

Corporate Factbook

23 September 2020



VATTENFALL

Table of contents

Vattenfall Group

- [Overview and strategy](#) 3
- [Green Financing](#) 20
- [Sustainability deep-dives](#) 28

Operating segments

- [Customers and Solutions](#) 39
- [Power Generation](#) 44
- [Wind](#) 51
- [Heat](#) 61
- [Distribution](#) 67

Financials

- [Financial performance](#) 73
- [Hedging, debt and funding](#) 77

Overview and strategy




VATTENFALL


This is Vattenfall


In Brief

- Vattenfall is a leading European energy company
- We want to make **fossil-free living possible within one generation**
- We are driving the transition to a more sustainable energy system through growth in renewable production and climate smart energy solutions for our customers
- **100 per cent owned by the Swedish State**
- Our long-term credit ratings are **BBB+ stable outlook by S&P** and **A3 negative outlook by Moody's**

 **6.9 Million**
Electricity Customers

 **1.9 Million**
Heat Customers

 **3.3 Million**
Electricity Network Customers

 **2.5 Million**
Gas Customers

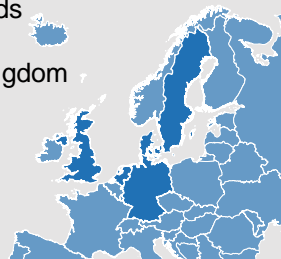
 **19,814**
Employees

Activities in the Value Chain ● Active ● Inactive

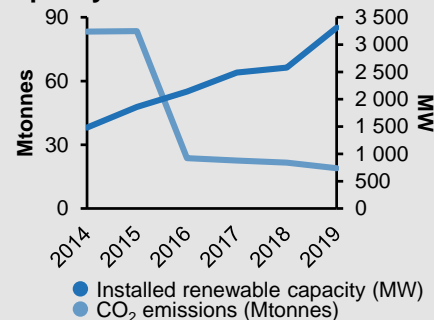


Main markets

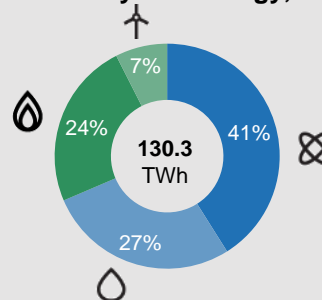
- Sweden
- Germany
- Netherlands
- Denmark
- United Kingdom



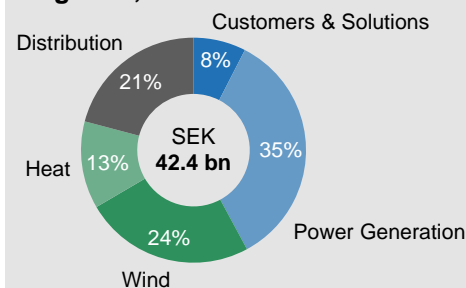
CO₂ emissions & Renewable capacity



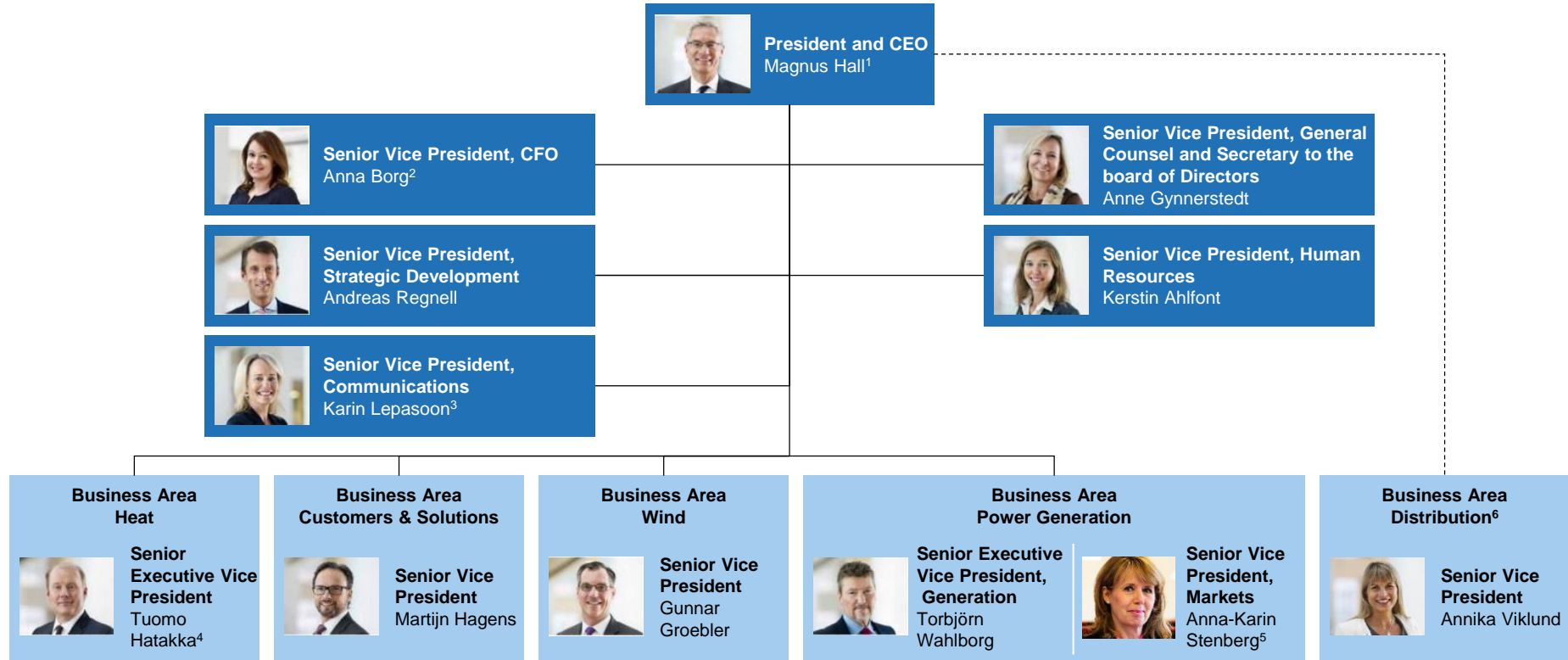
Electricity generation breakdown by technology, 2019



EBITDA breakdown by segment, 2019



Vattenfall Executive Group Management



¹ Magnus Hall will leave Vattenfall, at latest in January 2021.

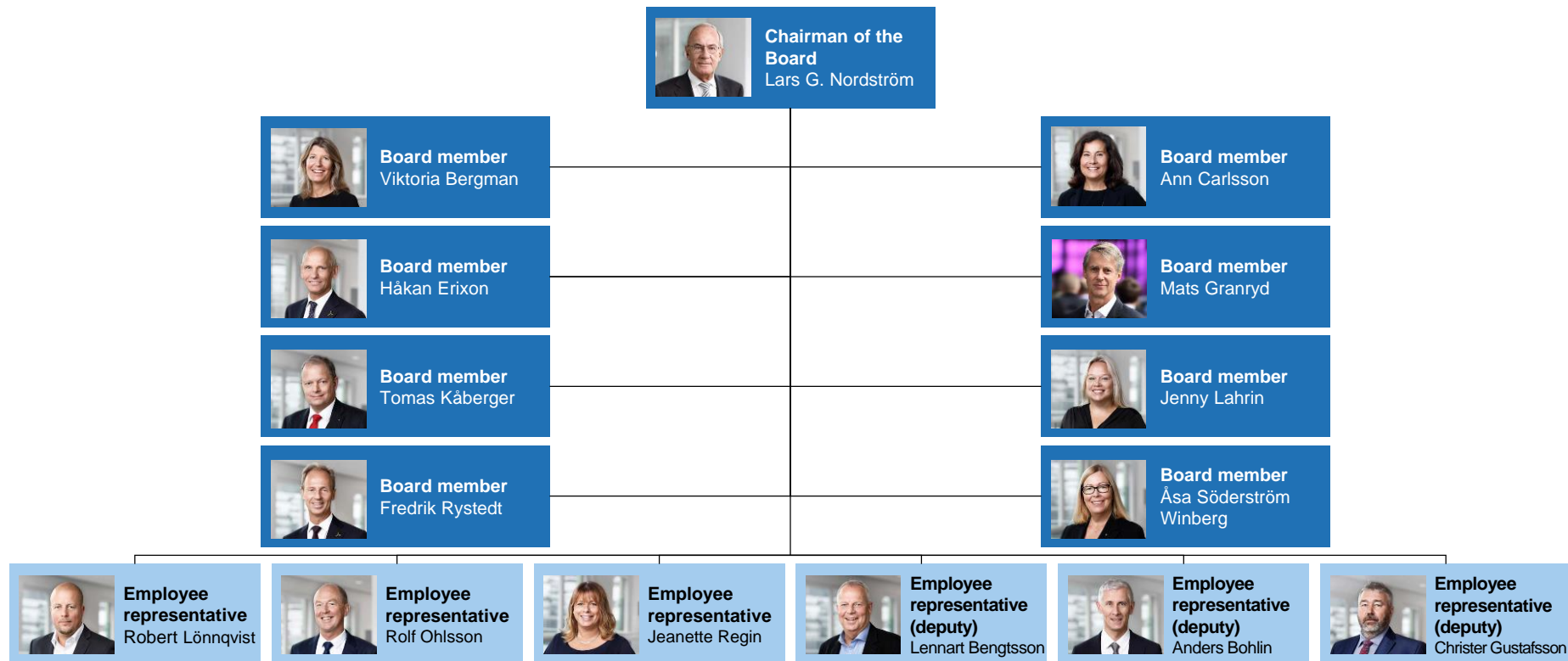
² Anna Borg will take over as CEO on 1 November 2020.

³ Karin Lepasoon will leave Vattenfall at the end of September 2020.

⁴ Tuomo Hatakka will retire at the end of 2020.

⁵ Acting SVP.

Vattenfall Board of Directors



Vattenfall's value chain



Production

Production from

- Hydro
- Nuclear
- Coal
- Natural gas
- Wind
- Solar
- Biomass
- Waste

Actively phasing out fossil-based production

Electricity distribution

- Guarantees secure supply via well-functioning distribution networks and smart network solutions
- Enables customers to feed self-generated electricity into the grid ("prosumers")
- Flexibility services to both electricity producers and consumers to optimise network functionality

Sales of electricity, heat and gas

- Sells electricity, heat and gas to consumers and business customers
- Focuses on various price and service models, and gives customers the opportunity to understand and reduce their environmental impact

District heating

- Drives the transformation towards fossil-free heating and cooling solutions together with partners, cities and regions
- One of Europe's largest producers and distributors of district heating

Energy services & decentralised generation

Offers energy services

- Heat pumps
- Solar panels
- Charging solutions for electric vehicles
- Battery storage
- Network services
- Smart meters

Provides marketplaces and access to marketplaces where customers can buy and sell electricity

Operating segment overview FY 2019

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 Employees as of 31 December 2019¹

Customers and Solutions	3,150
Power Generation	7,429
Wind	1,000
Heat	3,310
Distribution	2,247
Other ²	2,678

¹ Full-time equivalents.

² Pertains mainly to Staff Functions and Shared Service Centres.

³ Numbers reflect FY 2019

Customers & Solutions

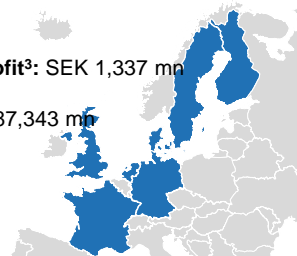
Responsible for sales of electricity, gas and energy services in all of Vattenfall's markets

- One of the market leaders in Sweden with nearly 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
- Activities in France expanded from business customers to also serve retail customers with electricity and gas
- Operates 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

Underlying Operating Profit³: SEK 1,337 mn
(5% of total)

External Net Sales: SEK 87,343 mn
(53% of total)

EBITDA: SEK 2,976 mn
(8% of total)



Power generation

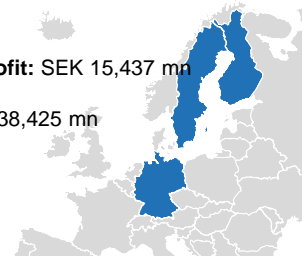
Responsible for Vattenfall's hydro and nuclear power operations, maintenance services business, and optimisation and trading operations, including certain large business customers

- Operates a portfolio with 7.2 GW nuclear 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 a leading player in PPA markets in northwest Europe
- Closure of Ringhals reactor 2 and preparation for the decommissioning of Ringhals reactor 1 in 2020

Underlying Operating Profit: SEK 15,437 mn
(58% of total)

External Net Sales: SEK 38,425 mn
(23% of total)

EBITDA: SEK 13,642 mn
(35% of total)



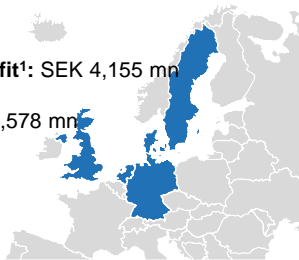
Operating segment overview FY 2019 (Cont'd)

Wind

Responsible for development 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

Underlying Operating Profit¹: SEK 4,155 mn
(16% of total)
External Net Sales: SEK 6,578 mn
(4% of total)
EBITDA: SEK 9,645 mn
(24% of total)

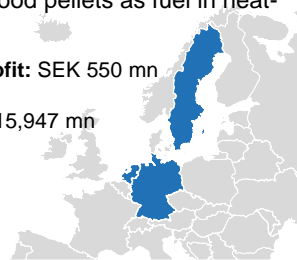


Heat

Responsible for Vattenfall's heat operations including sales, decentralised solutions and gas-and coal-fired condensing

- One of Europe's leading producers and distributors of heat with more than 1.9 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

Underlying Operating Profit: SEK 550 mn
(2% of total)
External Net Sales: SEK 15,947 mn
(10% of total)
EBITDA: SEK 4,957 mn
(13% of total)

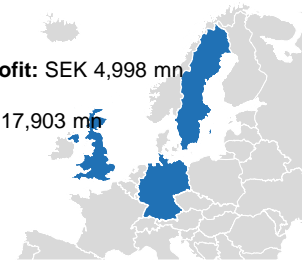


Distribution

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

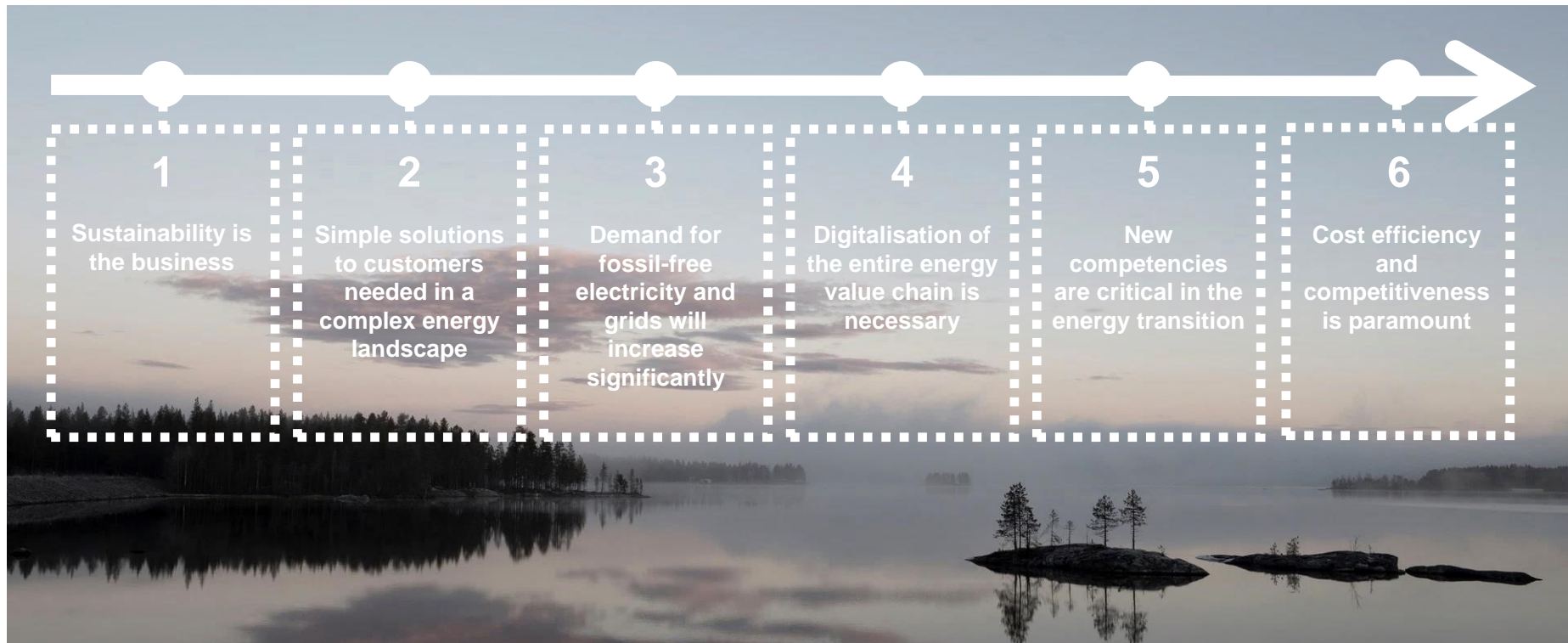
- Leading owner and operator of electricity distribution networks in Sweden
- Approximately 3.3 million business and retail customers in Sweden and Berlin, Germany
- Swedish Energy Markets Inspectorate announced significantly lower revenue frames for the next regulatory period, reducing the scope for needed investments
- Major disruptions after Storm Alfrida in 2019 with associated costs of approximately SEK 800 million

Underlying Operating Profit: SEK 4,998 mn
(19% of total)
External Net Sales: SEK 17,903 mn
(11% of total)
EBITDA: SEK 8,236 mn
(21% of total)



¹ Numbers reflect FY 2019

Our beliefs about the future



A strategy based on an “integrated utility logic”

To enable our goal of fossil-free living within one generation

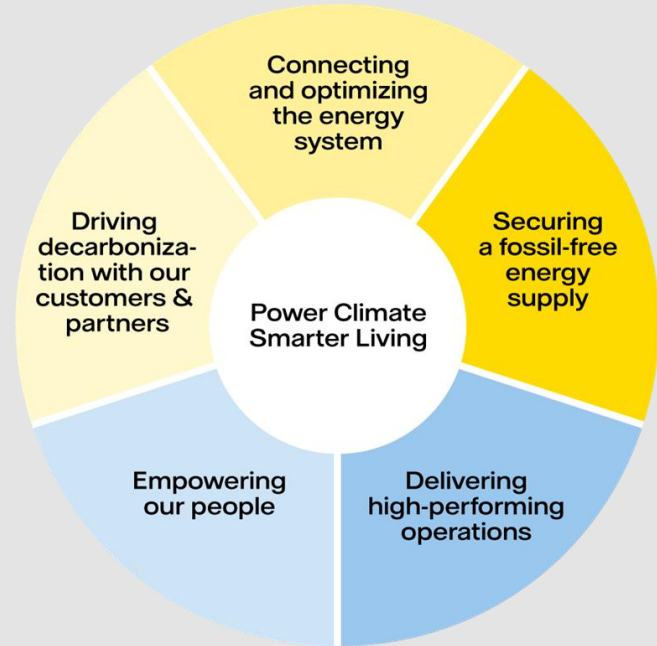
We believe being active in the whole value chain is strategically important:

It increases our competitive advantage in eg. wind auctions, by enabling stable revenues through Corporate PPAs with our customers

Access to renewable volumes on the customer side differentiates us from competitors as fossil-free electricity becomes more scarce

The ability to optimise dispatch across both customer loads and supply brings optimal value of a total portfolio

Diversifying and reducing total portfolio risk means lower cost of capital and an ability to take on more debt



Our milestones towards fossil-free living within one generation

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 additional, flexible hydro capacity enables more renewable generation

2025

We generate fossil-free energy 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

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...

Strategic targets

Outcome of our strategic targets in 2019

Strategic focus area	Strategic targets to 2020	FY 2019	Comments
Driving decarbonisation with our customers & partners	Customer engagement, Net Promoter Score relative (relative customer satisfaction): +2	+1	Improved performance by Vattenfall and peers
Securing a fossil-free energy supply	Commissioned new renewables capacity 2016-2020: $\geq 2,300$ MW	1 226 MW	Commissioning of Horns Rev 3 (407 MW) and Slufterdam (29 MW)
	Absolute CO ₂ emissions, pro rata: ≤ 21 Mtonnes	19.3 ¹ Mtonnes	Lower coal-fired generation
Delivering high-performing operations	Return On Capital Employed (ROCE): $\geq 8\%$	8.5%	Higher gross margin in Power Generation and capital gain (Hamburg)
Empowering our people	Lost Time Injury Frequency (LTIF): ≤ 1.25	2.1	Unsatisfactory level, major ongoing efforts
	Employee Engagement Index: $\geq 70\%$	69%	Strong improvement

¹ Including the heat operations in Hamburg, which have been sold and where emissions amounted to 1.1 Mtonnes during the period January-September.

Financial targets

Financial targets	Targets over a business cycle ¹	FY 2019	FY 2018	Comment
Profitability	Return on capital employed: ≥8% ^{2,3}	8.5%	7.0%	Return on capital employed was 8.5% (7.0%). A higher gross margin in the Power Generation segment and the capital gain from the divestment of the district heating operations in Hamburg made a positive contribution.
Capital structure	FFO/adjusted net debt: 22%–27% ²	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 Power Generation operating segment and lower paid tax.
Dividend policy	Dividend: 40%–70% of the year's profit after tax	SEK 3.6 bn	SEK 2 bn	At the end of Q1'2020, the Board of Directors proposed a revision of the previously proposed dividend for 2019 from SEK 7.2 to SEK 3.6 bn due to uncertain market conditions, which was also approved at the Annual General Meeting.

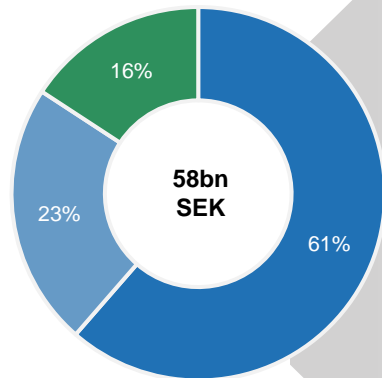
¹ 5–7 years

² Rolling 12-month values

³ The key ratio is based on average capital employed

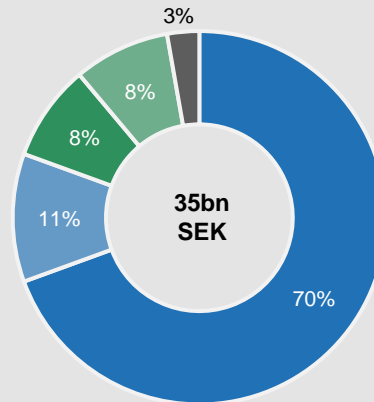
Investment plan 2020-2021

**Total capex
2020-2021**



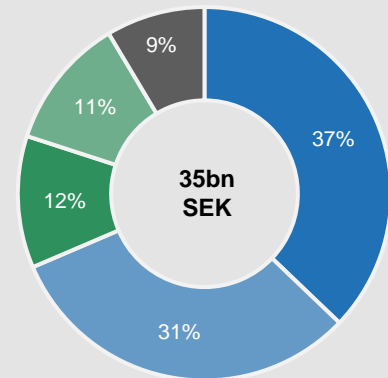
- Growth, 35bn SEK
- Maintenance, 13bn SEK
- Replacement, 9bn SEK

**Growth capex per technology
2020-2021**



- Wind power, 25bn SEK
- Heat grids, 4bn SEK
- Distribution grids, 3bn SEK
- New businesses¹, 3bn SEK
- Solar energy & batteries, 1bn SEK

**Growth capex per country
2020-2021**



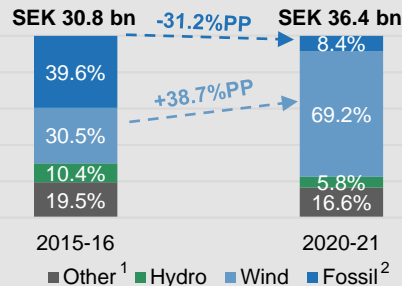
- Netherlands, 13bn SEK
- Denmark, 11bn SEK
- Sweden, 4bn SEK
- UK, 4bn SEK
- Germany, 3bn SEK

¹ Mainly decentralised solutions, energy storage and e-mobility

Significant shift in production portfolio over the past 5 years

The shift has accelerated with large investments in renewables and phase out of fossil production

CAPEX by technology



Major investments in renewable projects

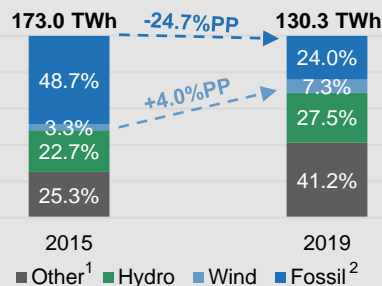
- Around SEK 25 billion of investments are planned for new wind farms, both onshore and offshore
- Recent milestones:
 - Winning bid for the world's first subsidy-free offshore wind farm once commissioned in 2023 (Hollandse Kust Zuid 1-4)
 - Major onshore projects in the Nordics and the Netherlands (Blakliden & Fäbodberget, Wieringermeer)
 - Proof of concept in solar & batteries ready for scaling up and innovative solutions such as co-location with wind farms (Haringvliet, Battery at Pen y Cymoedd)

¹ Other includes nuclear, solar & batteries (CAPEX only) & biomass

² Includes hard coal and gas

³ Consolidated values for 2015. Consolidated emissions are approximately 0.5% higher than pro rata emissions, corresponding to Vattenfall's share of ownership

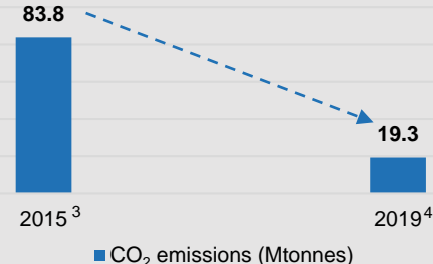
Electricity production mix



Share of fossil production has been reduced dramatically

- Strong wind growth: 3.4 GW installed capacity; > 3 GW under construction and >4 GW in development
- First large scale solar farm commissioned in 2016, Parc Cynog (5 MW)
- Increased focus on decentralised production, storage and EV charging
- Coal-fired production has been phased out such as Reuter C in Berlin and Hemweg-8 in the Netherlands

CO₂ emissions



...and with this our CO₂ emissions

We sold the lignite business in 2016, which reduced our CO₂ footprint dramatically

- We continue to identify further actions such as retiring coal fired power plants earlier than planned (such as Hemweg-8 in the Netherlands)
- We are also phasing out coal from all of our heat operations by 2030, at latest
- In 2030, the Nordic production fleet will be free from fossil fuels

⁴ Pro rata values, corresponding to Vattenfall's share of ownership including the heat operations in Hamburg, which have been sold and where emissions amounted to 1.1 Mtonnes during the period January-September

Vattenfall tackles CO₂ emissions throughout the value chain

CO₂ – emissions 2019



Suppliers

~ 5 Mt



Own business

~ 19 Mt



Customers¹

~ 15 Mt

- Transparency on climate footprint
- Collaboration for phasing out fossil fuels

- Climate neutral in the Nordic region 2030
- Coal phased out 2030 in the heat portfolio
- Fossil-free within one generation
- Travels (EV¹⁰⁰, EV² policy, climate compensate)

- Products and services with clear climate footprint (EPD³ / LCA⁴)
- Renewable decentralised solutions
- Low carbon district heating
- Climate targets together with cities
- E-mobility
- Electrification of industries

¹ Primarily related to natural gas consumption; ² EV – Electric Vehicle; ³ EPD – Environmental Product Declaration – a third-party environmental declaration in accordance with ISO 14025; ⁴ LCA – Life Cycle Assessment

Credit ratings overview



Long term rating: A3

Short term rating: P-2

Outlook: Negative

Latest publication: [04 June 2020](#)

- “Strategic role in Sweden, as well as “moderate” default dependence”
- “Overall, Vattenfall's A3 rating continues to be supported by (1) the company's breadth and scale of operations; (2) its clean generation portfolio in the Nordics; (3) moderate contribution from regulated electricity distribution and district heating activities; (4) an increasing contribution from contracted renewables; and (5) a solid financial profile with funds from operations (FFO)/net debt close to 25% in 2019
- “The negative outlook reflects Moody's expectation that Vattenfall's financial metrics will be weakly positioned against the guidance for the current rating, which includes FFO/net debt around the mid-twenties in percentage terms and RCF/net debt in the high teens in percentage terms”



Long term rating: BBB+

Short term rating: A-2

Outlook: Stable

Latest publication: [12 May 2020](#)

- “Above 45% of EBITDA stems from relatively stable and low-risk regulated electricity distribution networks and district heating operations”
- “Leading position in the Swedish power generation market, supported by large nuclear fleet and flexible low-cost hydropower generation assets”
- Low power prices in the Nordics over 2020-2021 and a 5%-10% reduction in power demand following the outbreak of COVID-19 is expected to cause a shortfall in earnings
- “Increased cash contribution from subsidised, long-term contracted renewables (with wind representing about 24% of our 2019 adjusted EBITDA)”. Vattenfall will make significant investments in renewables, in line with its strategy
- “Recent investments in wind and heat is expected to increase EBITDA in 2021-2023, Vattenfall is working to actively reduce operating costs and maintain a financial risk profile, namely FFO to debt above 20%

Vattenfall credit highlights

A leading European energy company with activities across the value chain

BBB+ stable outlook by S&P and A3 negative outlook by Moody's

100 per cent owned by the Swedish State

Regulated and predictable cash flow from electricity distribution and district heating

Leading towards sustainable production

VATTENFALL 

A significant transformation has already happened

Significant growth in renewable production and climate smart energy solutions

Experienced player in renewables and one of the leaders in wind power generation

Green financing



VATTENFALL

Vattenfall's green bond framework

Use of proceeds - eligible categories with examples of technologies

Renewable energy and related infrastructure



- Wind energy
- Solar energy
- Biomass
- Geothermal
- Hydrogen

Energy efficiency



- Hydro power
- Smart grids/meters
- Fossil-free¹ district heating and cooling
- Energy recovery

Electrification of transport and electrification of heating



- Infrastructure for electric vehicles
- Power to Heat

Industry projects



- Activities enabling the transformation to fossil-free¹ production

¹ Fossil-free: not depending on fossil fuels for its own operations (e.g. for Vattenfall no fossil fuels for energy generation and no fossil products to customers)

Green bond investor report

Investments under Vattenfall's Green Bond Framework, as of September 2020

Category	Project/country	Type	Capacity/ impact	Est. CO ₂ reduction (ktonnes) ¹	Vattenfall's share	Start/ completion	Total investment	Of which Green Bond/spent SEK million ²
Renewable energy and related infrastructure	Kriegers Flak/ Denmark	Wind offshore	605 MW	440	100%	2019/ 2021	7,700 MDKK	1,529
	Wieringemeer/ Netherlands	Wind onshore	180 MW	215	100%	2018/ 2020	220 MEUR	1,178
	Wieringermeer Extension/ Netherlands	Wind onshore	118 MW	140	100%	2019/ 2020	174 MEUR	881
Industry projects	HYBRIT/Sweden	Pilot project	Fossil-free steel	–	33%	2019/ 2021	858 MSEK	211
Total								3,799
Not yet used								6,648 ³
Grand total								10,447

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. Figures are p.a.

² 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.

³ We estimate to be fully invested by mid-2021.

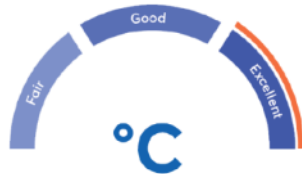
Dark green shading by CICERO

Governance: Excellent

“Vattenfall is deeply committed to contribute to a green transition towards a low carbon society in the longer run.





In addition to subscribing to UN Compact and other sustainability

guidelines, Vattenfall has clear and ambitious targets when it comes to reducing energy consumption and CO₂ emissions”



Project categories

“The Green Bond Principles are clearly fulfilled when it comes to the types of projects to be financed through the Green Bond, the selection process, the management of the proceeds and the reporting”

Categories		Green shading
	Renewable energy and related infrastructure	Dark Green
	Energy efficiency	Medium to Dark Green
	Electrification of transport and heating	Dark Green
	Industry projects	Dark Green

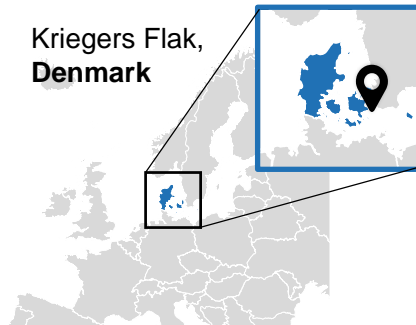
Project deep dive – Kriegers Flak

UN SDG's



Overview

- Danish Kriegers Flak is the latest and largest of Vattenfall's recent offshore projects in Denmark, located 15-40 km off the coast in the Baltic Sea
- The project is in construction and in May 2020 the first foundation was placed in the seabed
- When in full operation, scheduled by the end of 2021, this will be Denmark's largest offshore wind farm with a capacity to cover the annual electricity consumption of approximately 600,000 Danish households

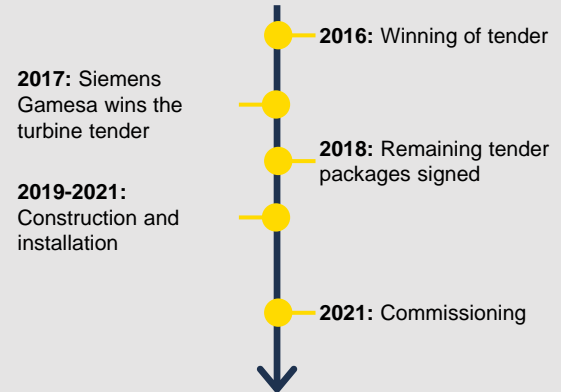


Key data

Capacity	605 MW
Country	Denmark
Technology type	Wind offshore
Turbine model	Siemens Games Turbines 8.4 MW
Ownership	100% Vattenfall
Total Investment (SEK million ¹)	10,700
Green bond/spent (SEK million ²)	801
Estimated CO ₂ reduction ³	440 ktonnes p.a.
Completion	2021



Project Timeline



¹ Year end exchange rate as per 31 December 2019

² 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

³ Production from offshore wind estimated to 3.5 GWh/MW installed. Actual production factors and savings will vary

Project deep dive - Wieringermeer

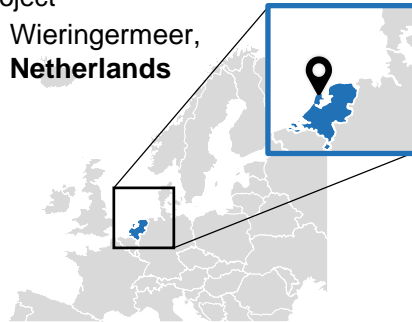
UN SDG's



Overview

- Wieringermeer wind farm, when completed will be the largest onshore wind farm in the Netherlands with a capacity to cover the annual electricity consumption of approximately 370,000 Dutch households
- The project includes re-powering of existing turbines as well as an extension of the wind farm
- Vattenfall has signed a ten-year agreement with Microsoft to power their nearby data center with the power produced from the project

Wieringermeer,
Netherlands

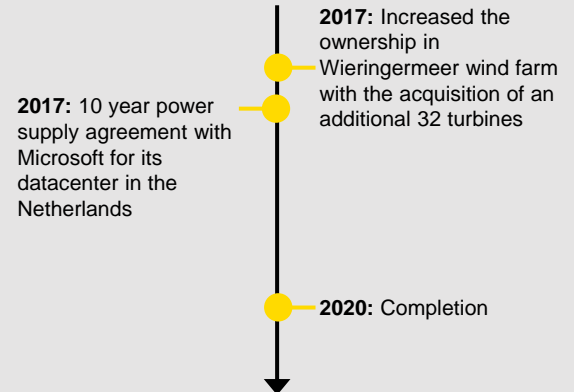


Key data

Capacity	303 MW
Country	Netherlands
Technology type	Wind onshore
Turbine model	Nordex N117/3600
Ownership	100%
Total Investment (SEK million ¹)	4,100
Green Bond/spent (SEK million ²)	1,073
Estimated CO ₂ reduction ³	355 ktonnes p.a.
Completion	2020



Project Timeline



¹ Year end exchange rate as per 31 December 2019

² 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

³ Production from onshore wind estimated to 2.6 GWh/MW installed. Actual production factors and savings will vary

Project deep dive – HYBRIT

HYBRIT – towards the world's first fossil-free steel

UN SDG's



A joint initiative by



What is HYBRIT?

- HYBRIT – short for Hydrogen Breakthrough Ironmaking Technology – is a joint venture between Vattenfall, SSAB (steel) and LKAB (mining and minerals)
- The aim is to replace coking coal, traditionally needed for ore-based steel making, with green hydrogen
- The result will be the world's first fossil-free steel, with virtually no carbon footprint

Why is this important?

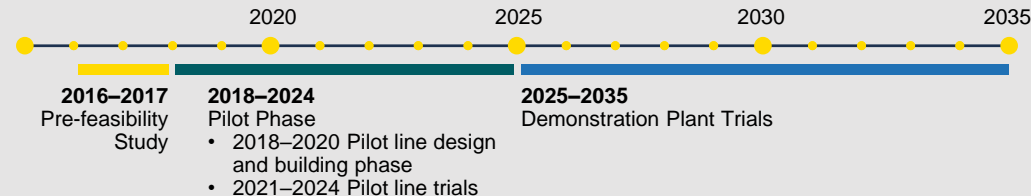
- The steel industry is one of the highest CO₂-emitting industries, accounting for 7% of global and 10% of Swedish total CO₂ emissions
- Steel demand is set to grow due to population and urbanisation → carbon footprint of the industry needs to be addressed

Financing and timeline

The total cost for the pilot phase is estimated to be SEK 1.4 billion. The Swedish Energy Agency will contribute more than SEK 500 million towards the pilot phase and the three owners, SSAB, LKAB and Vattenfall, will each contribute one third of the remaining costs. The Swedish Energy Agency has earlier contributed SEK 60 million to the pre-feasibility study and a four-year-long research project.

The pilot phase is planned to last until 2024, after which it will move to the demonstration phase in 2025-2035.

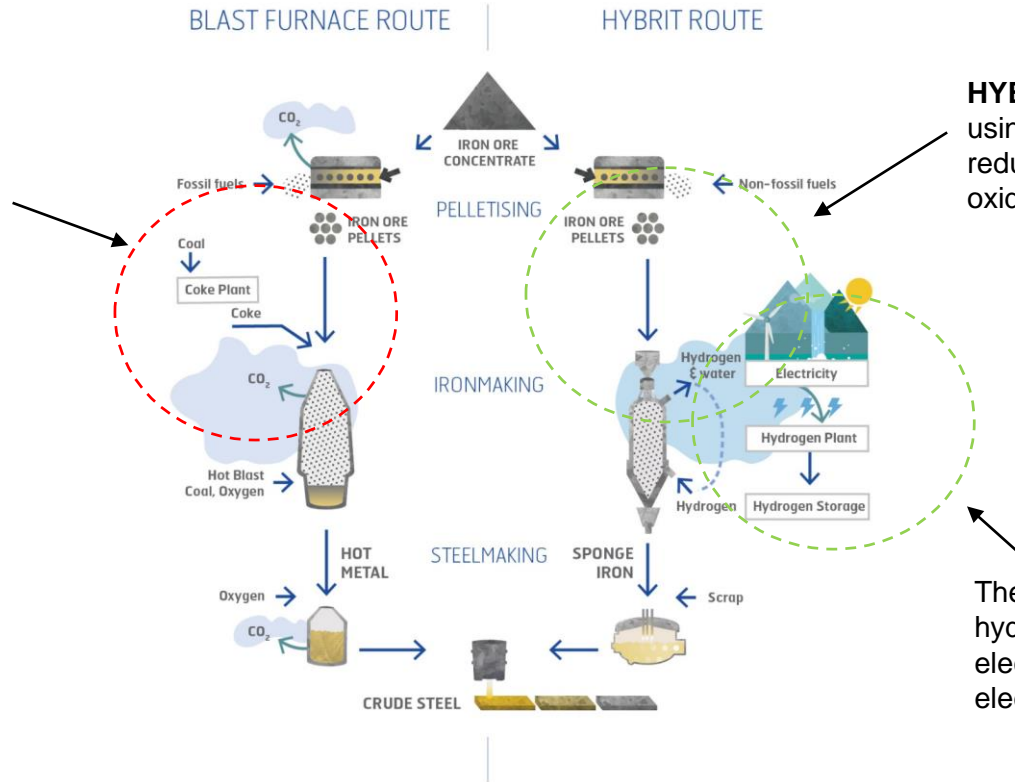
Main project phases



Project deep dive – HYBRIT

HYBRIT enables the decoupling of carbon dioxide and energy

Traditional ore-based steelmaking: Reduction reactions in ironmaking represent around 85 to 90 per cent of the total CO₂ emissions



HYBRIT: Iron metal is produced by using hydrogen gas as the main reductant. Hydrogen reacts with iron oxides to form water instead of CO₂

The hydrogen used is green hydrogen i.e. produced by electrolysis of water using fossil-free electricity

Sustainability deep-dives



VATTENFALL







A strategy and purpose that reflects UN's agenda 2030

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

Overview

- In 2016, Vattenfall identified the most relevant SDG's for the business, where we can have the greatest global impact
- These remain valid internally, as reflected in our strategy, as well as for our stakeholders, as confirmed by our materiality analysis
- Vattenfall also contributes to many other SDGs, including those in support of human rights, at the local level and indirectly through our supply chain

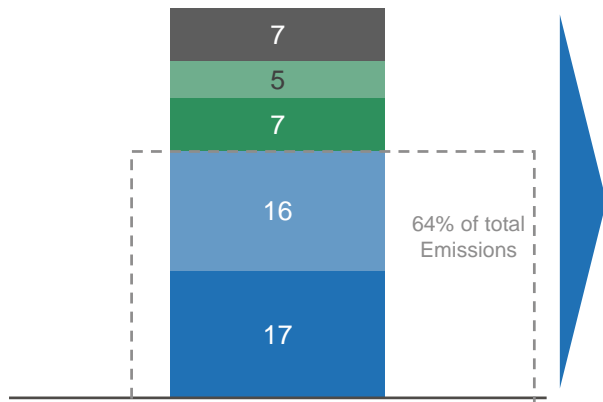
Examples of contribution to our selected SDGs by sub-category

SDG	Target	Examples
	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. We expect to have commissioned in total 7 GW of capacity by 2023 and have 3–5 GW in the pipeline to be built after that.
	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.
	11.6 By 2030, reduce the adverse per capita environmental impact of cities.	In addition to operating more than 18,500 charging points as of Q2 2020, 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.
	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.
	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.
	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.

Going beyond our own production maximises CO₂ impact

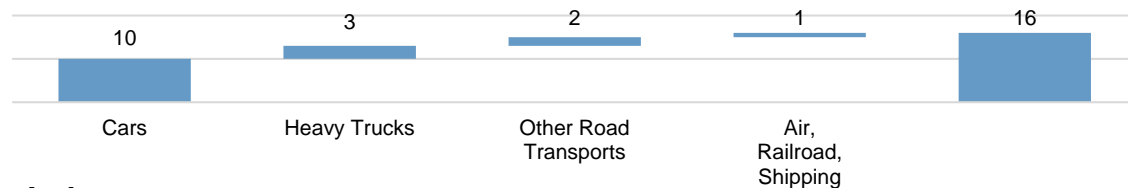
All parts of society need to adjust – electrifying transports and industry is key to enable a fossil-free life

**Total green house gas emissions
Sweden¹ (2018) 52 MtCO₂e**



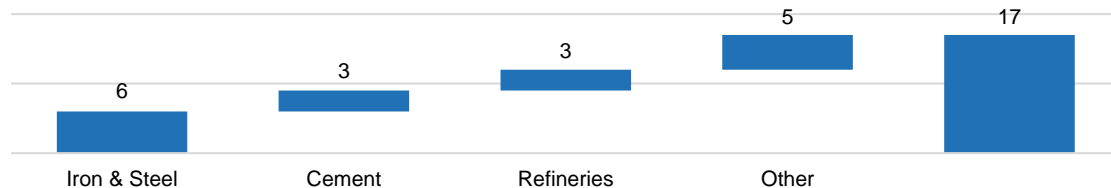
Transports

MtCO₂e



Industry

MtCO₂e



There is huge potential to reduce industry emissions through electrification. Vattenfall has discussions and research ongoing with (potential) partners in different sectors.

Besides fossil free steel via the HYBRIT initiative, with a 10% reduction potential of total Swedish emissions when fully implemented, Vattenfall sees potential in other sectors like cement, refinery, chemical, agriculture, shipping and aviation

¹ Source: Swedish Environmental Protection Agency

Electricity - from a power source to a source of innovation

Together with our partners, we pave the way for a new generation of transports, industries and materials

Research project for
a carbon dioxide-
free steel industry



VATTENFALL 

Cooperation in large
scale bio-diesel
production



VATTENFALL 

Feasibility study on
electrified
cement production



VATTENFALL 

Electrification of
mines and smelters



VATTENFALL 

Co-operation for e-
mobility



VATTENFALL 

Green guaranteed
energy delivery
large customers,
e.g.



VATTENFALL 

Support of a major
enterprise for
battery production
in Sweden



VATTENFALL 

Northern Europe's
largest charging
network for e-
vehicles



VATTENFALL 

Powering
sustainable
datacenters



VATTENFALL 

Storage projects at a
number of wind parks

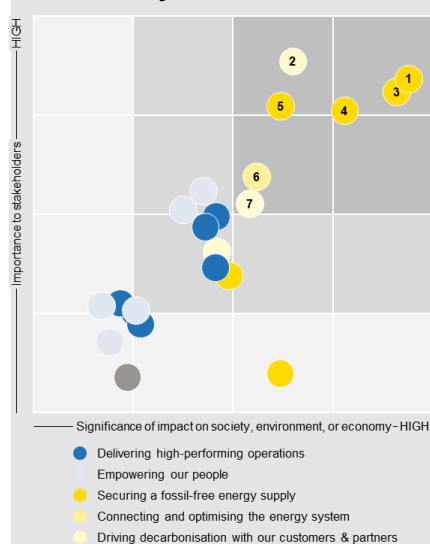


VATTENFALL 

Stakeholder materiality analysis supports strategic focus

According to our stakeholders, Vattenfall's core strategy is aligned with the areas of greatest potential impact

Materiality matrix



1. Reducing CO₂ emissions and phasing out fossil fuels
2. Providing affordable energy
3. Investing in renewable energy
4. Minimising emissions of pollutants into air, water and land
5. Protecting nature and biodiversity
6. Providing affordable, stable, and flexible grid infrastructure for future needs
7. Developing innovative and sustainable services and solutions for customers

Top 7 most material topics

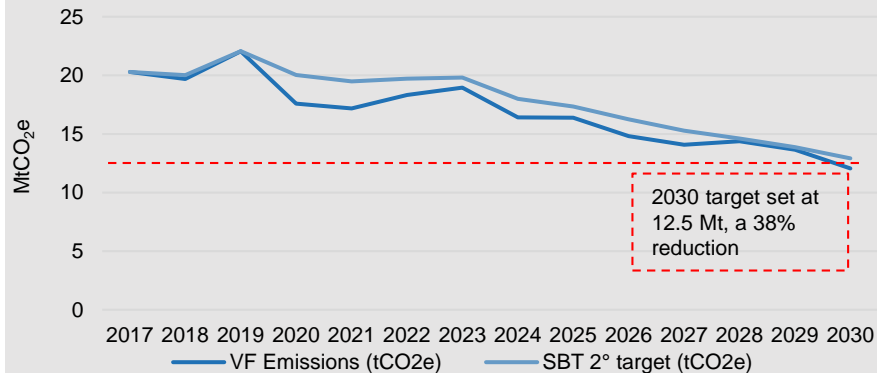
	7 AFFORDABLE AND CLEAN ENERGY	9 INDUSTRY, INNOVATION AND INFRASTRUCTURE	11 SUSTAINABLE CITIES AND COMMUNITIES	12 RESPONSIBLE CONSUMPTION AND PRODUCTION	13 CLIMATE ACTION	17 PARTNERSHIPS FOR THE GOALS
Reducing CO ₂ emissions	✓	✓	✓	✓	✓	✓
Providing affordable energy	✓		✓			
Investing in renewable energy	✓	✓	✓	✓	✓	✓
Minimising non-CO ₂ emissions		✓		✓		
Protecting nature and biodiversity				✓		
Providing affordable, stable and flexible grid infrastructure	✓	✓				
Developing sustainable solutions for customers and partners		✓	✓	✓		✓

Between May and June 2020, over 2,900 stakeholders from Vattenfall's main markets have rated the most material topics based on importance and significance of impact on the environment, society, or economy. Few take away things are mentioned below,

- Vattenfall's strategy remains in line with stakeholder's expectations. Covid-19 has had little impact on expectations
- Affordability, CO₂ reduction and renewables remain top 3 important topics
- Interview responses highlighted the importance of public acceptance to realise energy transition and engaging with local communities

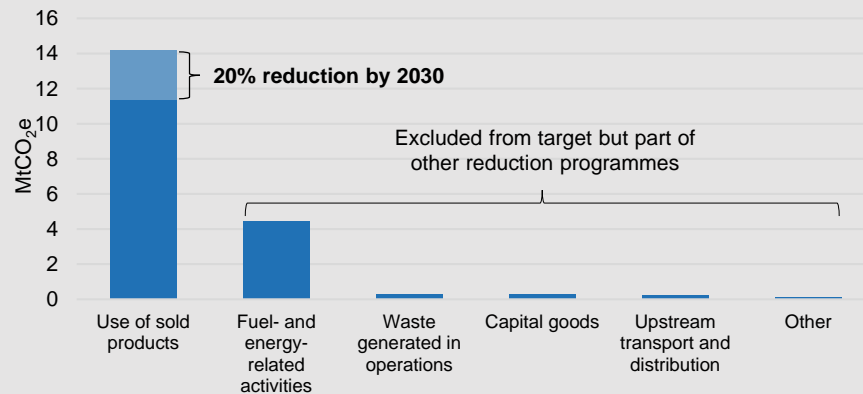
Vattenfall's 2030 emissions targets have been approved by the Science Based Target initiative

Project Vattenfall Scope 1 & 2 emissions vs. SBT 2° scenario



- Target set for 38% reduction from 2017-2030
- Based on planned coal phase out in heat operations by 2030
- Requires continued successful execution of major projects (fuel switches)




Vattenfall Total 2017 Scope 3 Emissions



- Target set for 20% reduction of emissions from use of sold products
- These accounts for nearly 75% of Vattenfall's total Scope 3 emissions and primarily consists of natural gas sold to customers
- Programmes are in place to reduce emissions in other categories (such as supplier CO₂ footprint, reducing business travel) but we have not included them in the target for the sake of simplicity.
- We will focus on further expanding non-fossil heating solutions such as heat pumps, solar thermal, non-fossil gas, and others

Biodiversity – examples of actions

We strive to minimise any direct and indirect negative impacts on biodiversity throughout our operations

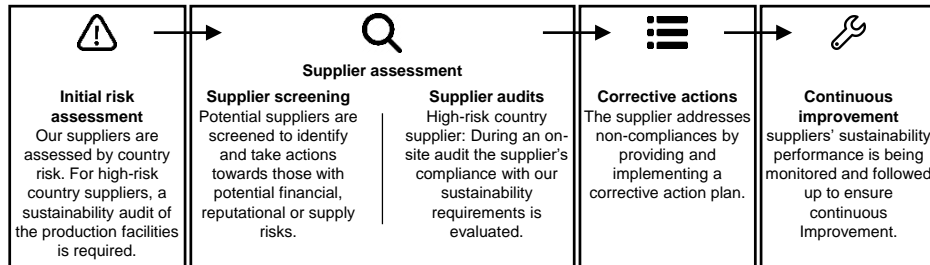
Business area	Aim	Examples
Hydro power	Identify new solutions to reduce environmental impact of hydro power production	 <p>“Laxelatorn” is a unique, large-scale laboratory for hydro power-related environmental and hydraulic experiments that was inaugurated in 2018. It combines knowledge of biology and hydraulics to find solutions that allow and attract fish to safely pass by the power plant with the smallest possible effect on operations. In 2019, the main projects focused on innovation for downstream fish migration such as bubble curtains and flexible nets to avoid turbine passage.</p> <p>We are investigating how we can use machine learning to identify and count animal species and how environmental DNA (eDNA i.e. the residual DNA left in the ambient environment by plants and animals) can be used to quickly identify species in our hydro operations. This would be less resource-intensive than the process is today and make it easier to evaluate the effect of measures like fish compensation programmes.</p>
	Biotope restoration and species protection	
	Knowledge building activities includes both research and pilot studies	
	Preserve and manage biodiversity and enhance recreation values	
Offshore wind power	Limit impacts on the marine environment	 <p>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.</p>
	Reduce impact on and contribute to conservation of fauna	
Power distribution	Maintenance of habitats and protecting species	 <p>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.</p>

Sustainability throughout the supply chain

Key ongoing activities

- Clearly define the environmental, social, and governance opportunities and risks per business area to deliver impact in our supply chain
- Further expand integration of sustainability requirements in tenders
- Increase clarity on potential human rights risks in our heat operations
- Fully implement the supplier risk assessment tool to enable identification and prioritisation of risks related to sustainability issues in the supply chain, including potential human rights issues
- Actively contribute to the Dutch initiative to work towards a sector-wide covenant covering the wind supply chain
- With Bettercoal, further discuss and address the identified main challenges and opportunities with Russian stakeholders
- Continue and expand cross-industry collaborations to build capacity among suppliers and push joint sustainability requirements

Vetting process to ensure compliance with the Code of Conduct for Suppliers



Sustainable supply chain across four primary sourcing and purchasing streams (2019 data)

	Number of suppliers	Number of site audits conducted	Share of new suppliers that have undergone social/environmental assessments	Share of new suppliers from high-risk countries that have undergone social/environmental assessments
Goods and services	~26,000	19	100%	No new suppliers from high-risk countries
Commodity fuels	~35	6	100%	No new suppliers from high-risk countries
Heat fuels	~80	3	100%	No new suppliers from high-risk countries
Nuclear fuel	~10	8	100%	100%

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.

Towards a circular economy

We are committed to enable sustainable use of resources and contribute to a circular economy

A circular economy is based on the principles of keeping products and materials in use, designing out waste and pollution, and using regenerative natural systems. It is a sustainable alternative to the current 'take-make-dispose' linear economic system. The transition to a more circular economy is central to the Green Deal – EU's policy road map towards a low-carbon, sustainable society.

In circular systems, focus is on extending the life-time of products and materials, sharing and pooling of resources, repairing, reusing and recycling to create closed-loop systems, and utilizing smart designs to minimise resource input and the generation of waste, pollution and CO₂ emissions.

Vattenfall contributes to the circular economy:

- ✓ **We invest heavily in renewable energy**
 - Our key role as an energy company is providing renewable energy to drive the circular economy.
- ✓ **We use resources in smarter ways**
 - We use life cycle assessments to assess and manage environmental performance across the full value chain. We also work to design our assets and processes to reduce resource consumption, increase reuse and recycling, and extend the lifetime of our assets.
- ✓ **We offer new products and business models**
 - We are developing new products and energy solutions, as-a-service based models and digital solutions to integrate small scale producers.
- ✓ **We change unsustainable processes and sectors**
 - We switch fuels, partner with industry to make materials more sustainable and fossil free (e.g. steel, cement, fuels), and work to electrify the transport sector.

Examples of activities



Recycling excess heat

In the initiative Samenergi, Vattenfall collaborates with SME's to help them recycle excess heat and utilise it in the district heating network. (Image from Lindvall's coffee manufacturing site, a Samenergi partner.)



Phase-out of creosote poles

In a circular economy, hazardous substances must be kept out of material streams. Vattenfall is phasing out creosote poles from distribution grids. Alternative materials and methods are used and tested for new poles.



Declaring life cycle impacts

Vattenfall provides transparent, verified and comparable information about the life-cycle resource utilisation and environmental impacts from our electricity generation through environmental product declarations®.

Adaptation to climate change

We continuously monitor, invest in and modernise our assets to ensure safety and resilience

- There is increasing urgency linked to climate change and the reduction of emissions needs to accelerate. Climate change affects Vattenfall through both 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.
- Vattenfall supports the disclosure of climate related risks and opportunities in accordance with recommendations from the Task Force on Climate-related Financial Disclosures (TCFD).



Climate change affects Vattenfall

Today, the world is about 1 °C warmer than preindustrial levels and it is rising. Climate change leads to physical changes in parameters such as temperature, rainfall and sea level. This will affect Vattenfall's assets and operations.

As an example, changes in the frequency and magnitude of extreme weather events such as strong winds, flooding or forest fires can lead to infrastructure damage. Similarly, changes to rainfall and snowmelt affects river flows, which has relevance for our hydropower production, planning and dam safety aspects. Vattenfall continuously works to improve the safety and robustness of our operations.



Ensuring security of supply and resilient operations






In 2019 an assessment of effects of climate change and status of adaptation was conducted for Vattenfall's operations. It showed that there is a good general level of awareness and measures in place to reduce climate-related risks.

Examples of measures to ensure resilient operations are replacing overhead powerlines with underground cables, tree clearance, flood protection, investments to adapt hydropower dams to future higher flows, and improved monitoring. Vattenfall will continue to have strong focus on management of climate risks, through e.g. scenario analyses and increased focus on supply chain aspects.

Environmental, social and governance (ESG) ratings

Vattenfall is assessed by several sustainability rating agencies on its ESG performance

We aim to be as open and transparent as possible in our sustainability reporting and we are proud to be highly ranked for our sustainability performance. The below table shows the agencies we actively engage with and our most recent rating scores

Rating Agency	Rating focus	Score	Latest assessment
 CDP <small>DISCLOSURE INSIGHT ACTION</small>	The leading system globally for disclosing environment data for investors, companies, cities, states and regions	Score A: top 2% of all rated companies	January 2020
 ecovadis	An online platform that enables companies to monitor the CSR performance of their supply chains by providing supplier sustainability ratings	Gold rating: top 1% of all rated companies and top 3% in the sector	December 2019
 ISS ESG	ESG rating mainly for the investment community. The assessment spans a broad range of ESG issues that are analysed on the basis of up to 100 rating criteria, most of them sector specific	Score B “Prime”: highest decile of companies assessed in the sector	January 2020
 MSCI	ESG rating mainly for the investment community. Uses a rules-based methodology to identify industry leaders and laggards. Ranks companies according to their ESG risk exposure and how well they manage those risks relative to peers.	Score AA “Leader”: meaning top 26% of companies assessed in the sector.	June 2020
 SUSTAINALYTICS <small>a Morningstar company</small>	ESG rating mainly for the investment community. Uses a two-dimensional materiality framework that measures a company’s exposure to industry specific material risks and how well a company is managing those risks.	ESG risk rating: Medium (Strong management score but high exposure). Top-15% of companies in subindustry	June 2020

Customers & Solutions



VATTENFALL

Customers & Solutions

Providing sustainable energy solutions and services to retail and business customers

Overview

- Strong incumbent positions in core markets
- A growing customer base with high loyalty
- Strong expertise across the full energy value chain means that we can offer simple integrated solutions to satisfy increasingly sophisticated customer needs
- Brand perception on positive trend according to several surveys
- Well-developed IT infrastructure keeps operations cost-effective
- Our e-mobility charging network - InCharge - is one of the largest in northern Europe

Highlights



10.2 million customer contracts in Europe



89.5 TWh of electricity sold



14,900 connected charging points for electric vehicles



Key data

	FY 2019	FY 2018
Net sales (SEK bn)	89.9	81.3
External net sales (SEK bn)	87.3	78.9
Underlying EBIT ¹ (SEK bn)	1.3	1.3
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 ²	+1	+1

¹ Operating profit excluding items affecting comparability

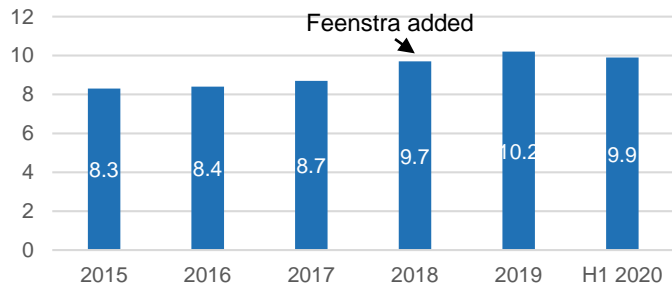
² NPS is a tool for measuring customer loyalty and for gaining an understanding of customers' perceptions of Vattenfall's products and services

Customers & Solutions

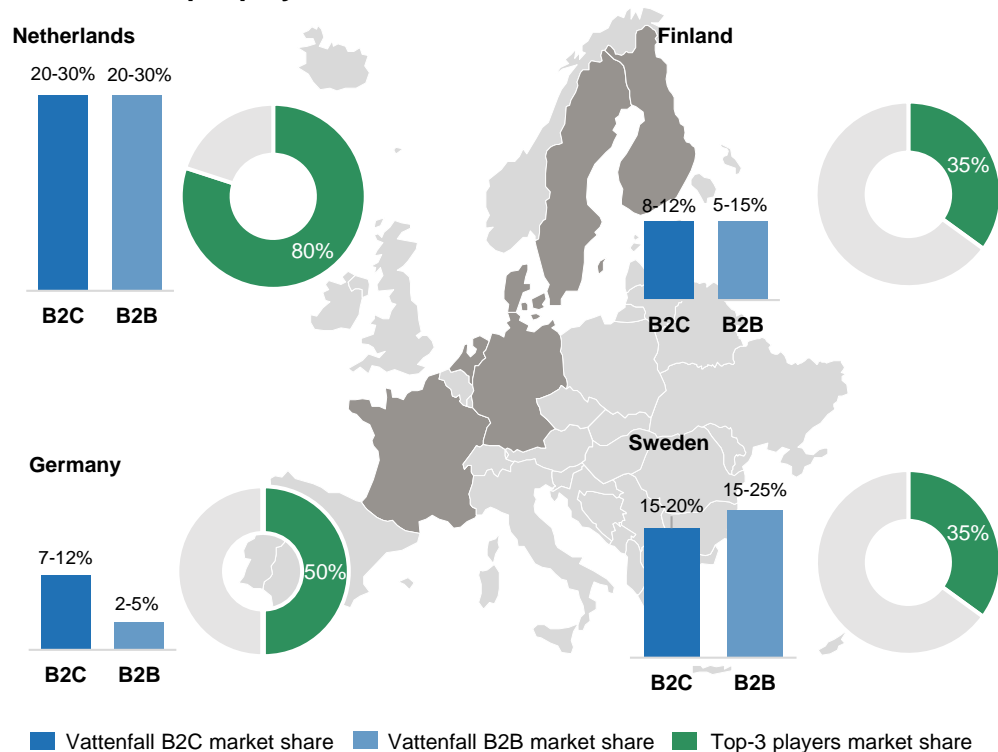
Market overview

- Customers & Solutions supplies electricity, gas and energy solutions to retail and business customers, with 10.2 million customer contracts
- We are one of the market leaders in the retail and business segments in Sweden (~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 businesses. In Berlin and Hamburg, we are the market leader in the electricity retail segment
- In Denmark, Finland and France our position is that of a challenger in sales of electricity and gas

Customer contracts (total), in millions



Vattenfall and top-3 players market share, main markets



E-mobility – enabling the electrification of transports

InCharge offers everything from infrastructure and hardware installation to software and connected services

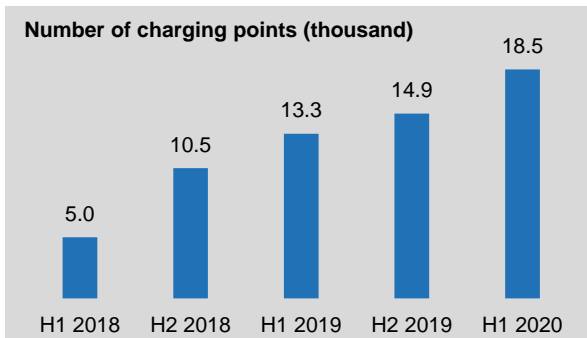


InCharge is fully owned by Vattenfall but grows together with our partners. We take care of all the details with end-to-end services, offering everything from infrastructure and hardware installation to software and connected services – all backed up with expertise and advice.

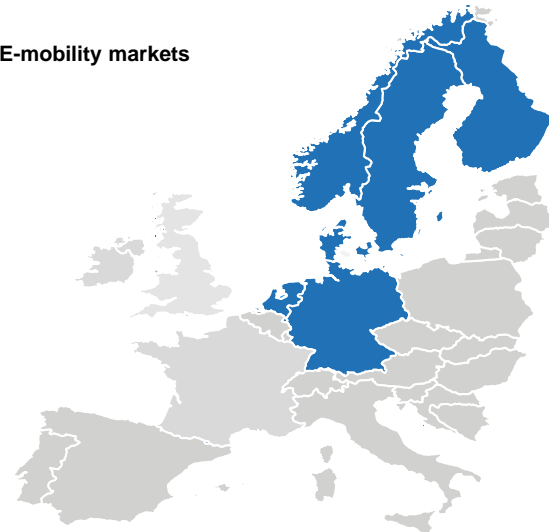
In close collaboration with government officials and planners, InCharge makes it easier for cities to become greener and cleaner. Businesses, large and small, housing associations and estates, as well as private homeowners all have flexible options to choose from our portfolio.

The e-mobility market is rapidly developing, and new players are 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.

One example is Flexpower in Amsterdam where InCharge charging points are steered based on daily load curves from the grid operator and forecasts for local neighborhood solar panel production.



E-mobility markets



Partners (examples)



Using digitalisation to enhance the customer experience

Customers increasingly expect instant information and access. Apps and other digital channels are gradually becoming the main interface for customer service and interaction. We strive to optimise the customer experience by accelerating digitalisation. We aim to meet our customers where they want, make it easy for them to handle their energy needs and to solve their queries in one click.

Example 1 - Digitalisation of customer service (NL)

The automated chatbot Nina has been available on our Dutch website for two years

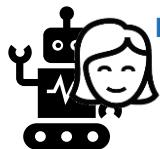
>8m Dutch citizens uses WhatsApp daily → WhatsApp launched as an additional customer service channel in 2019

Today 40.000 conversations per month are handled through WhatsApp

✓ Twice as efficient compared to phone

✓ Ease-of-use and fast response lead to highest customer satisfaction (measured by NPS) and reduced operating costs vs other channels

Currently, integration of Nina and WhatsApp is being piloted, and results indicate that 20% of queries can be handled with robotics, with further potential for improvement



Nina Chatbot



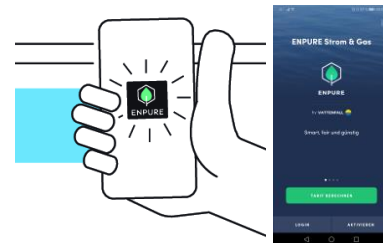
Customer Service via WhatsApp

Example 2 – A fully digital product offering (DE)

Enpure offers a fully digital product line for power and gas for the “digital native” target group with 100% fossil-free product portfolio:

- fully digital experience via Enpure App or Web
- hassle-free product with 12-month price guarantee, monthly cancellation option and no emissions
- first bilingual (DE/EN) product line within German B2C market
- different look and feel from traditional channels

Enpure has been on the market since 2016, and from September 2020, the product offering is fully CO₂ neutral, reaching tens of thousands of customers



Power Generation



VATTENFALL

Power Generation

One of Europe's largest providers of fossil-free electricity

Overview

- Largest segment by power production volume in Vattenfall, contributing to our position as Europe's second largest provider of fossil-free electricity
- Century-long roots in hydro power and a leading position in Sweden's hydro power development
- Major owner of nuclear power with vast experience of nuclear operations, decommissioning and management of radioactive waste and spent nuclear fuel
- One of the leading energy trading companies in Europe offering reliable, responsible and flexible access to all relevant commodity wholesale markets
- Sourcing of fuels and carbon credits for Vattenfall and third parties as well as optimising and managing risk and flexible assets of Vattenfall's fuel portfolio
- Proprietary trading within the risk mandate set by Vattenfall's Board of Directors
- Responsible for Sweden's leading maintenance service business in the energy sector

Highlights



7.2 GW nuclear power



11.7 GW hydro power



5.1 SEK bn services revenues



7.1 GW PPAs under management



Stornorrors power plant, Sweden

Key data

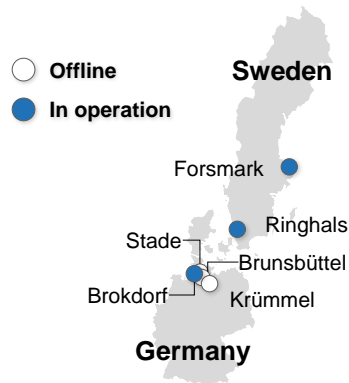
	FY 2019	FY 2018
Net sales (SEK bn)	102.4	100.0
External net sales (SEK bn)	38.4	36.1
Underlying EBIT¹ (SEK bn)	15.4	9.4
Electricity generation (TWh)	89.2	90.5
- of which, nuclear	53.3	55.0
- of which, hydro	35.7	35.5
Customer sales of electricity (TWh)	27.0	28.7
- of which, resellers	22.8	24.6
- of which, business customers	4.2	4.1

¹ Operating profit excluding items affecting comparability

Nuclear power

Vattenfall's nuclear power plants

- Vattenfall owns ten nuclear reactors. Seven reactors are located in Sweden (four at Ringhals, three at Forsmark), and three in Germany (Brunsbüttel, Krümmel and a minority stake in Brokdorf)
- Six of our reactors are in commercial operation in Sweden (five after Ringhals 1 closure by year-end 2020) and one reactor; Brokdorf, is in commercial operation in Germany (to be closed by year-end 2021)
- Vattenfall's power generation in 2019 amounted to 53.4 TWh (55.0). Average availability was 87.8 % (88.9%)



Nuclear Power Plant list

Nuclear Power Plant	Country	Installed Capacity (MW)	Vattenfall ownership share	Co-Owners	Commission Year	Final operating year	Operation status	Decommissioning status
Ringhals	Sweden	3,967	70.4%	E.ON Kärnkraft Sverige AB (29.6%)	Ringhals 1: 1976; Ringhals 2: 1975; Ringhals 3: 1981; Ringhals 4: 1983	Ringhals 2: 2019; Ringhals 1: 2020	In operation	Preparation for decommissioning of Ringhals 1 by year-end 2020
Forsmark	Sweden	3,271	66.0%	E.ON (8.5%) and Mellansvensk Kraftgrupp (25.5%)	Forsmark 1: 1980; Forsmark 2: 1981; Forsmark 3: 1985	-	In operation	-
Brunsbüttel	Germany	771	66.7%	E.ON (33.3%)	1977	2007	Offline	Decommissioning mode
Krümmel	Germany	1,346	50.0%	E.ON (50.0%)	1984	2011	Offline	Planned to initiate decommissioning in 2020
Stade	Germany	640	33.3%	PreussenElektra GmbH (66.7%)	1972	2003	Offline	Undergoing decommissioning since Oct 2005
Brokdorf	Germany	1,410	20.0%	PreussenElektra GmbH (80.0%)	1986	31 Dec 2021	In Operation	-

The financing system for post-operational nuclear costs

Financial implications of the various steps in the financing systems in Sweden and Germany

In Sweden

Nuclear power plant owners in Sweden are obligated to finance the costs for dismantling and management of spent nuclear fuel. The financing is handled by payment of fees for each generated kWh to the Swedish Nuclear Waste Fund, which manages paid-in funds. The fund also reimburses owner for the payment to SKB (responsible for long term safe-handling of radioactive waste) meeting the obligation based on Swedish law.

In Germany

Following the nuclear accident in Fukushima, Japan in 2011, Germany's government decided to shut down all the 17 nuclear power plants by 2022. The German state took over the responsibility for interim and final storage of low and intermediate level spent nuclear fuel in 2017, funded by the contributions that the NPP operators paid to state-controlled fund. The German Federal Council must agree on a suitable location for permanent storage of spent nuclear fuel by 2031 and final repository by 2050. The spent nuclear fuel and radioactive waste must be stored in interim storage close to the nuclear power plant.

Sweden

Nuclear power operators	Payments based on generated kWh	Swedish Nuclear Waste Fund	Financial implications	EBIT	Funds from operations (FFO)	Adjusted net debt (AND)
	Swedish National Debt Office decides on disbursements from the fund	The fair value of the Vattenfall Group's share in the Swedish Nuclear Waste Fund was SEK 46 billion as of 31 December 2019	Valuation of nuclear provisions	Provision value depreciated over operating life-time of nuclear power plant	N/A	Included in AND
			Payments to the Swedish Nuclear Waste Fund	No impact	Negative impact through payment to the Swedish Nuclear Waste Fund	Increase fund balance (offset AND)
			Decommissioning activities	No impact	FFO neutral	AND neutral

Swedish Nuclear Fuel and waste Management Company (SKB)

Remaining post-operational costs for the entire Swedish nuclear fleet

106

SEK billion¹

Final repository

Decommissioning and dismantling²

Encapsulation

Intermediate storage (Clab)

Other

39%

28%

13%

11%

9%

Germany

Nuclear power operators	German state	Financial implications	EBIT	Funds from operations (FFO)	Adjusted net debt (AND)
		Valuation of nuclear provisions	Non-operating plants – change in provision valuation directly impacts EBIT	N/A	Included in AND
Decommissioning and dismantling	Transport Intermediate storage Final repository	Decommissioning activities	N/A	Negative impact	AND neutral

¹ Remaining costs based on the latest calculation (plan 2016).

² Decommissioning and dismantling are the responsibility of the nuclear power operators and are not included in SKB's operations.

Hydro power

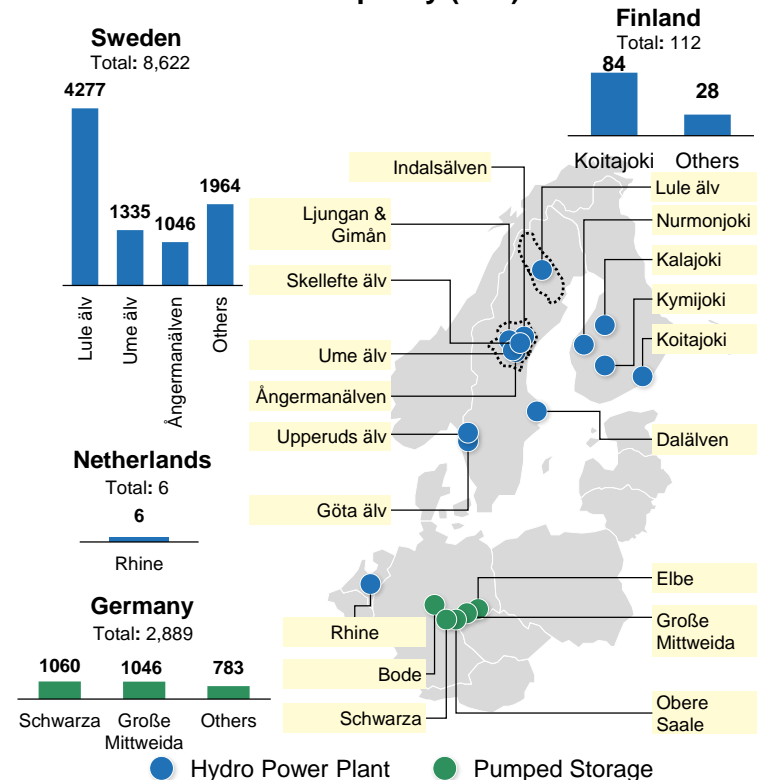
Hydro overview

- We own and operate hydro power plants, most of which are located in Sweden. Additional sites are located in Germany (pumped storage), Finland and the Netherlands. In 2019, Vattenfall's hydro power capacity amounted to 11.7 GW and the generation to 35.8 TWh (35.5)
- 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. We are also undertaking a number of initiatives to reduce the negative effects of hydro power on ecosystems and biodiversity

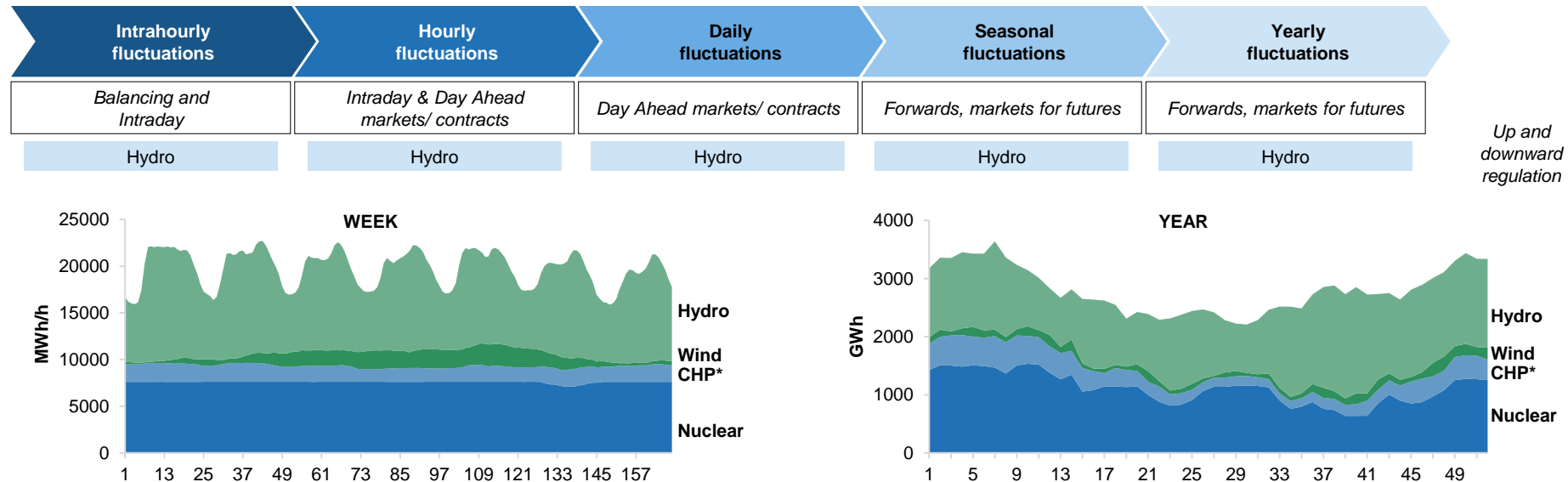
Major Hydro Power Plants

	Project	Turbine Type	Installed Capacity (MW)	Country	River	Vattenfall ownership share	Commission Year
Hydro Power	Harsprånget	Francis	871	Sweden	Lule älv	100%	1951
	Letsi	Francis	486	Sweden	Lule älv	100%	1967
	Messaure	Francis	463	Sweden	Lule älv	100%	1963
	Porjus	Francis	430	Sweden	Lule älv	100%	1915
	Stornorrfors	Francis	599	Sweden	Ume älv	75%	1958
Pumped storage	Goldisthal	Francis/Ossberger	1,060	Germany	Schwarza	100%	2004
	Markersbach	Francis/Ossberger	1,046	Germany	Große Mittweida	100%	1981
	Hohenwarte II	Francis	320	Germany	Obere Saale	100%	1966

River stream installed capacity (MW)













The inherent flexibility of Vattenfall's hydro power visualised



Flexible hydro power plays an instrumental role in an energy system with more and more wind and solar power

The intensified focus on climate change and CO₂ emissions has contributed to significant growth in installed capacity of renewable energy sources. However, the intermittent nature of these energy sources makes it necessary to have back-up capacity. Flexible hydro power can offer its huge reservoirs of stored water as a giant “green” battery for the Nordic region and other markets (with the help of interconnectors)

Sample deals on Corporate PPAs and PPAs

CPPA: 1.177 GWh	 BUILDING GREAT BRANDS	 220 GWh	Vattenfall will supply factories and stores of soft drink manufacturer AG Barr with 22 GWh per year from wind farms in the UK (tenor 10 years).
	 Microsoft  GVB  alliander	 909 GWh	Vattenfall has signed a 10 year agreement with Microsoft to power its international data center operations in the Netherlands from an adjacent wind farm.
	 T ..	 48 GWh	Vattenfall will provide solar power to Deutsche Telekom subsidiary „Power & Air Solutions“ from a 60 MW solar farm in North Germany over a tenor of 10 years.
PPA: 340 GWh		 340 GWh	Vattenfall has signed a 15 year agreement with Aquila Capital to acquire wind power from the 163 MW wind park Kråktorpet in Sweden.

Wind



VATTENFALL

Wind

One of the biggest renewable energy players in Europe

Overview

- Strong position within offshore wind with an extensive pipeline
- A pioneer within offshore wind from the outset and a leader in levelised energy cost reduction
- One of the largest producers of onshore wind power in Denmark and the Netherlands
- Highly experienced team managing all key processes with close supplier collaboration along the value chain
- Strong platform and project execution track record
- Reputation as a trustworthy partner helps securing financing and off-takers
- Front-runner on innovative solutions within solar & batteries such as co-location with wind farms and shared infrastructure

Highlights



2.1 GW installed offshore wind capacity



1.2 GW installed onshore wind capacity



> 1 GW solar and batteries pipeline



Slufterdam onshore wind farm, the Netherlands

Key data

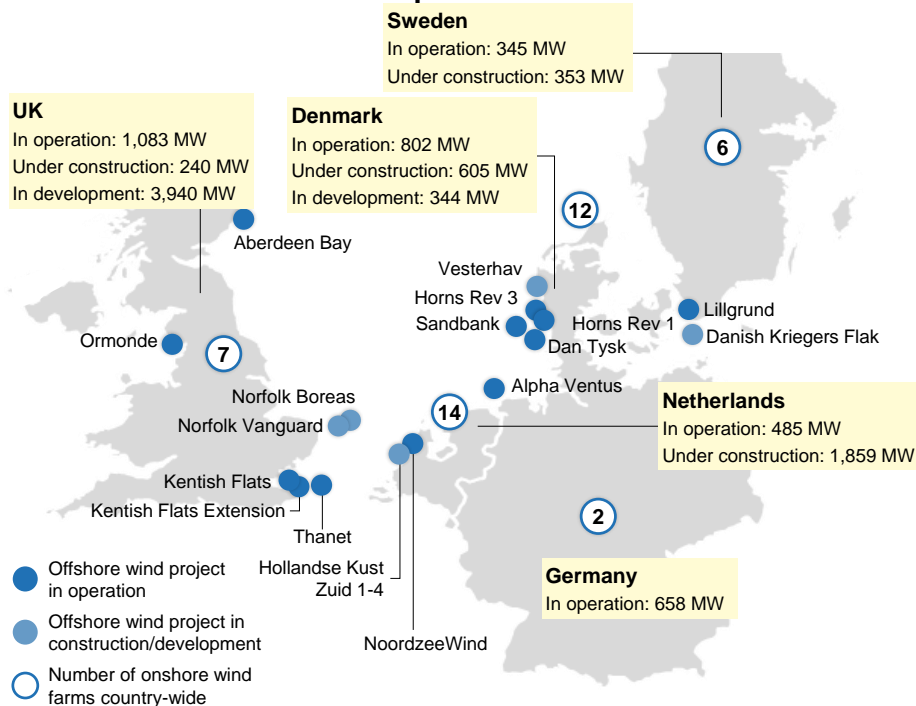
	FY 2019	FY 2018
Net sales (SEK bn)	13.5	11.9
External net sales (SEK bn)	6.6	5.7
Underlying EBIT ¹ (SEK bn)	4.2	3.7
Electricity generation (TWh)	9.5	7.8
Investments (SEK bn)	9.2	5.6
Electricity generated (TWh)	9.5	7.8

¹ Operating profit excluding items affecting comparability

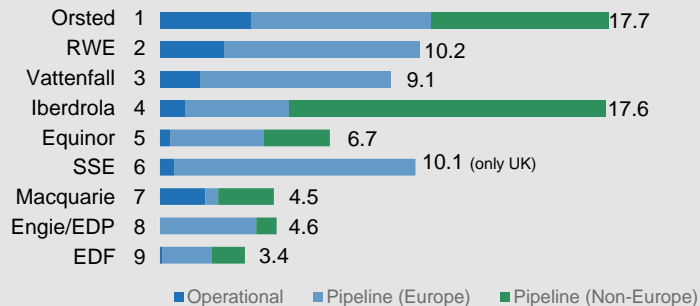
A leader in the renewables transition

Strong position within offshore wind and extensive pipeline ahead

Geographical overview – we develop and operate wind and solar farms in our core European markets¹



Competitive landscape – Offshore secured capacity (GW)



Under construction and pipeline¹

> 3 GW

Wind projects
under
construction

> 4 GW

Wind projects
in development

> 1 GW

Solar projects
in development

60 MW

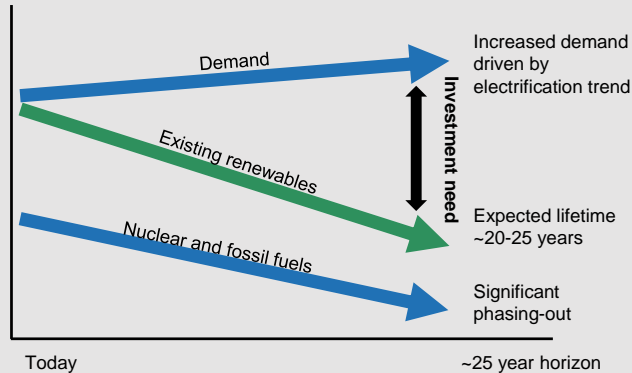
Batteries
pipeline

¹ As of June 2020

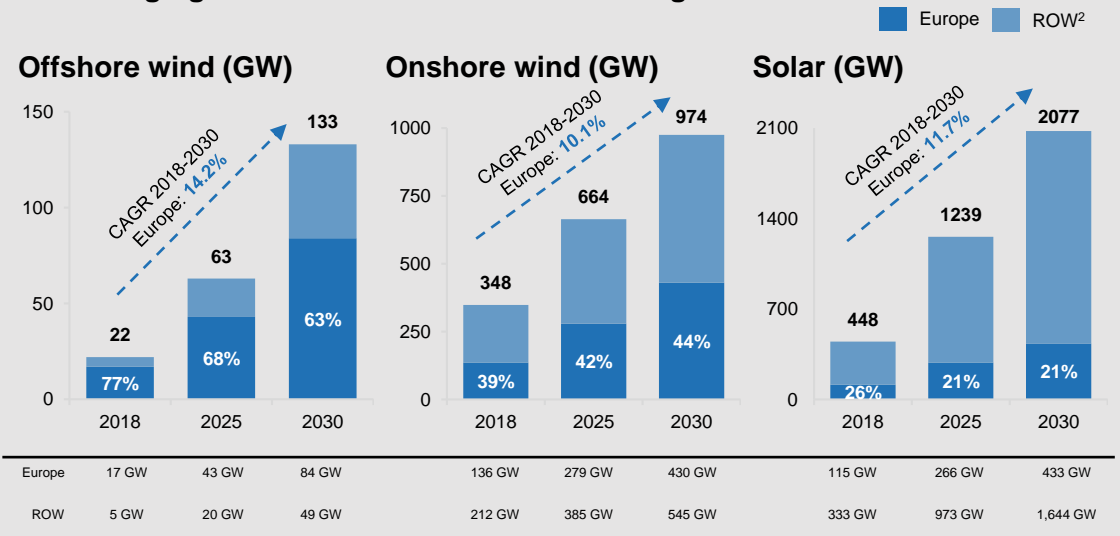
Europe continues to be a highly attractive growth market

Despite significant ramp-up in renewables, much more growth is expected in the coming decade

Increasing demand and phase-out of coal gives plenty of room for growth in Europe



Double-digit growth across renewable technologies until 2030¹



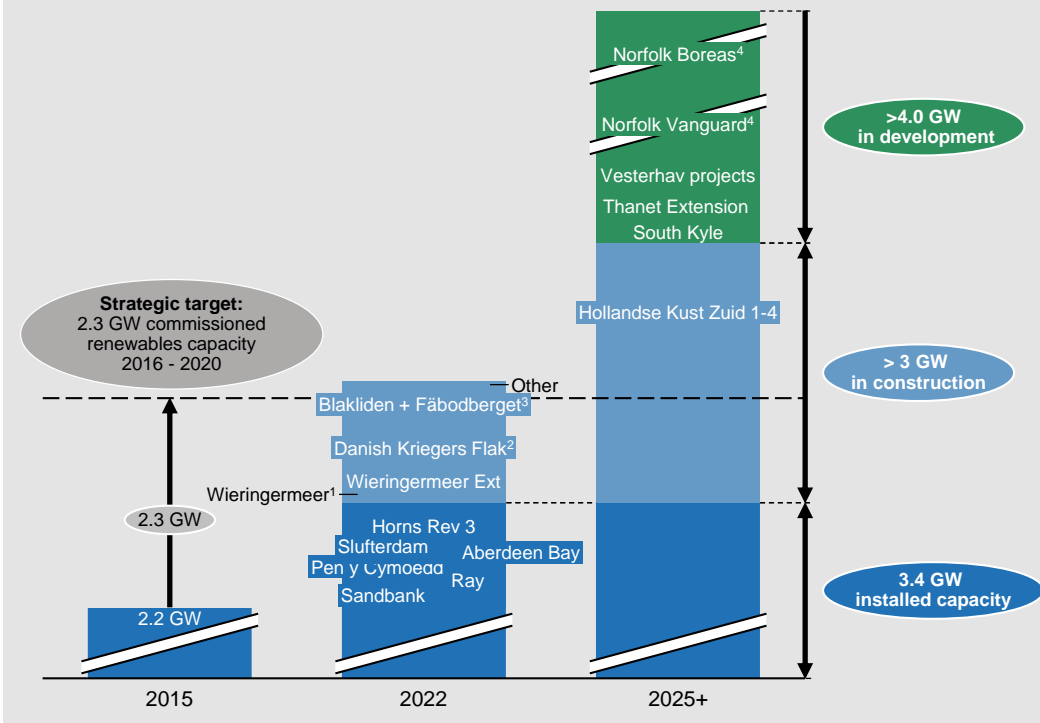
¹ Source: Bloomberg NEF – NEO 2019

² ROW excludes China

Pipeline of opportunities supports Vattenfall ambitions

Many projects in pipeline and several upcoming auctions in relevant markets

Installed capacity, projects in construction and in development (GW)



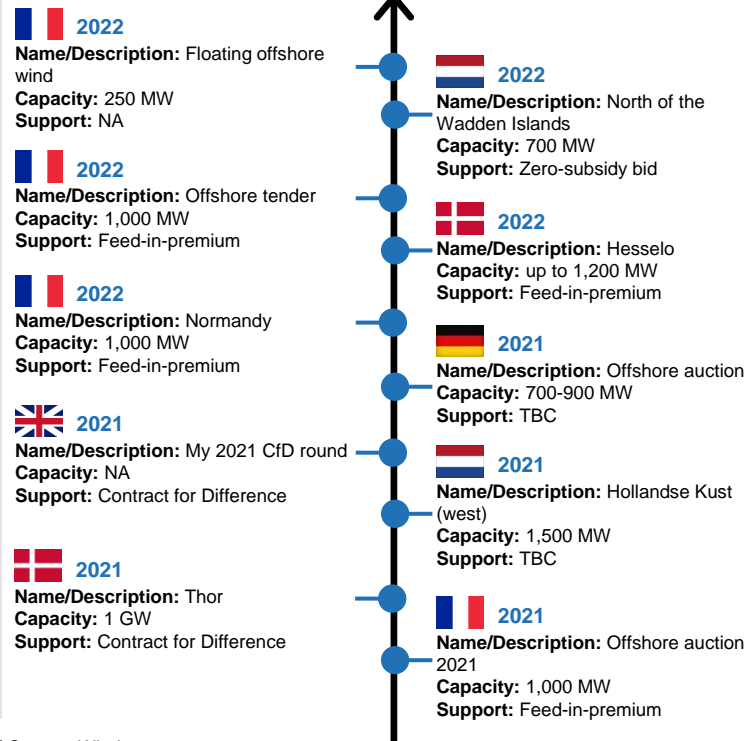
¹ Partially commissioned

² Danish Kriegers Flak expected commissioning 2021

³ Blakliden + Fäbodberget expected commissioning 2022

⁴ Commissioning expected in 2027-2029

Upcoming auctions in relevant markets⁵

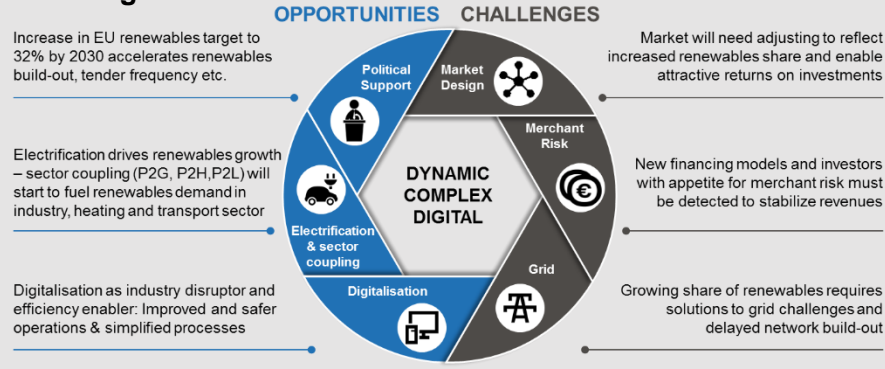


⁵ Source: Windeurope.org

Maturing renewables - challenges and opportunities

LEC development will be key going forward

Maturing renewables industry creates opportunities and challenges



...and leveraging several competitive advantages



- Leverage over suppliers**
- Latest access to technology
 - Joint cost-out programs



- Access to investors and off-takers**
- Leveraging delivery reputation
 - Leveraging vertical integration

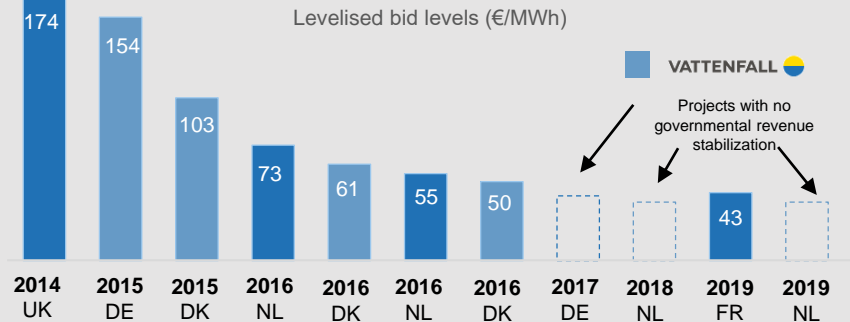


- Project access in key markets**
Based on:
- Financial & technological ability
 - Company credibility



- Internal optimisation / cluster synergies**
Through e.g.
- Accumulated O&M experience
 - Data

Vattenfall competes in this space by driving and leading the LEC development



...while our good reputation helps securing corporate PPA's

Wieringermeer



10-year deal with Microsoft signed in 2017 to supply nearby data centre. It is one of the largest wind PPAs in the Netherlands to date

Blakliden/Fäbodberget



20-year deal for 60% production volume of the 353 MW onshore wind farm, signed with Norsk Hydro in 2018

Examples of partnership structures within wind and solar



DanTysk and Sandbank (DE)

Status: In operation

Specs: Offshore wind (288 + 288 MW)

Partner: Stadtwerke München

Deal structure: Jointly owned subsidiary (Vattenfall share 51%) that constructed and now operates the wind farm



Ormonde (UK)

Status: In operation

Specs: Offshore wind (150 MW)

Partner: AMF

Deal structure: Sale of 49% stake in operating wind farm. Vattenfall continues to operate the wind farm as majority shareholder



Coevorden (NL)

Status: In operation

Specs: Solar (7 MW)

Partner: Patronale

Deal structure: Sale of 100% stake in operating solar farm.



Blakliden/Fäbodberget (SE)

Status:

Under construction

Specs: Onshore wind (353 MW)

Partner: Vestas and PKA

Deal structure: Sale of 70% stake before construction. In addition, ~60% of the production is covered in 20-year PPA (with Norsk Hydro)



South Kyle (UK)

Status: FID

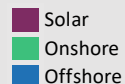
Specs: Onshore wind (240 MW)

Partner: Greencoat UK Wind

Deal structure: Sale upon completion and operation of the wind farm for a minimum of 10 years. Vattenfall will also purchase the power for a period of 15 years

Wind & Solar - Installed capacity (MW¹) Q2 2020

	Solar	Onshore	Offshore	Total
United Kingdom	5	391	687	1.083
Denmark	0	237	565	802
The Netherlands	29	348	108	485
Sweden	0	234	110	345
Germany	3	19	636	658
Total (MW)	37	1.229	2.106	3.372



United Kingdom – ROC scheme

■ Thanet	300
■ Ormonde (51%)	150
■ Aberdeen	97
■ Kentish Flats	90
■ Kentish Flats Extension	50
■ Pen Y Cymoedd	228
■ Ray	54
■ Edinbane	41
■ Clashindarroch	37
■ Swinford	22
■ Parc Cynog	4
■ PV@Cynog	5
■ Pendine	5
Installed capacity (MW)	1.083

Sweden – certificate scheme

■ Lillgrund	110
■ Stor-Rotliden	78
■ Högabjär-Kärsås (50%)	38
■ Høge Våg (50%)	37
■ Hjuleberg (50%)	36
■ Juktan (50%)	29
■ Östra Herrestad	16
Installed capacity (MW)	345

Denmark – FIT scheme

■ Horns Rev 1 (60%)	158
■ Horns Rev 3	407
■ Klim (98%)	67
■ Nørrekær Enge 1 (99%)	30
■ Rejsby Hede	23
■ Hagesholm	23
■ Nørre Økse Sø	17
■ Tjæreborg Enge	17
■ Hollandsbjerg	17
■ Bajlum (89%)	15
■ DræbyFed	9
■ Ryå	8
■ Ejning (97%)	7
■ Lyngmose	5
Installed capacity (MW)	802

Germany – EEG scheme

■ DanTysk (51%)	288
■ Sandbank (51%)	288
■ alpha ventus (26%)	60
■ Jänschwalde	12
■ Westküste (20%)	7
■ Decentral Solar installations	3
Installed capacity (MW)	658

The Netherlands – MEP/SDE(+)

■ NoordzeeWind (50%)	108
■ Princess Alexia	122
■ Wieringermeer	108
■ Slufterdam	29
■ Eemmeerdiijk	17
■ Irene Vorrink	17
■ Hoofdplaatpolder (70%)	10
■ Reyndersweg (50%)	9
■ Echteld	8
■ Coevorden	7
■ De Bjirmen	6
■ Oom Kees (12%)	6
■ Oudendijk	5
■ Mariapolder	5
■ Hiddum Houw	4
■ Eemshaven	6
■ Velsen	2
■ Enkhuizen	2
■ Hemweg	2
■ Decentral Solar installations	12
Installed capacity (MW)	485

¹ Capacity in operation: total capacity of the wind farms that Vattenfall has an ownership in.
Minority shares included as 100%























Main renewables projects in our 5 core countries

Country	Name	Capacity (MW)	Support scheme	Awarded	Duration of support	Ownership (%)	Commissioning	Current status
DK	Kriegers Flak	605	FIT	X	50.000hrs	100	2021	Under construction
NL	Hollandse Kust Zuid 1-4	1 520	-	X	-	100	2022/2023	FID taken and main contracts signed
UK	Norfolk projects	3 600	CfD		15 yrs	100	2027-2029	Vanguard positive consent achieved 1st July; Boreas DCO Examination extended until Oct-20
DK	Vesterhav	344	FIT	X	50.000hrs	100	2024	Geotechnical Site Investigation Offshore finalized. Environmental Impact Assessment reports are up for public hearing.
DK	Thanet Extension	~340	CfD		15 yrs	100	2024	Consent refused by BEIS, feasibility study for a smaller wind park initiated
NL	Wieringermeer	185	SDE+	X	15 yrs	100	2019/2020	All WTG erected, first revenues
NL	Wieringermeer ext.	118	SDE+	X	15 yrs	100	2020	Commissioning ongoing
NL	Moerdijk	27	SDE+	X	15 yrs	100	2021	Under construction
NL	Haringvliet	22	SDE+	X	15 yrs	100	2020	Under construction
NL	Nieuwe Hemweg	19	SDE+	X	15 yrs	100	2021	Under construction
UK	South Kyle	240	-	N/A	-	100	2022/2023	Under construction
NL	Jaap Rodenburg	38	SDE+	X	15 yrs	100	2021	Under construction
SE	Blakliden + Fäbodberget	353	Certs	N/A	-	30	2022	Under construction
NL	Haringvliet	38	SDE+	X	15 yrs	100	2020	Under construction
NL	Haringvliet	12	FCR*			100	2020	Under construction
Total >7 GW								

	Offshore
	Onshore
	Solar
	Batteries

FCR - Frequency Containment Reserve to maintain the network frequency (EU)

Overview of regulatory regimes

Country	Policy Name	Founding year/ Status / Eligible technology	Overview	Time period
	Contracts for Difference (CfD)	Founding year: - Status: In force Eligible technology: 	<ul style="list-style-type: none"> A settlement price is guaranteed for offshore power provider. The support is based on the difference between agreed and market price If market price is lower than the agreed price, the project owner receives the support. If the market price is higher than the agreed price, the profit is divided between the project owner and the government 	<ul style="list-style-type: none"> Maximum of 20 years (after the wind farm has been connected to the grid)
	Feed-in premium tariffs (FIT)	Founding year: 2009 Status: In force Eligible technology:  	<ul style="list-style-type: none"> The eligible producer receives premium from the TSO Energinet.dk equivalent to the difference between the spot market price and the fixed support income 	<ul style="list-style-type: none"> Depends on the type of technology and date of commissioning
	Contracts for Difference (CfD)	Founding year: 2014 Status: In force Eligible technology:   	<ul style="list-style-type: none"> A Contract for Difference (CfD) is a private law contract between a RES-E generator and the CfD Counterparty – Low Carbon Contracts Company (LCCC) The CfD is based on a difference between the market price and an agreed “strike price” If Strike price > market price: Then CfD counterparty must pay the difference between the two to RE generator If Strike price < market price: Then RE generator must pay the difference to the CfD counterparty 	<ul style="list-style-type: none"> CfD contracts are awarded for a period of 15 years
	ROC scheme	Founding year: 2002 Status: In force Eligible technology:   	<ul style="list-style-type: none"> Under the Renewable obligation scheme, all the electricity suppliers in the UK have to source an increasing proportion of renewable energy. They can also buy Renewable Obligation Certificates from a renewable energy producer to meet the obligation Renewable Obligation Certificates are issued to renewable energy producers for every MWh of renewable electricity produced 	<ul style="list-style-type: none"> ROC is issued for a period of 20 years RO scheme is closed for generating capacity after 31st March 2017
	MEP*/ SDE+	Founding year: 2011 Status: In force Eligible technology:  	<ul style="list-style-type: none"> Provides a feed-in-premium subsidy that covers the difference between wholesale market prices of electricity and the cost of electricity from renewable sources The budget is based on an auction system, where the lowest bidder receives the premium 2020 SDE+ overall budget: €4 millions 	<ul style="list-style-type: none"> The premium is paid for a period of up to 15 years The existing SDE+ scheme will be expanded to SDE++ in 2020
	EEG	Founding year: - Status: In force Eligible technology:   	<ul style="list-style-type: none"> Several models deployed over the years. Prior to 2017, FIT system. This has now been replaced with a tendering process (prices set by competitive auctions) where projects receive contracts to sell the produced electricity at the bid price Bids are based on floating market premium Market Premium: reference value of the respective renewable energy plant minus its technology-specific market value 	<ul style="list-style-type: none"> Market premium is paid for a period of 20 years
	The Electricity Certificate System	Founding year: 2003 Status: In force Eligible technology:   	<ul style="list-style-type: none"> The demand for certificates is regulated by a quota system, which is fixed in proportion to total electricity use (energy intensive industry is exempted) The electricity producer receives a certificate for each MWh from renewable sources and sell it to electricity consumers in open market Sweden and Norway have shared common electricity certificates since 2012 	<ul style="list-style-type: none"> Aims to add 18TWh by 2030 Sweden officially plans to continue the green certificate subsidy scheme until 2030, and is also considering to phase out onshore by 2021

*Older version of the SDE+ scheme

Heat



VATTENFALL

Heat

One of Europe's leading players in district heating

Overview

- One of Europe's leading players in district heating in large metropolitan areas
- Solid, semi-regulated, revenue streams
- Attractive growth prospects supported by urbanisation trend and increasing regulatory support for low carbon heating
- Strong partnerships with cities for realization of their carbon reduction plans supported by track record of fulfilling previous reduction targets
- Heat generation and distribution systems are a platform to integrate other energy solutions, e.g. cooling, e-mobility, wind and solar
- Heat also manages Vattenfall's condensing power plants in continental Europe

Highlights



5,500 km heat grids in operation



8.9 GW heat capacity



8.6 GW electricity capacity



1.9 million heat related end customers for heat



< 0.5% churn rate



Key data

	FY 2019 ¹	FY 2018
Net sales (SEK bn)	31.4	34.0
External net sales (SEK bn)	15.9	15.8
EBITDA (SEK bn)	4.2	4.0
Underlying EBIT ² (SEK bn)	0.6	0.8
Sales of heat (TWh)	17.1	18.3
Electricity generation (TWh)	31.7	32.0

¹ District heating Hamburg consolidated in 2019 (660 MSEK Underlying EBIT, 1.1 TWh electricity generation, 2.5 TWh Heat sales)

² Operating profit excluding items affecting comparability

Heat

Overview of markets and installed capacity

The Heat operating segment includes Vattenfall's heating and condensing businesses. Our core business is district heating, where we have 1.9 million end customers in large metropolitan areas like Berlin, Amsterdam and Uppsala. The condensing business consists of mainly gas-fired power plants in the Netherlands. Vattenfall recently entered the UK market and the first contract was signed to design, build and operate a new low carbon district heating network in London (serving 10,000 household equivalents¹), to be operational from 2023.

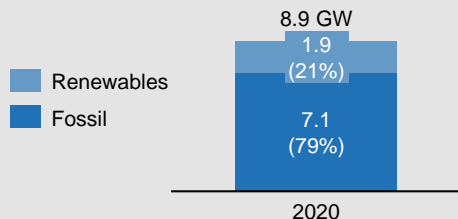
Heat cluster 2019

	Heat (TWh)	Power (TWh)
Germany	9.2	5.2
Sweden	3.0	0.2
Netherlands	1.7	-
Total	13.9	5.4

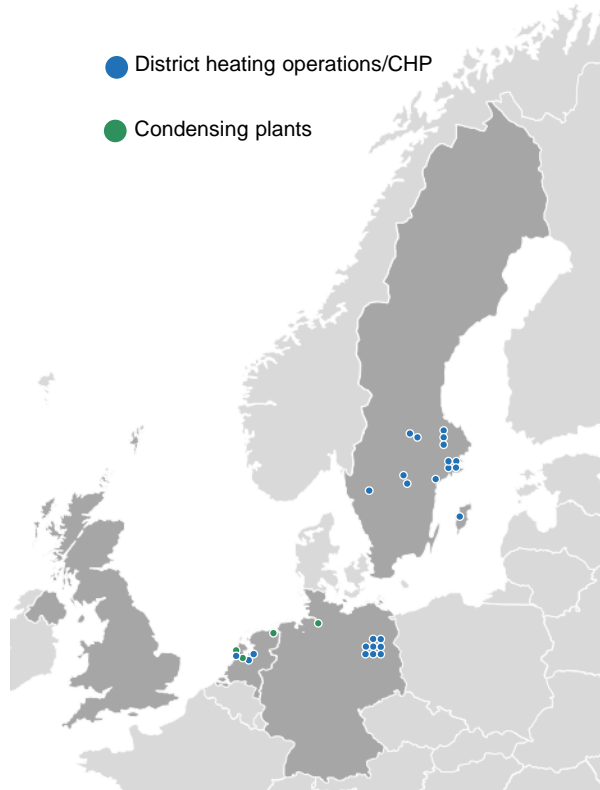
Condensing cluster 2019

	Power (TWh)
Germany	5.8
Netherlands	18.9
Total	24.8

Installed capacity by GW_{heat}



**Transformation into
fossil-free heat supply
by 2040+**

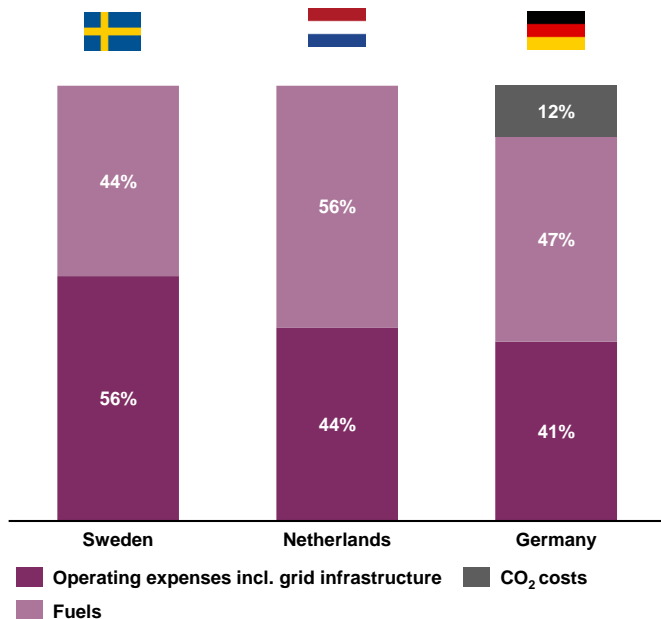


¹ 6,700 new homes and approximately 280,000 square metres of office, retail and commercial space

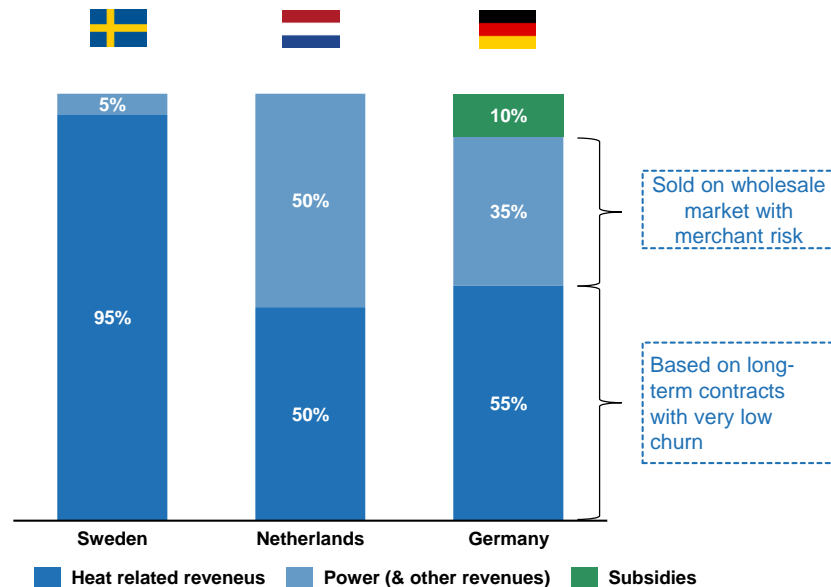
District heating revenue and cost structure per market

Business model differs per country – in Sweden stable heat revenues account for 95% of the total

Cost split (indicative)¹



Revenue split (indicative)








¹ Excluding overhead

Strong political support for district heat across our markets

District heating is an attractive option for cities to decarbonise their building sectors

As of 2020-08-28

	Market maturity ¹	Political support	Competitiveness	Concession based	Price setting (heat)	Typical customer contract length
		Green Deal – Climate neutral Europe until 2050 Strategy for more integrated energy systems + more circular energy system, with energy efficiency at its core / Hydrogen is a priority area for a clean and circular economy				
	Young	Low carbon district heating market share 30% by 2030 in metropolitan areas ² (2% today)	Highly competitive once plans to mandate district heating for new build are put in place	Mainly yes, (e.g. for Brent Cross South > 40 years)	Price escalation formula for heat	30 years
	Mature + Transition to Green	Prolonged CHP production support / subsidies (until 2030) Green heat funding program by federal ministry (EUR 1 bn)	Highly competitive Low primary energy factor for new houses Reliable and comfortable delivery of city heating	No	Price escalation formula for heat	10 years
	Mature + Transition to Green	Natural gas phase out boosts renewable district heating. New subsidy schemes for connecting existing houses	Competitive pricing against gas, but energy efficiency advantage cannot be leveraged with a price premium due to Heat Act	Mainly concession based, a typical term is then 30 years ³	All proposed heat solutions have to be cheaper than pure gas-fueled boiler solutions	15-25 years
	Mature (already green)	Supportive but few special incentives	Competitive position that is being challenged by heat pumps	No	No heat price regulation	Until further notice

¹ Referring to how established the technology is on the market and the future growth prospects

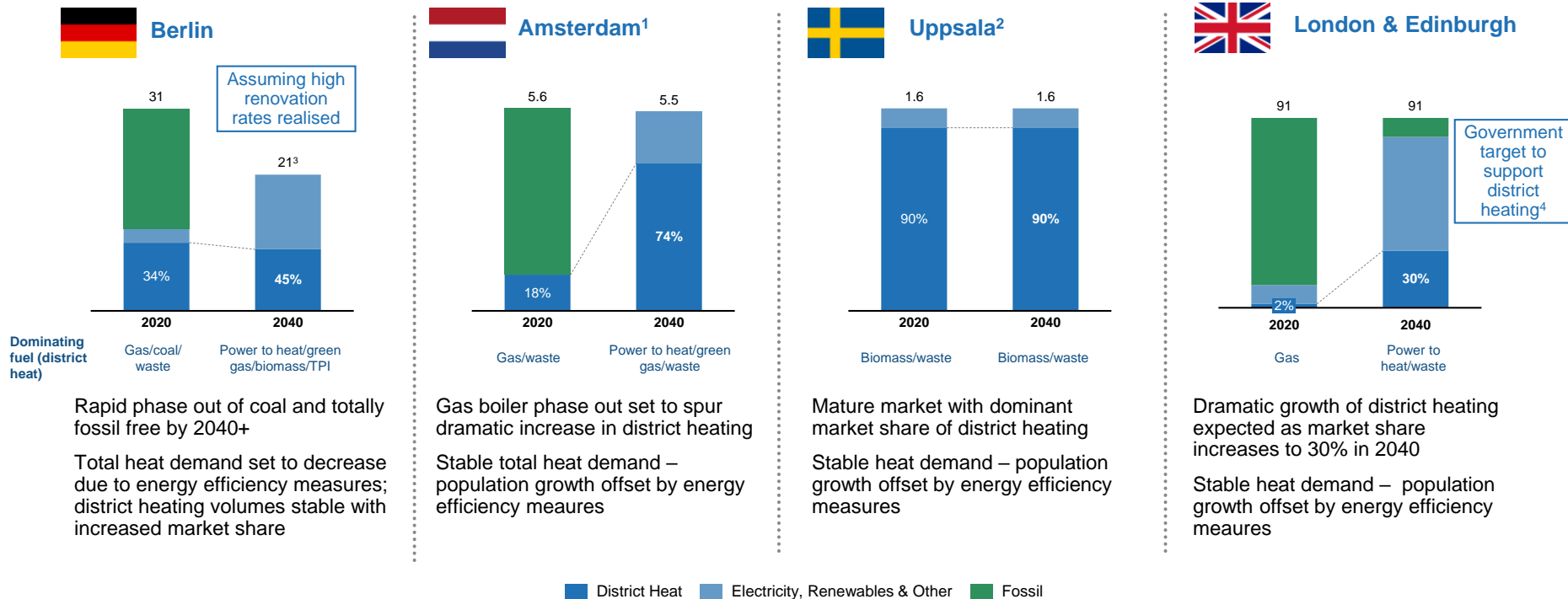
² District heating market share of 30% in metropolitan areas follows governmental goal to reach low carbon heat supply by 17% district heating UK wide

³ The other type of contract is the heat delivery contract. Contracts are then building-specific with a typical contract length of 10 years

District heating volumes set to increase significantly in Amsterdam and the UK...

... with a stable trend in Berlin and Uppsala as population growth is offset by energy efficiency measures

Heat consumption (TWh) and district heating market share (%) by City, 2020 vs 2040



Rapid phase out of coal and totally fossil free by 2040+

Total heat demand set to decrease due to energy efficiency measures; district heating volumes stable with increased market share

Gas boiler phase out set to spur dramatic increase in district heating

Stable total heat demand – population growth offset by energy efficiency measures

Mature market with dominant market share of district heating

Stable heat demand – population growth offset by energy efficiency measures

Dramatic growth of district heating expected as market share increases to 30% in 2040

Stable heat demand – population growth offset by energy efficiency measures

¹ Simplified to reflect connections in Amsterdam/Almere (= 70% of Heat Netherlands); Source for 2040: Study by Municipality of Amsterdam

² Simplified reflecting Uppsala demand (= 42% of Heat Sweden supply)

³ Source: Feasibility study with City of Berlin (2019) here considering building efficiency increase of 1.5% p.a.

⁴ District heating market share of 30% in metropolitan areas follows governmental goal to reach low carbon heat supply by 17% district heating UK wide

Distribution



VATTENFALL

Distribution

Leading owner and operator of electricity distribution networks in Sweden and Berlin, Germany

Overview

- Largest operator of regional electricity distribution networks in Sweden and top-3 position in local networks
- Regulated business with stable demand
- Enabler of the energy transition by connecting renewable production to the grid
- Demand set to grow – Vattenfall grids are located in areas with population growth and strong demand for industrial electrification
- High operational efficiency compared to industry average
- Our positioning across the whole energy value chain enables us to take advantage of our networks using both demand and supply side flexibility

Highlights



3.3 million household and business customers



>155,000 km of electricity grids



SEK 7.2 billion in investments 2019



SEK 64 billion RAB



Key data

	FY 2019	FY 2018
Net sales (SEK bn)	22.5	22.4
External net sales (SEK bn)	17.9	17.8
Underlying EBIT ¹ (SEK bn)	5.0	6.3
Investments (SEK bn)	7.2	6.6
SAIDI ² (minutes/customer)		
Sweden	439 ³	187
Germany	10	15
SAIFI ⁴ (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 SAIDI in 2019 for Sweden was driven by the storm "Alfrida"

⁴ SAIFI: System Average Interruption Frequency Index

Distribution

Market and business overview

In brief

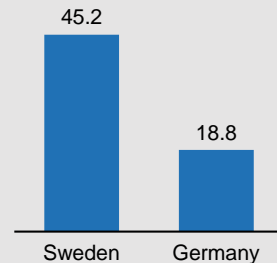
- Vattenfall's Distribution business owns and operates electricity distribution networks in Sweden and Germany (Berlin)
- Approximately 3.3 million business and household customers
- A new business unit for operation and ownership of new networks in the UK was established in 2017.
- During 2019, Vattenfall Networks in the UK was awarded its first three contracts, entailing ownership and operation of the electricity networks for industrial and commercial premises.

Market shares in Sweden

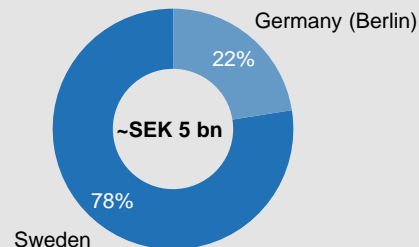
	Customers local grids	Markets share regional grid	Market share local grid
Vattenfall	900,000	52%	16%
Ellevio	960,000	21%	17%
E.ON	1,000,000	24%	19%



Vattenfall Regulatory Asset Base 2019 (SEK bn)



Operating result (EBIT) in 2019



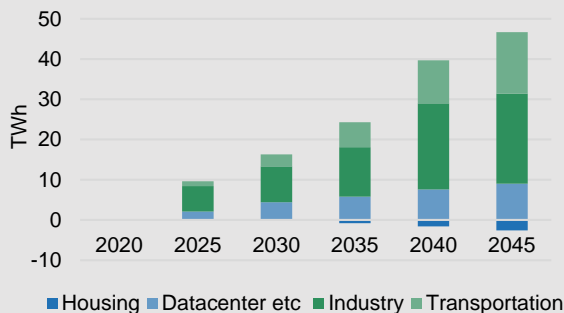
Energy transition to spur dramatic growth in electricity demand in Sweden

Electrification, growth in renewable production capacity and ageing assets call for large network investments

Electricity demand set to grow due to electrification and new electricity intensive businesses

- Electrification of industry and transports to increase total electricity demand
- New businesses such as data centres are also likely to have a significant impact
- Efficiency improvements in the housing sector only have a small mitigating effect on total demand

Forecast – Change in electricity demand (Sweden)¹



¹ Source: Nepp, Färdplan för fossilfri el, Aug 2019

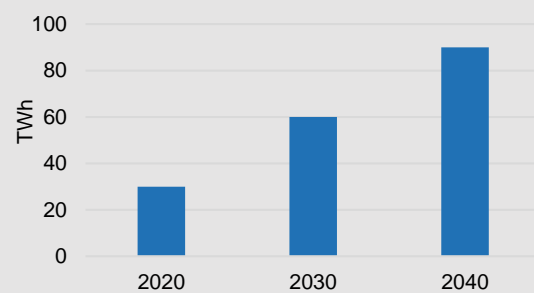
² Source: Svensk vindenergi, 100 procent förnybart 2040, Oct 2019

³ Asset base per 2020-01-01

Installed wind capacity continues to grow

- More and more capacity will be intermittent and decentralised
- Wind production is set to continue the growth in Sweden, mainly in the North and off the coast in Southern Sweden which increases the need for network capacity

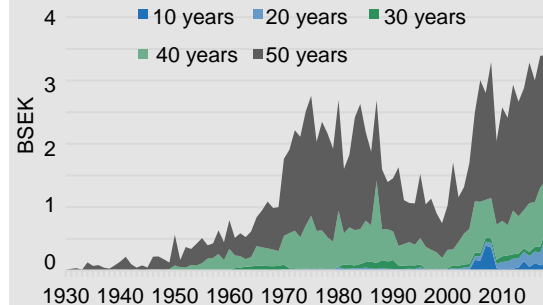
Forecast - installed wind capacity (Sweden)²



Existing network assets are increasingly in need of reinvestments

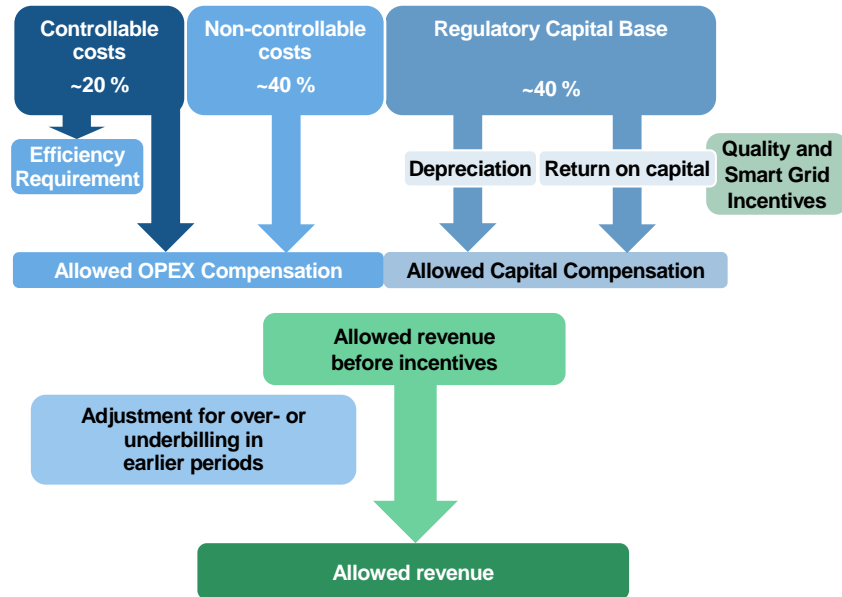
- There was a large build out of network assets in 1970-1990. These assets are now reaching the age when they need to be reinvested in
- This is on top of the need to make new investments in the network to accommodate more renewable energy and electrification

Asset age structure – Vattenfall Eldistribution³

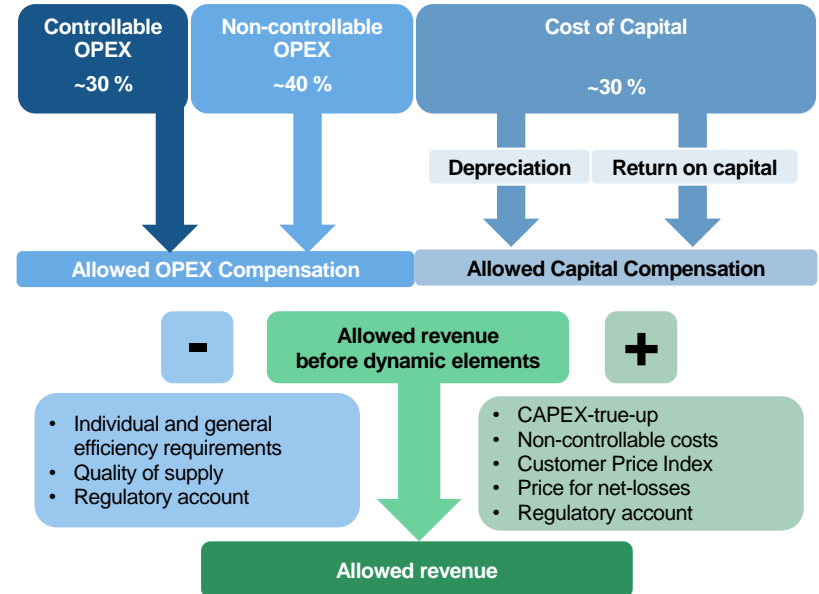


Allowed revenue framework – Sweden and Germany

Schematic overview - Sweden



Schematic overview - Germany



Smart solutions for optimising the energy system

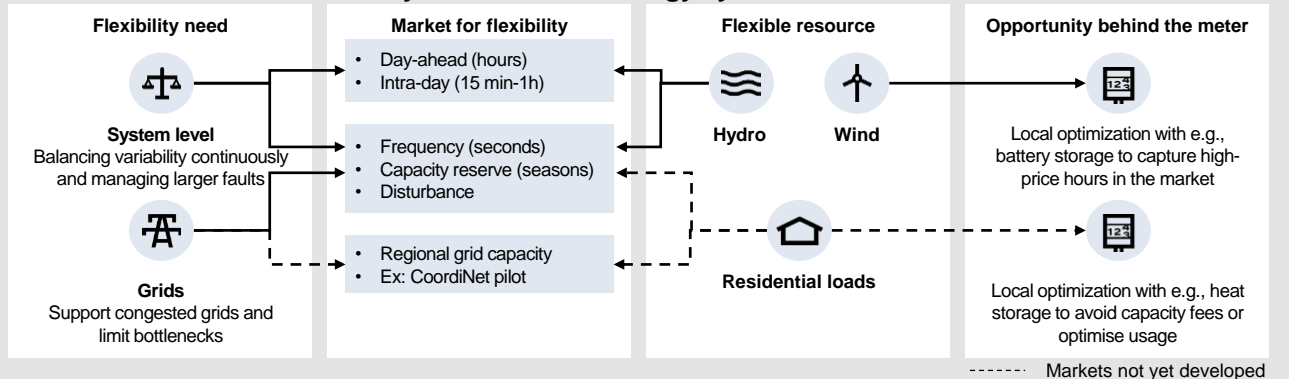
Addressing the shortage of network capacity in the short- and medium term

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:

1. Demand side: Further electrification, driven by urbanisation and decarbonisation of the heating, transport and industrial sectors, is resulting in new, large and power intensive loads
2. Supply side: More intermittent renewable energy is putting strain on the grid, creating congestion and increasing the need to manage fluctuations in power generation (sometimes on short notice)

Increasing the system flexibility is therefore becoming more and more valuable. However, flexibility is only part of the solution and it is necessary to invest in expanding the network as well as developing the existing network in order to fully enable the energy transition

Schematic overview of flexibility in the modern energy system



Sample Vattenfall projects

1. Demand side flexibility - Coordinet

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 with pilots in development in four Swedish regions

2. Supply side flexibility - Power-to-Heat plant in Berlin

Vattenfall commissioned a 120 MW_{heat} 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

Financial performance



VATTENFALL

Vattenfall H1 Results 2020

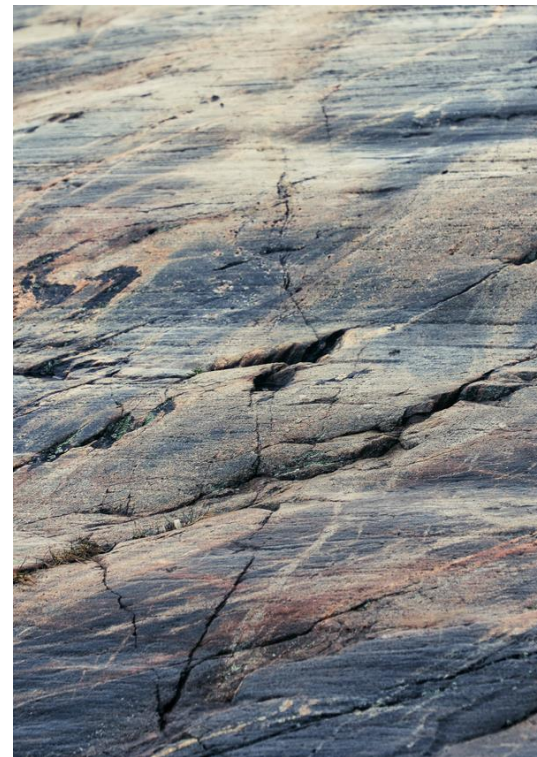
Financial highlights

Key data

SEK bn	H1 2020	H1 2019
Net Sales	79.4	84.2
EBITDA	25.2	20.1
Underlying operating profit (EBIT)	13.0	13.3
EBIT	5.3	11.0
Profit for the period	-1.6	7.7
Funds from Operations (FFO)	16.7	15.8
Cash flow operating activities	7.4	-1.9
Net debt	71.6	72.5
Adjusted net debt	140.3	137.2
Adjusted net debt/EBITDA ¹ (times)	3.0	3.7
Financial targets		
ROCE ¹ (≥8%)	6.1	7.1
FFO/adjusted net debt ¹ (22-27%)	25.5	19.2

Key developments

- Net sales decreased by SEK 4.8 bn to SEK 79.4 bn due to lower spot prices and lower volumes in the Nordics and the Netherlands, district heating Hamburg divestment and closure of Hemweg 8
- Underlying EBIT decreased by SEK 0.3 bn mainly due to lower achieved prices in the Nordics, lower nuclear generation and lower contribution from Heat. Offset by strong sales in Germany and the Netherlands and lower costs in Distribution (following Storm Alfrida in 2019)
- Profit for the period decreased to SEK -1.6 bn, mainly as a result of write-downs in the operating segments Heat (SEK 9.1 bn) and Wind (SEK 1.5 bn)
- ROCE was 6.1% mainly due to impairments
- FFO/Adjusted net debt increased to 25.5%, mainly as a result of higher FFO due to higher EBITDA. Main drivers were positive effects from hedging activities and lower costs in operating segment Distribution



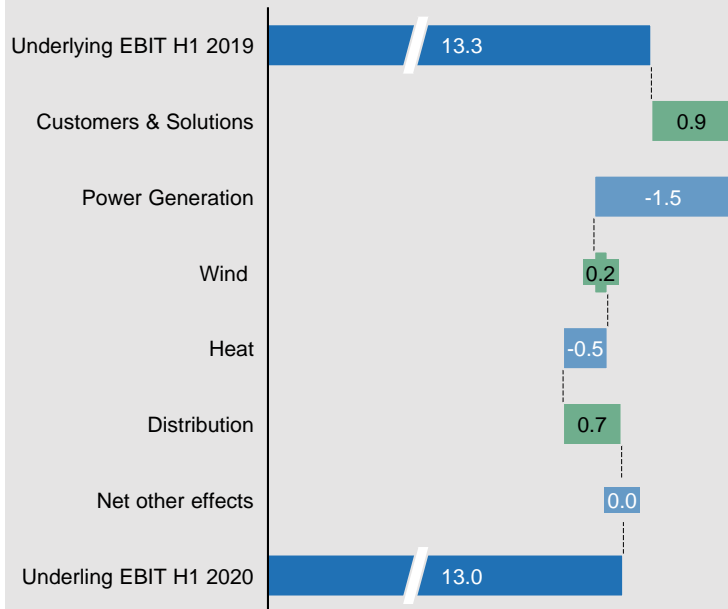
¹ Last 12-month values

Development of underlying EBIT H1 2020

Increase from C&S and Distribution offset by lower earnings in Power Generation and Heat

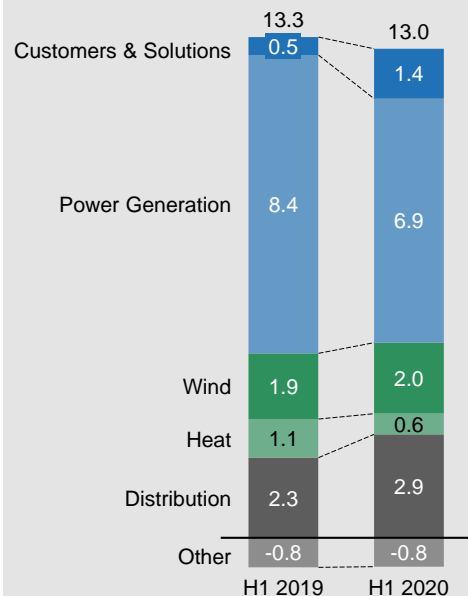
Change in H1 2020 vs. H1 2019

SEK bn



Breakdown per operating segment

SEK bn

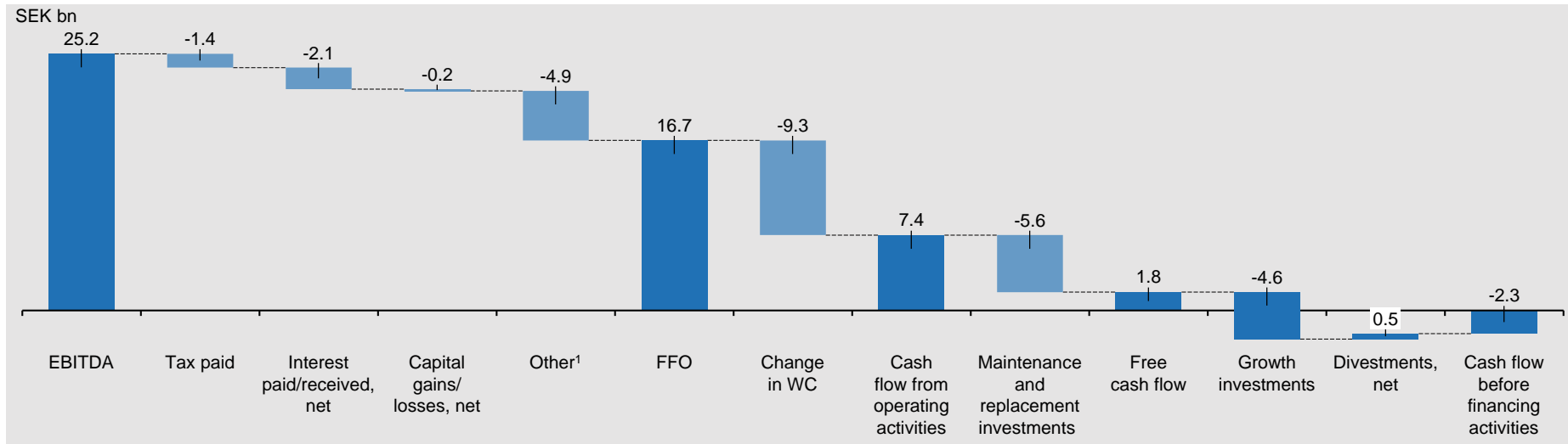


Highlights

- Customers & Solutions: strong contribution from sales in Germany and the Netherlands. Lower depreciation in the Netherlands
- Power Generation: lower achieved prices and lower nuclear generation, partly countered by higher realised earnings from trading
- Wind: additional capacity (Horns Rev 3) countered by lower availability and lower achieved prices
- Heat: effects from sale of district heating operations in Hamburg and the closure of Hemweg 8. Unfavorable clean dark and clean spark spreads also contributed to lower electricity production.
- Distribution: lower operating costs following the Storm Alfrida in Q1 2019

Cash flow development H1 2020

Negative working capital development mainly related to CO₂ emission allowances



Main effects

- Change in working capital mainly driven by changes related to CO₂ emission allowances (SEK -4.5 bn), net change in margin calls for commodity hedging activities (SEK -1.0 bn), seasonality in net change in operating receivables and liabilities in the Customers & Solutions and Heat operating segments (SEK -0.9 bn) and increased inventory (SEK -0.9 bn)
- Growth investments mainly related to wind power

1 "Other" includes non-cash items included in EBITDA, mainly changes in fair value of commodity derivatives in H1 2020

Hedging, debt and funding

H1 2020 numbers

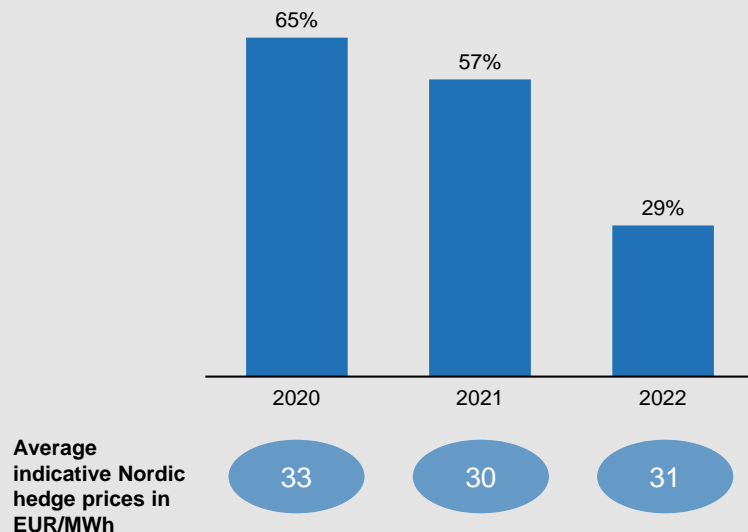


VATTENFALL

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

Estimated Nordic¹ hedge ratio (%) and indicative prices



Achieved prices² - Nordic portfolio

YTD 2020	YTD 2019	Q2 2020	Q2 2019	FY 2019
28	32	30	28	32

Sensitivity analysis – Continental³ portfolio

Market quoted	+/- 10% price impact on future profit before tax, MSEK ⁴			Observed yearly volatility
	2021	2022	2023	
Electricity	+/- 951	+/- 1,261	+/- 1,436	17% - 23%
Coal	-/+ 77	-/+ 93	-/+ 122	16% - 19%
Gas	-/+ 332	-/+ 587	-/+ 690	17% - 23%
CO ₂	-/+ 278	-/+ 358	-/+ 412	44% - 46%

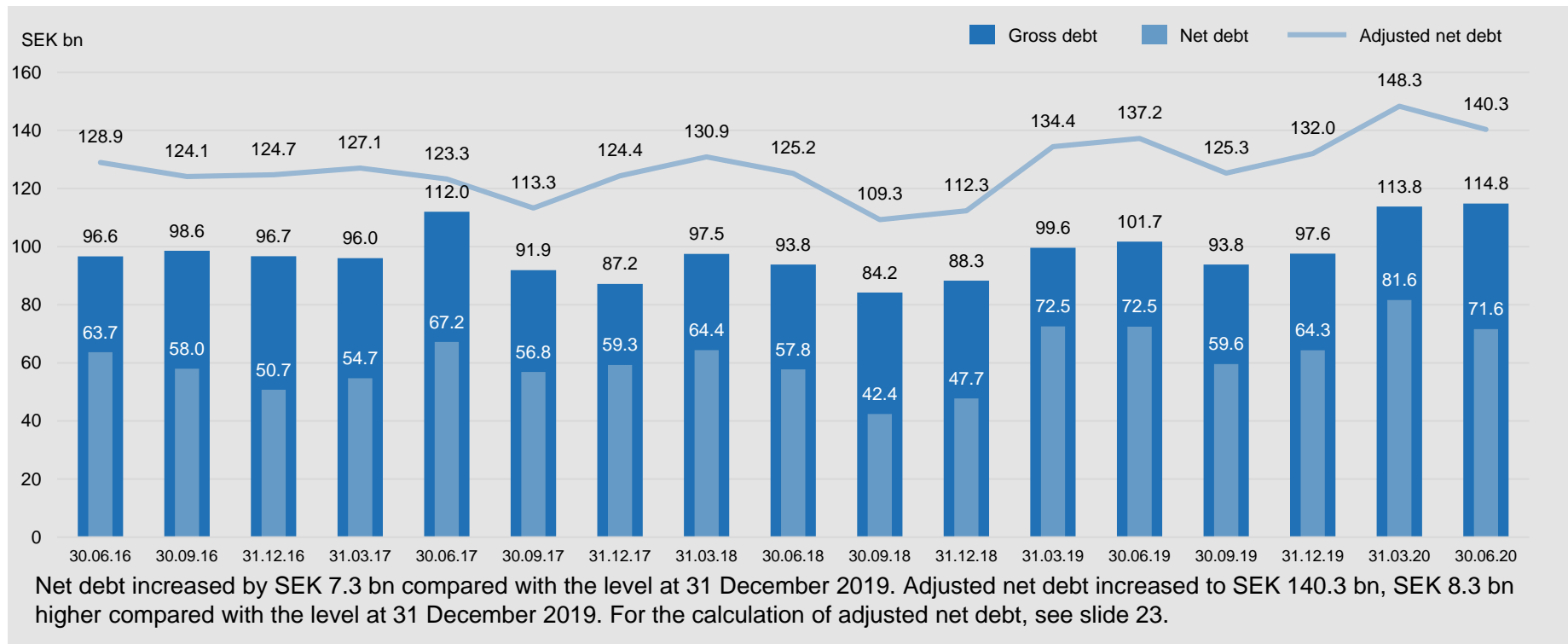
¹ Nordic: SE, DK, NO, FI

² Achieved prices from the spot market and hedges. Includes Nordic (SE, DK, FI) hydro, nuclear and wind power generation

³ Continental: DE, NL, UK.

⁴ The denotation +/- entails that a higher price affects operating profit favorably, and +/- vice versa

Debt development



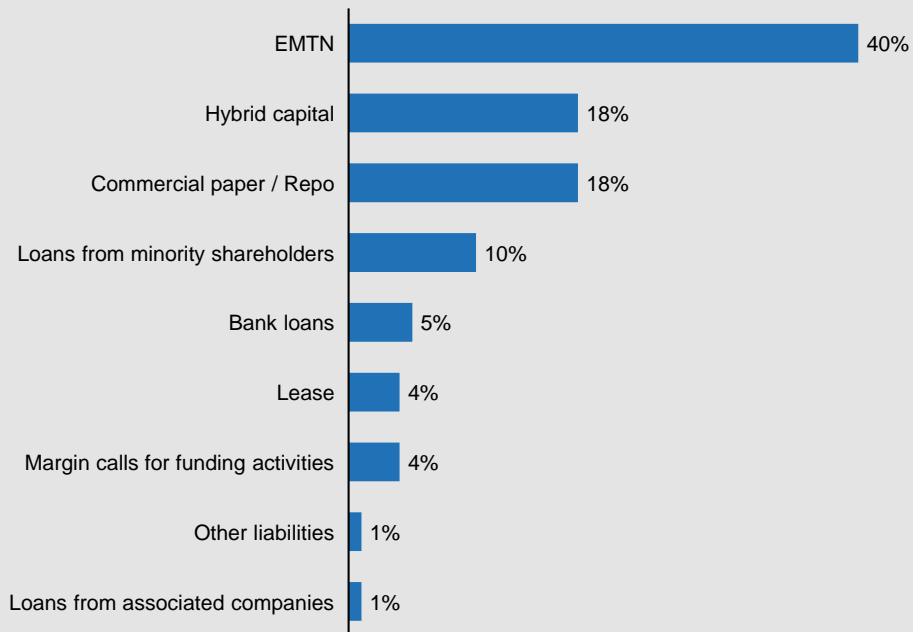
Reported and adjusted net debt

Reported net debt (SEK bn)	30 Jun. 2020	31 Dec. 2019	Adjusted net debt (SEK bn)	30 Jun. 2020	31 Dec. 2019
Hybrid capital	-20.2	-20.2	Total interest-bearing liabilities	-114.8	-97.6
Bond issues and liabilities to credit institutions	-51.9	-38.8	50% of Hybrid capital	10.1	10.1
Commercial papers and Repos	-20.2	-17.2	Present value of pension obligations	-43.2	-44.0
Liabilities to associated companies	-0,7	-0,7	Wind & other environmental provisions	-8.8	-8.6
Liabilities to minority shareholders	-11.0	-10.6	Provisions for nuclear power (net)	-37.9	-35.5
Lease liabilities	-4.4	-4.6	Margin calls received for funding activities	4.8	3.7
Other liabilities, incl. margin calls for funding activities	-6.3	-5.2	Liabilities to minority owners due to consortium agreements	11.0	10.6
Total interest-bearing liabilities	-114.8	-97.6	= Adjusted gross debt	-178.7	-161.3
Reported cash, cash equivalents & short-term investments	42.6	33.2	Reported cash, cash equivalents & short-term investments	42.6	33.2
Loans to minority owners of foreign subsidiaries	0.5	0.2	Unavailable liquidity	-4.3	-3.9
Net debt	-71.6	-64.3	= Adjusted cash, cash equivalents & short-term investments	38.4	29.3
			= Adjusted net debt	-140.3	-132.0

Breakdown of gross debt

Total debt: SEK 114.8 bn (EUR 10.9 bn)

External market debt: SEK 103.1 bn (EUR 9.8 bn)

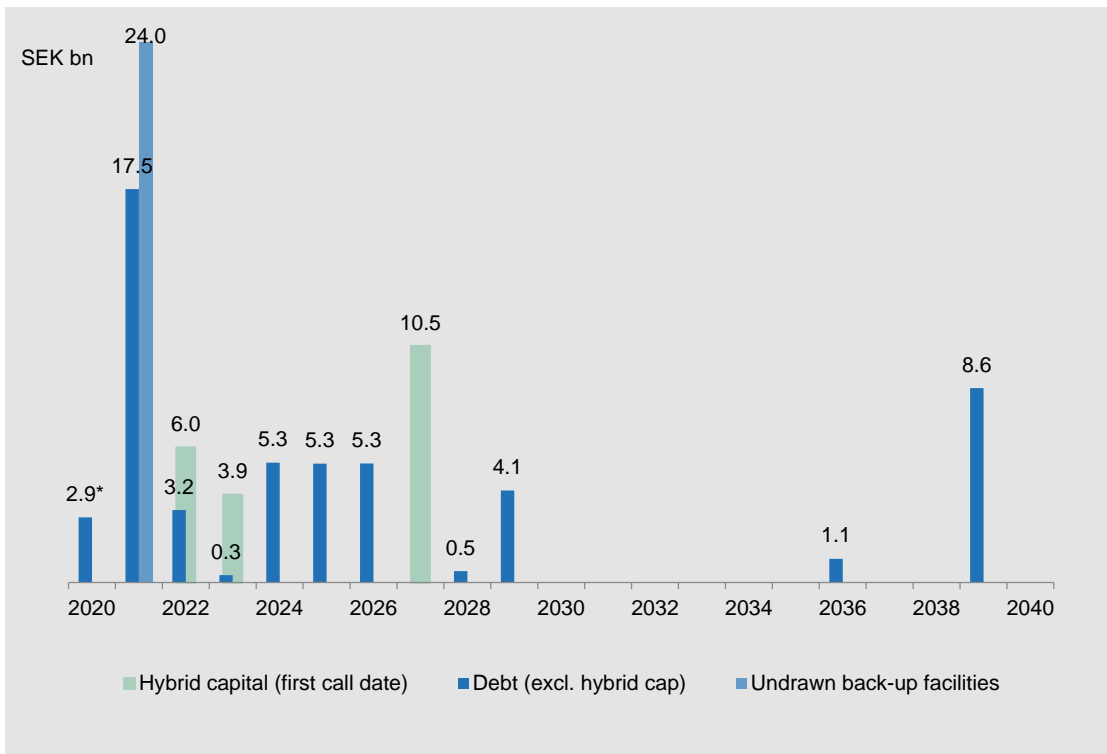


Debt issuing programmes	Size (EUR bn)	Utilization (EUR bn)
EUR 10bn Euro MTN	10.0	4.1
EUR 4bn Euro CP	4.0	1.7
Total	14.0	5.8

- All public debt is issued by Vattenfall AB
- The main part of debt portfolio has no currency exposure that has an impact on the income statement. Debt in foreign currency is either swapped to SEK or booked as hedge against net foreign investments.
- No structural subordination

¹ EMTN= Euro Medium Term Notes

Debt maturity profile¹



* Short term debt are excluded (Repo, ECP and SCP) (20,0) ¹ Commercial paper (ECP) Loans from associated companies, minority owners, margin calls received (CSA) and valuation at fair value are excluded and currency derivatives for hedging debt in foreign currency are included

	30 Jun. 2020	31 Dec. 2019
Duration (years)	4.3	4.7
Average time to maturity (years)	5.5	6.8
Average interest rate (%)	3.4	4.0
Net debt (SEK bn)	71.6	64.3
Available group liquidity (MSEK)	38.4	29.3
Undrawn committed credit facilities (MSEK)	24.0	21.4

Cumulative maturities excl. undrawn back-up facilities

	2020- 2022	2023- 2025	From 2026
Debt incl. hybrid capital	29.6	20.1	24.8
% of total	40%	27%	33%

Liquidity position

Group liquidity	SEK bn	Committed credit facilities	Facility size, EUR bn	SEK bn
Cash and cash equivalents	19.8	RCF (maturity Dec 2021)	2.0	21.0
Short term investments	22.8	RCF (maturity Jul 2021)		3.0
Reported cash, cash equivalents & short term investments	42.6	Total undrawn		24.0
		Debt maturities²		SEK bn
Unavailable liquidity ¹	-4.3	Within 90 days		0.4
Available liquidity	38.4	Within 180 days		2.9

¹ German nuclear "Solidarvereinbarung" 1.0 SEK bn, Margin calls paid (CSA) 2.4 SEK bn, Insurance "Provisions for claims outstanding" 0.8 SEK bn

² Excluding loans from minority owners and associated companies

Nuclear provisions

Reactor	Net capacity (MW)	Start (year)	Vattenfall share (%)	Vattenfall provisions, SEK bn (IFRS accounting)	Vattenfall provisions, SEK bn (pro rata)	Sw nuclear waste fund SEK bn (Vattenfall pro rata share)
Ringhals 1	879	1976	70.4			
Ringhals 2	809	1975	70.4			
Ringhals 3	1,070	1981	70.4			
Ringhals 4	942	1983	70.4	Total Ringhals: 35.5	Total Ringhals: 35.5¹	
Forsmark 1	984	1980	66.0			
Forsmark 2	1,120	1981	66.0			
Forsmark 3	1,170	1985	66.0	Total Forsmark: 31.3	Total Forsmark: 20.6	
Total Sweden	6,974	-		69.6²	57.4²	38.9³
Brunsbüttel	771	1977	66.7	12.0	8.0	
Brokdorf	1,410	1986	20.0	0	3.5	
Krömmel	1,346	1984	50.0	7.6	7.6	
Stade ⁴	640	1972	33.3	0	0.9	
Total Germany	4,167	-	-	19.6	20.0	
Total SE & DE	11,141			89.2	77.4	

¹ Vattenfall is 100% responsible for Ringhals decommissioning, while owning only 70.4%

² Total provisions in Sweden (IFRS accounting) include provisions of SEK 0.5 bn (pro rata SEK 0.3 bn considering share in Studsviks-fonden) related to Ågesta, and SEK 2.3 bn (pro rata SEK 1.0 bn considering share in Studsviks-fonden) related to SVAFO

³ Vattenfall's share of the Nuclear Waste Fund. IFRS consolidated value is SEK 46.2 bn.


⁴ Stade is being dismantled

Investor Relations contacts



Johan Sahlqvist

Head of Investor Relations


 +46 8 739 72 51


 johan.sahlqvist@vattenfall.com



Tobias Sjöberg

Investor Relations Officer


 +46 8 739 60 63


 tobias.sjoberg@vattenfall.com



Emmi Östlund

Investor Relations Officer

 +46 8 739 69 24

 emmi.oestlund@vattenfall.com



[Investor webpage](#) / [Financial reports & presentations](#)

Financial calendar

27 October 2020	Interim report January-September 2020
4 February 2021	Year-end report for 2020
29 March 2021	Annual and Sustainability report 2020
29 April 2021	Interim report January-March 2021
20 July 2021	Interim report January-June 2021