currently being established at the Vattenfall Laboratory in Älvkarleby. Here we can train new drone pilots, further develop digital inspection technology and transfer inspection data from the field to secure servers within

Vattenfall IT's environment. The Technology Centre will be an enabler to a wider implementation of digital inspections using drones and new technology.

Future focus - automated systems

Over the coming year, Vattenfall R&D will look further into the possibility of using automated systems. One example of a useful future application of automated inspection is ice formation in rivers above hydro power dams. When operating a hydro power station it is important to understand how the ice layer in the river is forming to not get ice in the hydro power intakes or damage critical infrastructure like bridges, etc. Therefore, the river upstream needs to be monitored. Today this is done manually using a car to drive up the side of the river, which gives poor visibility of the ice formation. Using a drone with a pre-programmed route that does the same inspection every day, delivering detailed images, will make our operations more efficient. Operators will be able to receive a detailed picture of the current state of ice in the river every morning and make decisions accordingly.

Investment plan

Vattenfall continues to invest heavily in growth with a clear focus on additional renewable production accompanied by measures to decarbonise the heat business and strengthen supply networks for electricity and heat.

Total planned investments in 2020 and 2021 amount to SEK 58 billion, with growth investments accounting for nearly 62% (SEK 35 billion). The investment strategy reflects Vattenfall's goal to enable fossil-free living within one generation.

Around SEK 25 billion of investments are planned for new wind farms (net, including divestment revenues from projects developed to be sold), of which approximately SEK 17 billion is dedicated to offshore wind. SEK 9 billion pertains to the Kriegers Flak (605 MW) offshore wind project. The plan also includes expenditures for major offshore projects that are planned to be completed further ahead in time, like Hollandse Kust Zuid 1-4 (1,500 MW) in the Netherlands, the Vesterhav projects in Denmark (350 MW), and Norfolk Boreas and Norfolk Vanguard in the UK (3,600 MW). Main onshore projects are Wieringermeer (180 MW) and Wieringermeer Extension (118 MW) in the Netherlands, Blakliden/Fäbodberget (353 MW) in Sweden, Nørre Økse Sø (54 MW) in Denmark and South Kyle (240 MW) in the UK. Vattenfall is also exploring additional growth options in several different markets. Furthermore, Vattenfall is investing around SEK 0.5 billion in solar and battery projects (net, including divestment revenues from

projects developed to be sold), including a major renewable energy park in Haringvliet, combining onshore wind (22 MW), large-scale solar (38 MW) and battery storage (12 MW). Read more on page 45. For large-scale solar projects, a develop-to-sell business model is applied, which means that most of the projects are divested after construction.

In addition, almost SEK 3 billion of investments will be made in new energy solutions - mainly distribution network solutions, decentralised heat solutions and e-mobility. New businesses also include initiatives like HYBRIT, a joint cooperation with SSAB and LKAB with the aim of developing a fossil-free steel manufacturing process.

Growth investments in electricity networks and heat supply, mainly connecting new customers and areas, amount to over SEK 7 billion. For the heat operations this includes major projects like Amsterdam South Connection, enabling considerable growth in district heating, and Green Heat Diemen, a new wood pellet-fired heat-only boiler with a capacity of 120 MW heat located southeast of Amsterdam. Vattenfall will not invest in new coal-fired capacity. The electricity distribution operations are investing heavily in electricity

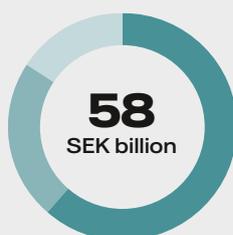
networks as a result of increased capacity requirements and a high number of requests for new connections from business customers.

Besides these growth activities, Vattenfall is planning significant investments in maintenance and replacement of the existing assets, amounting to around SEK 22 billion in 2020 and 2021. This comprises major replacements of heat assets, such as a new biofuelled combined heat and power (CHP) plant in Uppsala and a new gas-fired CHP plant in Berlin Marzahn, which will reduce CO₂ exposure.

Vattenfall plans to invest SEK 9 billion in the next two years in its electricity networks in Sweden and Berlin to secure the quality of supply and reinforce the network (included in maintenance and replacement investments). A total of SEK 5 billion is being invested in Vattenfall's hydro and nuclear power plants to allow continued operation (included in maintenance and replacement investments). This includes investments in dams and reactor safety systems. The Ringhals 3 and 4 nuclear reactors as well as Forsmark 1, 2, and 3 are being equipped with systems for independent core cooling. Read more on page 41.

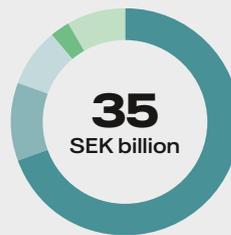
Vattenfall's investment plan 2020-2021

Total investments per type



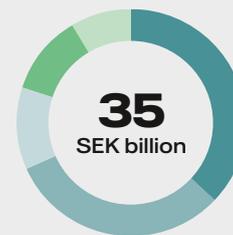
■ Growth investments, 35
■ Maintenance investments, 13
■ Replacement investments, 9

Growth investments per technology



■ Wind power, 25
■ Heat grids, 4
■ Distribution, 3
■ Solar & batteries, 1
■ New businesses, 3

Growth investments per country



■ Netherlands, 13
■ Denmark, 11
■ Sweden, 4
■ UK, 4
■ Germany, 3

Major investment projects - decided on and in progress

Project	Country	Type	Capacity	Est. CO ₂ reduction ¹ (ktonnes)	Vattenfall's interest	Completion	Total investment	Total investment, SEK million ²
Kriegers Flak	Denmark	Wind offshore	605 MW	440	100%	2021	7,700 MDKK	10,700
Wieringermeer	Netherlands	Wind onshore	180 MW	215	100%	2020	220 MEUR	2,300
Wieringermeer Extension	Netherlands	Wind onshore	118 MW	140	100%	2020	174 MEUR	1,800
Moerdijk	Netherlands	Wind onshore	27 MW	30	100%	2021	38 MEUR	400
Haringvliet Renewable Park	Netherlands	Wind onshore, solar, battery	72 MW	50	100%	2020	58 MEUR	600
Blakliden + Fäbodberget	Sweden	Wind offshore	353 MW	10	30%	2022	3,312 MSEK	3,312
Marzahn CHP	Germany	Gas	260 MW _{el}	350	100%	2020	289 MEUR	3,000
Replacement Reuter C	Germany	Gas/electricity	240 MW _{th}	170	100%	2020	105 MEUR	1,100
Uppsala Carpe Futurum	Sweden	Biofuel	112 MW _{th}	n.a.	100%	2022	1,686 MSEK	1,686
Amsterdam South Connection	Netherlands	Heat network	n/a	75	96%	2021	91 MEUR	950

¹ Production from onshore wind estimated to 2.6 GWh/MW installed, from offshore wind to 3.5 GWh/MW installed, and from solar to 1.0 GWh/MW installed. Resulting production is compared against grid average emission factors. Actual production factors and savings will vary. Other projects are compared to project-specific reference cases.

² Year-end exchange rate as per 31 December 2019.

Green bond investor report

In line with Vattenfall's investments in fossil-free energy and climate-smart solutions, the first green bond was issued in June 2019.

The size of Vattenfall's first green bond issue was EUR 500 million, with a tenor of seven years. The bond is the first international issuance under an EMTN programme under Swedish governing law, listed on Nasdaq Stockholm.

This senior unsecured green bond gives investors the opportunity to support the transformation of the energy system and Vattenfall's goal of a fossil-free future. The Green Bond Framework¹ consists of four eligible categories: renewable energy and related infrastructure, energy efficiency, electrification of transport and heating, and industry projects. The framework has been externally reviewed by the climate research institute CICERO² and given their highest rating, "Dark Green".

Projects with funds allocated from the green bond are listed in the table below. Estimated CO₂ reductions for pure

electricity production are based on the assumption that the new production will replace an equal amount of the existing production mix in the respective country. Country-specific emission factors for the production mix from the Association of Issuing Bodies³ are used. For new heat-producing assets, the CO₂ reduction is estimated based on the assets replaced in each individual case. Only direct emissions are considered. The calculations are based on the project's full capacity, independent of Vattenfall's ownership share. See page 173 for the auditor's limited assurance report for this investor report.

¹ Vattenfall's Green Bond Framework (https://group.vattenfall.com/siteassets/corporate/investors/funding_ratings/doc/vattenfall-green-bond-framework.pdf).

² Cicero Second Opinion (https://group.vattenfall.com/siteassets/corporate/investors/funding_ratings/doc/vattenfall-second-opinion-29may2019.pdf).

³ <https://www.aib-net.org/facts/european-residual-mix> European Residual Mixes 2018, Version 1.2, 2019-07-11, Figure 5.

Investments under Vattenfall's Green Bond Framework

Category	Project/country	Type	Capacity/impact	Est. CO ₂ ⁴ reduction (ktonnes)	Vattenfall's share	Start/completion	Total investment	Of which Green Bond/spent SEK million ⁵
Renewable energy and related infrastructure	Kriegers Flak/Denmark	Wind offshore	605 MW	440	100%	2019/2021	7,700 MDKK	801
	Wieringermeer/Netherlands	Wind onshore	180 MW	215	100%	2018/2020	220 MEUR	778
	Wieringermeer Extension/Netherlands	Wind onshore	118 MW	140	100%	2019/2020	174 MEUR	295
Industry projects	HYBRIT/Sweden	Pilot project	Fossil-free steel	-	33%	2019/2021	858 MSEK	51
Total								1,925
Not yet used								3,298
Grand total								5,223

⁴ Production from onshore wind estimated to 2.6 GWh/MW installed, from offshore wind to 3.5 GWh/MW installed, and from solar to 1.0 GWh/MW installed. Resulting production is compared against grid average emission factors. Actual production factors and savings will vary.

⁵ Pertains to actual payments to third parties. No acquisition costs or retroactive payments are included. Converted to SEK using year-end exchange rate as per 31 December 2019.

Markets and regulations



EU

EU Long-Term Climate Strategy – During the past year the European Council worked on preparing a new EU Long-Term (Climate) Strategy (LTS), with a “net-zero” greenhouse gas emissions target by 2050 at its core. The aim is to adopt and submit the EU’s mid-century climate plan to the UNFCCC in early 2020. The European Commission aims to sharpen the EU’s 2030 climate target in order to align it with the Paris Agreement’s goal and enshrine it in a new EU Climate Law as part of the “European Green New Deal” which was presented after the new Commission took office at the end of 2019. The details about the Green New Deal will be presented gradually over the coming two years.

Digitalisation – In 2019 the Directive on open data and re-use of public sector information was adopted. In addition, the European Council is currently discussing the details of a proposed ePrivacy Regulation, the purpose of which is to protect the confidentiality of electronic communication and users’ devices. Finally, new policy areas under consideration by the European Commission include Artificial Intelligence, data sharing within the private sector, cyber security for ICT services and networks, and blockchain technology. All of the above show a clear trend at the EU level to shape the policy framework for data in an effort to find a balance between data protection and availability of data for smart solutions.

National Energy and Climate Plans – The EU Governance Regulation requires Member States to prepare National Energy and Climate Plans, which are to contain national targets and policies on how to reach the EU’s 2030 climate and energy targets during the period 2021-2030. The drafts were submitted in 2018. The European Commission concluded that efforts had been made by Member States, but not enough to fully meet the targets. Detailed information on the planned measures to achieve the targets was missing. All Member States were to have submitted their final versions by the end of 2019. However, many countries have announced a delay.

Sweden

New revenue frames affect distribution system operators – New revenue frames for distribution system operators will be introduced in 2020, which affects all distribution business in Sweden. The Weighted Average Capital Cost will be set to 2.16% compared to the previous period’s 5.85%, and this will reduce Vattenfall’s revenues from electricity distribution substantially. It will also negatively impact Vattenfall’s investment programme for distribution at a time when major network upgrades and build-outs are needed to cope with growth in urban areas, energy-intensive industries and more renewables.

Nuclear fuel waste management – In April 2019 the Swedish Nuclear Fuel and Waste

Management Company (SKB) provided the additional information on the copper canisters that was required by the Land and Environmental Court to the government. The copper canisters serve as one of the protective barriers for the method of final storage of spent nuclear fuel. The public consultation on the additional documentation ended in September 2019. The government may decide on the matter in 2020.

Hydro power regulatory framework to improve environmental performance – New legislation to upgrade hydro power plants to modern environmental standards according to the EU Water Framework Directive entered into force on 1 January

2019. The law aims to ensure a proper balance between environmental and energy interests, recognising the importance of hydro power as a renewable energy source and its ability to regulate the entire electricity system. A national plan, containing a 20-year time schedule for the assessment of mitigation measures in court for all hydro power water bodies, was submitted to the government on 1 October 2019 for approval. Together with seven other hydro power operators, Vattenfall has established the Hydro Power Environmental Fund, which will provide SEK 10 billion in funding for environmental mitigation measures.

Germany

Coal phase-out – Based on the recommendations from a special commission, Germany has decided on a plan for the gradual reduction of coal-fired power generation, with 2038 as the final end date. Lignite capacity will be shut down on the basis of bilateral talks between operators and the government. As regards hard coal capacity, tenders as well as increased financial support for a coal-to-gas-switch for combined heat and power plants is foreseen.

Climate programme – The German government has adopted a package of measures

that should help the country deliver on its target of a 55% CO₂ reduction by 2030 compared to 1990. Most relevant is the introduction of a moderate CO₂ tax/trading system for the transportation and construction sectors. Germany’s 2030 renewable electricity target has been raised to 65%, with offshore wind delivering an additional 5 GW. Decarbonisation of the transportation sector should be accelerated by generous funding support for public charging facilities as well as tax benefits for hybrid and zero-emission vehicles.

Climate Act – To ensure target achievement, Germany’s climate ambitions are to be cemented in a Climate Act that will set sectoral and legally binding carbon reduction targets in combination with a clear monitoring and penalty structure. While the policies agreed over the course of 2019 are unlikely to be sufficient to deliver on Germany’s 2020 and 2030 climate and energy targets, they do mark an increase in the level of ambition for the climate and energy policy.

Finland

Roadmap to carbon-neutrality – A new government took office in May 2019 and has presented a roadmap for Finland to become carbon neutral by 2035. The plan is to increase the electrification in society as well as growing the share of renewable

electricity production. The Government has decided to gradually lower the electricity tax paid by the manufacturing industry to attract new companies and support the build out of renewable electricity production. Nuclear power will

continue to be a cornerstone in the energy system and the owner of Finland’s fifth nuclear reactor (Olkiluoto 3), Teollisuuden Voima, announced that regular electricity production of the reactor would start in March 2021.

Denmark

Ambitious CO₂ target approved by Parliament – All parties in the Danish Parliament except the Liberal Alliance and the New Right have approved a 70% CO₂ reduction target for 2030 compared to the 1990 level. The target will be connected to the state budget process with annual stocktaking and a new government committee to coordinate the effort. The next step is for the government to negotiate climate action plans on how the target

should be achieved, including an electrification and green gas strategy.

New regulatory framework for onshore wind – New legislation has been presented in Parliament that updates schemes and regulations around onshore renewable energy. Most notably, a new sales option for property will be granted to neighbours along with a removal of the height limitation of 150 metres for onshore turbines, balancing citizen rights with development of new technology.

Offshore wind tender – The tender process for the Thor offshore wind farm is ongoing with a new process for the environmental impact assessment presented in 2019, placing increased responsibility on the developer. At the same time, the developer will be responsible for construction, ownership and operation of transmission from the offshore wind farm to land.

The Netherlands

Climate Act and Climate Agreement – In 2019 a legally binding Climate Act with focus on carbon-neutral power generation by 2050 was passed. In addition, a non-binding societal Climate Agreement, with a 2030 greenhouse gas reduction target of 49% compared to 1990, was concluded. These measures should result in a total of more than 84 TWh renewable power generation, 2 million zero-emission passenger cars, and 1.5 million households switching from natural gas to sustainable energy sources for heating and cooking. Electrification of industry, including carbon capture and storage (CCS), will be incentivised via subsidies and a national carbon

tax. By 2030, hydrogen technology should be built out as an important energy carrier in several sectors. Vattenfall has committed itself to contribute to the goal of the Climate Agreement and to implementation of relevant agreements and actions.

National ban on coal for power generation – The use of hard coal for power generation is prohibited as per 1 January 2020, which led to the closing of Vattenfall's only coal-fired power plant in the Netherlands, Hemweg 8, in December 2019. The four remaining coal-fired power plants in the Netherlands have been given a transition period until 1 January 2030 at the latest.

National minimum CO₂ price for power generation – As per 1 January 2020 a national minimum CO₂ price has been introduced for power generation. The price path (2020-2030) is below the forecast EU ETS price, leading to limited additional impact, except for some certainty for financing of sustainable projects.

Gas production from Groningen field to stop by year-end 2022 – The government has decided to stop gas production from the Groningen field in 2022, instead of 2030, providing impetus to develop fossil-free heating. The use of natural gas from other fields will still be possible and allowed.

United Kingdom

Decarbonisation – In June the UK passed landmark legislation targeting net-zero carbon emissions by 2050. This was welcomed by the Committee on Climate Change, which emphasised that more action was needed to drive decarbonisation in the heating, transportation and industrial sectors. The government sees a continued role for nuclear power generation in decarbonising the economy, and work is continuing on a newbuild

programme. The UK will be hosting COP26 in Glasgow in December 2020.

Offshore wind – The UK's offshore wind industry signed a landmark "Sector Deal" in 2019. The government has agreed to give forward visibility of future Contracts for Difference rounds with support of up to GBP 557 million. Industry has made a number of commitments including increasing UK content in contracts to 60% by 2030, and investing up to GBP 250

million in building a stronger UK supply chain. The Crown Estate, meanwhile, launched the UK's first major offshore wind leasing round in a decade, opening up the opportunity for at least 7 GW of new clean energy in the waters around England and Wales – enough to meet the electricity needs of over six million homes. Crown Estate Scotland is currently consulting on a new leasing round in Scottish waters and is expected to finalise its proposal in 2020.

France

Decarbonisation – In its latest energy and climate bill adopted at the end of September 2019 the French government pledged for a high level of commitment towards transitioning to a sustainable and low-carbon economy. Three main goals have been confirmed: first, the objective of net zero carbon emissions by 2050; second, the reduction of nuclear power in the electricity mix to 50% by 2035; and third, to increase the share of renewable energy in the electricity mix to 45% by 2035.

Nuclear power – Policy changes regarding access to nuclear power generation for

alternative electricity suppliers have been included in the energy and climate bill but have yet to be implemented. This bill would allow the government to raise the cap for accessing a share of nationally generated nuclear power at a regulated tariff for alternative suppliers from 100 TWh to 150 TWh (so-called ARENH cap). This would support competition in the French electricity market and allow all French customers to benefit from a regulated price.

Offshore wind – France currently has a lower share of offshore wind power than many European countries. In the energy

and climate bill, the French government has decided to support offshore wind with a target of 1 GW per year by 2024. This is a positive development in the French market although offshore wind players and trade associations are closely following the pace and volume of future tenders to ensure that announced targets are confirmed in the final version of the multi-annual energy plan issued in January 2020 (programmation pluriannuelle de l'énergie), and that these ambitions can effectively be reached.

Competitive landscape

The megatrends of decarbonisation and expansion of renewables have had a strong impact on competitor strategies, both at an asset portfolio level and downstream on customer offerings.

More and more countries are committing themselves to phasing out coal, which is creating regulatory stability and opening up business opportunities in fossil-free energy. European energy companies have therefore continued to centre their strategies around this. A growing number of international financial institutions and insurers are showing greater interest in sustainable investments, which is also helping to drive the energy transition.

In parallel with this, as expansion of wind power attracts strong new players like financial institutions and the major oil companies, developers are searching for new tools to ensure profitability.

With new, large players moving into wind power, competition and professionalism in the sector are increasing. In tandem with growing cost competition, this has led to wind industry leaders competing head-on to maintain scale and secure limited sites for new assets. Competitors have reacted in two ways. Several are trying to reduce their exposure, such as by diversifying geographically or between offshore and onshore, or even spinning off their wind businesses. Others are forging alliances to build scale, create financial synergies or secure a local presence. While the build-sell-operate model continues to dominate, developers are exploring new ways to enhance zero-subsidy projects, such as power purchase agreements (PPAs), wind and solar co-location, sector coupling, and storage.



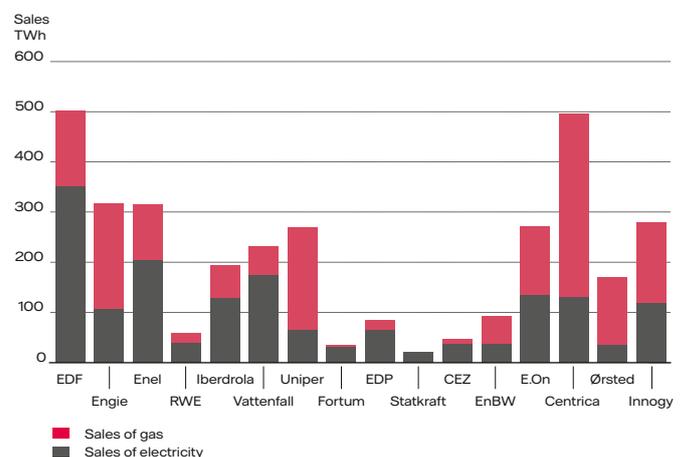
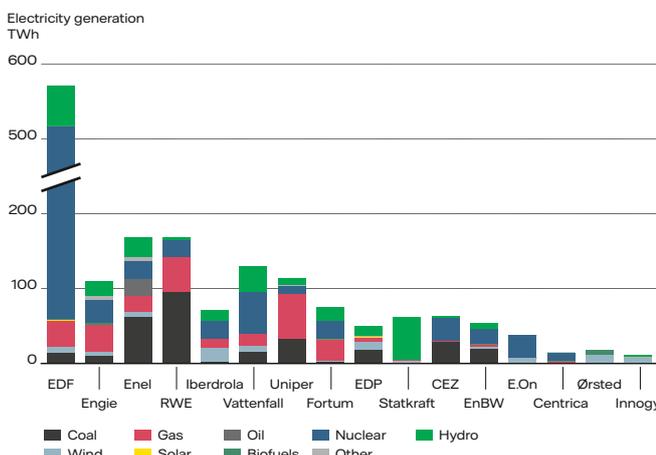
To obtain a position in fossil-free electricity and heat generation, European energy companies continue to invest heavily in renewable energy, especially in wind and solar power.

To help customers decarbonise, new players are jumping into the fast-growing decentralised market, making it increasingly important to secure a competitive edge. For instance, the major oil companies are expanding their presence by acquiring start-ups, such as virtual power companies, battery providers and car charging operators. As car manufacturers introduce new electric car models, they are also stepping into charging infrastructure and/or battery manufacturing to remove industry bottlenecks. Energy companies rely on various models to provide decentralised solutions. Some are turning to partners to offer a broad range of residential offerings, such as solar panels, smart home appliances, e-mobility and heat pumps. Others are targeting specific areas, like providing services to corporates and local authorities or betting on battery recycling. In addition, many local installa-

tion companies offer rooftop solar or heat pump installation and services to their own customer bases. As the number of decentralised products and players increases, companies will need to focus on segments where they have or can carve out a clear competitive advantage.

As industrial decarbonisation pilot projects gain momentum, finding business cases for full-scale solutions becomes key. As the industrial sector is forecast to contribute up to 40% of future greenhouse gas emissions, decarbonising and electrifying the sector is of major importance and increasingly in the public eye. Industry leaders have taken note, announcing decarbonisation ambitions and initiating pilots to prepare emission cuts. As many different players move in, the ability to develop scalable solutions is growing increasingly important.

Europe's largest energy companies in electricity generation (energy mix), and in sales of electricity and gas¹



¹ Source: Company annual reports for 2018.

Operating segment overview

Operating segments

We report our operations broken down by the Group's operating segments: Customers & Solutions, Power Generation, Wind, Heat, and Distribution. The operating segments reflect our Business Area organisational structure except for the Power Generation segment, which is divided into the Generation and Markets Business Areas.

Number of employees¹

3,150

Customers & Solutions

7,429

Power Generation

1,000

Wind

3,310

Heat

2,247

Distribution

2,678

Other²

¹ Full-time equivalents.

² Pertains mainly to Staff Functions and Shared Service Centres.

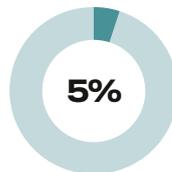
Customers & Solutions

Responsible for sales of electricity, gas and energy services in all of Vattenfall's markets.

- A market leader in Sweden with close to 900,000 electricity contracts
- One of the market leaders in the Netherlands with 3.6 million electricity and gas contracts
- Leading position in Berlin and Hamburg as an electricity supplier
- Acquisition of sales company DELTA Energie in the Netherlands
- Operates one of northern Europe's largest charging networks, InCharge, with 14,900 e-mobility charging points in Sweden, Germany and the Netherlands
- Launch of Flexpower, a public smart charging network for e-vehicles, in cooperation with the city of Amsterdam

87,343

External net sales, SEK million



Share of underlying operating profit



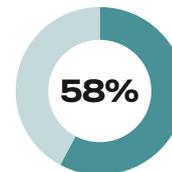
Power Generation

Responsible for Vattenfall's hydro and nuclear power operations, maintenance services business, and optimisation and trading operations, including certain large business customers.

- Operates a portfolio with 7.2 GW nuclear power capacity and 11.7 GW hydro power capacity across Sweden, Finland and Germany
- One of Europe's largest providers of fossil-free electricity, with 35.8 TWh from hydro power and 53.4 TWh from nuclear power
- Provides professional asset optimisation services and market access, and is a leading player in commodity trading and the market for power purchase agreements (PPAs) in northwest Europe
- Closure of Ringhals reactor 2 and preparation for the decommissioning of Ringhals reactor 1 in 2020

38,425

External net sales, SEK million



Share of underlying operating profit



Wind

Responsible for development, construction and operation of Vattenfall's wind farms as well as large-scale and decentralised solar power and batteries.

- One of the largest producers of offshore wind power in the world
- One of the largest producers of onshore wind power in Denmark and the Netherlands
- Inauguration of the Horns Rev 3 offshore wind farm (407 MW) in Denmark
- Winning bid for the subsidy-free Hollandse Kust Zuid 3 & 4 offshore wind farm (~750 MW) in the Netherlands
- Construction started on the Kriegers Flak (605 MW) offshore wind farm in Denmark

Heat

Responsible for Vattenfall's heat business (district heating and decentralised solutions) and gas- and coal-fired condensing plants.

- One of Europe's leading producers and distributors of heat with approximately 2.2 million end customers
- Power-to-Heat facility connected to district heating network in Berlin, enabling the closure of a coal-fired power plant
- Feasibility study conducted by Vattenfall and the City of Berlin shows that a coal phase-out in Berlin is feasible by 2030
- Transfer of district heating operations in Hamburg completed
- Closure of the Hemweg 8 coal-fired power plant in the Netherlands
- Switch from peat to wood pellets as fuel in heat-only boiler in Uppsala

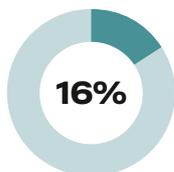
Distribution

Responsible for Vattenfall's electricity distribution operations in Sweden, Germany (Berlin) and the UK.

- Leading owner and operator of electricity distribution networks in Sweden
- Approximately 3.3 million business and household customers in Sweden and Berlin, Germany
- Swedish Energy Markets Inspectorate announced significantly lower revenue frames for the next regulatory period, reducing the scope for needed investments
- Major disruptions after Storm Alfrida with associated costs of approximately SEK 800 million

6,578

External net sales, SEK million

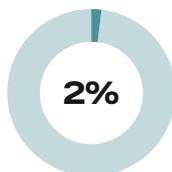


Share of underlying operating profit



15,947

External net sales, SEK million

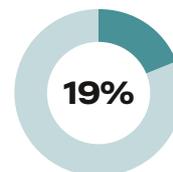


Share of underlying operating profit



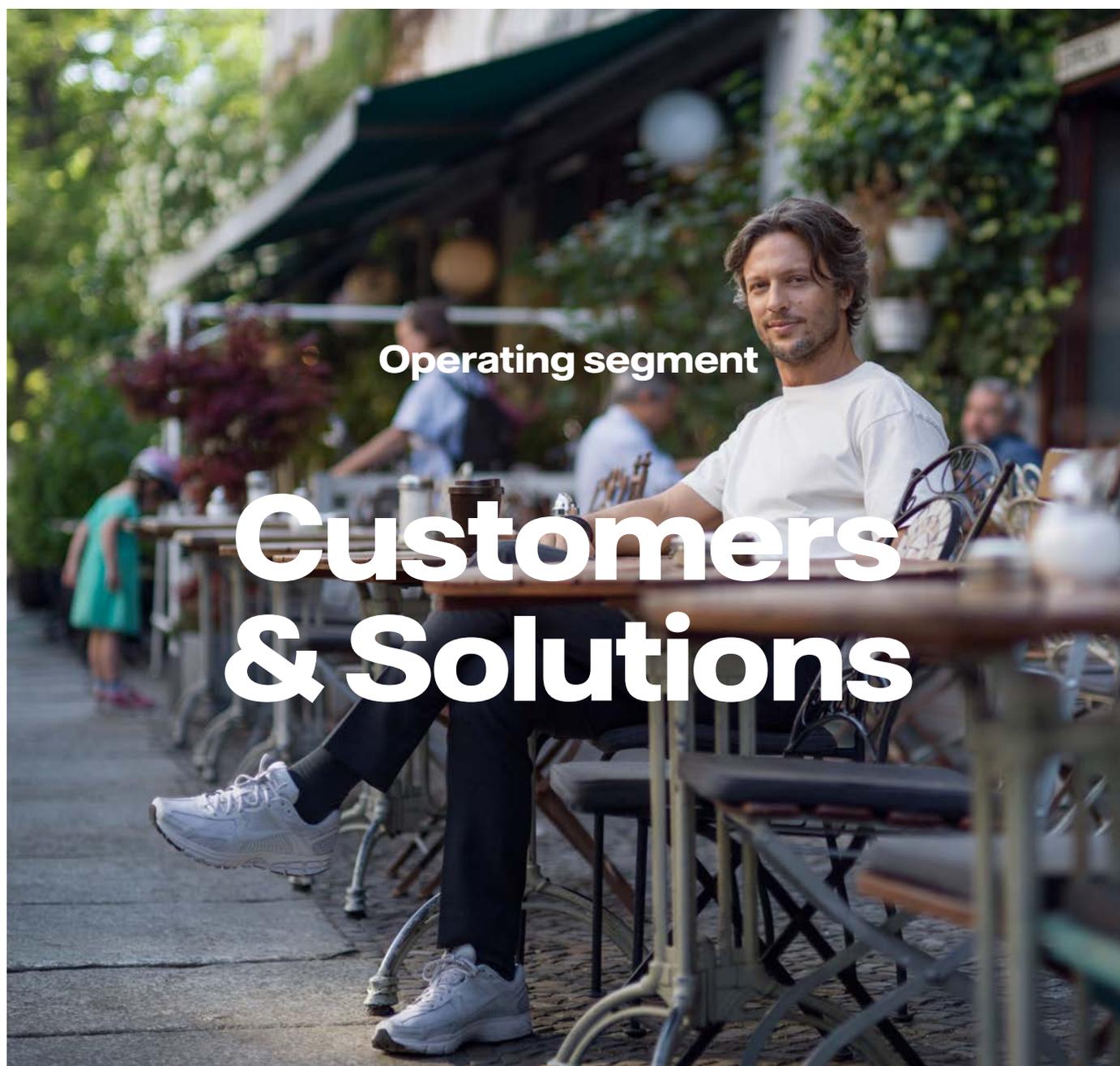
17,903

External net sales, SEK million



Share of underlying operating profit





Operating segment

Customers & Solutions

Operations

Vattenfall's Customers & Solutions business supplies electricity, gas and energy solutions to retail and business customers, with 10.2 million customer contracts in Europe. We are one of the market leaders in the retail and business segments in Sweden (with close to 900,000 electricity contracts) and in the Netherlands (3.6 million electricity and gas contracts). In Germany we supply electricity and gas to retail customers (3.8 million contracts) and to the business segment with a focus on property companies. In the cities of Berlin and Hamburg, we are the market leader in the electricity retail segment. In Denmark, Finland, France and the UK our position is that of a challenger in sales of electricity and gas. We offer a broad range of decentralised solutions in most of our markets and are one of the largest energy solution providers in the Netherlands through our subsidiary Feenstra, with 860,000 customer contracts.

Key data

	2019	2018
Net sales (SEK million)	89,859	81,318
External net sales (SEK million)	87,343	78,883
Underlying operating profit ¹ (SEK million)	1,337	1,269
Sales of electricity (TWh)	89.5	88.3
– of which, private customers	28.0	27.4
– of which, resellers	6.5	4.9
– of which, business customers	55.0	56.0
Sales of gas (TWh)	54.2	55.5
Net Promoter Score (NPS) relative to competitors ²	+1	+1

¹ Operating profit excluding items affecting comparability.

² NPS was reported for the first time in 2016. For definition, see page 13.

Strategy

Our ambition is to be a leading customer-centric company, providing a wide range of sustainable energy solutions and services to retail and business customers.

- We help our customers to live a climate-smart life and contribute to their safety and comfort. We offer sustainable and efficient products and services based on customers' individual energy needs. Our focus is on areas like smart, data-based solutions, decentralised generation (in particular solar (PV) and heat pumps),

and new customer interaction models with the aim to achieve significant market size. We are aiming for a top-three position in e-mobility charging solutions in northwest Europe.

- We are striving to optimise the customer experience by accelerating digitalisation and offering bundled, integrated and climate-smart solutions. We meet our customers where they want, make it easy for them to handle their energy needs and to solve their queries in one click. We

want our customers to actively promote us and thereby grow our business.

- We are increasing the profitability of our commodity sales business by retaining and growing our customer base while reducing the cost to serve. We offer a diversified commodity portfolio that covers fossil-free electricity and certified Environmental Product Declarations (EPDs)¹ and leverages on Vattenfall's fossil-free generation.

¹ <https://group.vattenfall.com/who-we-are/sustainability/environmental-responsibility/sustainable-resource-use>

Developments in 2019

Net sales increased as a result of higher sales in most of Vattenfall's markets. Underlying operating profit increased mainly as a result of a larger customer base in Germany and a strong contribution from sales in the Nordic countries. Earnings growth was held back by continued high competition and costs for growth activities.

Our retail customer base grew by 0.5 million contracts during the year, which includes the customers from the Dutch regional supplier DELTA Energie, which we acquired in March. In Germany we are one of the fastest growing sales companies in electricity and gas, and our retail business in France also showed strong growth. Despite overall growth in the number of contracts, volumes of sold electricity and gas remained around the same level, mainly owing to warm weather in the heating season, especially from February to April.

We improved our absolute Net Promoter Score (NPS²) during the year and stayed ahead of our average peer competitors as evidenced by our relative NPS of +1.

Vattenfall's Dutch subsidiary Nuon changed its brand name to Vattenfall with good response and reasonably limited impact on churn and commercial results

given the magnitude of this change. Powerpeers, our previously separately branded peer-to-peer platform for sharing renewable energy in the Netherlands, is being integrated into Vattenfall to offer this service to all of our Dutch retail customers.

We continued our progress in digitalisation, both for our customers and our internal operations. In Germany we have expanded our digital partnerships in city mobility to strengthen our positions in Berlin and Hamburg and to promote sustainable mobility to our customers. We started collaborations with the ridesharing services Berlkönig (BVG in Berlin) and MOIA (Volkswagen in Hamburg) and the e-car sharing service WeShare (Volkswagen start-up), all of which serve to reduce the number of cars and their emissions in the cities. Specially discounted offers for these city mobility products are integrated in our "my Highlights app" which has been downloaded by more than 100,000 customers. The app has received a high

average user rating and besides a broad range of special deals, also offers contract management and customer self-service elements.

Sales of solar panels showed very strong growth in the Netherlands. In Germany, Vattenfall's white label platform for procurement, sales and installation of decentralised solutions around solar, heat and e-mobility confirmed its strong market position with currently 50 partners including newly signed contracts with two large German municipal utilities.

We increased our sales of e-mobility solutions in the Netherlands, Germany and Sweden, and started operations in Norway. We now operate 14,900 charging points, making the transition to sustainable, electrified transport easier. Access to additional charging points is provided through roaming agreements, and new partnerships have been entered into with the housing cooperative HSB Norr in Sweden and the dairy company TINE in Norway. In the Netherlands, we have launched the public smart charging network Flexpower with around 900 charging points, read more on page 34.



With our 14,900 charging points and our collaborations with mobility service providers, we are reducing transport emissions in our core cities.

² NPS is a tool for measuring customer loyalty and for gaining an understanding of customers' perceptions of Vattenfall's products and services.

Planned activities

Our portfolio of energy solutions will be scaled by establishing sales channels that support our growth targets coupled with automated low-cost operations. This will be especially relevant for the Dutch market, where a national climate agreement was passed in the Parliament in 2019, which among other things aims at gradually phasing out natural gas. We are developing a portfolio of fossil-free decentralised

heating solutions to achieve a relevant market share in the transition to a fossil-free heating system in the Netherlands. We continue to grow our customer base organically while also working on retention initiatives, just as we will act upon acquisition opportunities when they arise. We plan to extend our e-mobility services to all our current customer markets, capturing significant benefits of scale and enhancing

value for our customers and key partners, such as leasing companies and car makers. We will continue to work towards exceeding our customers' sustainability expectations with our products and services. We take sustainability into account in our procurement processes and engage with internal and external partners to share best practices and learn from each other.

Topical issue

The transport sector forms a vital part of Vattenfall's electrification and decarbonisation efforts, and we are offering a full range of services in electric vehicle charging to our customers and partners.

E-mobility – charging made simple

Vattenfall considers electrification to be the most efficient, flexible and sustainable way to decarbonise the economy, in particular industry, heating, cooling and transportation, and according to Tomas Björnsson, Head of E-mobility, that makes e-mobility a vital part of Vattenfall's climate ambitions.

"Vattenfall is involved in the full energy value chain, and management of complex energy and network systems is one of our core competences. So when an electric vehicle (EV) is plugged in for charging and it becomes part of the big network, Vattenfall can offer the charging station owners, network operators and the individual EV owner the best possible integrated solution under the InCharge brand – backed by one of the largest utility companies in the market. That sets us apart from many competitors."

It is central for Vattenfall that its EV customers get a smooth charging experience – easy, smart, without borders and affordable. They should not have to worry about the web of contracts and parties behind the charging, no matter whether it is at home, at work or in the public domain.

The e-mobility ecosystem

To make the EV charging infrastructure work for the car owner, a number of players must all fulfil their roles: the electricity supplier, the charging station owner, the charging point operator and the e-mobility service provider (see illustration). Vattenfall can act in all these roles.

When Vattenfall acts in its supplier role, renewable energy is made available

at all its public stations. The charging station owner investing in charging infrastructure can be a household, a company, a housing association, a real estate owner or a utility like Vattenfall. To enable smart and integrated charging for a household customer as well as more sophisticated services for the professional charging station owner, a connected charger is of course required. Here, a charging point operator can provide monitoring, control, charging station access and invoicing, load balancing, etc., which leads to a better customer experience and easy access to additional digital services. The EV driver who wants to charge at public charging stations on the other hand, needs an e-mobility service provider who makes sure the driver can be identified at the station and pay for the electricity. The service provider will provide a mobile app or token to the EV driver and enable access to public charging points through roaming agreements with operators or to their own stations. It works the same way as mobile telephone roaming.

In the Netherlands, for instance, Vattenfall owns and operates almost 20% of the public charging stations but offers its customers access to around 95% of all charging stations in the country through roaming agreements. In addition, together with our partners we are building InCharge to be one of the biggest charging networks in north-west Europe.

Innovative and agile

- building on our solid utility base

The e-mobility market is rapidly developing, and new players like start-ups, car manufacturers, hardware manufacturers and major oil companies are testing and shaping their roles in the value chain. Vattenfall therefore needs to be innovative and agile, taking advantage of the multitude of services our organisation as well as our partners can offer.

Tomas Björnsson explains: "For instance, we have won the tender for public charging of electric cars in Amsterdam. Here we are operating more than 3,500 charging points of which around 900 are included in our so-called Flexpower project, which means that we steer the charging stations based on daily load curves from the grid operator and forecasts for local neighbourhood solar panel production. At times when demand peaks in an area, the grid operator instructs us to support the grid by scaling down on the output delivered by our charging points – especially if at the same time the local solar panels are not delivering sufficient power."

On the consumer side, we have installed private home chargers that are controlled by Vattenfall's trading business so that the customer's EV is charged when prices are the lowest. A pilot project is ongoing in Amsterdam, and similar business solutions are being tested in Germany. This gives a flavour of the kind of services that will be available and reduces the cost for the end consumer without impacting the quality of services and customer experience.

A versatile portfolio of partnerships and customer relations

The transport sector is undergoing a major transformation with an increasing number of new fully electric cars or plug-in hybrids. There were close to 1.4 million electric cars in Vattenfall's customer markets at the end of 2019, an increase by 37% compared to 2018. With an increased range, a lower total cost of ownership and a strong regulatory push towards low-emission vehicles, a dramatic increase is expected in the number of EVs on the road.

To position ourselves in this market, we are partnering with car manufacturers like Volvo and Honda as sales channel partners, offering home charging boxes to new car owners to simplify the experience of getting an electric car for the first time, and sometimes also providing charging facilities at the manufacturer's factories and offices.

In the Netherlands, a partnership was formed with the leasing company Athlon, where Vattenfall installs home charging boxes tailored to the need of Athlon's customers and provides customer support. In addition to this, Athlon's sales and service employees receive training by Vattenfall to make sure they can inform their customers about the basics of charging, charging speeds, costs and basic technical aspects.

In the Nordics, Vattenfall is partnering with other local energy companies that invest in charging infrastructure. Vattenfall can provide the physical

charging stations, operate them and provide the back-end services under the neutral InCharge brand, which allows the partners to take the service provider role towards their customers while using Vattenfall's hardware and systems.

Both housing associations that want to offer charging of their residents' cars, and real estate companies, like Diös in Sweden, buy and install charging stations operated by Vattenfall. Diös now always offers their customers charging infrastructure in their new buildings (see box).

There are also so-called location partners who provide a convenient space for a charging station. As such an example, Vattenfall has teamed up with McDonald's in the Netherlands to install 168 dual-outlet fast-charging stations at all McDrives. In Sweden, Vattenfall has a cooperative venture with the Swedish fast-food chain Max, installing fast chargers at some of their restaurants.

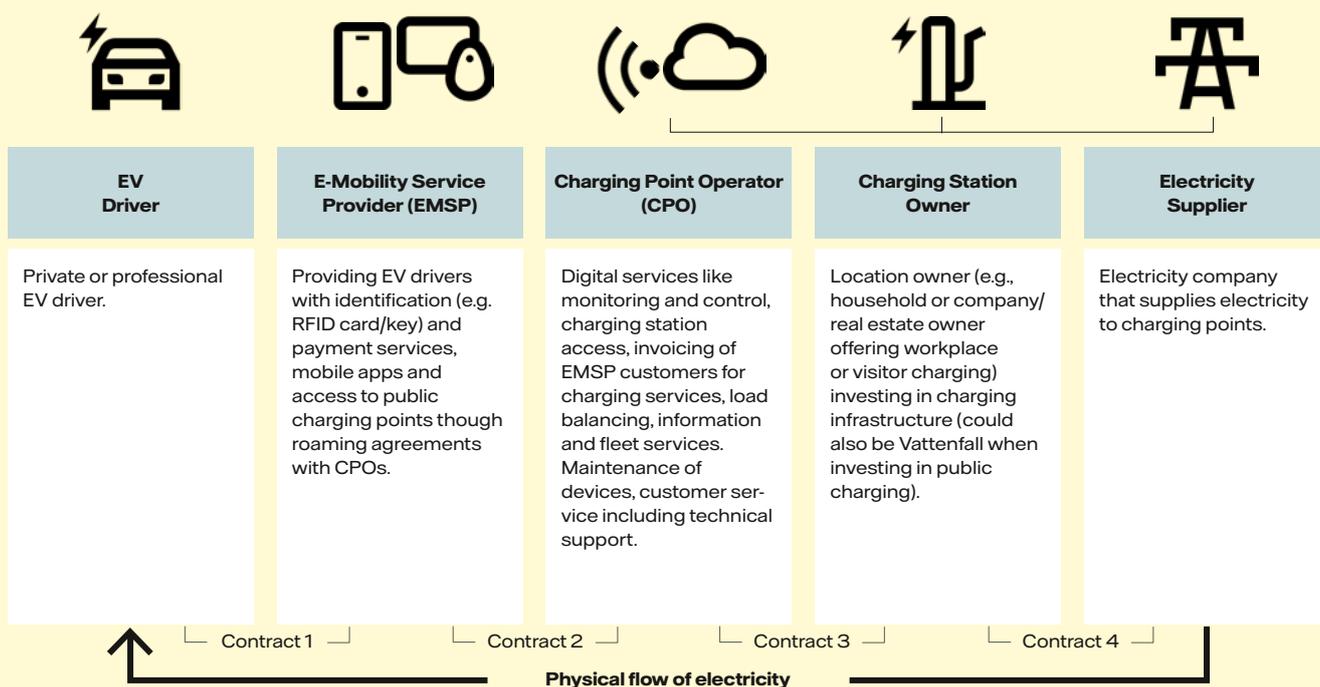
"And if we look a few years into the future, we have the upcoming markets such as buses, service vans, package delivery vans, heavy transport and even maritime transport. For instance, Vattenfall's subsidiary Stromnetz Berlin has installed 40 fast chargers for bus depot charging. We are also involved in an e-road for lorries at Stockholm's Arlanda Airport, and we have started to electrify ferries in Stockholm, just to mention some initiatives," Tomas Björnsson concludes.

Real estate company Diös

Kristina Grahn Persson, Sustainability Manager at Diös says: "To contribute to more opportunities for charging of electric cars is part of our strategy around sustainable urban development. People are changing their behaviour, and the development of electric cars goes fast and leads to a heavy increase in the demand for charging stations among our residents as well as our employees. That creates new conditions and offers us new opportunities for developing the cities where we are active. Vattenfall has broad competences in charging solutions, and we have had a good cooperation as regards the different needs we and our tenants have."

The role of distribution as enabler of e-mobility

A precondition for electrification of the transport sector is that an extensive charging infrastructure is available. This requires a modern high-quality electricity network with sufficient capacity to accept all new customers who want to connect. The capacity of the network must allow connection of new charging stations and, if they offer steering capabilities they can also contribute with increased flexibility in the network. For all new connections to the network, it is always important to plan well ahead to ensure that the process runs as smoothly as possible for all parties.





Operating segment

Power Generation

Operations

The Power Generation operating segment produced a total of 89.2 TWh of electricity from hydro and nuclear power in 2019. Vattenfall's total installed hydro power capacity of 11,700 MW generated 35.8 TWh (35.5) of electricity. At year-end, Vattenfall's Nordic reservoir levels were at 60% capacity (55%), which is 3 percentage points above normal. Combined installed capacity of the nuclear reactors was 7,200 MW. Nuclear power generation amounted to 53.4 TWh (55.0). Optimisation and sales of reliable and flexible power to the market is provided by the Markets Business Area, which handles hedging, sourcing and trading to ensure competitive sourcing and security of supply for Vattenfall's customers.

Key data

	2019	2018
Net sales (SEK million)	102,378	99,970
External net sales (SEK million)	38,425	36,064
Underlying operating profit ¹ (SEK million)	15,437	9,371
Electricity generation (TWh)	89.2 ²	90.5
Sales of electricity (TWh)	27.0	28.7
– of which, resellers	22.8	24.6
– of which, business customers	4.2	4.1

¹ Operating profit excluding items affecting comparability.

² The value has been adjusted compared with information previously published in Vattenfall's year-end report 2019.

Strategy

With increasing intermittent electricity generation, the value of owning and operating dispatchable fossil-free generation increases. Vattenfall has solid experience in operating both hydro and nuclear power, two large-scale means of fossil-free dispatchable generation. This will be of great value in the future energy landscape.

The following focus areas have been identified for Power Generation:

- Be a world class nuclear operator, with high safety standards, high availability and a target cost level of 19 öre/kWh in 2021
- Ensure effective decommissioning and management of spent nuclear fuel and radioactive waste
- Manage both hydro and nuclear power plants with the goal of optimising long-term value creation
- Strengthen our position as the Nordic market leader in servicing grids and major electrical installations by improving our efficiency and continue developing our capability to support the grid and charging infrastructure
- Expand further in the operation of pumped hydro power, which provides efficient energy storage that will be required to deliver fossil-free electricity 24/7 in certain markets
- Be a leading player in management of renewable capacity through power purchase agreements (PPAs), with the goal of growing to a portfolio of 10 GW before the end of 2023. The PPA portfolio currently amounts to 7.1 GW
- Selling renewable electricity through corporate PPAs that directly link to the renewable energy source, with the goal of at least 10 TWh of annual supply at the end of 2023
- Utilise digital technology to improve asset optimisation and further expand the use of algorithms for trading in commodity markets, as well as drive cost efficiency through relentless process automation

Developments in 2019

Net sales increased mainly due to an improved hedge result, higher sales of electricity and gas in the business segment in Germany and positive currency effects. Underlying operating profit increased mainly as a result of hedges and higher realised earnings from trading.

Hydro power

In response to the increasing value of dispatchable production, investments in our hydro power stations have focused on refurbishments and upgrades that increase availability and flexibility. The German pumped storage hydro power operations have shown improvements after a major review to ensure profitability.

In October the authorities involved in reassessing the licences for Swedish hydro power delivered their plan to the government for approval. All permits for the some 300 Swedish water bodies hosting hydro power need to be reassessed in the years 2022-2039. Court hearings will be held where our measures to mitigate

local environmental consequences of the dams and power stations will be assessed.

To reduce the negative effects of hydro power on ecosystems and biodiversity, we are undertaking a great number of initiatives that will maximise ecological benefits while minimising production and flexibility losses. See pages 164-165 for biodiversity projects.

Nuclear power

Our nuclear power generation in 2019 amounted to 53.4 TWh (55.0). Average availability was 87.8 % (88.9%). The lower level of generation is mainly due to the gradually reduced output at Ringhals 2 ahead of its closure on 31 December. The last electricity was generated on 30 December, 44 years after Ringhals 2 was first connected to the grid in 1975.

Except for Ringhals 1, none of our nuclear reactors have planned decommissioning dates. Investments are made in the reactors to allow stable operations in the future, and systems for independent core cooling at Ringhals 3 and 4 and Forsmark 1, 2 and 3 are currently being installed, read more on page 41.

Preparations are ongoing for the construction start of the final repository for spent nuclear fuel in Sweden. The application for an environmental permit for the repository and encapsulation plant has

been completed by the Swedish Nuclear Fuel and Waste Management Company (SKB), in accordance with the decision by the Land and Environment Court in January 2018. The application is now with the Swedish Ministry of the Environment, and we expect to have a decision in 2020.

The application to extend the repository for low- and medium-level radioactive waste in Forsmark was accepted by the Land and Environment Court without comments on 13 November 2019. This application has now also been passed on to the government.

Markets

2019 witnessed high volatility in many of the markets where Vattenfall trades in spot and forward markets. Our diversified trading operations and strong market analytics allowed us to benefit from these price movements. In addition, we have significantly grown our renewable power purchase agreement (PPA) business. We are among the top three players in PPA capacity in Germany. PPAs have also been signed for the Brännliden (42 MW) onshore wind farm in Sweden and for the Zeewolde onshore wind farm in the Netherlands, where Vattenfall will purchase approximately 300 MW of the wind farm's power.



Bubble curtains, in which a wall of bubbles directs fish to safer passages away from the turbines, is one example of a responsibility measure taken in our hydro power operations.

Planned activities

The preparations for dismantling Ringhals reactors 1 and 2 are progressing. Dismantling activities should commence in 2022, when the environmental permit and the licence from the Swedish Radiation Safety Authority (SSM) are expected to be in place. In parallel with this, Ringhals is changing its organisation and procedures to fit with two reactors as Ringhals 1 will close on 31 December 2020.

Vattenfall is also preparing the Ågesta nuclear reactor site for dismantling work, which is scheduled to start in spring 2020. In December 2019 the Swedish Radiation Safety Authority approved the dismantling of the facility.

Furthermore, we have established "Vattenfall Flexibility Services" to operate and optimise decentralised assets. With this platform we are able to help our indus-

trial customers monetise their flexibility, help electric car owners save money via Smart Charging and perform optimised charging for batteries. See pages 38-39 for more information. Through automation and digitalisation of trading and asset optimisation activities, we are further enhancing our ability to meet customer demands and doing so with improved efficiency.

In focus

Decentralised flexibility



Utilising the flexibility of decentralised assets for the benefit of customers and the grid

Offering flexibility services to customers who own decentralised assets is becoming increasingly important both for customers and the grid.

With the ongoing urbanisation, electrification and build-out of renewable electricity generation, a flexible energy system is needed to keep the system balanced in real time, optimise the use of renewable energy and address capacity constraints in the grid infrastructure. This means that the inherent flexibility of many decentralised assets represents a value that can be unlocked and monetised. The assets range from industrial assets like electrolysers, electric boilers, and standalone small or industrial-scale batteries, to charging stations and the batteries of electric vehicles (EVs) or fleets of EVs. Unlocking this flexibility value benefits both Vattenfall's customers and the grid: The customer gets an extra financial value, and the grid can be more intelligently steered and utilised.

Vattenfall Flexibility Services (VFS) helps customers unlock their flexibility value

Thorsten Möller, Programme Manager Business Development & Strategy, explains: "VFS is an innovative digital solution, automated and driven by algorithms, that provides Vattenfall's customers with the opportunity to easily

earn money by using the flexibility of their assets. This is done by encouraging them to consume electricity when there is an oversupply from renewables – usually periods in time when prices are low – and vice versa. In case of smaller-scale assets, electricity volumes need to be aggregated before they can be traded in fast moving markets with the help of the software program."

A practical example of this could be the charging speed of an electric vehicle fleet that is connected to VFS. The charging speed can be accelerated when electricity prices traded in the wholesale market are low and reduced when prices are high, resulting in lower electricity costs for customers. In cases where the flexible asset provides flexible capacity to the grid, the Transmission System Operator (TSO) remunerates the owner of the flexible asset for the capacity provided.

An unlimited application

VFS is already in operation for a few batteries that are being pooled in order to provide grid stabilisation and fully automated charge management. "We are also offering these services to Berlin Waste Management (BSR) that is

electrifying parts of its fleet of vehicles, including garbage collection trucks, and wants to use steered charging. We have seen broad interest from potential customers, to whom we are pitching our services," comments Thorsten Möller regarding current demand for flexibility services.

"Offering flexibility products to consumers and business customers in addition to energy supply is something that is becoming more and more important to customers. VFS is a win-win, as it helps customers save money, increases the use of renewable electricity, and generally helps make the energy system more efficient," Thorsten Möller concludes.

Acquisition offers increased momentum for VFS

During the first quarter of 2019, Vattenfall acquired Senfal, a Dutch energy services company that specialises in offering solutions for decentralised flexibility. Senfal is one of the front-runners in the market, and the acquisition provides increased opportunities to speed up development of VFS.

In focus

Independent core cooling



Independent core cooling for Swedish nuclear plants

Vattenfall is introducing independent core cooling systems as an additional, separate safety measure.

Sweden's nuclear power plants have been generating fossil-free electricity for decades. While reactor 2 at Ringhals was closed in 2019 and reactor 1 will close in 2020, the implementation of so-called independent core cooling (ICC) will allow Vattenfall's Swedish nuclear reactors Ringhals 3 and 4 and Forsmark 1, 2 and 3 to continue operations and supply electricity for future decades.

"Independent core cooling is a physically separated back-up function for existing safety systems already in place at the nuclear power plants," explains Mats Ladeborn, Vice President of Fleet Development in the Nuclear Business Area. "The new ICC system is designed on the basis of the two fundamental principles that apply to nuclear safety - redundancy and diversification. Redundancy means that multiple similar systems take care of the same task while diversification means that different solutions solve the same task."

Stress tests and national action plans

Following the 2011 Fukushima accident in Japan, the European Council initiated so-called stress tests of all nuclear reactors in operation in the EU. National

nuclear safety authorities oversaw this work. In Sweden, both technical and administrative measures were considered, as well as how and when changes may be implemented. The emphasis of these stress tests was on extreme external impacts, such as flooding or dire weather conditions.

Robust and simple design

Once the Swedish Radiation Safety Authority presented its ICC requirements in December 2014, Ringhals and Forsmark began planning in detail for very robust systems that had to come with a simplicity of design.

"Reducing complexity is important in designing an impeccable additional safety system," says Ladeborn. "The planning phase included consideration of ways to meet demands even from scenarios that could possibly occur once in a million years. The total investment in ICC for the five reactors amounts to approximately SEK 3 billion."

At least 72 hours of uninterrupted cooling

The requirement for an ICC function is to maintain the ability to uphold core cool-

ing for at least 72 hours in the wake of a long-term loss of external power supply. This capability must be sustained even in combination with extreme conditions such as exceptional weather, earthquakes, etc. Simply put, ICC is an independent function to ensure external cooling water supply into the reactor pressure vessel by connecting it to a water reservoir located outside of the reactor containment. This water reservoir is well-protected. Water is provided into the reactor by means of a fully separate power feed and water pump independent of the reactor protection system.

Functional testing in 2020

Construction of ICC at Vattenfall's reactors will be completed and the functions will be tested in summer 2020. With ICC solutions in place, Vattenfall's reactors Ringhals 3 and 4 and Forsmark 1, 2 and 3 will be fit to provide safe and reliable fossil-free electricity for the future.



Operating segment

Wind

Operations

Vattenfall continues to be a leading player in the offshore wind power industry as well as one of the leading companies in onshore wind power in Europe, especially in Denmark and the Netherlands. We operate a portfolio of more than 1,100 wind turbines with total installed capacity of approximately 3.3 GW across five countries. In 2019 we continued our focus on solar power (PV) technology and battery storage. We now operate 30 MW of solar power comprising a combination of decentralised and large-scale projects and have installed 30 MW of battery capacity.

Key data

	2019	2018
Net sales (SEK million)	13,492	11,852
External net sales (SEK million)	6,578	5,726
Underlying operating profit ¹ (SEK million)	4,155	3,747
Electricity generation (TWh)	9.5 ²	7.8
Investments (SEK million)	9,245	5,626

¹ Operating profit excluding items affecting comparability.

² The value has been adjusted compared with information previously published in Vattenfall's year-end report 2019.

Strategy

Accelerated renewables growth is key to achieving a sustainable energy system and unlocking the climate benefits of widespread electrification of society and ultimately reducing CO₂ emissions. We want to be a leader in the renewables transition through construction and operation of onshore and offshore wind power and to achieve a leading position in solar power in the near future. At year-end 2019 Vattenfall had 3.3 GW of wind and solar capacity in operation plus an additional 3.9 GW at advanced development stages. Based on the resulting portfolio of almost 7 GW in operation by 2023, Vattenfall is profitably growing at a competitive pace within

renewables. By 2021 we aim to secure additional on- and offshore wind power as well as solar growth options of 3 to 5 GW that will be built after 2023. To achieve this ambition and succeed in an increasingly competitive market environment, the following focus areas have been identified for the Wind operating segment:

- Further strengthen the project pipeline by acquiring project development rights or entering into joint development agreements
- Be a leader in Levelised Energy Cost (LEC), delivering the first new off- and onshore projects without subsidies

- Innovate in operations and maintenance and keep focus on digitalisation of our entire value chain to reduce costs and improve availability
- Use the potential of combining solar, wind and battery technology for renewable hybrid power plants and to a greater extent decouple the delivery of electricity from the time of production



Vattenfall commissioned an additional 474 MW of renewable capacity in 2019 and has a pipeline to develop nearly 4 GW of additional capacity by 2023.

Developments in 2019

2019 was a highly successful year for Vattenfall's Wind business. Net sales and underlying operating profit increased during the year, mainly owing to new capacity. This was partly countered by lower prices. Electricity generation was higher compared to 2018 and amounted to 9.5 TWh (7.8).

During the year, Vattenfall's as well as Scandinavia's largest offshore wind farm, Horns Rev 3, was commissioned in Denmark. The wind farm has a capacity of 407 MW and can supply approximately 425,000 Danish households with fossil-free electricity. The construction of the Kriegers Flak offshore wind farm in the Baltic Sea is progressing on schedule. The wind farm will be commissioned by the end of 2021 and will have total capacity of 605 MW. In addition to the already-won tender for the Hollandse Kust Zuid 1 & 2 offshore wind farm, Vattenfall also won the second phase of the Dutch offshore wind farm, Hollandse Kust Zuid 3 & 4. Together

the wind farms will have a capacity of approximately 1.5 GW and will be the two first non-subsidised offshore wind farms in the world, when commissioned. This is proof that our continuous efforts to reduce costs along our entire value chain are working successfully. The wind farms will contribute significantly to Vattenfall's goal of enabling fossil-free living within one generation.

In early 2019 the original 17 turbines of the Dutch Slufterdam onshore wind farm were replaced by 14 more efficient ones. As a result, the power output doubled from 25 MW to 50 MW, of which 29 MW belongs to Vattenfall. Vattenfall currently has approximately 1 GW of onshore wind capacity under construction. About 60 km north of Amsterdam, Vattenfall is repowering and expanding the Wieringermeer onshore wind farm up to a total combined capacity of 298 MW. In northern Sweden, construction of the 353 MW Blakliden/

Fäbodberget wind farm is ongoing, and once it is commissioned in 2022 it will be one of Sweden's largest onshore wind farms.

Next to our wind activities, a number of solar power and battery projects were developed during the year. Vattenfall has finalised the installation of solar panels at existing power plants in Velsen, Eemshaven and Hemweg in the Netherlands, with total capacity of 10 MW. In Germany, land lease deals for several sites in Brandenburg were signed with an option to install up to 300 MW of solar power. The projects will be developed at different paces depending on the size, area and permit process. The first projects will try to apply for subsidies in the first half of 2020. Additionally, Vattenfall is building a new hybrid energy park, consisting of solar panels, wind turbines and batteries at Haringvliet in the Netherlands. See also page 45.

Planned activities

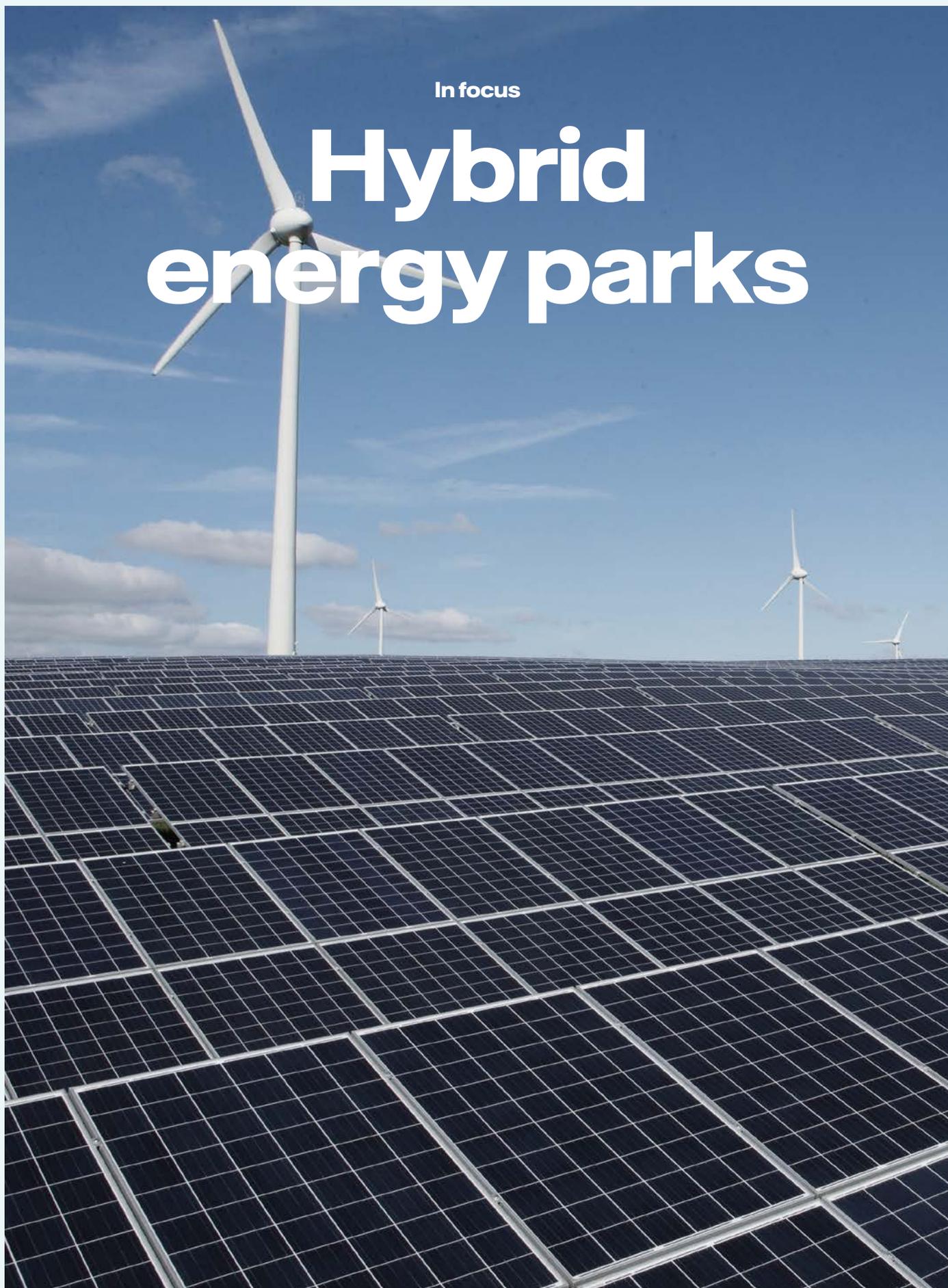
Renewable energy is key to supporting Vattenfall's purpose to Power Climate Smarter Living and realise the transition to fossil-free living. We will continue to bid for tenders and invest in wind, solar, and battery projects in the coming years, as well as optimise our operations to maximise renewable electricity generation in a sustainable manner. With respect to our existing wind farms, costs will be lowered by raising the level of standardisation, digitalisation, and data analysis for predictive maintenance and optimised marketing of the electricity generated. Sustainability is the basis for Vattenfall's strategy and is a prerequisite for long-term

profitability. In the wind, solar and battery business, sustainability has been identified as one of the key levers to facilitate our growth ambition. In 2018 we identified five focus areas that we worked on in 2019 and will continue to work on in 2020: 1) CO₂ emissions reduction, 2) Sustainable use of resources, 3) Sustainable procurement, 4) Community engagement, and 5) Biodiversity protection. In these five focus areas we want to go beyond just being compliant. We will continue to work on defined activities. In biodiversity protection, for instance, a new four-year R&D programme, Biodiversity protection in Wind & Solar (BioWinS), will be launched in

2020, assessing biodiversity impacts and mitigation measures, as well as potential improvements for our wind, solar, and battery projects. Furthermore, the European Offshore Wind Deployment Centre (EOWDC) scientific research programme will continue its work throughout 2020 and beyond. To monitor our operational sustainability performance in projects and operating sites, we developed a sustainability assessment tool in 2019 which will be applied in 2020 to define clear KPIs for future operations. This is to ensure clear guidelines for our operations to be in line with the sustainability ambition of the Wind operating segment.

In focus

Hybrid energy parks



Vattenfall's first hybrid energy park

In the Netherlands Vattenfall is building Haringvliet Zuid, which is expected to be the largest, state-of-the-art hybrid renewable energy park in Europe, with wind turbines, solar panels and energy storage combined already in the design phase.

Vattenfall has previously integrated batteries at a Dutch and a Welsh wind farm, but the innovative Haringvliet Zuid is the first hybrid park where wind, solar and batteries have been fully integrated from the concept development phase. When generation, storage and grid connection are co-designed and share the same infrastructure from the outset, it can be exploited more economically thanks to the synergies offered by the integrated systems.

"Wind and solar energy complement each other very well," says Margit Deimel, head of solar development. "When wind conditions are optimal, there is often less sunshine. Conversely, if there is a full day of sunshine, there is generally little wind. So, there is rarely a lot of wind and a lot of sun at the same time, so the required infrastructure doesn't need to be designed for maximum simultaneous generation from both wind and solar."

She continues: "On a small scale, batteries that are charged by solar and wind energy are already being used for occasional events, such as the Alpine World Ski Championships in Åre, Sweden, and the World Sprint Speed Skating Championships in Heerenveen, the Netherlands. And although batteries placed next to the wind turbines and solar panels are primarily intended to keep the frequency of the network stable, they can also serve as storage."

Multiple advantages

"There are many advantages to combining wind, solar and batteries," adds

Ross Williams, construction project manager of project Haringvliet Zuid. "Firstly, wind and solar share a lot of infrastructure, such as a substation, site roads and compounds, meaning there is both a cost saving and a reduced environmental impact for this setup when, for instance, only one substation is required. Secondly, electricity generation from wind and solar tends to be complementary with regards not only to daily production but also seasonally higher and lower producing months, which provides a more stable and reliable average annual production across the site throughout the year. The battery facility then provides the additional service of maintaining a balance on the system when it comes to operating frequency and storage of excess electricity."

Taking up the challenge

Hybrid parks, however, present a technological challenge. Running a wind farm, a solar farm or a battery unit individually is in itself a complicated technical accomplishment, but when two or even three of these technologies are combined into one integrated hybrid system, the optimisation challenges are multiplied to a level that only few companies have the capability to master. This is where Vattenfall's professional dispatching and trading units play a vital role.

Haringvliet Zuid hybrid energy park

Haringvliet Zuid will consist of a total of six wind turbines with a total capacity of around 22 MW and a maximum turbine

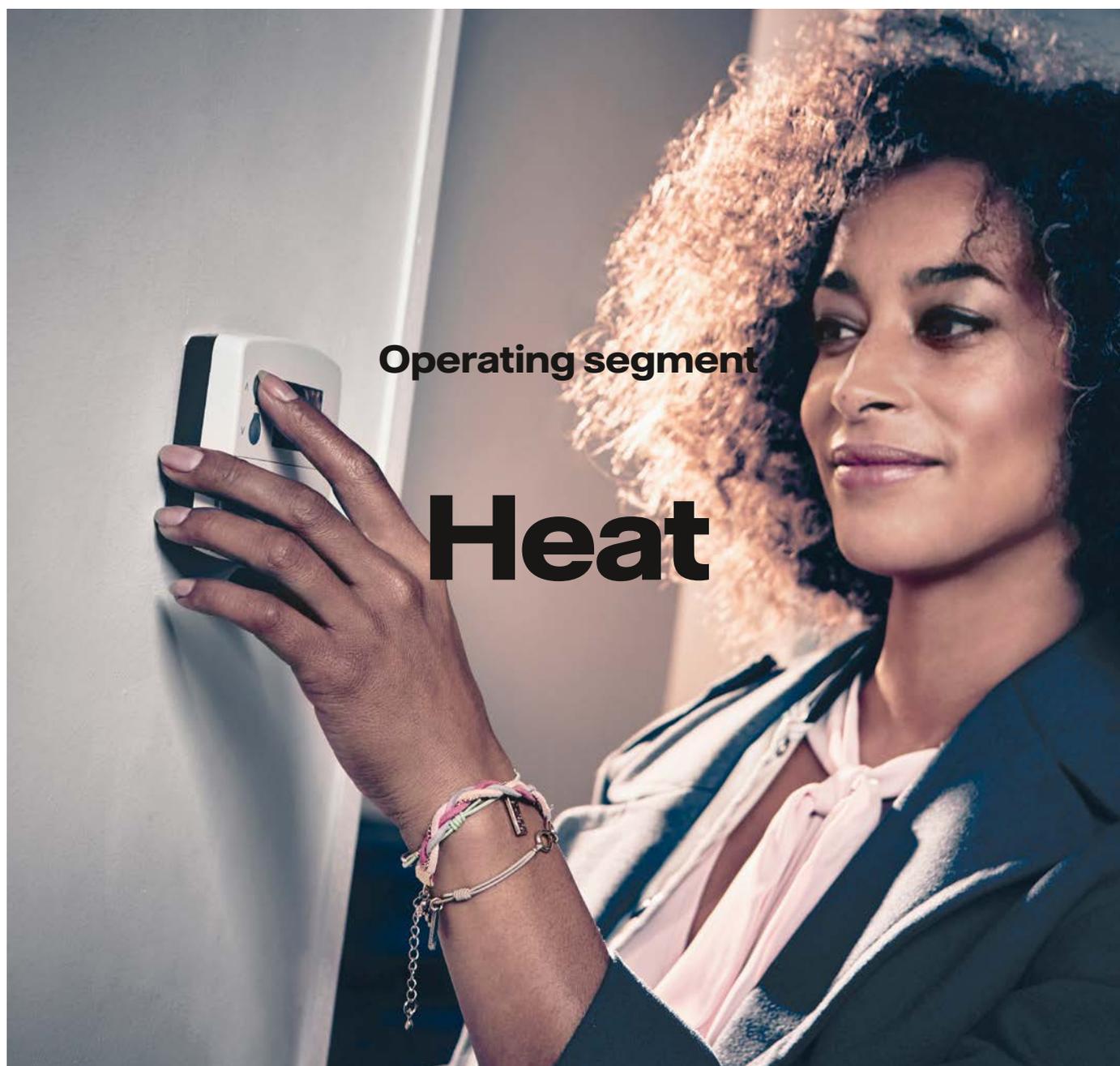
height of 150 metres. They will enable Vattenfall to supply approximately 27,000 households with renewable electricity.

The solar farm will be Vattenfall's largest solar installation so far and consists of 124,000 solar panels with a total capacity of 38 MW, which is enough to supply about 12,000 households with renewable electricity. The batteries will be placed at the solar farm in 12 shipping containers. They are manufactured by BMW and have an energy capacity of 12 MWh in total.

Concept of the future

"I am sure that wind and solar power will be vital in the coming decades in the transition to a sustainable energy system," says Margit Deimel. "They are fully proven technologies, so we have to apply them on a large scale. Wind and solar power as well as batteries have many synergies if we develop them together, so we simply have to combine them where we can."

Ross Williams agrees: "The Haringvliet Zuid project is centred around maximising the use of renewable energy whilst having as little impact on the environment as possible. With Vattenfall's ambition to enable fossil-free living within one generation, the hybrid renewable energy park can play a huge part in that ambition. I am convinced we will see many more parks like Haringvliet Zuid in all of our markets."



Operating segment

Heat

Operations

The Heat operating segment comprises Vattenfall's heating and condensing businesses, and in this area Vattenfall is present in four of the ten largest markets in Europe. Our core business is district heating, where we have 1.8 million customers in large metropolitan areas like Berlin, Amsterdam and Uppsala, serving the residential and commercial property markets (B2B business). In addition, we have a decentralised heat/energy business with 75,000 customers and significant growth potential in Sweden, Germany, the Netherlands and the UK. Vattenfall's Heat business focuses on solid cash flows, health and safety for all operations including service companies and high reliability of generation and supply.

Key data

	2019	2018
Net sales (SEK million)	31,403	33,970
External net sales (SEK million)	15,947	15,828
Underlying operating profit ¹ (SEK million)	550	771
Sales of heat (TWh)	17.1	18.3
Electricity generation (TWh)	31.7	32.0
CO ₂ emissions ² (Mtonnes)	19.3	22.0
Nitrogen oxide, NO _x (ktonnes)	7.4 ³	9.9
Sulphur dioxide, SO ₂ (ktonnes)	2.3 ³	4.2
Particulates (ktonnes)	0.1 ³	0.2

¹ Operating profit excluding items affecting comparability.

² CO₂ emissions are pro rata.

³ Excluding the divested heat operations in Hamburg.

Strategy

Our strategy is to be a leader in decarbonisation and the management of heat solutions and customer-centric energy solutions.

- We are decarbonising our production portfolio in the cities where we are active. The decarbonisation process will be implemented in two major steps: first with the coal/peat phase-out by 2030, and then with the replacement of fossil gas by 2050 at the latest. This will require active system management, with the Heat business positioning itself as a system manager that integrates a mix of own and external heat sources while minimising individual customers' energy

consumption with the help of state-of-the-art digital tools.

- Our focus is on profitable growth of our district heating operations. Our decentralised business is also growing, among other things with decentralised district heating networks in areas that are not covered by a main district heating network, and decentralised energy solutions in residential areas and buildings. Vattenfall intends to continue its growth course in Germany and expand its position as a leading provider of decentralised energy solutions in the UK, the Netherlands and Sweden.

- Going forward, we will become even more customer-centric and develop our product/service offering beyond district heating. We will offer fossil-free, simple and smart comfort with focus on energy efficiency and integrated energy solutions (heating, cooling, e-mobility, local electricity generation and digital solutions that minimise energy consumption).



The joint feasibility study with the City of Berlin demonstrated that, using a variety of available replacement or substitute technologies, it will be possible to phase out coal in Berlin by 2030.

Developments in 2019

Net sales and underlying operating profit decreased as a result of higher costs for CO₂ emission allowances and the sale of the district heating operations in Hamburg. This was partly offset by positive price effects and an increased customer base in the heat business.

A feasibility study conducted together with the City of Berlin and published in September 2019 has shown that a coal exit in Berlin is feasible by 2030 at the latest. In September Europe's largest power-to-heat facility was connected to the district heating network in Berlin, making it possible to take the coal-fired Reuter C unit out of operation on 1 October 2019. The new plant, with a capacity of 120 MW heat, will produce and store heat from excess electricity generated by renewable energy sources. In addition to this, together with the Swedish company SaltX Technology, Vattenfall is investigating the use of salt to store heat generated from excess electricity at the Reuter CHP plant in Berlin, and digitalisation efforts have progressed with

10,000 smart heat meters installed in Berlin during 2019.

In Amsterdam, conversion of the Diemen gas-fired CHP plant to biomass is in progress. The permit application has been submitted, the engineering has been executed and invitations for tenders have been sent out. Projects are also planned to integrate geothermal heat and excess heat from data centres in the district heating network in Amsterdam.

During 2019, heat operations in Sweden gradually shifted to more sustainable fuels, among other things with the replacement of peat by wood pellets in the existing heat-only-boiler in Uppsala. Biomass is a sustainable source of energy given responsible cultivation and production, which we ensure through checks on suppliers and sourcing of certified biomass whenever possible. Additionally, the Carpe Futurum project was started, entailing replacement of the old power plant in Uppsala with a biofuel-fired heat plant. In Jordbro, a project was initiated to integrate

excess heat from data centres into the district heating network.

In the UK, Vattenfall is entering the market with offers for area solutions, and we were chosen as a preferred partner to deliver a major infrastructure project in London, helping the city move towards a fossil-free future. The project will include a new district heating network in Brent Cross that will serve 6,700 households using a mix of low-carbon technologies, including the UK's largest installation of heat pumps.

In September, after years of partnership, Vattenfall transferred the responsibility for district heating in Hamburg to the City of Hamburg. The city exercised its call option to purchase Vattenfall's share (74.9%) in the district heating company for EUR 625 million (SEK 6.6 billion), generating a capital gain of SEK 3.1 billion. However, Hamburg remains a core market for Vattenfall, and we are further expanding our offering of decentralised solutions.

Planned activities

In Berlin, Vattenfall plans to replace its coal-fired CHP plants before 2030 with the most innovative, low-carbon heat generation portfolio feasible. Two possible options are under consideration for the Moabit power plant, either reconstruction of unit A for 100% biomass, or installation of a biomass heat-only-boiler in combination with geothermal energy, a heat pump and a block CHP, offering a modular plant for generation of electricity and heat. The plan is to replace the coal-fired units at the Reuter West plant with a new heat pump

using sewage water as the energy source. In addition, the development of a well-insulated heat storage at the Reuter West location has a strong strategic fit supporting both the City of Berlin's and Vattenfall's strategies.

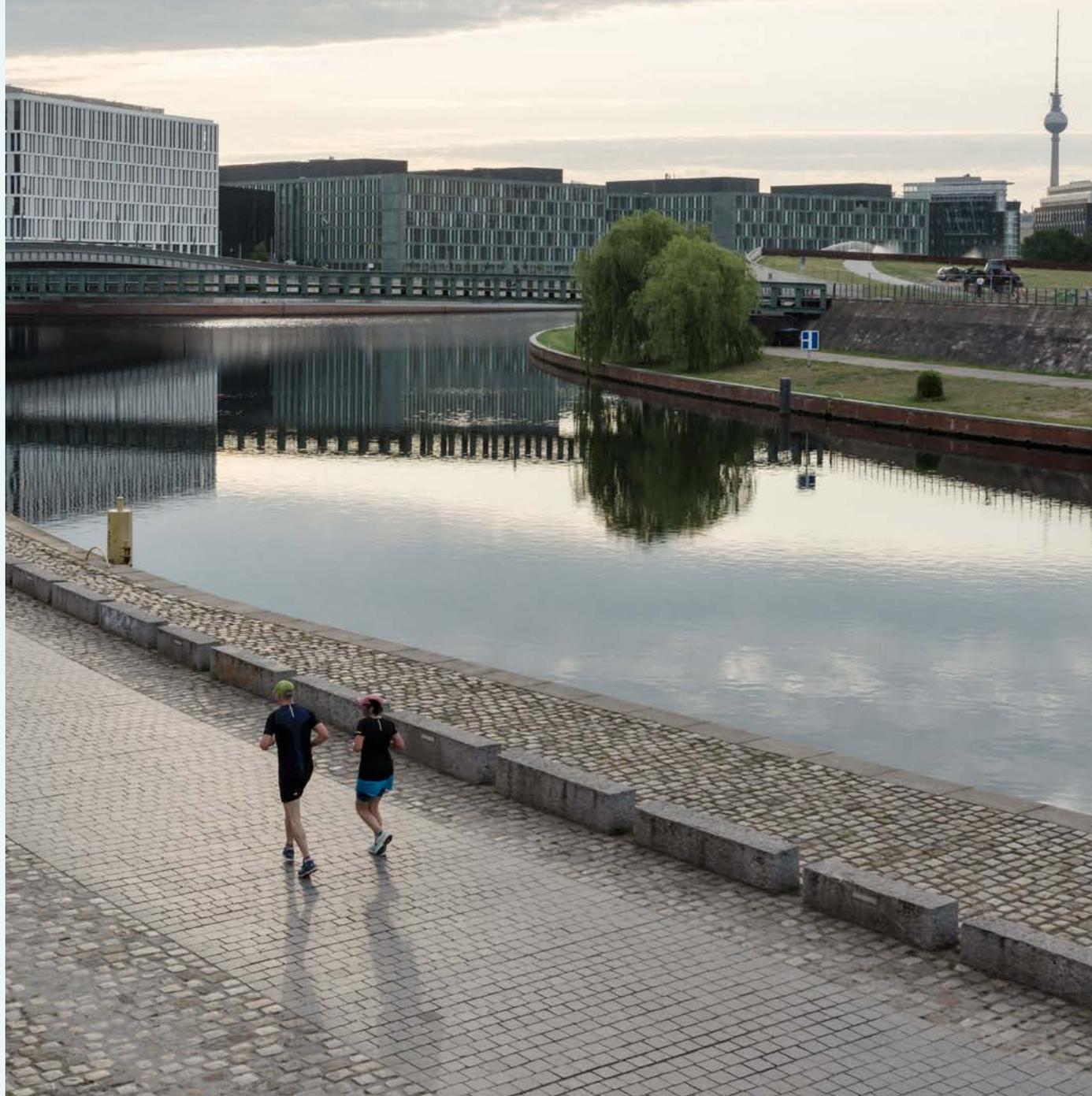
Development of the Almere Pipeline project in the Netherlands to integrate third-party biomass is in progress. In addition, the fuel switch at the Diemen CHP plant from gas to biomass is in the approval stage. Due to the closing of the Hemweg 8 coal-fired power plant, the

location is currently being developed into a site where sustainable heat and electricity can be produced for our customers.

The climate roadmap for the Heat business in Sweden included 14 concrete activities for 2019, one of them being to develop a plan for how to make the operations in Sweden 100% fossil-free by 2025. In Gustavsberg, new digital products and services will continue to be tested and developed together with customers, end consumers and the municipality.

In focus

Enabling fossil-free living



Aligning emissions reductions with climate science

Vattenfall's new 2030 CO₂ targets were approved by the Science Based Targets initiative.

In 2019 our total carbon footprint was approximately 38 million tonnes. We report our emissions in accordance with the Greenhouse Gas Protocol, which is the prevailing international standard, and break down our emissions into three categories: Scope 1, which are essentially our chimney emissions (~19 Mtonnes); Scope 2, which are emissions from the energy we purchase (~100,000 tonnes); and Scope 3, which include upstream (supplier) and downstream (customer) emissions linked to our activities or products (~19 Mtonnes).

Vattenfall strongly believes in the importance of decarbonisation. In 2016 we established our purpose – to Power Climate Smarter Living – and in 2018 we launched our ambition to enable fossil-free living within one generation. Meanwhile, in the background, we have been working hard to make sure we succeed.

“Our responsibility starts at home,” says Tuomo Hatakka, Head of Business Area Heat, “which is why in 2016 we developed our first official CO₂ roadmap. The roadmap identifies the technologies we could use and the path we could take to decarbonise our entire portfolio while still ensuring security of supply for our cities and customers. It will also allow us to maintain the level of profitability required to continue investing in new low- or zero-emission technologies.”

Tuomo Hatakka continues: “Since then we have constantly refined the roadmap, looking for ways to do more and decarbonise faster. We have exited coal in the Netherlands after the closure of the Hemweg 8 coal-fired power plant in 2019. We recently completed a major study with the City of Berlin that involved active participation of representatives of the Berlin civil society as well as NGOs, which determined that exiting coal in the city is possible by 2030. By the end of 2020 we will present the best strategy to achieve this. We anticipate a system that integrates multiple solutions will be necessary, including biomass, geothermal heat, excess industrial heat, gas-fired combined heat and power plants that can also be fired by hydrogen, and power-to-heat. In September we inaugurated Europe's largest power-to-heat installation, a 120 MW heat plant at our Reuter site in Berlin which can use excess renewable electricity to provide heat for up to 30,000 households. By 2030 we will have reduced our Scope 1 and 2 emissions by nearly 40% compared to 2017.”

Vattenfall's efforts are not focused just on our own emissions. In parallel, we have expanded our initiatives to drive decarbonisation with suppliers, partners, and customers. This is being done by engaging key suppliers on topics like carbon footprint and circular economy solutions, and including such

elements in our tenders as well. We continue to work with industry partners to develop new, low-carbon technologies, for instance in sectors such as steel, cement and biofuels, just as we seek to improve the availability of fossil-free solutions to our customers, like heat pumps, solar panels, or renewable energy contracts, to name a few. By 2030, we expect to have reduced our customer emissions (GHG Protocol: Scope 3, Use of Sold Goods) by about 20% compared to 2017.

“In 2019 we put our efforts to the ultimate test and asked ourselves ‘are we doing enough?’. To get an answer, we submitted our 2030 targets to the Science Based Targets initiative (SBTi)¹ for approval. The SBTi then compared our targets to the level of emissions reductions that climate science requires, and they certified that our decarbonisation trajectories, both for our own emissions and for our Scope 3 emissions, are in line with limiting global warming to 2° C or less,” says Tuomo Hatakka, concluding:

“While we're proud of this achievement, our work is not done. We will continue to engage all of our stakeholders, from our suppliers to city partners and customers, to accelerate the drive towards fossil-free living. Our path to 2030 is a strong first step towards ensuring we achieve this within one generation.”

¹ The Science Based Targets initiative is a joint initiative between the Carbon Disclosure Project (CDP), the UN Global Compact, the World Resources Institute (WRI) and WWF. For more information on the SBTi and methodologies, see www.sciencebasedtargets.org.

Operating segment

Distribution



Operations

Vattenfall's Distribution business owns and operates electricity distribution networks in Sweden and Germany (Berlin) and has approximately 3.3 million business and household customers. A new business unit for operation and ownership of new networks in the UK was established in 2017. Electricity distribution is primarily a regulated business supervised by network regulators in the respective countries. In Sweden, revenue regulation will be much stricter and the revenue frames significantly lower from the next regulatory period, which starts in 2020. Vattenfall has reviewed its investment plans to adjust to the new conditions while at the same time maintaining focus on maximising the efficiency of investments.

We strive to minimise impact on biodiversity in our distribution operations and make best use of the areas around our assets to aid protected or threatened species. Sustainable nature conservation and the protection of species are important aspects in the construction and operation of our electricity networks. We therefore place high demands on suppliers and contractors to adhere to our environmental policy.

Key data

	2019	2018
Net sales (SEK million)	22,540	22,374
External net sales (SEK million)	17,903	17,845
Underlying operating profit ¹ (SEK million)	4,998	6,250
Investments (SEK million)	7,163	6,554
SAIDI ² (minutes/customer)		
Sweden	439	187
Germany	10	15
SAIFI ³ (number/customer)		
Sweden	2.4	2.9
Germany	0.2	0.3

¹ Operating profit excluding items affecting comparability.

² SAIDI: System Average Interruption Duration Index

³ SAIFI: System Average Interruption Frequency Index

Strategy

Electricity distribution is essential for a sustainable society, and expectations on the security and quality of our power supply are high. Despite major investments in the network over many years, we must continue to improve the quality of supply by reducing the frequency of outages and their average duration. We also see an urgent need to increase network capacity in many areas to be able to connect more customers and enable growth in society. The ageing network must be modernised to manage the growing volume of decentralised renewable power generation that needs to be connected. We are committed to enabling the adoption of smart meters,

digital solutions and related customer information.

The following focus areas have been identified for Distribution:

- To be customer centric – enable efficient customer interactions and connections
- To operate secure and efficient networks – invest to improve distribution network quality and capacity
- To ensure the right and diverse competence – develop our people and encourage new ways of working
- To be the preferred partner for new networks – grow and deliver customer-centric solutions

- To be sustainable in the long term – strive for a stable revenue framework and minimising environmental impact

Safety has top priority in the Distribution business. We strive for a healthy and safe workplace through leadership and a culture of health and safety awareness. We continuously work with safety inspections at our facilities to mitigate risks. In the event of incidents in the electricity network, we report to and cooperate with the relevant authorities and take necessary measures to prevent similar events from occurring again. This is a continuous process with the long-term goal to have zero accidents.

Developments in 2019

Net sales were unchanged from 2018 as lower volume in Sweden was compensated by a higher contribution from Germany. Underlying profit decreased mainly due to costs associated with Storm Alfrida.

Storm Alfrida hit Sweden in January with winds reaching 38 metres per second, causing an extremely tough situation for our customers with major disruptions in electricity supply (see page 53). The work to repair and restore the electricity distribution network was very extensive but has been performed without any serious accidents or incidents. Costs for Alfrida amounted to approximately SEK 800 million, of which roughly half pertains to outage compensation and the other half to repair costs.

In October the Swedish Energy Markets Inspectorate issued the new revenue frames for the regulatory period 2020–2023. The allowed return (WACC) was

set at 2.16%, which is considerably lower than in the 2016–2019 regulatory period (5.85%). The negative impact on EBIT is approximately SEK 2 billion per year on average. In late October the Swedish government announced that carry-over of the non-utilised part of the revenue frame from 2012–2015 would be permitted if certain requirements concerning investments were met. The plan is that the carry-over revenue may be utilised during 2020–2027.

To further increase the reliability of the electricity network in Berlin, investments are being made to renew assets, for instance through substation upgrades and asset automation. During the year we announced a price increase of about 5% in Berlin, which took effect on 1 January 2020. Vattenfall's electricity network company Stromnetz Berlin received a positive outcome in the first court instance regarding

the award decision for the electricity network concession. The court has ruled the city's decision to award the concession to a city-owned entity as unlawful. Despite the court ruling, the legal process is expected to continue in 2020. Our aim is to cooperate with the City of Berlin. Meanwhile, we remain committed to guarantee security of supply in Berlin, and we will continue our work on digitalising and modernising the network.

Vattenfall's electricity network operations in the UK, Vattenfall Networks, were launched at the end of 2017. Vattenfall Networks has now been awarded its first three contracts, entailing ownership and operation of the electricity networks for industrial and commercial premises.

Planned activities

Further investments are being made in improved security of supply, digitalisation and automation to ensure a smart, efficient and stable network. This will improve our service to customers, support development of new business models and enable continued integration of renewable energy sources. We will continue to build relationships with local stakeholders to create an understanding of the role of the networks in the development of society. Environmental focus areas in the coming years include further proactive management of biodiversity in maintenance and construction activities, responsible handling of equipment to avoid oil spills, and the ambition to adopt new insulation technologies

for high voltage breakers to avoid the use of the greenhouse gas SF₆.

In Sweden, demand for electricity and network capacity is growing fast, especially in the Stockholm and Mälardalen regions. In parallel, the industrial and transport sectors are working to be fossil-free, and new electricity-intensive industries such as data centres require network capacity. Pending the ability to increase capacity, a number of temporary solutions such as more flexible contracts are being developed in dialogue with customers. To ensure secure power supply in Stockholm, Vattenfall has begun extensive upgrading work to strengthen the electricity network in a number of municipalities. In total,

investments of SEK 1.8 billion are planned for the coming five years.

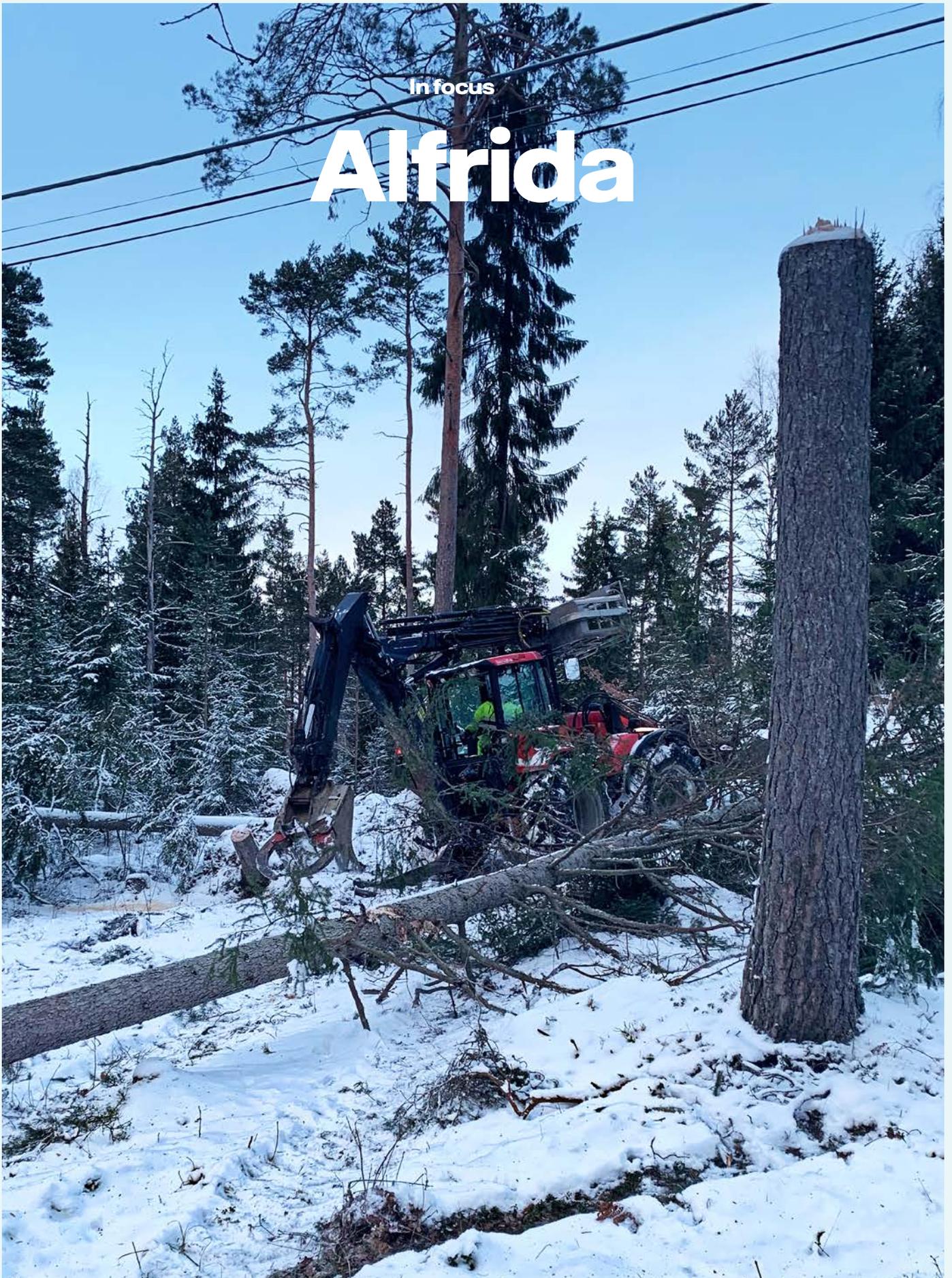
In Berlin we are continuing our commitment to the “WindNODE – showcase smart energy” project with the aim of integrating large amounts of renewable electricity into the energy system and at the same time keeping the power networks stable.



Vattenfall's participation in WindNODE is contributing to the development of smart, efficient, and future-proof infrastructure for the energy transition in Germany.

In focus

Alfrida



Alfrida hit Sweden with hurricane strength

Storm Alfrida hit parts of Sweden in January 2019 with severe consequences for the electricity network and left households without electricity for weeks.

The early days of 2019 were tough on parts of Sweden. On New Year's Day Storm Alfrida accelerated to hurricane strength over Sweden with wind gusts of up to 38 metres per second. An estimated 500,000 cubic metres of trees were swept away in forests, bringing down poles and power lines in their path.

A total of 100,000 customers, of whom 65,000 were Vattenfall customers, were left without electricity in the regions of Roslagen, Bergslagen, Uppland, the greater Stockholm area and northeast Götaland. Lights, heating systems, drinking water pumps – everything operated by electricity had to be replaced by other solutions for as long as it took to bring back power to the individual homeowners.

“The situation was very hard, especially for older people,” says Lee Gidlöf, Head of Strategy & Development Distribution Sweden. “So while we were working day and night to restore the electricity distribution, some people had to move to friends and family or even to a hotel paid by Vattenfall. It was impressive to see that all people came together and helped each other under these difficult circumstances.”

Prepared but taken by surprise

Vattenfall's Operations Centre in Trollhättan had prepared for an incoming storm. However, when they started up the outage organisation and technicians began working in the field, nobody knew how hard-hit the region actually was. Wind and snow initially prevented helicopters from flying, so it took some time before the extent of the damage

became clear to everyone, but when the seriousness of the situation was known, offers for help came in from all over Sweden. In addition to Vattenfall Services, contractors, other network companies and Vattenfall office workers in large numbers volunteered their assistance to help the many customers in need.

Pelle Larsson, Head of Network Operations in Trollhättan recalls: “During the most intensive period we had more than 500 technicians, loggers and machine operators working in the field. They used tracked vehicles, forest harvesters, excavators and line machines to repair and, in some places, even rebuild the network from scratch. Helicopters were in the air to find faulty lines, and boats were used to reach some of the worst affected areas on islands in the northeastern part of the Stockholm archipelago.”

Safety a major concern

With so many people working in hazardous weather conditions in the field, it was vital to focus on safety. Safety was always the main concern, and situations were constantly assessed from a safety perspective when conducting all field work. If it was not 100% safe, work had to be postponed until the weather conditions improved.

Open and transparent

Lee Gidlöf explains: “The first night 2,500 fault report calls reached Vattenfall's 24/7 customer service hotline. Already after a few days, we set up temporary customer information centres in the Norrtälje and Östhammar

regions to meet customers and give information and help. An Alfrida web page, Vattenfall's app and Vattenfall's Facebook account were updated regularly with current status, outage information and repair prognoses. We worked in close cooperation with the local municipalities, and it was a priority to provide open and transparent information to the general public and media about the situation.”

For Vattenfall, the cost of Storm Alfrida amounted to approximately SEK 800 million, of which about half is compensation to customers for being without electricity and the other half costs for restoring the power supply. Over 60,000 customers received outage compensation for the time they were without electricity. While all customers had their electricity back by 23 January, it became clear that it would take the rest of 2019 to replace the temporary lines and repair and build the new network.

Annika Viklund, Senior Vice President and Head of Business Area Distribution, reflects on these first days of 2019: “The feeling that everyone in our company engaged in bringing electricity back to our customers makes me very proud. Alfrida was the worst storm for our networks in a decade, with severe consequences and long outages for our customers. At the same time, to work in a safe way with more than 500 technicians out in the forest was our first priority, and I am thankful that we succeeded in avoiding serious accidents.”

Topical issue

Addressing the needs and opportunities in the modern energy system with a range of smart solutions will improve the efficiency and sustainability of the entire energy system.

Optimising the energy system

A challenging future full of opportunities

For many years, large-scale, dispatchable production and predictable demand patterns have been the basis for controlling the power system. However, two major trends in the energy transition are challenging this status quo:

- More intermittent renewable energy on the production side – meaning more variable and decentralised power supply – is putting strain on the grid, creating congestion and increasing the need to manage fluctuations in power generation, sometimes on short notice
- Further electrification on the demand side, driven by urbanisation and decarbonisation of the heating, transport and industry sectors, is resulting in new, large and power-intensive loads that need to come online quickly

Planned investments in grid expansion and modernisation are greatly needed, but will only partly alleviate the challenges facing the modern energy system. The increase in consumption,

energy storage systems, and decentralised generation, along with the increasing steerability of these assets, is putting greater strain on the system, but at the same time it is allowing us to expand our activities to both connect and optimise the system, creating value for Vattenfall, industry, and the entire energy system.

System flexibility needs

The fundamental importance of frequency:

Frequency is crucial, as all devices that run on electricity are designed to run at a specific frequency, and any deviation in electricity frequency will change the device's performance and potentially cause damage. A real-world example demonstrates this nicely. Frequency in Europe is 50 Hertz (Hz), and for a period of months in 2018, the average frequency was 49.996 Hz, causing millions of digital clocks to "turn slower" and eventually be a six full minutes behind. A harmless example, but when one considers that changes in frequency also lead to rotating machinery spinning

either faster or slower, the potential consequences of frequency instability become much more serious.

Frequency is affected by electricity supply and demand. All else equal, an increase in electricity supply will increase frequency, while a boost in demand will decrease frequency. Thus an increasing amount of intermittent electricity generation (inherently variable increases/decreases in frequency) and increased electricity demand (decreases in frequency, also increasingly variable) create challenges to maintain the required frequency. At system level, it is the responsibility of the Transmission System Operator (TSO) to maintain desired frequency.

Securing desired frequency:

The flexibility needed for frequency control during normal operation ranges from seconds to sub-seconds on a continuous basis, while during disturbances quick ramping capability is needed. Generation flexibility, such as flexible hydro power or batteries, can supply this

type of flexibility. On the consumption side, turning equipment on or off (so-called demand side response) can often also provide this type of flexibility.

Network flexibility needs

At a more regional or local level, both demand and supply of electricity can exceed the capacity of the network to transport it. In these areas with constrained network capacity, flexible loads can be triggered to alleviate congestion. Loads derived from heat pumps or electric vehicle charging are likely suitable to participate in this type of market, possibly via an aggregator – someone who connects and controls multiple smaller loads, turning them into a single, larger load.

Optimising the energy system requires a multi-pronged approach

As the energy transition places increasing pressure on managing the energy system, Vattenfall is leveraging its position across the energy value chain to develop solutions and strategies to make the current system function as effectively and efficiently as possible.

Flexible operation of our hydro portfolio:

We are increasing the flexibility of our conventional hydro portfolio to better provide ancillary services (like frequency control) and arbitrage in the day-ahead and intra-day markets. The need for dispatchable power to maintain system stability also translates into a potential for high value creation in pumped hydro.

Regional flexibility markets for network capacity:

As part of the CoordiNet project, in collaboration with E.ON and the Swedish TSO, Svenska Kraftnät, Vattenfall is piloting a marketplace for demand-side flexibility. Artificial intelligence is used to forecast the capacity of the electricity network and analyse electricity consumption in real time, to help alleviate network capacity shortages at a regional level. Pilots are being developed in four regions in Sweden: Stockholm, Skåne, Gotland and Jämtland.

Vattenfall Flexibility Services connects decentralised flexibility to the wholesale markets:

We are developing a platform to leverage decentralised loads and generation to offer flexibility. These loads range from industrial assets like electrolysers and electric boilers to the growing number of standalone small or industrial scale batteries, to charging stations and e-vehicle batteries. Automation will play a key role in many of the specific offerings and will be instrumental in steering assets closer to real time supply and demand. See page 39 for more information.

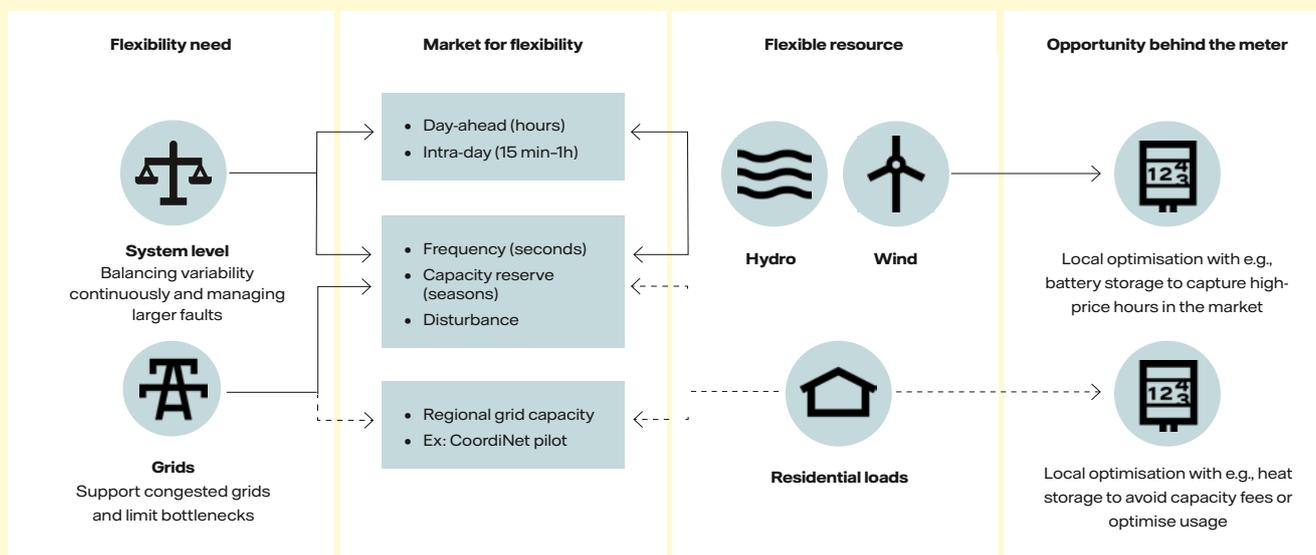
Sector coupling:

Sector coupling, or the partnering between energy companies and other sectors, will not only enable industrial decarbonisation, but it will also do so while at the same time optimising the energy system. Vattenfall is working on solutions to connect the energy

system to the heat sector, for example. We recently commissioned a 120 MWth power-to-heat plant that can take local excess renewable electricity – which would otherwise be shut off to maintain frequency – and use it to provide district heating for more than 30,000 Berlin residents. We are also developing solutions to connect municipal transport systems to renewable energy, coupling excess renewable electricity to electrolysers to produce fossil-free hydrogen for their fuel cell fuelling stations.

Smart and timely investments key to success

Creating the infrastructure and intelligence required to optimise the energy system, and being able to continuously adapt services to the needs of the evolving energy landscape, requires significant investments. Enabling hydro power to quickly ramp up or shut down requires the creation of additional complex water management systems to deal with rapidly changing water flows. Likewise, sector coupling requires investments in electrolysers, power-to-heat boilers, and other physical assets. Furthermore, all physical assets require investments in the sensors and digital tools that enable them to be quickly and accurately steered according to myriad market signals. Through its investments in both infrastructure and digital tools, Vattenfall has positioned itself well to address the challenges to create value for the company and society.



---- Markets not yet developed



Our people

Vattenfall offers a wide array of job opportunities with continuous learning possibilities. All employees in our company are given the opportunity to support the energy transition to fossil-free living within one generation. We want every individual to bring their unique talents and competences and be their authentic selves at work. In this way we form a diverse environment with the right conditions for employees to make a difference in enabling climate-smart living.

Strategy

We strive to enable our people to unlock their unique potential here at Vattenfall, stay engaged and high-performing in a work environment with a special mix of professionalism and informality that is healthy, safe, supporting and inclusive. Our ambition for a

fossil-free future is a foundation for meaningful work and opportunities for individual growth and learning across the entire energy value chain - in a variety of roles, businesses and regions.

In general, we are working actively with the following focus areas:

- Provide a safe and healthy work environment
- Enable an engaging, high-performance culture
- Secure the right and diverse competences

Developments during 2019

Ensuring a safe and healthy work environment

Our goal is to have zero accidents and zero work-related sickness. The focus of our health and safety (H&S) strategy is to enable employees to perform in an inspiring and caring culture, free from any harm to mind or body. Our policy clearly states that work shall stop if employees or contractors are in danger.

The most common hazards are slips, trips and falls, fall from heights, contact with sharp edges and improper working positions. Within Vattenfall the hazards are defined and documented in instructions, identified locally after investigations and subsequently reported centrally.

Internal evaluation shows that the accidents causing the most serious injuries (>60 days absence) largely correspond to the identified most common hazards. Each accident is methodically investigated by local H&S specialists and the hierarchy of controls used to define measures with the intention to completely eliminate the hazard. Unfortunately, this is not always possible, and other mitigating measures are taken in accordance with the hierarchy of controls.

To address the root causes, it was decided in 2019 to target the actual H&S culture - in addition to leadership and maturity development - by implementing the Hearts and Minds approach, an international best practice. A variety of related activities have been implemented and will continue in a number of business units.

Despite all efforts, Lost Time Injury Frequency (LTIF) increased to 2.1 in 2019 from 1.9 in 2018. There is no single explanation for the increase in accidents, although the most common root cause is culture and awareness. To counter this, we will continue to work relentlessly to improve the H&S culture, H&S maturity level, and have a high focus of the entire organisation including top management. We expect this will be reflected in a reduction in LTIF in 2020.

Given that organisational and social health aspects play an increasingly important role in employee well-being, a variety of initiatives have been taken, including workshops and podcasts focusing on stress, work/life balance and general workload. In addition, specific activities are organised on a local level, such as briefings, workshops and surveys related to health and harassment. The positive impact from our efforts is reflected in the sick leave rate, which decreased from 4.0% in 2018 to 3.7% in 2019. The decreasing trend can also be seen in previous years.



We work for an open and inclusive culture where our employees find their own role in driving the transition to a fossil-free society.

Any kind of harassment is clearly unacceptable, and routines for dealing with undesirable behaviour have been in place for years. During 2019 we continued to drive Diversity & Inclusion (D&I) labs for both managers and employees. We can see the results of our efforts to ensure that our people are treated fairly, regardless of gender, transgender identity or expression, ethnicity, religion or other faith, disability, sexual orientation or age. The D&I index, a measure of employees' attitudes and behaviour as well as their perceptions of Vattenfall's diversity and inclusion efforts, was introduced in the annual employee survey for the first time this year. A total of 92% of our employees responded that they can be themselves at work. It is a good result, but it also highlights that there is still work to be done, as we can only be satisfied when 100% of our people feel they can be their authentic selves.

Enabling an engaging, high-performance culture

In 2017 we set out on a journey to transform our culture towards being more open, active and positive in a work environment committed to safety. Since then we have launched our activation programme stepwise with the aim to strengthen employee engagement by driving change in the company culture. The programme is helping all our people understand our purpose and our goal, how to get there and why we need to change, just as it puts everyone's personal contribution into this context. From the results of the annual employee survey we can see that our efforts are now paying off, as 75% of Vattenfall's employees feel proud to work for Vattenfall, an increase of nine percentage points since the last full survey in 2017. 73% of employees would recommend Vattenfall as a place to work, also an increase by nine per-

centage points since 2017. The Employee Engagement Index has also increased to 69%, compared to 64% in 2017.

Vattenfall Management Institute (VMI), our internal training organisation, has integrated the corporate strategy into its curriculum, graduating all senior managers during 2019. We are working consciously to promote an open and inclusive culture that increases awareness of the benefits of diversity throughout the company. Our goal is to have the same gender balance in management positions as in the company as a whole, thus enhancing equal leadership by narrowing the gap between the number of female and male managers. In 2019 we reached our yearly female manager hiring target, as women represented more than 36% of all managerial hires in 2019, increasing the share of female managers to 26%, compared to 24% in 2018.

In 2019 we redefined the leadership behaviour necessary to deliver on our purpose and drive the desired company culture. For the first time, each manager has received a new Leadership Focus Area Index in their My Opinion survey, helping the manager define where additional attention is needed. We expect our managers to Accelerate Learning, Connect People, and Drive Innovation. Accelerate Learning scored the lowest in this year's survey (67% vs. 71% and 78%, respectively), and we are looking more closely at what actions to take, as securing the right competence is crucial for Vattenfall.

Securing the right and diverse competences

During 2019 the number of employees decreased to 19,814 full-time equivalents (FTEs) from 19,910 FTEs in 2018.

As the speed of progress on climate issues needs to increase during the years to come, so does our speed in learning and

the ability to adapt to new ways of working. This is why we have given even more attention to securing the availability of competences in the long term.

In 2019 we focused on further launching our Employer Brand to attract sought-after competences in technology and maintenance, using different methods and channels to find and attract people with the right skills and attitudes. We also launched our new career website. Particularly important competences lie in the areas of analytics, various engineering specialties, digital know-how and nuclear power technology. Internally, we have continued to run and promote job rotation programmes, talent networking and transparent career paths for managers, project managers and specialists. Every year Vattenfall recruits a number of international trainees, and we had an exceptionally high number of applicants for the 23 available positions in 2019. The aim is to find young talents in the company who can be tracked to become the leaders, experts and project managers of tomorrow. A Nordic Nuclear Trainee Programme will start again in 2020, with recruitment actively under way. We are also establishing the Vattenfall Gymnasium in Forsmark, where the students will have possibilities for hands-on training at the nuclear power plant, SKB's facilities and our R&D laboratory in Älvkarleby.

For new employees, we have launched Vattenfall IntroDays, an inspiring live onboarding programme for new employees, as well as a digital onboarding package.

Vattenfall also runs and participates in various programmes and initiatives that support broad aspects of diversity and inclusion. We believe

this strengthens us as an employer and enables us to better understand our customers' expectations and makes us a better partner in the communities we serve.

Our ongoing outsourcing programme is providing access to modern IT tools, making training and development opportunities more visible for our people and making performance more visible in internal career movements. In this way we are enabling each individual to own their development and thrive - what we call Limitless Learning.

Vattenfall's transformation is both narrowing and expanding the business at the same time, which requires the ability to re-skill and re-train people in many different areas. Any staff reductions resulting from changing competence needs and rightsizing decisions are being handled in a socially responsible way, supporting career development and employability to help our employees find the next career step within Vattenfall when possible, or outside the company when necessary. Due to the change in sales strategy and location consolidation in Vattenfall's German trading operations in 2019, individual solutions needed to be found for more than 30 highly specialised employees in trading and sales units. Within less than a year it was possible to achieve a good solution for all affected employees. Due to their professional competences, most employees could be recruited to new jobs within trading, sales, distribution or other Vattenfall units in Germany. Some of them were supported with a voluntary package plus individual outplacement coaching, enabling them to get new jobs in the external labour market.



Vattenfall is working actively to ensure a safe and healthy work environment, and our goal is to have zero accidents.

In September 2019 Vattenfall's organisation in the UK was awarded the Committed to Equality (C2E) Diversity Assured Accreditation at a Gold Standard. C2E is a non-profit organisation, working through National Equality Partners licensed by Ernst & Young. Vattenfall received the award after an equality audit was carried out across Vattenfall's UK

businesses. The audit assessed the principles applied by management and how well known the policies and practices are amongst employees. We are very proud to get recognition of our work and want to make sure that our organisation offers equal opportunities throughout our workforce in all countries.

Integrity

Operating our business with integrity is essential for ensuring that we live up to our stakeholders' expectations. They depend on us to conduct our business in a fair and responsible manner. We have a zero-tolerance policy for bribery and corruption, and we are a member of the Partnering Against Corruption Initiative (PACI), a cross-industry collaboration launched by the World Economic Forum, as well as of Transparency International Sweden. We

require that all employees take personal responsibility to act in accordance with the company's ethical guidelines, which are laid out in the Vattenfall Code of Conduct and Integrity. Tailor-made face to face training programmes and e-learning tools support these ambitions. We expect our suppliers and business partners to act ethically and in full compliance with the applicable rules in every country they do business, as outlined in the Vattenfall Code

of Conduct for Suppliers. Read more about Vattenfall's integrity organisation in the Corporate Governance Report on page 79.

The Code of Conduct and Integrity

The Vattenfall Code of Conduct and Integrity applies worldwide to all employees as well as temporary staff (such as consultants and contractors) acting on behalf of Vattenfall. It describes the behaviour we expect of all representatives of Vattenfall.

An e-learning on the Code, which is mandatory for all employees, was launched in December 2018, and extensive awareness activities were conducted in 2019 to promote the e-learning. By year-end 2019 it had been completed by 75% of all active employees.

Integrity training

All managers in the Executive Group Management and three levels below, as well as all employees who have extensive contact with competitors, are required to participate in the Vattenfall Integrity Programme (VIP). The VIP includes both e-learning and instructor-led training on the Code of Conduct and Integrity, antitrust/competition issues, anti-bribery and anti-corruption and conflicts of interest. The purpose of the VIP is to raise the level of awareness, ensure that all employees understand our integrity standards, and ensure a common compliance culture throughout the Group. 760 employees attended the VIP in 2019 (2018: 957; 2017: 698), corresponding to nearly 2,700 hours of education. Integrity content is also part of our leadership programmes.

Awareness and monitoring

It is the responsibility of every manager to lead by example and to ensure their team members understand our way of working. More than 400 managers complete the Vattenfall Integrity Survey every year. Based on the survey responses and various interviews, a range of activities may

be initiated, such as monitoring compliance with our governing rules or providing tailor-made trainings. One specific action in 2019 was to further raise awareness about potential conflict of interest situations through various communication initiatives and by updating relevant internal instructions and working procedures.

Incidents

All suspected incidents are to be reported to the employee's immediate manager, to the integrity organisation or to the Internal Audit department. Additionally, we have a Group-wide whistleblowing function with locally appointed external ombudsmen (attorneys) to whom employees, consultants and suppliers can anonymously report suspected improprieties. All incident investigations are led by Vattenfall's Internal Audit unit. A total of 53 integrity-related incidents were reported in 2019 (2018: 46; 2017: 47), of which 11 (2018: 11; 2017: 15) led to disciplinary action. Two of the incidents in 2019 were related to suspected antitrust/competition issues. Currently there are no pending integrity-related cases against Vattenfall in court. Most of the incidents were reported internally, while five cases were reported via the external ombudsmen (2018: 4; 2017: 8). All reported incidents and wrongdoings are evaluated and subject to a lessons-learned process to ensure continuous improvement within the company. An example of an investigation of a reported incident

conducted in 2019 is provided in the box below.

Integrity risks

We have conducted and will continue to conduct risk assessments related to integrity. The two greatest integrity risks that we have identified, based on the potential damage to Vattenfall and our stakeholders, are non-compliance with competition laws and corruption. In 2019 we had four reported incidents in these areas (2018: 6; 2017: 1). Accordingly, Vattenfall will continue its work to raise awareness within the company through training and communication to ensure compliance with the rules in these areas.

Code of Conduct for Suppliers

Our integrity work is not just an internal issue - we also have corresponding requirements for our suppliers. We require our suppliers to comply with the Vattenfall Code of Conduct for Suppliers, or an equivalent standard agreed together with us. In the integrity area, the Code of Conduct for Suppliers puts special emphasis on business integrity, anti-corruption, conflicts of interest and competition law, as well as information on how to use the whistleblowing function. It is based on, among other things, the UN Global Compact, the UN Guiding Principles for Business and Human Rights, ILO declarations and the OECD Guidelines for Multinational Enterprises.

Example of an investigation of an incident

In spring 2019 the Integrity organisation was informed that an employee had been involved in discussions regarding a private financial investment in a company that Vattenfall was looking to acquire. According to the informant, the employee had knowledge about the potential acquisition when they engaged in these discussions. An investigation was initiated, led by Internal Audit with support from the Integrity organisation.

The investigation focused on three questions, (i) what was the employee's motive to invest in the potential target company, (ii) was there any personal relationship between the employee and the owners of the company, and (iii) had the employee in any way acted in breach of law, the Code of Conduct

and Integrity or any other internal instruction. As a first step in the investigation, publicly and internally available information was collected to confirm alleged facts and circumstances in the case. Thereafter, several employees with knowledge about the potential acquisition were interviewed and, lastly, the employee in question was also interviewed. The investigation was conducted under strict confidentiality.

The investigation confirmed that the employee had engaged in detailed discussions with the owners about some sort of personal involvement in the target company, including a financial investment; he had received an investment offer from the owners that he decided not to accept. The employee had informed his manager about the

discussions but only at a late stage. It was also confirmed that there were no personal relationships between the employee and the owners.

The investigation concluded that the employee had acted in breach of the Code of Conduct and Integrity and supplementing instructions when he engaged in the discussions with the owners of the target company. The employee should have realised that the discussions were inappropriate given Vattenfall's acquisition plans and should also have informed his manager immediately. The incident resulted in a written warning, and the investigation was summarised in a report which was distributed to the employee and other relevant individuals in the organisation, including the informant.

Topical issue

With the rising level of digitalisation and the changing geopolitical situation, Vattenfall must not only take increasing steps to protect itself and society from security threats from various national and international threat actors, we must also manage a fast-paced regulatory development.

Vattenfall in the new security landscape

Corporate security today has changed significantly from when it was very much a matter of simply preventing outsiders from physically entering one's premises. Today's landscape of threat actors is more complex. State-sponsored groups have significant resources and capabilities, and with the new geopolitical landscape, some are highly motivated. Organised crime can make significant amounts of money through cyber attacks while only taking limited risks. Terrorist groups, whether affiliated with extreme religious, political or racial ideologies, also pose an increasing risk, just as the use of new technology is enhancing activist groups' reach and effectiveness.

The growing exchange of information throughout society through numerous digital platforms is opening new and significant opportunities for threat actors on a global scale. Companies like Vattenfall are exposed to a combination of cyber, physical and insider threats which calls for a holistic security approach addressing physical, personnel, and information

security to ensure that we do not leave any blind spots open to be exploited by a threat actor.

The geopolitical situation

"Given the geopolitical situation, there are probably some 20 active countries that can pose a threat to our operations and infrastructure in our core countries," says Fredrik Torp, Vattenfall's Chief Security Officer. "State-sponsored threat actors are targeting many sectors in society, with critical infrastructure as one of their most highly prioritised areas. Increasingly, these actors are working together with criminal organisations, thus adding to the complexity of the situation and creating a new set of direct risks towards Vattenfall."

Threat actors often linked to a clear objective

It is often very hard to know where cyber threats originate, as it is easy to be anonymous when working in the digital space. Criminals are typically searching

for financial gain or may even want to finance terror, while some countries, due to sanctions, want to get hard currency and may run cyber attacks threatening to block access to or publish the victim's information unless a ransom is paid.

Other actors have geopolitical motives and are more likely to attack critical infrastructure in order to disrupt societies or achieve other political objectives.

Says Fredrik Torp: "The big battle between large nations concerns more than mere tactical issues of financial status, sanctions, taxes and intellectual property. What we see are the symptoms – like trade wars – but it is actually about the long-term perspective of who sets the global agenda 20 years from now within areas such as human rights, environmental impact, free speech, etc. To achieve this, financial, military and technological global dominance are seen as prerequisites."

Vattenfall in the hot seat

Because of Vattenfall's line of business, many of these threats are relevant to us. It is therefore necessary to work actively to protect the company's assets – information, people, operations, reputation and physical assets.

Fredrik Torp elaborates: "A very concrete example is our nuclear business. We have operated nuclear power plants for 40 years. For us it is business as usual, but for actors looking to develop the technology, the situation is different. With all threat actors, we need to see what they want to achieve and how sophisticated they are. We cannot protect everything, so we focus on the things that are the most valuable to us and society."

Information security is top priority

Information is an asset of growing importance for Vattenfall, and it is easy to underestimate the value of one's intellectual property and know-how, whether it is technical data, operational data or customer information. An increasing part of the energy business relies on using information to offer services to customers and run an efficient business in order to stay competitive. Interaction with customers and society is dependent on exchange of information, so authorities in the many countries in which we operate are introducing new legislation that multiplies the complexity of our handling of data and information. This increases

the risk of noncompliance, if not managed correctly.

"If customers are to hand over information to us, they need to trust that we will handle it in a secure and compliant way," says Fredrik Torp. "But also internally, different parts of the company must be able to trust each other to maintain a uniform level of security to safely exchange vital information and data."

Therefore, in any project, the focus is on security from the very outset. Information is classified according to three security considerations – society, the individual person, and the company – and the information classification in these three areas will lead to a labelling according to Vattenfall's security governance model.

Three lines of defence

Vattenfall has increased focus on security throughout the company and has performed well in handling security issues in recent years. This is partly due to increasingly good compliance with the security governance model and the strengthening of a "three lines of defence" security structure throughout the company. The first line of defence comprises the business units and staff functions that, supported by local security resources with in-depth knowledge, must follow the Security Management system. The second line of defence is represented by the corporate security organisation, which sets risk-based priorities and targets and provides gov-

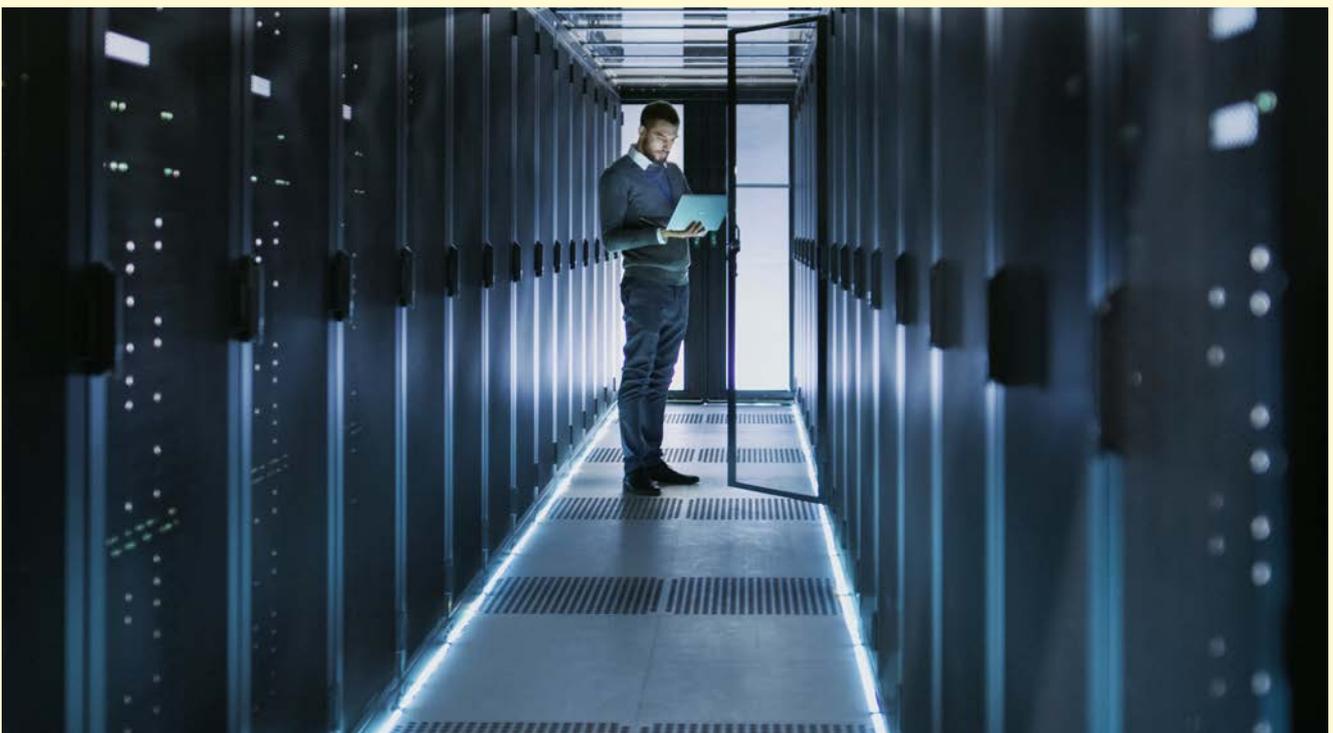
ernance, instructions, tools and support, while the third and last line of defence is represented by the overall supervision by Internal Audit. (See also page 78).

Awareness is crucial

"When state actors, criminals or other antagonistic groups launch an attack, they often combine three different methods," Fredrik Torp explains. "A cyber part, some sort of physical access or intrusion, and a (willing or unwilling) insider. This means that we must safeguard ourselves against all three types of threats, including raising the awareness of our employees not to become an unwilling insider. We have just run our first micro-burst training with a false phishing mail to a large number of employees, and we will continue with these super short on-the-job training activities instead of long e-learning sessions."

Physical security is presently being streamlined throughout Vattenfall, as even the best cyber security will be seriously weakened if outsiders get inside the company, where they can create much more damage and also threaten employee safety.

"Through risk-based security work, with focus on the most critical risks, we can get really far in safeguarding our organisation and its assets. However, we must remember that there is no such thing as absolute security, but there are degrees of resilience!" Fredrik Torp underlines.



Risks and risk management

We apply conscious and balanced risk-taking in which business transactions are reviewed from both profitability and risk perspectives. Our risks are managed based on a sound risk culture throughout the entire company to support our strategy and achieve our long-term goals. In accordance with the Swedish Corporate Governance Code and the Risk Policy, decided by the Board of Directors, Vattenfall's risk management framework ensures thorough identification and management of our risks and acceptable risk exposure.



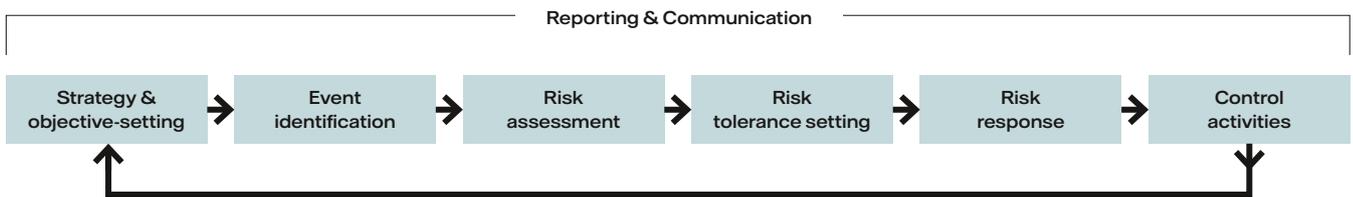
Enterprise Risk Management

The aim of Enterprise Risk Management (ERM) is to manage risks to which the Group is exposed in order to support value creation, ensure risk awareness, and bal-

ance risk against reward. ERM at Vattenfall involves analysing and monitoring all types of risks. It is based on the risk management standards of the Committee of Sponsoring

Organizations of the Treadway Commission (COSO) and the three lines of defence model.

ERM process



Risks and risk management are part of the financial statements in accordance with the International Financial Reporting Standards (IFRS). Read more on pages 89-150.

ERM process

Vattenfall's strategy serves as the basis for setting objectives for the respective business units in the business planning process. When setting these objectives, risks that could hinder their achievement are identified. In our risk management process, risks are quantified and analysed with respect to both financial and non-

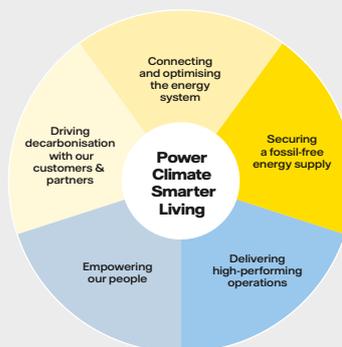
financial consequences (e.g., concerning the environment, including climate change, as well as reputation). These risks are assessed against the company's risk tolerance and a decision is made on suitable risk measures. The Business Areas' most important risks and measures are followed up as part of the financial monitoring. After aggregating the risks,

a composite overview of our risk situation is achieved. The potential financial impact is linked to financial key data that is used for the steering of the company. Information is provided on a regular basis to the Executive Group Management and the Board of Directors.

Risk structure

With the ongoing growth in intermittent renewable generation and continuous changes in the energy market structure (e.g., decentralisation, electrification and sector coupling), as well as changes in energy policies, our risk/return profile is changing. However, these developments entail not only risks but also opportunities. The long-term market price risk remains one of our largest risks (our risk management regarding short- and mid-term market price risk is described on page 68). Additionally, the relative importance of market price risk is increasing for Vattenfall due to dramatic changes in support schemes – especially for offshore wind investments. To mitigate this risk we are further diversifying our portfolio in several areas. Our challenge is to find an optimal long-term balance between different portfolio components.

In 2019 the Group's overall risk portfolio posed no threat to the company's continued existence based on a single risk or aggregated risk position. Nor are such risks discernible for 2020.



We expect the consequences of a potential hard Brexit to be limited for us. The UK left the European Union on 31 January 2020, and we are now in the transition period, which the UK government has pledged will end on 31 December 2020. The UK government is determined to agree on a deal with the EU in that time and thereby avoid a hard Brexit. While the details are worked through in the

coming months by the UK and the EU, our main areas of interest remain the impact at operational level on the wind and trading businesses. During this time the position with regard to the movement of people, and related HR issues, will hopefully become clearer. Indirect effects of macroeconomic consequences are hard to predict at the moment.

The risk structure outlined in the following pages reflects the company's strategic focus areas: Driving decarbonisation with our customers and partners, Connecting and optimising the energy system, Securing a fossil-free energy supply, Empowering our people, and Delivering high-performing operations. The main risks we are exposed to are presented, as well as the way in which we manage these risks. This section is accompanied by an example on how we manage impacts caused by climate change. Certain financial risks are associated with more than one of the strategic focus areas and are therefore addressed in a separate paragraph in the risk section.



Risks related to Driving decarbonisation with our customers & partners

We are strongly focused on supporting our customers and promoting electrification and climate-smart energy solutions in areas where we have a competitive advantage.

Risks

- Inability to meet customer expectations which might lead to loss of customers
- Inability to develop and provide sufficient solutions to support decarbonising of customers and partners and possibly leading to loss of existing and potential market shares
- Inability to secure a position in e-mobility services in line with our market share, possibly resulting in a loss of potential customers and growth

Risk management activities during the year

We have partnered with basic industries in Sweden to electrify and decarbonise their industrial processes. For example, in partnership with SSAB and LKAB, Vattenfall is running a hydrogen gas pilot project – HYBRIT – for a fossil-free steel industry. Other examples are the production of sustainable biofuel in collaboration with Preem and sustainable mining with Boliden.

Our solar and battery business continues to develop various products that enable customers to have solar/battery/charging solutions in their homes. Also, we are piloting alternative heating solutions, which is especially important with the phase-out of gas in the Netherlands (e.g.,

electric heat pumps or district heating), but also for housing solutions (e.g., the cooperation with Brainheart in the Nordic region for geothermal energy and “Grüne Aue” in Berlin, entailing installation of sewage heat pumps).

Additionally, we offer corporate power purchase agreements (CPPAs) to supply large customers with renewable energy and help them achieve their sustainability goals (e.g., with Microsoft).

To further help our customers and partners decarbonise, we continue to develop energy solutions – such as charging solutions in the InCharge charging network and other digital offerings – to optimise and increase value for customers (e.g., with the Norwegian dairy producer TINE S.A.).



Risks related to Connecting and optimising the energy system

We are focusing on maximising the value of flexibility and promoting a stable and cost-efficient network infrastructure.

Risks

- Failure to ensure satisfactory security of supply due to network capacity constraints or extreme weather conditions. Additionally, the long permit processes for building new networks is a risk, as this is already delaying projects and thereby delaying improvements in quality of supply
- Risk of continued political changes to regulation of electricity distribution in Sweden and lack of a forward-looking regulatory scheme, which is reducing the scope for Vattenfall Distribution to make investments in the electricity network and improve capacity and quality, which is necessary to support development of electrification
- Risk of losing the concession for the electricity distribution network in Berlin
- Risk of failing to automate wholesale market transactions in time and not being able to reach optimal performance of the flexibility of our assets
- Risk of failing to optimise and monetise on the flexibility of our assets

Risk management activities during the year

To meet customer and regulatory demands on quality of supply, we are working continuously to make the electricity network less vulnerable in the Nordic region by successively replacing overhead power lines with underground cables and replacing old equipment. In parallel with this, development of smart grid solutions is enabling us to reduce outage frequency and duration while allowing customers to monitor and steer their own energy use.

Because of the worsening investment conditions imposed by the new revenue frames in Sweden, and the long lead-times for network build-out, we have to look into alternative solutions. We are making more room in congested parts of the networks by load steering or new tariffs that support flexibility. With complementary solutions such as Power-as-a-Service, we can bridge the gap until new infrastructure is in place. Furthermore, we have appealed the decision on the revenue frames to the Administrative Court in Linköping.

In Berlin, we received a positive outcome in the first court instance regarding the award decision for the electricity network concession. The court ruled that the city's

decision to award the concession to a city-owned entity is unlawful. The legal process is expected to continue in 2020. Meanwhile, Vattenfall's electricity network company Stromnetz Berlin will continue its high quality of supply and efforts in digitalisation and modernisation of the network in Berlin.

To maintain high profitability of our trading operations, we started with algorithmic trading during 2019. The acquisition of the Dutch company Senfal will add new services for large industrial customers with the aim of unlocking value through flexibility and optimisation of renewable generation.



Risks related to Securing a fossil-free energy supply

Our focus is on growing in renewables, maximising the value of our existing fossil-free assets, and implementing our CO₂ roadmap.

Risks

- Our competitiveness could be reduced by insufficient speed in developing our renewable production portfolio and phasing out fossil fuels. The lack of speed in the transition could commit us to less profitable technologies and result in a loss of market share
- Renewables are becoming increasingly exposed to competition, entailing both profitability and growth risks. New investments in renewables also add risks especially to our long-term market risk
- Lack of speed in implementation of sector coupling measures and Third Party Integration
- New players are entering the electricity value chain, leading to higher strategic risks and competition, resulting in both profitability and growth risks

Risk management activities during the year

We are achieving our strategic target of reducing our CO₂ exposure through a stepwise phase-out of fossil fuels, which started by closing our most emissions-intensive assets. In 2019 we closed our Hemweg 8 coal-fired power plant in Amsterdam. In Berlin, we closed down a coal-fired heat boiler at Reuter C and opened a new power-to-heat site. Additionally, our new gas-fired combined heat and power plant at Lichterfelde started operation in 2019, and we are building another one at Marzahn. The switch from coal- to biomass- or gas-fired combined heat and power plants, as well as gas boilers, battery storage, and expansion of power-to-heat solutions, provides greater flexibility and reduces CO₂ emissions. We will have coal-free heat generation in all countries where we operate by 2030. The focus on integration of third-party heat will further decarbonise our district heating networks (e.g., producers of residual heat, such as biomass infeed from Veolia (waste, water

and energy services management company) into the district heating network of Arnhem/Nijmegen in the Netherlands).

To further diversify in renewables, we continue to invest in other technologies besides wind power, including solar power and battery storage, and new business models. It is essential to execute large construction projects on time and budget. In 2019 we finalised multiple solar farms, such as at existing power plants in Velsen, Eemshaven and Hemweg in the Netherlands. As subsidy levels for wind, solar, and battery projects decrease, Vattenfall is using all its expertise (including its past experience in delivering offshore wind farms, combining projects to achieve economies of scale and further deploying operational excellence) to ensure that its Levelised Energy Cost (LEC) remains competitive and declines faster than that of its key competitors.



Risks related to Empowering our people

We are focusing on securing necessary competence while improving the employee journey and providing a safe work environment.

Risks

- An inability to attract and retain people with key competences, and the risk of lower employee engagement for Vattenfall in connection with outsourcing and/or cost-cutting
- Work environment risks of accidents and incidents not only affect the individuals concerned but also threaten workforce productivity and Vattenfall's attractiveness as an employer

Risk management activities during the year

To support our strategy of enabling fossil-free living within one generation, we rely on a broad mix of junior and senior people, bringing in their unique talents and competences. The developing digital transformation requires that we make cultural changes from "traditional" expectations (strict work regulations) to proactive and solutions-oriented behaviour (changes in working models) in more Vattenfall units. An employee activation programme is being used throughout the organisation to create clarity about our future goals and increase employee engagement. To secure long-term competence supply, we are using activities such as job rotations, talent networking and trainee and leadership programmes. We are also establishing the Vattenfall Gymnasium in Forsmark, where the students will have possibilities

for hands-on training at the nuclear power plant and SKB's facilities, as well as our R&D laboratory in Älvkarleby.

To fully live up to our principle of Diversity & Inclusion (D&I), we performed a number of activities, including diversity and inclusion workshops/labs open to all employees and managers, and a Group-wide D&I day, and we utilised all vacancies as an opportunity to improve gender balance especially at the management level.

Health and Safety (H&S) is crucial and a guiding principle in our day-to-day operations, where the goal is to have zero injuries and no work-related illnesses. Monitoring and controlling H&S risks are covered in the various risk management systems of the respective Business Areas or Staff Functions. We are performing thorough analyses of past accidents and creating systems, routines and processes to detect and prevent future ones.



Risks related to Delivering high performing operations

We are focusing on being both competitive and cost effective, leveraging opportunities in digitalisation and exercising social and environmental responsibility throughout the value chain.

Risks

- Operational asset risks – such as power availability, dam failure, or environmentally hazardous emissions – could have significant negative financial and non-financial consequences. Furthermore, as the geopolitical environment is becoming increasingly challenging, in parallel with increased globalisation and digitalisation our operations are becoming more vulnerable to disruption
- Political risks, e.g., changes in climate-related policy or environmental regulations, could negatively affect business development or restrict our operations or permits. This includes long permit processes for electricity networks in Sweden as well as for wind power, the prolonged implementation of the Water Framework Directive by the Swedish authorities, and the discussion in Sweden on the licence to build a final repository for spent nuclear fuel
- Given the data we collect, the smart services we offer and critical infrastructure

we operate, we face many forms of cyber risks, including phishing and digital trust, as well as data and privacy breaches

- Fraud and breaches of our Code of Conduct for Suppliers or our Code of Conduct and Integrity could disrupt operations, resulting in negative impacts on people and the environment and hence also on our brand and trust, or could lead to the loss of our licence to operate

Risk management activities during the year

Management of operational asset risks involves a systematic inspection programme, continuous control of plant conditions and effective maintenance. Our maintenance strategy ensures safe and reliable operations while also reducing maintenance costs. New methods of monitoring and predictive maintenance are being deployed, and thus we are further improving our resilience regarding disruptions.

To reduce costs and improve sustainability performance we have established a Group-wide human rights action plan, an environmental plan and a sustainable supply chain roadmap. In the supply chain we are strengthening Know Your Customer/ Counterpart procedures and implement-

ing a new, more robust risk assessment tool to enable greater sustainability risk management.

To ensure compliance with the Swedish Protective Security Act and other security regulations, we have formulated internal instructions and defined roles and responsibilities at the corporate level and in the businesses.

We perform risk assessments and reviews of our suppliers based on our Code of Conduct for Suppliers. The Vattenfall Environmental Management System is part of our overarching Vattenfall Management System, see page 78. Vattenfall has implemented appropriate technical and organisational measures to ensure that personal data is processed in accordance with data protection laws and regulations, such as the GDPR. Read more about security at Vattenfall on pages 60-61. We have a Code of Conduct and Integrity and zero tolerance for bribery and corruption. To increase awareness and ensure compliance, we conduct continuous training and e-learning programmes. Read more on pages 58-59. The “four eyes principle” is applied to protect assets and information from improprieties and fraud.

Adapting to change



Climate change affects our operations and activities

There is increasing urgency linked to climate change, and efforts to reduce emissions need to accelerate. There is also a need to adapt to a changing climate.

Climate change affects Vattenfall - through

physical effects on our assets and operations, and through changes associated with the transition to a fossil-free society. We are committed to our goal of enabling fossil-free living within one generation and have a high focus on adapting to change. This is enabling us to secure a resilient business and capture future opportunities.

Vattenfall strongly believes in transparency. We support the disclosure of climate-related risks and opportunities in accordance with recommendations of the Task Force on Climate-related Financial Disclosures (TCFD).

In 2019 an assessment of effects of climate change and status of adaptation was conducted for Vattenfall's operations. The assessment highlighted that there is a good general level of awareness and measures in place to reduce climate-related risks, considering e.g., investments to further strengthen hydro power dams and weatherproof distribution networks. Vattenfall will continue to have strong focus on management of climate risks, for example through scenario analyses and increased focus on supply chain aspects.

Physical risk drivers

- Temperature
- Precipitation
- Extreme weather
- Fires



Examples of risks

- Infrastructure damage from extreme weather events
- Flooding caused by high river flows
- Reduced production due to increased cooling water temperatures
- Supply chain disturbances



Examples of mitigation

- Measures to strengthen the electricity network and infrastructure
- Adjusted flow regulation, investments in dam safety
- Alternative cooling solutions
- Diversification of the supply chain

Transitional risk drivers

- Legal
- Market
- Technology
- Reputation
- Policy



Examples of risks

- Changed customer preferences
- Stranded assets due to new demands and requirements
- Brand damage
- Not meeting stakeholder expectations



Examples of mitigation

- New products and fossil-free energy solutions
- Climate target in line with science
- High focus on sustainable operations and production
- Clear targets and purpose

Investments in the electricity network reduce vulnerability to climate change



At the start of January 2019, Storm Alfrida hit Sweden, resulting in extensive damage and approximately SEK 800 million in costs for Vattenfall. Climate change is expected to increase the frequency and severity of extreme weather events. We are investing about SEK 4 billion per year to modernise and weatherproof the electricity network, for example by:

- Burying overhead lines
- Clearing trees, adjusting maintenance intervals and increasing the width of power line corridors
- Improving insulation and corrosion protection
- Strengthening our organisation to manage critical situations

Aligning CO₂ reductions with climate science



Lost opportunities and the risk of stranded assets due to not transforming the portfolio fast enough are among Vattenfall's most important transitional risks. To ensure that the emissions intensity of the portfolio declines rapidly enough, Vattenfall developed a new climate target in 2019 based on an analysis of a 2 degree climate scenario. The analysis showed that projected emissions will lie below what is needed for Vattenfall as an energy company to support a 2 degree scenario. The target was later externally approved by the Science Based Targets initiative, a joint initiative between CDP, the UN Global Compact, the World Resources Institute and WWF. Read more on page 49.

Market risk - commodities including electricity

Market risk for electricity and commodities refers to the risk of Vattenfall failing to achieve its financial targets as a result of an adverse change in commodity prices. Vattenfall's price hedging strategy is primarily focused on the Nordic generation assets.

Risk management activities

Through our asset ownership and sales activities, we are exposed to electricity, fuel, and CO₂ emission allowance prices, which are affected by several fundamental factors, such as the global macroeconomic situation, local supply, demand, and political decisions. We are active in the wholesale trading market and hedge our electricity position and fuel requirements through physical and financial forward contracts and long-term customer contracts. These contracts pertain to time horizons in which there is no possibility to hedge prices in the liquid part of the futures market and stretch as far as 2026. Most volumes are hedged at the beginning of this time horizon, with falling volumes towards the end. The Vattenfall Risk Committee (VRC) decides how much generation is to be hedged within the mandates issued by the Board of Directors. Sales volumes are to a large extent hedged back-to-back. To measure electricity price risk, we use methods such as Value at Risk (VaR) and Gross Margin at Risk along with various stress tests. Price risk for uranium is limited, as uranium accounts for a relatively small share of the total cost of nuclear power generation. With the current portfolio structure, the dominant risk exposure is now coupled to Nordic nuclear and hydro power base load generation. Vattenfall's operations generate a substantial share of regulated revenue from electricity distribution, heat and wind power, which diversifies the total risk exposure on the Continent (Germany, the Netherlands and the UK) as well as in the Nordic countries. However, Vattenfall continues to have some price exposure between electricity and used fuel/emissions on the Continent. Such exposure has a lower risk profile than the outright power exposure in the Nordic countries. Market price risk of Vattenfall's production assets and hedges for electricity, fuel prices and emissions as well as ancillary trading market price risks are monitored daily.

Nordic market

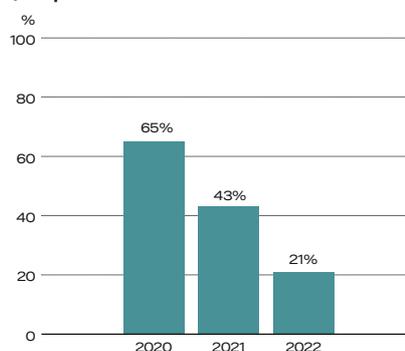
The table below shows the average indicative Nordic hedge prices as per 30 December 2019, while the chart below shows the estimated Nordic hedge ratio. The hedge ratio has been estimated based on an internal risk management model that uses simulations to reflect - in a realistically interlinked way - both future possible price scenarios and the volume risk associated with hydro power generation.

Average indicative Nordic hedge prices as per 30 December 2019

EUR/MWh	2020	2021	2022
Nordic ¹	33	33	33

¹ Including remaining price hedges on the Continent.

Vattenfall's estimated Nordic hedge ratio (% as per 30 December 2019)



Continental market

Due to the combined effect that various commodity price changes have on the Continental portfolio, the table below shows on one hand the individual impact of changes in commodity prices on expected future profit before tax and on the other hand the observed yearly volatility of relevant commodity prices. This sensitivity analysis includes both the expected production and hedge levels. However, it does not reflect possible changes in expected generation in response to changes in price levels nor the interrelationship between fuel and power prices. Both of these factors tend to reduce the impact of price changes on profit. The effect of price movements on future

Market-quoted risks

	+/- 10% impact on future profit before tax, SEK million ¹			Observed yearly volatility ² , %
	2020	2021	2022	
Electricity	+/- 1,433	+/- 1,678	+/- 1,547	17% - 22%
Coal	-/+ 133	-/+ 157	-/+ 157	19% - 22%
Gas	-/+ 660	-/+ 720	-/+ 754	17% - 26%
CO ₂	-/+ 419	-/+ 438	-/+ 407	40% - 41%

¹ The denotation +/- entails that a higher price affects operating profit favourably, and +/- vice versa.

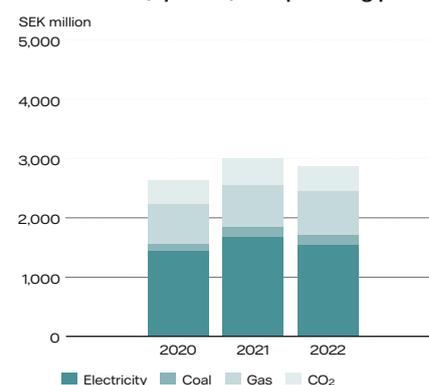
² Observed yearly volatility in 2019 for daily price movements for each commodity, based on forward contracts for the period 2020-2022. Volatility normally declines the further ahead in time the contract pertains to.

profit before tax increases as the share of exposure that is not hedged increases. The analysis is based on the assumption that risks are independent of each other and that there are 252 trading days in a year. Prices and positions are stated as per 30 December 2019. For example, a movement of +10% in the price of electricity in 2020 would have an impact on profit before tax of SEK +1,433 million. Observed yearly volatilities during 2019 are shown in the far-right column in the table below. The chart below visualises the information shown in the sensitivity table.

Ancillary trading

In addition to commodity market risk resulting from our assets and sales activities, Vattenfall's Board of Directors has given the CEO a risk mandate to allow discretionary risk-taking and trading in the wholesale market. Most of our risk exposure in the ancillary trading portfolio is based on market valuation (mark-to-market). In cases where market prices cannot be observed, modelled prices are used (mark-to-model). Mark-to-model positions arise mainly in asset- and sales-related portfolios, see Note 36 to the consolidated accounts, Financial instruments. Management of such valuation models is strictly regulated, and approval is required from the risk organisation before they may be used.

Sensitivity analysis - impact of price movements (+/-10%) on operating profit



Volume risk

Volume risk pertains to the risk for deviations between anticipated and actual delivered volume.

Risk management activities

In hydro power generation, volume risk is managed by analysing and forecasting

historical weather data, including such factors as precipitation and snowmelt. District heating volumes are managed by improving and developing forecasts for heat consumption. There is a correlation between electricity prices and generated electricity volume. Volume risk also arises

in the sales activities as deviations in the anticipated volumes against actual volumes delivered to customers. Improved monitoring and forecasting capabilities are the most efficient risk management instruments also in this case.

Liquidity risk

Liquidity risk refers to the risk of Vattenfall not being able to finance its capital needs and arises if asset values at maturity do not match those of liabilities and other derivatives.

Risk management activities

Access to capital and flexible financing solutions are ensured through several types of debt issuance programmes and credit facilities. The maturity profile of our debt portfolio is shown in the chart below.

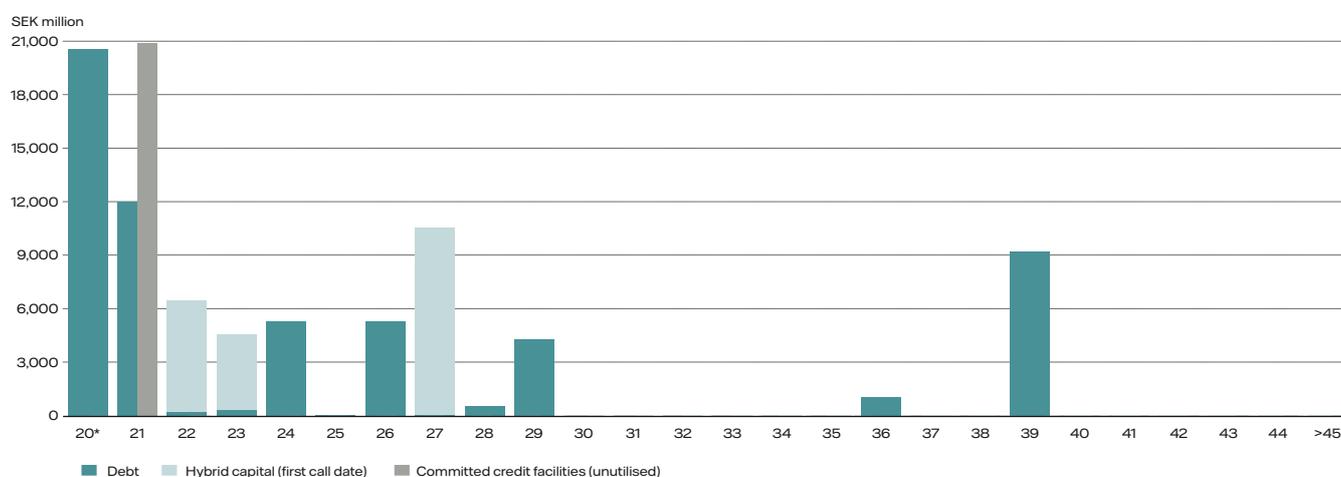
The Group has a defined target for its short-term accessibility to capital. The

goal is that funds corresponding to no less than 10% of the consolidated net sales, or the equivalent of 90 days' stressed liquidity needs of the business (whichever is higher) shall be available. As per 31 December 2019, available liquid assets and/or committed credit facilities amounted to 30% (35%) of consolidated net sales. Vattenfall is committed to maintaining financial stability, which is reflected in the company's long-term targets for capital structure. On 8 November 2018 Standard & Poor's affirmed Vattenfall's long-term BBB+ rating and short-term A-2 rating. On

4 June 2019 Moody's affirmed Vattenfall's long-term A3 rating and Baa2 rating for hybrid bonds. At the same time the outlook for Vattenfall's rating was revised from stable to negative by Moody's.

Vattenfall issued its first green bond in June 2019. The size of the bond issue is EUR 500 million, with a tenor of seven years. See page 25 for more information. Vattenfall has a strong liquidity reserve but given our large future investments we aim to opportunistically use good market conditions for refinancing.

Maturity profile for Vattenfall's loans as per 31 December 2019¹



¹ Excluding loans from minority owners and associated companies.

Borrowing programmes and committed credit facilities

	Currency	Maximum aggregated amount, in millions		Maturity		Used portion, %		Reported external liabilities, SEK million	
		2019	2018	2019	2018	2019	2018	2019	2018
Borrowing programmes									
Commercial paper	SEK	15,000	15,000	–	–	5	2	2,410	300
Euro Commercial paper	EUR	2,000	2,000	–	–	55	53	9,858	7,108
Euro Medium Term Note	EUR	10,000	10,000	–	–	35	37	37,402	40,699
Committed credit facilities									
Revolving Credit Facility ¹	EUR	2,000	2,000	–	–	–	–	–	–

¹ Back-up facility for short-term borrowing.

Committed credit facilities consist of a EUR 2.0 billion Revolving Credit Facility that expires on 10 December 2021, with an option for one-year extension. The maturity structure pertains to the debt portfolio excluding loans from minority owners and associated companies, which amounted to SEK 11,380 million for 2019 (10,910). Further information about the maturity structure of loans is provided in Note 29 to the Consolidated accounts, Interest-bearing liabilities and related financial derivatives.

Interest rate risk

Interest rate risk refers to the negative impact of changed interest rates on the Group's income statement and cash flow.

Risk management activities

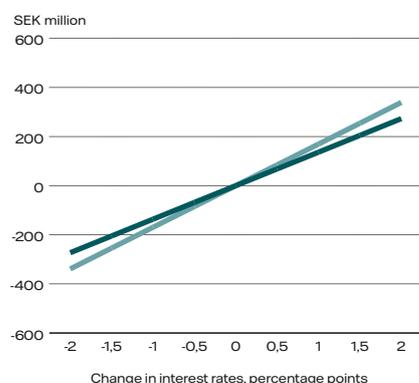
We quantify interest rate risk in our debt portfolio in terms of duration, which describes the average term of fixed interest. The given norm duration of 4 to 7 years is based on the company's current financing need and desired interest rate sensitivity in net interest income/expense. The duration of the Group's debt portfolio at year-end was 4.67 years (4.40) including Hybrid Capital. See the table for the remaining fixed rate term in our debt portfolio.

Remaining fixed rate term in debt portfolio

SEK million	Debt		Derivatives		Total	
	2019	2018	2019	2018	2019	2018
< 3 months	17,643	19,910	15,116	16,064	32,759	35,974
3 months-1 year	2,909	3,241	-66	-2,894	2,844	347
1-5 years	27,507	20,049	-6,791	-8,130	20,716	11,919
> 5 years	31,076	26,867	-8,310	-4,992	22,766	21,875
Total	79,135	70,067	-50	48	79,085	70,115

The debt portfolio includes loans and interest rate derivatives in order to steer the duration of borrowing. Negative amounts are explained by the use of derivatives, such as interest rate swaps and interest rate forwards. The sum of derivatives is not equal to zero due to currency effects. Figures are exclusive of loans from minority owners and associated companies, totalling SEK 11,380 million for 2019 (10,910). The average financing rate as per 31 December 2019 was 3.96% (4.48%). All figures in nominal amounts.

Interest rate sensitivity, excluding loans from minority owners and associated companies



The interest rate sensitivity analysis shows how changes in interest rates affect the Vattenfall Group's interest income and expenses (before tax and including capital gain/losses on interest rate derivatives) within a 12-month period given the Group's current structure of borrowing at fixed interest rates. With the same method and an assumption that interest rates would rise by 100 basis points, the impact on the Vattenfall Group's equity after tax would be SEK -107 million (-132), including derivatives and Hybrid Capital, but excluding loans from minority owners and associated companies. All figures in nominal amounts.

Currency risk

Currency risk refers to the negative impact of changed exchange rates on the Group's income statement and balance sheet.

Risk management activities

We are exposed to currency risk through exchange rate movements attributable to future cash flows (transaction exposure) and in the revaluation of net assets in foreign subsidiaries (translation or balance sheet exposure). Currency exposure in borrowing is limited by using currency interest rate swaps. We strive for an even maturity structure for derivatives. Derivative assets and derivative liabilities are reported

in Note 36 to the consolidated accounts, Financial instruments. We have limited transaction exposure, since most generation, distribution and sales of electricity take place in the respective local markets. Sensitivity to currency movements is therefore relatively low. All transaction exposure that exceeds a nominal value equivalent to SEK 10 million is to be hedged immediately when it arises. The target for hedging translation exposure is to, over time, match the currency composition in the debt portfolio with the currency composition of the Group's funds from operations (FFO). Vattenfall's largest exposure is in EUR,

totalling SEK 62,332 million (2018: 76,999). Of this amount, 40% (39%) was hedged at year-end. For further information, see Note 38 to the consolidated accounts, Specifications of equity. With respect to currency movements, a 5% change in exchange rates, for example, would affect the Group's equity by approximately SEK 2.6 billion (2.9), where a strengthening of the currencies shown in the table in Note 38 to the consolidated accounts, Specifications of equity, would result in a positive change in equity.

Debt portfolio, breakdown per currency, in millions

Original currency	Debt		Derivatives		Total	
	2019	2018	2019	2018	2019	2018
DKK	5,175	2,148	–	–	5,175	2,148
EUR	44,819	42,026	5,939	5,830	50,758	47,857
GBP	10,987	11,724	0	-3,056	10,987	8,668
JPY	1,713	1,874	-1,713	-1,874	0	–
NOK	579	564	-579	-564	0	–
PLN	0	0	–	–	0	0
SEK	11,351	8,148	23	3,294	11,374	11,442
USD	4,510	3,582	-3,720	-3,582	790	–
Total	79,135	70,067	-50	48	79,085	70,115

The table shows currency risk in the debt portfolio and the currencies that Vattenfall is exposed to. The level of debt, and thus the currency risk, decreased in 2019 compared with 2018. Figures above are exclusive of loans from minority owners and associated companies, totalling SEK 11,380 million (10,910). All figures are in nominal amounts.

Consolidated operating income and expenses per currency, %

Currency	Income		Expenses	
	2019	2018	2019	2018
EUR	80%	79%	87%	85%
SEK	16%	13%	8%	3%
GBP	3%	6%	2%	5%
DKK	1%	1%	1%	1%
Other	0%	1%	3%	6%
Total	100%	100%	100%	100%

The values are calculated based on a statistical compilation of external operating income and expenses. Changes in inventories and investments are excluded.

Credit risk

Credit risk can arise if a counterparty cannot or fails to meet its obligations and exists in all parts of Vattenfall's operations.

Risk management activities

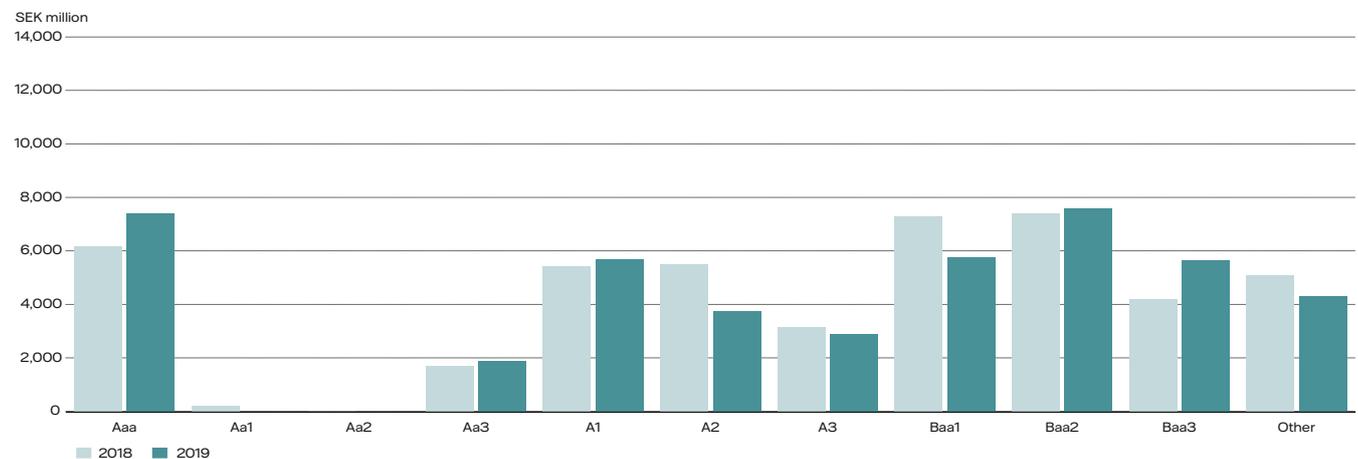
We have a strict framework for governing and reporting credit risks to ensure

that risks are monitored, measured and minimised so that the total credit exposure is kept within the Group's risk appetite.

The company's credit risk management involves the analysis of its counterparties, reporting of credit risk exposures, contract negotiations and proposals for risk mitiga-

tion measures (e.g., obtaining collateral). Credit risk exposure per rating class in SEK million is shown in the chart below.

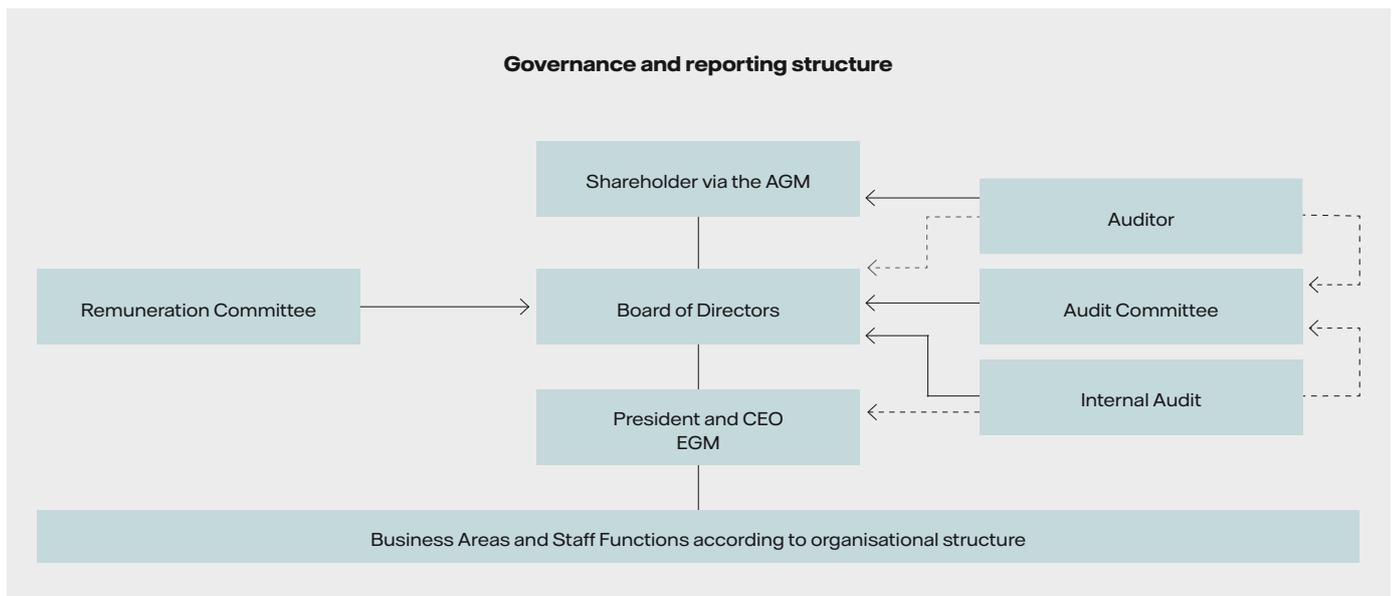
Counterparty exposure per rating class



The chart shows exposures to Vattenfall's counterparties where the exposure is greater than SEK 50 million per counterparty, broken down per rating class according to Moody's rating scale. Counterparties are reviewed and approved in line with Vattenfall's credit mandates and policies. Smaller exposures are considered to have such a large diversification effect that the net risk for Vattenfall is judged to be low. Exposures in procurement, sales in France, and heat are not included. Other financial assets (that are neither past-due nor impaired) are considered to have good creditworthiness. The values for "Other" in the chart include mostly counterparties covered by policy and limit exceptions, mainly pertaining to long-term sales contracts.

Corporate Governance Report

The following pages include information on corporate governance during the 2019 financial year, as prescribed by law and the Swedish Corporate Governance Code. Supported by good corporate governance - with effective organisational structure, internal control and risk management - Vattenfall's business can be driven towards the set targets and in accordance with Vattenfall's principles. The Corporate Governance Report has been reviewed by the company's external auditor.



Vattenfall's corporate governance model

The Parent Company of the Vattenfall Group, Vattenfall AB, is a Swedish public limited liability company with registered office in Solna. Vattenfall AB is thereby subject to the provisions of the Swedish Companies Act. The main decision-making bodies are the Annual General Meeting (AGM), the Board of Directors, and the President. The AGM elects the Board of Directors, which in turn appoints the President, who is responsible for the day-to-day administration of the company in accordance with the Board's guidelines and instructions.

Application of the Code

Vattenfall adheres to the Swedish Corporate Governance Code ("the Code", available in Swedish and English at www.bolagsstyrning.se). However, since Vattenfall is wholly owned by the Swedish state, certain stipulations in the Code are not applicable. This applies to the matter of reporting on board members' independence, regulated in points 4.4 and 4.5, among other things.

In addition, Vattenfall also deviates from chapter 2, pertaining to the requirement that the company shall have a nomination committee. Due to its ownership structure,

Vattenfall has no nomination committee.

The nomination process for the Board and auditors is conducted in accordance with the Swedish state's ownership policy and is described below. Thus, the references to the nomination committee in points 1.2, 1.3, 4.6, 8.1 and 10.2 are not applicable either. However, information on the nomination of board members for new election or re-election is posted on the company's website in accordance with point 2.6. Election of an AGM chairman is done at the AGM in accordance with the stipulations of the Swedish Companies Act and the Swedish state's ownership policy.

Important external and internal rules and regulations for Vattenfall

External rules and regulations

- Swedish and foreign legal rules, particularly the Swedish Companies Act and the Swedish Annual Accounts Act
- The Swedish state's ownership policy
- The Swedish Corporate Governance Code ("the Code")
- Stock exchange rules. Vattenfall follows the stock exchange rules that apply for companies that have fixed-income instruments registered on Nasdaq Stockholm and other marketplaces
- International Financial Reporting Standards (IFRS) and other accounting rules

- The Global Reporting Initiative (GRI) Standards and UN Global Compact, as well as reporting according to Green Bonds Impact Reporting and according to Science Based Targets

Internal rules

- The Articles of Association
- The Board's and committees' Rules of Procedure, including the CEO instruction and the instruction for reporting to the Board
- The Vattenfall Management System (VMS), including the Code of Conduct and Integrity and the Human Rights Policy, and other internal governance documents

Vattenfall AB's Articles of Association and continuously updated information about corporate governance at Vattenfall are available on Vattenfall's website, www.vattenfall.com (original Swedish documents are available on www.vattenfall.se). The website is also a source for previous corporate governance reports and documentation from the most recent general meetings, and links to the Swedish state's ownership policy, the Swedish Corporate Governance Code and Vattenfall's Code of Conduct and Integrity.

Shareholder and general meetings

Vattenfall AB is wholly owned by the Swedish state. The right of the state, as a shareholder, to make decisions about Vattenfall's affairs is exercised at the Annual General Meeting and other general meetings. Through a general meeting resolution on the content of the Articles of Association, the shareholder makes decisions on the company's operations. The Swedish state's ownership policy and the guidelines for external reporting in state-owned companies are decided on at the general meeting. In accordance with the Swedish state's ownership policy, the company's financial targets are also decided on by a general meeting.

By law, the AGM of Vattenfall AB is to be held yearly within six months after the end of the financial year and not later than

30 April, in accordance with the Swedish state's ownership policy.

Annual General Meeting 2019

Vattenfall held its 2019 AGM on 11 April. The company's owner, the Swedish state, participated at the AGM through its owner representative. The President, auditor and quorumed Board were also in attendance. Members of Parliament were given the opportunity to ask questions during the AGM, and an open Q&A session was arranged after the meeting, in accordance with the Swedish state's ownership policy. The AGM was open to the general public and was aired live via webcast.

The 2020 AGM will be held on 28 April in Solna, Sweden.

Duties of the Annual General Meeting

- Elect the Board of Directors, the Chairman of the Board and the auditors, and decide on their fees
- Adopt the income statement and balance sheet for Vattenfall AB and the Vattenfall Group
- Decide on distribution of the company's profit
- Grant discharge from liability for the board members and the President
- Decide on guidelines for remuneration of senior executives
- Decide on other matters of business prescribed by law or the company's Articles of Association

Board of Directors

The Board's duties

The Board is the company's highest administrative body. Its fundamental duties are laid out in the Swedish Companies Act and the Code. Each year, the Board adopts its Rules of Procedure and a number of instructions. The Rules of Procedure and instructions regulate such matters as reporting to the Board, allocation of duties between the Board, the President and the Board's committees, the Chairman's duties, the form and content of board meetings, and the evaluation of the work of the Board and the President.

The Board's Rules of Procedure stipulate that the Board shall set the overarching targets for Vattenfall's operations, decide on Vattenfall's strategy for achieving those targets, and ensure that suitable systems are in place for monitoring and controlling Vattenfall's operations, risks and financial position in respect of the set targets. The

Board is responsible for approving major investments, acquisitions and divestments, and for adopting central policies and instructions. Part of this is to define appropriate guidelines to govern the company's conduct in society, with the aim of ensuring its long-term value creation capability. The Board shall also approve certain important contracts, including contracts between Vattenfall and the President and other senior executives.

The Board's duties pertain to Vattenfall AB as well as the Vattenfall Group. Vattenfall's General Counsel serves as secretary to the Board of Directors.

The Chairman is responsible for – among other things – ensuring that the board members receive relevant information, contacts with the owner on ownership matters, and serving as a liaison between the owner and the Board. According to the Rules of Procedure, the Board – through

the Chairman – shall coordinate its views with representatives of the owner when the company is facing particularly important decisions.

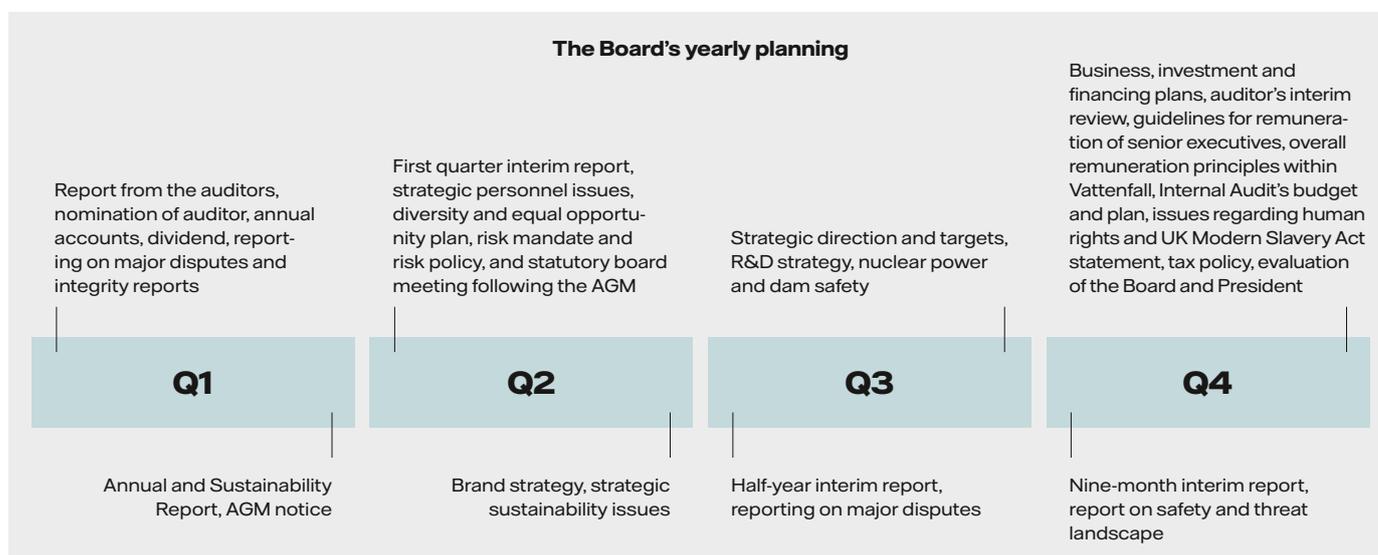
Board meetings

The Board shall hold eight to twelve regular board meetings every year. In addition to the regular meetings, the Board is convened when necessary. The agenda of every regular meeting shall include the following items of business:

- The Group's business situation
- Financial report for the Group
- Reports from board committees, when committee meetings have been held
- Matters that are not handled by the President in the day-to-day administration
- Other matters of material importance for the Group

In addition, certain items of business are included on the agenda every year, in

The Board's yearly planning



accordance with the yearly planning in the Board's Rules of Procedure. Investments approved by the Board are followed up by the Board one year after their commercial operation date. Strategy issues are discussed in more detail at an annual board seminar where the Executive Group Management participates. The Board met ten times in 2019, including the statutory meeting. The board members' attendance is found on pages 82-83.

Appointment of the Board

For companies that are wholly owned by the Swedish state, uniform and joint principles for a structured nomination process apply. These principles are set forth in the Swedish state's ownership policy and supersede the Code's rules on drafting work for decisions on the nomination of board members and auditors.

The board nomination process in the Swedish Government Offices is coordinated by the Ministry of Enterprise and Innovation. The competency needs are analysed on the basis of the company's operations, situation and future challenges as well as the Board's composition and evaluations of the Board that have been carried out. Included in the Government Offices' nomination process is a continuous evaluation of all state-owned company boards. Thereafter, any recruitment needs are determined and recruitment work is initiated. Once this process has been completed, the nominations are publicly announced in accordance with the Code; however, no account is made regarding directors' independence vis-à-vis the company, the company's management and the owner. Vattenfall provides orientation training for new directors who are elected by the AGM.

The Swedish state's ownership policy, which is the diversity policy applied with regard to the Board, stipulates that the selection of board members shall be made from a broad recruitment pool in the aim of soliciting expertise of both women and men as well as persons with varying backgrounds and experience. Discrimination based on gender, transgender identity or expression, ethnic origin, religion or other

faith, functional disability, sexual orientation or age may not take place.

At the 2019 AGM the owner's representative presented a reasoned statement on the Board's composition as well as on the changes that had been proposed. In summary, the Board's composition – in respect of the company's operations, stage of development and conditions in general – was judged to be suitable and distinguished by diversity and breadth regarding the directors' competence, experience and backgrounds, as well as fulfilling the government's goal on gender balance.

More detailed information on the board nomination process is provided in the Swedish state's owner policy, at www.regeringen.se.

The Board's composition

Vattenfall's Articles of Association stipulate that the Board of Directors shall have, in addition to the employee representatives, a minimum of five and a maximum of ten members without deputies. The directors are elected annually by the Annual General Meeting, which also elects the Chairman of the Board.

In 2019, no member of the Executive Group Management (EGM) was a director on the Board. By law, the unions are entitled to appoint three board members plus three deputies, and they exercised this right. All directors were Swedish citizens. Biographical information about the board members is provided on pages 82-83.

Sustainability issues addressed by the Board

Based on a decision by Swedish Parliament in 2010, Vattenfall AB's Articles of Association stipulate that the objective for the company's activities is to generate a market rate of return by, directly or indirectly through subsidiaries and associated companies, operating a commercial energy business that enables the company to be among the leaders in developing environmentally sustainable energy production.

The Swedish state's ownership policy stipulates that companies with state ownership shall integrate sustainability in their corporate governance and act exemplarily

in this area. Companies with state ownership shall promote a healthy and safe work environment, respect for human rights, good and decent working conditions, equality and diversity, reduced climate and environmental impact, good business ethics and active work on anti-corruption, ensure that no abuses occur due to their special status of being state-owned and exhibit responsible conduct in the tax area.

The annual planning for the Board and its committees includes recurring items in several of the areas identified by the owner. These areas are furthermore included as an integral part of the handling of concrete board matters and are also handled by the Executive Group Management. Also, Vattenfall's strategic focus areas in themselves constitute sustainability objectives. Among others, sustainability issues such as climate-related consequences of CO₂ emissions are included in the Board's handling of the strategy and in the business planning process.

Guidelines for directors' fees

Directors' fees and fees for committee work are set by the owner at the AGM, in accordance with the Swedish state's ownership policy. Information on directors' fees in 2019 is provided in the Annual and Sustainability Report, Note 42 to the consolidated accounts, Number of employees and personnel costs.

Evaluation of the Board's and the President's work

The Board evaluates its own work and the President's work once a year as part of efforts to develop the Board's work forms and effectiveness. This evaluation is conducted under the direction of the Chairman and is reported to the Board and the owner.

During a succession of years, the Board has carried out extensive evaluations with a consistent methodology and with the support of external consultants. The averages have generally risen since 2015. Evaluations have contributed to the continuous development of board work both in terms of content and composition. In 2019, with the aim of renewing the evaluation method, the Board conducted

The Board's main items of business in 2019

- Items according to the Rules of Procedure
- The energy transition to a fossil-free future
- E-mobility
- Strategy for wind investments
- Bidding and investments in new wind farms
- District heating investments
- Decommissioning of Ringhals 1 and 2
- Business in the UK
- Tariffs and investments in the Distribution business
- Acquisitions and divestments
- Items on security and new legislation on protective security

a less comprehensive evaluation, including evaluation of the President, based on a number of key issues and an open dis-

cussion in the Board. The Chairman also follows up with individual dialogues on a voluntary basis with each of the directors

elected by a general meeting and jointly with the employee representatives.

Board committees

The Board has established two committees and has established Rules of Procedure for these. At the statutory board meeting, the Board appointed a number of directors elected by a general meeting for each committee, of whom one serves as committee chair. Information on the committees' composition and attendance is provided on pages 82–83.

The committees report their work to the Board at the next regular board meeting, whereby the committee chair presents a report accompanied by minutes from the committee meetings. Except for a few matters handled by the Audit Committee, the committees are only drafting bodies and make recommendations to the Board. The Board's legal responsibility under company law for the company's organisation and administration of the company's affairs is not constrained by the committees' work.

Audit Committee

The Audit Committee oversees Vattenfall's financial reporting and is responsible for

meeting with Vattenfall AB's external and internal auditors on a regular basis in order to stay informed about the planning, focus and scope of the company's audit. The Audit Committee is also responsible for discussing coordination of the external and internal audit work and views of the company's financial risks. The committee prepares Internal Audit's budget, the Internal Audit Charter and the internal audit plan for resolution by the Board. It has the right, on behalf of the Board, to decide on guidelines for other services than auditing that Vattenfall may procure from the Group's auditors, as well as to decide on procurement in specific cases based on these guidelines.

The Audit Committee meets prior to Vattenfall's publication of interim reports and when warranted by the prevailing conditions. The CFO and head of Internal Audit serve in a reporting role. The company's external auditors attend all regular meetings and report on their observations of the audit.

The Audit Committee's most important duties are:

- To oversee Vattenfall's financial reporting, including sustainability reporting
- With respect to financial reporting, to monitor the effectiveness of Vattenfall's internal control, internal audit and risk management
- To stay informed about the audit of the annual report and consolidated accounts
- To review and monitor the auditor's impartiality and independence
- To assist in the drafting of recommendations for decisions on the election of auditor by the Annual General Meeting
- To review and oversee the management of market and credit risks
- To conduct an annual evaluation of the external auditors' work

Remuneration Committee

The Remuneration Committee's duties include serving as a drafting body to ensure implementation and compliance with guidelines for remuneration of senior executives. Where applicable, it conducts drafting work for any special reasons that may exist in an individual case to deviate from the guidelines. It also conducts work for the Board's report on remuneration of senior executives in the annual report and, ahead of the Annual General Meeting, monitoring and following up the auditors' review. The President serves in a reporting role on the Remuneration Committee.

The Remuneration Committee's most important duties are:

- To conduct drafting work for board decisions on matters regarding remuneration principles, and on remuneration and other terms of employment for members of the Executive Group Management and other senior executives
- To monitor and evaluate application of the guidelines for remuneration of senior executives, which the AGM has decided on, as well as remuneration structures and levels of remuneration in the company
- To conduct drafting work for the Board's decisions regarding overarching remuneration principles, such as the general existence of, amount and structure of variable remuneration (for employees who are not senior executives)

Auditor

The Swedish state's ownership policy stipulates that the owner is responsible for election of auditors and that the auditors are to be appointed by the Annual General Meeting. Proposals for election of auditors and for auditors' fees are submitted by the Board and drafted by the company. The auditors are elected for a mandate period of one year, in accordance with the main rule in the Swedish Companies Act. Vattenfall's Articles of Association stipulate that the company shall have one or two auditors with or without one or two deputy auditors, or a chartered account-

ing firm as auditor. The applicable legal provisions for rotation mean that Vattenfall must elect a new accounting firm no later than 2021. Work on the procurement process was initiated in 2019.

At the 2019 AGM, the accounting firm Ernst & Young AB was re-elected as auditor. The accounting firm appointed Authorised Public Accountant Staffan Landén as auditor-in-charge. He has held this position since the 2015 AGM. Staffan Landén is also the auditor of, among others, Alfa Laval AB, Nederman Holding AB, Ambea AB and Polygon AB and is a stock exchange audi-

tor appointed by Nasdaq Stockholm. The auditor has no assignments with companies that affect its independence as auditor of Vattenfall.

The auditor's audit assignment includes a review of the annual report, the consolidated accounts, the corporate governance report, the sustainability reporting and the compliance with the guidelines for remuneration of senior executives. The auditor has access to minutes of board meetings and board committee meetings, as stipulated in the Board's Rules of Procedure. The Audit Committee has approved guidelines

for how procurement of other services than auditing shall take place from the auditor.

At the 2019 AGM the auditor reported on the audit work in 2018 and on its review of compliance with the guidelines for remuneration of senior executives. The auditor reported on its review of the year-end accounts for 2019 to the entire Board at the board meeting on 4 February 2020 (with-

out the presence of any person from the Executive Group Management), and also reported on its observations at the board meeting on 17 December 2019. In addition, the auditors performed a review of the half-year interim report.

In accordance with the Act on Auditing of State Activities, etc., the Swedish National Audit Office may appoint one or more audi-

tors to participate in the annual audit. No such auditor was appointed in 2019.

The auditor's fees are payable according to an approved invoice. The Group's auditing costs are described in more detail in the Annual and Sustainability Report, in Note 15 to the consolidated accounts, Auditor's fees, and in Note 15 to the Parent Company accounts, Auditor's fees.

CEO and Executive Group Management

The President of Vattenfall AB, who is also Chief Executive Officer (CEO) of the Vattenfall Group, is responsible for the day-to-day administration in accordance with the Swedish Companies Act. An account of the President's remuneration is provided in the Annual and Sustainability Report, Note 42 to the consolidated accounts, Number of employees and personnel costs.

The CEO has set up internal bodies for governance of the Group and makes decisions independently or with the support of these bodies. The most important of these are the Executive Group Management (EGM) and the Vattenfall Risk Committee (VRC). The EGM focuses on the Group's overall direction and addresses – within

the framework of the CEO's mandate from the Board of Directors – matters of importance for the Group, such as certain investments. In the EGM, the Head of Strategic Development covers sustainability issues. The VRC focuses on decisions pertaining to risk mandates and credit limits, among other things, and exercises oversight of the risk management framework.

Both bodies convene monthly and also conduct preparatory drafting work on matters that are to be decided by the Board of Directors. Ahead of decisions made by the President in the EGM or VRC on certain major investments and transactions, the risk unit performs an independent risk analysis, which makes up part of the decision-making documentation.

In addition, the President follows up operations via quarterly Business Performance Meetings. At these meetings, outcomes, forecasts, important events and challenges are analysed (including the status of Vattenfall's strategic targets) with the top management of each business unit. Yearly deep-dives into sustainability topics (challenges, progress and actions for coming year) are performed with the top management of each Business Area.

Biographical information about the members of the EGM is provided on pages 84–85.

Internal Audit

Internal Audit is an independent and objective function that evaluates, recommends and monitors improvements to the effectiveness of Vattenfall's risk management, internal controls and governance processes throughout the Group. This also applies to compliance with Vattenfall's governance documents, including the Code of Conduct and Integrity. The func-

tion is directly subordinate to the Board of Directors and Audit Committee and performs its work in accordance with an established internal audit plan.

Internal Audit's budget, the Internal Audit Charter and the internal audit plan are drafted by the Audit Committee and decided on by the Board of Directors. The Head of Internal Audit reports adminis-

tratively to the President and informs the management teams of the business units and other units about audit activities that have been performed. The Head of Internal Audit also submits a report to the Audit Committee at each regular Committee meeting.

Internal governance

Principles and strategy

Vattenfall formulated a strategy in 2016 with the purpose to Power Climate Smarter Living and the goal to enable fossil-free living within one generation.

In 2019, five strategic focus areas replaced the previous four strategic objectives. The strategy wheel, which visualises Vattenfall's way forward to ensure profitability and be a leader in the energy transition, has therefore been updated in 2019. In addition to this are the financial targets, decided on by the general meeting. The targets are further described in the Annual and Sustainability Report on page 13. Group scorecards support by linking to financial, non-financial and operational requirements, for instance with regard to absolute CO₂ emissions and fossil-free generation capacity. Reporting back to the

Board is performed as part of the quarterly reporting.

Vattenfall's strategy is well aligned with the UN's Agenda 2030 Sustainable Development Goals and will drive Vattenfall to make an important contribution to the global sustainable development agenda.

Governing business ethics

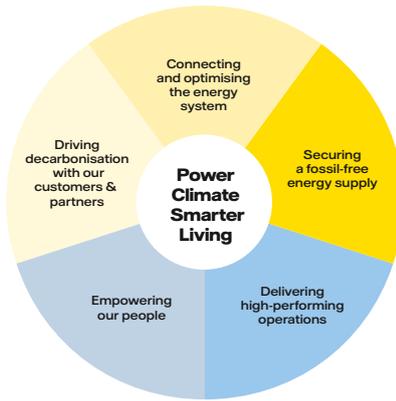
Vattenfall's Code of Conduct and Integrity builds upon the four Vattenfall principles – open, active, positive and safety – and contains a number of rules built on the “think first” approach. It includes references to the Vattenfall Management System (VMS), which elaborates on these rules. The Code has been communicated throughout the Group and is available on the intranet in several language versions, corresponding to the countries where Vattenfall has

business operations. Information about the Code is provided in connection with new hiring and training. An e-learning programme on application of the Code has also been launched, which is mandatory for all Vattenfall employees.

To ensure ethical and non-corrupt conduct throughout the organisation, Vattenfall requires all employees to act in accordance with the company's ethical guidelines, which are set forth in the Code of Conduct and Integrity as well as in internal instructions. Vattenfall believes that competition plays a decisive role for a market to function effectively and has zero tolerance for bribery and corruption. An important step in ensuring this is the training that is conducted within the Vattenfall Integrity Programme, which is described on page 59.

Vattenfall's employees, consultants, contractors and other stakeholders have the opportunity to report serious improprieties anonymously through a whistleblowing function staffed by locally appointed external ombudsmen (attorneys), if the whistleblower does not want to report internally via the normal reporting channels. In 2019 an update of the whistleblowing function was performed, which among other things resulted in a decision to introduce an additional reporting channel (web-based), where the reporter could also choose to remain anonymous.

The strategy wheel



Read more about reported incidents in the Annual and Sustainability Report on page 59. Ongoing legal processes are described in Note 40 to the consolidated accounts, Contingent liabilities. Examples of sustainability initiatives and principles that Vattenfall has aligned itself with or supports are listed on page 168.

Three lines of defence

Vattenfall applies the "three lines of defence" model, for management and control of risks in general. The model secures the principle of segregation of duties and includes different roles for risk ownership, control and independent reporting and assurance. In particular, it is applied in the internal control of the financial reporting and in the integrity organisation, as described further below.

1. The first line of defence consists of the business operations (business units and Staff Functions), which are responsible for managing risks.
2. The second line of defence consists of Staff Functions governing the organisation, among them Health & Safety, Environment, Integrity, Security, Group Internal Financial Control and Risk Management.

Risk Management is headed by the Chief Risk Officer (CRO), who is accountable for the risk management framework (as described on pages 62-71) and is responsible for ensuring risk governance and risk control. Included in this responsibility are processes related to, among other things, new products and certain contracts with long durations. The CRO provides information on a regular basis to the Vattenfall Risk Committee and to the Executive Group Man-

agement as well as to the Board and the Board's audit committee.

3. The third line of defence is made up of internal and external audit. Internal audit oversees and evaluates the first and second lines of defence.

Vattenfall Management System

The most important internal rules for governing Vattenfall are found in the Vattenfall Management System (VMS). The VMS is the Group framework that ensures that Vattenfall adheres to formal requirements as well as to requirements made by the Board, the President, the business operations and the Staff Functions. It covers the necessary overall governance, while local management systems cover specific business governance. The VMS is documented in binding governance documents, consisting of policies and instructions. Certain central documents are approved by the Board of Directors of Vattenfall AB, including all policies except the policies on dam safety and nuclear safety; however, within these areas, regular reporting is conducted to the Board of Directors. The VMS is an integrated management system that applies for the entire Vattenfall Group, with the limitations that may arise from legal requirements, such as regarding the unbundling of the electricity distribution business. Special routines are

in place to ensure adherence to the management system also by subsidiaries.

The policies lay out the company's direction and exist in the areas of

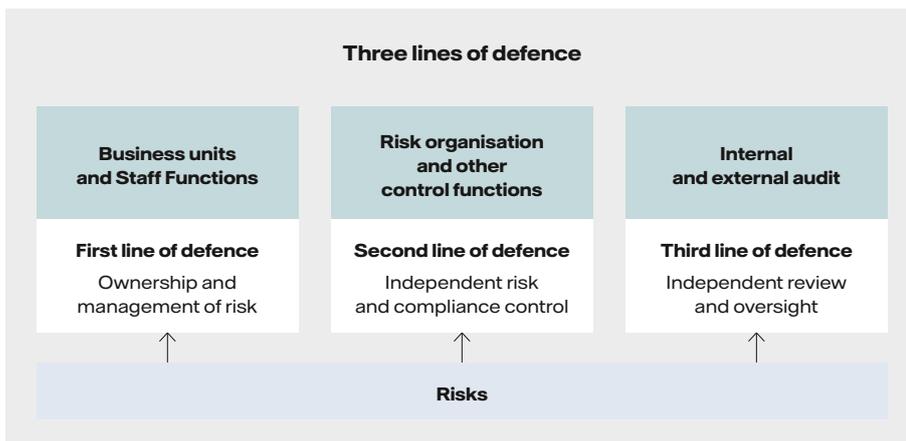
- remuneration,
- dam safety,
- nuclear safety and
- risk

as well as in the sustainability area, where the governance is based on an overall sustainability policy. This policy stipulates, among other things, that for Vattenfall, sustainability entails taking responsibility for future generations by contributing to sustainable development in society – economically, environmentally and socially. Further highlighted is that access to energy is a precondition for our society to function and to develop in a sustainable way and that Vattenfall's sustainability focus extends throughout its value chain.

In addition to the Sustainability Policy, specific policies exist for the various sustainability areas:

- **Environment.** This policy states Vattenfall's commitment to being climate neutral, to protect nature and biodiversity and use resources in a sustainable manner. The environmental policy also states the principles for Vattenfall's work within these areas.
- **Health and safety.** This policy was updated in 2019, and the starting point is the vision of a culture of care where everyone takes responsibility, and where accidents and work-related illnesses never occur.
- **Human rights.** This policy identifies Vattenfall's salient human rights risks and describes how the company identifies, assesses, and manages these risks.
- **The Code of Conduct and Integrity,** which is described above.
- **The Code of Conduct for Suppliers,** which addresses issues such as human rights, working conditions, the environment and anti-corruption, based on the UN Global Compact. Also, the Board issues a general statement on Vattenfall's tax policy.

Three lines of defence



The content of the policies is concretised in instructions within the VMS, such as in special instructions for matters concerning bribery and corruption. Instructions in the VMS can also include concretisations of the content of the Board's Rules of Procedure, such as allocation of responsibilities and risk mandates.

Instructions shall be implemented in the relevant organisation and acknowledged by the defined target group. VMS documents are accessible for employees on the intranet, and certain policies are also communicated externally. Vattenfall does not require any acknowledgement by employees or management that they have read the content. Implementation and adherence are regularly followed up, and identified issues are addressed.

The evaluation with respect to knowledge about and compliance with the VMS is made through regular surveys and self-assessments. Results from these evaluations are reported to the EGM and to the Audit Committee. In addition, self-assessments are conducted via the Staff Functions for certain stipulations, including matters concerning integrity and competition law. A special routine ensures that all VMS content is reviewed and updated at least every other year.

Vattenfall's Environmental Management System is integrated in the VMS. At year-end 2019 nearly 100% of Vattenfall's production and distribution portfolios had certified environmental management systems in accordance with ISO 14001. In addition, all the Group's business units are certified for occupational health and safety, of which about half have implemented ISO

45001, and the rest are certified according to OHSAS 18001. Seven business units have certificates in accordance with ISO 50001.

In 2019, continuing updates of the VMS were conducted. A new common technical platform has contributed to better integration of the VMS and the local management systems.

Organisation

Vattenfall's organisational structure comprises six Business Areas: Heat, Wind, Customers & Solutions, Generation, Markets and Distribution. The Business Areas are organised in five operating segments, where Generation and Markets make up a single operating segment. The central Staff Functions support and direct the business activities. The organisational structure has been formed to reflect Vattenfall's overall strategy for the coming years. For further information see pages 20-25.

The company structure differs from the business structure. Decisions are made primarily in the business organisation and, to the extent necessary or suitable, by subsidiaries' boards. Governance is conducted financially, non-financially (such as through Staff Functions), and operationally. Unit scorecards and the VMS are the most important governance tools. The business performance steering model consists of an annual business planning process and monthly reporting and follow-up of forecasts and actual results.

In accordance with legislation both within the EU and in the UK, operations of the electricity distribution network shall be separated from sales and generation of

electricity (unbundling). For Vattenfall, this entails, among other things, that electricity distribution operations are conducted in separate subsidiaries that have the actual decision-making rights in respect of the company's day-to-day operations, as well as for decisions needed to ensure operation, maintenance and development of the network. The electricity distribution operations are conducted in a special business area. The Head of the Distribution Business Area is not member of any decision-making forums outside of the Business Area.

Integrity organisation

The aim of integrity work at Vattenfall is to uphold integrity and protect the Group's reputation. Toward this end, an organisational framework has been created which, within its area of responsibility, is tasked with ensuring transparency, understanding of applicable laws, guidelines and standards, and promoting compliance with these in all countries in which Vattenfall operates.

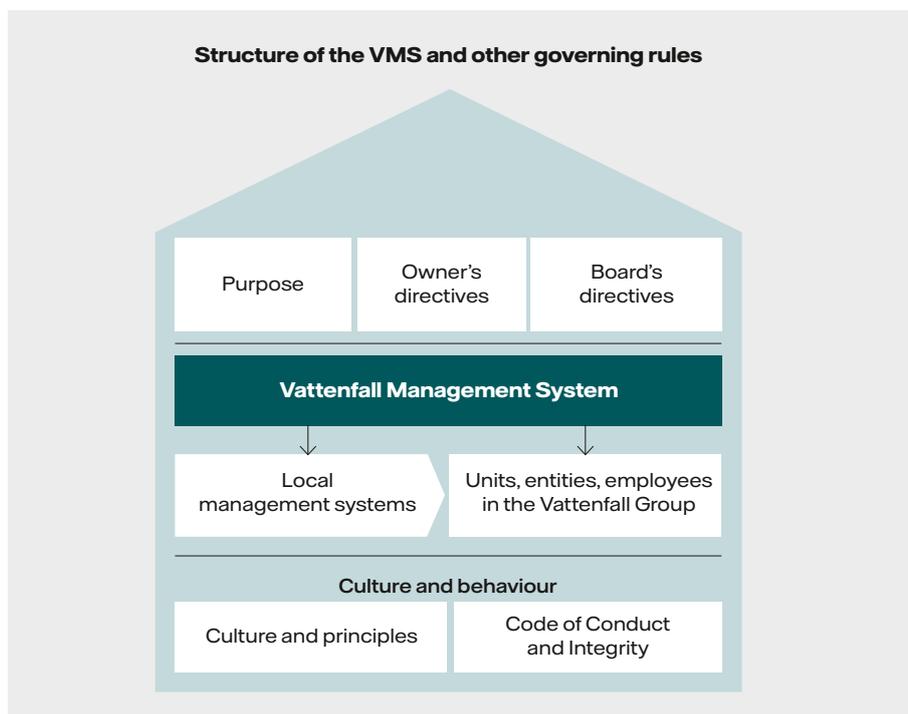
Integrity work at Vattenfall is organised according to the three lines of defence principle:

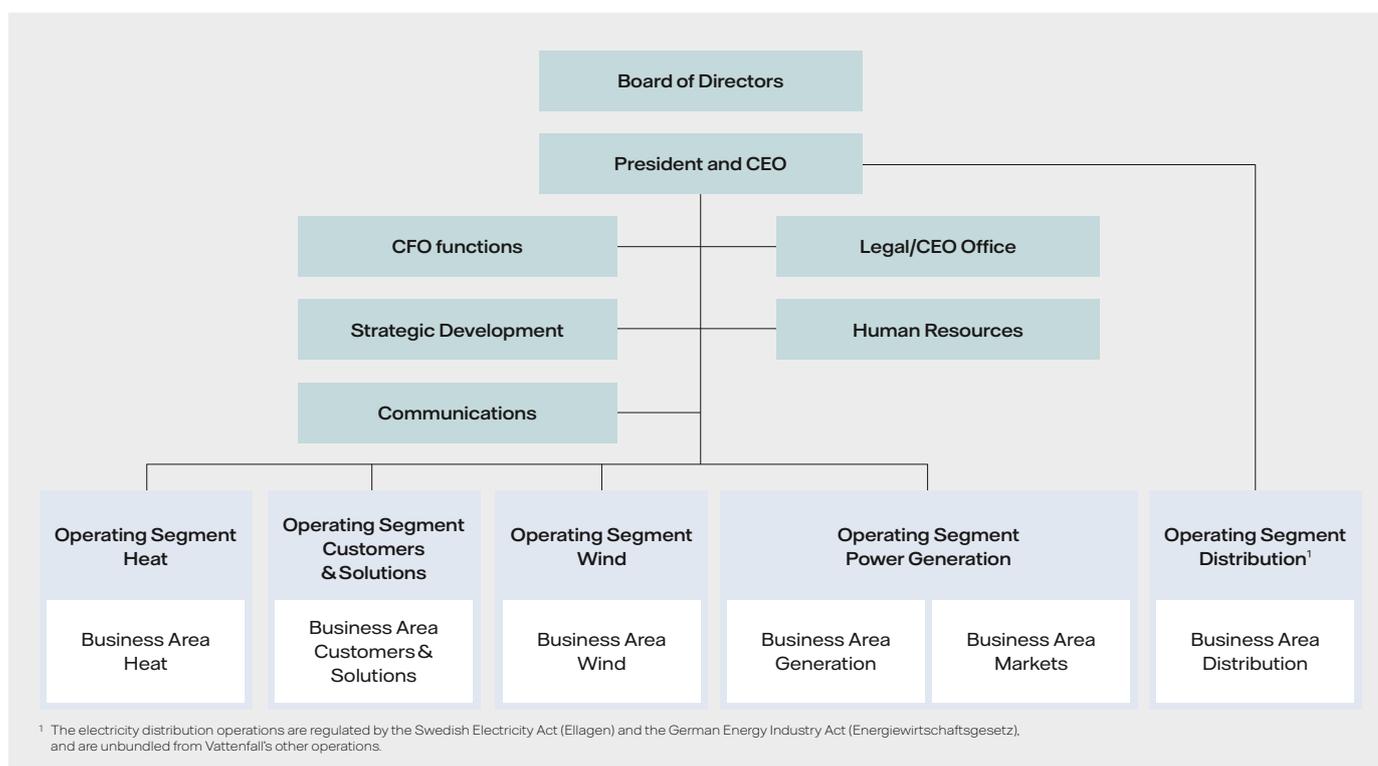
1. Ownership: The line organisation, which is responsible for compliance with laws and regulations within the unit
2. Control and advice: The integrity organisation, with reporting to the Group's General Counsel
3. Quality assurance: The Internal Audit unit

The Integrity organisation's area of responsibility covers competition matters, bribery and corruption, conflicts of interest, inside information, awareness of Vattenfall's Code of Conduct and Integrity, and coordination of Vattenfall's whistleblowing function.

Within its area of responsibility, the Integrity organisation supports Vattenfall in identifying, avoiding, managing and monitoring the risk for non-compliance with laws, other legal stipulations, regulations, norms and codes of conduct that are relevant for operations. Work is carried out in accordance with an annual plan, which is approved by an Integrity Committee consisting of EGM members and others. The day-to-day work is aligned at meetings within the Integrity organisation and via regular follow-ups. The annual integrity work is summarised in an integrity report to the Board.

Current integrity issues in 2019 are described in more detail in the Annual and Sustainability report on pages 58-59.





Guidelines for remuneration of senior executives

Vattenfall AB applies the Swedish Government Offices' "Guidelines for remuneration and other terms of employment for senior executives in state-owned companies", decided by the government on 22 December 2016. These guidelines are available on the Government Offices' website, www.regeringen.se.

In line with previous years, at the 2019 AGM the owner approved Vattenfall's application of the guidelines with one deviation: instead of the definition of senior executive in the Swedish Companies Act, senior executives shall be defined on the basis

of whether they have a significant impact on the Group's earnings, through use of the International Position Evaluation (IPE) model. Managers with positions of IPE 68 and higher are to be considered as senior executives. The Board's explanation for this deviation is stated in the 2018 Annual and Sustainability Report, page 84.

Actions taken with respect to agreements with the senior executives were continuously reported to the Remuneration Committee and the Board, which also decided on the entering into such agreements. Remuneration and compliance

with the adopted guidelines are described in the Annual and Sustainability Report, Note 42 to the consolidated accounts, Number of employees and personnel costs.

The Board and Remuneration Committee's report on compliance with the guidelines for remuneration of senior executives set by the AGM is posted on www.vattenfall.se (English translation is available on www.vattenfall.com). The proposed guidelines ahead of the 2020 AGM are shown on page 86.

Internal control over financial reporting

This section describes the most important elements in Vattenfall's system of internal control and risk management in connection with financial reporting, as prescribed by the Swedish Annual Accounts Act and the Code. Vattenfall's framework for this control is based on the updated COSO framework "Internal Control – Integrated Framework" from 2013, which has been developed by the Committee of Sponsoring Organizations of the Treadway Commission. Vattenfall's overall risks and risk management are further described in the Annual and Sustainability Report, pages 62–71.

Control environment

The control environment is based on the allocation of authority between the Board

and the President, which is set forth in the Board's Rules of Procedure, along with the reporting requirements made by the Board. The Board has also adopted Vattenfall's Code of Conduct and Integrity, which lays out the overarching rules governing conduct for all employees.

The Board of Directors has overarching responsibility for internal control over financial reporting, according to the Swedish Companies Act and the Code. In this context the Board shall ensure that the company's organisation is structured in such a way that the bookkeeping, treasury management and the company's financial conditions in general are controlled in a satisfactory manner.

The Board's audit committee conducts drafting work for the Board on matters

related to internal control over financial reporting and makes recommendations and proposals to ensure the reliability of reporting. The committee also informs the Board about the results of the audit and about the ways in which the audit contributed to the reliability of the financial reporting and about which function the committee has had.

The VMS (described on page 78) contains steering rules for all identified material areas, including roles and responsibilities, authority and risk mandates, decision-making processes, risk management, internal control, and ethics and integrity issues. The VMS lays out the so-called grandparent principle and four eyes principle for decision-making. For assignment of Group internal authority concerning invoic-

ing, among other things, a new instruction and IT solution were implemented in 2019. The VMS also stipulates which decision-making, oversight and advisory bodies exist within the Group, on top of those required by law.

Vattenfall has an internal financial control (IFC) process, organised in Group Finance and whose overall purpose is to ensure that controls are in place in the financial reporting but also in certain non-financial reporting.

Risk assessment

The Board addresses the Group’s risk assessment and risk management process for the financial reporting at an overarching level. The Board’s audit committee conducts drafting work for evaluation and monitoring of risks and quality in financial reporting. The Audit Committee maintains continuous and regular contact with the Group’s internal and external audit functions.

A continuous Enterprise Risk Management (ERM) process makes it possible to quantify and compare financial risks. The risk department reports the findings in the ERM process to the Executive Group Management, to the Vattenfall Risk Committee and ultimately to the Audit Committee and the Board.

For the financial reporting, the IFC process serves as the framework for internal control that identifies and defines risks for material errors in the reporting. These are overseen by the CFO function through regular reporting on tests performed of defined control points. The CFO function is also responsible for performing regular analyses of risks related to financial reporting and for updating this framework.

The external and internal auditors discuss Vattenfall’s risk situation in connection with the planning work ahead of the annual audit.

Control activities and monitoring

The Board monitors and addresses the Group’s financial situation at every regular board meeting, with a starting point from the financial report submitted by the President and the Chief Financial Officer.

The Audit Committee conducts the Board’s monitoring of the effectiveness of internal control and regularly receives status reports on the Group’s internal control over financial reporting, in accordance with the IFC process. A financial report, including a report on accounting and sustainability issues, is presented at every regular Audit Committee meeting, and tax issues are reported on and followed up on a regular basis. The Audit Committee, in turn, reports to the Board on its most important observations and recommendations. The timing and forms of this reporting are set in

the Board’s and Audit Committees’ respective Rules of Procedure.

The Executive Group Management holds regular follow-up meetings with the heads of the Business Areas and Staff Functions regarding the financial outcome. Operations are followed up on a quarterly basis via Business Performance Meetings.

Internally, Vattenfall applies the “three lines of defence” model (described on page 78) for internal control over financial reporting. In this context, the second line of defence includes the Group Internal Financial Control Officer (IFCO), who is responsible for monitoring and control of risks in the financial reporting. The Group IFCO is responsible for the IFC process, which aims to strengthen the governance structure and effectiveness of controls. Continuous improvements to the IFC process are ensured through an annual evaluation and updating process. Information about ineffective controls is provided to internal and external audit. Each incidence of ineffectiveness is risk-assessed in consultation with the first line of defence. Information about these risks is provided to the risk organisation. An IFC status update is provided semi-annually to the Audit Committee.

The internal framework for internal control includes processes for self-assessments, monitoring, reporting and improvement of control activities in order to prevent, discover and correct errors in the financial reporting. Written confirmation of adherence to internal and external stipulations is part of these processes. This is done in particular through internal Representation Letters to management.

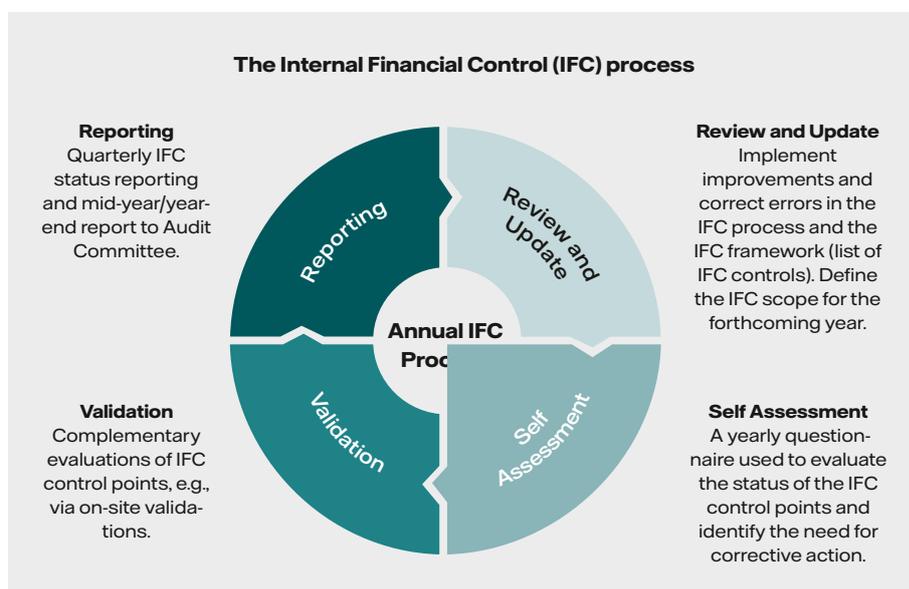
Information and communication

The Group’s steering documents are accessible via Vattenfall’s intranet. The forms for handling internal and external communication are documented in a VMS instruction which aims to ensure that Vattenfall is in compliance with legal as well as stock exchange rules, the state’s ownership policy (including guidelines for external reporting), and other obligations. Accounting and reporting principles are laid out in a joint manual for the entire Group. Updates and changes in these policies and principles are communicated on a continuous basis via the intranet as well as at meetings with representatives of the Group’s Business Areas and Staff Functions.

Reporting and follow-up reporting to the Board and EGM are part of monitoring activities. Internal and external audit and the CRO also report on their observations to the Board’s audit committee.

Furthermore, the semi-annual status report from IFC is a basis for the assessment.

Financial reporting includes interim reports, the year-end report and the annual report. In addition to these reports, financial information is provided to the Group’s external stakeholders via press releases and Vattenfall’s websites, in accordance with the Swedish Securities Market Act, among other things. Presentations and conference calls for financial analysts, investors and the media are held as a rule on the same day that reports are published.



Board of Directors



LARS G. NORDSTRÖM (1943)

Chairman of the Board

Education:

Law studies
Other assignments: Chairman of the Finnish-Swedish Chamber of Commerce. Board member of Viking Line Abp, the Swedish-American Chamber of Commerce and SNS. Member of the Royal Swedish Academy of Engineering Sciences (IVA). Honorary Consul for Finland in Sweden.

Previous positions: Board member of TeliaSonera (2006-2010). Chairman of the Royal Swedish Opera (2005-2009). President and CEO of Posten Norden AB (2008-2011). Various executive positions with Nordea Bank (1993-2007), including as President and Group CEO (2002-2007), also Board member (2002-2019) and Deputy Chairman (2017-2019). Various positions with Skandinaviska Enskilda Banken (1970-1993), including as Executive Vice President (1989-1993).

Elected: 2011

Committee assignment: Member of the Remuneration Committee

Board meeting attendance: 10/10

Committee meeting attendance: Remuneration Committee: 3/3



FREDRIK ARP (1953)

Board member

Education: B.Sc. Econ. Honorary Doctor of Economics.

Other assignments: Chairman of the Board of Nolato AB and Bravida Holding AB. Board member of Swedfund.

Previous positions: President and CEO of Volvo Car Corporation (2005-2008). CEO of Trelleborg AB (1999-2005), PLM AB (1996-1999), Trelleborg Industrier AB (1989-1996) and Boliden Kemi AB (1988-1989). Various positions in Trelleborg AB (1986-1989) and Tarkett (1979-1986).

Elected: 2014

Committee assignment: Audit Committee chair

Board meeting attendance: 10/10

Committee meeting attendance: Audit Committee: 5/5



VIKTORIA BERGMAN (1965)

Board member

Education: Communication Executive Programme at Stockholm School of Economics. Berghs School of Communication.

Other assignments: Chairman of the Board of Galber AB. Board member of Trianon AB and WaterAid Sweden.

Previous positions: Member of Group Management and Senior Vice President Stakeholder Management & Corporate Sustainability E.ON Nordic, Board member E.ON Försäljning, E.ON Kundsupport and E.ON Smart Living (2012-2014). Positions in Trelleborg Group (2002-2011), member of Group Management and Senior Vice President Corporate Communications Trelleborg Group (2005-2011). Various positions in Falcon Breweries/ Unilever (1989-1996), Cerealia Group (1987-1989).

Elected: 2015

Committee assignment: Member of the Remuneration Committee

Board meeting attendance: 10/10

Committee meeting attendance: Remuneration Committee: 3/3



ANN CARLSSON (1966)

Board member

Education: Bachelor's degree in Personnel, Work and Organisation at Stockholm University.

Current position: CEO Apoteket AB.

Other assignments: Board member of Martin & Servera, The Swedish Pharmacy Association, The Confederation of Swedish Enterprise, The Swedish Trade Federation, SNS and Ruter Dam.

Previous positions: Several positions within ICA, most recently as SVP Store Sales Division at ICA Sverige AB.

Elected: 2019

Committee assignment: Member of the Remuneration Committee

Board meeting attendance: 8/8

Committee meeting attendance: Remuneration Committee: 1/2



HÅKAN ERIXON (1961)

Board member

Education: B.Sc. International Business Administration and Economics.

Other assignments: Chairman of the Board of Hemnet Group AB. Board member of Alfvén & Didrikson Invest AB.

Previous positions: Board member of Opus Group AB (2018-2020). Chairman of the Board of Capacent Holding AB (2015-2019). Chairman of the Board of Orlo AB (publ) (2012-2017). Member of the Nasdaq OMX Stockholm AB Listing Committee (2010-2016). Senior Advisor, Corporate Finance, Swedish Government Offices, which included work for the Swedish National Debt Office (2007-2010). Board member of Carnegie Investment Bank AB (2008-2009). Board member of Vasakronan AB (2007-2008). Various positions with UBS Investment Bank Ltd, London (1997-2007), including Vice Chairman of the Investment Banking Division. Various positions with Merrill Lynch International Ltd, London (1992-1997).

Elected: 2011

Committee assignment: Member of the Audit Committee

Board meeting attendance: 9/10

Committee meeting attendance: Audit Committee: 5/5



TOMAS KÅBERGER (1961)

Board member

Education: M.Sc. Engineering Physics. Ph.D. Physical Resource Theory. Associate Professor (Docent), Environmental Science.

Other assignments: Industrial Growth Executive InnoEnergy. Executive Board Chairman of Renewable Energy Institute, Tokyo. Board member of Sustainable Energy Angels AB, Tanke och Möda AB and The Research Council of Norway. Senior Advisor GEIDCO, Beijing. Affiliate professor at Chalmers University of Technology. Member of the Royal Swedish Academy of Engineering Sciences (IVA).

Previous positions: Professor Chalmers University of Technology, Industrial Energy Policy (2012-2018). Director General, Swedish Energy Agency (2008-2011). Professor Lund University, International Sustainable Energy Systems (2006-2008).

Elected: 2015

Committee assignment: Member of the Audit Committee

Board meeting attendance: 10/10

Committee meeting attendance: Audit Committee: 4/5



JENNY LAHRIN (1971)

Board member

Education: Master of Laws. Executive MBA.

Current position: Investment Director and Head of Group, Department for State-Owned Enterprises, Ministry of Enterprise.

Other assignments: Board member of AB Göta kanalbolag and V.S. VisitSweden AB.

Previous positions: Board member of SOS Alarm Sverige AB (2015-2016). Board member of Swedavia AB (2012-2015). Board member of RISE Research Institutes of Sweden AB (2012-2013). Legal Counsel at the Division for State-Owned Enterprises, Ministry of Enterprise/Ministry of Finance (2008-2012). Legal Director at Veolia Transport Northern Europe AB (2003-2008) and admitted to the Bar Association (2001-2002).

Elected: 2013

Committee assignment: Member of the Audit Committee

Board meeting attendance: 10/10

Committee meeting attendance: Audit Committee: 5/5



FREDRIK RYSTEDT (1963)

Board member

Education: M.Sc. Business and Economics.

Current position: Executive Vice President and CFO of Essity Aktiebolag (publ).

Other assignments: Board member of Vinda International Holdings Limited.

Previous positions: Executive Vice President and Chief Financial Officer, Country Senior Executive, Nordea Sweden (2008-2012). Chief Financial Officer, Electrolux Group (2001-2008). Chief Financial Officer (2000-2001) and Head of Business Development (1998-1999), Sapa Group. Various positions in the Electrolux Group (1989-1998), including as Vice President and Head of Mergers & Acquisitions (1996-1998), Director of Mergers & Acquisitions (1995-1996) and Managing Director of Svensk Inkassoservice, an Electrolux finance company (1992-1994).

Elected: 2017

Committee assignment: Member of the Audit Committee

Board meeting attendance: 9/10

Committee meeting attendance: Audit Committee: 5/5

**ÅSA SÖDERSTRÖM WINBERG (1957)****Board member****Education:** B.Sc. Econ.**Other assignments:** Chairman of the Board of Scanmast AB. Board member of OEM International AB, Balco Group AB, Delete Oy and Fibo AS. Fellow to the Royal Swedish Academy of Engineering Sciences (IVA).**Previous positions:** President of SWECO Theorells AB (2001-2006) and Ballast Väst AB (1997-2001). Marketing Manager NCC Industry (1994-1997), and Communications Manager NCC Bygg AB (1991-1993).**Elected:** 2013**Committee assignment:** Remuneration Committee chair**Board meeting attendance:** 9/10**Committee meeting attendance:** Remuneration Committee: 3/3**ROBERT LÖNNQVIST (1979)****Employee representative****Education:** 3-year upper secondary degree in electrical installation. Further education in project management, labour law and health & safety.**Current position:** Employee representative for SEKO Facket för Service och Kommunikation. Vattenfall employee since 2007, currently as Project Manager at Vattenfall Services Nordic AB.**Other assignments:** Member of the European Works Council. Assignments for Seko.**Elected:** 2017**Board meeting attendance:** 9/10**ROLF OHLSSON (1961)****Employee representative****Education:** Mechanical M.Sc., KTH Royal Institute of Technology.**Current position:** Employee representative for Akademikerrådet at Vattenfall. Vattenfall employee since 1998, currently as full time representative for Akademikerna at Forsmarks Kraftgrupp AB.**Other assignments:** Employee representative on Forsmarks Kraftgrupp AB's board. Chairman of Akademikerrådet i Vattenfall.**Elected:** 2017**Committee assignment:** Member of the Audit Committee**Board meeting attendance:** 10/10**Committee meeting attendance:** Audit Committee: 5/5**JEANETTE REGIN (1965)****Employee representative****Education:** Secondary school diploma and two-year education in healthcare.**Current position:** Employee representative for Unionen. Currently head of customer service/office services for Gotlands Energi AB.**Elected:** 2011**Board meeting attendance:** 9/10**LENNART BENGTSSON (1958)****Employee representative (deputy)****Education:** Two-year secondary school degree in mechanics and network technology training in IT.**Current position:** Employee representative for SEKO Facket för Service och Kommunikation. Vattenfall employee since 1979, currently as IT technician.**Elected:** 2018**Board meeting attendance:** 10/10**ANDERS BOHLIN (1965)****Employee representative (deputy)****Education:** Energy Engineer from Polhemsskolan, Gävle.**Current position:** Research Engineer at Strategic Development, Vattenfall AB.**Other assignments:** Member of the European Works Council. Vice Chairman, Unionen Vattenfall.**Elected:** 2019**Board meeting attendance:** 8/8**CHRISTER GUSTAFSSON (1959)****Employee representative (deputy)****Education:** Four-year education in technology.**Current position:** Employee representative for Ledarna (the Association of Management and Professional Staff). Employed at Vattenfall since 1986, currently in the staff function for the engineering department, Forsmarks Kraftgrupp AB.**Other assignments:** Representative for Energy & Technology, Confédération Européenne des Cadres (for energy issues).**Elected:** 2013**Board meeting attendance:** 10/10**Directors who left the Board in 2019:**

The deputy employee representative Johnny Bernhardsson resigned in connection with the Annual General Meeting on 11 April. Board meeting attendance: 2/2

Executive Group Management



MAGNUS HALL (1959)
President and CEO
Vattenfall employee since: 2014
Education: M.Sc. Industrial Engineering and Management.
Previous positions: President and CEO of the forestry group Holmen.
Other assignments: Chairman the Board of NTM AB and President in Eurelectric. In 2019 Magnus Hall did not have any significant shareholdings in companies with which Vattenfall has business relations.



KERSTIN AHLFONT (1971)
Senior Vice President, Human Resources
Vattenfall employee since: 1995
Education: M.Sc. Eng.
Previous positions: Long-standing experience from Vattenfall through various management positions in Finance in Business Unit Heat Nordic, Business Group Pan Europe, Business Division Production and Region Nordic as well as acting head of Human Resources.



ANNA BORG (1971)
Senior Vice President, Chief Financial Officer
Vattenfall employee since: 2017 and 1999-2015
Education: Master's in Economics and Political Science.
Previous positions: Senior Vice President, Business Area Markets, Vattenfall (2017), Senior Vice President, Nordic Klarna (2015-2017), Vice President, Marketing and Sales Nordic, Vattenfall (2013-2015), Vice President B2C Sales Europe, Vattenfall (2011-2013), Vice President, Sales Nordic, Vattenfall (2009-2011), Various management positions in Strategy, Business Development, Project Management and Trading, Vattenfall (1999-2009).
Other assignments: Board member of Gunnebo AB and Cellmark AB.



GUNNAR GROEBLER (1972)
Senior Vice President, Business Area Wind
Vattenfall employee since: 1999
Education: Mechanical Engineering.
Previous positions: Vice President, Business Unit Renewables, Continental/UK Region, Vattenfall (2014-2015), Head of Business Unit Hydro Germany, Vattenfall (2011-2013), Head of Corporate Development & M&A, Business Group Central Europe, Vattenfall Europe AG (2009-2010), Head of Mergers & Acquisitions, Business Group Central Europe, Vattenfall Europe AG (2008-2009), Head of Corporate Restructuring, Vattenfall Europe AG (2007-2008), Head of Purchasing, Vattenfall Europe Hamburg AG (2005-2007).



ANNE GYNNERSTEDT (1957)
Senior Vice President, General Counsel and Secretary to the Board of Directors
Vattenfall employee since: 2012
Education: LL.B.
Previous positions: General Counsel, Secretary to the Board and member of executive management of SAAB AB (2004-2012), General Counsel and member of executive management of the Swedish National Debt Office (2002-2004), Corporate Legal Counsel, SAS (1987-2002).
Other assignments: Board member of Swedish Space Corporation.



MARTIJN HAGENS (1971)
Senior Vice President, Business Area Customers & Solutions
Vattenfall employee since: 2003
Education: M. Sc. Industrial Engineering and Management.
Previous positions: Head of Heat Continental/UK, Vattenfall (2014-2015), Head of Customer Service, Vattenfall (2011-2013), Head of Customer Care Centre, Nuon (2008-2010), Program Director Unbundling, Nuon (2006-2007), Nuon Consultancy Group & Lean Competence Center, Nuon (2005-2006), Head of Customer Care B2B, Nuon (2003-2004), Management Consultant, Accenture (1996-2002).
Other assignments: Managing Director of Vattenfall N.V. Netherlands.



TUOMO HATAKKA (1956)
Senior Executive Vice President, Business Area Heat
Vattenfall employee since: 2002
Education: B. Sc. Econ. MBA.
Previous positions: Head of Business Division Production (2010-2013), Head of Business Group Central Europe (2008-2010), Head of Business Group Poland (2005-2007).
Other assignments: Board member of PKP Energetyka S.A.



NIEK DEN HOLLANDER (1973)
Senior Vice President, Business Area Markets
Vattenfall employee since: 2014
Education: Master's in Financial Econometrics. MBA.
Previous positions: Head of Business Unit Trading, Vattenfall Energy Trading GmbH (2014-2017), Head of Trading, Statkraft Markets GmbH (2008-2014), Head of Long-term Energy Management, Statkraft Markets B.V. (2006-2006), Head of Asset Management, Statkraft Markets B.V. (2005-2006), Various trading positions, Statkraft Markets B.V. (2002-2005), Various trading positions in the financial sector (1997-2002).

Tuomo Hatakka will retire at the end of 2020.

Niek den Hollander has decided to leave Vattenfall and will stay on until 31 March 2020.

**KARIN LEPASOON (1968)**

**Senior Vice President,
Group Communications**

Vattenfall employee since: 2016

Education: Master's (LL.M.) in Swedish and International Laws from the University of Lund, Sweden and Master's (LL.M.) in EU Laws from the University of Leiden, the Netherlands.

Previous positions: Director of Sustainability, Communications and HR, Nordic Capital (2015-2016), Executive Vice President and member of the Group Senior Executive Team (full member since 2008), Skanska (2006-2015), Vice President Group Communications, Gambro (1999-2006).

Other assignments: Board member of Energiföretagen Sverige – Swedenergy AB.

**ANDREAS REGNELL (1966)**

**Senior Vice President,
Strategic Development**

Vattenfall employee since: 2010

Education: B.Sc. Econ.

Previous positions: Head of Nordic Business Strategy (2014-2015), Head of Strategy and Sustainability (2010-2013), Senior Partner and Managing Director, Managing Partner of Nordic Region, The Boston Consulting Group (1992-2010), Analyst and Account Manager, Citibank (1989-1992).

Other assignments: Board member of Svevia AB and Hybrit AB.

**TORBJÖRN WAHLBORG (1962)**

**Senior Executive Vice President,
Business Area Generation**

Vattenfall employee since: 1990

Education: M.Sc. Eng.

Previous positions: Head of Business Region Nordic (2014-2015), Head of Business Division Nuclear (2012-2013), Head of Business Division Distribution and Sales (2010-2012), Head of Business Group Nordic (2010), Vattenfall's Polish operations (1997-2010), including as country manager (2008-2009).

Other assignments: Board member of the Confederation of Swedish Enterprise, Chairman of the Board of Energiföretagens Arbetsgivareförening (EFA) AB.

AGM proposal

Proposed guidelines for compensation and other terms of employment for senior executives

The Board proposes that the 2020 Annual General Meeting resolves to adopt the Board's proposal which corresponds to the government's principles for remuneration and other terms of employment for senior executives in state-owned companies, adopted by the government on 27 February 2020 (www.regeringen.se), with the deviation set out below.

In accordance with a resolution by the Annual General Meeting on 11 April 2019, Vattenfall deviates from the definition of senior executive of a subsidiary. Instead of using the definition of senior executive set forth in the Swedish Companies Act, senior executives shall be defined based on whether the individual has significant influence on the Group's earnings. Through application of the International Position Evaluation (IPE) model, executives with positions of IPE 68 and higher shall be considered to be senior.

The guidelines' promotion of the company's business strategy, long-term interests and sustainability

Vattenfall has defined a strategy with the purpose to Power Climate Smarter Living and enable fossil free living within one generation. The business strategy is further described on the website <https://group.vattenfall.com/who-we-are/about-us/our-goals-and-strategy>.

A prerequisite for the successful implementation of Vattenfall's business strategy and the safeguarding of its long-term interests, including its sustainability, is that Vattenfall is able to recruit and retain qualified personnel. To this end, it is necessary that Vattenfall offers competitive remuneration. These guidelines enable Vattenfall to offer members of the executive management a competitive total remuneration package.

Salary and employment conditions for employees

In the preparation of the Board's proposal for these remuneration guidelines, salary and employment conditions for employees of the company have been taken into account by including information on the increase and growth rate over time in the Remuneration Committee's and the Board's basis of decision when evaluating whether the guidelines and the limitations set out herein are reasonable.

Decision-making process to determine, review and implement the guidelines

The Board has established a Remuneration Committee. The Committee's tasks include preparing the Board's decision to propose guidelines for executive remuneration. The Board shall prepare a proposal for new guidelines and annually submit it to the general meeting. The guidelines shall be in force until new

guidelines are adopted by a general meeting. The Remuneration Committee shall also monitor and evaluate application of the guidelines for executive remuneration as well as the current remuneration structures and compensation levels in Vattenfall. The members of the Remuneration Committee are independent of Vattenfall and its executive management. The CEO and other members of the executive management do not participate in the Board's processing of and resolutions regarding remuneration-related matters in so far as they are affected by such matters.

The Board certifies that the compensation in question is in compliance with the guidelines set by the general meeting in such way that before a decision is made on compensation and other terms of employment for a senior executive, written documentation shall be available that shows the company's total cost. The proposal for decision shall be drafted by the Board's remuneration committee and thereafter be put to the Board for a decision. The company's auditors shall perform a review to ensure that the set compensation levels and other terms of employment have not been exceeded and, in accordance with the Companies Act, shall once a year – not later than three weeks before the general meeting – issue a written statement as to whether the adopted guidelines have been adhered to.

The Board's explanation for deviations from the government's principles

The deviation from the government's guidelines for terms of employment for senior executives of state-owned companies, decided on by the owner at the 2019 Annual General Meeting, entails use of a generally accepted ranking model instead of the definition of senior executive of a subsidiary in the Swedish Companies Act. The Board is of the opinion that the following, special reasons exist for deviating from the principles.

Like other international groups, Vattenfall governs its operations from a commercial perspective and not according to the legal company structure. For commercial and legal reasons, the Vattenfall Group has approximately 300 subsidiaries. Through application of the government's principles for subsidiaries, a very large number of executives would be considered to be senior, without them having any significant influence on the Group's earnings.

The proposed deviation reflects these circumstances. The criteria used to define what constitutes a senior executive are the individual subsidiary's size based on sales, the number of employees and number of steps in the value chain, as well as the requirements on the individual executive for innovation, knowledge, strategic/visionary role and international responsibility.

The International Position Evaluation (IPE) model is used as support for determining in a systematic manner which positions

can be considered to be senior. The Board's conclusion is that, in addition to the members of the Executive Group Management, executives in positions of IPE 68 or higher should be considered to be senior.

Proposed distribution of profits

The Annual General Meeting has at its disposal retained profits, including the profit for the year, totalling SEK 65,172,029,238.

The Board of Directors and President propose that the profits be distributed as follows:

To be distributed to the shareholder:	SEK 7,245,000,000
To be carried forward:	SEK 57,927,029,238

The proposed distribution corresponds to a dividend of SEK 55.01 per share. The dividend is proposed for payment on 12 May 2020.

Statement by the Board of Directors pursuant to the Swedish Companies Act, Chapter 18, Section 4

Based on the Parent Company's and Group's financial position, earnings and cash position, the Board of Directors is of the opinion that the proposed distribution of profits will not lead to any material limitation of the Parent Company's or Group's ability to make any necessary investments or to meet their obligations in

the short and long term. In view of the above, the Board of Directors finds the proposed dividend, totalling SEK 7,245,000,000 to be carefully considered and justified, and that the proposal adheres to the principles of the adopted dividend policy (page 13).

The Board of Directors' and the President's assurance upon signing the Annual and Sustainability Report for 2019

The undersigned certify that the consolidated accounts and the Annual Report have been prepared in accordance with International Financial Reporting Standards (IFRS), as endorsed by the European Commission, for application within the EU, and generally accepted accounting principles, respectively, and give a true and fair view of the Parent Company's and the Group's financial position and earnings, and that the Administration Report for the Parent Company and the Group presents a fair overview of the development of the Parent Company's and the Group's operations, financial position and earnings and describes significant risks and uncertainties that the companies in the Group face. In addition, the undersigned certify that the sustainability data and the statutory sustainability report according to the Swedish Annual Accounts Act Chapter 6 11§, as defined in the GRI Index on pages 168-171, have been prepared in accordance with the GRI Standards, and have been adopted by the Board of Directors.

Solna, 19 March 2020

Lars G. Nordström, Chairman of the Board

Fredrik Arp	Viktoria Bergman	Ann Carlsson	Håkan Erixon
Tomas Kåberger	Jenny Lahrin	Robert Lönnqvist	
Rolf Ohlsson	Jeanette Regin	Fredrik Rystedt	Åsa Söderström Winberg

Magnus Hall, President and CEO

Our auditor's report was submitted on 19 March 2020
Ernst & Young AB

Staffan Landén, Authorised Public Accountant

Financial information



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Vattenfall's financial performance

The underlying operating profit was SEK 25.1 billion in 2019, an increase of SEK 5.2 billion compared with 2018. Higher earnings contribution from the Power Generation and the Wind operating segments had a positive

effect on underlying operating profit. This was offset in part by a lower earnings contribution from the Distribution operating segment.

Amounts in SEK million	2019	2018
Net sales	166,360	152,091
Operating profit before depreciation, amortisation and impairment losses (EBITDA) ¹	42,445	34,341
Underlying operating profit before depreciation, amortisation and impairment losses ¹	43,940	36,469
Operating profit (EBIT) ¹	22,141	17,619
Underlying operating profit ¹	25,095	19,883
Profit for the year	14,861	12,007
Funds from operations (FFO) ¹	34,949	23,275
Net debt ¹	64,266	47,728
Adjusted net debt ¹	132,014	112,324
Electricity generation, TWh	130.3	130.3
– of which, hydro power	35.8	35.5
– of which, nuclear power	53.4	55.0
– of which, fossil-based power	31.3	31.6
– of which, wind power	9.5	7.8
– of which, biomass, waste	0.4	0.4
Sales of electricity, TWh ²	169.4	169.3 ⁶
Sales of heat, TWh	17.1	18.3
Sales of gas, TWh	59.2	60.7 ⁶
CO ₂ emissions, Mtonnes	18.2 ⁴	22.0 ⁴
Work-related accidents, number (LTIF) ³	2.1	1.9
Number of employees, full-time equivalents	19,815	19,910
Key ratios		
Return on capital employed, %	8.5 ⁵	7.0 ⁵
Net debt/equity, %	59.2	46.1
FFO/adjusted net debt, %	26.5	20.7
Adjusted net debt/EBITDA, times	3.1	3.3

¹ See Definitions and calculations of key ratios for definitions of Alternative Performance Measures.

² Sales of electricity also include bilateral trading on the Nordic electricity exchange.

³ Lost time Injury Frequency (LTIF) is expressed in terms of the number of lost time work injuries (per 1 million hours worked), i.e., work-related accidents resulting in absence longer than one day, and accidents resulting in fatality. The measure pertains only to Vattenfall employees.

⁴ Pro rata values, corresponding to Vattenfall's share of ownership.

⁵ The key ratio is based on average capital employed.

⁶ The value has been adjusted compared with information previously published in Vattenfall's financial reports.

Sustainability reporting

In addition to reporting on financial performance, Vattenfall also reports on its sustainability performance. In accordance with the Annual Accounts Act, 6 chapter 11§ Vattenfall has chosen to develop the statutory sustainability report as a report separated from the annual accounts and consolidated accounts. The statutory sustainability report was delivered to the auditor at the same time as the annual accounts. The statutory sustainability report, which can be found on pages 13, 16–18, 58–59, 63–67, 77–79 and 156–167, pertains to Vattenfall and its subsidiaries.

Wholesale price trend

Average Nordic spot prices were 11% lower in 2019 than in 2018, mainly owing to a higher hydrological balance and lower fuel prices. Average spot prices in Germany and the Netherlands were 15% and 22% lower, respectively, than in 2018, mainly owing to lower fuel prices.

Futures prices for electricity for delivery in 2020 and 2021 were 8% to 18% higher, respectively, than in 2018.

Futures prices for coal and gas were 20% and 12% lower, respectively, than in 2018, while the price for CO₂ emission allowances was 57% higher than a year ago. The higher price for CO₂ emission allowances is partly attributable to the Market Stability Reserve (MSR), which took effect in January 2019 to manage the surplus of CO₂ emission allowances.

Electricity generation

Total electricity generation in 2019 was 130.3 TWh (130.3).

Hydro power generation amounted to 35.8 TWh (35.5). The Nordic reservoir levels were at 60% (55%) of capacity, which is 3 percentage points above normal.

Nuclear power generation decreased by 1.6 TWh to 53.4 TWh (55.0), owing in part to a gradual reduction in output at Ringhals 2 ahead of its final closure. Combined availability for Vattenfall's nuclear power plants in 2019 was 87.8% (88.9%). Forsmark had availability of 88.9% (88.1%) and generation of 25.3 TWh (24.9). Ringhals had availability of 86.7% (89.5%) and generation of 28.0 TWh (30.1).

Electricity generation from wind power increased to 9.5 TWh (7.8) in 2019. During 2019 two wind farms were commissioned, Slufterdam (29 MW) and Horns Rev 3 (407 MW).

Fossil-based power generation totalled 31.3 TWh (31.6).

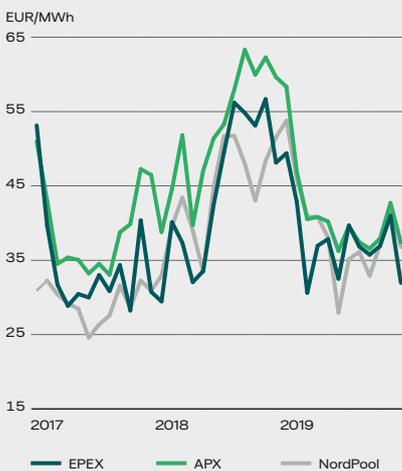
Sales of electricity, heat and gas

Sales of electricity, excluding sales to Nord Pool Spot and deliveries to minority shareholders, decreased by 0.2 TWh to 119.0 TWh (119.2). Sales of gas decreased by 1.5 TWh to 59.2 TWh (60.7) as a result of warmer weather in the Netherlands and Germany. Sales of heat decreased by 1.2 TWh to 17.1 TWh (18.3).

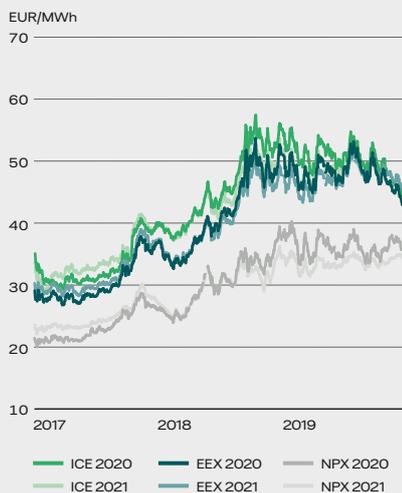
Vattenfall's price hedging

Vattenfall continuously hedges its future electricity generation through sales in the forward and futures markets. Spot prices therefore have only a limited impact on Vattenfall's earnings in the near term. Vattenfall's dominant risk exposure is related to price exposure for Nordic nuclear and hydro power base load generation. In addition, Vattenfall's operations generate a substantial share of regulated revenue from distribution, heat and tendered wind power, which reduces the total risk exposure. On the Continent (Germany and the Netherlands) and in the UK, Vattenfall has some price exposure between electricity and used fuel. This exposure has a lower risk profile than in the Nordic countries. Based on this, Vattenfall has decided to focus on hedging its Nordic generation. Read more on Vattenfall's price hedging in the Risks and risk management section on the pages 62-69.

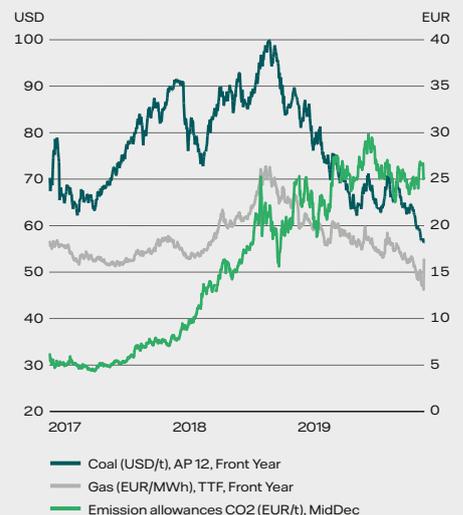
Electricity spot prices in the Nordic countries, Germany and the Netherlands, monthly averages



Electricity futures prices in the Nordic countries, Germany and the Netherlands



Price trend for coal, gas and CO₂ emission allowances



Comments on the consolidated income statement

Sales

	External net sales		Internal net sales		Total net sales	
	2019	2018	2019	2018	2019	2018
Customers & Solutions	87,343	78,883	2,516	2,435	89,859	81,318
Power Generation	38,425	33,608	63,953²	63,906²	102,378	97,514
Wind	6,578	5,726	6,914	3,849	13,492	9,575
Heat	15,947	15,828	15,456	18,142	31,403	33,970
Distribution	17,903	17,845	4,637	4,529	22,540	22,374
– of which, Distribution Germany	6,498	6,265	4,156	4,053	10,654	10,318
– of which, Distribution Sweden	11,288	11,462	509	493	11,797	11,955
Other¹	164	201	5,392	5,054	5,556	5,255
Eliminations	–	–	-98,868	-97,915	-98,868	-97,915
Total	166,360	152,091	–	–	166,360	152,091

¹ "Other" pertains mainly to all Staff functions including treasury activities and Shared Service Centres.

² Pertains mainly to Traders' sales of electricity, fuel and CO₂ emission allowances to other segments within Vattenfall.

Consolidated net sales increased by SEK 14.3 billion (of which, positive currency effects of SEK 3.2 billion) compared with 2018. The increase is mainly attributable to higher achieved prices through hedges, higher sales in the Nordic countries, Germany, France and the Netherlands (positive price effects), and higher generation in the Wind operating segment.

Underlying operating profit

Amounts in SEK million	2019	2018
Operating profit (EBIT)	22,141	17,619
Depreciation, amortisation and impairment losses	20,304	16,722
Operating profit before depreciation, amortisation and impairment losses (EBITDA)	42,445	34,341
Items affecting comparability excl. impairment losses and reversed impairment losses	1,495	2,128
Underlying operating profit before depreciation, amortisation and impairment losses	43,940	36,469
Operating profit (EBIT)	22,141	17,619
Items affecting comparability ¹	2,954	2,264
Underlying operating profit	25,095	19,883

¹ See Definitions and calculations of key ratios for definition of this Alternative Performance Measure.

The underlying operating profit increased by SEK 5.2 billion, which is mainly explained by the following:

- Higher earnings contribution from the Power Generation operating segment (SEK 6.1 billion), mainly owing to higher achieved prices and a higher contribution from the trading operations
- Higher earnings contribution from the Wind operating segment (SEK 0.4 billion), mainly owing to new capacity
- Lower earnings contribution from the Distribution operating segment (SEK -1.3 billion), mainly owing to costs related to the storm "Alfrida", higher transmission costs and higher depreciation

Operating segments

	Operating profit (EBIT)		Underlying operating profit	
	2019	2018	2019	2018
Customers & Solutions	1,157	1,139	1,337	1,269
Power Generation	9,870	6,711	15,437	9,371
Wind	3,603	3,681	4,155	3,747
Heat	354	393	550	771
Distribution	4,986	6,218	4,998	6,250
– of which, Distribution Germany	1,118	950	1,132	985
– of which, Distribution Sweden	3,858	5,257	3,856	5,254
Other¹	2,279	-526	-1,274	-1,528
Eliminations	-108	3	-108	3
Total	22,141	17,619	25,095	19,883

	2019	2018
Underlying operating profit	25,095	19,883
Items affecting comparability (for specification, see page 83)	-2,954	-2,264
Financial income and expenses	-3,819	-3,616
Profit before income taxes	18,322	14,003

¹⁾ "Other" pertains mainly to all Staff functions including treasury activities, Shared Service Centres and material capital gains and -losses.

The underlying operating profit for the Customers & Solutions operating segment increased by SEK 0.1 billion compared with 2018, mainly as a result of a larger customer base in Germany and a strong contribution from sales in the Nordic countries. Higher costs for electricity purchases in Germany were compensated by tariff increases. Earnings growth was held back by continued high competition and costs for growth activities. The underlying operating profit for the Power Generation operating segment increased by SEK 6.1 billion, mainly as a result of higher prices achieved in the Nordic countries through hedging and a higher realised earnings contribution from the trading operations. The underlying operating profit for the Wind operating segment improved by SEK 0.4 billion, mainly owing to new capacity. The underlying operating profit for

the Heat operating segment decreased by SEK 0.2 billion, mainly as a result of higher costs for CO₂ emission allowances, warmer weather during the first quarter of the year, the sale of the district heating operations in Hamburg as well as higher maintenance costs and depreciation. This was partly offset by positive price effects and an increased customer base in the heat business. The underlying operating profit for the Distribution operating segment decreased by SEK 1.3 billion, mainly due to costs related to the storm "Alfrida", higher transmission fees in Sweden and higher depreciation following major investments. Lower transmission fees in Germany had an offsetting effect. Read more about the Group's operating segments in Note 7 to the consolidated accounts, Operating segments.

Items affecting comparability that affected operating profit

Amounts in SEK million	2019	2018
Capital gains	3,538	1,067
Capital losses	-25	-111
Impairment losses	-1,459	-136
Reversed impairment losses	–	–
Provisions	-3,431	-1,649
Unrealised changes in the fair value of energy derivatives	-1,688	-156
Unrealised changes in the fair value of inventories	-556	61
Restructuring costs	-148	-554
Other infrequent items affecting comparability	815	-786
Total	-2,954	-2,264

Items affecting comparability amounted to SEK -2.3 billion–3.0 billion in 2019. Capital gains on the divestment of the district heating operations in Hamburg (SEK 3.1 billion) and the sale of nuclear production rights in Germany (SEK 1.5 billion) were countered by unrealised changes in market value for energy derivatives and inventories (SEK -2.2 billion) and higher provisions for nuclear power (SEK -3.4 billion), partly owing to changed discount rates for Germany and Sweden. SEK -2.3 billion.

Items affecting comparability in 2018 totalled SEK -2.3 billion. Provisions of SEK -1.6 billion were mainly related to nuclear power decommissioning, partly owing to adjusted discount rates. Capital gains of SEK 1.1 billion pertain mainly to sales of properties in Hamburg and Berlin, and the sale of 70% of the Blakliden/Fåbodberget wind farm.

Read more about impairment losses in Note 9 to the consolidated accounts, Impairment losses and reversed impairment losses.

Costs for CO₂ emission allowances

Costs for CO₂ emission allowances for own use amounted to SEK 3.7 billion in 2019, compared with SEK 2.1 billion in 2018. The increase is mainly attributable to higher prices for CO₂ emission allowances.

Research and development

Vattenfall conducts research and development (R&D) to contribute to and support the execution of the company's strategy in both the short and long term. In 2019 Vattenfall invested SEK 626 million (494) in R&D. For further information on Vattenfall's R&D activities, see pages 54-55.

Financial items

Financial items amounted to SEK -3.8 billion, which is SEK 0.2 billion lower than in 2018.

Taxes

The Group reported a tax expense of SEK 3.5 billion for 2019 and an effective tax rate of 18.9%. The low tax expense and effective tax rate are mainly attributable to the divestment of the district heating operations in Hamburg, which was mostly tax free. For 2018 the Group reported a tax expense of SEK 2.0 billion and an effective tax rate of 14.3%. For further information, see Note 13 to the consolidated accounts, Income taxes.

Comments on the consolidated balance sheet**Assets and capital employed**

Amounts in SEK million	31 December 2019	31 December 2018
Intangible assets: current and non-current	18,870	18,792
Property, plant and equipment	256,700	238,801
Participations in associated companies and joint arrangements	4,827	5,429
Deferred and current tax assets	15,746	14,144
Non-current noninterest-bearing receivables	3,758	3,657
Contract assets	188	214
Inventories	13,353	13,647
Trade receivables and other receivables	26,345	26,003
Prepaid expenses and accrued income	7,853	8,427
Unavailable liquidity	3,859	5,596
Other	530	624
Total assets excl. financial assets	352,029	335,334
Deferred and current tax liabilities	-16,215	-15,969
Other noninterest-bearing liabilities	-2,134	-2,305
Contract liabilities	-8,462	-7,935
Trade payables and other liabilities	-27,809	-29,482
Accrued expenses and deferred income	-17,098	-16,485
Total noninterest-bearing liabilities	-71,904	-72,176
Other interest-bearing provisions not related to adjusted net debt ¹	-11,314	-11,589
Capital employed²	268,811	251,569
Capital employed, average	260,190	250,283

¹ Includes personnel-related provisions for non-pension purposes, provisions for tax and legal disputes and certain other provisions.

² See Definitions and calculations of key ratios for definitions of this Alternative Performance Measure.

Total assets decreased by SEK 11.8 billion compared with the level at 31 December 2018, to SEK 450.8 billion (462.6). Short-term derivative assets decreased by SEK 13.9 billion. Property, plant and equipment decreased by SEK 6.5 billion. Cash and cash equivalents decreased by SEK 6.5 billion.

Financial position

Amounts in SEK million	2019	2018
Cash and cash equivalents, and short-term investments	33,155	40,071
Committed credit facilities (unutilised)	20,894	20,510

Cash and cash equivalents, and short-term investments decreased by SEK 6.9 billion compared with the level at 31 December 2018.

Committed credit facilities consist of a EUR 2.0 billion Revolving Credit Facility that expires on 10 December 2021. As per 31 December 2019, available liquid assets and/or committed credit facilities amounted to 30% of net sales. Vattenfall's target is to maintain a level of no less than 10% of the Group's net sales, but at least the equivalent of the next 90 days' maturities.

Interest-bearing liabilities and net debt as per 31 December

Amounts in SEK million	2019	2018
Hybrid Capital ¹	-20,164	-19,832
Bond issues, commercial paper and liabilities to credit institutions	-51,099	-50,303
Present value of liabilities pertaining to acquisitions of Group companies	-28	-51
Liabilities to associated companies	-733	-504
Liabilities to owners of non-controlling interests	-10,647	-10,406
Other liabilities	-14,956	-7,179
Total interest-bearing liabilities¹	-97,627	-88,275
Cash and cash equivalents	10,604	17,094
Short-term investments	22,551	22,977
Loans to owners of non-controlling interests in foreign Group companies	206	476
Net debt¹	-64,266	-47,278

¹ See Definitions and calculations of key ratios for definitions of Alternative Performance Measures.

Net debt increased by SEK 16.5 billion compared with the level at 31 December 2018, mainly owing to a negative cash flow after investments (SEK 6.1 billion), implementation of IFRS 16 Leases (SEK 4.6 billion), dividends (SEK 3.7 billion) and exchange rate effects (SEK 2.0 billion).

Adjusted gross and net debt as per 31 December

Amounts in SEK million	2019	2018
Total interest-bearing liabilities	-97,627	-88,275
50% of Hybrid Capital ¹	10,082	9,916
Present value of pension obligations	-44,026	-39,686
Provisions for gas and wind operations and other environment related provisions	-8,571	-7,656
Provisions for nuclear power (net) ²	-35,521	-31,920
Margin calls received	3,706	3,370
Liabilities to owners of non-controlling interests due to consortium agreements	10,647	9,195
Adjustment related to assets/liabilities held for sale	-	-1,743
Adjusted gross debt	-161,310	-146,799
Reported cash and cash equivalents and short-term investments	33,155	40,071
Unavailable liquidity	-3,859	-5,596
Adjusted cash and cash equivalents and short-term investments	29,296	34,475
Adjusted net debt³	-132,014	-112,324

¹ 50% of Hybrid Capital is treated as equity by the rating agencies, which thereby reduces adjusted net debt.

² The calculation is based on Vattenfall's share of ownership in the respective nuclear power plants, less Vattenfall's share in the Swedish Nuclear Waste Fund and liabilities to associated companies. Vattenfall has the following ownership interests in the respective plants: Forsmark 66%, Ringhals 70.4%, Brokdorf 20%, Brunsbüttel 66.7%, Krümmel 50% and Stade 33.3%. (According to a special agreement, Vattenfall is responsible for 100% of the provisions for Ringhals.)

³ See Definitions and calculations of key ratios for definitions of Alternative Performance Measures.

In their assessments of a company's credit strength, the rating agencies and analysts regularly make a number of adjustments of various items on the balance sheet in order to arrive at a figure for adjusted gross and net debt. Vattenfall's calculations of its adjusted gross and net debt are shown in the table above.

Adjusted net debt increased by SEK 19.7 billion, mainly related to the higher level of net debt and higher provisions for pensions (SEK 4.3 billion) and nuclear power (SEK 3.6 billion).

Equity

The Group's equity increased by SEK 4.9 billion. The increase is mainly attributable to the profit for the year.

Comments on the consolidated statement of cash flows**Cash flow from operating activities**

Amounts in SEK million	2019	2018
Funds from operations (FFO)	34,949	23,275
Cash flow from changes in operating assets and operating liabilities (working capital)	-18,230	17,779
Cash flow from operating activities	16,719	41,054

Funds from operations (FFO) increased by SEK 11.7 billion in 2019 to SEK 34.9 billion (23.3), mainly owing to a higher operating profit before depreciation, amortisation and impairment losses (EBITDA) and lower paid tax.

Cash flow from changes in working capital amounted to SEK -18.2 billion (17.8) in 2019, which is mainly explained by a net change in margin calls (SEK -20.9 billion).

Cash flow from investing activities

Amounts in SEK million	2019	2018
Maintenance/replacement investments	15,148	13,479
Growth investments	11,685	8,434
Total investments	26,833	21,913
Total divestments	7,452	1,569
- of which, shares	6,703	99

Investments are specified in the table below. Divestments in 2019 pertains mainly to the district heating operations in Hamburg.

Specification of investments

Amounts in SEK million	2019	2018
Hydro power	920	1,109
Nuclear power	2,213	2,389
Coal power	139	305
Gas	277	259
Wind power	7,501	7,902
Biomass, waste	149	112
Other	-	-
Total electricity generation	11,199	12,076
Fossil-based power	2,134	3,028
Biomass, waste	94	148
Other	2,188	1,776
Total CHP/heat	4,416	4,952
Electricity networks	7,071	6,449
Total electricity networks	7,071	6,449
Purchases of shares, shareholder contributions	498	-223
Other	1,754	1,267
Total investments	24,938	24,521
Accrued investments, unpaid invoices (-)/release of accrued investments (+)	1,895	-2,608
Total investments with cash flow effect	26,833	21,913

Cash flow from financing activities

Cash flow from financing activities amounted to SEK -3.4 billion (-9.5) in 2019. The majority pertains to dividends to owners and minority owners (SEK -4.9 billion).

Consolidated income statement

Amounts in SEK million, 1 January–31 December	Note	2019	2018
Net sales	6, 7, 8	166,360	152,091 ⁷
Cost of purchases		-87,580	-80,463 ⁷
Other external expenses	10	-22,675	-19,375
Personnel expenses		-20,249	-19,157
Other operating incomes and expenses, net		6,167	925
Participations in the results of associated companies	19	422	320
Operating profit before depreciation, amortisation and impairment losses (EBITDA)	7	42,445	34,341
Depreciation, amortisation and impairments		-20,304	-16,722
Operating profit (EBIT)⁶	7, 8, 9, 14, 15	22,141	17,619
Financial income ^{2,5}	11	2,703	2,887
Financial expenses ^{3,4,5}	12	-6,522	-6,503
Profit before income taxes		18,322	14,003
Income taxes expense	13	-3,461	-1,996
Profit for the year		14,861	12,007
Attributable to owner of the Parent Company		13,173	10,157
Attributable to non-controlling interests		1,688	1,850
Supplementary information			
Underlying operating profit before depreciation, amortisation and impairment losses ⁶	7, 8	43,940	36,469
Underlying operating profit ⁶	7, 8	25,095	19,883
Financial items, net excl. discounting effects attributable to provisions and return from the Swedish Nuclear Waste Fund		-3,774	-3,407

¹⁾ Including items affecting comparability⁶

²⁾ Including return from the Swedish Nuclear Waste Fund.

³⁾ Including interest components related to pension costs.

⁴⁾ Including discounting effects attributable to provisions.

⁵⁾ Items affecting comparability recognised as financial income and expenses, net.

⁶⁾ See Definitions and calculations of key ratios for the definitions of the Alternative Performance Measures.

⁷⁾ Due to changed presentation of transactions related to Renewable Obligation Certificates and due to netting of certain commodity trading contracts in order to better reflect the substance of these transactions, Net sales and Cost of purchases for the comparative periods have been adjusted, with no effect on EBITDA. Please see note 2 to the consolidated accounts.

Consolidated statement of comprehensive income

Amounts in SEK million, 1 January–31 December	2019	2018
Profit for the year	14,861	12,007
Other comprehensive income		
Items that will be reclassified to profit or loss when specific conditions are met		
Cash flow hedges – changes in fair value	181	7,776
Cash flow hedges – dissolved against income statement	-5,641	-6,066
Cash flow hedges – transferred to cost of hedged item	-34	3
Hedging of net investments in foreign operations	-1,275	-2,177
Translation differences, divested companies	-94	2
Remeasurement of financial assets available-for-sale	–	–
Impairment of available-for-sale financial assets	–	–
Translation differences	2,728	4,193
Income taxes related to items that will be reclassified	2,157	-237
Total Items that will be reclassified to profit or loss when specific conditions are met	-1,978	3,494
Items that will not be reclassified to profit or loss		
Remeasurement pertaining to defined benefit obligations	-4,577	-415
Income taxes related to items that will not be reclassified	1,244	-5
Total Items that will not be reclassified to profit or loss	-3,333	-420
Total other comprehensive income, net after income taxes	-5,311	3,074
Total comprehensive income for the year	9,550	15,081
Attributable to owner of the Parent Company	7,757	12,821
Attributable to non-controlling interests	1,793	2,260

Consolidated balance sheet

Amounts in SEK million	Note	31 December 2019	31 December 2018
Assets			
Non-current assets			
Intangible assets: non-current	16	18,735	18,082
Property, plant and equipment	17	256,700	238,801
Participations in associated companies and joint arrangements	19	4,827	5,429
Other shares and participations		333	331
Share in the Swedish Nuclear Waste Fund	20	45,691	42,038
Derivative assets	36	7,788	13,951
Deferred tax assets	13	14,583	11,719
Other non-current receivables		5,537	5,566
Total non-current assets		354,194	335,917
Current assets			
Inventories	21	13,353	13,647
Intangible assets: current	22	135	710
Trade receivables and other receivables	23	26,345	26,003
Contract assets	6	188	214
Advance payments paid	24	3,996	2,926
Derivative assets	36	10,080	23,955
Prepaid expenses and accrued income	25	7,853	8,427
Current tax assets	13	1,163	2,425
Short-term investments	26	22,551	22,977
Cash and cash equivalents	27	10,604	17,094
Assets held for sale	28	318	8,313
Total current assets		96,586	126,691
Total assets	7	450,780	462,608
Equity and liabilities			
Equity attributable to owners of the Parent Company			
Share capital		6,585	6,585
Reserve for cash flow hedges		-3,147	450
Other reserves		3,874	2,466
Retained earnings incl. profit for the year		86,319	78,595
Total equity attributable to owners of the Parent Company	38	93,631	88,096
Equity attributable to non-controlling interests		14,891	15,501
Total equity		108,522	103,597
Non-current liabilities			
Hybrid Capital	29	20,164	19,832
Other interest-bearing liabilities	29	52,405	43,981
Pension provisions	30	44,026	39,686
Other interest-bearing provisions	31	102,395	93,222
Derivative liabilities	36	7,833	14,042
Deferred tax liabilities	13	14,713	15,119
Contract liabilities	6	8,462	7,935
Other noninterest-bearing liabilities	32	2,134	2,305
Total non-current liabilities		252,132	236,122
Current liabilities			
Trade payables and other liabilities	33	27,809	29,482
Advance payments received	34	1,577	15,293
Derivative liabilities	36	13,701	27,245
Accrued expenses and deferred income	35	17,098	16,485
Current tax liabilities	13	1,502	850
Other interest-bearing liabilities	29	25,058	24,462
Interest-bearing provisions	31	3,371	3,734
Liabilities associated with assets held for sale	28	10	5,338
Total current liabilities		90,126	122,889
Total equity and liabilities		450,780	462,608

See also information on Collateral (Note 39), Contingent liabilities (Note 40) and Commitments under consortium agreements (Note 41), in the notes to the consolidated accounts.

Consolidated statement of cash flows

Amounts in SEK million, 1 January–31 December	Note	2019	2018
Operating activities			
Operating profit before depreciation, amortisation and impairment losses		42,445	34,341
Tax paid		-1,528	-3,698
Capital gains/losses, net		-3,513	-956
Interest received		329	343
Interest paid		-2,969	-3,046
Other, incl. non-cash items	37	185	-3,709
Funds from operations (FFO)¹		34,949	23,275
Changes in inventories		-196	1,549
Changes in operating receivables		-6,294	-790
Changes in operating liabilities		9,171	8,128
Other changes ³		-20,911	8,892
Cash flow from changes in operating assets and operating liabilities		-18,230	17,779
Cash flow from operating activities		16,719	41,054
Investing activities			
Acquisitions in Group companies	4	-754	-31
Investments in associated companies and other shares and participations		256	254
Other investments in non-current assets	37	-26,335	-22,136
Total investments		-26,833	-21,913
Divestments	37	7,452	1,569
Cash and cash equivalents in acquired companies		148	5
Cash and cash equivalents in divested companies		-3,542	-43
Cash flow from investing activities		-22,775	-20,382
Cash flow before financing activities		-6,056	20,672
Financing activities			
Changes in short-term investments		559	-4,523
Changes in loans to owners of non-controlling interests in foreign Group companies		282	562
Loans raised ²		12,622	8,720
Amortisation of debt pertaining to acquisitions of Group companies		-23	-
Amortisation of other debt		-12,001	-9,562
Effect of early termination of swaps related to financing activities		-	-122
Dividends paid to owners		-3,714	-3,299
Contribution/repaid contribution from owners of non-controlling interests		-1,138	-1,260
Cash flow from financing activities		-3,413	-9,484
Cash flow for the year		-9,469	11,188
Cash and cash equivalents			
Cash and cash equivalents at start of year		17,094	8,805
Cash and cash equivalents included in assets held for sale		2,992	-2,992
Cash flow for the year		-9,469	11,188
Translation differences		-13	93
Cash and cash equivalents at end of year		10,604	17,094

Supplementary information

Amounts in SEK million, 1 January–31 December	2019	2018
Cash flow before financing activities	-6,056	20,672
Financing activities		
Effects from terminating swaps related to financing activities	–	-122
Dividends paid to owners	-3,714	-3,299
Contribution to/from owners of non-controlling interests	-1,138	-1,260
Cash flow after dividend	-10,908	15,991
Cash flow from operating activities	16,719	41,054
Maintenance investments	-15,148	-13,479
Free cash flow¹	1,571	27,575
Analysis of change in net debt		
Net debt at start of year	-47,728	-59,260
Change accounting principles	-4,609	–
Cash flow after dividends	-10,908	15,991
Changes as a result of valuation at fair value	-456	387
Change in interest-bearing liabilities for leasing	-711	–
Interest-bearing liabilities/short-term investments acquired/divested	-11	–
Cash and cash equivalents included in assets held for sale	2,992	-2,992
Interest-bearing liabilities associated with assets held for sale	-792	781
Translation differences on net debt	-2,043	-2,635
Net debt at end of year	-64,266	-47,728

	Liquid funds bank overdraft	Short-term investments	Non-current receivables	Financial leasing agreements	Current liabilities	Non-current liabilities	Total
Net debt as at 1 January 2018	8,805	18,515	574	-622	-13,631	-72,901	-59,260
Cashflow	11,188	4,524	-563	1	-10,937	11,778	15,991
Translation differences on net debt	93	414	-11	20	-615	-2,536	-2,635
Assets held for sale	-2,992	–	–	–	781	–	-2,211
Other non-cash items	–	–	–	–	-11	398	387
Net debt as at 31 December 2018	17,094	23,453	–	-601	-24,413	-63,261	-47,728
Cashflow	-9,469	-841	–	903	2,454	-3,955	-10,908
Change accounting principles	–	–	–	-4,609	–	–	-4,609
Change in interest-bearing leasing liabilities	–	–	–	-711	–	–	-711
Translation differences on net debt	-13	145	–	-155	-901	-1,119	-2,043
Assets held for sale	2,992	–	–	12	-804	–	2,200
Other non-cash items	–	–	–	-11	12	-468	-467
Net debt as at 31 December 2019	10,604	22,757	–	-5,172	-23,652	-68,803	-64,266

¹⁾ See Definitions and calculations of key ratios for the definition of this Alternative Performance Measure.

²⁾ Short-term borrowings in which the duration is three months or shorter are reported net.

³⁾ The value pertains mainly to changes in Margin calls related to commodity derivatives.

Consolidated statement of changes in equity

Amounts in SEK million	Attributable to owner of the Parent Company						Attributable to non-controlling interests	Total equity
	Share capital	Reserve		Fair value reserve	Retained earnings	Total		
		for hedges	Translation reserve					
Balance brought forward 2019	6,585	450	2,466	–	78,595	88,096	15,501	103,597
Profit for the year	–	–	–	–	13,173	13,173	1,688	14,861
Cash flow hedges – changes in fair value	–	181	–	–	–	181	–	181
Cash flow hedges – dissolved against income statement	–	-5,624	–	–	–	-5,624	-17	-5,641
Cash flow hedges – transferred to cost of hedged item	–	-34	–	–	–	-34	–	-34
Hedging of net investments in foreign operations	–	–	-1,275	–	–	-1,275	–	-1,275
Translation differences, divested companies	–	–	-94	–	–	-94	–	-94
Translation differences	–	–	2,504	–	–	2,504	224	2,728
Remeasurement pertaining to defined benefit obligations	–	–	–	–	-4,443	-4,443	-134	-4,577
Income taxes related to other comprehensive income	–	1,880	273	–	1,216	3,369	32	3,401
Total other comprehensive income for the year	–	-3,597	1,408	–	-3,227	-5,416	105	-5,311
Total comprehensive income for the year	–	-3,597	1,408	–	9,946	7,757	1,793	9,550
Dividends paid to owners	–	–	–	–	-2,000	-2,000	-1,714	-3,714
Group contributions from (+)/to (-) owners of non-controlling interests	–	–	–	–	–	–	30	30
Contribution to/from minority interest	–	–	–	–	–	–	-1,138	-1,138
Changes as a result of changed ownership	–	–	–	–	–	–	197	197
Other changes	–	–	–	–	-222	-222	222	–
Total transactions with equity holders	–	–	–	–	-2,222	-2,222	-2,403	-4,625
Balance carried forward 2019	6,585	-3,147	3,874	–	86,319	93,631	14,891¹	108,522

Amounts in SEK million	Attributable to owner of the Parent Company						Attributable to non-controlling interests	Total equity
	Share capital	Reserve		Fair value reserve	Retained earnings	Total		
		for hedges	Translation reserve					
Balance brought forward 2018	6,585	-541	455	–	70,586	77,085	15,247	92,332
Profit for the year	–	–	–	–	10,157	10,157	1,850	12,007
Cash flow hedges – changes in fair value	–	7,776	–	–	–	7,776	–	7,776
Cash flow hedges – dissolved against income statement	–	-6,074	–	–	–	-6,074	8	-6,066
Cash flow hedges – transferred to cost of hedged item	–	3	–	–	–	3	–	3
Hedging of net investments in foreign operations	–	–	-2,177	–	–	-2,177	–	-2,177
Translation differences, divested companies	–	–	2	–	–	2	–	2
Translation differences	–	–	3,707	–	–	3,707	486	4,193
Remeasurement pertaining to defined benefit obligations	–	–	–	–	-310	-310	-105	-415
Income taxes related to other comprehensive income	–	-714	479	–	-28	-263	21	-242
Total other comprehensive income for the year	–	991	2,011	–	-338	2,664	410	3,074
Total comprehensive income for the year	–	991	2,011	–	9,819	12,821	2,260	15,081
Dividends paid to owners	–	–	–	–	-2,000	-2,000	-1,299	-3,299
Group contributions from (+)/to (-) owners of non-controlling interests	–	–	–	–	–	–	743	743
Contribution to/from minority interest	–	–	–	–	–	–	-1,260	-1,260
Other changes in ownership	–	–	–	–	190	190	-190	–
Total transactions with equity holders	–	–	–	–	-1,810	-1,810	-2,006	-3,816
Balance carried forward 2018	6,585	450	2,466	–	78,595	88,096	15,501¹	103,597

¹ Of which, reserve for hedges SEK 22 million (35).

See also Note 38 to the consolidated accounts, Specifications of equity.

Notes to the consolidated accounts

Amounts in SEK million unless indicated otherwise.

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Note 1 Company information

Vattenfall's year-end report for 2019 was approved for publication on 4 February 2020 in accordance with a decision by the Board of directors. The Annual and Sustainability Report was approved in accordance with a decision by the Board of directors on 19 March 2020. The Parent Company, Vattenfall AB (publ) with corporate identity number 556036-2138, is a limited liability company with its registered office in Solna, Sweden and with the mailing address SE-169 92 Stockholm, Sweden. The consolidated balance sheet and income statement included in Vattenfall's Annual and Sustainability Report will be submitted at the Annual General Meeting (AGM) on 28 April 2020. The main activities of the Group are described in Note 7 to the consolidated accounts, Operating segments.

Note 2 Important changes in the financial statements compared with the preceding year

Recalculation of financial statements for 2018

No recalculations are made.

Presentation of Consolidated income statement and Consolidated statement of cash flows

Due to changed presentation of transactions related to Renewable Obligation Certificates and due to netting of certain commodity trading contracts in order to better reflect the substance of these transactions, Net sales and Cost of purchases for the comparative periods have been adjusted with SEK 4,733 million, with no effect on EBITDA

Note 3 Accounting policies

Conformity with standards and regulations

The consolidated accounts have been prepared in accordance with the International Financial Reporting Standards (IFRS) issued by the International Accounting Standards Board (IASB) as well as the interpretations issued by the IFRS Interpretations Committee (IFRSIC) as endorsed by the European Commission for application within the EU. In addition, recommendation RFR 1 – "Supplementary Accounting Policies for Groups", issued by the Swedish Financial Reporting Board (RFR), has been applied. RFR 1 specifies the additions to the IFRS disclosure requirements that are required by the Swedish Annual Accounts Act.

New IFRSs and interpretations effective as from 2019

Presented below are the new accounting standards that have a material impact on the Vattenfall's Group's financial statements.

IFRS 16 – "Leases"

IFRS 16 – "Leases" replaces IAS 17 – "Leases" along with the accompanying interpretations. IFRS 16 became effective as from January 1st 2019. Vattenfall has transitioned into the new leasing standard by applying the modified retrospective approach, and therefore the 2018 financial statements are not restated. Starting 1 January 2019, a right-of-use asset along with a lease liability is recognised on the balance sheet for all lease contracts except for leases for which the underlying asset is of low value and short-term leases. Short-term leases are leasing contracts with a duration of 12 months or less.

As per 1 January 2019, a lease liability was recognised for leases that were previously classified as operating leases through application of IAS 17. The lease liability is measured as the present value of the remaining lease payments discounted by Vattenfall's currency and term specific incremental borrowing rate as per 1 January 2019. The right-of-use asset is recognised initially at the same value as the lease liability. In the income statement, the lease expenses are replaced by depreciation of the right-of-use asset and interest expense on the lease liability. The implementation of IFRS 16 also entails a positive effect on operating cash flows and a negative effect on cash flow from financing activities.

The implementation of IFRS 16 resulted in a higher EBITDA by SEK 841 million and in a higher interest expense by SEK 104 million in 2019, compared with previous years accounting under IAS 17 where all cost for operational lease contracts were accounted for in operating profit.

Lease liabilities as per 1 January 2019 amounted to SEK 5.2 billion. The difference between the operating lease commitment as per 31 December 2018 according to IAS 17 and lease liabilities as per 1 January 2019 according to IFRS 16 is shown below:

Operating lease commitment as per 31 December 2018	5,830
Recognition exemption for short-term leases and leases of low-value assets	-202
Effect of discounting operating lease commitment	-1,019
Lease liabilities as a result of IFRS 16 implementation	4,609
Finance lease liabilities recognised as per 31 December 2018	601
Lease liabilities as per 1 January 2019	5,210

Definition of a lease

Vattenfall applies the definition under IFRS 16 to determine whether or not a contract contains a lease.

As a lessee

Under IAS 17, Vattenfall classified leases as either operating leases or finance leases. Under IFRS 16 this distinction is no longer made for lessees. A right-of-use asset along with a corresponding liability are created for all leases except for leases for which the underlying asset is of low value and short-term leases.

As a lessor

Vattenfall's lessor accounting remains mainly unchanged with application of the new leasing standard IFRS 16.

New IFRSs and interpretations effective as from 2020 and later

A number of accounting standards and interpretations have been published, but have not become effective. These are not considered to have a material impact on the Vattenfall Group's financial statements.

Basis of measurement

Assets and liabilities are reported at cost or amortised cost, with the exception of certain financial assets and liabilities and inventories held for trading, which are measured at fair value. Fair value is defined as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Vattenfall uses valuation methods that reflect the fair value of an asset or liability appropriately. Financial assets and liabilities that are measured at fair value are described below according to the fair value hierarchy (levels), which in IFRS 13 is defined as follows:

- Level 1: Quoted prices (unadjusted) in active markets for identical assets or liabilities
- Level 2: Inputs other than quoted prices included in Level 1 that are observable for the asset or liability, either directly (that is, as prices) or indirectly (that is, derived from prices).
- Level 3: Inputs for the asset or liability that are not based on observable market data (that is, unobservable inputs)

Classification into a level is determined by the lowest level input that is significant for the measurement of the fair value at the end of a reporting period. Vattenfall assesses whether reclassifications between the levels are necessary. Observable input data are used whenever possible and relevant. For assets and liabilities included in Level 3, fair value is modelled either on the basis of market prices with adjustments that consider specific terms of a contract, or on the basis of unobservable inputs such as future cash flows. The assumptions for the estimated cash flows are monitored on a regular basis and adjusted if necessary.

Functional and presentation currencies

The functional currency is the currency of the primary economic environment in which each Group entity operates. The Parent Company's functional currency is Swedish kronor (SEK), which is also the presentation currency of both the Parent Company and the Group. This means that the financial statements are presented in Swedish kronor. Unless otherwise stated, all figures are rounded off to the nearest million Swedish kronor (SEK million).

Significant accounting policies

The accounting policies of the Group described below and in each respective note to the consolidated accounts have been applied consistently for all periods presented in the consolidated financial statements.

Principles of consolidation

The consolidated financial statements cover the Parent Company, subsidiaries, associated companies, joint ventures and joint arrangements that are reported as a joint operation according to IFRS 11.

Subsidiaries

Subsidiaries are all entities over which the Parent Company has control. Control is considered to exist when the following three criteria are met: (1) the investor is exposed to or is entitled to a variable return from the investment, (2) the investor has the opportunity to influence the return through its opportunity to govern the company, and (3) there is a link between the return that is received and the opportunity to govern the company. By influence is meant the rights that allow the investor to govern the relevant business, that is, the business which significantly influences the company's return. Business combinations are accounted for using the purchase method. Subsidiaries' financial statements, which are prepared in accordance with the Group's accounting policies, are included in the consolidated accounts from the point of acquisition to the date when control ceases.

Joint arrangements

A joint arrangement is an arrangement over which two or more parties have joint control. Joint arrangements are classified as a joint operation or joint venture. A joint operation entails that the parties that have joint control of the arrangement have rights to the assets, and obligations for the liabilities, relating to the arrangement. A joint venture entails that the parties that have joint control of the arrangement have rights to the net assets of the arrangement. In a joint operation, the respective owners recognise in relation to their interest in the joint organisation: their assets and liabilities as well as their respective share of assets and liabilities held or incurred jointly. Joint ventures are reported in accordance with the equity method.

Associated companies

Associated companies are companies in which the Group has a significant – but not controlling – influence or joint control with other owners over their operational and financial management, usually through shareholdings corresponding to between 20% and 50% of the votes. From the point at which the significant influence is acquired, participations in associated companies are reported in the consolidated accounts in accordance with the equity method.

Transactions that are eliminated upon consolidation

Intra-Group receivables and liabilities, income and expenses, as well as gains or losses arising from intra-Group transactions between Group companies, are eliminated in their entirety when preparing the consolidated accounts. Gains arising from transactions with associated companies and joint ventures are eliminated to an extent that corresponds to the Group's holding in the company. Losses are eliminated in the same manner as gains, but are treated as an indicator of impairment.

Foreign currencies**Transactions in foreign currencies**

Transactions in foreign currencies are translated to the functional currency at the exchange rate on the day of the transaction. On the balance sheet date, monetary assets and liabilities in foreign currencies are translated to the functional currency at the exchange rate applicable on that day. Exchange rate differences arising from translation of currencies are reported in the income statement. Operationally derived exchange gains and losses are shown under Other operating income and Other operating expenses, respectively. Financially derived exchange gains and losses are shown as Financial income and Financial expenses, respectively.

Financial reporting of foreign activities

Assets and liabilities of foreign activities, including goodwill and other consolidated surplus and deficit values, are translated to SEK at the exchange rate in effect on the balance sheet date. Income and expenses of foreign activities are translated to SEK using an average exchange rate. Translation differences arising from foreign currency translation of foreign activities are reported in Other comprehensive income.

For the Vattenfall Group, key exchange rates applied in the accounts are provided in Note 5 to the consolidated accounts, Exchange rates.

Important estimations and assessments in the preparation of the financial statements

Preparation of the financial statements in accordance with IFRS requires the company's executive management and Board of directors to make estimations and assessments as well as to make assumptions that affect application of the accounting policies and the reported amounts of assets, liabilities, income and expenses. These estimations and assessments are based on historic experience and other factors that seem reasonable under current conditions. The results of these estimations and assessments are then used to establish the reported values of assets and liabilities that are not otherwise clearly documented from other sources. The final outcome may deviate from the results of these estimations and assessments. The estimations and assessments are revised on a regular basis. The effects of changes in estimations are reported in the period in which the changes were made if the changes affected this period only or in the period the changes were made and future periods if the changes affect both the current period and future periods.

Important estimations and assessments are described further in the following notes to the consolidated accounts:

- Note 13 Income taxes
- Note 16 Intangible assets: non-current
- Note 17 Property, plant and equipment
- Note 28 Assets held for sale
- Note 30 Pension provisions
- Note 31 Other interest-bearing provisions

Note 4 Acquired and divested operations**Acquired operations****Acquisitions 2019**

End of February 2019, Vattenfall finalized the acquisition of the Dutch electricity and gas sales company DELTA Energie. DELTA Energie supplies green electricity and gas to households and small and medium-sized companies, mainly in the Dutch province Zeeland. The company has 120 employees and 170,000 customers.

End of March 2019, Vattenfall finalized the acquisition of the Dutch company Senfal. Senfal is a company that offers innovative software services to large industrial customers, wind and solar farms and owners of large batteries.

In addition to the operations mentioned above Vattenfall has acquired a number of wind and solar project companies that are currently in a pre-construction stage.

The total purchase consideration paid was SEK 754 million and total assets acquired was SEK 1,135 million whereof SEK 1,109 million pertains to intangible assets.

Acquisitions 2018

In 2018, no major acquisitions of operations were made by Vattenfall.

Divested operations**Divestments in 2019**

On 2nd of September 2019, Vattenfall finalized the divestment of the district heating in Hamburg to the City of Hamburg. The transaction was based on the decision taken by the City of Hamburg in October 2018 to exercise its option to acquire Vattenfalls shareholding of 74.9% in the company. The consideration received amounts to EUR 634 million including interest.

	2019
Intangible assets: non-current	1
Property, plant and equipment	4,819
Participations in associated companies and joint arrangements	4
Other shares and participations	6
Deferred tax assets	513
Other non-current assets	552
Inventories	278
Trade receivables and other receivables	587
Current tax assets	27
Cash and cash equivalents	3,579
Borrowings	-10
Pension provisions	-4,021
Other interest-bearing provisions	-571
Deferred tax liabilities	-232
Trade payables and other liabilities	-1,823
Current tax liabilities	-97
Total net assets	3,612
Proceeds from sales/Cash flow for the year	6,703
Cash flow for the year	6,703
Capital gain (+)/loss (-) recognised in the income statement	3,091

Divestments in 2018

In January 2018 Vattenfall divested Forst Briesnig, a small onshore wind project in Germany. In March 2018, 100% of the shares were sold in Vattenfall Europe Netcom GmbH, a provider of telecommunication services based in Germany. In October 2018, Vattenfall sold 70% of the shares in Blakliden/Fäbodberget onshore wind farms in Sweden. Together with the partners, Vattenfall has joint control over the project and will classify Blakliden/Fäbodberget as a joint venture.

Total net assets divested in 2018 amount to SEK 88 million. The effect on cash flow for the year was SEK 99 million. A capital gain of SEK 316 million was recognised, which includes revaluation of remaining holdings of Blakliden/Fäbodberget in accordance with IFRS 10, Consolidated Financial Statements.

Note 5 Exchange rates

Key exchange rates applied in the accounts of the Vattenfall Group:

	Currency	Average rate		Balance sheet date rate	
		2019	2018	31 December 2019	31 December 2018
Euro countries	EUR	10.5572	10.2591	10.4468	10.2548
Denmark	DKK	1.4140	1.3765	1.3982	1.3733
UK	GBP	12.0391	11.5785	12.2788	11.4639
USA	USD	9.4180	8.6988	9.2993	8.9562

Note 6 Net sales

Accounting policy

Net sales include revenue from sales and distribution of electricity and heat, sales of gas, energy trading and other revenues such as service and consulting assignments and connection fees. Significant judgements are made in relation to timing of recognition of connection fees.

Vattenfall offers customers discounts and bonuses on sales of electricity, gas and heat through various campaigns. Various types of discounts and bonuses are offered from country to country. Vattenfall recognises discounts and bonuses when the performance obligation to the customer is satisfied, which in general is when the electricity, gas or heat has been delivered to the customer.

Various sales channels are used to sell Vattenfall's products, which gives rise to different types of costs associated with sales activities. These costs to obtain a contract related to revenues from contracts with customers are shown in Note 16 to the consolidated accounts, Intangible assets: non-current. The amortisation schedule depends on the contract duration.

Sales and distribution of electricity, heat and gas

Sales of electricity, heat and gas and related distribution are recognised as revenue at the time of delivery, excluding value-added tax and excise taxes. Depending on the system for metering of consumption, Vattenfall invoices either based on expected consumption, with a reconciliation when the readout takes place, or based on actual consumption.

Vattenfall's electricity transactions between Nordic electricity generation and sales activities in the Nordic countries are transactions vis-à-vis the Nordic electricity exchange. The purchases that the sales activities make from the Nordic electricity exchange are, at the Group level, offset against sales of generation to the Nordic electricity exchange.

Connection fees

Distribution and Heat are responsible for physical connections of the respective distribution networks to houses and buildings. The fee for the physical connection is paid by the customer when the connection is established. Revenue from connection fees is recognised over time since

Vattenfall handles maintenance and repairs of the assets used in the physical connection, which is satisfied over time. The basis for revenue recognition of connection fees is the useful life of the underlying assets.

Vattenfall recognises revenues from contracts with customers and other revenues through profit or loss.

	2019	2018
Sales of electricity	102,028	91,107 ¹
Sales of gas	18,458	17,212
Sale of heat and steam	13,315	13,315
Distribution	15,975	15,951
Sale of service and consulting services	5,999	5,783
Total revenues from contracts with customers	155,775	143,368
Other revenues	10,585	8,723
Total	166,360	152,091

Revenue from contracts with customers is recognised when the performance obligation is satisfied, but the payment recognised may not match the revenue for the period. This results in the recognition of contract assets and contract liabilities.

Contract balances	2019	2018
Contract assets	188	214
– of which, released as cost from opening balance during the year	445	446
Contract liabilities	8,462	7,935
– of which, released as revenue from opening balance during the year	781	577

¹) Due to changed presentation of transactions related to Renewable Obligation Certificates and due to netting of certain commodity trading contracts in order to better reflect the substance of these transactions, Net sales and Cost of purchases for the comparative periods have been adjusted, with no effect on EBITDA. Please see note 2 to the consolidated accounts.

Note 7 Operating segments

Accounting policy

An operating segment is a component of the Group that engages in business activities from which it may earn revenues and incur expenses and for which discrete financial information is available. An operating segment's result is reviewed regularly by "the chief operating decision maker", who in Vattenfall is the Chief Executive Officer, to assess its performance and to make decisions about resources to be allocated to the operating segment.

Financial information

Vattenfall is organised in six Business Areas: Customers & Solutions, Generation, Markets, Wind, Heat, and Distribution. The aim with the organisational structure is to increase the Group's business and performance focus, and to capitalise on cross-border synergies. The segment reporting corresponds with Vattenfall's organisational structure.

Areas of responsibility for the operating segments

The Customers & Solutions operating segment is responsible for sales of electricity, gas and energy services in all of Vattenfall's markets.

The Power Generation operating segment comprises the Generation and Markets Business Areas. The segment includes Vattenfall's hydro and

nuclear power operations, maintenance services business, and optimisation and trading operations, including certain large business customers. The Wind operating segment is responsible for development, construction and operation of Vattenfall's wind farms as well as large-scale and decentralised solar power and batteries.

The Heat operating segment comprises Vattenfall's heat business (district heating and decentralised solutions) and gas- and coal-fired condensing plants.

The Distribution operating segment comprises Vattenfall's electricity distribution operations in Sweden, Germany (Berlin) and the UK.

Staff Functions and Shared Service Centres

A number of Group-wide Staff Functions direct, administrate and support the business activities. The Staff Functions are centrally placed within the organisation as a whole and in the Business Areas. Shared Service Centres (Shared Services) focus on transaction-related processes and are an integral part of Vattenfall's business activities. Shared Services are led with a focus on efficiency and utilisation of scale economies. Staff Functions and Shared Services are reported under the heading Other.

	External net sales		Internal net sales		Total net sales	
	2019	2018	2019	2018	2019	2018
Customers & Solutions	87,343	78,883	2,516	2,435	89,859	81,318
Power Generation	38,425	33,608⁴	63,953²	63,906^{2,4}	102,378	97,514⁴
Wind	6,578	5,726⁴	6,914	3,849	13,492	9,575⁴
Heat	15,947	15,828	15,456	18,142	31,403	33,970
Distribution	17,903	17,845	4,637	4,529	22,540	22,374
– of which, Distribution Germany	6,498	6,265	4,156	4,053	10,654	10,318
– of which, Distribution Sweden	11,288	11,462	509	493	11,797	11,955
Other¹	164	201	5,392	5,054	5,556	5,255
Eliminations	–	–	-98,868	-97,915	-98,868	-97,915
Total	166,360	152,091	–	–	166,360	152,091

	Operating profit before depreciation, amortisation and impairment losses (EBITDA)		Underlying operating profit before depreciation, amortisation and impairment losses	
	2019	2018	2019	2018
Customers & Solutions	2,976	2,650	3,021	2,663
Power Generation	13,642	10,170	19,207	12,830
Wind	9,645	8,277	9,620	8,328
Heat	4,957	4,071	4,409	4,448
Distribution	8,236	9,260	8,248	9,292
- of which, Distribution Germany	2,175	1,923	2,189	1,957
- of which, Distribution Sweden	6,018	7,299	6,016	7,297
Other¹	3,097	-90	-457	-1,095
Eliminations	-108	3	-108	3
Total	42,445	34,341	43,940	36,469

	Operating profit (EBIT)		Underlying operating profit	
	2019	2018	2019	2018
Customers & Solutions	1,157	1,139	1,337	1,269
Power Generation	9,870	6,711	15,437	9,371
Wind	3,603	3,681	4,155	3,747
Heat	354	393	550	771
Distribution	4,986	6,218	4,998	6,250
- of which, Distribution Germany	1,118	950	1,132	985
- of which, Distribution Sweden	3,858	5,257	3,856	5,254
Other¹	2,279	-526	-1,274	-1,528
Eliminations	-108	3	-108	3
Total	22,141	17,619	25,095	19,883

	2019	2018
Underlying operating profit	25,095	19,883
Items affecting comparability (for specification, see page 83)	-2,954	-2,264
Financial income and expenses	-3,819	-3,616
Profit before income taxes	18,322	14,003

	Investments		Assets	
	2019	2018	2019	2018
Customers & Solutions	1,548	785	52,616	51,016
Power Generation	3,439	3,759	290,112	305,567
Wind	9,245	5,626	85,453	67,505
Heat	5,079	5,125	94,478	106,745
Distribution	7,163	6,554	65,662	61,900
- of which, Distribution Germany	1,951	1,735	18,202	16,278
- of which, Distribution Sweden	5,068	4,717	46,866	45,180
Other¹	12,066	127	184,490	168,124
Eliminations	-11,707	-63	-322,031³	-298,249³
Total	26,833	21,913	450,780	462,608

¹ "Other" pertains mainly to all Staff functions including treasury activities and Shared Service Centres.

² Pertains mainly to Tradings' sales of electricity, fuel and CO2 emission allowances to other segments within Vattenfall.

³ Chiefly concerns Tradings' liquid assets and financial receivables from other operating segments.

⁴ Due to changed presentation of transactions related to Renewable Obligation Certificates and due to netting of certain commodity trading contracts in order to better reflect the substance of these transactions, Net sales and Cost of purchases for the comparative periods have been adjusted, with no effect on EBITDA. Please see note 2 to the consolidated accounts.

Note 8 Information about geographical areas

	External net sales		Internal net sales		Total net sales	
	2019	2018	2019	2018	2019	2018
Sweden	52,455	47,785	14,785	8,677	67,240	56,462
Germany	77,215	72,626 ¹⁾	53,696	56,156	130,911	128,782 ¹⁾
Netherlands	29,493	26,204	22,985	38,713	52,478	64,917
Other countries	7,198	5,476 ¹⁾	5,558	3,626	12,756	9,102 ¹⁾
Eliminations	-1	-	-97,024	-107,172	-97,025	-107,172
Total	166,360	152,091	-	-	166,360	152,091

	Operating profit (EBIT)		Underlying operating profit		Intangible assets: non-current, property, plant and equipment and investment property	
	2019	2018	2019	2018	2019	2018
Sweden	16,580	13,085	17,449	16,177	128,036	119,086
Germany	4,279	2,155	5,739	1,456	71,268	70,147
Netherlands	293	1,235	496	1,098	38,284	35,541
Other countries	993	1,144	1,416	1,152	37,813	32,109
Eliminations	-4	-	-4	-	34	-
Total	22,141	17,619	25,096	19,883	275,435	256,883

¹⁾ Due to changed presentation of transactions related to Renewable Obligation Certificates and due to netting of certain commodity trading contracts in order to better reflect the substance of these transactions, Net sales and Cost of purchases for the comparative periods have been adjusted, with no effect on EBITDA. Please see note 2 to the consolidated accounts.

Note 9 Impairment losses and reversed impairment losses**Accounting policy****General principles**

Assessments are made throughout the year for any indication that an asset may have decreased in value. If there is an indication of this kind, the asset's recoverable amount is estimated. For goodwill and other intangible assets with an indefinite useful life and for intangible assets that are still not ready for use, the recoverable amount is calculated at least annually or as soon as there is an indication that an asset has decreased in value.

If the essentially independent cash flow for an individual asset cannot be established for the assessment of any need for impairment, the assets must be grouped at the lowest level where it is possible to identify the essentially independent cash flow (a so-called cash-generating unit). An impairment loss is reported when an asset or cash-generating unit's reported value exceeds the recoverable amount. Any impairment loss is recognised in profit or loss. Impairment of assets attributable to a cash-generating unit is allocated primarily to goodwill. Thereafter, a proportional impairment loss is conducted of other assets that are part of the unit.

Calculation of the recoverable amount

The recoverable amount is the higher of fair value less costs to sell and value in use. When calculating value in use, the future cash flow is discounted by a discounting rate that takes into consideration risk-free interest and the risk associated with the specific asset.

Reversal of impairment losses

Impairment of goodwill is never reversed. Impairment of other assets is reversed if a significant and lasting change has occurred in the assumptions that formed the basis for the calculation of the recoverable amount. An impairment loss is reversed only if the asset's carrying amount after reversal does not exceed the carrying amount that the asset would have had if the impairment loss had not been recognised.

Financial information**Process for impairment testing**

The main assumptions that executive management has used in calculating projections of future cash flows in cash-generating units with finite useful lives are based on forecasts of the useful life of the respective assets. The projected cash flows are based on market prices and on Vattenfall's long-term market outlook. The long-term market outlook is based on internal and external input parameters and is benchmarked against external price projections. Based on the price assumptions, the dispatch of the power plants is calculated, taking technical, economic and legal constraints into consideration. Technical flexibility of the assets, that is the ability to adapt generation to changes in spot market prices, has been taken into account. Cash flow projections of other cash-generating units are based on the business plan for the coming five years, after

which their residual value is taken into account, based on a growth factor of 0%–0.5% (0%–0.5%). If the final year of the business plan horizon does not represent reasonable basis for assessing long-term value, an extended forecast may be required to arrive at a steady-state earnings situation on which to calculate the terminal value.

Future cash flows have been discounted to value in use using the following discount rates:

	2019		2018	
	Before tax	After tax	Before tax	After tax
Discount rate regulated business, %	5.3	4.1	4.8-6.1	3.8-4.7
Discount rate non-regulated business, %	5.8-8.9	4.5-6.9	6.6-9.4	4.9-7.0

The discount rate varies for the various asset classes, depending on their risk. When setting the discount rate for non-regulated business, consideration has been given to the extent of exposure this has for changes in wholesale prices of electricity, fuel, CO₂ emission allowances, and regulatory risks. An increase in the discount rate by 0.5 percentage points would give rise to a SEK 4 billion impairment need under value in use, but render no need to recognise additional impairment losses in a fair value less cost to sell valuation.

Electricity prices and margins for generation assets represent another major value driver. Electricity prices are relevant for hydro and nuclear power plants, while the most important production margins are the "clean spark spread" for gas-fired power plants and the "clean dark spread" for hard coal-fired power plants. Those spreads include electricity prices as well as the respective cost for fuel and CO₂ emission allowances to produce the electricity, considering fuel type and efficiency factors. Based on the assumptions used in the impairment testing, a decrease in future electricity prices by 5%, with unchanged costs for fuel and CO₂ emission allowances, would lead to a decrease in the value of fossil-based assets in Germany and the Netherlands. For gas-fired assets in the Netherlands, this would result in a 25% value reduction and for coal fired condensing assets in Germany, the corresponding figure would be 20%. The latter would lead to recognition of further impairment losses of approximately SEK 1 billion (all else equal). For other assets, such a decrease in electricity prices would not lead to any impairment.

Vattenfall has performed impairment testing by calculating the recoverable amount of the cash-generating units. The structure of the cash-generating units, which represent the smallest group of identifiable assets that generate continuous cash inflows that are largely independent of other assets or groups of assets, is based on the Group's Business Area structure.

Vattenfall closely monitors market developments on a continuous basis and their impact on operations.

Goodwill is not amortised but is instead tested annually for impairment. Impairment testing of goodwill is included in the impairment testing process described above.

In addition to the regular impairment test for the Cash Generating Units, Vattenfall recognises impairment losses for individual assets if these are planned to be divested and the expected consideration is below the carrying amount. Furthermore, shareholdings in associated companies for which the equity method is applied are outside a Cash Generating Unit and thus tested for an impairment need on an individual basis.

Impairment losses 2019

The result of above described impairment test process in 2019 was that no impairments on assets in the Cash Generating Units had to be made. Moreover, no previously recognised impairment losses were reversed in the income statement in 2019.

Outside the regular impairment test impairments in an amount of SEK 1,459 million were recognised, whereof SEK 747 million pertains to power plants in BA Heat, SEK 265 million to assets that are subject to a divest plan in BA Wind and SEK 230 million to write-downs of investment cost for a project in BA Wind. Further smaller impairments relate to asset in BA Heat, BA Customers & Solutions and a shareholding in an associated company in BA Wind.

Impairment losses 2018

Impairment losses charged against operating profit in 2018 amounted to SEK 136 million. Of this total, SEK 117 million is attributable to the Customers & Solutions operating segment.

Note 10 Other external expenses

	2019	2018
Purchased services	10,545	10,351
IT expenses	2,012	1,950
Consulting expenses	3,864	3,795
Non-capitalised lease expenses	484	1,090
Marketing and selling expenses	1,454	1,209
Expenses related to provisions	3,760	477
Other	556	503
Total	22,675	19,375

Note 11 Financial income

Accounting policy

Interest income is reported as it is earned. The calculation is made on the basis of the return on underlying assets in accordance with the effective interest method. Dividend income is reported when the right to receive payment is established. Interest income is adjusted for transaction costs and any rebates, premiums and other differences between the original value of the receivable and the amount received when due.

Financial information

	2019	2018
Return from the Swedish Nuclear Waste Fund	2,252	2,030
Interest income attributable to investments	226	513
Net change in value from remeasurement of derivatives	146	264
Dividends	70	74
Capital gains from divestments of shares and participations	9	6
Total	2,703	2,887

Note 12 Financial expenses

Accounting policy

For calculation of interest effects attributable to provisions, various discount rates have been used, see Note 30 to the consolidated accounts, Pension provisions, and Note 31 to the consolidated accounts, Other interest-bearing provisions, for the discount rates used. Issue costs and similar direct transaction costs for raising loans are distributed over the term of the loan in accordance with the effective interest method. Borrowing costs directly attributable to investment projects in non-current assets which take a substantial period of time to complete are not reported as a financial expense but are included in the cost of the non-current asset during the construction period. Leasing fees pertaining to finance leases are distributed between interest expense and amortisation of the outstanding debt. Interest expenses are distributed over the leasing period so that each accounting period is charged in the amount corresponding to a fixed interest rate for the reported debt in each period. Variable fees are carried as an expense in the period in which they arise.

Financial information

	2019	2018
Interest expenses attributable to loans	3,126	3,206
Interest effects attributable to provisions	2,297	2,239
Interest expenses for the net of pension provisions and plan assets	871	844
Exchange rate differences, net	225	214
Capital losses from divestments of shares and participations	3	—
Total	6,522	6,503

Note 13 Income taxes

Accounting policy

Income taxes comprises current tax and deferred tax. Income tax is reported in the income statement except when the underlying transaction is reported in Other comprehensive income or in Equity, whereby also the associated tax effect is reported in Other comprehensive income and Equity, respectively.

Current tax is tax to be paid or received for the current year, with the application of the tax rates that are established or, established in practice as of the balance sheet date. Adjustments of tax paid attributable to previous periods are also included in this.

Deferred tax is calculated in accordance with the balance sheet method on the basis of temporary differences between the reported and taxable values of assets and liabilities. The valuation of deferred tax is based on how the reported value of assets or liabilities is expected to be realised or settled. Deferred tax is calculated in accordance with the tax rates and tax rules that have been established or have been established in practice by the balance sheet date.

Deferred tax assets concerning non-deductible temporary differences and tax-loss carryforwards are only reported to the extent that it will be possible for these to be used. The value of deferred tax assets is reduced when it is no longer considered likely that they can be used.

Important estimations and assessments

On its balance sheet, Vattenfall reports deferred tax assets and liabilities that are expected to be realised in future periods. In calculating these deferred taxes, certain assumptions and estimations must be made. The estimations include assumptions about future taxable earnings, that applicable tax laws and tax rates will be unchanged in the countries in which the Group is active, and that applicable rules for utilising tax-loss carryforwards will not be changed. The Group also reports future expenses arising out of ongoing tax audits or tax disputes under Provisions. The outcome of these may deviate from the estimations made by Vattenfall.

Financial information**Break down of the reported income tax**

	2019	2018
Current tax expense (-)/ tax income (+)		
Current taxes pertaining to the period:		
Sweden	-2,221	-1,449
Germany	-776	-601
Netherlands	-56	-267
Other countries	-23	-269
Adjustment of current tax for prior periods:		
Sweden	16	-9
Germany	-804	831
Netherlands	-39	58
Other countries	70	-7
Total current tax	-3,833	-1,713
Deferred tax expense (-)/ tax income (+)		
Sweden	-789	-149
Germany	1,166	145
Netherlands	182	-359
Other countries	-187	80
Total deferred tax	372	-283
Total income tax expense	-3,461	-1,996

The difference between the nominal Swedish tax rate and the effective tax rate

	2019		2018	
	%		%	
Profit before tax		18,322		14,003
Swedish income tax rate at 31 December	21.4	-3,921	22.0	-3,081
Difference in tax rate in foreign operations	1.2	-226	0.1	-7
Tax adjustments for previous periods	3.0	-553	-3.9	539
Revaluation of previously non-valued losses and other temporary differences	-0.4	78	-0.9	119
Tax-loss carryforwards from current year that are not valued	0.2	-45	0.4	-50
Other non-taxable income	-1.9	356	-1.3	181
Other non-deductible expenses	1.1	-206	2.0	-275
Capital gains	-5.0	922	0.0	-
Participations in the results of associated companies	0.0	9	-2.0	281
Changed tax rates ¹⁾	-0.7	125	-2.1	297
Effective tax rate	18.9	-3,461	14.3	-1,996

¹⁾ Of which SEK 35 million (573) relates to a decrease of the deferred tax liability due to the reduction of the Swedish income tax rate as of 1 January 2021 and SEK 88 million (-281) to an increase of the deferred tax asset due to the change of the Netherlands income tax rate as of 1 January 2021.

Balance sheet reconciliation of current tax

	2019	2018
Balance brought forward net asset (+)/ net liability (-)	1,575	-679
Translation differences, acquisitions, disposals and assets held for sale	98	-1
Interest and discounting effects on non-current tax items	18	1
Change via income statement	-3,833	-1,713
Tax effect through equity ¹⁾	275	269
Taxes paid, net	1,528	3,698
Balance carried forward net asset (+)/ net liability (-)	-339	1,575

¹⁾ Of which, equity hedge amounts to SEK 479 million (250).

Break down of the deferred tax

	2019	2018
Non-current assets	-28,339	-25,454
Current assets	-4,208	-9,732
Provisions	21,897	19,361
Other non-current liabilities	2,045	1,570
Current liabilities	6,323	10,953
Cash flow hedges	741	-1,085
Tax losses carried forward	1,411	987
Total	-130	-3,400

Accumulated tax-loss carryforwards

	2019	2018
Sweden	33	56
Germany	12,415	11,341
Netherlands	84	83
Other countries	1,173	1,208
Total	13,705	12,688

The tax-loss carryforwards fall due as follows:

	2019
2019	8
2020-2023	52
2024 and beyond	38
No time limit	13,607
Total	13,705

The tax-loss carryforwards correspond to a potential deferred tax asset of SEK 2,647 million, of which SEK 1,411 million is booked on the balance sheet as of 31 December 2019. Tax-loss carryforwards not included in the computation of deferred tax represent a tax value of SEK 1,236 million and pertain mainly to loss carryforwards in German operations. These have not been assigned any value, since it is unclear at present whether it will be possible to use them.

Note 14 Leasing**Accounting policy**

A right-of-use asset along with a lease liability is recognised on the balance sheet for all lease contracts except for leases for which the underlying asset is of low value or if the contract duration is 12 months or less.

The right-of-use-asset is initially measured at cost, which comprises the initial amount of the lease liability adjusted for any lease payments made at or before the commencement date, plus any initial direct cost incurred and an estimate of costs to dismantle and remove the underlying asset.

The right-of-use asset is subsequently depreciated using the straight-line method from the commencement date to the earlier of the end of the useful life of the right-of-use asset or the end of the lease term.

The lease liability is initially measured at the present value of the lease payments outstanding at the commencement date, discounted using Vattenfall's incremental borrowing rate, which is updated by the Treasury department twice a year.

Lease payments included in the measurement of the lease liability comprise:

- Fixed payments
- Variable lease payments that depend on an index or rate
- Amounts expected to be payable under a residual value guarantee; and
- The exercise price under a purchase option that the Group is reasonably certain to exercise, lease payments in an optional renewal period, if the Group is reasonably certain to exercise an extension option, and penalties for early termination of a lease unless the Group is reasonably certain not to terminate early.

Right-of-use-assets	Land	Buildings	Vehicles	Other	Total
Balance as of 1 January	1,900	1,931	326	452	4,609
Depreciation for the year	-95	-443	-125	-185	-848
Additions to the right of use asset during the year	48	247	135	100	530
Other changes to the right of use asset during the year	213	-41	-11	8	169
Balance carried forward	2,066	1,694	325	375	4,460

Lease liability development

Balance as of 1 January	4,609
Additions to the liability	530
Repayment of the liability	-797
Other changes	212
Balance carried forward	4,554

Total leasing related cash-outflows amounted to 901 MSEK in 2019 of which 104 MSEK is related to interest expenses.

Maturity analysis – contractual undiscounted cash flows

< 1 year	884
1 - 5 years	2,131
> 5 years	2,557
Total as of 31 December 2019	5,572

Lease payments amounting to 484 MSEK have not been capitalized as a result of the practical expedients relating to short-term contracts and low value items or because they related to variable components of contracts. As of 31 December 2019, Vattenfall has signed contracts, which have yet not commenced with a corresponding lease liability amounting to 775 MSEK in the year of commencement.

Leasing revenues**As a lessor**

Certain Group companies own and operate power facilities on behalf of customers. Revenues from customers are broken down into two components – a fixed component to cover capital expenses and a variable component based on the quantity delivered. On 31 December 2019, cost of assets reported under operating leases amounted to SEK 5,493 million (5,957). Accumulated depreciation amounted to SEK 3,500 million (3,787) and accumulated impairment losses amounted to SEK 232 million (318).

Vattenfall is applying the practical expedient related to low value leases and short term leases. These contracts will be expensed directly.

Assets leased out under finance leases are not reported as property, plant and equipment, since the risks associated with ownership are transferred to the lessee. Instead, a financial receivable is entered for the future minimum lease payments.

Assets leased out under operating leases are reported as property, plant and equipment and are subject to depreciation.

Leased Property plant and equipment**As a lessee**

Vattenfall leases different assets, including but not limited to land within BA Wind, office buildings, vehicles and other. More detailed information on leases for which Vattenfall is a lessee is presented below.

Future payments for this type of facility are broken down as follows:

	Operating leasing
2020	1,108
2021	1,077
2022	1,020
2023	992
2024	963
2025 and beyond	1,092
Total	6,252

Note 15 Auditors' fees

	2019	2018
Annual audit assignment		
EY	42	39
Audit-related activities besides the annual audit assignment		
EY	11	4
Tax consulting		
EY	–	–
Other assignments		
EY	28	26

Note 16 Intangible assets: non-current**Accounting policy****Goodwill**

Goodwill is measured at cost less any accumulated impairment losses. Goodwill is not subject to amortisation but is tested at least annually for impairment. Goodwill that arises on acquisition of associated companies or joint ventures is included in the carrying amount of Participations in associated companies and joint ventures.

Other Intangible non-current assets

Other Intangible non-current assets such as concessions, patents, licences, trademarks and similar rights as well as renting rights, and similar rights are reported at cost less accumulated amortisation and impairment losses.

Principles for amortisation

Amortisation of Intangible non-current assets other than goodwill is reported on a straight-line basis in the income statement over the estimated useful life of the asset, provided the useful life is not indefinite.

Important estimations and assessments

Intangible assets are tested for impairment in accordance with the accounting policies described in Note 9 to the consolidated accounts, Impairment losses and reversed impairment losses. The recoverable amount for cash-generating units is determined by calculating the value in use or fair value less costs to sell. For these calculations, certain estimations must be made regarding future cash flows along with other adequate assumptions regarding the required rate of return, for example.

Financial information

2019

	Develop- ment costs	Goodwill	Concessions and similar rights with finite useful lives	Costs to obtain a contract	Renting rights and similar rights with finite useful lives	Total
Cost						
Cost brought forward	2,271	44,682	18,117	1,222	178	66,470
Acquired companies	–	–	1,337	17	–	1,354
Investments	259	–	161	611	1	1,032
Transfer from development projects in progress	-1	–	2	–	–	1
Divestments/disposals	-3	–	-126	-80	-11	-220
Reclassifications	–	–	1	–	–	1
Assets held for sale	-3	–	-1	–	–	-4
Translation differences	24	860	380	21	2	1,287
Accumulated cost carried forward	2,547	45,542	19,871	1,791	170	69,921
Amortisation according to plan						
Amortisation brought forward	-1,769	–	-12,627	-604	-46	-15,046
Acquired companies	–	–	-172	–	–	-172
Amortisation for the year	-50	–	-1,224	-476	-4	-1,754
Divestments/disposals	3	–	10	80	11	104
Reclassifications	–	–	-1	–	–	-1
Assets held for sale	3	–	1	–	–	4
Translation differences	-24	–	-216	-10	-1	-251
Accumulated amortisation according to plan carried forward	-1,837	–	-14,229	-1,010	-40	-17,116
Impairment losses						
Impairment losses brought forward	-212	-30,891	-2,129	-35	-76	-33,343
Impairment losses for the year	–	-45	-89	–	–	-134
Divestments/disposals	–	–	84	–	–	84
Translation differences	–	-601	-75	-1	–	-677
Accumulated impairment losses carried forward	-212	-31,537	-2,209	-36	-76	-34,070
Residual value according to plan carried forward	498	14,005	3,433	745	54	18,735
Advance payments to suppliers						–
Total						18,735

2018

	Develop- ment costs	Goodwill	Concessions and similar rights with finite useful lives	Costs to obtain a contract	Renting rights and similar rights with finite useful lives	Total
Cost						
Cost brought forward	2,194	43,356	17,345	941	831	64,667
Acquired companies	–	-89	–	–	–	-89
Investments	75	–	151	505	1	732
Transfer from development projects in progress	-4	–	–	–	–	-4
Divestments/disposals	–	-258	-7	-315	-9	-589
Reclassifications	-34	-119	27	52	-619	-693
Assets held for sale	-15	–	-29	–	-31	-75
Divested companies	–	–	-31	–	–	-31
Translation differences	55	1,792	661	39	5	2,552
Accumulated cost carried forward	2,271	44,682	18,117	1,222	178	66,470
Amortisation according to plan						
Amortisation brought forward	-1,701	–	-11,172	-512	-189	-13,574
Amortisation for the year	-45	–	-1,092	-371	-5	-1,513
Divestments/disposals	–	–	5	315	9	329
Reclassifications	16	–	3	-15	112	116
Assets held for sale	15	–	29	–	31	75
Divested companies	–	–	26	–	–	26
Translation differences	-53	–	-426	-21	-4	-504
Accumulated amortisation according to plan carried forward	-1,768	–	-12,627	-604	-46	-15,045
Impairment losses						
Impairment losses brought forward	-212	-30,032	-1,974	–	-583	-32,801
Impairment losses for the year	–	–	-82	-35	–	-117
Divestments/disposals	–	258	–	–	–	258
Reclassifications	–	119	–	–	507	626
Translation differences	–	-1,236	-73	–	–	-1,309
Accumulated impairment losses carried forward	-212	-30,891	-2,129	-35	-76	-33,343
Residual value according to plan carried forward	291	13,791	3,361	583	56	18,082

Contractual commitments for acquisitions of non-current intangible assets amounted to SEK 3 million (0) as per 31 December 2019.

Estimated useful life

Development costs	3–4 years
Concessions and similar rights	3–30 years
Costs to obtain a contract	1–6 years
Renting rights and similar rights	3–50 years

Estimated useful lives are unchanged compared with the preceding year.

Note 17 Property, plant and equipment**Accounting policy**

Property, plant and equipment are reported as assets on the balance sheet if it is likely that there will be future financial benefit for the company and the cost of the asset can be calculated in a reliable manner. Cost includes the purchase price and costs directly attributable to putting the asset in place and in a suitable condition for use in accordance with the management's intention of the acquisition. Examples of directly attributable expenses included in cost are delivery and handling, installation, land registration and consulting services. Borrowing costs directly attributable to investment projects in property, plant and equipment, which take a substantial period of time to complete, are included in the cost of the asset during the construction period.

In the nuclear power operations cost at the time of acquisition includes a calculated present value for estimated costs for dismantling and removing the plant and restoring the site where the plant is located. The equivalent estimated cost calculated on the basis of the present value is reported initially as a provision. The same principle applies for dismantling obligations in Vattenfall's Wind operations. See also Note 31 to the consolidated accounts, Other interest-bearing provisions.

Subsequent costs

Subsequent costs for property, plant and equipment are only added to the acquisition cost if it is likely that there will be future financial benefits associated with the asset for the company and the cost can be calculated in a reliable manner. All other subsequent costs are reported as

expenses in the period when they arise. What is decisive for the assessment when a subsequent cost is added to the acquisition cost is whether the cost concerns the replacement of identified components, or parts of them, whereby such costs are capitalised. Also in cases where new components are created, the cost is added to the cost of the asset. Any undepreciated reported values of replaced components, or parts of components, are retired and carried as an expense in connection with the replacement. Repairs and maintenance are expensed as incurred.

Depreciation principles

Depreciation is reported on a straight-line basis in the income statement over the estimated useful life of the asset. The Group applies component depreciation, which means that the components' estimated useful life provides the basis for the straight-line depreciation. Estimated useful life is described below in this note. Assessments of the residual value and useful life of an asset are conducted annually. Land and water rights are not subject to depreciation.

Important estimations and assessments

Property, plant and equipment are tested for impairment in accordance with the accounting policies described in Note 9 to the consolidated accounts. Impairment losses and reversed impairment losses. The recoverable amount for cash-generating units is determined by calculating the value in use or fair value less costs to sell. For these calculations, certain estimations must be made regarding future cash flows along with other adequate assumptions regarding the required rate of return, for example.

Financial information

2019

	Land and buildings ¹	Plant and machinery and other technical installations	Equipment, tools, fixtures and fittings	Construction in progress ²	Total
Cost					
Cost brought forward ³	56,072	463,347	12,436	30,591	562,446
Adoption of new accounting standard (IFRS 16)	3,832	–	778	–	4,610
Acquired companies	10	13	92	11	126
Investments ⁴	410	1,580	632	21,259	23,881
Reversed investments	–	–	–	-38	-38
Advance payments capitalised	–	–	–	85	85
Capitalised/reversed future expenses for decommissioning, restoration	20	4,947	–	–	4,967
Transfer from construction in progress	1,453	25,121	131	-26,703	2
Divestments/disposals	-697	-1,855	-999	-8	-3,559
Other reclassifications	97	–	1	–	98
Assets held for sale	-33	-1,939	-4	118	-1,858
Translation differences	614	6,481	203	505	7,803
Accumulated cost carried forward	61,778	497,695	13,270	25,820	598,563
Depreciation according to plan					
Depreciation brought forward	-25,577	-216,842	-9,149	–	-251,568
Acquired companies	–	-12	-54	–	-66
Depreciation for the year	-1,485	-14,608	-999	–	-17,092
Divestments/disposals	506	1,663	917	–	3,086
Other reclassifications	-16	–	–	–	-16
Assets held for sale	5	1,120	-1	–	1,124
Translation differences	-289	-2,929	-140	–	-3,358
Accumulated depreciation according to plan carried forward	-26,856	-231,608	-9,426	–	-267,890
Impairment losses					
Impairment losses brought forward	-3,638	-67,779	-423	-336	-72,176
Acquired companies	–	1	–	–	1
Impairment losses for the year	-11	-876	-80	-230	-1,197
Divestments/disposals	33	101	1	–	135
Other reclassifications	-4	–	–	–	-4
Assets held for sale	–	281	–	–	281
Translation differences	-56	-1,021	-7	-2	-1,086
Accumulated impairment losses carried forward	-3,676	-69,293	-509	-568	-74,046
Residual value according to plan carried forward	31,246	196,794	3,335	25,252	256,627
Advance payments to suppliers					73
Total					256,700

2018

	Land and buildings ¹	Plant and machinery and other technical installations	Equipment, tools, fixtures and fittings	Construction in progress ²	Total
Cost					
Cost brought forward ³	56,367	453,270	12,473	26,467	548,577
Acquired companies	–	–	1	–	1
Investments ⁴	44	1,557	297	22,022	23,920
Reversed investments	–	–	–	-95	-95
Advance payments capitalised	–	–	–	186	186
Capitalised/reversed future expenses for decommissioning, restoration	60	3,134	–	367	3,561
Transfer from construction in progress	1,260	15,305	218	-16,779	4
Divestments/disposals	-706	-2,381	-572	-1,592	-5,251
Other reclassifications	4	-10	-35	-8	-49
Assets held for sale	-2,071	-18,023	-318	-593	-21,005
Divested companies	–	-398	-36	-24	-458
Translation differences	1,114	10,893	408	640	13,055
Accumulated cost carried forward	56,072	463,347	12,436	30,591	562,446
Depreciation according to plan					
Depreciation brought forward	-25,896	-214,688	-8,977	–	-249,561
Depreciation for the year	-931	-13,482	-661	–	-15,074
Divestments/disposals	219	1,912	493	–	2,624
Other reclassifications	–	11	-11	–	–
Assets held for sale	1,708	14,333	271	–	16,312
Divested companies	–	305	33	–	338
Translation differences	-677	-5,234	-296	–	-6,207
Accumulated depreciation according to plan carried forward	-25,577	-216,843	-9,148	–	-251,568
Impairment losses					
Impairment losses brought forward	-3,813	-65,730	-402	-2,002	-71,947
Impairment losses for the year	-4	-15	–	–	-19
Divestments/disposals	301	78	-6	1,525	1,898
Assets held for sale	–	–	–	158	158
Divested companies	–	1	–	–	1
Translation differences	-122	-2,113	-16	-17	-2,268
Accumulated impairment losses carried forward	-3,638	-67,779	-424	-336	-72,177
Residual value according to plan carried forward	26,857	178,725	2,864	30,255	238,701
Advance payments to suppliers					100
Total					238,801

¹ Cost for land and buildings includes cost of land and water rights amounting to SEK 12,550 million (12,482), which are not subject to depreciation.

² Borrowing costs during the construction period have been reported as an asset in the amount of SEK 137 million (254) for the year. The average interest rate for 2019 was 2.55% for borrowings in SEK, 4.34% for borrowings in EUR and 4.80% for borrowings in GBP.

³ Government grants received, balance brought forward, amount to SEK 7,552 million (7,338).

⁴ Government grants received during the year amounted to SEK 237 million (192).

At 31 December 2019, contractual commitments for the acquisition of property, plant and equipment amounted to SEK 9,515 million (10,827).

Estimated useful life

Hydro power installations	5–50 years
Nuclear power installations	3–60 years
Combined heat and power installations	5–50 years
Wind power installations	10–25 years
Solar power installations	5–25 years
Distribution assets	10–35 years
Office and warehouse buildings and workshops	15–100 years
Office equipment	3–10 years

Estimated useful lives are unchanged compared to the preceding year.

Note 18 Shares and participations owned by the Parent Company Vattenfall AB and other Group companies**Shares and participations owned by Parent Company Vattenfall AB**

	Corporate Identity Number	Registered office	Number of shares 2019	Participation in % 2019	Carrying amount Parent Company	
					2019	2018
Sweden						
Borås Elhandel AB	556613-7765	Borås	1,000	100	100	100
Chlorout AB	556840-9253	Stockholm	500	100	–	–
Forsaströms Kraft AB	556010-0819	Åtvidaberg	400,000	100	48	48
Forsmarks Kraftgrupp AB	556174-8525	Östhammar	198,000	66	198	198
Försäkrings AB Vattenfall Insurance	516401-8391	Solna	200,000	100	524	524
Gotlands Energi AB	556008-2157	Gotland	112,500	75	13	13
InCharge AB	559178-6081	Stockholm	50,000	100	–	–
Klimatum AB	559030-1148	Borås	100	100	39	39
Produktionsbalans PBA AB	556425-8134	Stockholm	4,800	100	5	5
Ringhals AB	556558-7036	Varberg	248,572	70	379	379
Svensk Kärnbränslehantering AB	556175-2014	Solna	360	36 ¹	–	–
Vattenfall Biomass Liberia AB	556809-8809	Stockholm	3,317	100	–	–
Vattenfall Business Services Nordic AB	556439-0614	Stockholm	100	100	130	130
Vattenfall Computing Services AB	559217-9229	Stockholm	50,000	100	–	–
Vattenfall Elanläggningar AB	556257-5661	Solna	1,000	100	1	1
Vattenfall Eldistribution AB	556417-0800	Solna	8,000	100	38,000	38,000
Vattenfall France Holding AB	556815-4214	Stockholm	30,500	100	11	11
Vattenfall Kundservice AB	556529-7065	Umeå	100,000	100	30	30
Vattenfall Nuclear Fuel AB	556440-2609	Solna	100	100	96	96
Vattenfall PHEV Holding AB	556785-9383	Stockholm	1,000	100	–	–
Vattenfall Power Consultant AB	556383-5619	Stockholm	12,500	100	–	15
Vattenfall Power Management AB	556573-5940	Stockholm	6,570	100	12	12
Vattenfall Services Nordic AB	556417-0859	Stockholm	26,000	100	19	19
Vattenfall Vattenkraft AB	556810-1520	Stockholm	1,200	100	1	1
Vattenfall Vindkraft AB	556731-0866	Stockholm	1,000	100	14,000	14,000
Västerbergslagens Energi AB	556565-6856	Ludvika	14,674	51	15	15
Denmark						
Vattenfall A/S	213 11 332	Copenhagen	10,040,000	100	33	33
Vattenfall Energy Trading A/S	310 811 81	Copenhagen	500	100	49	49
Vindstød A/S	340 451 43	Århus	1,333,333	90 ²	60	37
Finland						
Vattenfall Sähkömyynti Oy	1842073-2	Helsinki	85	100	5	5
Germany						
Vattenfall GmbH	(HRB) 124048	Berlin	500,000,000	100	51,366	51,366
Poland						
Vattenfall IT Services Poland Sp.z.oo	0000402391	Gliwice	58,000	100	12	12
Netherlands						
Vattenfall N.V.	33292246	Amsterdam	136,794,964	100	44,138	44,138
Other countries						
Parc Eolien En Mer des Bancs de Flandre SAS	2018B02593	Boulogne Billancourt	53	1 ³	1	–
Vattenfall Wind Power Ltd	6205750	London	646,000,001	100	10,510	–
Vattenfall UK Sales Limited	05461926	London	104,000,400	100	288	288
Total					160,083	149,564

¹ The Group owns a further 30% via Forsmarks Kraftgrupp AB.² The remaining 10 % of the shares will be paid in two tranches: 2020 and 2022.³ The Group owns a further 79 % via Vattenfall Vindkraft AB

Larger shareholdings owned by other Group companies than the Parent Company Vattenfall AB

When calculating the participation percentages, consideration is taken for the non-controlling interests in the respective companies.

	Registered office	Participation in % 2019		Registered office	Participation in % 2019
Sweden			Netherlands		
Vattenfall Indalsälven AB	Bispgården	74	DELTA Energie B.V.	Middelburg	100
			Feenstra N.V.	Amsterdam	100
			Feenstra Verwarming B.V.	Lelystad	100
Denmark			Nuon Epe Gas Service B.V.	Amsterdam	100
Vattenfall Vindkraft A/S	Esbjerg	100	Nuon Storage B.V.	Amsterdam	100
Vattenfall Vindkraft Nørrekær Enge A/S	Esbjerg	100	Vattenfall Customers & Solutions Netherlands N.V.	Amsterdam	100
			Vattenfall Duurzame Energie N.V.	Amsterdam	100
Germany			Vattenfall Energy Sourcing Netherlands N.V.	Amsterdam	100
DanTysk Sandbank Offshore Wind GmbH & Co. KG	Hamburg	51	Vattenfall Energy Trading Netherlands N.V.	Amsterdam	100
Fernheizwerk Neukölln AG	Berlin	81	Vattenfall Klantenservice N.V.	Amsterdam	100
Kernkraftwerk Brunsbüttel GmbH & Co. oHG	Hamburg	67	Vattenfall Eemshaven B.V.	Amsterdam	100
Kernkraftwerk Krümmel GmbH & Co. oHG	Hamburg	50	Vattenfall Power Generation Netherlands B.V.	Amsterdam	100
MVR Müllverwertung Rugenberger Damm GmbH & Co. KG	Hamburg	55	Vattenfall Renewables NSW I B.V.	Amsterdam	100
Nuon Epe Gasspeicher GmbH	Gronau	100	Vattenfall Sales Nederland N.V.	Amsterdam	100
Stromnetz Berlin GmbH	Berlin	100	Vattenfall Warmte N.V.	Amsterdam	100
Vattenfall Energy Trading GmbH	Hamburg	100	Vattenfall Windpark Wieringermeer B.V.	Amsterdam	100
Vattenfall Europe Business Services GmbH	Hamburg	100	Vattenfall Windpark Wieringermeer EXT B.V.	Amsterdam	100
Vattenfall Europe Information Services GmbH	Hamburg	100	Zuidlob Wind B.V.	Amsterdam	100
Vattenfall Europe New Energy GmbH	Hamburg	100			
Vattenfall Europe New Energy Ecopower GmbH	Rostock	100	UK		
Vattenfall Europe Nuclear Energy GmbH	Hamburg	100	Aberdeen Offshore Wind Farm Ltd	Aberdeen	100
Vattenfall Europe Sales GmbH	Hamburg	100	I Supply Energy Ltd	Poole	100
Vattenfall Europe Windkraft GmbH	Hamburg	100	Kentish Flats Ltd	London	100
Vattenfall Smarter Living GmbH	Berlin	100	Nuon UK Ltd	Cornwall	100
Vattenfall Wärme Berlin AG	Berlin	100	Ormonde Energy Ltd	London	51
Vattenfall Heizkraftwerk Moorburg GmbH	Hamburg	100	Pen Y Cymoedd Wind Farm Ltd.	Cornwall	100
Vattenfall Wasserkraft GmbH	Berlin	100	Thanet Offshore Wind Ltd	London	100
			Vattenfall Wind Power Ltd	London	100

Subsidiaries with material non-controlling ownership interests**Forsmarks Kraftgrupp**

Forsmarks Kraftgrupp conducts nuclear power operations from three nuclear reactors in Östhammar municipality, Uppsala County. Forsmarks Kraftgrupp is owned by Vattenfall AB (66.0%) together with Mellansvensk Kraftgrupp AB (25.5%), with Fortum as the largest owner, and Sydkraft Nuclear Power AB (8.5%). The part-owners have a consortium agreement that regulates how the operations of Forsmarks Kraftgrupp are conducted and how decision-making is done. Forsmarks Kraftgrupp is reported as a Group company in the Vattenfall Group since Vattenfall has control over Forsmarks Kraftgrupp according to IFRS 10 – “Consolidated Financial Statements”.

Sales of the electric power that is generated are made on a pro rata basis to the part owners at cost, pursuant to the consortium agreement. In addition, the consortium agreement entails that the part owners are responsible for the company's funding on a pro rata basis, and that the company's operations shall in principle not generate any profit. Generation in 2019 amounted to 25.3 TWh (24.9), and the average availability for Forsmark was 88.9 % (88.1%).

Ringhals

Ringhals conducts nuclear power operations from four nuclear reactors on the Swedish west coast in Varberg municipality. Ringhals is owned by Vattenfall AB (70.4%) and Sydkraft Nuclear Power AB (29.6%). The part-owners have a consortium agreement that regulates how the operations of Ringhals are conducted and how decision-making is done. Ringhals is reported as a Group company in the Vattenfall Group since Vattenfall has control over Ringhals according to IFRS 10 – “Consolidated Financial Statements”.

Following is condensed financial information for Forsmarks Kraftgrupp, Ringhals and DanTysk Sandbank Offshore Wind:

Sales of the electric power that is generated are made on a pro rata basis to the part owners at cost, pursuant to the consortium agreement. In addition, the consortium agreement entails that the part owners are responsible for the company's funding on a pro rata basis, and that the company's operations shall in principle not generate any profit. Generation in 2019 amounted to 28.0 TWh (30.1), and the average availability for Ringhals was 86.7% (89.5%).

DanTysk Sandbank Offshore Wind

The DanTysk offshore wind farm, west of the island of Sylt (Germany) and just over the border with Denmark, was one of the first large marine wind farms built in the German North Sea. The wind farm comprises 80 wind turbines of 3.6 MW each with a total capacity of 288 MW. DanTysk began generating electricity in December 2014. The Sandbank wind farm comprises 72 wind turbines of 4 MW each with a total capacity of 288 megawatts. The wind farm is located 90 kilometres off the coast of Schleswig-Holstein (Germany), adjacent to DanTysk. Sandbank was inaugurated in 2017.

Both wind farms are part of the company DanTysk Sandbank Offshore Wind GmbH & Co. KG, in which Vattenfall Europe Windkraft GmbH owns 51% of the shares, and the partner Stadtwerke München holds 49% of the shares. Vattenfall has control over DanTysk Sandbank Offshore Wind in accordance with IFRS 10 – “Consolidated Financial Statements”.

	2019			2018		
	Forsmarks Kraftgrupp	Ringhals	DanTysk Sandbank Offshore Wind	Forsmarks Kraftgrupp	Ringhals	DanTysk Sandbank Offshore Wind
Income statements in summary						
Net sales	5,720	7,161	5,774	6,132	7,701	5,457
Profit for the year	762	1,416	2,575	936	1,711	2,582
– of which allocated to non-controlling interests	164	174	1,262	206	76	1,265
Balance sheets in summary						
Non-current assets	62,611	48,983	17,461	57,871	43,545	18,975
Current assets	4,362	4,253	1,037	4,813	4,074	1,082
Total assets	66,973	53,236	18,498	62,684	47,619	20,057
Equity	12,814	1,426	17,218	12,090	435	18,993
Liabilities	54,159	51,810	1,280	50,593	47,184	1,064
Total equity and liabilities	66,973	53,236	18,498	62,683	47,619	20,057
Statement of cash flows in summary						
Cash flow for the year	139	911	112	-64	356	-131

Note 19 Participations in associated companies and joint arrangements**Shares and participations owned by the Parent Company Vattenfall AB or by other Group companies**

	Corporate Identity Number	Registered office	Participation in % 2019	Carrying amount Group		Carrying amount Parent Company	
				2019	2018	2019	2018
Associated companies and joint ventures owned by the Parent Company Vattenfall AB							
Sweden							
BrainHeart Energy Sweden Holding AB ¹⁾	556813-3846	Stockholm	81	52	45	69	47
Hybrit Development AB	559121-9760	Stockholm	33	116	7	128	12
Norway							
NorthConnect KS	996625001	Kristiansand	33	68	42	68	42
NorthConnect AS	995878550	Kristiansand	30	10	6	8	6
Associated companies and joint ventures owned by other Group companies than the Parent Company Vattenfall AB							
Sweden							
Blakliden Fäbodberget Wind Holding AB	559148-3408	Solna	30	245	240	–	–
V ² Plug-In Hybrid Vehicle Partnership HB	969741-9175	Gothenburg	50	292	350	–	–
UK							
East Anglia Offshore Wind Ltd	06990367	Hexham	50	50	46	–	–
Germany							
Solytic GmbH	HRB 190395 B	Berlin	20	15	25	–	–
DOTI Deutsche Offshore-Testfeld- und Infrastruktur-GmbH & Co. KG	HRA 200395	Oldenburg	26	106	116	–	–
GASAG AG	HRB 44343	Berlin	32	3,584	4,105	–	–
Kernkraftwerk Brokdorf GmbH & Co. oHG	HRA 99143	Hamburg	20	–	–	–	–
Kernkraftwerk Stade GmbH & Co. oHG	HRA 99146	Hamburg	33	–	–	–	–
Netherlands							
B.V. Nederlands Elektriciteit Administratiekantoor	09018339	Arnhem	23	78	66	–	–
C.V. Groettocht (liquidated)	37085868	Amsterdam	0	–	2	–	–
C.V. Oudelandertocht (liquidated)	37085867	Amsterdam	0	–	2	–	–
C.V. Waardtocht (liquidated)	37085866	Amsterdam	0	–	1	–	–
C.V. Waterkaaptocht (liquidated)	37085865	Amsterdam	0	–	2	–	–
C.V. Windpoort	34122462	Heemskerk	40	6	5	–	–
NoordzeeWind C.V.	34195602	Ijmuiden	50	47	157	–	–
V.O.F. Windpark Oom Kees	09210903	Amsterdam	13	2	2	–	–
Westpoort Warmte B.V.	34121626	Amsterdam	50	142	101	–	–
Windpark Hoofdplaatpolder B.V.	22053732	Sluis	70	–	88	–	–
V.O.F. Noordpier Wind	51173441	Heemskerk	50	–	5	–	–
Vliegasonie B.V.	30123419	De Bilt	20	14	16	–	–
Total				4,827	5,429	273	107

¹⁾ As a result of a current shareholder agreement, Vattenfall does not have such control over BrainHeart Energy Sweden Holding AB that is required for the company to be reported as a subsidiary of the Vattenfall Group. The company is therefore reported as an associated company.

Participations in the results of associated companies

	2019	2018
Sweden		
Blakliden Fäbodberget Wind Holding AB	–	-22
BrainHeart Energy Sweden Holding AB	-16	-1
Hybrit Development AB	-6	-5
V ² Plug-In Hybrid Vehicle Partnership HB	360	315
Germany		
Solytic GmbH	-3	-5
DOTI Deutsche Offshore-Testfeld- und Infrastruktur-GmbH & Co. KG	-4	-20
GASAG Berliner Gaswerke AG	91	91
Netherlands		
B.V. Nederlands Elektriciteit Administratiekantoor	10	-13
NoordzeeWind C.V.	-52	-48
Westpoort Warmte B.V.	39	29
Windpark Hoofdplaatpolder B.V.	-3	-14
Vliegassunie B.V.	7	6
Other associated companies	-1	7
Total	422	320

Note 20 Share in the Swedish Nuclear Waste Fund

	2019	2018
Balance brought forward	42,038	38,591
Payments	2,445	2,421
Disbursements	-1,044	-1,004
Returns	2,252	-7
Revaluation of the Swedish Nuclear Waste Fund to fair value through profit or loss	–	2,037
Balance carried forward	45,691	42,038

According to the Swedish Nuclear Activities Act (1984:3), any organisation in Sweden with a permit to own or run a nuclear installation is obliged to dismantle the plant in a safe manner, to manage spent fuel and other radioactive waste and to conduct necessary research and development. The permit holder shall also finance this dismantling. The financing of future fees for spent nuclear fuel is currently ensured by Swedish law. The reactor owner is required to pay a generation-based fee to the board of the Swedish Nuclear Waste Fund, which manages paid-in funds. The fund reimburses the owner of the reactor for expenses as the owner's obligations pursuant to the Swedish law are fulfilled. According to agreements between the Swedish state, Vattenfall AB and E.ON Sverige AB, fund assets for Ringhals AB shall be managed by Vattenfall AB. Due to changed investment policy for the Swedish Nuclear Waste Fund in quarter 2 2018, the measurement category for Share in the Swedish Nuclear Waste Fund has been changed from amortised cost to fair value through profit or loss.

As stated in Note 31 to the consolidated accounts, Other interest-bearing provisions, provisions for future expenses for decommissioning within Swedish nuclear power operations amount to SEK EUR 66,137 thousand million (EUR 59,904 thousand). Contingent liabilities attributable to the Swedish Nuclear Waste Fund are described in Note 40 to the consolidated accounts, Contingent liabilities.

Note 21 Inventories**Accounting policy**

Inventories (except for inventories held for trading) are valued at the lower of their cost and net realisable value. Net realisable value is the estimated sales price in operating activities, less estimated costs for completion and to bring about a sale. The consumption of nuclear fuel is calculated as a depletion of the energy content of the fuel rods, and is based on the cost of each batch of fuel loaded into the core. The cost of inventories is calculated, depending on the type of inventory, either through application of the first-in, first-out (FIFO) method or through the application of a method based on average prices. Both methods include costs that arose on acquisition of the inventory assets.

Inventories held for trading are valued at fair value less costs to sell. For CO₂ emission allowances that are held for trading, fair value is based on quoted prices (Level 1). For other commodities fair value measurement is derived from an observable market price (API#2 for coal), which means a categorisation into Level 2 of the fair value hierarchy. See Note 3 to the consolidated accounts, Accounting policies.

The value of the energy stored in the form of water in reservoirs is not reported as an asset.

Financial information

	2019	2018
Inventories held for own use		
Nuclear fuel	5,667	5,749
Materials and spare parts	3,064	2,818
Fossil fuel	704	803
Biological assets	19	20
Other	374	402
Total	9,828	9,792
Inventories held for trading		
Fossil fuel	1,482	1,952
CO ₂ emission allowances/certificates	1,954	1,850
Biomass	89	53
Total	3,525	3,855
Total inventories	13,353	13,647

Inventories recognised as an expense in 2019 amount to SEK 7,793 million (16,726). Impairment losses for inventory for own use amounted to SEK 1 million (4) during the year. Reversed impairment amounted to SEK 40 million (0).

Note 22 Intangible assets: current**Accounting policy****CO₂ emission allowances held for own use**

Purchased emission allowances held for own use are reported as intangible assets under current assets at cost less accumulated impairment losses. As carbon dioxide is emitted, an obligation arises to deliver emission allowances (EUAs, CERs, ERUs) to the authorities in the respective countries. This obligation is reported as an expense and a liability or a decrease of the current intangible asset. This liability is valued in the amount at which it is expected to be settled.

Certificates held for own use

Accumulated certificates, which are received free of charge, are reported as intangible assets under current assets at fair value when obtained. The corresponding amount is recognised as revenue under Net sales. Purchased certificates held for own use are reported at cost less accumulated impairment losses. When electricity is sold, an obligation arises to deliver certificates to the authorities in the respective countries. This obligation is reported as an expense and as a liability or as a decrease of the current immaterial asset. The liability is valued at the amount at which it is expected to be settled.

Financial information

	CO ₂ emission allowances		Certificates		Total	
	2019	2018	2019	2018	2019	2018
Balance brought forward	324	1,579	386	266	710	1,845
Purchases	14,321	4,128	397	428	14,718	4,556
Received free of charge	–	–	139	194	139	194
Sold	-9,547	-3,745	-258	-8	-9,805	-3,753
Redeemed	-5,108	-1,705	-529	-494	-5,637	-2,199
Translation differences	10	67	–	–	10	67
Balance carried forward	–	324	135	386	135	710

Note 23 Trade receivables and other receivables**Accounting policy**

For trade receivables calculation of the loss reserve is based on expected credit losses for the remaining term. A collective method is used where the receivables are grouped together based on e.g., the number of days past due including any past-due receivables, and a credit loss percentage is calculated for the respective intervals, where in the model Vattenfall has based its calculations on experience from historic loss levels for similar receivables while taking into account forward-looking macroeconomic conditions that may affect expected cash flows. For individual, significant receivables, an individual assessment may be made. Impairment of trade receivables is reported in operating expenses.

Financial information

	2019	2018
Accounts receivable - trade	20,648	20,334
Receivables from associated companies	193	81
Other receivables	5,504	5,588
Total	26,345	26,003

Age analysis

The collection period is normally between 10 and 30 days.

	2019			2018		
	Receivables, gross	Impaired receivables	Receivables, net	Receivables, gross	Impaired receivables	Receivables, net
Accounts receivable - trade						
Not due	18,707	25	18,682	18,216	19	18,197
Past due 1-30 days	1,189	12	1,177	1,071	11	1,060
Past due 31-90 days	420	39	381	373	13	360
Past due >90 days	1,159	751	408	1,517	800	717
Total	21,475	827	20,648	21,177	843	20,334
Receivables from associated companies						
Not due	192	–	192	80	–	80
Past due 1-30 days	1	–	1	–	–	–
Past due >90 days	2	2	–	2	1	1
Total	195	2	193	82	1	81
Other receivables						
Not due	5,489	–	5,489	5,578	–	5,578
Past due 1-30 days	8	–	8	2	–	2
Past due >90 days	23	16	7	27	19	8
Total	5,520	16	5,504	5,607	19	5,588

Note 24 Advance payments paid

	2019	2018
Margin calls paid, energy trading	3,522	2,330
Other advance payments	474	596
Total	3,996	2,926

A margin call paid is a marginal security (collateral) that Vattenfall pays its counterparty, that is, to the holder of a derivative position to cover the counterparty's credit risk, either bilaterally via OTC or through an exchange. In Vattenfall's business activities, margin calls occur in energy trading and in the financing activities.

Margin calls paid within energy trading are recognised on the balance sheet as advance payments paid and are thereby recognised in the statement of cash flows as cash flows from changes in operating assets. Margin calls paid within financing activities are recognised as short-term investments (Note 26 to the consolidated accounts, Short-term investments) and are thereby reported in the statement of cash flows as cash flows from financing activities.

Note 25 Prepaid expenses and accrued income

	2019	2018
Prepaid expenses and accrued income, electricity	5,568	5,207
Prepaid expenses, other	1,235	1,740
Accrued income, other	1,050	1,480
Total	7,853	8,427

Note 26 Short-term investments

	2019	2018
Interest-bearing investments	20,547	20,541
Margin calls paid, financing activities	2,004	2,436
Total	22,551	22,977

Note 27 Cash and cash equivalents

	2019	2018
Cash and bank balances	6,335	8,286
Cash equivalents	4,269	8,808
Total	10,604	17,094

Note 28 Assets held for sale**Accounting policy**

Non-current assets (or disposal groups) are classified as held for sale if their carrying amount will be recovered principally through a sale transaction rather than through continuing use. To be classified as held for sale a number of criteria must be met, see the heading "Important estimations and assessments". Assets held for sale are valued at the lower of their carrying amount and fair value less costs to sell and are not subject to amortisation or depreciation. Assets (and liabilities) held for sale are classified as current assets (current liabilities) when the sale transaction is expected to be settled within twelve months after the balance sheet date.

Important estimations and assessments

Certain criteria must be fulfilled to classify an asset as held for sale. The asset must be available for immediate sale in its present condition subject to usual and customary terms. Further, the sale must be highly probable within one year from the date of classification. The last-mentioned criterion means that a plan for the disposal must have been prepared and approved at the appropriate level of management, an active programme for the disposal must have been initiated, and the asset must be marketed for sale at a price that is reasonable in relation to its current fair value. In the event shareholder approval is required before a sale can be carried out, Vattenfall is of the opinion that a transaction cannot be regarded as likely until shareholder approval has been obtained.

Financial information

Assets held for sale as per 31 December 2019 refer to assets in BA Wind. As per 31 December 2018 assets held for sale refer to Vattenfall Wärme Hamburg.

	2019	2018
Property, plant and equipment	289	4,535
Other non-current assets	29	445
Trade receivables and other receivables	–	341
Cash and cash equivalents	–	2,992
Total assets	318	8,313
Other interest-bearing provisions	5	3,954
Other non-current liabilities	3	–
Deferred tax liabilities	–	234
Trade payables and other liabilities	2	1,150
Total liabilities	10	5,338

Note 29 Interest-bearing liabilities and related financial derivatives

Interest-bearing liabilities include Hybrid Capital and other interest-bearing liabilities – mainly bond issues. The hybrid bonds are reported as an interest-bearing liability and are subordinated to Vattenfall's other debt instruments. The credit rating agencies Moody's and Standard & Poor's classify 50% of the hybrid bonds as equity in their credit analyses. The two SEK bonds of SEK 3 billion and the EUR bond of EUR 1 billion have set terms of 62 years, and the USD bond of USD 400 million has a set term of 63 years. Vattenfall has an option at specifically defined points in time to redeem the bonds at a call date prior to maturity. These call dates arise for the first time in 2022 for the two SEK-denominated bonds, in 2023 for the USD-denominated bond, and in 2027 for the EUR-denominated bond.

Hybrid Capital is reported as follows:

	2019	2018
Balance brought forward	19,832	19,118
Effects from hedge accounting	3	4
Translation differences	329	710
Balance carried forward	20,164	19,832

Reported values for Hybrid Capital and other interest-bearing liabilities are specified as follows:

	Non-current portion maturity 1-5 years		Non-current portion maturity >5 years		Total non-current portion		Current portion		Total	
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
Bond issues	17,649	12,410	19,553	18,297	37,202	30,707	200	9,992	37,402	40,699
Commercial paper	–	–	–	–	–	–	17,453	7,408	17,453	7,408
Liabilities to credit institutions	–	1,401	–	–	–	1,401	1,427	795	1,427	2,196
Liabilities pertaining to acquisitions of subsidiaries	–	51	–	–	–	51	–	–	–	51
Liabilities to owners of non-controlling interests	–	–	10,514	10,406	10,514	10,406	133	–	10,647	10,406
Liabilities to associated companies	–	–	–	–	–	–	733	504	733	504
Lease liability	3,766	–	–	–	3,766	–	802	–	4,568	–
Other liabilities	208	710	715	706	923	1,416	4,310 ¹	5,763 ¹	5,233	7,179
Total interest-bearing liabilities excl. Hybrid Capital	21,623	14,572	30,782	29,409	52,405	43,981	25,058	24,462	77,463	68,443
Hybrid Capital	9,717	9,577	10,447	10,255	20,164	19,832	–	–	20,164	19,832
Total interest-bearing liabilities	31,340	24,149	50,946	39,664	72,569	63,813	25,058	24,462	97,627	88,275
Derivatives (swaps) attributable to the above interest-bearing liabilities	248	262	-2,203	-941	-1,955	-679	262	-141	-1,693	-820

¹ Of which, margin calls within financing activities SEK 3,706 million (3,370).

Undiscounted future cash flows including interest payments on the interest-bearing liabilities mentioned above, future cash flow for derivatives, trade payables and financial instruments with contractual payments on 31 December, are shown in the table below. Floating interest cash flows with future interest fixing dates are estimated based on observable interest rate curves at year end. All future cash flows in foreign currency are translated to SEK using the rate on the balance sheet date for the annual accounts.

	Non-current portion maturity 1-5 years		Non-current portion maturity > 5 years		Total non-current portion		Current portion		Total	
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
Interest-bearing liabilities	34,496	31,845	52,595	48,228	87,091	80,073	27,585	27,473	114,676	107,546
Derivatives (swaps)	-426	-110	-2,264	-1,783	-2,690	-1,893	40	-307	-2,650	-2,200
Trade payables and other financial liabilities	428	561	1,706	1,744	2,134	2,305	27,809	29,482	29,943	31,787
Total	34,498	32,296	52,037	48,189	86,535	80,485	55,434	56,648	141,969	137,133

The table below shows the largest benchmark bond issues by Vattenfall:

Type	Issued	Currency	Nominal amount	Coupon %	Maturity
Euro Medium Term Note	2009	EUR	1,085	6.250	2021
Euro Medium Term Note	2004	EUR	500	5.375	2024
Euro Medium Term Note	2019	EUR	500	0.500	2026
Euro Medium Term Note	2009	GBP	750	6.875	2039

Note 30 Pension provisions

Accounting policy

Vattenfall's pension obligations in the Group's Swedish and German companies are to a large extent defined benefit pension obligations. The concerned pension plans are primarily retirement pensions, disability pensions and family pensions. There are also pension plans in these and other countries that are defined contribution plans.

Defined benefit pension plans

The Group's defined benefit pension obligations are calculated separately for each plan in accordance with the Projected Unit Credit Method by calculating employees' current and past service cost. Estimated future salary adjustments are taken into consideration as well as taxes levied on pension costs, for example, the Swedish special employers' payroll tax ("särskild löneskatt"). The net obligation comprises the discounted present value of the total earned future salaries less the fair value of any plan assets. The discount rate consists of the interest rate on the balance sheet date of high quality corporate bonds with lifetimes that correspond to the Group's pension obligations. When there is no deep market in corporate bonds of this kind, the market rate yield on government bonds with an equivalent lifetime should be used instead.

Items related to the earnings of defined benefit pensions and interest on the net of defined benefit plans assets and liabilities are recognised in the income statement. Remeasurements recognised in Other comprehensive income under the heading "Items that will not be reclassified to profit or loss" consist of actuarial gains and losses. Actuarial gains and losses arise from the effects of changes in actuarial assumptions and from experience adjustments (the effects of differences between the previous actuarial assumptions and what has actually occurred). The difference between the actual and the calculated return on pension assets are also recognised in Other comprehensive income.

Defined contribution pension plans

Defined contribution pension plans are post-employment benefit plans according to which fixed fees are paid to a separate legal entity. There is no legal or constructive obligation to pay additional fees if the legal entity does not have sufficient assets to pay all benefits to the employees. Fees for defined contribution pension plans are reported as an expense in the income statement in the period they apply to.

Important estimations and assessments

The value of pension obligations for defined benefit pension plans is determined through actuarial computations that are based on assumptions about the discount rate, future salary increases, inflation and demographic conditions.

For pension provisions in Sweden, the discount rate in 2019 was changed to 1.75% (2.50%). The discount rate is based on mortgage bonds with high credit ratings, the market for which is large and liquid. In Germany, where the discount rate is based on high quality corporate bonds, the discount rate in 2019 was also changed to 1.00% (1.75%).

Financial information

Swedish pension plans

The Swedish pension plans supplement the Swedish social insurance system and are the result of agreements between employer and employee organisations. Essentially all Vattenfall employees in Sweden are enrolled in the collectively bargained ITP-Vattenfall pension plan. For employees born in 1978 and earlier, the plan is mostly a defined benefit solution, while for employees born in 1979 and later, the plan is entirely a defined contribution solution.

In defined benefit pension solutions, the employee is guaranteed a lifetime pension that corresponds to a set percentage of the employee's

final salary. Defined benefit pensions are secured through provisions on the balance sheet, and the obligation is covered by credit insurance with PRI Pensionsgaranti. In addition, certain pensions attributable the time prior to Vattenfall's incorporation are covered by a government guarantee via the Swedish National Debt Office. Defined contribution pensions are secured through insurance with any of the insurance companies that are electable within the framework of the ITP plan.

Certain of Vattenfall's obligations in the ITP plan such as spousal benefits and disability pensions are secured through an insurance policy from Alecta. According to a statement (UFR 10) issued by the Swedish Financial Reporting Board, this plan is a multi-employer defined benefit plan. As in previous years, Vattenfall has not had access to such information to make it possible to report this plan as a defined benefit plan. The pension plan according to ITP secured by insurance in Alecta is therefore reported as a defined contribution plan. This year's share of the total savings premium in Alecta is 0.30551%, while Vattenfall's share of the total number of actively insured in Alecta is 1.23772%. Alecta's surplus can be distributed among the policyholders and/or the insured. At the end of 2019, Alecta's surplus in the form of its so-called collective funding amounted to 148% (142%). Collective funding consists of the fair value of Alecta's assets as a percentage of the insurance obligations calculated in accordance with Alecta's actuarial calculation assumptions.

German pension plans

The pension plans in Germany are based on collective agreements. Substantial defined benefit plans exist for employees in Berlin and Hamburg.

Berlin

Two pension plans exist, both secured through Pensionskasse der Bewag, a mutual insurance company. Obligations are secured through funds paid in by Vattenfall and its employees. Pensionskasse der Bewag's operations are supervised by a regulatory authority.

The pension plan for employees and retirees shown as a defined benefit plan is based on the statutes of the Bewag pension fund and a supplementary agreement to grant a pension subsidy. For employees who began their employment before 1 January 1984 and work until retirement age, the pension is based on up to 80% of the salary. Half of the statutory pension and the entire benefit from Pensionskasse der Bewag, including surpluses, are credited to the guaranteed amount. Vattenfall's obligations encompass the entire pension obligation. The plan assets attributable to personnel hired before 1 January 1984 are reported as plan assets at fair value. The assets of Pensionskasse are investment funds that are not listed on the stock exchange. The fair value is determined by the repurchase price.

The second plan has been classified as a defined contribution plan and is reported as such since the benefit is based on paid-in premiums and Pensionskasse der Bewag's financial position.

Hamburg

Vattenfall has pension obligations for employees in Hamburg that mainly consist of the company's obligations to personnel and pensioners employed before 1 April 1991 in the former company HEW AG, and who have been employed for at least 10 years. The sum of the retirement pension, statutory pension and pensions from third parties normally amounts to a maximum of 65% of pensionable salary.

Dutch pension plans

In the Netherlands Vattenfall has the majority of the pension obligations secured through the ABP pension fund and the "Metaal en Techniek" pension fund. The ABP and "Metaal en Techniek" plans are classified and reported as defined contribution plans.

Defined benefit pension plans

	2019			
	Germany			Total
	Sweden	Plan Berlin	Plan Hamburg	
Present value of unfunded obligations	14,374	455	21,425	36,254
Present value of fully or partly funded obligations	–	16,066	412	16,478
Present value of obligations	14,374	16,521	21,837	52,732
Fair value of plan assets	–	8,585	121	8,706
Net defined benefit liability	14,374	7,936	21,716	44,026

	2018			
	Germany			Total
	Sweden	Plan Berlin	Plan Hamburg	
Present value of unfunded obligations	12,786	448	19,834	33,068
Present value of fully or partly funded obligations	–	15,198	160	15,358
Present value of obligations	12,786	15,646	19,994	48,426
Fair value of plan assets	–	8,620	120	8,740
Net defined benefit liability	12,786	7,026	19,874	39,686

Changes in obligations

	2019	2018
Balance brought forward	48,426	50,910
Benefits paid by the plan	-2,392	-2,349
Service cost	717	692
Contributions by plan participants	4	4
Actuarial gains (-) or losses (+) due to changes in financial assumptions	5,297	787
Actuarial gains (-) or losses (+) due to changes in demographic assumptions	–	890
Actuarial gains (-) or losses (+) due to plan experience	-946	-1,486
Current interest expense	1,024	1,002
Divested companies	–	-62
Liabilities associated with assets held for sale	-55	-3,604
Translation differences	657	1,642
Balance carried forward	52,732	48,426

Changes in plan assets

	2019	2018
Balance brought forward	8,740	8,948
Benefits paid by the plan	-520	-521
Contributions by employer	18	21
Contributions by plan participants	4	4
Interest income	153	158
Difference between calculated and actual return	144	-226
Divested companies	–	-18
Translation differences	167	374
Balance carried forward	8,706	8,740

Plan assets consist of the following

	2019	2018
Shares and participations	4,890	4,384
Interest-bearing instruments	2,285	2,705
Property	1,236	1,318
Other	295	333
Total	8,706	8,740

Pension costs

	2019	2018
Defined benefit plans:		
Current service cost	654	661
Interest expenses	1,024	1,002
Interest income	-153	-158
Past service cost	63	31
Total cost for defined benefit plans	1,588	1,536
Cost for defined contribution plans	911	862
Total pension costs	2,499	2,398

In calculating pension obligations, the following actuarial assumptions have been made (%):

	Sweden		Germany	
	2019	2018	2019	2018
Discount rate	1.75	2.50	1.00	1.75
Future annual salary increases	2.75	3.00	2.50	2.50
Future annual pension increases	2.00	2.00	0.0-2.0	0.0-2.0

Sensitivity to key actuarial assumptions

	Sweden				Germany			
	2019		2018		2019		2018	
		%		%		%		%
Impact on the defined benefit obligation at 31 December of a:								
Increase by 50 basis points in the discount rate	-1,236	-8.6	-1,060	-8.3	-2,510	-6.5	-2,536	-6.5
Decrease by 50 basis points in the discount rate	1,405	9.8	1,200	9.4	2,818	7.3	2,843	7.3
Increase by 50 basis points in the annual pension increases	1,291	9.0	1,200	9.4	2,164	5.6	2,109	5.4
Decrease by 50 basis points in the annual pension increases	-1,394	-9.7	-1,060	-8.3	-1,977	-5.2	-2,025	-5.2

At 31 December 2019 the weighted duration of pension obligations was 14.1 (13.9) years for Germany and 16.7 (19.0) years for Sweden.

Note 31 Other interest-bearing provisions

Accounting policy

A provision is reported on the balance sheet when the Group has a legal or constructive obligation as a result of a past event and it is probable that an outflow of financial resources will be required to regulate the obligation and a reliable estimate of the amount can be made. Where the effect of the time when payment is made is material, provisions are estimated by discounting the anticipated future cash flow at an interest rate before tax that reflects market estimates of time value of money. The discount rate does not reflect such risks that are taken into consideration in the estimated future cash flow.

Changes in discounted provisions for dismantling, restoration or similar measures, which at the time of acquisition have also been reported as tangible non-current assets, are reported as follows: In cases where the change is due to a change in the estimated outflow of resources or a change in the discount rate, the cost of a non-current tangible asset is changed in an amount corresponding to the provision. The periodic change of the present value is recognised as a financial expense.

Provisions are also reported for onerous contracts, that is, where unavoidable costs of meeting the obligations under the contract exceed the economic benefits expected to be received from the contract.

Important estimations and assessments

Provisions for future expenses for nuclear power operations

Provisions for future expenses for nuclear power operations, which pertain to future obligations for handling the decommissioning of Vattenfall's nuclear power plants in Sweden and Germany as well as for handling nuclear waste, are based on long-term cash flow estimations with respect to future expenses. These long-term cash flow estimations mainly pertain to technical plans, estimations on the amount of the expenses, when in time these are expected to fall due, and the discount rate. In many cases, these cash flow estimations must be approved by the pertinent authorities.

For provisions for future expenses for nuclear power operations in Sweden, the discount rate has been reduced to 2.75% (3.00%) and in Germany to 0.50% (1.00%) compared with the preceding year.

Other provisions than pension provisions and provisions for future expenses for nuclear power operations

For other types of provisions, such as provisions for future expenses for gas and wind operations and other environmental measures/undertakings, and for personnel-related provisions for non-pension purposes, provisions for legal disputes, or other provisions, the following discount rates are used, when discount effect is material: Sweden 2.75% (3.00%), Germany 0.50-2.50% (0.50-2.75%) Netherlands 0.50% (0.75%), Denmark 2.75% (2.75%) and the UK 3.25% (3.50%).

Financial information

	Non-current portion		Current portion		Total	
	2019	2018	2019	2018	2019	2018
Provisions for future expenses of nuclear power operations	83,929	75,533	1,952	2,155	85,881	77,688
Provisions for future expenses of gas and wind operations and other environmental measures/undertakings	8,532	7,594	39	63	8,571	7,657
Personnel-related provisions for non-pension purposes	4,753	4,949	1,200	1,330	5,953	6,279
Provisions for legal disputes	2,292	2,268	116	118	2,408	2,386
Other provisions	2,889	2,878	64	68	2,953	2,946
Total	102,395	93,222	3,371	3,734	105,766	96,956

Provisions for future expenses for nuclear power operations

Vattenfall's nuclear power producers in Sweden and Germany have a legal obligation upon the cessation of production to decommission and dismantle the nuclear power plants and to restore the plots of land where the plants are located.

The Swedish obligation also encompasses the safeguarding and final storage of spent radioactive fuel and other radioactive materials used by

the plants. The provisions include future expenses for the handling of low- and intermediate-level radioactive waste. As the permit-holder in Sweden, Vattenfall is responsible for the financing of this handling. As shown in Note 20 to the consolidated accounts, Share in the Swedish Nuclear Waste Fund, Vattenfall's share in the Swedish Nuclear Waste Fund amounts to SEK 45,691 million (42,038).

	Sweden	Germany	Total
Balance brought forward	59,904	17,784	77,688
Provisions for the period from the income statement	1,184	2,744	3,928
Interest effects	1,757	183	1,940
Revaluations versus non-current tangible assets	4,522	–	4,522
Reversed provisions	–	-191	-191
Provisions used	-1,230	-1,092	-2,322
Translation differences	–	316	316
Balance carried forward	66,137¹	19,744²	85,881

¹ Of which, approximately 35% (32%) pertains to the dismantling of nuclear power plants and approximately 65% (68%) to the handling of spent radioactive fuel.

² Of which, approximately 66% (69%) pertains to the dismantling of nuclear power plants and approximately 34% (31%) to the handling of nuclear waste.

Other provisions than provisions for future expenses for nuclear power operations

	Provisions for dismantling and other environmental measures	Personnel-related provisions for non-pension purposes	Provisions for legal disputes	Other provisions
Balance brought forward	7,656	6,279	2,386	2,946
Acquired companies	–	3	–	–
Provisions for the period from the income statement	93	1,164	26	146
Interest effects	228	69	60	–
Reclassified to/from other provision	–	-10	–	–
Revaluations	447	-76	-25	–
Provisions used	-21	-1,163	-7	-26
Provisions reversed	–	-235	-70	-143
Assets held for sale	-26	-190	–	–
Translation differences	194	112	38	30
Balance carried forward	8,571	5,953	2,408	2,953

Provisions for future expenses for heat and wind operations and other environmental measures/undertakings

Provisions are made in Germany and the Netherlands for the dismantling and removal of assets and restoration of sites where the Group conducts heat operations. Provisions are also made for restoration of sites where the Group conducts wind operations and for environmental measures/undertakings within other activities carried out by the Group.

Personnel-related provisions for non-pension purposes

Provisions are made for future costs pertaining to long-term time accounts, jubilee payments, severance payments related to restructuring measures, and other costs for giving notice to personnel.

Provisions for tax and legal disputes

Provisions are made for possible future tax expenses due to ongoing tax audits and for ongoing legal disputes and actions.

Other provisions

Other provisions include, among others, provisions for onerous contracts, restructuring and guarantee commitments.

Future expenses of non-current provisions

With the current assumptions, provisions are expected to result in outgoing payments as shown below:

	Provision for nuclear Germany	Provision for gas and wind operations	Personnel-related provision	Provision for legal disputes	Other provisions	Total
2-5 years	5,103	167	2,199	2,292	2,342	12,103
6-10 years	7,887	946	1,363	–	547	10,743
11-20 years	4,738	5,530	1,148	–	–	11,416
Beyond 20 years	64	1,889	43	–	–	1,996
Total	17,792	8,532	4,753	2,292	2,889	36,258

Payments of future expenses for nuclear power in Sweden are not included in the amounts reported above, since the owners of the reactors are compensated in corresponding amounts from the Swedish Nuclear Waste Fund.

Note 32 Other noninterest-bearing liabilities (non-current)

Of total liabilities of SEK 2,134 million (2,305), SEK 1,706 million (1,744) falls due after more than five years. Of the total liabilities, SEK 1,862 million (1,905) pertains to deferred income and SEK 272 million (400) to other liabilities.

Note 33 Trade payables and other liabilities

	2019	2018
Accounts payable - trade	17,049	20,824
Liabilities to associated companies	86	146
Other liabilities	10,674	8,512
Total	27,809	29,482

Note 34 Advance payments received

	2019	2018
Margin calls received, energy trading	1,391	15,293
Other advance payments	186	—
Total	1,577	15,293

A margin call received is marginal security (collateral) that Vattenfall's counterparty pays to Vattenfall as the holder of a derivative position to cover Vattenfall's credit risk, either bilaterally via OTC or through an exchange. In Vattenfall's business activities, margin calls occur in energy trading and in the treasury operations.

Margin calls received within energy trading are recognised on the balance sheet as Advance payments received and are thereby recognised in the statement of cash flows as cash flows from changes in operating liabilities while margin calls received within financing activities are recognised on the balance sheet as Current interest-bearing liabilities (Note 29 to the consolidated accounts, Interest-bearing liabilities and related financial derivatives) and are thereby recognised in the statement of cash flows recognised as cash flows from financing activities.

Note 35 Accrued expenses and deferred income

	2019	2018
Accrued personnel-related costs	2,898	2,333
Accrued expenses, CO ₂ emission allowances	5,167	4,744
Accrued nuclear power-related fees and taxes	377	397
Accrued interest expense	1,795	2,134
Other accrued expenses	3,739	4,264
Deferred income and accrued expenses, electricity	2,739	2,359
Other deferred income	383	254
Total	17,098	16,485

Note 36 Financial instruments by measurement category, offsetting of financial assets and liabilities, and financial instruments' effects on income

Accounting policy

Classification and measurement

Financial assets

Financial assets are classified in various categories based in part on the objective (the business model) of holding the financial asset, and in part on the financial instrument's contractual cash flows, in the event they consist only of principal amounts and interest. The classification is determined at the original point of acquisition. Settlement day accounting is applied for spot purchases and spot sales of financial assets.

Amortised cost

Financial assets (debt instruments) are classified in this category if they are held in a business model whose objective is to hold financial assets in order to collect their contractual cash flows, and if the contractual terms

of the financial asset give rise on specified dates to cash flows that are solely payments of principal and interest on the principal amount outstanding. These instruments are measured at amortised cost, where the reported gross value is adjusted for expected credit losses. For Vattenfall this category includes Other non-current receivables, Trade receivables and other receivables, Advance payments paid, certain Short-term investments, and Cash and bank balances.

Fair value through profit or loss

This category includes all of Vattenfall's financial assets (debt instruments) that are not measured at amortised cost. This includes assets held for trading, which entails that the objective is that they will be sold in the near term, assets held for sale, and assets that Vattenfall is monitoring and measuring based on fair value. Debt instruments are also classified in this category if the contractual terms do not consist solely of payments of principal and interest. This category also includes Cash equivalents with terms shorter than three months, which Vattenfall monitors and measures based on their fair value. The category also includes certain Short-term investments with original terms in excess of three months.

Derivative assets are always measured at fair value through profit or loss, except for derivative instruments designed as hedge instruments in an effective hedge, where the principles for hedge accounting are used.

Vattenfall classifies holdings of equity instruments at fair value through profit or loss. Vattenfall does not apply the irrevocable option to measure equity instruments that are not held for trading at fair value through other comprehensive income.

The assets in this category are remeasured on a regular basis to fair value with changes in value reported in profit or loss.

Financial liabilities

Financial liabilities at fair value through profit or loss

Derivative liabilities are always classified in this category. These financial liabilities are measured at fair value with changes in value recognised in profit or loss.

Other financial liabilities

In this category, interest-bearing and noninterest-bearing financial liabilities that are not held for trading purposes are reported. Other financial liabilities are measured at amortised cost. Trade liabilities have a short anticipated term and are therefore valued at a nominal amount without discounting.

Impairment

Impairment of financial assets is based on models for expected credit losses. For trade receivables that do not include a significant financing component, a simplified method is used, where calculation of the loss reserve is based on expected credit losses for the remaining term. A collective method is used where the receivables are grouped together based on e.g., the number of days past due including any past-due intervals, where in the model Vattenfall has based its calculations on experience from historic loss levels for similar receivables while taking into account forward-looking macroeconomic conditions that may affect expected cash flows. For individual, significant receivables, an individual assessment may be made. Impairment of trade receivables is reported in operating expenses.

For other financial assets where the policies for impairment are applied, a loss reserve is reported that corresponds to 12 months' expected credit losses at initial recognition. If the credit risk increases significantly since initial recognition, a reserve corresponding to expected credit losses during the entire term is reported. Vattenfall presumes that the credit risk has not increased significantly if the instrument has a low credit risk on the balance sheet date, such as instruments with an investment grade rating. The credit risk is considered to have increased significantly if the counterparty's rating has been lowered to a lower rating than investment grade or, alternatively, if the counterparty already had a lower credit rating than investment grade at initial recognition and this rating was significantly lowered further. Expected credit losses are calculated by assessing the probability of default, the loss given default and the exposure at default.

Hedge accounting

Hedge accounting is applied for derivative instruments that are included in a documented hedge relationship. The reporting of changes in value depends on the type of hedge entered into.

Cash flow hedges

Cash flow hedges are used primarily in the following cases: i) when forward commodity contracts are used to hedge commodity price risk in future purchases and sales, ii) when forward exchange rate contracts are

used to hedge currency risk in future purchases and sales in foreign currencies, and iii) when interest rate swaps are used to replace borrowing at a floating interest rate with a fixed interest rate.

For derivative instruments that constitute a hedge instrument in a cash flow hedge, the effective part of the change in value is reported in Other comprehensive income while the ineffective part is recognised directly in profit or loss. The part of the change in value that is reported in Other comprehensive income is then transferred to the income statement in the period when the hedged item affects the income statement. In cases where the hedged item refers to a future transaction, which is later capitalised as a non-financial asset or liability on the balance sheet (for example, when hedging future purchases of non-current assets in a foreign currency), the part of the change in value reported in Other comprehensive income is transferred to and included in the cost of the asset or liability.

Financial instruments by measurement category

Presented below are assets and liabilities where the carrying amount differs from the fair value.

	2019		2018	
	Carrying amount	Fair value	Carrying amount	Fair value
Financial assets at amortised cost				
Other non-current receivables	5,537	5,566	5,566	5,594
Short-term investments	2,852	2,852	3,283	3,283
Financial liabilities at amortised cost				
Hybrid Capital, non-current interest-bearing liability	20,164	21,671	19,832	19,957
Other non-current interest-bearing liabilities	52,405	58,469	43,981	48,886
Current interest-bearing liabilities	25,058	25,066	24,462	24,635

For other financial assets and liabilities there are no substantial differences between carrying amount and fair value.

Offsetting financial assets and financial liabilities

Presented below are financial assets and liabilities that are subject to enforceable master netting arrangements and similar agreements.

Assets 31 December 2019

	Gross amounts of recognised financial assets	Gross amounts of recognised financial liabilities set off on the balance sheet	Net amounts of financial assets presented on the balance sheet	Related amounts not set off on the balance sheet		Net amount
				Financial liabilities, not intended to be settled net ¹	Cash collateral received	
Derivatives, financial operations	5,774	–	5,774	2,124	3,537	113
Derivatives, commodity contracts	63,998	53,933	10,065	–	1,176	8,889
Total	69,772	53,933	15,839	2,124	4,713	9,002
Derivatives, not subject to offsetting	2,029	–	2,029	–	–	2,029
Total derivative assets			17,868			11,031

Assets 31 December 2018

	Gross amounts of recognised financial assets	Gross amounts of recognised financial liabilities set off on the balance sheet	Net amounts of financial assets presented on the balance sheet	Related amounts not set off on the balance sheet		Net amount
				Financial liabilities, not intended to be settled net ¹	Cash collateral received	
Derivatives, financial operations	5,599	–	5,599	2,294	3,290	15
Derivatives, commodity contracts	96,766	64,927	31,839	–	15,068	16,771
Total	102,365	64,927	37,438	2,294	18,358	16,786
Derivatives, not subject to offsetting	468	–	468	–	–	468
Total derivative assets			37,906			17,254

Liabilities 31 December 2019

	Gross amounts of recognised financial liabilities	Gross amounts of recognised financial assets set off on the balance sheet	Net amounts of financial liabilities presented on the balance sheet	Related amounts not set off on the balance sheet		Net amount
				Financial assets, not intended to be settled net ¹	Cash collateral pledged	
Derivatives, financial operations	4,113	–	4,113	2,124	2,015	-26
Derivatives, commodity contracts	68,470	53,933	14,537	–	3,510	11,027
Total	72,583	53,933	18,650	2,124	5,525	11,001
Derivatives, not subject to offsetting	2,884	–	2,884	–	–	2,884
Total derivative liabilities			21,534			13,885

Liabilities 31 December 2018

	Gross amounts of recognised financial liabilities	Gross amounts of recognised financial assets set off on the balance sheet	Net amounts of financial liabilities presented on the balance sheet	Related amounts not set off on the balance sheet		Net amount
				Financial assets, not intended to be settled net ¹	Cash collateral pledged	
Derivatives, financial operations	4,659	–	4,659	2,294	2,337	28
Derivatives, commodity contracts	98,637	64,927	33,710	–	2,330	31,380
Total	103,296	64,927	38,369	2,294	4,667	31,408
Derivatives, not subject to offsetting	2,918	–	2,918	–	–	2,918
Total derivative liabilities			41,287			34,326

¹ These items cannot be settled net as each transaction has a unique due date and they were not entered into with the purpose to be settled net. Settlement can be entailed only in case of default.

Financial assets and liabilities that are measured at fair value on the balance sheet at 31 December 2019

	Level 1	Level 2	Level 3	Total
Assets				
Share in the Swedish Nuclear Waste Fund	45,691	–	–	45,691
Derivative assets	–	17,490	377	17,867
Short-term investments, cash equivalents, other shares and participations	15,870	8,430	–	24,300
Total assets	61,561	25,920	377	87,858
Liabilities				
Derivative liabilities	–	21,514	20	21,534
Total liabilities	–	21,514	20	21,534

Financial assets and liabilities that are measured at fair value on the balance sheet at 31 December 2018

	Level 1	Level 2	Level 3	Total
Assets				
Share in the Swedish Nuclear Waste Fund	42,038	–	–	42,038
Derivative assets	–	37,905	1	37,906
Short-term investments, cash equivalents, other shares and participations	15,471	13,361	–	28,832
Total assets	57,509	51,266	1	108,776
Liabilities				
Derivative liabilities	–	41,191	96	41,287
Total liabilities	–	41,191	96	41,287

Sensitivity analysis for electricity and fuel derivatives

The price of electricity is the main factor impacting the change in fair value recognised in other comprehensive income. Changes in fair value that are recognised in the income statement originate from the prices for gas and oil. The sensitivity analysis is based on volumes and market prices at year-end. The analysis pertains to profit before tax.

Fair valuation on the balance sheet date of 31 December 2019 of +/-10% would change the fair value of Vattenfall's electricity and fuel derivatives by +/- SEK 352 million (-/+ 664) in other comprehensive income (hedge-accounted derivatives) and +/- SEK 793 million (+/-4,987) in the income statement (non-hedge-accounted derivatives).

Sensitivity analysis for Level 3 contracts

For the determination of fair value of financial instruments, Vattenfall strives to use valuation techniques that maximise the use of observable market data where it is available and rely as little as possible on entity-specific estimates.

Entity-specific estimates are based on internal valuation models that are subject to a defined process of validation, approval and monitoring. In the first step the model is designed by the business. The valuation model and calibration of the valuation model is then independently reviewed and approved by Vattenfall's risk organisation. If deemed necessary, adjustments are required and implemented. Afterwards, Vattenfall's risk organisation continuously monitors whether the application of the method is still appropriate. This is made by usage of several back-testing tools. In order to reduce valuation risks, the application of the model can be restricted to a limited scope.

Vattenfall's Level 3 contracts consist of CDM, virtual gas storage contracts and gas swing contracts. The net value as per 31 December 2019 has been calculated at SEK 357 million (-95) and is most sensitive to the optionality volatility. A change in the value of the daily volatility of +/-5% would affect the total value by approximately +/- SEK 23 million (+/-35).

Financial instruments: Effects on income by category

Net gains (+)/losses(-) and interest income and expenses for financial instruments recognised in the income statement:

	2019			2018		
	Net gains/losses ¹	Interest income	Interest expenses	Net gains/losses ¹	Interest income	Interest expenses
Total Vattenfall						
Financial assets at fair value through profit or loss	-258	2,354	-107	-5,866	2,077	56
Financial assets measured at amortised cost	26	–	–	33	–	–
Financial liabilities at fair value through profit or loss	124	76	–	-131	106	–
Financial liabilities measured at amortised cost	-380	–	-2,791	-377	–	-3,246
Total	-488	2,430	-2,898	-6,341	2,183	-3,190

¹ Exchange rate gains and losses are included in net gains/losses.

Derivative assets

	Non-current portion, maturity 1-5 years		Non-current portion, maturity >5 years		Total non-current portion		Current portion		Total	
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
Financial contracts	850	1,074	4,393	3,718	5,243	4,792	533	808	5,776	5,600
Commodity and commodity-related contracts	2,599	9,156	-54	3	2,545	9,159	9,547	23,147	12,092	32,306
Total	3,449	10,230	4,339	3,721	7,788	13,951	10,080	23,955	17,868	37,906

Derivative liabilities

	Non-current portion, maturity 1-5 years		Non-current portion, maturity >5 years		Total non-current portion		Current portion		Total	
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
Financial contracts	1,032	1,216	2,185	2,759	3,217	3,975	896	685	4,113	4,660
Commodity and commodity-related contracts	2,213	9,269	2,403	798	4,616	10,067	12,805	26,560	17,421	36,627
Total	3,245	10,485	4,588	3,557	7,833	14,042	13,701	27,245	21,534	41,287

Note 37 Specifications of the cash flow statement**Other, including non-cash items**

	2019	2018
Undistributed results from participation in associated companies	-255	-200
Unrealised foreign exchange gains/losses	-28	-22
Unrealised changes in values related to derivatives	1,669	152
Changes in the Swedish Nuclear Waste Fund	-1,258	-1,597
Changes in provisions	-223	-1,908
Other	280	-134
Total	185	-3,709

Dividends received totalled SEK 136 million (98).

Other investments in non-current assets

	2019	2018
Investments in intangible assets: non-current, including advance payments	-1,031	-731
Investments in property, plant and equipment, including advance payments	-25,304	-21,405
Total	-26,335	-22,136

Divestments

	2019	2018
Divestments of shares and participations	6,703	99
Divestments of intangible assets: non-current	4	28
Divestments of property, plant and equipment	745	1,442
Total	7,452	1,569

Note 38 Specifications of equity**Share capital**

As of 31 December 2019 the registered share capital comprised 131,700,000 shares with a share quota value of SEK 50.

Translation reserve

The translation reserve comprises all exchange rate differences arising from the translation of financial reports from non-Swedish operations that prepare their reports in a currency other than that in which the Group reports. Further, the translation reserve includes exchange rate differences arising from the reassessment of debts raised as hedges for net investments in non-Swedish operations.

Reserve for hedges

The reserve for hedges comprises mostly unrealised changes in values of commodity derivatives used to hedge future sales (cash flow hedges). The reserve for hedges is expected to affect the income statement and cash flow, respectively, in the periods indicated below:

	2019		2018	
	Cash flow	Income statement	Cash flow	Income statement
Within 1 year	-1,668	-2,663	-1,475	985
Between 1-5 years	-314	-406	1,243	1,297
Total	-1,982	-3,069	-232	2,282
Other	-611	–	-17	–
Total	-2,593	-3,069	-249	2,282

The change in the reserve for hedges relating to Cash flow hedges - dissolved against income statement amounted to SEK 5,641 million (6,066), of which SEK 5,597 million (6,079) has been reported in net sales.

Retained earnings including profit for the year

Retained earnings including profit for the year include earned profits in the Parent Company and its subsidiaries, associated companies and joint ventures, and effects of remeasurements of defined benefit pension plans.

Translation exposure of equity in other currencies than SEK

Original currency	Equity		Hedging after tax		Net exposure after tax		Average net exposure after tax	
	2019	2018	2019	2018	2019	2018	2019	2018
EUR	62,331	76,999	25,213	30,354	37,118	46,645	41,806	45,521
DKK	5,781	3,450	–	–	5,781	3,450	4,863	3,598
GBP	13,200	11,946	4,826	4,471	8,374	7,475	7,978	8,925
Total	81,312	92,395	30,039	34,825	51,273	57,570	54,647	58,044

Note 39 Collateral

	2019	2018
Participations in subsidiaries pledged to PRI Pensionsgaranti, as security for credit insurance in respect of pension obligations in Vattenfall's Swedish operations	7,295	7,295
Blocked bank funds as security for trading on the Nordic electricity exchange and trading with CO ₂ emission allowances	199	5,103
Blocked bank funds as security for guarantees issued by bank	–	–
Total	7,494	12,398

In addition to the collateral mentioned above, Vattenfall has the following significant commitments:

To fulfil the requirements for security in the derivative market, in its energy trading and financial operations Vattenfall has pledged security to counterparties for the negative fair value of derivative positions. As per 31 December 2019 this security amounted to SEK 3,522 million (SEK 2,330 million) for energy trading and SEK 2,004 million (SEK 2,436 million) for the financial operations. The amounts are reported as assets on the balance sheet under Advance payments (Note 24 to the consolidated accounts, Advance payments paid) and under Short-term investments (Note 26 to the consolidated accounts, Short-term investments). The counterparties are obligated to repay this security to Vattenfall in the event the negative fair value decreases.

In a similar manner, Vattenfall's counterparties in energy trading and the financial operations have pledged security to Vattenfall. Security received as per 31 December 2019 amounted to SEK 1,391 million (SEK 15,293 million) for energy trading and SEK 3,706 million (3,370) for the financial operations. The amounts are reported as liabilities on the balance sheet under Advance payments received for the energy trading position (Note 34 to the consolidated accounts, Advance payments received) and Interest-bearing liabilities (current) for the financial operations (Note 29 to the consolidated accounts, Interest-bearing liabilities and related financial derivatives).

Note 40 Contingent liabilities

The contingent liabilities mainly consist of the following:

- Norfolk Bank Zone, East Anglia Offshore Wind Ltd are equally owned by Vattenfall Wind Power Limited and Scottish Power Renewables and part of the construction of 7.2GW of wind capacity off the coast of East Anglia as part of The Crown Estate's Round Three wind program. Vattenfall AB has issued guarantees with a total nominal value of SEK 68 million per 31 December 2019.
- Pending legal issues
- Pension commitments PRI
- Various contingent liabilities in relation to eSett Oy, the Swedish Nuclear Waste Fund, Forsmark, Ringhals and Nord Pool Spot A/S

In addition to the contingent liabilities mentioned above, Vattenfall has the following significant commitments.

In certain rivers, joint regulation facilities exist for several hydro power plants. The owners of the power plants have payment obligations for their share of these regulation costs. Vattenfall has an obligation to compensate certain owners of water rights, in rivers where hydro power stations are built, through the delivery of power. In 2019, such compensation deliveries amounted to 0.8 TWh (0.8), for a value of approximately SEK 326 million (354).

Under Swedish law, Vattenfall has strict and unlimited liability for third-party loss resulting from dam accidents. Together with other hydro power producers in the Nordic countries, Vattenfall has liability insurance that is limited to payment of a maximum of SEK 10,000 million (10,000) in benefits for these types of claims.

In Germany, nuclear power operators have strict and unlimited liability to third parties. By law, nuclear power plants are required to have insurance or other financial guarantees for amounts up to EUR 2,500 million. Claims of up to EUR 256 million are covered by the German Mutual Atomic Energy Reinsurance Pool. The nuclear power plants and their German parent companies (in Vattenfall's case, Vattenfall GmbH) are liable for amounts in excess of this, in proportion to the ownership interests the respective parent companies have in the nuclear power plants. It is not until these resources are exhausted that a joint liability insurance agreement (Solidarvereinbarung) takes force between the owners of the German nuclear power plants (Vattenfall GmbH, E.ON, RWE and EnBW), for amounts up to EUR 2,500 million. Since the liability is unlimited, the nuclear power plants and their German parent companies are ultimately liable for losses that exceed this amount.

Vattenfall owns nuclear power plants in Germany together with other partners in the legal form oHG partnerships. The liability of partners in those partnerships is joint and several. Accounting is based on the assessment that the partnerships themselves as well as the partners are able to fulfil the legal and financial obligations of the partnerships. The

total amount of the liabilities (including provisions) of the German nuclear companies as per 31 December 2019 is as follows:

	Share %	Total liabilities	Of which reported in Vattenfall's consolidated statements
Kernkraftwerk Brunsbüttel GmbH & Co. oHG	66.7	12,545	8,367
Kernkraftwerk Krümmel GmbH & Co. oHG	50.0	16,445	8,222
Kernkraftwerk Stade GmbH & Co. oHG	33.3	3,015	–
Kernkraftwerk Brokdorf GmbH & Co. oHG	20.0	18,589	–

In July 2019, the Nuclear Power plant Kernkraftwerk Krümmel GmbH & Co. OHG, in which Vattenfall has a shareholding of 50%, sold production rights to the co-shareholder PreussenElektra GmbH. Vattenfall's share in the sales price is SEK 1.5 billion. The price is subject to a court proceeding initiated by PreussenElektra. Should a lower price be confirmed by the court, a repayment has to be made.

Atomic liability in Sweden is strict and limited to 300 million Special Drawing Rights (SDRs) (rate 12,8879), corresponding to SEK 3,866 million (3,743), which means that the companies that are owners of nuclear power plants are only liable for damage to the surrounding environment up to this amount. The obligatory atomic liability insurance for this amount is issued by the Nordic Nuclear Insurers and by the mutual insurance company ELINI (European Liability Insurance for the Nuclear Industry). As policyholders of the mutual insurance companies ELINI and EMANI (European Mutual Association for Nuclear Insurance), Vattenfall's Swedish nuclear power plants Forsmark and Ringhals have an obligation to cover any deficits in insurance reserves in these insurance companies.

In 2009 Vattenfall AB, together with its subsidiary the Swedish Nuclear Fuel and Waste Management Company (SKB) and the other part-owners of that company, signed a long-term co-operation agreement with the Östhammar and Oskarshamn municipalities. The agreement covers the period 2010 to 2030 and regulates development efforts in association with the implementation of the Swedish nuclear waste programme. Through development initiatives in areas such as training, enterprise and infrastructure, over time the parties will generate value-added worth SEK 1,500 million to SEK 2,000 million. The parties are to finance the development efforts in proportion to their ownership interests. The

Vattenfall Group's ownership interest is 56%. Implementation of the efforts is being carried out across two periods: a period before all necessary permits have been received (Period 1), and a period during implementation and operation of the facilities (Period 2). As per 31 December 2019 Vattenfall reported a provision of SEK 34 million (43) for its share of Period 1 activities.

In the Energy Agreement from 2016 it was made clear that the hydro power industry must itself finance the transition to modern environmental standards. Toward this end, the company Vattenkraftens Miljöfond Sverige AB was established in 2018 by Vattenfall, Statkraft, Fortum, Tekniska verken i Linköping, Mälarenergi, Jämtkraft and Skellefteå Kraft. Joint financing of SEK 10 billion, of which Vattenfall accounts for just over 50 percent, over a 20-year period will be used to improve the water environment in and around hydro power plants in Sweden. Vattenfall's payment to Vattenkraftens Miljöfond in 2019 totalled SEK 10 million.

As a consequence of the Group's continuing business activities, companies in the Group become parties to legal processes. In addition, disputes arise in the Group's operations that do not lead to legal processes. Vattenfall's management assesses these legal processes and disputes on a regular basis and makes provisions in cases where it believes an obligation exists and this can be judged with a reasonable degree of certainty. In 2019, Vattenfall was not party to any legal actions, concerning alleged anti-competitive behaviour or incidents of bribery or corruption. For legal processes or disputes where at present it cannot be determined whether an obligation exists or where for other reasons it is not possible to calculate the amount of a possible provision with a reasonable degree of certainty, management makes the overall judgement that there is no risk for material impact on the Group's result of operations or financial position. As part of the Group's business activities, in addition to the contingent liabilities stated here, guarantees are made for the fulfilment of various contractual obligations.

Note 41 Commitments under consortium agreements

Power plants are often built on a joint venture basis. Under the consortium agreements, each owner is entitled to electricity in proportion to its share of ownership, and each owner is liable, regardless of output, for an equivalent proportion of all the joint venture's costs. Vattenfall's investments often entail a liability for costs in proportion to its share of ownership. For more information, see Note 18 to the Consolidated accounts, Shares and participations owned by the Parent Company Vattenfall AB and other Group companies.

Note 42 Number of employees and personnel costs

Number of employees at 31 December, full-time equivalents:

	2019			2018		
	Men	Women	Total	Men	Women	Total
Sweden	6,722	2,416	9,138	6,567	2,322	8,889
Denmark	253	77	330	230	60	290
Germany	4,569	1,334	5,903	5,142	1,421	6,563
Netherlands	2,647	894	3,541	2,577	822	3,399
UK	343	181	524	324	140	464
Other countries	281	98	379	229	76	305
Total	14,815	5,000	19,815	15,069	4,841	19,910

Average number of employees during the year, full-time equivalents:

	2019			2018		
	Men	Women	Total	Men	Women	Total
Sweden	6,634	2,360	8,994	6,563	2,271	8,834
Denmark	241	69	310	216	55	271
Germany	4,931	1,389	6,320	5,259	1,475	6,734
Netherlands	2,644	881	3,525	2,586	829	3,415
UK	338	164	502	300	137	437
Other countries	258	88	346	213	75	288
Total	15,046	4,951	19,997	15,137	4,842	19,979

Personnel costs:

	2019	2018
Salaries and other remuneration	14,797	13,931
Social security costs ¹	5,452	5,226
Total	20,249	19,157

¹ Pension costs are specified in Note 30 to the Consolidated accounts, Pension provisions.

Benefits for board members of Vattenfall AB and senior executives of the Vattenfall Group

Amounts in SEK thousands	2019			2018		
	Directors' fees and base salary including vacation pay	Other remuneration and benefits	Pension and severance costs	Directors' fees and base salary including vacation pay	Other remuneration and benefits	Pension and severance costs
Board of Directors						
Lars G. Nordström, Chairman of the Board	821	–	–	768	–	–
Fredrik Arp, board member	454	–	–	441	–	–
Viktoria Bergman, board member	410	–	–	389	–	–
Håkan Erixon, board member	438	–	–	412	–	–
Tomas Kåberger, board member	438	–	–	414	–	–
Jenny Lahrin, board member	–	–	–	–	–	–
Åsa Söderström Jerring, board member	418	–	–	410	–	–
Fredrik Rystedt, board member	438	–	–	414	–	–
Ann Carlsson (from April 11, 2019)	300	–	–	–	–	–
Employee representatives	–	–	–	–	–	–
Total, Board of Directors	3,717	–	–	3,248	–	–
	2019			2018		
Amounts in SEK thousands	Directors' fees and base salary including vacation pay	Other remuneration and benefits	Pension and severance costs	Directors' fees and base salary including vacation pay	Other remuneration and benefits	Pension and severance costs
Executive Group Management						
Magnus Hall, President and CEO	15,818	73	4,643	15,242	68	4,507
Anna Borg, CFO	6,712	90	2,060	6,625	92	2,020
Torbjörn Wahlborg, Head of Generation Business Area	7,432	72	2,193	7,309	67	2,149
Tuomo Hatakka, Head of Heat Business Area	13,783	97	2,903	13,132	94	2,821
Kerstin Ahlfont, Head of Human Resources Staff Function	4,400	24	1,300	4,283	18	1,274
Gunnar Groebler, Head of Wind Business Area	6,704	128	1,284	5,961	97	1,181
Anne Gynnerstedt, Head of Legal & CEO Office Staff Function and Secretary to the Board of Directors	5,249	70	1,467	4,802	54	1,438
Martijn Hagens, Head of Customers & Solutions Business Area	7,538	39	1,250	7,181	38	1,754 ¹
Niek den Hollander, Head of Business Area Markets	7,538	1,939 ³	1,344	7,181	4,524 ²	1,293
Andreas Regnell, Head of Strategic Development Staff Function	4,665	79	1,381	4,575	74	1,354
Karin Lepasoon, Head of Communication	4,518	63	1,345	4,482	28	1,318
Other senior executives						
Björn Linde, Head of Business Unit Nuclear Generation	3,423	91	1,010	2,941	77	878
Annika Viklund, Head of Distribution Business Area	5,419	40	1,504	4,791	34	1,474
Total Executive Group Management and senior executives	93,199	2,805	23,684	88,505	5,265	23,461
Total Board of Directors, Executive Group Management and other senior executives	96,916	2,805	23,684	91,753	5,265	23,461

¹ The pension cost was higher in 2018 due to a one-time adjustment in 2018 of payments made in 2016 and 2017.

² Of this amount, SEK 4,391 thousand pertains to payment of variable remuneration received in 2018 related to a previous position at Vattenfall.

³ Of this amount, SEK 1,795 thousand pertains to payment of variable remuneration received in 2018 related to a previous position at Vattenfall.

Board of Directors

As of 11 April 2019 the Annual General Meeting resolved in favour of increasing these fees by 6.8% and 5.9%, respectively, entailing that directors' fees for the period until the end of the next Annual General Meeting shall amount to SEK 790 thousand for the Chairman of the Board and SEK 370 thousand for each of the other directors elected at the Annual General Meeting. In addition, it was resolved that for service on the Audit Committee, a fee of SEK 99 thousand shall be paid to the respective committee chairs and SEK 75 thousand to the other

committee members. For service on the Remuneration Committee, a fee of SEK 60 thousand shall be paid to the respective committee chairs and SEK 45 thousand to the other committee members. No directors' fees are paid to board members who are employed by the Swedish Government Offices or to employee representatives. The fees paid to each individual board member are shown in the table above. The board members' respective committee assignments are described in the Corporate Governance section on pages 82-83.

President and Chief Executive Officer

Magnus Hall received a salary of SEK 15,818 thousand in 2019. The value of other benefits in 2019 amounted to SEK 73 thousand and pertains to the benefit of an annual pass with SJ. Magnus Hall has no variable salary component in his employment as President and CEO of Vattenfall AB.

Magnus Hall has a defined contribution pension solution. Premiums paid for 2019 totalled SEK 4,643 thousand, which corresponds to 30% of his 2019 salary excluding benefits. The retirement age for Vattenfall's CEO is 65 years. Magnus Hall's term of employment is until further notice, with a mutual notice period of six months. In the event Vattenfall serves notice, Magnus Hall is entitled to a maximum of 18 months' severance pay after the notice period, but not longer than until his date of retirement. The amount of the severance pay shall be based on the fixed salary that applied at the time the notice was served. In the event Magnus Hall accepts new employment or earns income from other business activities, the severance pay shall be reduced by an amount corresponding to the new income or other benefit received during the period in question. Severance pay is to be paid out monthly. Magnus Hall's terms of employment are in agreement with the Swedish government's guidelines.

Other senior executives**Salaries and other remuneration**

For other members of the Executive Group Management, a total of 10 individuals (10), the sum of salaries and other remuneration for 2019, including the value of company cars and other benefits, was SEK 71,140 thousand. For other persons defined as senior executives by Vattenfall, who are not members of the Executive Group Management – a total of 2 individuals (2) – the sum of salaries and other remuneration for 2019, including the value of company cars and other benefits, was SEK 8,973 thousand.

Retirement benefits

Kerstin Ahlfont, Gunnar Groebler, Anne Gynnerstedt, Tuomo Hatakka, Andreas Regnell, Torbjörn Wahlborg, Björn Linde, Annika Viklund, Karin Lepasoon, Anna Borg and Niek den Hollander all have defined contribution pension solutions. Martijn Hagens has a pension solution under

collective agreements in the Netherlands. All pensions for these executives are in compliance with the Swedish government's guidelines.

Terms of notice on the part of the company

According to the government's guidelines, the notice period for a senior executive in the event the company serves notice shall not exceed six months. In addition, severance pay equivalent to a maximum of 12 months' salary¹ is payable thereafter. In the event the individual in question accepts new employment or receives income from other business activities, the severance pay shall be reduced by an amount corresponding to the new income or benefit received during the time in question. The severance pay is paid out monthly. All senior executives have severance terms that are in compliance with the government's guidelines.

Incentive programmes

The members of the Executive Group Management and other senior executives do not receive any variable salary component.

Payment from variable remuneration programmes

Vattenfall offers short-term variable performance-based remuneration programmes to certain categories of employees in order to attract, retain and motivate.

Amounts in SEK thousands	Payment 2019	Payment 2018
Type of programme:		
Profit-sharing	97,833 ²	217,754
Short-term incentive programmes	280,171	294,599
Long-term incentive programmes	37,914	26,376

¹ Based on new guidelines from the government. Contracts entered into before the Annual General Meeting 27 April 2017 have severance pay corresponding to a maximum of 18 months.

² The difference in the amount paid out in 2019 compared with 2018 is due to lower target achievement and a lower EBIT result than expected, which affected the outcome of the profit-sharing programmes.

Note 43 Gender distribution among senior executives

	Women, %		Men, %	
	2019	2018	2019	2018
Gender distribution among board members	33	29	67	71
Gender distribution among other senior executives	36	36	64	64

Note 44 Related party disclosures

Vattenfall AB is 100%-owned by the Swedish state. The Vattenfall Group's products and services are offered to the state, state authorities and state companies in competition with other vendors under generally accepted commercial terms. In a similar manner, Vattenfall AB and its Group companies purchase products and services from state authorities and state companies at market prices and otherwise under generally accepted commercial terms. No significant share of the Vattenfall Group's net sales, purchasing or earnings is attributable to the Swedish state or any of its authorities or companies.

Disclosures of transactions with key persons in executive positions in the company are shown in Note 42 to the Consolidated accounts, Number of employees and personnel costs.

Disclosures of transactions with major associated companies in 2019 and associated receivables and liabilities as per 31 December 2019 are described below.

Kernkraftwerk Brokdorf GmbH & Co. oHG

This is a nuclear power plant from which Vattenfall purchases electricity. Purchases amounted to SEK 655 million (446). Operating revenue from the company amounted to SEK 0 million (0). Vattenfall's interest expense to the company amounted to SEK 4 million (2). Loan liabilities amounted to SEK 449 million (156).

GASAG Berliner Gaswerke AG

The company sells, distributes and stores natural gas in the Berlin area. Operating revenue from the company amounted to SEK 300 million (282) and purchases from the company totalled SEK 20 million (13). Trade liabilities amounted to SEK -8 million (0). Vattenfall's part of contingent liabilities of the company amounted to SEK 34 million (123).

Note 45 Events after the balance sheet date

On 5 March 2020, Vattenfall issued a new EUR 500 million green senior bond. Vattenfall now has two green bonds outstanding with a total size of EUR 1 billion.

On 12 March 2020, Vattenfall announced that the customer accounts of its UK energy retail business, iSupplyEnergy, had been acquired by EDF. Vattenfall will focus on developing its core UK renewable power generation, heating, B2B sales and distribution businesses.

Covid-19: We are continuously monitoring the effect on our business as a whole and our financial position but it is too early to draw any conclusions at this point in time.

Note 46 Operations requiring permits

During the year Vattenfall conducted operations that require permits under national legislation in Sweden, Finland, Denmark, Germany, the Netherlands and the UK. Vattenfall AB conducts operations that require permits in accordance with the Swedish Environmental Code. These consist primarily of electricity and heat production plants that require permits and/or registration. Vattenfall's other operations requiring permits that make up a significant part of the business are conducted primarily by subsidiaries.

Parent Company Vattenfall AB

Condensed review of 2019

A condensed income statement and balance sheet for the Parent Company are presented below.

- Net sales amounted to SEK 49,807 31,676 Tsd. €million (42,450).
- Profit before appropriations and income taxes was SEK 21,088 million (1,400–5,213 Tsd. €).
- Earnings were negatively affected by higher futures prices for the unrealized derivatives compared with the same period a year ago. Higher electricity generation and higher spot prices have had a positive effect on earnings. The result from participations in subsidiaries was SEK 8,226 million (3,389), of which SEK 7,963 million pertains to a dividend from N.V. Nuon Energi. The remaining amount consists of dividends, impairment losses and the result from liquidations. The change in other financial expenses is mainly attributable to currency effects.
- The balance sheet total was SEK 282,662 million (278,819).
- Investments during the period amounted to SEK 11,917 million (1,318), where of SEK 10,500 million pertains to a group internal share transactions.
- Cash and cash equivalents, and Short-term investments amounted to SEK 28,573 million (39,798). The decrease pertains mainly to dividends, the repayment of loans from subsidiaries and changes in the company's debt portfolio.
- Dividend paid to the owner of SEK 2,000 million (2,000)

Parent Company income statement

Amounts in SEK million, 1 January–31 December	Note	2019	2018
Net sales	5, 6	49,807	42,450
Cost of purchases	6	-28,256	-34,751
Other external expenses		-3,697	-3,745
Personnel expenses		-2,083	-2,053
Other operating incomes and expenses, net		160	71
Operating profit before depreciation, amortisation and impairment losses (EBITDA)	14, 15	15,931	1,972
Depreciation, amortisation and impairments	7	-525	-501
Operating profit (EBIT)		15,406	1,471
Result from participations in subsidiaries	8	8,226	3,389
Result from participations in associated companies	9	1	–
Other financial income	10	1,592	1,403
Other financial expenses	11	-4,137	-4,863
Profit before appropriations and income taxes		21,088	1,400
Appropriations	12	498	919
Profit before income taxes		21,586	2,319
Income taxes	13	-2,890	135
Profit for the year		18,696	2,454

Parent Company statement of comprehensive income

Amounts in SEK million, 1 January–31 December	2019	2018
Profit for the year	18,696	2,454
Total other comprehensive income	–	–
Total comprehensive income for the year	18,696	2,454

Parent Company balance sheet

Amounts in SEK million	Note	31 December 2019	31 December 2018
Assets			
Non-current assets			
Intangible assets: non-current	16	333	193
Property, plant and equipment	17	5,273	4,563
Shares and participations	18	160,465	149,779
Deferred tax assets	13	762	1,921
Other non-current receivables	19	66,195	63,366
Total non-current assets		233,028	219,822
Current assets			
Inventories	20	383	269
Intangible assets: current		168	337
Current receivables	21	20,510	17,949
Current tax assets	12	–	644
Short-term investments	22	21,702	22,129
Cash and cash equivalents	23	6,871	17,669
Total current assets		49,634	58,997
Total assets		282,662	278,819
Equity, provisions and liabilities			
Equity			
Restricted equity			
Share capital (131,700,000 shares with a share quota value of SEK 50)		6,585	6,585
Revaluation reserve		37,989	37,989
Other reserves		1,480	1,341
Non-restricted equity			
Retained earnings		46,479	46,163
Profit for the year		18,696	2,454
Total equity		111,229	94,532
Untaxed reserves	12	11,598	11,753
Provisions	24	5,219	5,256
Non-current liabilities			
Hybrid capital	25	20,167	19,837
Other interest-bearing liabilities	25	40,494	39,171
Other noninterest-bearing liabilities	26	12,148	11,196
Total non-current liabilities		72,809	70,204
Current liabilities			
Other interest-bearing liabilities	25	70,892	86,207
Current tax liabilities	13	249	–
Other noninterest-bearing liabilities	27	10,666	10,867
Total current liabilities		81,807	97,074
Total equity, provisions and liabilities		282,662	278,819

See also information on Collateral (Note 29), Contingent liabilities (Note 30) and Commitments under consortium agreements (Note 31), in the notes to the Parent Company accounts.

Parent Company cash flow statement

Amounts in SEK million, 1 January–31 December	Note	2019	2018
Operating activities			
Operating profit before depreciation, amortisation and impairment losses		15,931	1,972
Tax paid		-836	-1,284
Interest received		1,595	1,452
Interest paid		-2,767	-3,110
Other, incl. non-cash items	35	-5,796	6,101
Funds from operations (FFO)		8,127	5,131
Changes in inventories		-114	-48
Changes in operating receivables		-3,333	-6,416
Changes in operating liabilities		-2,236	2,696
Cash flow from changes in operating assets and operating liabilities		-5,683	-3,768
Cash flow from operating activities		2,444	1,363
Investing activities			
Investments in subsidiaries	18	-10,510	-364
Investments in associated companies and other shares and participations	18	-23	-147
Other investments in non-current assets		-1,384	-807
Total investments		-11,917	-1,318
Divestments		9	383
Cash flow from investing activities		-11,908	-935
Cash flow before financing activities		-9,464	428
Financing activities			
Changes in short-term investments		427	-4,924
Loans raised		7,369	26,933
Amortisation of other debts		-15,545	-14,118
Dividend paid to owner		-2,000	-2,000
Effect of early termination of swaps related to financing activities		-222	-122
Amortisation received from subsidiaries		-	-
Dividend received from subsidiaries		8,249	3,670
Group contributions received/paid		388	1,386
Cash flow from financing activities		-1,334	10,825
Cash flow for the year		-10,798	11,253
Cash and cash equivalents			
Cash and cash equivalents at start of year		17,669	6,416
Cash flow for the year		-10,798	11,253
Cash and cash equivalents at end of year		6,871	17,669

Parent Company statement of changes in equity

Amount in SEK million	Share capital	Revaluation reserve	Other reserves ¹	Non-restricted equity	Total
Balance brought forward 2018	6,585	37,989 ²	1,322	48,182	94,078
Dividend paid to owner	-	-	-	-2,000	-2,000
Fund for development costs	-	-	18 ³	-18 ³	-
Profit for the year	-	-	-	2,454	2,454
Balance carried forward 2018	6,585	37,989	1,340	48,618	94,532
Dividend paid to owners	-	-	-	-2,000	-2,000
Fund for development costs	-	-	140 ³	-139 ³	1
Profit for the year	-	-	-	18,696	18,696
Balance carried forward 2019	6,585	37,989	1,480	65,175	111,229

¹ Other reserves consist of Statutory reserve SEK 1,286 million (1,286) and Fund for development costs SEK 194 million (54).

² Pertains to the revaluation of shares in Vattenfall Eldistribution AB. This revaluation is a non-taxable item, and the book value before the revaluation was SEK 11 million.

³ Pertains to the year's capitalised costs less depreciation according to plan for own development work that have been reserved in the Fund for development costs. The capitalised costs are considered to be tax-deductible once the assets they pertain to become operational and depreciation according to plan is made.

As of 31 December 2019 the registered share capital comprised 131,700,000 shares with a share quota value of SEK 50.

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Note 1 Company information

Vattenfall AB's 2019 Annual Report was approved in accordance with a decision by the Board of directors on 19 March 2020. Vattenfall AB (publ) with corporate identity number 556036-2138, which is the Parent Company of the Vattenfall Group, is a limited liability company with its registered office in Solna, Sweden and with the address SE-169 92 Stockholm, Sweden. The balance sheet and income statement of the Parent Company included in Vattenfall's Annual and Sustainability Report will be submitted at the Annual General Meeting (AGM) on 28 April 2020.

Note 2 Proposed distribution of profits

The Annual General Meeting as at its disposal retained profits including the result for the year, totalling SEK 65,172,029,238. In accordance with the dividend policy adopted by the Annual General Meeting of Vattenfall AB, the Board of Directors and President propose, in view of the result for the year, that the profits to be distributed as follows:

To be distributed to the shareholder	7,245,000,000
To be carried forward	57,927,029,238
Total	65,172,029,238

Note 3 Accounting policies**General**

The Parent Company's accounts are prepared in accordance with the Swedish Annual Accounts Act and recommendation RFR 2 - "Accounting for Legal Entities", issued by the Swedish Financial Reporting Board (RFR). RFR 2 entails that the Parent Company should apply all standards and interpretations issued by IASB and IFRIC as endorsed by the European Commission for application within the EU. This should be done as far as possible within the framework of the Swedish Annual Accounts Act by taking into consideration the relationship between accounting and taxation.

The applied accounting policies are outlined in applicable parts of Note 3 to the consolidated accounts, Accounting policies, or in the respective notes for the Group, with the following addition for the Parent Company.

Important changes in the financial statements compared with the preceding year

No changed accounting standards and interpretations valid from 2019 have had any material effect on the Parent Company's financial statements. The parent company does not report leasing in accordance with IFRS 16 as per the exception rule in RFR 2.

Presentation of Parent Company's income statement

See Note 2 to the consolidated accounts, Important changes in the financial statements compared with the preceding year.

Depreciation and amortisation

As in the consolidated accounts, depreciation and amortisation are based on cost and are applied on a straight-line basis over the estimated useful life of the asset in question. In addition, certain accelerated depreciation/amortisation (the difference between depreciation/amortisation according to plan and depreciation/amortisation for tax purposes) in the Parent Company is reported under Appropriations and Untaxed reserves, respectively.

Financial instruments

The Parent Company reports financial instruments in accordance with IFRS 9 - "Financial Instruments". The principles for classification and measurement of financial instruments, impairment of financial assets, and hedge accounting are described in Note 36 to the consolidated accounts - Financial instruments by category, offsetting of financial assets and liabilities, and financial instruments' effects on income.

The Parent Company effectively hedges net investments in foreign operations via currency forward contracts and loans in foreign currency. Effects of changes in exchange rates are therefore not recognised for loans raised for the financing of foreign subsidiaries, associated companies and joint arrangements. Nonmonetary assets acquired in a foreign currency are recognised at the exchange rate at the time of the acquisition.

Foreign currency

Assets and liabilities in foreign currencies that not applies hedge accounting for are recognised at the exchange rates of the balance sheet date.

Capitalised costs for own development work

For costs for own development work that are capitalised, a corresponding amount is transferred from unrestricted equity to the fund for development costs.

Income taxes

Tax legislation in Sweden allows companies to defer tax payments by making provisions to untaxed reserves. In the Parent Company, untaxed reserves are reported as a separate item on the balance sheet that includes deferred tax. In the Parent Company's income statement, provisions to untaxed reserves and dissolution of untaxed reserves are reported under the heading Appropriations.

Important estimations and assessments in the preparation of the financial statements

Preparation of the financial statements requires the company's executive management and Board of directors to make estimations and assessments as well as to make assumptions that affect application of the accounting policies and the reported amounts of assets, liabilities, income and expenses. These estimations and assessments are based on historic experience and other factors that seem reasonable under current conditions. The results of these estimations and assessments are then used to establish the reported values of assets and liabilities that are not otherwise clearly documented from other sources. The final outcome may deviate from the results of these estimations and assessments. The estimations and assessments are revised on a regular basis. The effects of changes in estimations are reported in the period in which the changes were made if the changes affected this period only or in the period the changes were made and future periods if the changes affect both the current period and future periods. Important estimations and assessments are described further in Note 18 to the Parent Company, Shares and participations.

Significant accounting policies applicable as from 1 January 2020

As from 2020, no changed accounting standards and interpretations are considered to have any material effect on the Parent Company's financial statements.

Note 4 Exchange rates

See Note 5 to the consolidated accounts, Exchange rates.

Note 5 Net sales

Net sales per geographical area	2019	2018
Nordic	34,397	33,162
Germany	14,947	9,116
Netherlands	443	402
Other countries	20	-230
Total	49,807	42,450

Net sales for products and services	2019	2018
Sales of electricity	43,707	36,459
Sale of heat and steam	1,894	1,947
Service and consulting	1,999	1,922
Total Revenues from contracts with customers	47,600	40,328
Other Revenues	2,207	2,122
Total	49,807	42,450

Contract balances	2019	2018
Contract assets	–	2
– of which, released as cost from opening balance during the year	–	–
Contract liabilities	225	213
– of which, released as revenue from opening balance during the year	-13	-12

Note 6 Intra Group transactions

Of the Parent Company's total income from sales and total purchase costs, transactions with subsidiaries account for 37% (29%) of sales and 90% (64%) of purchase costs.

Note 7 Impairment losses

No impairment was recognised of intangible non-current assets or of property, plant and equipment 2019 or 2018 financial years.

Note 8 Result from participations in subsidiaries

	2019	2018
Dividends	8,249	3,670
Impairment losses	-15 ¹⁾	-482
Capital gains/losses on divestments	–	201
Reversed debt to subsidiaries	-8	–
Total	8,226	3,389

¹⁾ The impairment losses pertain to dividend received from Vattenfall Consultant AB.

Note 9 Result from participations in associated companies

	2019	2018
Dividends	1	–
Total	1	–

Note 10 Other financial income

	2019	2018
Interest income from subsidiaries	1,464	1,341
Other interest income	128	62
Total	1,592	1,403

Note 11 Other financial expenses

	2019	2018
Interest expenses to subsidiaries	27	39
Other interest expenses	2,772	3,222
Foreign exchange gains and losses, net	1,338	1,602
Total	4,137	4,863

Note 12 Appropriations and untaxed reserves**Appropriations**

	2019	2018
Group contributions paid	-2,392	-2,625
Group contributions received	2,735	3,013
Provision/Dissolution of untaxed reserves, net	155	531
Total	498	919

Untaxed reserves

	Balance brought forward	Provision (+)/dissolution (-)	Balance carried forward
Accelerated depreciation	1,985	255	2,240
Tax allocation reserves for 2013-2019 tax years	9,768	-410	9,358
Total	11,753	-155	11,598

Note 13 Income taxes

The reported tax income/tax expense is broken down as follows:

	2019	2018
Current tax	-1,730	-746
Deferred tax	-1,160	881
Total	-2,890	135

The tax effect of the standard interest on tax allocation reserves amounts to SEK 11 million (8).

The difference between the nominal Swedish tax rate and the effective tax rate is explained as follows:

	2019		2018	
	%		%	
Profit before tax		21,586		2,319
Swedish income tax rate at 31 December	21.4	-4,620	22.0	-510
Current tax adjustment attributable to previous years	0.0	1	0.2	-4
Capital gains, non-taxable	0.0	-	-1.9	44
Non-taxable income	-8.2	1,766	-34.8	808
Impairment losses, non-deductible	0.0	-3	4.6	-106
Interest expense, non-deductible	0.1	-15	0.5	-13
Other non-deductible expenses	0.1	-23	0.2	-4
Tax rate change	0.0	4	3.4	-80
Effective tax rate in Sweden	13.4	-2,890	-5.8	135

Balance sheet reconciliation – Deferred tax:

	Balance brought forward		Changes via income statement		Balance carried forward	
	2019	2018	2019	2018	2019	2018
Non-current assets	-108	-1,425	111	1,317	3	-108
Current assets	-1,235	-401	-230	-834	-1,465	-1,235
Provisions	111	126	-20	-15	91	111
Other non-current liabilities	971	2,119	-341	-1,148	630	971
Current liabilities	2,182	621	-679	1,561	1,503	2,182
Total	1,921	1,040	-1,159	881	762	1,921

Note 14 Leasing**Leasing expenses**

Future payment commitments, as of 31 December 2019 for leasing contracts and rental contracts are broken down as follows:

	Finance leases	Operating leases
2020	-	621
2021-2024	-	16
2025 and beyond	-	-
Total	-	637

Leasing expenses for the year amounted to SEK 83 million (71).

Note 15 Auditors' fees

Annual audit assignment:

Annual audit assignment	2019	2018
EY	7	7
Total	7	7

Auditing activities besides the annual audit assignment

	2019	2018
EY	2	2
Total	2	2

Note 16 Intangible assets: non-current

2019

	Capitalised development costs	Concessions and similar rights and cost to obtain a contract	Renting and similar rights	Total
Cost				
Cost brought forward	377	987	–	1,364
Investments	160	65	–	225
Divestments/disposals	–	-11	–	-11
Accumulated cost carried forward	537	1,041	–	1,578
Amortisation according to plan				
Amortisation brought forward	-197	-859	–	-1,056
Amortisation for the year	-4	-80	–	-84
Divestments/disposals	–	11	–	11
Accumulated amortisation according to plan carried forward	-201	-928	–	-1,129
Impairment losses				
Impairment losses brought forward	-116	–	–	-116
Accumulated impairment losses carried forward	-116	–	–	-116
Residual value according to plan carried forward	220	113	–	333

2018

	Capitalised development costs	Concessions and similar rights and cost to obtain a contract	Renting and similar rights	Total
Cost				
Cost brought forward	356	936	–	1,292
Investments	22	63	–	85
Divestments/disposals	–	-13	–	-13
Accumulated cost carried forward	378	986	–	1,364
Amortisation according to plan				
Amortisation brought forward	-193	-796	–	-989
Amortisation for the year	-4	-75	–	-79
Divestments/disposals	–	13	–	13
Accumulated amortisation according to plan carried forward	-197	-858	–	-1,055
Impairment losses				
Impairment losses brought forward	-116	–	–	-116
Accumulated impairment losses carried forward	-116	–	–	-116
Residual value according to plan carried forward	65	128	–	193

At 31 December 2019 there were no contractual commitments for the acquisition of intangible non-current assets.

Note 17 Property, plant and equipment

	2019				
	Land and buildings	Plant and machinery and other technical installations	Equipment, tools, fixtures and fittings	Construction in progress	Total
Cost					
Cost brought forward	1,193	8,377	442	1,173	11,185
Investments	–	46	127	986	1,159
Transfer from construction in progress	31	807	24	-861	1
Divestments/disposals	-8	-103	-35	–	-146
Accumulated cost carried forward	1,216	9,127	558	1,298	12,199
Depreciation according to plan					
Depreciation brought forward	-724	-5,630	-265	–	-6,619
Depreciation for the year	-29	-321	-91	–	-441
Divestments/disposals	7	100	30	–	137
Accumulated depreciation according to plan carried forward	-746	-5,851	-326	–	-6,923
Impairment losses					
Impairment losses brought forward	-1	-2	–	–	-3
Accumulated impairment losses carried forward	-1	-2	–	–	-3
Residual value according to plan carried forward	469	3,274	232	1,298	5,273
Accumulated accelerated depreciation	–	-2,239	–	–	-2,239
Carrying amount	469	1,035	232	1,298	3,034
	2018				
	Land and buildings	Plant and machinery and other technical installations	Equipment, tools, fixtures and fittings	Construction in progress	Total
Cost					
Cost brought forward	1,182	8,091	509	865	10,647
Investments	–	–	96	626	722
Transfer from construction in progress	11	294	13	-318	–
Divestments/disposals	–	-8	-176	–	-184
Accumulated cost carried forward	1,193	8,377	442	1,173	11,185
Depreciation according to plan					
Depreciation brought forward	-695	-5,331	-341	–	-6,367
Depreciation for the year	-29	-305	-88	–	-422
Divestments/disposals	–	7	163	–	170
Accumulated depreciation according to plan carried forward	-724	-5,629	-266	–	-6,619
Impairment losses					
Impairment losses brought forward	-1	-2	–	–	-3
Accumulated impairment losses carried forward	-1	-2	–	–	-3
Residual value according to plan carried forward	468	2,746	176	1,173	4,563
Accumulated accelerated depreciation	–	-1,985	–	–	-1,985
Carrying amount	468	761	176	1,173	2,578

At 31 December 2019 there were no contractual commitments for the acquisition of property, plant and equipment.

Note 18 Shares and participations**Important estimations and assessments**

Participations in subsidiaries are tested for impairment in accordance with the accounting policies described in Note 9 to the consolidated accounts, Impairment losses and reversed impairment losses. The recoverable amount for cash-generating units is determined by calcula-

ting the value in use or fair value less costs to sell. For these calculations, certain estimations must be made regarding future cash flows along with other adequate assumptions regarding the required rate of return, for example.

Financial information

	2019				2018			
	Participations in subsidiaries	Participations in associated companies	Other shares and participations	Total	Participations in subsidiaries	Participations in associated companies	Other shares and participations	Total
Balance brought forward	149,565	104	110	149,779	149,850	56	8	149,914
Investments	10,510	23	–	10,533	24	11	–	35
Shareholder contributions	–	145	–	145	340	29	102	471
New share issue	23	–	–	23	–	5	–	5
Divestments	–	–	–	–	–	–	–	–
Profit participations in associated companies	–	–	–	–	–	3	–	3
Liquidation	–	–	–	–	-167	–	–	-167
Impairment losses	-15	–	–	-15	-482	–	–	-482
Balance carried forward	160,083	272	110	160,465	149,565	104	110	149,779

For a breakdown of the Parent Company's shares and participations in subsidiaries, associated companies and other shares and participations, see Notes 18-19 to the consolidated accounts.

Note 19 Other non-current receivables

	2019					2018				
	Receivables from subsidiaries	Receivables from associated companies	Derivative assets	Other receivables	Total	Receivables from subsidiaries	Receivables from associated companies	Derivative assets	Other receivables	Total
Balance brought forward	57,309	29	5,324	704	63,366	52,180	5	6,473	730	59,388
New receivables	2,588	13	–	67	2,668	5,126	24	–	11	5,161
Payments received	-36	-16	–	–	-52	–	–	–	–	–
Foreign exchange gains/losses	401	–	–	–	401	–	–	–	–	–
Derivative changes	–	–	856 ¹	–	856	–	–	-1,149 ¹	–	-1,149
Other changes	–	–	–	-492	-492	3	–	–	-37	-34
Reclassification between non-current and current receivables	–	–	–	-552	-552	–	–	–	–	–
Balance carried forward	60,262	26	6,180	-273	66,195	57,309	29	5,324	704	63,366

¹) Net change and measurement at fair value.

Note 20 Inventories**Accounting policies**

The cost of inventories is calculated, depending on the type of inventory, either through application of the first-in, first-out (FIFO) method or through the application of a method based on average prices. Both methods include costs that arose on acquisition of the inventory assets.

Financial information

Inventories consist mainly of biofuels and fossil fuels for heat production.

Note 21 Current receivables

	2019	2018
Advance payments paid	132	123
Accounts receivable - trade	1,405	1,866
Receivables from subsidiaries	12,881	9,093
Receivables from associated companies	1	1
Other receivables	1,355	2,106
Derivative assets	1,448	1,456
Prepaid expenses and accrued income	3,288	3,304
Total	20,510	17,949

Age analysis of current receivables

The collection period is normally 30 days.

	2019			2018		
	Receivables gross	Impaired receivables	Receivables net	Receivables gross	Impaired receivables	Receivables net
Accounts receivable - trade						
Not due	1,348	8	1,340	1,719	–	1,719
Past due 1-30 days	58	1	57	126	–	126
Past due 31-90 days	4	–	4	5	–	5
Past due >90 days	31	27	4	34	18	16
Total	1,441	36	1,405	1,884	18	1,866

Receivables from subsidiaries, Receivables from associated companies, and Other receivables include no receivables that are due for payment.

Note 22 Short-term investments

	2019	2018
Fixed-income investments	19,698	19,693
Margin calls, financing activities ¹	2,004	2,436
Total	21,702	22,129

¹⁾ With respect to pledged assets, see Note 28 to the Parent Company accounts, Collateral.

Note 23 Cash and cash equivalents

	2019	2018
Cash and bank balances	2,603	8,891
Cash equivalents	4,268	8,778
Total	6,871	17,669

Note 24 Provisions**Accounting policies**

The Parent Company's defined benefit pension plans are reported in accordance with the simplification rule. For the pension plans that are subject to the Act on Safeguarding of Pension Obligations, ("Tryggandelagen"), the calculation of future obligations to pay pensions is made in accordance with the stipulations of the Act. For other pension plans, the obligations are calculated on the basis of actuarial principles. See also Note 30 to the consolidated accounts, Pension provisions.

Financial information

	2019	2018
Pension provisions ^{1,2}	4,262	4,205
Personnel-related provisions for non-pension purposes	364	483
Provisions for environmental measures/undertakings	41	40
Other provisions	552	528
Total	5,219	5,256
¹⁾ Of which, information registered by PRI	3,875	3,794
²⁾ Of which, covered by credit insurance with FPG/PRI	4,258	4,201

The Parent Company owns, together with Svafo Ågestaverket, a nuclear power station that previously produced district heating in southern Stockholm. Vattenfall is settling its obligation for dismantling, restoration and final storage through payments to the Swedish Nuclear Waste Fund. Vattenfall's payments to the Swedish Nuclear Waste Fund have been expensed in the Parent Company's accounts and are therefore not recognised as a liability for the obligation nor a balance with the Swedish Nuclear Waste Fund in the Parent Company. See also Note 20, Share in Nuclear Waste Fund and Note 31, Other interest-bearing provisions in the notes to the consolidated accounts.

Note 25 Other interest-bearing liabilities

	Non-current portion maturity 1-5 years		Non-current portion maturity >5 years		Total non-current portion		Current portion		Total	
	2019	2018	2019	2018	2019	2018	2019	2018	2019	2018
Bond issues	18,077	12,902	18,426	17,165	36,503	30,067	5,366	13,088	41,869	43,155
Commercial paper	–	–	–	–	–	–	12,270	7,408	12,270	7,408
Liabilities to credit institutions	–	1,401	–	–	–	1,401	1,427	795	1,427	2,196
Liabilities to subsidiaries	19	576	–	–	19	576	45,162	54,771	45,181	55,347
Derivative debts	3,824	5,207	148	1,920	3,972	7,127	2,746	6,550	6,718	13,677
Other liabilities (margin calls within financing activities) ¹⁾	–	–	–	–	–	–	3,921	3,595	3,921	3,595
Total interest-bearing liabilities excluding Hybrid capital	21,920	20,086	18,574	19,085	40,494	39,171	70,892	86,207	111,386	125,378
Hybrid capital ²⁾	9,720	9,582	10,447	10,255	20,167	19,837	–	–	20,167	19,837
Total interest-bearing liabilities	31,640	29,668	29,021	29,340	60,661	59,008	70,892	86,207	131,553	145,215

¹⁾ With respect to pledged assets, see Note 29 to the Parent Company accounts, Collateral.

²⁾ See Note 29 to the consolidated accounts, Interest-bearing liabilities and related financial derivatives.

**Note 26 Other noninterest-bearing liabilities
(non-current)**

	2019	2018
Liabilities to subsidiaries	11,871	10,921
Contract debts	225	212
Other liabilities	52	63
Total	12,148	11,196

Liabilities to subsidiaries refer mainly to liabilities pertaining to Group contributions and to a non-current liability to Forsmarks Kraftgrupp AB for power charges. For this latter debt, in accordance with an agreement between the co-owners, no interest is payable on the debt. Of other liabilities, SEK 8 million (12) falls due after more than five years.

Note 27 Other noninterest-bearing liabilities (current)

	2019	2018
Accounts payable - trade	488	412
Liabilities to subsidiaries	5,625	5,775
Other liabilities	1,527	1,008
Accrued expenses and deferred income	3,026	3,672
Total	10,666	10,867

Breakdown of accrued expenses and deferred income:

	2019	2018
Accrued personnel-related costs	358	298
Accrued interest expenses	1,399	1,638
Other accrued expenses	844	1,095
Deferred income and accrued expenses, electricity	388	609
Other deferred income	37	32
Total	3,026	3,672

Note 28 Financial instruments by measurement category

The measurement categories for assets and liabilities below correspond to the categories described in Note 36 to the consolidated accounts. Financial instruments by measurement category, offsetting of financial assets and liabilities, and financial instruments effects on income.

Presented below are assets and liabilities where the carrying amount differs from the fair value.

	2019		2018	
	Carrying amount	Fair value	Carrying amount	Fair value
Financial assets at amortised cost				
Other non-current receivables	66,195	66,916	63,366	66,798
Short-term investments	21,702	21,702	22,129	22,129
Total	87,897	88,618	85,495	88,927
Financial liabilities at amortised cost				
Hybrid capital	20,167	21,671	19,837	19,957
Other non-current interest-bearing liabilities	40,494	43,205	39,171	44,618
Current interest-bearing liabilities	70,892	70,899	86,207	86,394
Total	131,553	135,775	145,215	150,969

Note 29 Collateral**Collateral and pledged assets (given)**

	2019	2018
Shares pledged to the Swedish insurance company PRI Pensionsgaranti as security for credit insurance for pension obligations in Vattenfall's Swedish operations ²	7,295	7,295
Pledged security to counterparties (derivative market) ¹	2,004	2,435
Blocked bank funds as security for trading on Nord Pool, ICE and EEX	–	4,822
Blocked bank funds as security for guarantees issued by bank	–	–
Total	9,299	14,552

Collateral and pledged assets (received)

	2019	2018
Pledged security from counterparties (derivative market) ¹	3,760	3,370

¹ To fulfil the requirements for security in the derivative market, in its financial operations Vattenfall has pledged security to counterparties for the negative fair value of derivative positions. The counterparties are obligated to repay this security to Vattenfall in the event the negative fair value decreases. In a similar manner, counterparties of Vattenfall have pledged security to Vattenfall.

² Pledged shares contains of shares of Vattenfall Eldistribution AB.

Note 30 Contingent liabilities**Guarantees pertaining to:**

	2019	2018
Swedish Nuclear Waste Fund	23,935	15,448
Contractor guarantees provided by order of subsidiaries	9,462	5,974
Guarantees provided as collateral for the subsidiaries within Vattenfall Energy Trading's energy trading	9,307	8,712
Other contingent liabilities	13,466	11,793
Total	56,170	41,927

Swedish Nuclear Waste Fund

According to the Swedish Act (2006:647) on the Financing of Nuclear Waste Products, a party that has a permit to conduct nuclear engineering activities, such as Ringhals AB and Forsmarks Kraftgrupp AB, is required to provide security to the Swedish state as a guarantee that sufficient funds exist to cover the future costs of nuclear waste management. The security is provided in the form of guarantee commitments from the owners of the nuclear power companies. In a decision made on 21 December 2017, the Swedish government set new guarantee amounts for the years 2018-2020. Following this decision, as security for the subsidiaries Forsmarks Kraftgrupp AB and Ringhals AB, the parent company Vattenfall AB will make guarantee commitments for a combined value of SEK 23,935 million. Two types of guarantees will be issued. The first guarantee – so-called Financing Security, totaling SEK 15,892 million – is intended to cover the current deficit of the Nuclear Waste Fund assuming no more nuclear waste fees are paid. This deficit is calculated

as the difference between expected costs and existing funds. The second guarantee – so-called Supplementary Security, totaling SEK 8,043 million – pertains to potential future cost increases stemming from unforeseen events. The amounts for both of these types of security have been determined based on a probability-based risk analysis in which the former amount has been determined as such that there is a 50% probability that it, together with currently funded amounts (the median value), will provide full cost coverage for all waste produced to date. The latter amount consists essentially of the supplement that would be required if the corresponding probability was 90%. See also Note 22 to the consolidated accounts, Share in the Swedish Nuclear Waste Fund and Note 35 to the consolidated accounts, Other interest-bearing provisions.

Contract guarantees provided by order of subsidiaries

As collateral for contractors' obligations, Vattenfall AB has issued guarantees amounting to SEK 9,462 million (5,974), mainly attributable to obligations in the Wind Business Area, which increased significantly in 2019.

Guarantees provided as collateral for subsidiaries in Vattenfall Energy Trading's energy trading

Vattenfall AB has issued guarantees with a total nominal value of SEK 43,425 million (42,083) for energy trading conducted by the subsidiary Vattenfall Energy Trading. As per 31 December 2019 a total of SEK 9,307 million (8,712) of these guarantees had been utilised, which is included in the reported amount of contingent liabilities.

Other contingent liabilities

Other contingent liabilities SEK 13,466 million (11,793) consists mainly of guarantees that Vattenfall AB has issued for the Customers & Solutions and Wind Business Areas (for the latter, see Note 44 to the consolidated accounts, Contingent liabilities), and pension obligations, which amounted to SEK 1,431 million (1,382).

In addition to the contingent liabilities mentioned above, Vattenfall has the following significant commitments

In 2009 Vattenfall AB, together with its subsidiary SKB (the Swedish Nuclear Fuel and Waste Management Company) and the other part-owners of that company, signed a long-term cooperation agreement with the Östhammar and Oskarshamn municipalities. The agreement covers the period 2010 to 2030 and regulates development efforts in association with the implementation of the Swedish nuclear waste programme. Through development initiatives in areas such as training, enterprise and infrastructure, over time the parties will generate value-added worth SEK 1,500 million to SEK 2,000 million. The parties are to finance the development efforts in proportion to their ownership interests. The Vattenfall Group's ownership interest is 56%. Implementation of the efforts is being carried out across two periods: a period before all necessary permits have been received (Period 1), and a period during implementation and operation of the facilities (Period 2). In 2019 Vattenfall reported a provision of SEK 34 million (43) for its share of Period 1 activities.

Atomic liability in Sweden is strict and limited to 300 million Special Drawing Rights (SDRs) (rate 12,8879), corresponding to about SEK 3,866 million (3,743), which means that the companies that are owners of nuclear power plants are only liable for damage to the surrounding environment up to this amount.

Note 31 Commitments under consortium agreements

See note 41 to the consolidated accounts, Commitments under consortium agreements.

Note 32 Average number of employees and personnel**Average number of employees**

	2019			2018		
	Men	Women	Total	Men	Women	Total
Sweden	1,127	556	1,683	1,106	537	1,643

Personnel costs

	2019	2018
Salaries and other remuneration	1,256	1,195
Social security expenses	847	829
– of which pension costs ¹	289	274
Total	2,103	2,024

¹ SEK 4.6 million (4.5) of the pension costs are attributable to CEO.

None of the board members receive any pension benefits in connection with their board duties.

Salaries and other remuneration:

	2019			2018		
	Senior executives ¹	Other employees	Total	Senior executives ¹	Other employees	Total
Sweden	68	1,188	1,256	65	1,130	1,195

¹ Senior executives comprise board members and deputy board members as well as the President and the Executive vice president. The term also refers to former board members and deputy board members, former Presidents and Executive Vice Presidents, and other senior executives who are members of the Executive Group Management.

Total salaries and other remuneration to board members and Presidents include bonuses of SEK 0 million (0). For benefits to senior executives at Vattenfall AB, see Note 42 to the consolidated accounts, Number of employees and personnel costs.

Note 33 Gender distribution among senior executives

See Note 43 to the consolidated accounts, Gender distribution among senior executives.

Note 34 Related party disclosures

See Note 44 to the consolidated accounts, Related party disclosures.

Note 35 Specification of the cash flow statement**Other, including non-cash items**

	2019	2018
Realised foreign exchange gains/losses	1,177	3,028
Changes in provisions	-37	62
Other	-6,936 ¹	3,011 ¹
Total	-5,796	6,101

¹⁾ Including the value of unrealised derivatives in operating profit before depreciation, amortisation and impairment losses (EBITDA), totalling SEK -6.820 million (3,041).

Financial liabilities

	Current	Non-current
Financial liabilities at 1 January 2018	57,308	69,527
Cashflow	12,276	-756
Non-cash effecting currency effects	1,356	2,003
Other non-cash flow effecting items	15,267	-11,766
Financial liabilities at 31 December 2018	86,207	59,008
Cashflow	-14,514	5,316
Non-cash effecting currency effects	1,808	874
Other non-cash flow effecting items	-2,611	-4,538
Financial liabilities at 31 December 2019	70,890	60,660

Note 36 Events after the balance sheet date

See Note 45 to the consolidated accounts, Events after the balance sheet date.

Auditor's Report

To the general meeting of the shareholders of Vattenfall AB, corporate identity number 556036-2138

Report on the annual accounts and consolidated accounts

Opinions

We have audited the annual accounts and consolidated accounts of Vattenfall AB (publ) except for the corporate governance statement on pages 72-87 for the year 2019. The annual accounts and consolidated accounts of the company are included on pages 4-5, 8-13, 62-150 in this document.

In our opinion, the annual accounts have been prepared in accordance with the Annual Accounts Act and present fairly, in all material respects, the financial position of the parent company as of 31 December 2019 and its financial performance and cash flow for the year then ended in accordance with the Annual Accounts Act. The consolidated accounts have been prepared in accordance with the Annual Accounts Act and present fairly, in all material respects, the financial position of the group as of 31 December 2019 and their financial performance and cash flow for the year then ended in accordance with International Financial Reporting Standards (IFRS), as adopted by the EU, and the Annual Accounts Act. Our opinions do not cover the corporate governance statement on pages 72-87. The statutory administration report is consistent with the other parts of the annual accounts and consolidated accounts. We therefore recommend that the general meeting of shareholders adopts the income statement and balance sheet for the parent company and the group.

Basis for Opinions

We conducted our audit in accordance with International Standards on Auditing (ISA) and generally accepted auditing standards in Sweden. Our responsibilities under those standards are further described in the Auditor's Responsibilities section. We are independent of the parent company and the group in accordance with professional ethics for accountants in Sweden and have otherwise fulfilled our ethical responsibilities in accordance with these requirements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinions.

Key Audit Matters

Key audit matters of the audit are those matters that, in our professional judgment, were of most significance in our audit of the annual accounts and consolidated accounts of the current period. These matters were addressed in the context of our audit of, and in forming our opinion thereon, the annual accounts and consolidated accounts as a whole, but we do not provide a separate opinion on these matters. For each matter below, our description of how our audit addressed the matter is provided in that context.

We have fulfilled the responsibilities described in the Auditor's responsibilities for the audit of the financial statements section of our report, including in relation to these matters. Accordingly, our audit included the performance of procedures designed to respond to our assessment of the risks of material misstatement of the financial statements. The results of our audit procedures, including the procedures performed to address the matters below, provide the basis for our audit opinion on the accompanying financial statements.

Key audit matters, the Group

Valuation of Tangible and Intangible assets

Description of the matter	How this matter has been reflected in the audit
<p>In the Group's statement of financial position as per December 31, 2019 reported value of fixed tangible and intangible assets amounts to SEK 275,435 million, which equals 61.1 % of the Group's total assets. Of the carrying value, SEK 14,005 million was goodwill. As described in note 9 the Company is making assessments throughout the year for any indication that an asset may have decreased in value. If there is an indication of this kind, the asset's recoverable amount is calculated in order to determine whether there is any need for impairment. For goodwill the recoverable amount is calculated at least annually or as soon as there is an indication that an asset has decreased in value.</p> <p>The Company has grouped its assets to the smallest group of assets that generates cash inflows that are largely independent from cash inflows from other assets. Recoverable amount is determined by calculating value in use. In note 9 the main assumptions, such as future prices of electricity, fuel and CO2 emission allowances used when calculating the value in use, are described. Further, in note 9 it is described that the calculation of value in use for cash-generating units with finite useful lives are based on forecasts of the useful life of the respective asset. Cash flow projections for cash-generating units with infinite useful lives are based on the business plan for the coming five years. Cash flows after the five year-period are calculated based on a growth factor of 0-0.5 %. Future cash flows have been discounted to value in use using a discount rate as described in note 9.</p> <p>Goodwill impairment is never reversed. Impairment of other assets is reversed if there has been a significant and lasting change in the assumptions used to calculate the recoverable amount.</p> <p>In 2019, the company wrote-down a total of SEK 1,459 million primarily within Business Area Heat and Wind. No write-down reversals have occurred during the year.</p> <p>Changes in assumptions may have a significant impact on the calculation of value in use which imply that the determination of assumptions is of significant importance to the valuation. Hence, we have assessed the valuation of tangible and intangible assets as a key audit matter in the audit.</p>	<p>In our audit we have evaluated the Company's process to develop and perform impairment tests. We have assessed how cash-generating units, based on established criteria's, are identified and compared to how the Company internally monitors its business. We have involved valuation specialists to assist us in the assessment of the Company's valuation and calculation methods, assessment of reasonableness in used assumptions, sensitivity analysis of changed assumptions, comparisons with historical results and the accuracy in previous forecasts. Each cash-generating units' discount rate and long-term growth have been evaluated through comparisons with other companies within the same industry and current market rates. We have also assessed whether the information disclosed is appropriate.</p>

Provision for future expenses of nuclear power operations

Description of the matter	How this matter has been reflected in the audit
<p>In the Group's statement of financial position as per December 31, 2019 the provisions for future expenses of nuclear power operations amounts to SEK 85,881 million. As described in note 31 the provisions pertain to future obligations for handling the decommissioning of the Company's nuclear power plants in Sweden and Germany as well as for handling nuclear waste. The provisions are based on forecasts for future expenditures that cover a period of up to 50 years. These forecasts include assessments with significant uncertainties, such as for expenditures for the disposal of nuclear fuel and radioactive waste as well as for the decommissioning of reactor plants. The estimated expenditures have thus been calculated based on a discount rate.</p> <p>Calculation of future expenses for decommissioning of nuclear power operations include a number of assumptions determined by the Company and changes in these assumptions may have a significant impact on the provision amount. Hence, we have assessed the recognition of provisions for future expenses of nuclear power operations as a key audit matter in the audit.</p>	<p>In our audit we have evaluated the Company's process to calculate the amount of the provisions. We have evaluated the Company's calculation methods, obtained assessments by third-parties, assessed the reasonableness in used assumptions and sensitivity analysis of changed assumptions and performed comparisons with historical results and the accuracy in previous forecasts. The reasonableness of used discount rate has been evaluated through comparisons with other companies within the same industry and current market rates. We have also assessed whether the information disclosed is appropriate.</p>

Other Information than the annual accounts and consolidated accounts

This document also contains other information than the annual accounts and consolidated accounts and is found on pages 1-3, 6-7, 14-61 and 156-185. The Board of Directors and the Managing Director are responsible for this other information.

Our opinion on the annual accounts and consolidated accounts does not cover this other information and we do not express any form of assurance conclusion regarding this other information.

In connection with our audit of the annual accounts and consolidated accounts, our responsibility is to read the information identified above and consider whether the information is materially inconsistent with the annual accounts and consolidated accounts. In this procedure we also take into account our knowledge otherwise obtained in the audit and assess whether the information otherwise appears to be materially misstated.

If we, based on the work performed concerning this information, conclude that there is a material misstatement of this other information, we are required to report that fact. We have nothing to report in this regard.

Responsibilities of the Board of Directors and the Managing Director

The Board of Directors and the Managing Director are responsible for the preparation of the annual accounts and consolidated accounts and that they give a fair presentation in accordance with the Annual Accounts Act and, concerning the consolidated accounts, in accordance with IFRS as adopted by the EU. The Board of Directors and the Managing Director are also responsible for such internal control as they determine is necessary to enable the preparation of annual accounts and consolidated accounts that are free from material misstatement, whether due to fraud or error.

In preparing the annual accounts and consolidated accounts, The Board of Directors and the Managing Director are responsible for the assessment of the company's and the group's ability to continue as a going concern. They disclose, as applicable, matters related to going concern and using the going concern basis of accounting. The going concern basis of accounting is however not applied if the Board of Directors and the Managing Director intends to liquidate the company, to cease operations, or has no realistic alternative but to do so.

The Audit Committee shall, without prejudice to the Board of Director's responsibilities and tasks in general, among other things oversee the company's financial reporting process.

Auditor's responsibility

Our objectives are to obtain reasonable assurance about whether the annual accounts and consolidated accounts as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinions. Reasonable assurance is a high level of assurance but is not a guarantee that an audit conducted in accordance with ISAs and generally accepted auditing standards in Sweden will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these annual accounts and consolidated accounts.

As part of an audit in accordance with ISAs, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:

- Identify and assess the risks of material misstatement of the annual accounts and consolidated accounts, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinions. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of the company's internal control relevant to our audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the company's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Board of Directors and the Managing Director.
- Conclude on the appropriateness of the Board of Directors' and the Managing Director's use of the going concern basis of accounting in preparing the annual accounts and consolidated accounts. We also draw a conclusion, based on the audit evidence obtained, as to whether any material uncertainty exists related to events or conditions that may cast significant doubt on the company's and the group's ability to continue as a going concern. If we conclude that a material uncertainty

exists, we are required to draw attention in our auditor's report to the related disclosures in the annual accounts and consolidated accounts or, if such disclosures are inadequate, to modify our opinion about the annual accounts and consolidated accounts. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause a company and a group to cease to continue as a going concern.

- Evaluate the overall presentation, structure and content of the annual accounts and consolidated accounts, including the disclosures, and whether the annual accounts and consolidated accounts represent the underlying transactions and events in a manner that achieves fair presentation.
- Obtain sufficient and appropriate audit evidence regarding the financial information of the entities or business activities within the group to express an opinion on the consolidated accounts. We are responsible for the direction, supervision and performance of the group audit. We remain solely responsible for our opinions.

We must inform the Board of Directors of, among other matters, the planned scope and timing of the audit. We must also inform of significant audit findings during our audit, including any significant deficiencies in internal control that we identified.

We must also provide the Board of Directors with a statement that we have complied with relevant ethical requirements regarding independence, and to communicate with them all relationships and other matters that may reasonably be thought to bear on our independence, and where applicable, related safeguards.

From the matters communicated with the Board of Directors, we determine those matters that were of most significance in the audit of the annual accounts and consolidated accounts, including the most important assessed risks for material misstatement, and are therefore the key audit matters. We describe these matters in the auditor's report unless law or regulation precludes disclosure about the matter or when, in extremely rare circumstances, we determine that a matter should not be communicated in the auditor's report because the adverse consequences of doing so would reasonably be expected to outweigh the public interest benefits of such communication.

Report on other legal and regulatory requirements

Opinions
In addition to our audit of the annual accounts and consolidated accounts, we have also audited the administration of the Board of Directors and the Managing Director of Vattenfall AB (publ) for the year 2019 and the proposed appropriations of the company's profit or loss.

We recommend to the general meeting of shareholders that the profit be appropriated in accordance with the proposal in the statutory administration report and that the members of the Board of Directors and the Managing Director be discharged from liability for the financial year.

Basis for Opinions

We conducted the audit in accordance with generally accepted auditing standards in Sweden. Our responsibilities under those standards are further described in the *Auditor's Responsibilities* section. We are independent of the parent company and the group in accordance with professional ethics for accountants in Sweden and have otherwise fulfilled our ethical responsibilities in accordance with these requirements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinions.

Responsibilities of the Board of Directors and the Managing Director

The Board of Directors is responsible for the proposal for appropriations of the company's profit or loss. At the proposal of a dividend, this includes an assessment of whether the dividend is justifiable considering the requirements which the company's and the group's type of operations, size and risks place on the size of the parent company's and the group's equity, consolidation requirements, liquidity and position in general.

The Board of Directors is responsible for the company's organization and the administration of the company's affairs. This includes among other things continuous assessment of the company's and the group's financial situation and ensuring that the company's organization is designed so that the accounting, management of assets and the company's financial affairs otherwise are controlled in a reassuring manner. The Managing Director shall manage the ongoing administration according to the Board of Directors' guidelines and instructions and among other matters take measures that are necessary to fulfill the company's accounting in accordance with law and handle the management of assets in a reassuring manner.

Auditor's responsibility

Our objective concerning the audit of the administration, and thereby our opinion about discharge from liability, is to obtain audit evidence to assess with a reasonable degree of assurance whether any member of the Board of Directors or the Managing Director in any material respect:

- has undertaken any action or been guilty of any omission which can give rise to liability to the company, or
- in any other way has acted in contravention of the Companies Act, the Annual Accounts Act or the Articles of Association.

Our objective concerning the audit of the proposed appropriations of the company's profit or loss, and thereby our opinion about this, is to assess with reasonable degree of assurance whether the proposal is in accordance with the Companies Act.

Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with generally accepted auditing standards in Sweden will always detect actions or omissions that can give rise to liability to the company, or that the proposed appropriations of the company's profit or loss are not in accordance with the Companies Act.

As part of an audit in accordance with generally accepted auditing standards in Sweden, we exercise professional judgment and maintain professional skepticism throughout the audit. The examination of the administration and the proposed appropriations of the company's profit or loss is based primarily on the audit of the accounts. Additional audit procedures performed are based on our professional judgment with starting point in risk and materiality. This means that we focus the examination on such actions, areas and relationships that are material for the operations and where deviations and violations would have particular importance for the company's situation. We examine and test decisions undertaken, support for decisions, actions taken and other circumstances that are relevant to our opinion concerning discharge from liability. As a basis for our opinion on the Board of Directors' proposed appropriations of the company's profit or loss we examined the Board of Directors' reasoned statement and a selection of supporting evidence in order to be able to assess whether the proposal is in accordance with the Companies Act.

The auditor's examination of the corporate governance statement

The Board of Directors is responsible for that the corporate governance statement on pages 72-87 has been prepared in accordance with "The State's Ownership Policy and guidelines for companies with state ownership" ("the Ownership Policy").

Our examination of the corporate governance statement is conducted in accordance with FAR's auditing standard RevU 16 *The auditor's examination of the corporate governance statement*. This means that our examination of the corporate governance statement is different and substantially less in scope than an audit conducted in accordance with International Standards on Auditing and generally accepted auditing standards in Sweden. We believe that the examination has provided us with sufficient basis for our opinions.

A corporate governance statement has been prepared. Disclosures in accordance with chapter 6 section 6 the second paragraph points 2-6 of the Annual Accounts Act and chapter 7 section 31 the second paragraph the same law are consistent with the other parts of the annual accounts and consolidated accounts and are in accordance with the Annual Accounts Act.

Stockholm, 19 March 2020
Ernst & Young AB

Staffan Landén
Authorized Public Accountant

Non-financial information



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Our target is to enable fossil-free living within one generation and to do so responsibly, while maintaining our commitment to respect the environment and human rights throughout our value chain, from our suppliers to our customers and the communities we work in.

At Vattenfall, sustainability is considered a fundamental part of everything we do and is thus integrated into our business and strategy. In practice, this means our business areas and staff functions are directly responsible for their sustainability performance and therefore integrate material social and environmental topics into their individual strategies and business plans. This comes together at the Group level, where our key social (employee

engagement and LTIF) and environmental (CO₂ and renewable capacity) targets are given equal weight to financial targets.

The chapters on Strategy and Operating Segments describe how our businesses contribute towards fossil-free living while focusing on sustainability throughout the entire energy value chain, and the following sections provide additional details and supporting context.

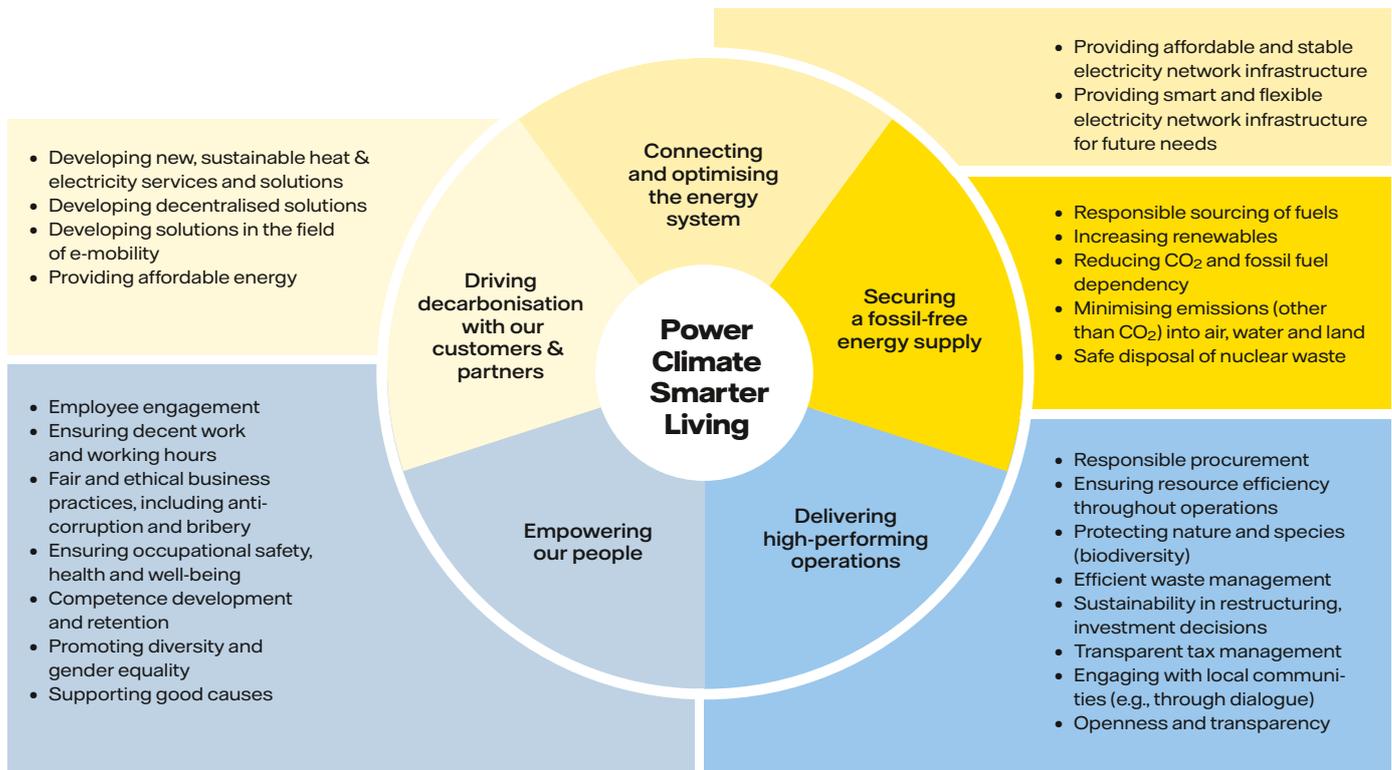
Materiality analysis

We last conducted our materiality analysis in 2018.¹ After collecting feedback from over 2,700 stakeholders, it became clear that the following three topics are most material:

1. Reducing CO₂ and fossil fuel dependency
2. Providing affordable energy
3. Increasing renewable capacity

Although we will next update our materiality analysis in 2020, there were many indications in 2019 that our key focus areas remain aligned with broader stakeholder expectations. Fridays for Future, Dutch and German climate agreements, and the rising popularity of Green parties throughout Europe are just a few indicators that our focus on reducing our climate impact and driving the buildout of renewables continue to be extremely relevant to society.

While some topics may be more widely relevant, all the topics covered in the 2018 analysis are material. We have mapped them to the strategic focus areas they most clearly belong to, though many topics apply to multiple if not all areas.



¹ Please see the 2018 Annual and Sustainability Report for the full analysis.



Stakeholders

Our stakeholders

We continuously map our stakeholders, from the Group level all the way down to project level, based on the impacts we have through our footprint in the entire energy value chain, and the impacts stakeholders throughout our value chain can have on us. Stakeholders include – among others – employees, local communities, NGOs and civil society, both private and business customers, partners, investors, authorities, our owner, and the general public.

The importance of dialogue with our stakeholders

As an employer we influence the mental and physical health as well as the economic livelihood of our employees and the communities we work in. As a provider of electricity, heat, gas, and associated products and services, Vattenfall has a fundamental and direct impact on millions of people's lives. As a developer of wind and solar projects, we impact local communities and ecosystems through our assets. Moreover, as a purchaser of fuels, goods, and services from around the world, we have social, environmental and economic impacts through our suppliers on an even greater number of people and local communities. We also have a global impact through the fossil fuels that are used in our electricity and heat production, as these lead to greenhouse gas emissions that are contributing to climate change, which in turn affects the entire earth. We are constantly striving to better understand and manage these impacts – maximising the positive and minimising the negative – and we view dialogue with our stakeholders as crucial to our success in this regard.

As a company with both local and global impacts, we have countless stakeholders. They include employees at our power plants, families that are kept warm by the heat we produce, and investors who help finance our operations. They are our owner, authorities and city partners we work with to set climate ambitions, our customers and industrial partners with and for whom we develop new solutions, the NGOs that help us address critical environmental and social issues in our value chain, and many more. With such a diverse range of stakeholders it is important that we are engaged in a constant dialogue with everyone, in order to make the best decisions possible. The Vattenfall Project Governance Principles, valid throughout the Group, ensure that the various local interests are considered and addressed in our projects. Our dialogues take many other forms as well, including attitude surveys, direct customer satisfaction feedback,

and many direct lines of communication with people throughout our organisation.

Feedback

While our strategy is in line with stakeholder expectations, priorities among certain stakeholders and stakeholder groups vary, and we must strive to achieve balance between sometimes conflicting priorities.

Stakeholders, such as local authorities and NGOs, have a strong focus on impacts on the local nature and biodiversity. This is especially relevant in our hydro power and wind plants, and even electricity distribution businesses. There is a challenge to balance the conflict between local impacts on biodiversity and the global benefits of fossil-free electricity generation. As climate change is growing in importance, also as a driver for biodiversity loss, it is of utmost importance that we evaluate projects taking a system perspective to find solutions that maximise fossil-free electricity generation while limiting local biodiversity impacts. Vattenfall actively works to minimise impacts without reducing the effectiveness of our projects by conducting R&D projects and by building and sharing knowledge with our stakeholders. Read more about our work with biodiversity on pages 164–165.

Ratings

Sustainability or ESG (Environment, Social, Governance) ratings are an important tool for customers, investors, and general stakeholders to understand a company's performance. Vattenfall believes in the benefits of transparency and participates, both voluntarily and upon the request of customers, in several different surveys and ratings.

- **EcoVadis:** We confirmed our Gold rating in 2019, improving our score by three points from 73 to 76 and putting us in the top 3% of companies assessed by EcoVadis in the "Electricity, gas, steam and air conditioning supply" category and among the top 1% of all companies assessed.
- **Sustainalytics:** Our most recent rating is from 2018, when we were assessed against nearly 200 peers in the "Oil, gas, and energy" category and given the rating "leader", the highest rating possible.
- **CDP:** Our Climate Score has improved significantly from year to year, and we are striving to continue this upward trend. In 2019 we scored an A (on a scale of A to F), recognising us as leaders and placing us in the top 2% of all companies that disclosed.

Stakeholder perspective



Frank Tazelaar

"Amsterdam is a remarkable city. It's a city combining a long history with rapid growth. In order to keep the city liveable in the future for everyone who lives, works or visits, Amsterdam too is aiming to reduce CO₂ emissions in line with the Paris Agreement. We have plans underway for four key transition paths: the built environment, mobility, electricity, and industry & port," says Frank Tazelaar, Head of Sustainability for the City of Amsterdam.

"E-mobility, with its benefits of reduced CO₂ emissions and improved air quality, has been a focus of Amsterdam for quite some time now, and we're aiming for emissions-free transportation in the city ring by 2030. Vattenfall has been

a partner in this journey, building the charging infrastructure and supporting Amsterdam to be in the forefront of e-mobility."

"Another big challenge is in the built environment, with the complete phase-out of natural gas by 2040. To realise this ambition, we brought together key stakeholders including Vattenfall, housing corporations, and grid operators to sign the City Deal 'towards a city without gas'. Parties involved work together to implement sustainable and affordable heating alternatives to replace natural gas. This is a real long-term challenge, as we need to take it one house at a time, neighbourhood by neighbourhood."

"Though there will be many more challenges along the way, Amsterdam does not shy away from its ambitions. The city sees its role as a facilitator as key. If we want to realise our ambitions, we need to work together with citizens and companies. It's fundamental to engage with all our stakeholders on a regular basis, and equally important that we have stakeholders like Vattenfall who are open to the dialogue. We need companies like Vattenfall to keep a steady course, maintain their clear vision, and be a trustworthy partner. Our success is intertwined, as we both strive towards fossil-free living. Amsterdam's citizens are Vattenfall's customers and partners, and vice versa."

Amundi

At Amundi, with more than EUR 12 billion invested in green bonds, we are convinced of the benefit of this type of bonds both for issuers and investors. The strong demand for green bonds reflects investors' need for higher transparency and dedicated financial instruments to measure and track their allocation to finance the energy transition. The development of this market at an international level requires standardisation and broad diversification.

Consequently, we were happy to see Vattenfall entering this market with their inaugural green bond. We appreciate the Green Bond Framework aligned with the Green Bond Principles with a third-party opinion that brings confidence on the quality and helps all investors to have a quick overview of the Green Bond Framework. The ability of the issuer to measure the environmental impact of the project financed is also key for us, and Vattenfall is willing to provide environmental impact indicators in their annual and sustainability report. Finally, as a new entrant, this new green bond helps to broaden and diversify the market, thereby creating more leeway to manage dedicated Green Bond funds.

Amundi
ASSET MANAGEMENT



Reduce climate impact

Climate change is widely regarded as the greatest challenge facing modern society because of the myriad environmental and social consequences it will have. Reducing climate impact is therefore Vattenfall's number one sustainability focus. We take a full lifecycle and value chain perspective on our climate footprint. Our main impact comes from the CO₂ emissions from our operations, but our efforts cover our entire value chain, including enabling customers and partners to reduce their emissions.

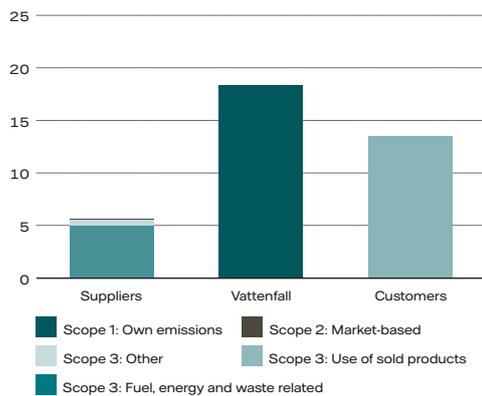
Climate change is expected to impact our business. Consequently, climate change risks are included in our risk management process, which means they are assessed and reported upon. Our goal is to be transparent about the challenges associated with climate change and how we work strategically to phase out fossil fuels and capture opportunities. Vattenfall supports the Task Force on Climate-related Financial Disclosures (TCFD) with the goal of improving climate-related disclosures to enable the financial markets to understand and assess climate-related financial risks and opportunities of investments. For more details, see Risk Management, page 67.

CO₂ emissions

Vattenfall is taking concrete steps towards our ambition of making fossil-free living possible within one generation. With the carveout of the Hamburg plants and reduced production from coal, we reached our 2020 target of 21 MtCO₂ already in 2019 (see page 13). Further, Vattenfall's new emission reduction targets were approved by the Science Based Targets initiative, SBTi, providing external validation that these are in line with climate science, i.e., what is required to limit global warming to 2 degrees Celsius (see page 49 for more information).

Direct emissions still make up our largest impact, but upstream and downstream emissions also account for a significant share in our value chain. We therefore have continuously high ambitions on emission reduction objectives together with our suppliers, customers and partners.

Vattenfall's carbon footprint, MtCO₂e



Scope 1: 18.4 Mtonnes, Emissions include CO₂, SF₆ and N₂O. 0.2 Mtonnes CO₂-equivalents consist of SF₆ and N₂O. **Scope 2:** 0.1 Mtonnes (market based emission factors), the majority of energy used is bought from Vattenfall's own production facilities and therefore booked as Scope 1. **Scope 3:** 19.0 Mtonnes; The "Other" category contains: Business travel (17 ktCO₂e); Capital Goods, goods and services (530 ktCO₂e). Emissions factors have been obtained from the IPCC Fifth Assessment Report, average national grid factors from the Association of Issuing Bodies and Scope 3 emissions calculated from lifecycle data and information from suppliers. All numbers are consolidated.

Additionally, we compensate for our business travel through purchases and cancellation of CO₂ certificates in the UN's Clean Development Mechanism system. In 2019 this compensation consisted of Gold Standard verified carbon credits that amounted to about 25,000 tonnes of CO₂.

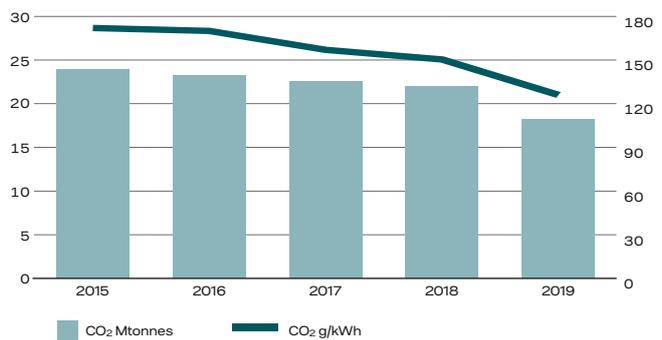
Renewable energy

Our target is to install at least 2,300 MW of cumulative new renewable energy capacity from 2016 to 2020. In 2019 we installed 474 MW of new capacity, resulting in combined new capacity of 1,226 MW from 2016 to 2019. The Horns Rev 3 (407 MW) offshore wind farm in Denmark was inaugurated in August. We have also installed 20 MW of solar capacity. For more information, see the Wind section on page 42.

Environmental Product Declarations

For more than 20 years we have worked actively with lifecycle assessments, and in 1997 we were among the first companies in the world to prepare an environmental product declaration (EPD) for our hydro power. The disclosure of a full environmental footprint for our various energy sources is valuable information for our customers as demands on transparency and environmental data increase. The EPDs and accompanying environmental data can then be used in the customers' own environmental work and communication. The EPD itself has been developed and certified in accordance with the International EPD® system. The system measures the environmental impact of products and services in an objective and standardised way, allowing us to account for the entire environmental impact from extraction of raw materials to end use, including impacts on biodiversity. Vattenfall's EPDs are based on all electricity generated in the Nordic countries, and for wind it covers the full portfolio. The EPD enables the possibility to keep track of the environmental consequences of Vattenfall's operations and choices made in the product lifecycle, allowing us to continuously work to reduce our environmental impact throughout the value chain.

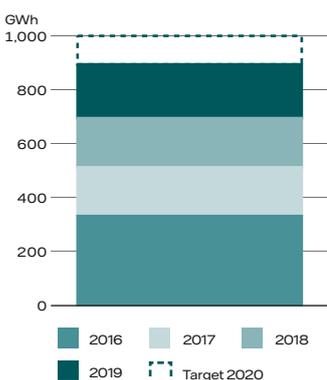
CO₂ emissions¹



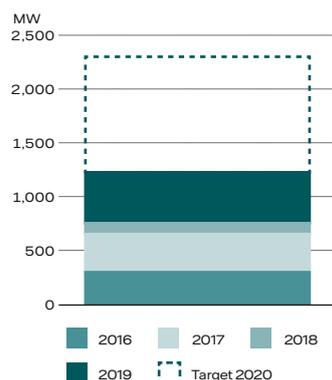
¹ Data for 2015 and 2016 does not include the lignite operations.

Vattenfall's total CO₂ emissions in 2019 amounted to 18.2 Mtonnes pro rata.

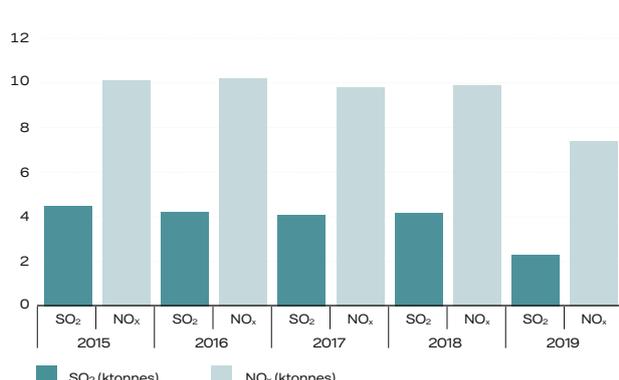
Energy efficiency improvements



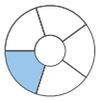
New renewable capacity



Nitrogen oxide (NO_x) and sulphur dioxide (SO₂)¹



Data for 2015 and 2016 does not include lignite operations



Human rights

Our commitment

We accept our duty to respect all internationally recognised human rights and that we are in a position to make a positive impact on human rights issues. We base our work on the UN Global Compact, the International Labour Organization's (ILO) eight fundamental conventions, the OECD's guidelines for Multinational Enterprises, and the UN's Guiding Principles for Business and Human Rights. Our commitment to respecting human rights is expressed in our human rights policy¹ and is also included in our Code of Conduct and Integrity, our Code of Conduct for Suppliers, and in our Statement on slavery and human rights in accordance with the UK Modern Slavery Act. Further, ensuring social responsibility throughout the value chain is a key focus area of Vattenfall's overall strategy.

Vattenfall's Code of Conduct and Integrity defines how we are to act with integrity within the company in the course of our business. A whistleblowing function is in place for employees and business partners to report suspected violations of this Code. We also strive to work with others who are committed to doing business in an ethically sound manner. Our Code of Conduct for Suppliers² (CoCfS) defines the company's basic requirements and expectations for suppliers with respect to sustainability. This includes requiring that our suppliers agree with the ten principles laid out in the UN Global Compact. The CoCfS was updated in 2019 and explicitly addresses modern slavery and forced labour. Embedded in the CoCfS are specific clauses regarding community engagement and development, child labour and young workers, modern slavery and forced labour, working hours, wages and benefits, health and safety, freedom of association and collective bargaining, non-discrimination, protection of third-party rights, and information security. Our suppliers shall respect the rights of indigenous and tribal peoples and their social, cultural, environmental, and economic interests, including their connection with lands and other natural resources. Vattenfall conducts its operations primarily in northwest Europe (Sweden, Germany, the Netherlands, Denmark, the UK, France, and Finland). All these countries adhere to the ILO's eight fundamental conventions.

At Vattenfall we strive to conduct due diligence by regularly and systematically identifying and assessing human rights, environmental and business ethics-related risks and impacts in our value chain, and to use this information to avoid, mitigate or remedy the impacts.

Welcoming the global trend towards integrating human rights in business practices

Vattenfall welcomes the emerging human rights due diligence laws. We strive to be leader in responsible business conduct and will remain vigilant in respecting human rights in our business practices, and we recognise the value of external input in achieving this. As with the introduction of the 2015 UK Modern Slavery Act, we have used the implementation of the Dutch Child Labour Due Diligence Law and the proposed legislation in Germany and the EU as opportunities to review our policies and due diligence processes against regulatory expectations as well as the highest international standards such as the ILO Child Labour Guidance Tool for Business.

Human rights impact and risk screening, and action plan for mitigation

We have screened for human rights impacts and risks across our value chain together with an independent third party. The latest screening showed the salient risks we contribute to or are linked to exist in our supply chain in high-risk countries in the areas of working conditions and local communities' livelihood. Salient risks associated with our own operations are mainly related to subcontractors' working conditions, local communities' livelihood, indigenous people, and privacy (personal data and information).

Human rights activities in 2019

- Included more human rights elements, such as child labour and overtime, in our standard due diligence process for goods and services suppliers
- Continued participation in external initiatives with focus on human rights in order to raise awareness, share best practices and discuss challenges
- A small group of key employees completed an SA 8000 training to increase internal capacity for sustainability auditing, including social audits
- Took action on our '11 Steps to 2022 human rights action plan',³ making progress on 9 of the 11 Steps, including creating action plans to address the highest priority areas for individual businesses and staff functions
- Published an updated statement on slavery and human rights in accordance with the UK Modern Slavery Act⁴
- Continued work in the Colombia and Russia Bettercoal Working Groups
- In September, Vattenfall hosted the BSR Human Rights Working Group attended by a wide range of cross-sectoral, multinational corporations to share best practices and collaborate on human rights issues
- Continued participation in several forums for best practice sharing, like the Swedish Network on Business & Human Rights

Planned Human Rights activities

- Further increase awareness by conducting cross-departmental trainings
- Document best practices for Vattenfall in areas where indigenous people live and work in Sweden as well as maintain an open dialogue aimed at minimising impact on all stakeholders in these areas
- Review and update Vattenfall's human rights policy to ensure compliance and adequacy with regard to the latest trends in human rights legislation
- Continue implementing our '11 Steps human rights action plan
- Review and update Vattenfall's whistleblowing process against the UNGP Grievance Mechanisms requirements
- Complete the review of our Know Your Counterparty and supplier onboarding process across all business areas to ensure more consistency and uniformity on how Vattenfall addresses salient risks including human right impacts

¹ https://group.vattenfall.com/sitesassets/corporate/who-we-are/sustainability/doc/human_rights_policy.pdf

² https://group.vattenfall.com/sitesassets/corporate/who-we-are/about_us/suppliers/code_of_conduct_for_suppliers_en.pdf

³ https://group.vattenfall.com/sitesassets/corporate/who-we-are/sustainability/doc/human_rights_11_steps.pdf

⁴ https://group.vattenfall.com/sitesassets/corporate/who-we-are/sustainability/doc/modern_slavery_statement2_2019.pdf





Sustainable supply chain

We have extended our commitment to responsible business practices beyond our corporate boundaries and into the entire supply chain. That means we aim to procure our fuels, goods and services with respect for people and the environment, wherever extraction, production, manufacturing or transportation take place. By sustainably managing our supply chain, we not only create long-term competitive advantages by reducing risks, reducing costs and improving our brand value, but we can also be a strong value driver. Through our global supplier relationships we can spread good business practices. Using our supplier engagement strategy, sustainability assessments and collaboration in specific industry initiatives, we are striving to increase our influence in the supply chain and to improve our suppliers' sustainability performance.

Our approach towards sustainable supply chain

Our supplier base consists of approximately 26,000 suppliers across our four primary sourcing and purchasing streams: goods and services; commodity fuels: coal, biomass, gas and oil; directly sourced heat fuels; and nuclear fuel. As the risk profiles and legal and sustainability requirements of our purchasing streams vary significantly, we have a framework of process-based instruments in place to move towards sustainable supply chains (see illustration below).

Improvements of our processes

Our focus is to continuously improve our own sourcing and purchasing methods. We increase awareness for specific supply chain topics and develop guidelines to increase consistency and implement the sustainable supply chain approach across our functions and business areas. We have started an internal and external benchmarking project to bring consistency and uniformity to the way we onboard suppliers. This covers compliance, Know Your Counterparty checks and sustainability checks. The development of a supplier risk assessment tool aims to provide greater insight into category risk across our entire supplier base and strengthen our risk assessment and management capabilities.

Following are some practical examples of sustainability improvements in our supply chain:

Showcase 1: Recycled concrete in heat project tenders

In Berlin we started a pilot project on recycled concrete for constructing the foundation of the Reuter heat storage project. By giving bidders that use recycled concrete additional points in the evaluation of the construction tender, we encourage the construction companies to make sustainable material choices. The use of recycled concrete not only reduces CO₂ emissions related to transport, but also saves resources and reduces the impact on mining areas. We aim to increase the share of recycled concrete in our projects in 2020 by making it standard to award extra points for the use of recycled materials in tenders.

Staff functions work together with the business in sustainable supply chain workshops, we deep dive into business-specific challenges and identify potential to improve our sustainability performance. Several trainings were conducted to build our own competences, such as a SA8000 training for buyers and sustainability experts, learning sessions on conflict minerals, and a sustainable supply chain training for procurement. This year we relaunched the Sustainable Supply Chain Knowledge Network, with participants from all business areas and functions dealing with suppliers. The network, which meets quarterly, aims to provide a forum for exchanging best practices, challenges, and developments. The ultimate aim is to promote awareness-raising of sustainability issues in the supply chain and bring consistency to the way we onboard suppliers. Similarly, we also continue to increase our leverage in the supply chain by participating in industry initiatives like WindEurope and Bettercoal. In Bettercoal, we have established working groups for Russia and Colombia with the aim to build capacity and set action plans for improvement through increased engagement. With the closure of our Hemweg 8 coal-fired power plant in the Netherlands, we will no longer source Colombian coal and will thus focus our efforts in Bettercoal on Russia.

Our activities planned for 2020

- Clearly define the environmental, social, and governance opportunities per business area to deliver impact in our supply chain
- Continue with Share & Learn sessions with global strategic suppliers, and with other forums for sharing best practice
- With Bettercoal, further discuss and address the identified main challenges and opportunities with Russian stakeholders
- Actively contribute to the Dutch initiative to work towards a sector-wide covenant covering the Wind supply chain
- Further expand integration of sustainability requirements in tenders
- Increase clarity on potential human rights risks in our heat operations
- Continue and expand cross industry collaborations to build capacity among suppliers and push joint sustainability requirements

Showcase 2: CO_{2e} reduction and sustainability in onshore wind tenders

In our onshore wind business we tested CO_{2e} emissions reduction and sustainability as award criteria in three Balance of Plant (BoP) tenders in the Netherlands: Haringvliet, Moerdijk and Nieuwe Hemweg. In doing so, we incentivise our wind farm constructors to be innovative and more sustainable in project design. We expect these pilots to reduce environmental impact through design optimisation, sustainable material choices (asphalt and concrete), shorter transport distances, and re-use of foundation material. Using CO_{2e} reduction as an award criterion should also reduce project costs by reducing the use of resources and optimising the Vattenfall reference model. We are currently developing a handbook about sustainable procurement for BoP, and we plan to roll out sustainable award criteria in other countries as well.



Initial risk assessment

Our suppliers are assessed by country risk. For high-risk country suppliers, a sustainability audit of the production facilities is required.



Supplier assessment

Supplier screening
All potential suppliers are screened to identify and take actions towards those with potential financial, reputational or supply risks.

Supplier audits

High-risk country supplier: During an on-site audit the supplier's compliance with our sustainability requirements is evaluated.



Corrective actions

The supplier addresses any non-compliances by providing and implementing a corrective action plan.



Continuous improvement

Our suppliers' sustainability performance is being monitored and followed up to ensure continuous Improvement.

Compliance with a Code of Conduct for Suppliers

Our Code of Conduct for Suppliers defines our requirements and expectations to ensure that our suppliers and sub-suppliers share the same values as we do.

Goods and services

- Main sourcing countries are Sweden, Germany and the Netherlands, with a small but increasing share of suppliers in Asia.
- All suppliers >SEK 3,000 are subject to screening (to the extent permitted by Swedish law).
- New suppliers from high-risk countries are assessed via third-party on-site audits. In many audits in Asia, severe levels of overtime, issues with health and safety, and adequate payment of social benefits for suppliers' employees continue to be identified. One audit identified that female candidates were required to conduct pregnancy testing in the hiring process. However, after intense collaboration with the suppliers, these issues were corrected.
- A guideline to address excess overtime among suppliers was developed. Other guidelines for child labour and red flags are in process.
- A sustainable supply chain roadmap was developed with two main steps: Secure the foundation and Deliver impact. Based on this, cross-functional workshops were held enabling deep-dives into business specific challenges and generating various follow-up activities.
- As follow-up to the Share & Learn sessions in 2017, further sessions were held on health and safety, supply chain CO₂ footprints, and sector initiatives.
- We developed an online platform to facilitate inclusion of sustainability requirements in tenders.
- A supplier risk assessment tool is being developed to identify and prioritise salient risks related to sustainability issues in the supply chain, including potential human rights issues, and will be implemented in 2020.
- Internal capacity was improved by sustainable supply chain trainings, learning sessions on conflict minerals and an SA8000 training.

Number of suppliers: **~26,000**

Number of site audits conducted: **19**

Share of new suppliers that have undergone social/environmental assessments: **100%**

Share of new suppliers from high-risk countries that have undergone social/environmental assessments: **No new suppliers from high-risk countries**

Heat fuels

- Primary fuels are biomass and waste. Purchases of peat are limited.
- In Germany nearly 100% of biomass and waste is sourced locally. In Sweden approximately 50% of biomass and 75% of waste is sourced locally.
- The Code of Conduct for Suppliers is implemented in all new contracts and contract renewals.
- No new suppliers from high- or medium-risk countries to Sweden or Germany in 2019.
- In addition to three full audits, we conducted over 50 site visits, with no major non-conformities found.
- Closure of the Reuter C coal-fired power plant in November and Hemweg 8 in December 2019. With the closure of Hemweg 8, we will phase out of Colombian coal.
- Began a review of coal sourcing strategy with particular focus on human rights risks and potential mitigating actions.

Number of suppliers: **~80**

Number of site audits conducted: **3**

Share of new suppliers that have undergone social/environmental assessments: **100%**

Share of new suppliers from high-risk countries that have undergone social/environmental assessments: **No new suppliers from high-risk countries**

Commodity fuels

- Primary fuels include coal, biomass, and gas. Purchases of oil are limited.
- The main sourcing countries are Russia (80%), USA (15%) and Colombia (5%) for coal, and Estonia, Latvia, and USA for biomass.
- As Chair of the Bettercoal Russia Working Group, we led a visit to Russia and met with, among others, mining companies, communities, a labour union, and government officials to discuss the environmental, social and governance challenges and opportunities around the coal supply chain in Russia.
- We are an active participant in the Bettercoal Colombia Working Group (CWG). The CWG has aligned its actions with the Vattenfall Colombia report¹ and has engaged with Bettercoal assessors and mining companies to better understand and discuss the findings of the site assessments and monitor progress against the Continuous Improvement Plans. It also actively tracks recent developments related to politics, the peace deal, and other issues such as ongoing violence and death threats.
- At the end of 2019 all six of the suppliers we publicly report on went through the Bettercoal assessment process. The six suppliers that went through the assessment process are in different stages, with some implementing the corrective action plan. For more information, see the Bettercoal website.²
- Continued close engagement with external stakeholders both directly and through Bettercoal. Examples include meetings with:
 - Stakeholder organisations such as PAX and Forum Syd
 - Government representatives, including various Dutch, Swedish, and Colombian Ministries, human rights advisers to the President of Colombia, and the Swedish, Dutch, and German embassies in Colombia, as well as SIDA and NIR
 - Various mining companies throughout the year, including Drummond, CNR, Prodeco and Cerrejon, on our Colombia report.

¹ corporate.vattenfall.com/globalassets/corporate/sustainability/doc/vattenfall_colombia_coal_report_english.pdf

² <https://bettercoal.org/bettercoal-suppliers/>

Number of suppliers: **~35**

Number of site audits conducted: **6**

Share of new suppliers that have undergone social/environmental assessments: **100%**

Share of new suppliers from high-risk countries that have undergone social/environmental assessments: **No new suppliers from high-risk countries**

Nuclear fuel

- Uranium supplies are, over time, equally spread among Namibia, Canada, Australia, Kazakhstan and Russia. In a single year we may receive deliveries from a number of these countries.
- All uranium suppliers are regularly audited (every three to six years) and are continuously assessed if deviations or other events are reported or discovered during the contract period.
- All deliveries from nuclear fuel suppliers in 2019 were performed by audited and approved suppliers.
- All findings from audits are followed up between the regular audits.
- Management systems were generally at a high standard at nuclear fuel production facilities. No major findings were noted in 2019 among performed audits.
- All suppliers welcomed the VNF audit team, and the audits were performed in a constructive and open atmosphere.
- No sanctions are currently affecting the nuclear supply chain.

Number of suppliers: **10**

Number of site audits conducted: **8**

Share of new suppliers that have undergone social/environmental assessments: **100%**

Share of new suppliers from high-risk countries that have undergone social/environmental assessments: **100%**



Taxes

Taxes are a key issue for us and for our stakeholders. We regard taxes as an important component of our commitment to grow in a sustainable, responsible, and socially-inclusive way.

As a business we are subject to taxation in the countries we work in. We strive to pay the correct amount of tax on the profits we earn and in the countries where we create the value that generates those profits.

Vattenfall has established a process for tax management and monitoring to ensure that its taxation is in accordance with the law and to manage our tax risk. The Group and Country Tax functions ensure that the Vattenfall Group's business activities are conducted proactively and in accordance with laws and regulations, i.e., in a responsible manner. The Group Tax function reports to the Board of Directors and Audit Committee on tax strategy and provides updates on tax regulations and the main challenges we face. The Board of Directors and Audit Committee receive quarterly updates on significant tax issues.

Tax trends

In recent years we have seen a positive trend toward a more tax-transparent landscape, which Vattenfall supports. Vattenfall's Tax function participates in various CSR and tax-transparency projects and networks. Vattenfall has submitted the country-by-country reporting that is required by law in all of the countries where Vattenfall operates.

Vattenfall's tax strategy

Vattenfall's tax policy is approved by the Board of Directors on a yearly basis. The tax strategy focuses on compliance and efficiency. Vattenfall conducts tax planning to the extent required to secure efficient handling of taxes within the constraints of tax law. Vattenfall does not conduct any aggressive tax planning activities and does not have any business activities in countries listed as tax havens. Vattenfall aims for an open and transparent relationship with the tax authorities and to be transparent towards other external stakeholders. When possible, Vattenfall enters into country-specific tax enhanced relationship systems, with the benefits of a direct contact in the local tax authority, higher tax certainty, and no tax audit risks or exposures.

For more details about the tax strategy and policy, see corporate.vattenfall.com/about-vattenfall/strategy-and-objectives/.

Vattenfall as a taxpayer

Vattenfall's business generates considerable tax revenue for the national, regional, and local authorities in the countries we work in. In addition to corporate income tax, Vattenfall pays taxes on production, employment and property. In many of the countries in which we operate, these non-income-based taxes account for a majority of the tax revenues. In the income statement they are reported as operating expenses, which entails that corporate income taxes are only part of the total taxes paid by Vattenfall. Total taxes reported in Vattenfall's income statement for 2019 amounted to SEK 8.2 billion and are outlined at right. Corporate income taxes amounted to SEK 3.8 billion.



Human Resources

Diversity & Inclusion (D&I) at Vattenfall

Vattenfall is a strong advocate for human rights and equal opportunity. We have integrated gender equality in recruitment strategies and governance principles, and we strongly believe that diversity and inclusion enable us to better understand and reflect customers' expectations and make us a better partner in the communities we serve. Vattenfall's D&I strategy enables us to work towards an open and inclusive culture, increasing awareness throughout our company. This work is led by a dedicated Diversity & Inclusion Officer, on a two-year rotation among members of the Executive Group Management.

We are committed to a number of different initiatives. One initiative is Equal by 30, promoting equal pay, equal leadership, and equal opportunities for women in the energy sector. Our goal is to have an equal gender ratio, thus enhancing equal leadership and contributing to the UN Sustainable Development Goal of Gender Equality. One target area in our strategy is to decrease the gap between female and male managers. In 2019 women represented more than 36% of all managerial hires, increasing the share of female managers to 26% from 24% in 2018 (compared to 24% of employees in the company as a whole in 2018).

Another initiative is a commitment to address unconscious bias and increase awareness within our organisation. We are convinced that having diversity in work groups results in a greater variety of perspectives, which leads to more innovation and better results. To ensure equal opportunities

Effective tax rate

Vattenfall's effective tax rate in 2019 was 18.9%, expressed as a percentage of consolidated profit before tax. This corresponds to SEK 3,461 million. See Note 13 to the consolidated accounts, Income taxes, for more information.

When required, financial statements for the respective local companies are prepared and generally contain similar reconciliations of the effective tax rate.

The Group's future tax cost and effective tax rate may be affected by several factors, including changes in tax laws and their interpretation, tax reforms in progress that have yet to be enacted into law, and the effects of acquisitions, divestments and any restructuring of our operations.

Total taxes paid by type

Taxes reported in the 2019 income statement, SEK 8.2 billion

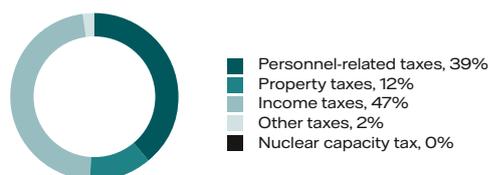
SEK million	Sweden	Germany	Netherlands	Other	Total
Personnel-related taxes ¹	2,016	861	300	70	3,247
Property tax	856	47	28	78	1,009
Income tax ²	2,205	1,580	95	-47	3,833
Other taxes	88	39	19	0	146
Nuclear capacity tax	0	0	0	0	0
Total taxes paid	5,165	2,527	442	101	8,235

¹ Including social security costs.

² Does not include deferred income taxes.

Total taxes 2019

SEK 8.2 billion, shown per tax type



Total taxes paid by region

Tax history by country

SEK million	Sweden	Germany	Netherlands	Other	Total
2019	5,165	2,527	442	101	8,235
2018	5,232	721	527	398	6,878
2017	7,473	2,729	457	95	10,754

and raise awareness, we have developed training material for our employees, and 93% of managers have participated in a D&I workshop. In November 2019 we celebrated our second annual Diversity Day with extensive D&I workshops open to employees throughout the organisation.

In addition, we run and participate in several mentoring programmes and offer internships for e.g., non-Europeans via Jobbsprånget, and collaborate with external partners to enhance our knowledge. We also measure inclusion among all employees through an enhanced set of targeted questions in our employee surveys and support our company-wide "Diverse Energy" networks.

Vattenfall's remuneration policy

Vattenfall's remuneration policy supports the Group's strategic direction and HR strategy. It aims to enable the organisation to foster an engaging and high-performance culture while securing relevant and diverse competences and talents. The remuneration policy outlines the general guidelines for compensation and benefits at Vattenfall. Beginning with the 2020 financial year, Vattenfall will produce an external, publicly available remuneration report on the paid and outstanding remuneration for the senior executives.

Remuneration objectives and structure

Remuneration at Vattenfall is to be fair and consistent, and reflective of the local market, local laws and collective agreements. It should also take into

account individual performance, Group objectives and professional competency. Variable salary programmes strengthen the connection between performance and reward and help to attract, retain and motivate employees on all levels. The programmes are structured in accordance with local laws, collective agreements and market conditions and therefore may differ from country to country. For more information, see Note 42.

we offer a wide range of training opportunities and e-learning courses. We also offer tools like mentoring and coaching to strengthen both professional and personal skills.

Looking back in 2019 we succeeded in offering more than 1,000 digital and classroom trainings and the possibility to select from over 100 mentors and coaches to support employee development.

Developing competent and engaged employees

We encourage our employees to actively develop their skills and competences as part of our work on building a high-performance culture. Employee development is key to Vattenfall's success, and we rely on our people to take personal initiative for their continuous development. Toward this end and in line with our strategic direction to accelerate digitalisation,

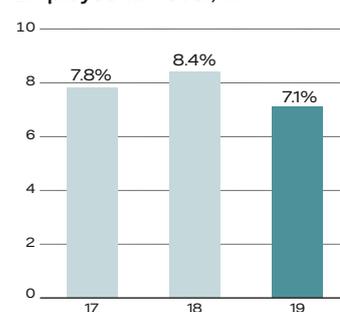
¹ 98% of employees are covered by collective bargaining agreements at the Group level.

Employee key ratios¹

	No. of employees	Women	Men	-29	30-49	50-
Managers	1,764	26%	74%	1%	56%	43%
Country						
Sweden	9,138	26%	74%	11%	49%	40%
Germany	5,903	23%	77%	10%	43%	47%
Netherlands	3,540	25%	75%	8%	56%	36%
Other	1,232	29%	71%	18%	65%	17%
Total	19,814	25%	75%	11%	49%	40%
Of which, part-time	1,656	19%	5%			
Of which, temporary	664	4%	3%			

¹ The gender composition of the Board of Directors is 33% female, 67% male. See pages 82-83 for details.

Employee turnover, %



LTIF¹ - Lost Time Injury Frequency for employees

	Sweden	Germany	Netherlands	Total ²
LTIF internal employees	1.6	3.0	2.0	2.1
Fatal accidents	0	0	0	0
High consequence LTI ³	0	2	2	4
Total LTI	24	34	12	72
TRIF ⁴	3.9	4.2	2.4	3.7
Worked hours (million)	15.3	11.4	6.0	34.6
External (contractors) ⁵	35	20	8	71
Fatal accidents	0	0	0	0
Total LTI	51	26	3	88
TRI	124	34	6	174

Sick leave per country 2019

	Sweden	Germany	Netherlands	Total
Men	2.1%	4.8%	3.8%	3.2%
Women	4.3%	6.1%	6.7%	5.1%
Total	2.6%	5.1%	4.5%	3.7%

¹ LTIF is expressed in terms of the number of lost time work injuries (per 1 million hours worked), i.e., work-related accidents resulting in absence longer than one day, and accidents resulting in fatality. Pertains only to Vattenfall's employees.

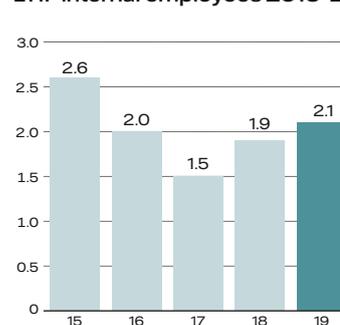
² Includes Denmark and the UK.

³ A high consequence LTI is an LTI with an actual or expected absence of more than six months.

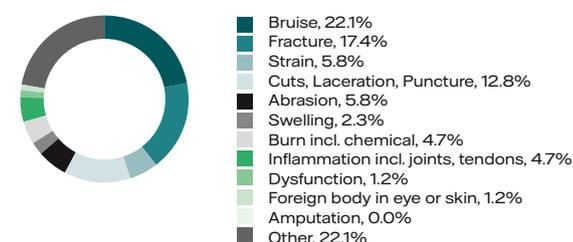
⁴ TRIF: Total Recordable Incident (Frequency).

⁵ Since the contractor LTIF cannot be calculated with sufficient reliability, only LTI is reported.

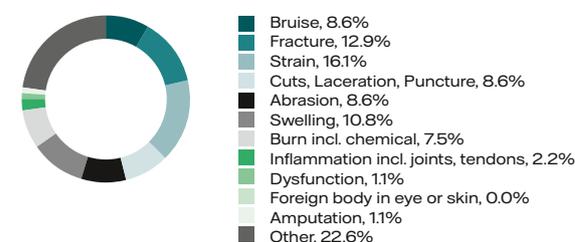
LTIF internal employees 2015-2019



Types of injuries (LTI) - employee



Types of injuries (LTI) - contractors



Tracking injury type allows us to identify problem areas and prioritise initiatives that will have the greatest impact on reducing injuries.



Environmental governance

A new environmental policy was adopted in 2018 that includes strong commitments in three important areas: to become climate neutral (see Reducing climate impact, page 158), protect nature and biodiversity, and ensure sustainable use of resources. A prerequisite to fulfil these commitments is to have a strong foundation of environmental practices and management system. The policy is therefore followed by an action plan with 20 overarching measures to deliver on the policy commitments. The policy and action plan are implemented in the business, and contributions to the measures are followed up on a regular basis.

Goals coupled to the EU 2020 targets

Vattenfall informs the Swedish Parliament yearly via the Government Offices on the company's progress in relation to the EU's 2020 targets. The three relevant targets for Vattenfall are the CO₂ emissions reduction target, the renewable energy target, and the energy efficiency target.

Environmental management systems

Vattenfall's environmental management system is part of the Vattenfall Management System (VMS). At year-end 2019, 99.9% (99.9%) of our electricity generation and 99.1% (98.0%) of our heat production came from facilities with certified environmental management systems, all of them

according to ISO 14001 or EMAS. The remaining facilities pertain to a very limited number of back-up installations. Our environmental activities are governed by our environmental policy and operational instructions, which describe the principles for environmental governance and environmental management. Accountability within environment is also described in the management systems. Being certified is an important part in ensuring external validation of our environmental performance and practices, in gaining authorities' trust, and in delivering on customers' requirements.

Vattenfall's transparency on environmental governance and activities are also assessed by independent research and ratings companies that supply investors and customers with information. For example, in 2019 our score in the EcoVadis "Environment" sub-section corresponds to the top 2% of assessed companies in our category (see also page 157).

Environmental risk management

To protect the environment and reduce our environmental impact we put special emphasis on assessing the environmental risks associated with our operations, including climate change as mentioned above (see page 67). Another important issue involves monitoring relevant legislative changes in order for us to be able to draw up action plans at an early stage in order to ensure compliance with new legislation.



Protect nature and biodiversity

We strive to minimise any direct and indirect negative impacts on biodiversity throughout our operations. We integrate biodiversity aspects already from the early project planning through to construction, the operational phase, and to decommissioning. For impacts that cannot be fully avoided or mitigated, compensation measures are often considered in discussions with authorities and other stakeholders, such as local communities. A responsible approach to biodiversity management is important for reducing our impact, gaining acceptance from local communities, and reducing the risk for projects to be delayed and reducing permitting obstacles. We also strive to limit impacts on biodiversity in our value chain by engaging with our suppliers.

Vattenfall is active in biodiversity research, mainly associated with hydro power and wind power, with the overarching aim to better understand our impacts and to find the best mitigation measures. We are also involved in various types of environmental projects focused on the preservation,

promotion and restoration of biodiversity values. See the accompanying fact boxes as well as the table on page 166 for more details on a number of example projects. The table highlights the goals and activities of the projects, as well as the business areas in which the impacts occur.

Environmental foundation in Germany

In Germany, Vattenfall manages an environmental foundation that was established by Hamburgische Electricitäts-Werke (HEW) in 1994. Since its inception the foundation has provided support to more than 180 projects, including environmental education and nature conservation (projects in urban areas and renaturalisation of small watercourses). The foundation is operated as an independent non-profit association under civil law. Through Vattenfall's support of administrating the foundation, all earnings from the foundation's capital are used to fund environmental projects.

R&D projects reducing and limiting impacts on marine environment - wind power

Many R&D projects are conducted at the European Offshore Wind Deployment Centre (EOWDC) located in Aberdeen Bay, Scotland. A first project was conducted during construction of the Aberdeen Bay offshore wind farm, where a new type of jacket foundation was used, so-called suction buckets. Instead of monopiles driven into the seabed, giant upside-down buckets paired with jacket substructures anchor the wind turbines to the seabed. The method is virtually noiseless, which reduces the disturbance to marine life.

Another aim is to improve the understanding of species like bottlenose dolphins' lifecycles, movement patterns of the guillemot and razorbill seabirds, migration routes of salmon and sea trout, and insight to nearby communities. One of the projects is collecting data on seabird flight patterns and behavioural responses to offshore wind turbines during the breeding season with the aim to understand seabird collision and avoidance behaviours. The EOWDC scientific research and monitoring programme won in 2018 the Sustainable Development Award and the Nature of Scotland Awards.



Making eel migration safer

We are testing a system that aims to predict the time when eels migrate at two of our hydro power stations in the Netherlands. Eels follow the river to the Sargasso sea when spawning has started. Silver eels migrate in groups and respond, among other things, to pheromones in the water which indicate the time for migration. The solution being tested is a kind of aquarium connected to the river water. Eels in the Migromat® are implanted with animal-friendly chips and fitted with transponders. By tracking the eels' activity, we can better predict the timing of migration, enabling us to turn the turbines off so the eels can pass the power station safely. This will both increase eel survival and minimise production loss.



Maintenance of habitats and protecting species - distribution

Clearance work for power lines opens meadow-like fields for threatened and rare species, like the butterfly marsh fritillary. With GIS mapping and field inventories performed during 2018, important biodiversity hotspots have been identified, and adjusted clearance plans have been developed accordingly. A pilot project outside Stockholm uses goats instead of machines to clear the landscape, which favours biodiversity.



Environmental adaptation - hydro power

"Laxeleratorn" is a unique, large-scale laboratory for hydro power-related environmental and hydraulic experiments that was inaugurated in 2018. It combines knowledge of biology and hydraulics to find solutions that allow and attract fish to safely pass by the power plant with the smallest possible effect on operations. During 2019 the main projects conducted focused on innovations for downstream fish migration such as bubble curtains and flexible nets to avoid turbine passage.



Ensure sustainable use of resources

Vattenfall will take an active role in the development towards a circular economy. We will do this by providing renewable energy, developing new business models that enable our customers and partners to improve their resource footprint and by rethinking our internal processes to minimise our own use of resources.

In our operations we use many different types of resources e.g., energy, fuel, water, construction materials, and chemicals, and our activities also generate effluents, emissions, waste and by-products. Our resource footprint lies both within our own operations and in our supply chain. We therefore consider resource efficiency already in the design phase, choose Best Available Technologies, and continuously work to reduce environmental impacts based on a lifecycle perspective, including decommissioning of assets such as wind turbines and nuclear power plants.

Other emissions

Apart from CO₂, we focus specifically on reducing emissions of sulphur dioxide (SO₂), nitrogen oxides (NO_x) and particulates resulting from the combustion of fossil fuels and biomass in our power plants. During construction, operation and dismantling of our power plants and networks, we take necessary measures to reduce noise and emissions. We use innovative technologies to comply with all legal emission thresholds and to improve our environmental performance. This includes:

- Primary measures such as targeted mixing of coal quality (SO₂) or combustion controlling (NO_x, CO) to reduce combustion emissions
- Secondary measures such as electrostatic precipitators or filter bags (particulates), flue gas desulphurisation (SO₂) and DENOX (NO_x) to clean flue gas
- Noise abatement walls and facades or encapsulation of units to dampen noise from our operations
- Using combined heat and power (CHP) plants to improve fuel efficiency and reduce specific emissions. In addition, expansion of district heating is replacing large numbers of single heating units with high specific emissions
- The shift to biomass, which reduces both CO₂ and SO₂ emissions
- The use of power-to-heat is replacing fossil-based heating and eliminating associated emissions

As we reduce and eventually eliminate the use of fossil fuels, the associated emissions will be likewise reduced.

Energy efficiency improvement

We have set a target to achieve a cumulative total of more than 1,000 GWh in annual energy efficiency improvements for the period 2016-2020. In 2019 we achieved 200 GWh in efficiency improvements, mainly through upgrades of hydro power plants and distribution networks and by replacing local boilers with district heating. Vattenfall is working continuously

to improve energy efficiency by changing to more efficient components, expanding district heating networks and helping customers become energy-efficient.

The laws that have been enacted as a result of the EU Energy Efficiency Directive require all large companies to conduct energy audits to identify cost-effective energy saving measures. Such audits have been conducted or are in progress in Vattenfall, in line with national implementation requirements. To a large extent Vattenfall goes beyond the requirements of these laws through certified Energy Management Systems ISO 50001 or by adapting certified Environmental Management Systems, meaning that energy efficiency becomes a part of our systematic environmental work. Vattenfall also offers energy audits to customers.

Water management

Vattenfall has a high focus on ensuring efficient and environmentally sustainable management of water resources and minimising any impacts on aquatic ecosystems. Water is a key resource for our hydro power operations. It is also important for our nuclear and thermal power plants, as they require large amounts of cooling water. So-called "through cooling systems" are used at plants where large volumes of water, like river or sea water, are available. Alternative solutions such as cooling towers, which have closed cooling cycles and use considerably less water, are also used for some plants.

Vattenfall complies with all applicable regulations on water quality. Wastewater from Vattenfall's installations is carefully treated and constantly monitored – a process that also includes comprehensive laboratory controls. No untreated wastewater is discharged into watercourses.

The Berlin region in Germany, where Vattenfall owns and operates several heat and CHP plants, is classified as an area with high water stress.¹ Vattenfall's plants in this region use 211 million m³ of freshwater, equivalent to 11% of Vattenfall's total freshwater use of 1,952 million m³. The majority of the water is used for cooling purposes. Several measures are in place to reduce water use and impacts on aquatic ecosystems, e.g., regular thermographic aerial surveys to help detect water leaks, measures to reduce pressure on the storm water system in situations with heavy rain, and strict control of outlet water temperature to protect aquatic fauna and flora from potential harm caused by temperature variations.

¹ According to classifications in the World Resources Institute "Aqueduct Water Risk Atlas".

Selected biodiversity projects

Part of business	Aim	Projects and activities
Hydro power	Identify new solutions to reduce environmental impact of hydro power production	See fact box on environmental adaptation in hydro power.
	Biotope restoration and species protection	<p>Trap and transport of spawning migrating European eel past hydro power stations in the Göta älv river between Lake Vänern and the sea.</p> <p>Biotope restoration of tributaries to the Upperudsälven and Luleälven rivers to improve conditions for European crayfish, freshwater pearl mussel, trout and grayling.</p> <p>Environmental adaptation of an overflow dam in Purkijaur in the Lilla Luleälven river to improve conditions for trout and grayling.</p> <p>Ecological adaptation of minimum flow combined with restoration measures and morphology relative to minimum flow in a 60 km long section of the Juktån river, the second largest tributary to the Umeälven river.</p> <p>Reintroduction of sea trout (ReTrout project) by stocking of roe in restored tributaries to the Vindelälven river.</p>
	Knowledge building activities includes both research and pilot studies	<p>See fact box on eel migration.</p> <p>Modelling of attraction flow to find a solution to increase passage efficiency for spawning migrating salmon and seatrout in the old river channel downstream the Stornorrfors hydro power station in the Umeälven river.</p> <p>Investigation of the possibility to restore natural production of salmon and seatrout in the lower part of the Dalälven river using release of fish roe.</p>
	Preserve and manage biodiversity and enhance recreation values	Vattenfall has on a voluntary basis established four protected areas in the vicinity of hydro power plants. These areas have high and sometimes unique values and invite to recreation.
Offshore wind power	Limit impacts on the marine environment	See fact box on the marine environment in wind power.
	Reduce impact on and contribute to conservation of fauna	Initiating and participating in the DEPONS project, which has aimed to develop an evidence-based modelling tool in order to assess consequences of piling noise disturbance during the construction phase from offshore wind farms on the harbour porpoise population in the North Sea. The second version of the model was presented in January 2019 and can be used for spatial planning to reduce impact of disturbances.
Onshore wind power	Increase biodiversity, monitoring and improving the fauna conservation	Establishment and operation of wind power typically comes with extensive mitigation and monitoring measures. One example is the Ray wind farm (UK), in operation since 2017, where post-construction monitoring includes habitat enhancement works and monitoring for life of wind farm, bat monitoring and carcass searches for up to 10 years, and breeding bird surveys for 5 years.
	Reduce risk for bird collisions	The aim is to find ways to reduce the risk for bird collisions. The "Identiflight" project (Gotland, Sweden) evaluates a camera-based monitoring system for identification of big birds, such as eagles.
Nuclear	Preserve affected species by creating new habitats	Svensk Kärnbränslehantering AB (Swedish Nuclear Fuel and Waste Management Company) will build a nuclear fuel repository in Forsmark, Sweden. During the construction phase, a pond in which the nationally listed endangered pool frogs are known to live, will need to be filled. New habitats in the form of six new ponds have been created for the frogs, along with a frog hotel offering shelter from frost during winter. Pool frogs have since been seen in all of the ponds, and at several of them reproduction has been observed.
Power distribution	Maintenance of habitats and protecting species	See fact box on habitat maintenance in distribution.
Heat	Support various environmental projects	Supporting various projects through our environmental foundation in Germany, Vattenfall Umweltstiftung, see page 164.
	Preserve habitat	Preserving a "Green Berlin" by creating urban gardens around heat plants. Providing space for bee colonies, honey bees and wild bees in our fenced substations.
Real estate	Biodiversity enhancements linked to facilities	During 2019, a project with the aim to enhance biodiversity values at our facilities was initiated.

Waste management

Waste is generated during the operation and maintenance of power plants, electricity networks and heating grids, and during construction and dismantling of power generation systems. In addition, residual products such as ash, slag and gypsum are produced in combustion plants. Offices generate small amounts of waste as well. Depending on the waste content and national legislation, waste is classified either as hazardous or non-hazardous. Radioactive waste is a special form of waste produced from operations at nuclear power plants. See Radioactive waste.

Vattenfall increasingly works with substitution of materials to avoid waste, but where waste is unavoidable we work in accordance with the waste hierarchy. Waste is identified, classified and managed within the framework of the applicable national laws. At the local level, various activities are conducted to prevent and reduce waste as well as to optimise reuse and recycling rates as far as possible.

Combustion residues

Residual products such as ash, slag and gypsum are produced from the combustion of solid fuels such as hard coal, biomass and waste. The volumes produced are directly related to how much fuel is used. More than 90% of residual products are re-used and sold to the construction industry as secondary raw material for cement, concrete or asphalt production. The remainder is sent to landfills.

Radioactive waste

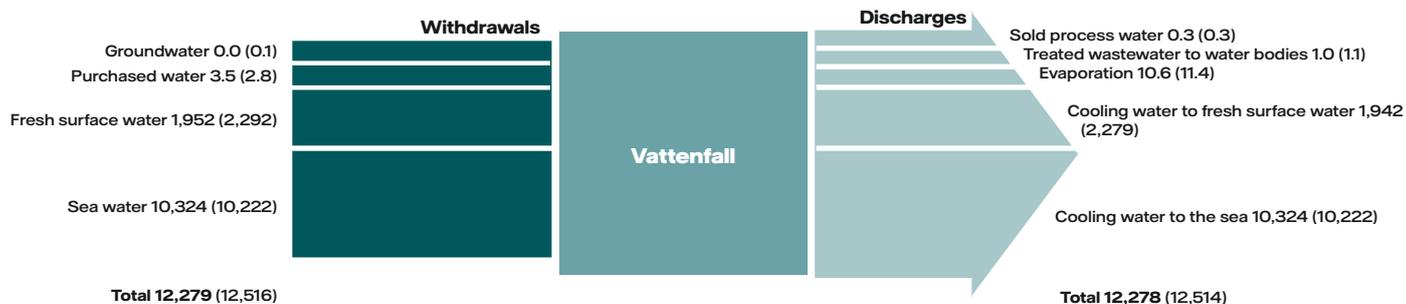
Vattenfall operates nuclear power plants in Sweden and Germany. It is the operator's responsibility to have reliable solutions for managing nuclear waste. All of Vattenfall's facilities that handle radioactive waste have operating guidelines and procedures for management and disposal.

High-level, long-life radioactive waste, consisting primarily of spent nuclear fuel and core components, must be carefully shielded during handling and transportation. When the waste is stored, it is encapsulated to prevent spreading of contamination. The type and location of storage depends on the radioactive level of the waste. The entire waste handling process is strictly regulated and monitored. At Vattenfall's nuclear power plants, all employees who have access to radiologically controlled areas complete training in radiation protection. The radioactive waste system and how to minimise radioactive waste are themes included in the training. Waste operators and personnel at production plants who work with waste handling also participate in special training programmes.

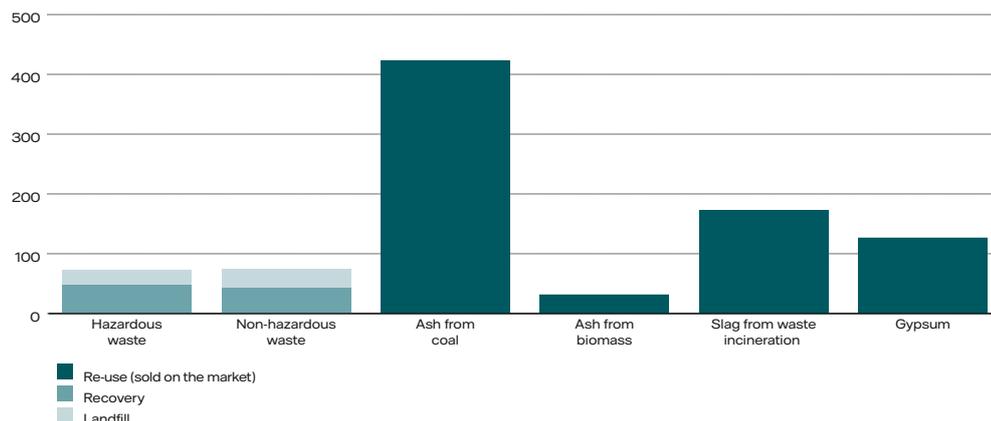
Chemicals

Chemicals are used in all our operations on a daily basis. To reduce the risk for harmful effects on health and the environment, Vattenfall is working continuously to eliminate or replace hazardous substances. We also urge our suppliers to do the same. The new restriction list, based primarily on the SIN list adopted 2018, is under implementation in the business and is expected to help them in this work.

Total withdrawals and discharges of water (million m³)



Waste and residues (ktonnes)



ktonnes	Hazardous waste ¹	Non-hazardous waste	Ash from coal	Ash from biomass	Slag from waste incineration	Gypsum
2019	72	75	423	33	173	128
2018	59	98	578	38	170	185

Waste from construction and demolition make up a small portion compared with the residues that are created at combustion plants.

¹ Includes fly ash from waste incineration.

GRI Index and supplementary disclosures

About this report

Vattenfall's Annual and Sustainability Report is a report in which information about the company's work with sustainability issues and outcomes is described together with the company's financial performance.

Vattenfall has been reporting in accordance with the Global Reporting Initiative (GRI) Guidelines since 2003. This report has been prepared in accordance with the GRI Standards: Core option. This means that Vattenfall has identified the aspects that are material for the company and reports at least one indicator per aspect. Omitted information is reported in the GRI Index on pages 169–171. Certain aspects, such as water, effluents and waste, are most relevant at the local level and are not as material at the Group level. No Group targets are currently defined for these areas; instead, they are steered and managed locally. Reporting on local communities focuses on the business areas and topics where Vattenfall's operations have the greatest impact on local communities. Vattenfall's overall ambition for its sustainability reporting is that it will be transparent and relevant. The GRI Index indicates where information about Vattenfall's reporting in accordance with GRI can be found in the Annual and Sustainability Report.

Reporting profile and scope

The Annual and Sustainability Report (ASR) describes the areas in which the Group has considerable environmental, social and financial impacts. Reporting on local communities does not correspond exactly to the GRI guidelines; instead, examples are used from the most relevant operations to describe Vattenfall's impact and handling. Vattenfall's activities, performance and results are reported as an integrated part of Vattenfall's strategy. The reporting covers all of the Vattenfall Group's operations during the 2019 financial year, unless indicated otherwise, and the figures provided pertain to the 2019 financial year. Vattenfall reports sustainability data annually in the ASR, and the preceding year's report was published on 20 March 2019.

Boundaries

Vattenfall has limited its reporting to the areas in which the company has full control over data collection and information quality, which entails all operations of the company unless indicated otherwise. While GRI Standards entail a greater focus on impacts along the entire value chain, the company cannot yet measure data outside of its own operations in a reliable manner; instead, activities connected to both suppliers and customers are described. Important events and information about changes in the organisation during the year are provided on pages 10–11 and 79–80. Changes in Vattenfall's supply chain are described on pages 160–161. Changes in the capital structure and other changes in capital are described in Note 38 to the Consolidated accounts, Specifications of equity. The limitations and changes in the reporting are also described in the respective sections or in comments to diagrams and tables. Vattenfall uses different definitions of "supplier" and "new supplier" for its four purchasing streams reported on page 161. A supplier of goods and services is defined as an entity providing goods and services to Vattenfall and whose paid invoices exceeded SEK 3,000 in 2019.

For commodity fuels, a coal supplier is an entity that delivered coal to Vattenfall's power plants for own use. A supplier of biomass, nuclear fuel or heat fuels is an entity that Vattenfall has a contract with. For all categories, a new supplier is an entity that did not previously have a contractual relationship with Vattenfall and which signed its first contract with us during the 2019 reporting period.

Data collection and accounting policies

Environmental data is collected via the Group's environmental reporting process. Group-wide definitions are used for all environmental parameters to enhance quality. Accounting policies for the financial reporting are described in Note 3 to the Consolidated accounts, Accounting policies. The principles of consolidation for environmental data are the same as for financial data. Consolidation includes subsidiaries in which Vattenfall AB owns shares corresponding to more than 50% of the voting rights or in some other way has control. Absolute CO₂ emissions are also reported in accordance with Vattenfall's share of ownership in the respective plants. Reported CO₂ emissions are calculated based on fuel consumption. It should be noted that the calculation methods differ from country to country. The calculation methods are set by national legislation, with ties to the EU Emissions Trading System. All other emissions have either been measured or calculated based on periodically recurring measurements. Figures for energy and water consumption are based, like all environmental data, on the production units' own reporting. Depending on the size and type

of operation, the measurement equipment differs from unit to unit. However, all reporting is to be in accordance with the Group-wide definitions and principles. The employee data that is presented is based on verified figures from Vattenfall's annual accounts. Vattenfall uses contractors to a considerable extent, but does not report the number of those persons due to the difficulty in obtaining quality data for this type of reporting. Significant corrections of last year's figures have been commented in notes at the affected information.

A handover of the district heating business in Hamburg to the city was completed on 2 September. Numbers for production, CO₂ emissions, sales, and financials on pages 1–155 include consolidated data for the Hamburg business for the period up to 2 September. However, for the majority of environmental data, it is not possible to report for part of a year. Thus, for consistency, the environmental, production and fuel data in Non-financial information (page 156–167), Five-year overview of sustainability data (page 174) and Facts about Vattenfall's markets (page 180–182) have been reported excluding the divested district heating business.

Statutory sustainability reporting

Vattenfall is subject to statutory sustainability reporting in accordance with the Swedish Annual Accounts Act. The statutory sustainability report is found in the following sections of the Vattenfall Annual and Sustainability Report and meets the reporting requirements for the environment, social conditions and personnel, human rights and anti-corruption:

- Strategic targets, page 13
- Business model and value creation, pages 16–18
- Integrity and risk management, pages 58–59, 63–67
- Internal governance, pages 77–79
- Materiality analysis and stakeholders, pages 156–157
- Human rights, page 159
- Sustainable supply chain, pages 160–161
- Human resources, pages 162–163
- Environment, pages 158, 164–167

External assurance

The sustainability information in the Annual and Sustainability Report for 2019 has been reviewed by Vattenfall's auditor, Ernst & Young. In addition, it has been approved by Vattenfall's Board of Directors.

Sustainability initiatives and principles that the company has aligned itself with or supports, and important memberships in interest association and organisations

The Vattenfall Group has adhered to the UN's voluntary Global Compact since 2002 through the Swedish partnership for Global Responsibility. Vattenfall has been a direct participant since 2008. Consequently, Vattenfall has undertaken to support the UN Global Compact and to adhere to the OECD Guidelines for Multinational Enterprises. The implementation and the monitoring of compliance to the Vattenfall Code of Conduct for Suppliers, based on the UN Global Compact, is in progress. Vattenfall also adheres to the UN Guiding Principles on Business and Human Rights. Vattenfall uses the Annual and Sustainability Report as its Communication on Progress for the UN Global Compact (UNGC), and a cross reference between the UN Global Compact and the GRI can be found in the GRI Index. The cross reference is primarily done to the DMA (disclosure on management approach) of each relevant aspect. If this connection is not possible or if the information is available on another page, the principle is directly linked to an indicator. In addition to these undertakings, Vattenfall has opted to align itself with a number of voluntary sustainability initiatives and organisations at the Group level. Examples of these include:

- CSR Europe
- Business for Social Responsibility (BSR)
- WindEurope
- EV100
- Fossilfritt Sverige (Fossil-free Sweden)
- Re-Source
- Dutch Covenant in respect of improvements in the coal supply chain
- Equal by 30
- SDG LGBTI Manifesto

Vattenfall conducts its operations primarily in northwest Europe (Sweden, Germany, the Netherlands, Denmark, the UK, France, and Finland). These countries have all ratified the International Labour Organization's (ILO) eight fundamental conventions. A country that has ratified an ILO convention must regularly report on its performance to the ILO.

GRI Standard	Disclosure number	Disclosure title	Page number(s) and/or URL(s)	Omission	UNGC Principle(s)
GRI 102: General Disclosure 2016					
Organisational profile					
	102-1	Name of the organisation	Cover, Note 1		
	102-2	Activities, brands, products, and services	4-5		8-9: Environment
	102-3	Location of headquarters	4, 73		
	102-4	Location of operations	4-5		
	102-5	Ownership and legal form	4		
	102-6	Markets served	5		
	102-7	Scale of the organisation	4, 8		
	102-8	Information on employees and other workers	162-163		6: Labour
	102-9	Supply chain	160-161		
	102-10	Significant changes to the organisation and its supply chain	10-11, 160-161		
	102-11	Precautionary Principle or approach	63-66, 164		All principles
	102-12	External initiatives	168		
	102-13	Membership of associations	168		
	EU1	Installed capacity	180-182		
	EU2	Energy production, net	180-182		
	EU3	Numbers of customers	4, 180-182		
	EU4	Length of transmission and distribution lines, based on voltage	180-181		
	EU5	Allocation of CO ₂ emission allowances	180-181		
Strategy					
	102-14	Statement from senior decision-maker	6-7		
Ethics and integrity					
	102-16	Values, principles, standards, and norms of behaviour	56-59, 78-79, 159-163		All principles
Governance					
	102-18	Governance structure	72-85		
Stakeholder engagement					
	102-40	List of stakeholder groups	157		
	102-41	Collective bargaining agreements	163		3: Labour
	102-42	Identifying and selecting stakeholders	157		
	102-43	Approach to stakeholder engagement	157		
	102-44	Key topics and concerns raised	157		
Reporting practice					
	102-45	Entities included in the consolidated financial statements	168		
	102-46	Defining report content and topic boundaries	168		
	102-47	List of material topics	157		
	102-48	Restatements of information	168		
	102-49	Changes in reporting	168		
	102-50	Reporting period	168		
	102-51	Date of most recent report	168		
	102-52	Reporting cycle	168		
	102-53	Contact point for questions regarding the report	III (185)		
	102-54	Claims of reporting in accordance with the GRI Standards	168		
	102-55	GRI content index	168-171		
	102-56	External assurance	168		

GRI Standard	Disclosure number	Disclosure title	Page number(s) and/or URL(s)	Omission	UNGC Principle(s)
Economic					
GRI 205: Anti-corruption 2016					
	103-1/2/3	Management approach, 205	58-59, 79		10: Anti-corruption
	205-2	Communication and training about anti-corruption policies and procedures	59		
GRI 206: Anti-competitive behavior 2016					
	103-1/2/3	Management approach, 206	58-59, 79		10: Anti-corruption
	206-1	Legal actions for anti-competitive behaviour, anti-trust, and monopoly practices	59		
Environmental					
GRI 302: Energy 2016					
	103-1/2/3	Management approach, 302	79, 164	Total consumption of electricity, heat, cooling and steam, and sold steam and cooling are not reported as data is not available at the Group level.	8-9: Environment
	302-1	Energy consumption within the organisation	174		
GRI 303: Water 2016					
	103-1/2/3	Management approach, 303	79, 165	Rain and wastewater from other organisations are not reported as this is not significant compared with other water flows.	8-9: Environment
	303-1	Water withdrawal by source	167		
GRI 304: Biodiversity 2016					
	103-1/2/3	Management approach, 304	164		8-9: Environment
	304-2	Significant impacts of activities, products, and services on biodiversity	164-166		
GRI 305: Emissions 2016					
	103-1/2/3	Management approach, 305	49, 79, 158	Focus on regulations and policies for CO ₂ as this is most significant for Vattenfall.	7-9: Environment
	305-1	Direct (Scope 1) GHG emissions	158, 174		
	305-4	GHG emissions intensity	174	CO ₂ emissions (Scope 1) are reported.	8: Environment
	305-7	Nitrogen oxides (NO _x), sulphur oxides (SO _x), and other significant air emissions	165, 174	Emissions of POPs, VOC and HAP are not reported because they are not measured regularly since they are not significant for Vattenfall plants. There are no specific legal requirements associated with these emissions.	
Electric Utility Sector-Specific Environmental Social Indicators					
	EN21	Nitrogen oxides (NO _x), sulfur oxides (SO _x), and other significant air emissions	165, 174		
GRI 306: Effluents and Waste 2016					
	103-1/2/3	Management approach, 306	164, 167		8-9: Environment
	306-1	Water discharge by quality and destination	167		
	306-2	Waste by type and disposal method	167		
Electric Utility Sector-Specific Environmental Performance Indicators					
	EN23	Waste by type and disposal method	167		
GRI 308: Supplier Environmental Assessment 2016					
	103-1/2/3	Management approach, 308	160		7: Environment
	308-1	New suppliers that were screened using environmental criteria	161		

GRI Standard	Disclosure number	Disclosure title	Page number(s) and/or URL(s)	Omission	UNGC Principle(s)
Social					
GRI 403: Occupational Health and Safety 2018					
	103-1/2/3	Management approach, 403	57, 78-79		1-2: Human rights 4-6: Labour
	403-1	Occupational health and safety management system	57	Most parts of the organisation are certified according to OHSAS 18001 or ISO45001 based on a risk analysis, which is a way to ensure legal compliance.	
	403-2	Hazard identification, risk assessment, and incident investigation	57	For the European countries Vattenfall operates in, reprisals are not considered to be an issue.	
	403-3	Evaluation of the management approach	57		
	403-4	Worker participation, consultation, and communication on occupational health and safety	57	<ul style="list-style-type: none"> Local forums for worker participation are set up according to OHSAS/ISO. Meeting frequency and detailed roles may vary depending on location. 	
	403-5	Worker training on occupational health and safety	57	We put demands on our contractors regarding health & safety conduct and competence.	
	403-6	Promotion of worker health	57		
	403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships	57		
	403-9	Work-related injuries	57, 163	Data is collected locally to a central reporting system.	
GRI 405: Diversity and Equal Opportunities 2016					
	103-1/2/3	Management approach, 405	57-58, 163	No reporting per minority group, as this is prohibited by rules in certain markets.	6: Labour
	405-1	Diversity of governance bodies and employees	163		
GRI 414: Supplier Social Assessment 2016					
	103-1/2/3	Management approach, 414	160		
	414-1	New suppliers that were screened using social criteria	161		
Electric Utility Sector-Specific Social Indicators					
	EU28	Power outage frequency	174		
	EU29	Average power outage duration	174		

Auditor's Combined Assurance Report on Vattenfall AB's Sustainability Report and statement regarding the Statutory Sustainability Report

This is the translation of the auditor's report in Swedish. To Vattenfall AB, corp id 556036-2138

Introduction

We have been engaged by the Board of Vattenfall AB to undertake a combined assurance engagement of Vattenfall AB's Sustainability Report for the year 2019. Vattenfall AB has defined the scope of the Sustainability Report to the pages referred to in the GRI index on the pages 169-171. The Statutory Sustainability Report is defined on page 89.

Responsibilities of the Board and Executive Management

The Board of Directors and Executive Management are responsible for the preparation of the Sustainability Report including the Statutory Sustainability Report in accordance with applicable criteria and the Annual Accounts Act respectively. The criteria are defined on page 168 in the Sustainability Report and are part of the Sustainability Reporting Guidelines published by GRI (The Global Reporting Initiative) that are applicable to the Sustainability Report, as well as the accounting and calculation principles that the Company has developed. This responsibility includes the internal control relevant to the preparation of a Sustainability Report that is free from material misstatements, whether due to fraud or error.

Responsibilities of the auditor

Our responsibility is to express a conclusion on the Sustainability Report based on the assurance procedures we have performed and to express an opinion regarding the Statutory Sustainability Report. Our engagement is limited to historical financial information presented in this document and does therefore not include future oriented information.

We conducted our engagement in accordance with ISAE 3000 Assurance engagements other than audits or reviews of historical financial information. The engagement includes a limited assurance engagement on the complete Sustainability Report and audit of the data that is specified below. The objective of an audit is to obtain reasonable assurance that the information is free of material misstatements. A reasonable assurance engagement includes examining, on a test basis, evidence supporting the quantitative and qualitative information in the Sustainability Report. A limited assurance engagement consists of making inquiries, primarily of persons responsible for the preparation of the Sustainability Report, and applying analytical and other limited assurance procedures. Our examination regarding the Statutory Sustainability Report has been conducted in accordance with FAR's accounting standard RevR 12 The auditor's opinion regarding the statutory sustainability report. A limited assurance

engagement and an examination according to RevR 12 are different from and substantially less in scope than reasonable assurance conducted in accordance with IAASB's Standards on Auditing and other generally accepted auditing standards in Sweden.

Ernst & Young AB applies ISQC 1 (International Standard on Quality Control) and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements. We are independent of Vattenfall AB in accordance with professional ethics for accountants in Sweden and have otherwise fulfilled our ethical responsibilities in accordance with these requirements.

The conclusion based on our limited assurance procedures and an examination according to RevR 12 does not provide the same level of assurance as the conclusion of our reasonable assurance procedures. Since this engagement is combined, our conclusions regarding reasonable assurance and limited assurance are presented separately below.

Our audit has consisted of following information:

Outcome of the strategic targets, disclosed on page 13:

- Customer loyalty, NPS (Net Promoter Score)
- Commissioned renewables capacity
- Absolute CO₂ emissions pro rata
- Work injuries, LTIF (Lost Time Injury Frequency)
- Employee Engagement Index

Our procedures are based on the criteria defined by the Board of Directors and the Executive Management as described above. We consider these criteria suitable for the preparation of the Sustainability Report.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion below.

Conclusions

Based on the limited assurance procedures we have performed, nothing has come to our attention that causes us to believe that the Sustainability Report is not prepared, in all material respects, in accordance with the criteria defined by the Board of Directors and Executive Management.

In our opinion the information in the Sustainability Report which has been subject to our reasonable assurance procedures have, in all material respects, been prepared in accordance with the criteria defined by the Board of Directors and Executive Management.

A Statutory Sustainability Report has been prepared.

Stockholm, 19 March 2020
Ernst & Young AB

Staffan Landén
Authorised Public Accountant

Outi Alestalo
Expert member of FAR

Auditor's Limited Assurance Report on Vattenfall AB's Green bond investor report

To Vattenfall AB, corp id 556036-2138

Introduction

We have been engaged by the management of Vattenfall AB to undertake a limited review of Vattenfall's Green bond investor report 2019 ("The Investor Report"). The Investor Report is located on page 25 in Vattenfall's Annual and Sustainability Report 2019.

Responsibilities of the Board and Executive Management

The Board of Directors and Executive Management are responsible for evaluating and selecting eligible assets, for the use and management of bond proceeds, and for preparing an Investor Report in accordance with applicable criteria. The criteria are defined on page 25 in the Annual and Sustainability Report 2019 and consist of relevant parts of Vattenfall's Green Bond Framework, available on Vattenfall's website, as well as the accounting and calculation principles that the Company has developed. This responsibility includes the internal control relevant to the preparation of an Investor Report that is free from material misstatements, whether due to fraud or error.

Responsibilities of the Auditor

Our responsibility is to express a conclusion on the Investor Report based on the limited assurance procedures we have performed.

We have conducted our limited assurance engagement in accordance with ISAE 3000 *Assurance engagements other than audits or reviews of historical financial information*. A limited assurance engagement consists of making inquiries, primarily of persons responsible for the management of bond proceeds and the process for selection of eligible assets, and applying analytical and other limited assurance procedures.

Ernst & Young AB applies ISQC 1 (International Standard on Quality Control) and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements. We are independent of SEB in accordance with professional ethics for accountants in Sweden and have otherwise fulfilled our ethical responsibilities in accordance with these requirements.

The procedures performed in a limited review do not enable us to obtain assurance that we would become aware of all significant matters that might be identified in a reasonable assurance engagement. Accordingly, we do not express a reasonable assurance conclusion.

Our procedures are based on the criteria defined by the Board of Directors and the Executive Management as described above. We consider these criteria suitable for the preparation of the Investor Report. We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our conclusion below.

Conclusion

Based on the limited assurance procedures we have performed and the evidence we have obtained, nothing has come to our attention that causes us to believe that the Investor Report has not been prepared, in all material respects, in accordance with the criteria defined by the Board of Directors and Executive Management.

Stockholm, 19 March 2020
Ernst & Young AB

Staffan Landén
Authorised Public Accountant

Outi Alestalo
Expert member of FAR

Five-year overview of sustainability data

	2015	2016	2017	2018	2019
Production and environment					
Electricity generation	117.4	119	127.3	130.3	129.3
– of which, hydro power	39.5	34.8	35.6	35.5	35.8
– of which, nuclear power	42.2	46.9	51.9	55.0	53.4
– of which, fossil power	29.2	30.8	31.9	31.6	30.2
– of which, wind power	5.8	5.8	7.6	7.8	9.5
– of which, biomass and waste	0.7	0.7	0.4	0.4	0.4
Energy consumption, TWh					
Gas	27.7	32.5	36.8	38.6	44.3
Hard coal	46.1	43.9	42.1	41.1	25.6
Lignite	3.2	3.2	1.5	–	–
Peat	0.5	0.5	0.4	0.6	0.2
Waste (non-biogenic)	1.8	1.9	1.2	1.2	1.2
Biomass, waste (biogenic)	4.3	4.6	3.7	3.9	4.1
Other fuels, including oil	1.5	1.5	1.5	1.7	1.6
Uranium (tonnes)	143	119.6	105.9	118.0	136.4
Emissions to air (Scope 1)¹					
Carbon dioxide (CO ₂), Mtonnes	23.9	23.7	23.0	22.5	18.2 ⁵
Specific CO ₂ emissions, g/kWh	172	170	157	150	126
Biogenic CO ₂ ² , Mtonnes	1.5	1.6	1.3	1.3	1.4
Nitrogen oxides (NO _x), ktonnes	10.1	10.2	9.8	9.9	7.4
Specific NO _x emissions, g/kWh	0.073	0.073	0.066	0.066	0.051
Specific NO _x emissions (only combustion plants), g/kWh	0.196	0.196	0.187	0.194	0.161
Sulphur dioxide (SO ₂), ktonnes ³	4.5	4.2	4.1	4.2	2.3
Specific SO ₂ emissions, g/kWh ³	0.032	0.030	0.028	0.028	0.016
Specific SO ₂ emissions (only combustion plants), g/kWh ³	0.087	0.081	0.078	0.082	0.051
Particulate matter (PM), ktonnes	0.3	0.3	0.3	0.2	0.1
Specific PM emissions, g/kWh	0.002	0.002	0.002	0.001	0.001
Specific PM emissions (only combustion plants), g/kWh	0.005	0.005	0.006	0.004	0.003
Carbon dioxide (CO₂), Mtonnes (Scope 2)	–	0.1	0.1	0.1	0.1
Carbon dioxide (CO₂), Mtonnes (Scope 3)	–	19.9	19.6	20.7 ³	19.0
Capital Goods, goods and services	–	0.4	0.4	0.2	0.5
Fuel and waste incl. transports	–	5.0	5.0	5.1 ³	5.0
Business travel	–	0.03	0.03	0.02	0.02
Use of sold products	–	14.4	14.2	15.4 ³	13.5
Waste and by-products, ktonnes					
Hazardous waste	76	106	61	59	72
Non-hazardous waste	128	133	145	98	75
Ash from coal	790	775	671	579	423
Ash from biomass	38.3	41.3	37.4	38.4	32.9
Slag from waste incineration	229	237	168	170	173
Gypsum	193	208	169	185	128
Radioactive waste					
Low and medium radioactive operational waste, m ³	3,353	1,013	912	829	411
Core components, tonnes	7	17	15	31	25
Spent nuclear fuel, tonnes	197	124	175	137	260
SAIDI (minutes/customer)					
Sweden	212	150	125	187	439
Germany	11	10	11	15	10
SAIFI (number/customer)					
Sweden	2.2	2.1	1.8	2.9	2.4
Germany	0.2	0.2	0.2	0.3	0.2
Our people					
Number employees, FTE	28,567	19,935	20,041	19,910	19,814
– of which females	6,399	4,773	4,827	4,840	5,000
– of which temporary employed (not permanent contract)	761	550	609	618	664
Sick leave					
men, %	4.1%	3.5%	3.6%	3.5%	3.2%
females, %	5.8%	5.4%	5.7%	5.4%	5.1%

Five-year overview of sustainability data - cont.

	2015	2016	2017	2018	2019
Work-related accidents					
Internal LTIF (employees)	2.6	2.0	1.5	1.9	2.1
External LTI ⁴ (contractors)	133	101	80	71	88
Gender diversity					
Female managers, %	19%	22%	23%	24%	26%
Share of managers per age category total					
-29	1%	1%	1%	1%	1%
30-49	52%	56%	58%	56%	56%
50-	46%	43%	40%	43%	43%

¹⁾ Emissions are presented in accordance to financial accounting and consolidated.

²⁾ CO₂ emissions from combustion of biomass.

³⁾ Scope 3 figures have been updated due to updated gas sales.

⁴⁾ As the Contractor LTIF calculation is not reliable enough, only LTI is reported.

⁵⁾ Total greenhouse emissions amount to 18.3 Mtonnes CO₂eq, 0.1 Mtonnes CO₂eq consist of SF₆ and N₂O emissions. Characterisation factors are obtained from the IPCC Fifth Assessment report.

Quarterly overview

Amounts in SEK million	2018				2019			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Income statement items								
Net sales	43,860 ²	31,176 ²	32,035 ²	45,020 ²	49,552	34,691	35,938	46,179
Operating profit before depreciation, amortisation and impairment losses (EBITDA)	10,938	6,888	7,854	8,662	12,587	7,515	13,499	8,844
Operating profit (EBIT)	6,975	2,775	3,680	4,189	8,168	2,869	8,677	2,427
Underlying operating profit	9,359	3,770	2,127	4,627	9,673	3,622	3,594	8,207
Financial net	-1,696	725	-1,499	-1,146	-307	-379	-879	-2,254
Profit before income taxes	5,279	3,500	2,181	3,042	7,861	2,490	7,798	173
Profit for the period	4,158	2,967	1,782	3,100	6,420	1,253	6,700	488
- of which, attributable to owners of the Parent Company	3,691	2,377	1,668	2,421	5,713 ³	935 ³	6,375	151
- of which, attributable to non-controlling interests	467	590	114	679	707 ³	318 ³	325	337
Cash flow items								
Funds from operations (FFO)	8,758	4,006	3,246	7,265	9,789	6,057	7,583	11,520
Cash flow from operating activities	1,259	15,215	18,816	5,764	10,965	9,085	13,609	4,990
Free cash flow	-1,165	12,002	15,973	766	-14,921	6,725	10,940	-1,171
Balance sheet items								
Cash and cash equivalents and short-term investments	32,492	35,449	41,186	40,071	26,788	29,006	33,929	33,155
Equity	97,815	99,194	104,213	103,597	108,613	104,815	109,461	108,522
- of which, attributable to owners of the Parent Company	82,587	83,812	89,085	88,096	92,680 ³	90,128 ³	94,385	93,631
- of which, attributable to non-controlling interests	15,228	15,382	15,128	15,501	15,933 ³	14,687 ³	15,076	14,891
Interest-bearing liabilities	97,497	93,832	84,182	88,275	99,609	101,713	93,821	97,627
Net debt	64,353	57,754	42,384	47,728	72,539	72,455	59,648	64,266
Adjusted net debt	130,900	125,182	109,273	112,324	134,384	137,244	125,373	132,014
Provisions	134,576	138,319	137,175	136,642	138,113	143,543	147,273	149,792
Noninterest-bearing liabilities	97,211	113,945	138,287	134,094	108,186	103,961	95,835	94,839
Capital employed, average	247,383	250,821	244,992	250,283	265,229	266,463	260,068	260,190
Balance sheet total	427,099	445,290	463,857	462,608	454,521	454,032	446,390	450,780

¹⁾ Based on Underlying operating profit, that is, Operating profit excluding items affecting comparability.

²⁾ Due to changed presentation of transactions related to Renewable Obligation Certificates and due to netting of certain commodity trading contracts in order to better reflect the substance of these transactions, Net sales and Cost of purchases for the comparative periods have been adjusted, with no effect on EBITDA.

³⁾ The value has been adjusted compared with information previously published in Vattenfall's financial reports.

Amounts in SEK million	2018				2019			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Key ratios in % unless otherwise stated. (x) means times.								
Operating margin	15.9 ²	8.9 ²	12.5 ²	11.6 ²	16.5	8.3	24.1	5.3
Operating margin ¹	21.3 ²	12.1 ²	14.2 ²	13.1 ²	19.5	10.4	10.0	17.8
Pre-tax profit margin	12.0 ²	11.2 ²	10.2 ²	9.2 ²	15.9	7.2	21.7	0.4
Pre-tax profit margin ¹	17.5 ²	7.9 ²	10.0 ²	9.4 ²	18.9	9.3	7.6	12.9
Return on equity	11.2	11.5	12.4	11.9	13.8 ³	12.0 ³	16.8	14.0
Return on capital employed	7.8	7.1	7.9	7.0	7.1	7.1	9.2	8.5
Return on capital employed ¹	9.8	9.2	9.2	7.9	7.6	7.5	8.3	9.6
EBIT interest cover, (x)	3.3	3.0	3.4	4.3	5.1	5.1	6.0	5.3
EBIT interest cover, (x) ¹	4.0	3.9	3.9	4.9	5.4	5.4	5.4	6.0
FFO interest cover, (x)	5.2	4.9	4.7	6.5	7.2	7.7	8.3	9.3
FFO interest cover, net, (x)	6.4	6.0	5.8	7.8	9.5	10.1	10.7	10.3
Cash flow interest cover after maintenance investments, (x)	3.8	5.3	6.0	9.1	5.5	3.8	2.1	1.5
FFO/gross debt	27.8	25.9	26.8	26.4	24.4	25.9	32.7	35.8
FFO/net debt	42.1	42.1	53.2	48.8	33.5	36.4	51.5	54.4
FFO/adjusted net debt	20.7	19.4	20.6	20.7	18.1	19.2	24.5	26.5
EBITDA/net financial items, (x)	8.4	7.3	8.6	10.1	16.5	7.9	13.0	8.7
EBITDA/net financial items, (x) ¹	10.2	8.4	9.2	10.7	18.5	8.6	8.1	12.9
Equity/total assets	22.9	22.3	22.5	22.4	23.9	23.1	24.5	24.1
Gross debt/equity	99.7	94.6	80.8	85.2	91.7	97.0	85.7	90.0
Net debt/equity	65.8	58.2	40.7	46.1	66.8	69.1	54.5	59.2
Gross debt/gross debt plus equity	49.9	48.6	44.7	46.0	47.8	49.2	46.2	47.4
Net debt/net debt plus equity	39.7	36.8	28.9	31.5	40.0	40.9	35.3	37.2
Net debt/EBITDA, (x)	1.8	1.7	1.2	1.4	2.0	2.0	1.4	1.5
Adjusted net debt/EBITDA, (x)	3.7	3.7	3.1	3.3	3.7	3.7	3.0	3.1
Other information								
Investments	3,284	5,558	4,036	9,035	6,756	5,696	4,586	8,464
Electricity generation, TWh	37.2	29.4	27.8	35.9	35.9	30.9	28.7	34.7
Sales of electricity, TWh	49.8	36.2	38.1	45.2 ³	45.4	42.4	38.7	42.9
Sales of heat, TWh	8.2	2.4	1.9	5.8	7.3	3.1	1.7	5.1
Sales of gas, TWh	26.9 ³	8.7 ³	6.1 ³	19.0 ³	24.3	9.0	6.3	19.7
Number of employees, full-time equivalents	20,031	19,959	19,951	19,910	20,202	20,272	19,786	19,814

¹ Based on Underlying operating profit, that is, Operating profit excluding Items affecting comparability.

² Due to changed presentation of transactions related to Renewable Obligation Certificates and due to netting of certain commodity trading contracts in order to better reflect the substance of these transactions, Net sales and Cost of purchases for the comparative periods have been adjusted, with no effect on EBITDA.

³ The value has been adjusted compared with information previously published in Vattenfall's financial reports.

Ten-year overview

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Income statement items										
Net sales	213,572	181,040	167,313	172,253	165,945	143,576	139,208	135,114	152,091 ³	166,360
Operating profit before depreciation, amortisation and impairment losses (EBITDA)	60,706	54,538	54,271	43,554	41,038	30,604	27,209	34,399	34,341	42,445
Operating profit (EBIT)	29,853	23,209	25,958	-6,218	-2,195	-5,069	1,337	18,524	17,619	22,141
Underlying operating profit	36,838	30,793	27,530	28,135	24,133	20,529	21,697	23,203	19,883	25,095
Financial net	-8,430	-8,911	-7,840	-9,037	-6,045	-4,776	-6,382	-5,755	-3,616	-3,819
Profit before income taxes	21,423	14,298	18,118	-15,255	-8,240	-9,845	-5,045	12,769	14,003	18,322
Profit for the year	13,185	10,416	17,047	-13,543	-8,284	-19,766	-26,004	9,484	12,007	14,861
- of which, attributable to owners of the Parent Company	12,997	11,083	16,759	-13,668	-8,178	-16,672	-26,324	8,333	10,157	13,173
- of which, attributable to non-controlling interests	188	-667	288	125	-106	-3,094	320	1,151	1,850	1,688
Cash flow items										
Funds from operations (FFO)	40,108	38,256	34,419	31,888	32,131	29,009	28,186	26,643	23,275	34,949
Cash flow from operating activities	41,231	33,468	28,485	37,843	40,146	40,934	30,783	25,728	41,054	16,719
Free cash flow	23,846	17,637	12,619	23,579	23,234	25,013	19,217	13,091	27,575	1,571
Balance sheet items										
Cash and cash equivalents and short-term investments	43,873	28,685	46,495	27,261	45,068	44,256	43,292	26,897	40,071	33,155
Equity	133,621	138,931	149,372	130,718	128,462	115,956	83,800	92,332	103,597	108,522
- of which, attributable to owners of the Parent Company	126,704	131,988	140,764	120,370	115,260	103,984	68,272	77,085	88,096	93,631
- of which, attributable to non-controlling interests	6,917	6,943	8,608	10,348	13,202	11,972	15,528	15,247	15,501	14,891
Interest-bearing liabilities	188,277	170,350	160,261	126,488	125,928	110,585	96,667	87,154	88,275	97,627
Net debt	144,109	141,089	111,907	98,998	79,473	64,201	50,724	59,260	47,728	64,266
Adjusted net debt	173,409	176,031	154,335	162,590	158,291	137,585	124,741	124,360	112,324	132,014
Provisions	87,822	91,719	103,832	118,166	138,567	138,263	138,344	131,680	136,642	149,792
Noninterest-bearing liabilities	131,712	123,558	114,899	110,112	104,252	97,513	90,449	88,200	134,094	94,839
Capital employed, average	-	317,799	313,124	302,743	293,992	279,435	248,640	240,778	250,283	260,190
Balance sheet total	541,432	524,558	528,364	485,484	497,209	462,317	409,260	409,132	462,608	450,780
Key ratios in % unless otherwise stated. (x) means times.										
Operating margin	14.0	12.8	15.5	-3.6	-1.3	-3.5	1.0	13.7	11.4 ³	13.3
Operating margin ¹	17.2	17.0	16.5	16.3	14.5	14.3	15.6	17.2	12.9 ³	15.1
Return on equity	10.0	8.6	12.3	-11.4	-6.9	-16.8	-33.4	11.1	11.9	14.0
Return on capital employed	-	7	8	-2.1	-0.8	-1.8	0.5	7.7	7.0	8.5
Return on capital employed ¹	-	10	9	9.3	8.2	7.3	8.7	9.6	7.9	9.6
EBIT interest cover, (x)	4.1	2.6	3.7	-0.7	-0.1	-0.8	0.5	3.3	4.3	5.3
EBIT interest cover, (x) ¹	5.0	3.3	3.9	4.1	5.0	4.8	4.6	4.1	4.9	6.0
FFO interest cover, (x)	6.2	4.9	5.7	5.4	7.3	6.5	6.5	5.4	6.5	9.3
FFO interest cover, net, (x)	7.5	5.8	6.6	6.2	10.1	9.4	7.7	6.9	7.8	10.3
FFO/gross debt	21.3	22.5	21.5	25.2	25.5	23.2	27.8	30.6	26.4	35.8
FFO/net debt	27.8	27.1	30.8	32.2	40.4	39.9	53.0	45.0	48.8	54.4
FFO/adjusted net debt	23	21.7	22.3	19.6	20.3	18.6	21.6	21.4	20.7	26.5
Equity/total assets	24.7	26.5	28.3	26.9	25.9	25.1	20.5	22.6	22.4	24.1
Gross debt/equity	140.9	122.6	107.3	96.8	98.0	95.4	115.4	94.4	85.2	90.0
Net debt/equity	107.8	101.6	74.9	75.7	61.9	55.4	60.5	64.2	46.1	59.2
Gross debt/gross debt plus equity	58.5	55.1	51.8	49.2	49.5	48.8	53.6	48.6	46.0	47.4
Net debt/EBITDA, (x)	2.4	2.6	2.1	2.3	1.9	2.1	1.9	1.7	1.4	1.5
Adjusted net debt/EBITDA, (x)	3	3.2	2.8	3.7	3.9	4.5	4.6	3.6	3.3	3.1
Other information										
Dividend to owners of the Parent Company	6,500	4,433	6,774	-	-	-	-	2,000	2,000	7,245 ²
Investments	41,794	35,750	29,581	27,761	29,032	25,776	21,921	21,294	21,913	26,833
Electricity generation, TWh	172.4	166.7	178.9	181.7	172.9	117.4	119.0	127.3	130.3	130.2
Sales of electricity, TWh	194.2	209.4	205.5	203.3	199.0	197.2	193.2	157.3	174.1	169.4
Sales of heat, TWh	47.1	41.6	29.8	30.3	24.1	20.6	20.3	18.9	18.3	17.1
Sales of gas, TWh	63.2	53.8	52.4	55.8	45.5	50.7	54.8	56.3	60.7 ⁴	59.2
Number of employees, full-time equivalents	38,459	37,679	33,059	31,819	30,181	28,567	19,935	20,041	19,910	19,814

¹ Based on Underlying operating profit, that is, Operating profit excluding Items affecting comparability.

² Proposed dividend.

³ Due to changed presentation of transactions related to Renewable Obligation Certificates, Net sales and Cost of purchases for the comparative periods have been adjusted, with no effect on EBITDA.

⁴ The value has been adjusted compared with information previously published in Vattenfall's financial reports.

Definitions and calculations of key ratios

The key ratios are presented as percentages (%) or times (x) and are based on full year 2019.

Alternative Performance Measures

In order to ensure a fair presentation of the Group's operations, the Vattenfall Group uses a number of Alternative Performance Measures that are not defined in IFRS or in the Swedish Annual Accounts Act. The Alternative Performance Measures that Vattenfall uses are described below, including their definitions and how they are calculated. The Alternative Performance Measures used are unchanged compared with earlier periods.

EBIT – Operating profit (Earnings Before Interest and Tax).

EBITDA – Operating profit before depreciation, amortisation and impairment losses (Earnings Before Interest, Tax, Depreciation and Amortisation).

Items affecting comparability – Capital gains and capital losses from shares and other non-current assets, impairment losses and reversed impairment losses and other material items that are of an infrequent nature. Also included here are, for trading activities, unrealised changes in the fair value of energy derivatives, which according to IFRS 9 cannot be recognised using hedge accounting and unrealised changes in the fair value of inventories. See Consolidated Income Statement for a specification of items affecting comparability.

Underlying EBITDA – Underlying operating profit before depreciation, amortisation and impairment losses. This measure is intended to provide a better view on the operating result by excluding items affecting comparability that are of an infrequent nature, while also excluding non-cash depreciation and amortisation.

Underlying operating profit – Operating profit (EBIT) excluding items affecting comparability. This measure is intended to provide a better view of the operating result by excluding items affecting comparability that are of an infrequent nature.

FFO – Funds From Operations, see Consolidated Statement of Cash Flows.

Free cash flow – Cash flow from operating activities less maintenance investments.

Interest-bearing liabilities – See Consolidated Balance Sheet – Supplementary Information.

Net debt – See Consolidated Balance Sheet – Supplementary Information.

Adjusted net debt – See Consolidated Balance Sheet – Supplementary Information.

Capital employed – Total assets less financial assets, noninterest-bearing liabilities and certain other interest-bearing provisions not included in adjusted net debt. see Consolidated Balance Sheet – Supplementary Information.

Other definition

Hybrid Capital – Perpetual subordinated securities, junior to all Vattenfall's unsubordinated debt instruments.

LTIF – Lost Time Injury Frequency (LTIF) is expressed in terms of the number of lost time work injuries (per 1 million hours worked), i.e., work-related accidents resulting in absence longer than one day, and accidents resulting in fatality.

Calculations of key ratios

Operating margin, %	= 100 x	EBIT Net sales	22,141 166,360	= 13.3
Operating margin excl items affecting comparability, %	= 100 x	Underlying EBIT Net sales	25,095 166,360	= 15.1
Pre-tax profit margin, %	= 100 x	Profit before income taxes Net sales	18,322 166,360	= 11.0
Pre-tax profit margin excl items affecting comparability, %	= 100 x	Profit before income taxes excl items affecting comparability Net sales	21,277 166,360	= 12.8
Return on equity, %	= 100 x	Profit for the period attributable to owner of the Parent Company Average equity for the period attributable to owner of the Parent Company excl the Reserve for cash flow hedges	13,173 94,417	= 14.0
Return on capital employed, %	= 100 x	EBIT Capital employed, average	22,141 260,190	= 8.5
Return on capital employed excl items affecting comparability, %	= 100 x	Underlying EBIT Capital employed, average	25,095 260,190	= 9.6
EBIT interest cover, (x)	=	EBIT + financial income excl return from the Swedish Nuclear Waste Fund Financial expenses excl discounting effects attributable to provisions	22,592 4,225	= 5.3
EBIT interest cover excl items affecting comparability, (x)	=	Underlying EBIT + financial income excl return from the Swedish Nuclear Waste Fund Financial expenses excl discounting effects attributable to provisions	25,546 4,225	= 6.0
FFO interest cover, (x)	=	FFO + financial expenses excl discounting effects attributable to provisions Financial expenses excl discounting effects attributable to provisions	39,174 4,225	= 9.3
FFO interest cover, net, (x)	=	FFO + financial items net excl discounting effects attributable to provisions and return from the Swedish Nuclear Waste Fund Financial items net excl discounting effects attributable to provisions and return from the Swedish Nuclear Waste Fund	38,723 3,774	= 10.3
Cash flow interest cover after maintenance investments, (x)	=	Cash flow from operating activities less maintenance investments + financial expenses excl discounting effects attributable to provisions and interest components related to pension costs Financial expenses excl discounting effects attributable to provisions and interest components related to pension costs	4,925 3,354	= 1.5
FFO/gross debt, %	= 100 x	FFO Interest-bearing liabilities	34,949 97,627	= 35.8
FFO/net debt, %	= 100 x	FFO Net debt	34,949 64,266	= 54.4
FFO/adjusted net debt, %	= 100 x	FFO Adjusted net debt	34,949 132,014	= 26.5
EBITDA/net financial items, (x)	=	EBITDA Financial items net excl discounting effects attributable to provisions and return from the Swedish Nuclear Waste Fund	42,445 3,774	= 11.2
EBITDA excl items affecting comparability/net financial items, (x)	=	EBITDA excl items affecting comparability Financial items net excl discounting effects attributable to provisions and return from the Swedish Nuclear Waste Fund	43,940 3,774	= 11.6
Equity/total assets, %	= 100 x	Equity Balance sheet total	108,522 450,780	= 24.1
Gross debt/equity, %	= 100 x	Interest-bearing liabilities Equity	97,627 108,522	= 90.0
Net debt/equity, %	= 100 x	Net debt Equity	64,266 108,522	= 59.2
Gross debt/gross debt plus equity, %	= 100 x	Interest-bearing liabilities Interest-bearing liabilities + equity	97,627 206,149	= 47.4
Net debt/net debt plus equity, %	= 100 x	Net debt Net debt + equity	64,266 172,788	= 37.2
Net debt/EBITDA, (x)	=	Net debt EBITDA	64,266 42,445	= 1.5
Adjusted net debt/EBITDA, (x)	=	Adjusted net debt EBITDA	132,014 42,445	= 3.1

Facts about Vattenfall's markets 2019¹

	Sweden	Finland	Denmark	Germany	Netherlands	UK	Total
Installed capacity electricity, MW, 31 December 2019							
Hydro power ²	8,689	138	–	2,880	6	–	11,713
Nuclear power	7,182	–	–	–	–	–	7,182
Fossil-based power	699	–	–	3,598	4,067	–	8,364
– of which, gas	–	–	–	1,293	3,417	–	4,710
– of which, hard coal	–	–	–	2,296	650	–	2,946
– of which, oil and other	699	–	–	9	–	–	708
Wind power	358	–	719	588	273	1,077	3,015
Biomass, peat, waste	189	–	–	44	2	–	235
Solar power	–	–	–	10	14	5	29
Total	17,117	138	719	7,119	4,362	1,082	30,538
Installed capacity heat, MW, 31 December 2019	2,144	–	–	5,639	1,079	–	8,861
Generated electricity, TWh							
Hydro power ²	32.2	0.3	–	3.3	–	–	35.8
Nuclear power	53.4	–	–	–	–	–	53.4
Fossil-based power	–	–	–	11.2 ³	19.0	–	30.2 ³
– of which, gas	–	–	–	3.6	16.5	–	20.1
– of which, hard coal	–	–	–	7.5	2.4	–	9.9
– of which, oil and other	–	–	–	0.2	–	–	0.2
Wind power	1.0	–	2.2	2.7	0.5	3.1	9.5
Biomass, peat, waste	0.2	–	–	0.2	–	–	0.4
Solar power	–	–	–	–	–	–	–
Total	86.8	0.3	2.2	17.4³	19.5	3.1	129.3³
Production of heat, TWh							
Fossil-based heat	0.2	–	–	9.5 ³	1.6	–	11.3 ³
– of which, gas	–	–	–	7.0	1.6	–	8.6
– of which, hard coal	–	–	–	1.7	–	–	1.7
– of which, oil and other	0.2	–	–	0.8	–	–	1.0
Biomass, peat, waste	3.1	–	–	1.0	–	–	4.2
Total heat production	3.4	–	–	10.5³	1.6	–	15.5³
Sales of electricity, TWh	91.3 ⁴	0.6	2.9	55.3 ⁵	18.7	0.6	169.4
Sales of heat, TWh	3.0	–	–	12.3	1.7	–	17.1
Sales of gas, TWh	–	–	–	14.2 ⁵	43.9	1.1	59.2
Number of electricity customers	873,812	310,832	77,065	3,435,645	2,117,578	112,872	6,927,804
Electricity volume, TWh retail customers	8.2	2.1	–	10.1 ⁵	6.9	0.6	27.9
Electricity volume, TWh resellers	5.0	0.6	0.8	22.9	–	–	29.3
Electricity volume, TWh businesses	23.8 ⁴	6.7	–	22.4 ⁵	8.9	–	61.8
Number of network customers	967,681	–	–	2,366,891	–	–	3,334,572
Number of gas customers	–	–	–	534,776 ⁵	1,851,618	81,162	2,467,556
Electricity network							
Transited volume, TWh	72.2	–	–	12.9	–	–	85.1
Distribution network, km	135,240	–	–	34,972	–	–	170,212
Number of employees (full-time equivalents)							
Per country	9,138	84	329	5,903	3,540	524	19,518
Group total							19,814
CO ₂ emissions per country, Mtonnes	0.3	–	–	9.4 ⁷	8.6	–	18.2 ⁷
CO ₂ emission allowances received, Mtonnes CO ₂ /year	0.2	–	–	0.7	0.1	–	1.0

Facts about Vattenfall's markets 2018¹

	Sweden	Finland	Denmark	Germany	Netherlands	UK	Total
Installed capacity electricity, MW, 31 December 2018							
Hydro power ²	8,677	124	–	2,880	6	–	11,687
Nuclear power	7,223	–	–	–	–	–	7,223
Fossil-based power	699	–	–	4,638	4,075	–	9,412
– of which, gas	–	–	–	1,220	3,425	–	4,645
– of which, hard coal	–	–	–	2,877	650	–	3,527
– of which, oil and other	699	–	–	540	–	–	1,239
Wind power	356	–	337	588	201	1,077	2,559
Biomass, peat, waste	189	–	–	45	2	–	236
Solar power	–	–	–	2	10	5	17
Total	17,144	124	337	8,152	4,294	1,082	31,133
Installed capacity heat, MW, 31 December 2018							
	2,170	–	–	7,915	1,225	–	11,310
Generated electricity, TWh							
Hydro power ²	31.6	0.4	–	3.5	–	–	35.5
Nuclear power	55.0	–	–	–	–	–	55.0
Fossil-based power	–	–	–	15.5	15.9	–	31.6
– of which, gas	–	–	–	3.4	12.7	–	16.1
– of which, hard coal	–	–	–	11.9	3.2	–	15.1
– of which, oil and other	–	–	–	0.3	–	–	0.3
Wind power	0.9	–	0.9	2.6	0.4	3.0	7.8
Biomass, peat, waste	0.3	–	–	0.2	–	–	0.4
Solar power	–	–	–	–	–	–	–
Total	87.9	0.4	0.9	21.9	16.4	3.0	130.3
Production of heat, TWh							
Fossil-based heat	0.3	–	–	12.8	1.6	–	14.7
– of which, gas	–	–	–	7.5	1.6	–	9.1
– of which, hard coal	–	–	–	4.8	–	–	4.8
– of which, oil	0.3	–	–	0.6	–	–	0.8
Biomass, peat, waste	3.1	–	–	1.0	–	–	4.2
Total heat production	3.4	–	–	13.9	1.7	–	18.9
Sales of electricity, TWh	91.8 ⁴	0.5	1.1	61.0 ⁵	190	0.7	174.1
Sales of heat, TWh	3.1	–	–	13.4	1.8	–	18.3
Sales of gas, TWh	–	–	–	13.3 ⁵	46.3 ⁶	1.1	60.7 ⁶
Number of electricity customers	878,461	322,215	50,419	3,220,782	2,015,107	113,826	6,600,810
Electricity volume, TWh retail customers	8.5	2.4	–	8.9	6.9	0.7	27.4
Electricity volume, TWh resellers	3.7	0.6	0.6	24.6	–	–	29.5
Electricity volume, TWh businesses	24.3 ⁴	6.3	–	22.6 ⁵	9.1	–	62.3
Number of network customers	965,601	–	–	2,348,086	–	–	3,313,687
Number of gas customers	–	–	–	511,518	1,766,893	68,408	2,346,819
Electricity network							
Transited volume, TWh	72.9	–	–	13.1	–	–	86.1
Distribution network, km	134,727	–	–	35,090	–	–	169,817
Number of employees (full-time equivalents)							
Per country	8,890	83	290	6,563	3,398	464	19,688
Group total							19,910
CO ₂ emissions per country, Mtonnes	0.4	–	–	14.1	7.9	–	22.5
CO ₂ emission allowances received, Mtonnes CO ₂ /year	0.3	–	–	1.1	0.1	–	1.5

¹ Rounding differences may be present for certain items.

² In Germany mainly pumped-storage power plants.

³ Excluding the heat operations in Hamburg, which have been divested and where generated electricity and produced heat amounted to 11 TWh and 21 TWh respectively during the period January–September.

⁴ Including sales in Norway.

⁵ Including sales in France.

⁶ Value adjusted compared to previous Annual and Sustainability Report. Number of electricity customers now also includes customers in Denmark.

⁷ Excluding the heat operations in Hamburg, which have been divested and where CO₂ emissions amounted to 11 Mtonnes during the period January–September.

Pro rata¹

2019	Sweden	Finland	Denmark	Germany	Netherlands	UK	Total
Installed capacity electricity, MW, 31 December 2019							
Hydro power ²	8,482	138	–	2,880	6	–	11,506
Nuclear power	4,914	–	–	282	–	–	5,196
Fossil-based power	699	–	–	3,596	4,067	–	8,362
– of which, gas	–	–	–	1,293	3,417	–	4,710
– of which, hard coal	–	–	–	2,296	650	–	2,946
– of which, oil and other	699	–	–	8	–	–	707
Wind power	287	–	717	322	345	1,004	2,675
Biomass, peat, waste	189	–	–	33	2	–	224
Solar power	–	–	–	10	14	5	29
Total	14,571	138	717	7,122	4,434	1,009	27,991
Installed capacity heat, MW, 31 December 2019	2,034	–	–	5,536	1,079	–	8,649
Generated electricity, TWh							
Hydro power ²	31.2	0.3	–	3.3	–	–	34.8
Nuclear power	36.5	–	–	1.9	–	–	38.4
Fossil-based power	0.0	–	–	11.2	19.0	–	30.2
– of which, gas	–	–	–	3.6	16.5	–	20.1
– of which, hard coal	–	–	–	7.5	2.4	–	9.9
– of which, oil and other	0.0	–	–	0.2	–	–	0.2
Wind power	0.8	–	2.2	1.4	0.7	2.8	7.9
Biomass, peat, waste	0.2	–	–	0.2	–	–	0.4
Solar power	–	–	–	–	–	–	–
Total	68.7	0.3	2.2	18.0	19.6	2.8	111.7
Produced heat, TWh	3.2	–	–	10.2	1.6	–	15.0
CO ₂ emissions per country, Mtonnes	0.3	–	–	9.3	8.6	–	18.2

Footnotes: For explanations, see page 181.

2018	Sweden	Finland	Denmark	Germany	Netherlands	UK	Total
Installed capacity electricity, MW, 31 December 2018							
Hydro power ²	8,470	124	–	2,880	6	–	11,479
Nuclear power	4,943	–	–	282	–	–	5,225
Fossil-based power	699	–	–	4,556	4,075	–	9,330
– of which, gas	–	–	–	1,188	3,425	–	4,613
– of which, hard coal	–	–	–	2,828	650	–	3,478
– of which, oil and other	699	–	–	540	–	–	1,239
Wind power	285	–	336	322	273	1,004	2,219
Biomass, peat, waste	189	–	–	34	2	–	225
Solar power	–	–	–	2	10	5	17
Total	14,585	124	336	8,075	4,365	1,009	28,495
Installed capacity heat, MW, 31 December 2018	2,062	–	–	7,475	1,225	–	10,762
Generated electricity, TWh							
Hydro power ²	30.8	0.4	–	3.5	0.0	–	34.8
Nuclear power	37.7	–	–	2.0	–	–	39.7
Fossil-based power	0.0	–	–	15.3	15.9	–	31.2
– of which, gas	–	–	–	3.3	12.7	–	16.0
– of which, hard coal	–	–	–	11.7	3.2	–	14.9
– of which, oil and other	–	–	–	0.3	–	–	0.3
Wind power	0.7	–	0.9	1.4	0.6	2.7	6.3
Biomass, peat, waste	0.3	–	–	0.2	–	–	0.4
Solar power	–	–	–	–	0.0	0.0	0.0
Total	69.5	0.4	0.9	22.3	16.5	2.7	112.3
Produced heat, TWh	3.2	–	–	13.0	1.7	–	17.9
CO ₂ emissions per country, Mtonnes	0.4	–	–	13.7	7.9	–	22.0

Footnotes: For explanations, see page 181.

Glossary

APX – Amsterdam Power Exchange. An energy exchange for the Netherlands, the UK and Belgium.

Aspect – GRI term that describes sustainability areas based on the categories Environment, Economy and Society.

Availability – Actual electricity generation in relation to the maximum possible generation.

Biomass – Renewable fuel, such as wood, bark and pine oil.

CHP (combined heat and power) – A plant that produces both heat and electricity. In such a plant a large share of the primary energy is used for electricity and heat production, with little wasted heat.

CO₂ – Carbon dioxide.

Derivative instrument – A financial instrument that is commonly used to manage risk. Its value and change in value are related to the underlying (derived) instrument. Examples of derivative instruments are options, forward contracts and swaps.

DMA – “Disclosures on Management Approach”. Describes why certain sustainability aspects are identified as material for the company and how steering and monitoring of these are conducted.

EEX – The European Energy Exchange. The German electricity exchange.

Efficiency – An efficiency rating indicates the relationship between energy output and the energy input in a system.

EPD – Environmental Product Declaration – a third-party environmental declaration in accordance with ISO 14025 (www.environdec.com).

EPEX – The spot market of EEX. Since 2009 part of EPEX Spot SE, Paris.

EU ETS – The EU Emissions Trading System. The EU's trading system for CO₂ emission allowances. The system sets a cap for emissions from businesses within the system and facilitates optimisation through trading in emission allowances.

Forward market – A market in which buyers and sellers agree on a set price for a future delivery of the underlying instrument, such as an electricity contract (see also derivative instrument).

Fossil fuels – Fuels based on hydrocarbons from ancient sedimentary layers – mainly coal, oil and natural gas.

Global Compact – The United Nations' (UN's) ten principles for companies surrounding human rights, labour issues, the environment and anti-corruption.

GRI – Global Reporting Initiative – a global standard for sustainability reporting.

Gross capacity – The electric output delivered directly from a plant's generator. Measured in MW (Megawatt).

HOB (Heat only boiler) – A plant that produces heat for district heating as its sole output

IED (Industrial Emissions Directive) – An EU directive that sets higher demands on lowering emission levels and spills to soil and water.

IFRS – International Financial Reporting Standards – Vattenfall has been reporting in accordance with IFRS since 2005.

Indicator – GRI term that provides qualitative or quantitative information about the performance and development of the aspects that are identified as material for the company.

Installed capacity – The performance according to design data for power plants. Commonly measured in MW (Megawatt).

Intrapreneurship – An innovative process within an organisation, typically larger companies.

ISO 14001 – An international standard in the ISO 14000 series for establishing environmental management systems.

ISO 9001 – An international standard in the ISO 9000 series for establishing quality management systems.

LEC (Levelised Energy Cost) – The average cost of production per kilowatt hour electricity, calculated over the full lifetime of the generating asset. The net present value method is used to discount future costs with the average cost of capital (WACC).

Life cycle analysis (LCA) – Methodology to establish a product's total environmental impact during its life cycle, from raw material extraction, through manufacturing processes and usage, to waste management, including all transportation and energy consumption.

LTI (Lost Time Injury) – Work-related accidents resulting in absence longer than one day, and accidents resulting in fatality. Commonly expressed as LTIF, or Lost Time Injury Frequency, the number of such accidents per 1 million hours worked.

Margin call – Marginal security that the holding of a derivative position must pledge to cover the credit risk of its counterparty (OTC or exchange).

Merit order – The order in which production capacity at plants is used.

Net capacity – The electric output that a plant delivers to distribution networks, i.e., gross capacity less the energy used by the plant itself. Measured in MW (Megawatt).

Nominal capacity – The capacity that a generator is designed for. This concept is used mainly for electricity generation power plants, e.g., hydro power plants and wind turbines. Measured in MW (Megawatt).

Nord Pool – The Nordic electricity exchange. Started in Sweden and Norway in 1996.

NO_x – Collective term for nitrogen oxide, nitrogen dioxide and similar nitrogen compounds.

NPS (Net Promoter Score) – NPS is a score ranging from -100 to 100 that measures the willingness of customers to recommend a company's products or services to others and is used to determine customers' overall satisfaction with a company and loyalty to the brand.

OHSAS 18000 – A series of standards that can be used as a basis for an occupational health and safety management system.

OTC (Over the Counter) – Trading outside of exchanges (directly or via brokers) in physical and financial contracts.

Peer-to-peer – Two or more individuals or customers can connect and transact directly, without going through a company.

Power-to-Heat – Converting electricity to heat using electric boilers combined with hot water storage. With Power-to-Heat systems, the excess power generated primarily from renewable energy can be utilised later as district heating.

Primary energy – Primary energy is the form of energy that is accessible directly from the original sources. Vattenfall uses the interpretation applied by Eurostat and IEA. This means that all fuels are assigned a primary energy content corresponding to their heating value. Uranium is assigned a primary energy content corresponding to the heat released in the power plant. Solar, wind and hydro power are assigned a primary energy content corresponding to the extracted electricity (or heat).

Prosumer – Someone who both produces and consumes electricity.

Renewable energy sources – Non-finite energy sources such as hydro power, biomass, wind, the sun, ocean waves and geothermal energy.

Repowering – The process of replacing older wind power turbines with newer ones that either have a greater capacity or more efficiency, which results in a net increase of power generated.

Reservoir levels – Refers to the volume of water stored in a reservoir which on a specific occasion can be used for hydro power generation. Reservoir levels vary during the year depending on precipitation and hydro power generation.

SAIDI (System Average Interruption Duration Index) – An index of average power interruption times within electricity distribution. Measured in terms of interruption duration per customer and year.

SAIFI (System Average Interruption Frequency Index) – An index of average power interruption frequency within electricity distribution. Measured in terms of the number of power interruptions per customer and year.

SF₆ – A greenhouse gas commonly used for electrical insulation that is 15,000 times more potent than CO₂.

SKB – Svensk Kärnbränslehantering AB (The Swedish Nuclear Fuel Management Company) – responsible for handling radioactive waste in Sweden.

SO₂ – Sulphur dioxide.

Spot market – A market in which trading is conducted for immediate delivery.

Swap – A financial instrument that is a combination of a spot and forward transaction – a type of financial swap agreement.

Thermal power – Electricity generated via a heating process, such as a gas turbine or a steam process in a coal or nuclear power plant (compare combined heat and power).

TPI (Third Party Integration) – A process in which excess or waste heat, which would otherwise be released to the atmosphere, is captured from the industrial facilities in which it is produced and integrated into the district heating network

Volatility – A measure of how the price of a product varies during a given period of time.

Waste hierarchy – The EU's prioritisation framework for how waste is to be avoided and managed.

White label – A product or service that is provided to customers who then brand the product themselves and resell it as their own.

For definitions of **financial key ratios**, see pages 178-179.

Power units

- Power is energy per unit of time
- Power output is measured in watts (W)
- 1 kW (kilowatt) = 1,000 W
- 1 MW (megawatt) = 1,000 kW
- 1 GW (gigawatt) = 1,000,000 kW

Energy units

- Energy is power multiplied by time
- 1 kWh (kilowatt hour) = 1 kW in one hour
- 1 MWh (megawatt hour) = 1,000 kWh
- 1 GWh (gigawatt hour) = 1,000,000 kWh
- 1 TWh (terawatt hour) = 1,000,000,000 kWh

Weight units

- ktonnes (kilotonnes) = 1,000 tonnes
- Mt or Mtonnes (megatonnes) = 1,000,000 tonnes

Voltage

- 1 kV (kilovolt) = 1,000 volts (V)

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Financial calendar

28 April 2020	Annual General Meeting
29 April 2020	Interim report January–March
21 July 2020	Interim report January–June
27 October 2020	Interim report January–September
4 February 2021	Year-end report for 2020 (preliminary)

Forecasts and forward-looking statements

This document contains forward-looking statements that are based on Vattenfall's current expectations. Even if Vattenfall's management believes that these expectations are reasonable, no guarantee can be made that these expectations will prove to be correct. The forward-looking statements herein pertain to risks and uncertainties that could have a material impact on future earnings. The statements are based on certain assumptions, including such that pertain to financial conditions in general in the company's markets and the level of demand for the company's products. The outcome may vary significantly compared with what is presented in the forward-looking statements, depending on, among other things, changed conditions regarding the economy, markets and competition, legal requirements, and other political actions and variations in exchange rates, as well as other factors referred to in the administration report. This English version of Vattenfall's Annual and Sustainability Report is a translation of the Swedish original, which is the binding version.

Rounding differences may occur in this document.

About Vattenfall's financial reports

Vattenfall's financial reporting includes interim reports, the year-end report, and the annual report. In addition to these reports, the company issues financial information via press releases and on Vattenfall's websites.

Vattenfall's Annual and Sustainability Report 2019 is published in Swedish and English. All financial reports are available on Vattenfall's websites. The reports are only available digitally for downloading and can therefore not be ordered in printed versions.

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A renewed Vattenfall with a clear goal

For more than 100 years we have electrified industries, powered people's homes and modernised our way of living through innovation and cooperation. We will now make it possible to live a fossil-free life within one generation. That is our goal. But to succeed it is not enough that we alone are fossil-free. It is for this reason that we are looking beyond our own production. Only then can we truly make a difference.

Energy & solutions from a broader perspective

We view our responsibility from a broader perspective. With our capabilities we are now contributing to change on a much larger scale, and we are leading the shift to fossil-free sources of energy - even beyond our own production. This means that we are finding new and innovative fossil-free ways of producing and delivering power to our customers. But it also means that - together with our partners and customers - we are electrifying important industrial manufacturing processes, transports, and other areas in which we can reduce or entirely eliminate CO₂ emissions.

Ability & capacity to enable a fossil-free life

Climate change is a global problem that requires major, sweeping solutions. Vattenfall has operations in most countries in northern Europe. We are one of Europe's largest producers and retailers of electricity and heat. By using our engineering know-how in all parts of the value chain - production, distribution and sales to customers - we can develop solutions and innovations that are bringing us closer to our goal. We are helping our customers live more energy-efficiently by making sure they can choose smart technologies for producing their own electricity or heat, and change over to cleaner alternatives that are both affordable and easy to use.



VATTENFALL