Corporate Factbook

20 September 2021

VATTENFALL

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This is Vattenfall

Activities in the Value Chain ● Active ● Inactive

Upstream | Production | Transmission | Distribution | Trading | Retail | Services

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 stable outlook by Moody's**

6.8 Million
Electricity customers

1.8 Million
Heat customers

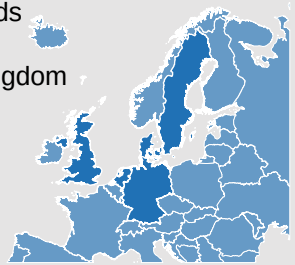
900 000[1]
Electricity grid customers

2.3 Million
Gas customers

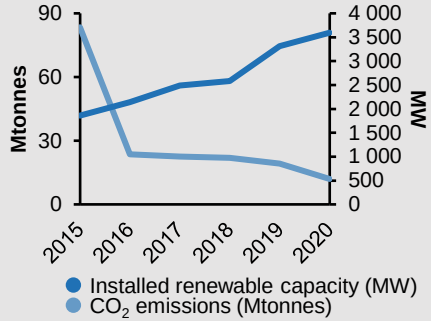
19,859
Employees

Main markets

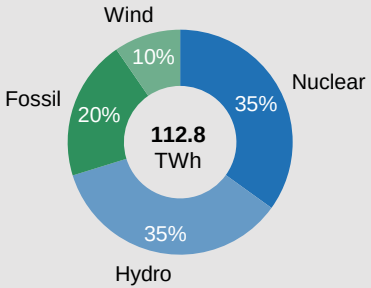
- Sweden
- Germany
- Netherlands
- Denmark
- United Kingdom



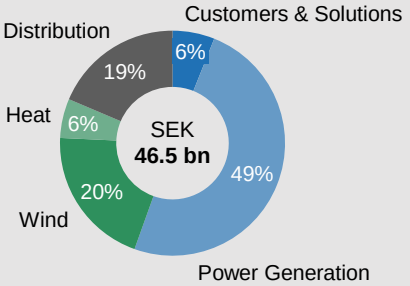
CO_2 emissions & Renewable capacity



Electricity generation breakdown by technology, 2020



EBITDA breakdown by segment, 2020



1 Excluding Vattenfall's subsidiaries Gotlands Elnät and Västerbergslagens Elnät as well as the Berlin grid business which was sold to the city of Berlin on July 1st, 2021

Vattenfall Executive Group Management

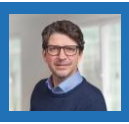
President and CEO
Anna Borg

Senior Vice President, CFO
Kerstin Ahlfont

Senior Vice President, Strategic Development
Andreas Regnell

Senior Vice President, Communications
Karin Lepasoon[1]

Senior Vice President, General Counsel and Secretary to the Board of Directors
Anne Gynnerstedt



Senior Vice President, Human Resources
Christian Barthélémy

Business Area Heat

Senior Vice President
Ulrika Jardfelt

Business Area Customers & Solutions

Senior Vice President
Martijn Hagens

Business Area Wind

Senior Vice President
Helene Biström

Business Area Power Generation

Senior Vice President, Generation
Torbjörn Wahlborg

Senior Vice President, Markets
Anna-Karin Stenberg

Business Area Distribution[2]

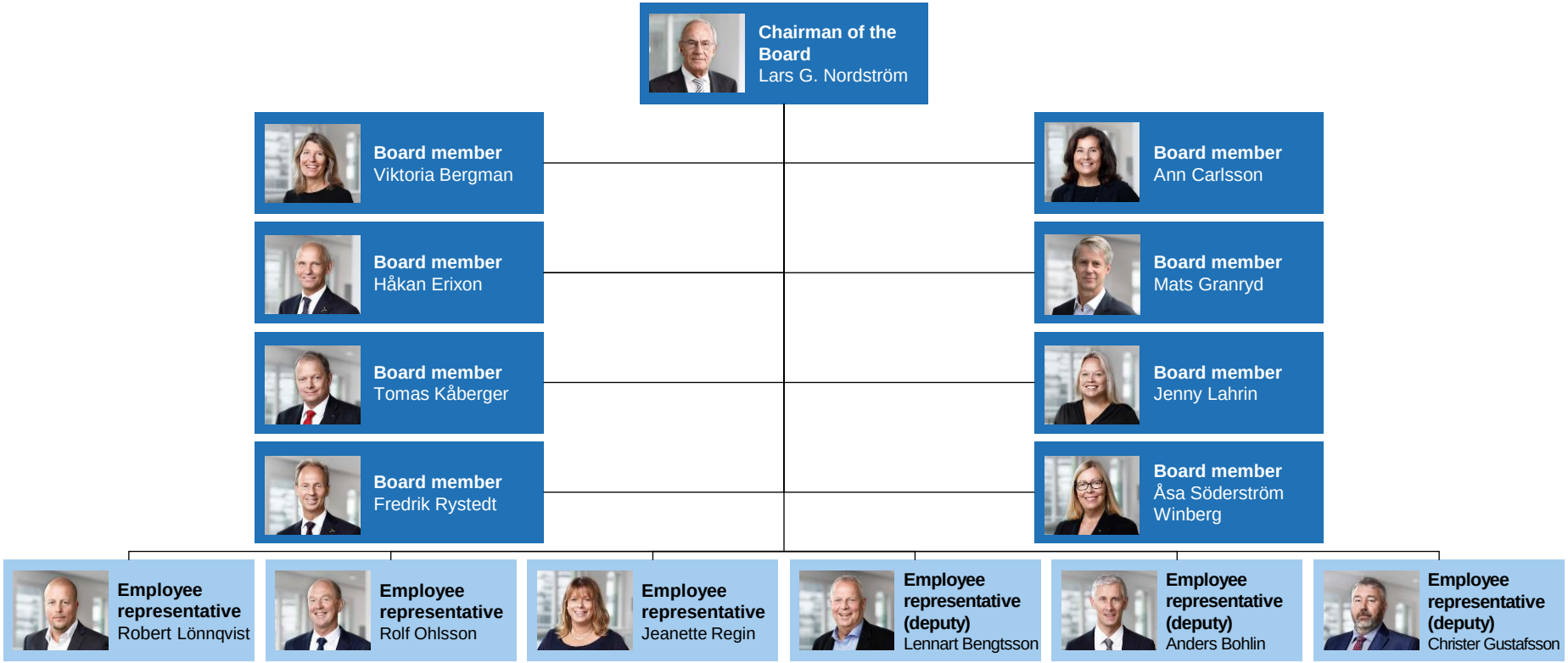
Senior Vice President
Annika Viklund

For more info: please see page 86-87 in the Annual- and Sustainability Report 2020

[1] Assumes position on October 1

[2] The electricity distribution operations are regulated by the Swedish Electricity Act (Ellagen) and the German Energy Industry Act (Energiewirtschaftsgesetz), and are unbundled from Vattenfall's other operations. The Head of Business Area Distribution is therefore not a member of the EGM

Vattenfall Board of Directors



For more info: please see page 84-85 in the Annual- and Sustainability Report 2020

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 grids and smart grid solutions
- Enables customers to feed self-generated electricity into the grid (“prosumers”)
- Flexibility services to both electricity producers and consumers to optimise grid 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
- Grid services
- Smart meters

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

Operating segment overview FY 2020

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 2020[1]

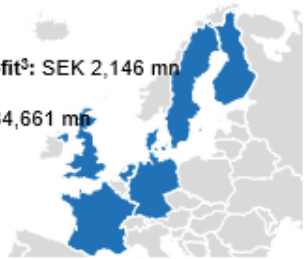
Customers and Solutions	2,971
Power Generation	7,474
Wind	1,104
Heat	3,213
Distribution	2,366
Other[2]	2,731

Customers & Solutions

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

- A market leader in Sweden with nearly 900,000 electricity contracts
- A market leader in the Netherlands with 3.8 million electricity and gas contracts
- Leading position as electricity supplier in Berlin and Hamburg
- Challenger position in sales of electricity in Denmark, Finland and France and in France also of gas
- Operates 22,400 EV charging points in Sweden, Germany and the Netherlands

Underlying Operating Profit[3]: SEK 2,146 mn (8% of total)
External Net Sales: SEK 84,661 mn (53% of total)
EBITDA: SEK 2,832 mn (6% 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 5.5 GW nuclear capacity and 11.5 GW hydro power capacity across Sweden, Finland and Germany
- One of Europe's largest providers of fossil-free electricity, with 39.7 TWh from hydro power and 39.3 TWh from nuclear power
- Provides professional asset optimisation services and market access, and a leading player in PPA markets in northwest Europe

Underlying Operating Profit: SEK 14,670 mn (54% of total)
External Net Sales: SEK 36,597 mn (23% of total)
EBITDA: SEK 23,144 mn (49% of total)

[1] Full-time equivalents
[2] Pertains mainly to Staff Functions and Shared Service Centres
[3] Numbers reflect FY 2020

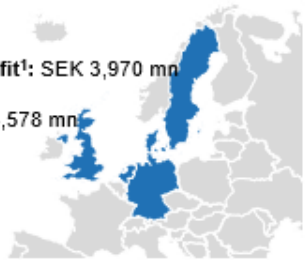
Operating segment overview FY 2020 (Cont'd)

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
- Strong wind power pipeline with 3 GW under construction and over 4 GW in development
- Front-runner in innovative solutions in solar & batteries, such as colocation with wind farms and shared infrastructure

Underlying Operating Profit[1]: SEK 3,970 mn
(15% of total)
External Net Sales: SEK 6,578 mn
(4% of total)
EBITDA: SEK 9,482 mn
(20% of total)



Heat

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

- One of Europe's leading providers of district heating in large metropolitan areas with approximately 1.8 million end customers
- Strong partnerships with cities for realisation of their carbon reduction plans, supported by a track record of fulfilling previous reduction targets
- Heat production and distribution systems used as platforms to integrate other energy solutions, e.g. cooling, EV charging solutions, wind and solar

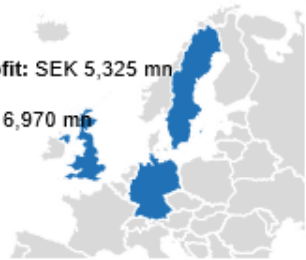
Underlying Operating Profit: SEK 978 mn
(4% of total)
External Net Sales: SEK 13,538 mn
(9% of total)
EBITDA: SEK 2,644 mn
(6% of total)

Distribution

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

- Leading operator of regional electricity distribution grids and top-3 position in local grids in Sweden
- Approximately 3.3 million business and household customers in Sweden and Berlin, Germany
- Unit for operation and ownership of new grids in the UK established in 2017 has now been awarded its first three contracts.

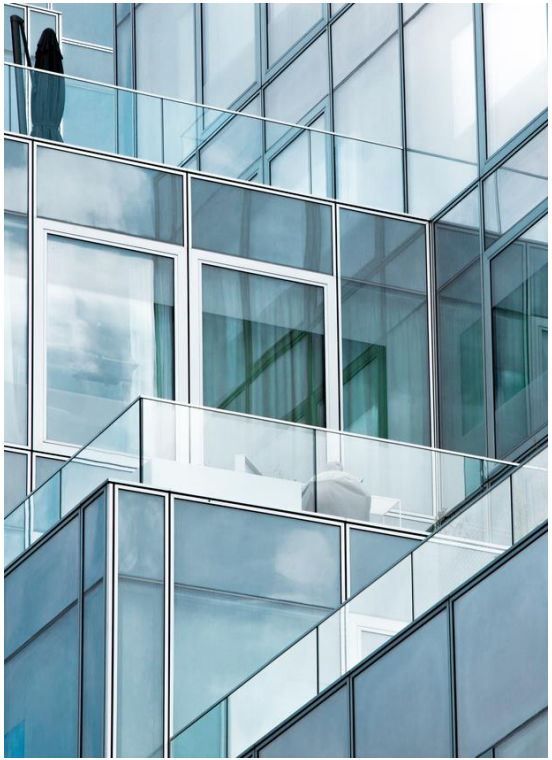
Underlying Operating Profit: SEK 5,325 mn
(20% of total)
External Net Sales: SEK 16,970 mn
(11% of total)
EBITDA: SEK 8,713 mn
(19% of total)



[1] Numbers reflect FY 2020

Financial characteristics per operating segment

Operating segment	Key drivers for earnings	Characteristics of earnings and cash flow
Customers & Solutions	Difference in sourcing costs compared to sales price (gross margin) and development in the customer base	Track record of stable earnings
Power Generation	A function of spot price, generation volume, hedge ratio and hedge level	Large outright power price exposure is offset by hedging activites, thereby reducing volatility
Wind	A function of existing subsidies schemes rolling off, net new capacity added, the achieved power price rewarded to new capacity, technological development and synergies	Growing contribution on the back of new capacity
Heat	Mainly fuel costs/spreads and temperature effects/weather	New, partly subsidized, assets replacing older ones and thereby increasing the availability in combination with increased hedging activities contribute to less volatility than seen in last couple of years.
Distribution	Largely a function of regulatory asset base (RAB), regulatory WACC, and the efficiency of the operations	Stable



Our beliefs about the future

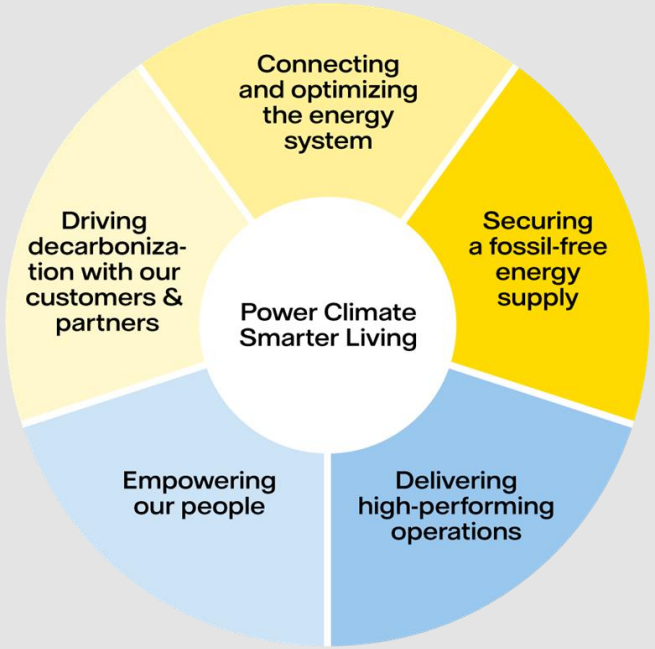
1	2	3	4	5	6
Sustainability is the business…	**Simple solutions to customers needed in a complex energy landscape…**	**Demand for fossil-free electricity and grids will increase significantly…**	**Digitalization of the entire energy value chain is necessary…**	**New competencies are critical in the energy transition…**	**Cost efficiency and competitiveness is paramount…**
…and leaders must have a positive track record, extending beyond climate	… and will be a sizeable business opportunity	…and will require thoughtful stakeholder management	…and is a key enabler for energy system flexibility	…and companies will compete for top talent	…for being a winner in the energy transition

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

Strategic targets 2025

Strategic focus area	Strategic targets to 2025	2025 Target	Actual 2020	Motivation
Driving decarbonisation with our customers & partners	Net Promoter Score[1] (Absolute)	+18	+7[2]	Established and recognised as key to assess customer behaviours/attitudes
Securing a fossil-free energy supply	CO_2 Emissions Intensity	≤86 gCO_2/kWh[3]	97 gCO_2/kWh	Established in Science Based Targets. Industry standard
Empowering our people	LTIF	≤1.0	1.8	Safety first, best practise KPI
	Engagement Index	75	72	Engaged employees is a key factor for success
Delivering high-performing operations	FFO/Adjusted Net Debt	22-27 %	28.8%	Key metric in financial steering
	ROCE	8 %	5.8 %	Key metric in financial steering

[1] NPS absolute target is calculated with a weighting of 80% from Customers & Solutions and 20% from Heat resembling size of customer basis
[2] No outcome for business unit Heat Berlin in 2020, similar level as in 2019 assumed

[3] Targeting 86 gCO_2/kWh by 2025 puts us on a "1.5°C" trajectory by 2030 according to Science Based Target levels

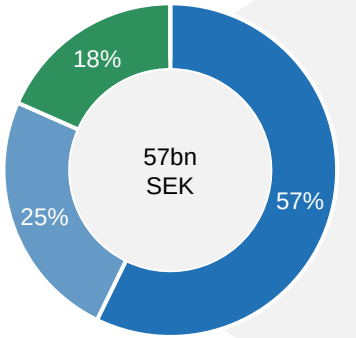
Financial targets

Financial targets	Targets over a business cycle[1]	FY 2020	FY 2019	Comment
Profitability	Return on capital employed: ≥8%[2]	5.8%	8.5%	Return on capital employed decreased to 5.8%, which is below the target of 8%, mainly owing to impairment losses related to the Moorburg power plant in Hamburg
Capital structure	FFO/adjusted net debt: 22%–27%	28.8%	26.5%	FFO/adjusted net debt increased to 28.8% in 2020, mainly owing to lower adjusted net debt resulting from higher cash flow from operations
Dividend policy	Dividend: 40%–70% of the year's profit after tax	SEK 4.0 bn	SEK 3.6 bn	The Board of Directors has proposed a dividend of SEK 4 billion, corresponding to 62% of profit for the year attributable to the owner of the Parent Company

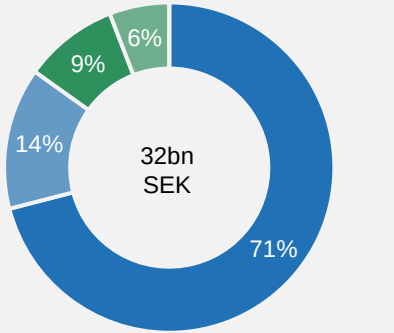
[1] 5–7 years
[2] The key ratio is based on average capital employed

Investment plan 2021-2022

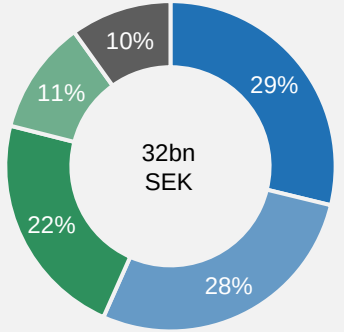
Total capex 2021-2022



Growth capex per technology 2021-2022



Growth capex per country 2021-2022

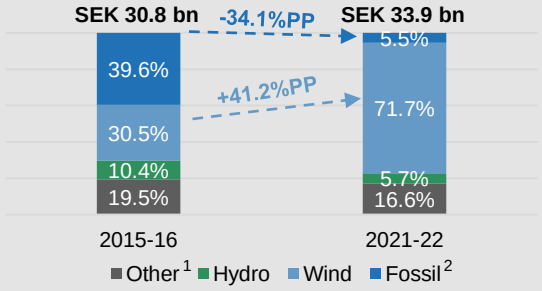


[1] Mainly charging solutions, solar and battery projects, decentralised solutions and the HYBRIT project

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

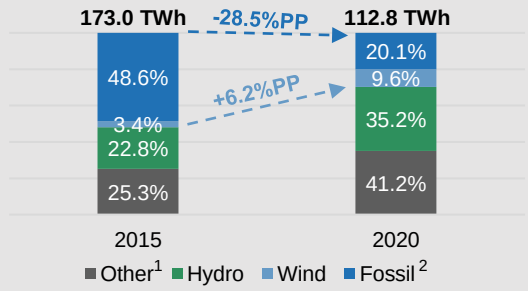
CAPEX by technology



Major investments in renewable projects

- Around SEK 23 billion of investments are planned for new wind farms, both onshore and offshore
- Recent milestones:
  - Final investment decision for Hollandse Kust Zuid 1-4 offshore wind farm in the Netherlands, the world's largest offshore wind farm when commissioned in 2023
  - Major onshore projects in the Nordics and the UK (Blakliden & Fäbodberget, South Kyle)
  - 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)

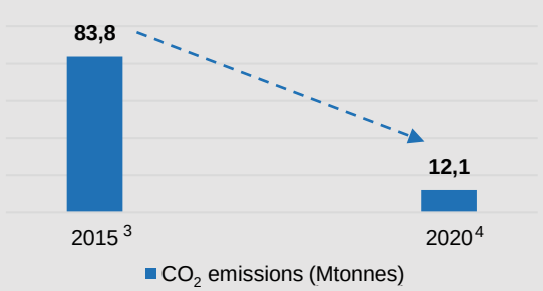
Electricity production mix



Share of fossil production has been reduced dramatically

- Strong wind growth: 3.5 GW installed capacity; ~ 3 GW under construction and >4 GW in development
- Increased focus on decentralised production, storage and EV charging
- Coal-fired production has been phased out such as Reuter C in Berlin, Moorburg in Hamburg and Hemweg-8 in the Netherlands

CO_2 emissions



…and with this our CO_2 emissions

We sold the lignite business in 2016, which reduced our CO_2 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 and Moorburg in Germany)
- We are also phasing out coal from all of our operations by 2030, at latest

[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
[4] Pro rata values, corresponding to Vattenfall's share of ownership

Vattenfall tackles CO_2 emissions throughout the value chain

CO_2 – emissions 2020

Suppliers

~ 5 Mt

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

Own business

~ 12 Mt

- **Climate neutral in the Nordic region 2030**
- **Coal phased out by 2030**
- **Fossil-free within one generation**
- **Travels (EV100, EV[2] policy, climate compensate)**

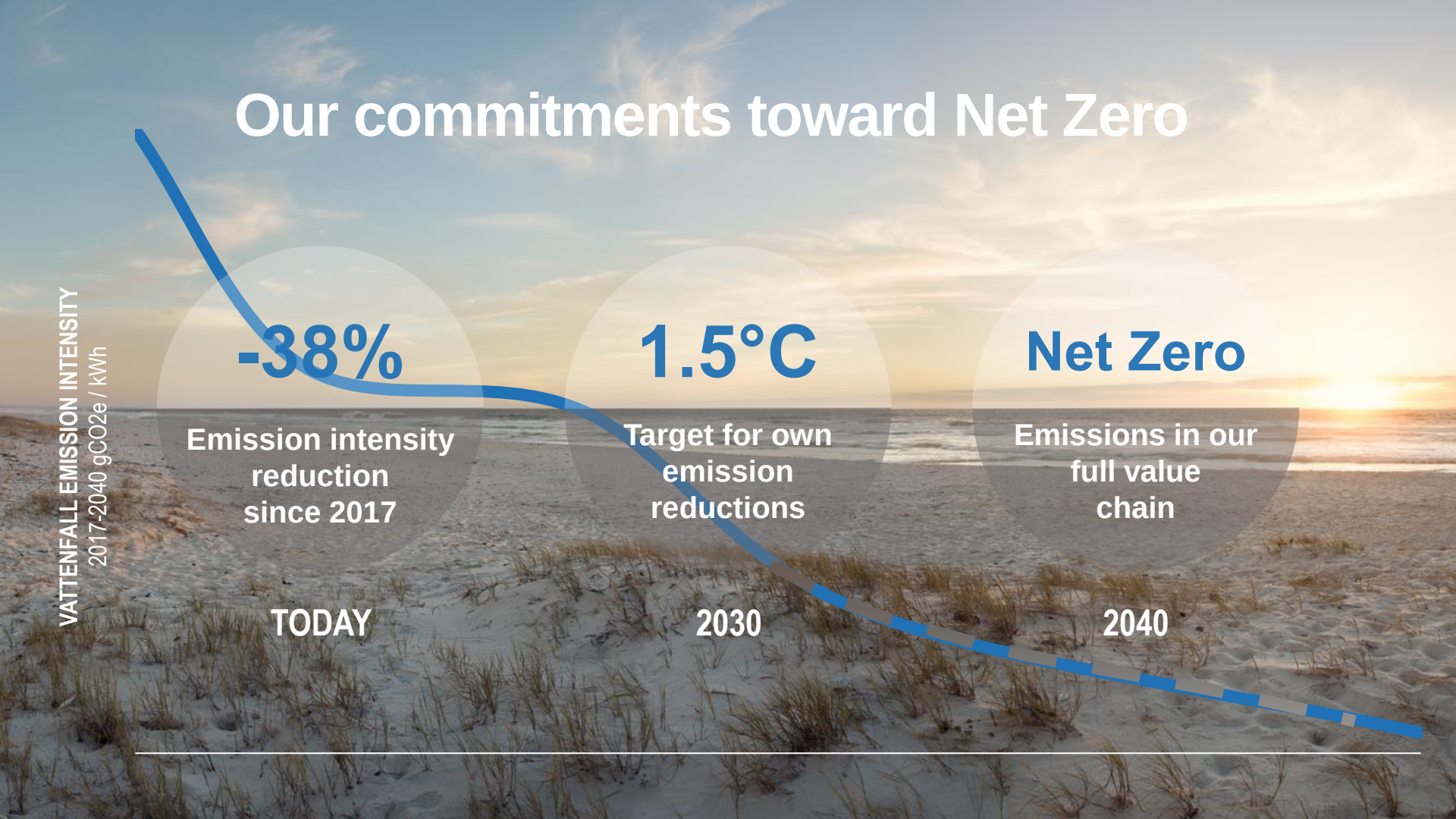
Customers[1]

~ 12 Mt

- **Products and services with clear climate footprint (EPD[3] / LCA[4])**
- **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

Our commitments toward Net Zero



Raising our climate ambition

Vattenfall's emissions intensity target is now in line with the 1.5˚C climate trajectory

Our ambitions to reach our 2030 commitment

2X

Electricity distributed in our grid

>125 TWh

Fossil-free electricity produced*

+30%

More customers with low or no carbon heat

-50%

CO_2 reductions in procurement of goods & services

25X

More e-mobility charge points in operation

X4

Commissioned solar & wind capacity added

*Not considering future ownership structure of added wind and solar production

VATTENFALL

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	The leading system globally for disclosing environment data for investors, companies, cities, states and regions	Score A: top 2% of all rated companies	January 2021
ecovadis	An online platform that enables companies to monitor the CSR performance of their supply chains by providing supplier sustainability ratings	Platinum rating: top 1% of all rated companies and top 3% in the sector	February 2021
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	May 2021
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 19% of companies assessed in the sector.	May 2021
SUSTAINALYTICS a Morningstar company	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 23.2 (strong management score and medium exposure). Top-8% of companies in subindustry	April 2021

Credit ratings overview

Long term rating: A3[1]
Short term rating: P-2
Outlook: Stable
Latest publication:* *06 July 2021

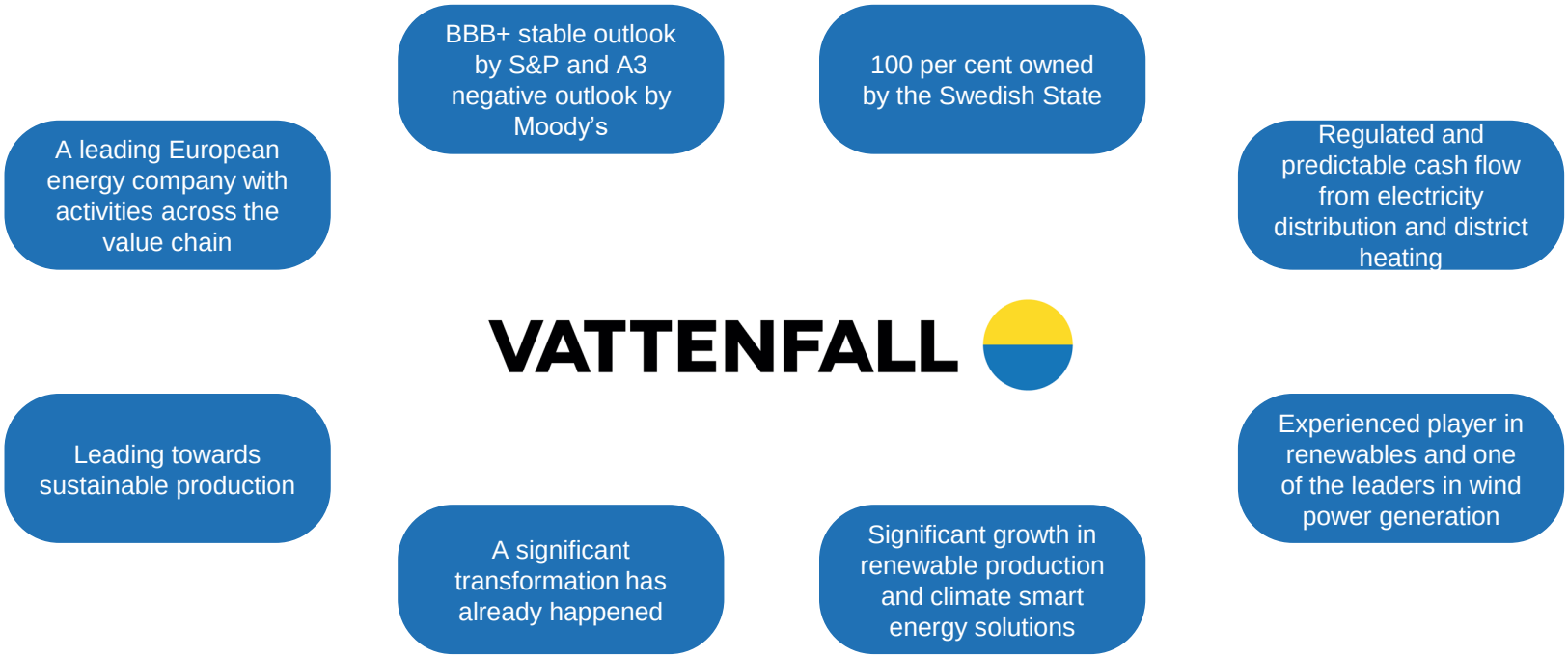
- "We stabilised the outlook of Vattenfall reflecting our expectations of a strengthening of the company's credit metrics on the back of a combination of recovering power prices in the Nordics, the EUR 2.1 billion the company will receive for the sale of its DSO grid in Berlin, and the approximately EUR 1.1 billion of net proceeds that Vattenfall will receive as compensation from the German government because of early shutdown of its nuclear operations."
- "Vattenfall's rating is supported by (1) the breadth and scale of the company's operations; (2) its clean generation portfolio in the Nordics; (3) a moderate contribution from regulated electricity distribution and district heating activities; (4) an increasing contribution from contracted renewables; and (5) its solid financial profile with funds from operations (FFO)/net debt in the high 20s as of 2020

Long term rating: BBB+[1]
Short term rating: A-2
Outlook: Stable
Latest publication:* *4 February 2021

- "Vattenfall managed to keep its operating performance relatively unchanged in 2020 compared with 2019, despite record low power prices, which we view as a support for the current rating."
- "Profitability continues to be underpinned by its diversified earnings base, with increased contributions from the heat business divisions partly offsetting the lower contribution from its power generation segment, which was also supported by hedges in place."
- "We anticipate that Vattenfall will gradually benefit from a recovery of Nord pool system spot prices in the Nordic region."
- "Although a continued stronger-than-expected financial risk profile could lead to upside rating pressure, we believe that Vattenfall's credit ratios will soften over 2021-2022. This is because investments are set to increase to about SEK 57 billion over 2021 and 2022, up from SEK 23.6 billion in 2020."

[1] Rating factors in a one notch uplift given that Vattenfall is 100% owned by the Swedish state

Vattenfall credit highlights



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-free[1] 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-free[1] 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)

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Green bond investor report

Investments under Vattenfall's Green Bond Framework, as of year-end 2020

								Of which green bond spent SEK million[2]		
Category	**Project/country**	**Type**	**Capacity/ impact**	**Est. CO_2 reduction (ktonnes)[1]**	**Vattenfall's share**	**Start/ completion**	**Total investment**	**2019**	**2020**	**Total**
Renewable energy and related infrastructure	Kriegers Flak/ Denmark	Wind offshore	605 MW	325	100%	2019/ 2021	7,600 MDKK	801	1,613	2,414
	Princess Ariane[3]/ Netherlands	Wind onshore	301 MW	350	100%	2018/ 2020	394 MEUR	1,073	1,170	2,243
	Hollandse Kust Zuid 1–4 /Netherlands	Wind offshore	1,500 MW	2,400	100%	2020/2023	2,600 MEUR	–	14	14
Industry projects	HYBRIT/Sweden	Pilot project	Fossil-free steel	–	33%	2019/ 2021	858 MSEK	51	232	283
Total								**1,925**	**3,029**	**4,954**
Not yet used										5,080
Grand total										**10,034**

[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 which will decline over time as the energy system decarbonises. Actual production, emission factors and savings will vary

[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 2020

[3] The project was formerly called Wieringermeer and Wieringermeer extension

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 CO_2 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"

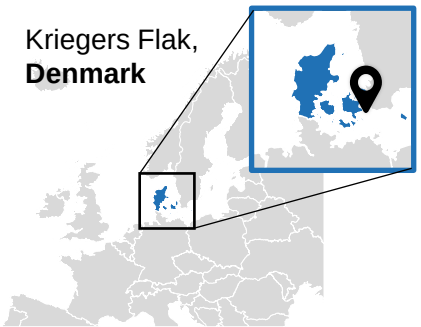
	Categories	Green shading
	Renewable energy and related infrastructure	Dark Green
	Energy efficiency	Medium to Dark Green
	Electrification of transport and heating	Dark Green
	Industry projects	Dark Green

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 Gamesa Turbines 8.4 MW
Ownership	100% Vattenfall
Total Investment (SEK million[1])	10,200
Green bond/spent (SEK million[2])	2,414
Estimated CO_2 reduction[3]	325 ktonnes p.a.
Completion	2021

Project Timeline

2016: Winning of tender

2017: Siemens Gamesa wins the turbine tender

2018: Remaining tender packages signed

2019-2021: Construction and installation

2021: Commissioning

[1] Year end exchange rate as per 31 December 2020
[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 2020
[3] Production from offshore wind estimated to 3.5 GWh/MW installed. Actual production factors and savings will vary

Princess Ariane

UN SDG's

Overview

- Princess Ariane is the largest onshore wind farm in the Netherlands
- The project is completed in 2021
- The electricity generated by the wind farm is used to power a nearby data centre, saving approximately 350 ktonnes of CO_2 emissions per year

Key data

Capacity	301 MW
Country	The Netherlands
Technology type	Wind onshore
Turbine model	Nordex N117 3.6 MW
Ownership	100% Vattenfall
Total Investment (SEK million[1])	4,000
Green bond/spent (SEK million[2])	2, 243
Estimated CO_2 reduction[3]	350 ktonnes p.a.
Completion	2021

Project Timeline

[1] Year end exchange rate as per 31 December 2020
[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 2020
[3] Production from offshore wind estimated to 3.5 GWh/MW installed. Actual production factors and savings will vary

Hollandse Kust Zuid

UN SDG's

Commitment to build the world's first subsidy-free offshore wind farm in the Netherlands

ACHIEVEMENT: After winning sites 1 & 2 in 2018, Vattenfall was awarded sites 3 & 4 in July 2019. The world's first subsidy-free offshore wind farm will be put in operation at the latest by 2023.

OUR WINNING FORMULA

- Project with excellent site conditions (shallow waters, proximity to shore) combined with continuous cost reduction focus and portfolio approach
- Attractive opportunity to support the Dutch energy transition
- Strong customer base demanding renewable energy

KEY DATA

Capacity	2 x 760 MW
Grid connection	provided by TenneT
Distance from shore	18-30 km
Water depth	18-28 m
Foundations	monopiles
Turbine model	140 x SG 11.0-200 DD
Ownership	50.5% Vattenfall/ 49.5% BASF

TIMELINE

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
Survey of seabed in the North Sea 2019	Design and tendering 2019-2020	Material orders and equipment production 2020	Installation of wind turbines 2022-2023	Wind farm commissioned 2023

More info: https://vattenfall-hollandsekust.nl/en/

HYBRIT

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

UN SDG's

HYBRIT FOSSIL-FREE STEEL

A joint initiative by LKAB SSAB VATTENFALL

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 fossil-free hydrogen
- The result will be the world's first fossil-free steel, with virtually no carbon footprint

Why is this important?

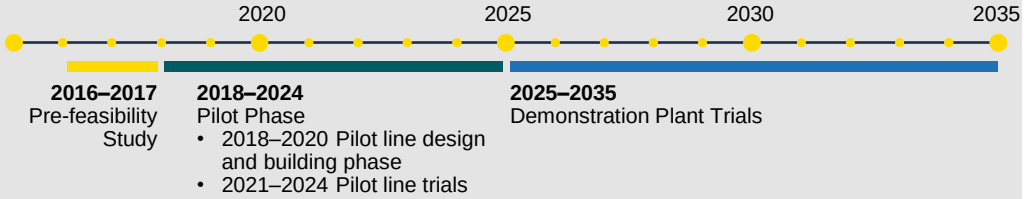
- The steel industry is one of the highest CO_2-emitting industries, accounting for 7% of global and 10% of Swedish total CO_2 emissions
- Steel demand is set to grow due to population and urbanisation → carbon footprint of the industry needs to be addressed

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.

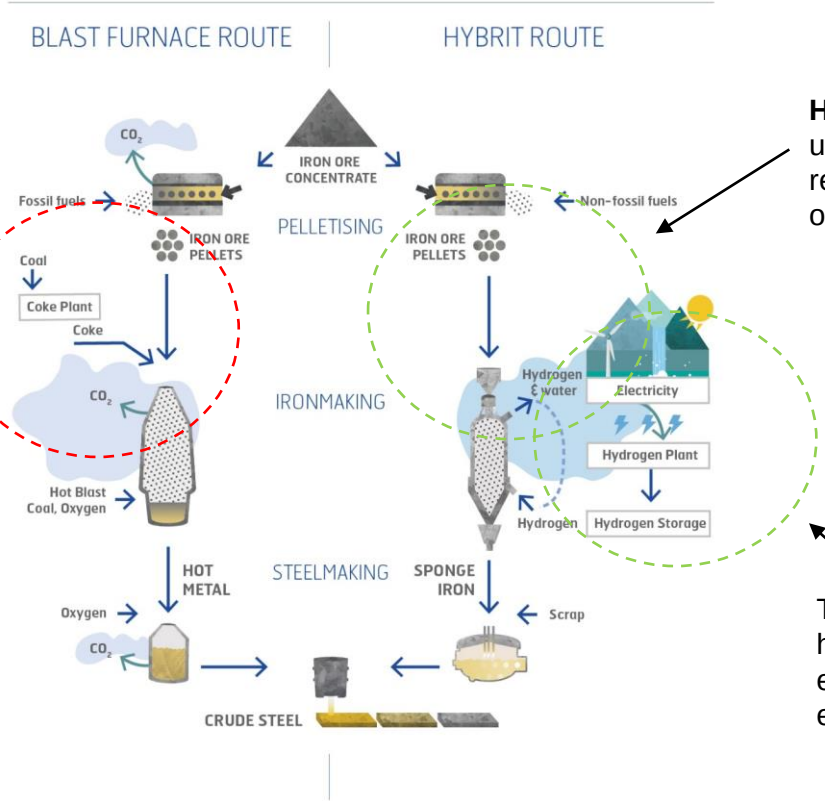
Main project phases



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 CO_2 emissions



HYBRIT: Iron metal is produced by using hydrogen gas as the main reductant. Hydrogen reacts with iron oxides to form water instead of CO_2

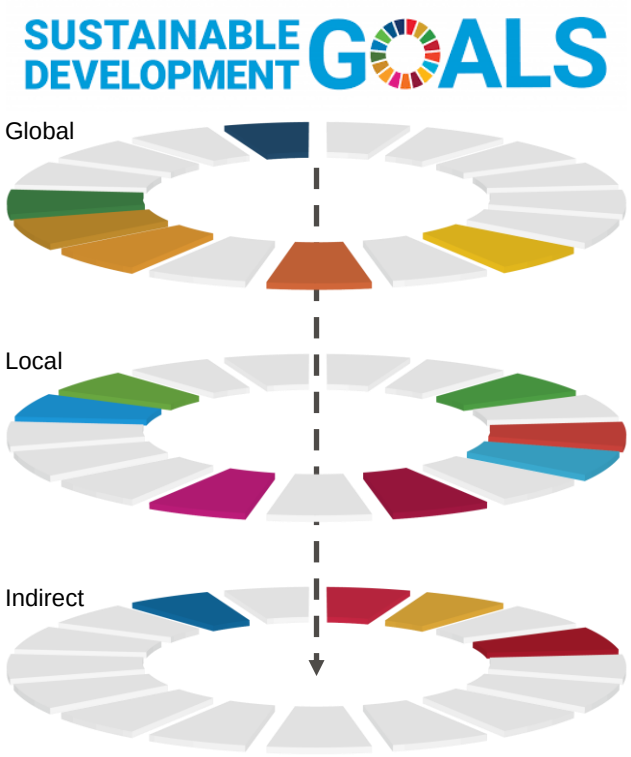
The hydrogen used is green hydrogen i.e. produced by electrolysis of water using fossil-free electricity

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)



Vattenfall's contribution to the UN Sustainable Development Goals

Strategic SDGs with global impact

Vattenfall contributes to the goals through its commercial operations. Contributions to these goals have global impacts and are the result of implementing our strategy, in particular when it comes to climate change and consequences for the energy system.

Responsible operations SDGs with local impact

Vattenfall contributes to the goals through its ways of working. Our responsible operations contribute locally, whether in the form of e.g., health & safety or internal diversity standards, or working to have a net positive contribution to biodiversity at our external operating sites.

Responsible supply chain SDGs with indirect impact

Vattenfall contributes to the goals through its engagement and influence in the value chain via suppliers and partners. By engaging only with suppliers and partners who meet our social and environmental standards, we ensure that they make positive contributions to the goals that are most relevant for developing countries, as exemplified here.

Execution of our strategy contributes the most to six prioritised goals

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

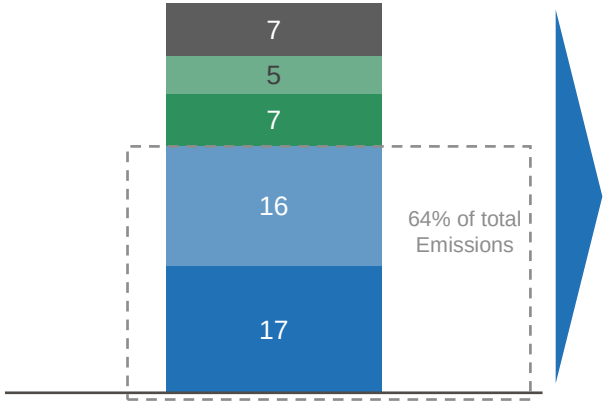
Examples of contribution to our selected SDGs by sub-category

SDG	Target	Examples
	**7.2** By 2030, increase substantially the share of renewable energy in the global energy mix.	In addition to commission an extra 334 MW of new renewables, we took the decision to build the world's largest non-subsidised offshore wind farm
	**9.4** By 2030, upgrade infrastructure and retrofit industries to make them sustainable.	Vattenfall's Power-as-a-Service offering enables industries to smoothly transition from fossil-fuels to fossil-free electricity.
	**11.6** By 2030, reduce the adverse per capita environmental impact of cities.	The 25,600 charging points we operate, and 90,000 that our customers have access to, as well as our partnerships with local city mobility providers, help reduce transport emissions in cities.
	**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.	By integrating waste heat and heat pumps, Vattenfall's Heat operation in the UK will introduce a district heating system that will deliver low-carbon and low-cost heat. Over 90% of residual products from our combustion plants are sold to the construction industry for re-use.
	**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 grid 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.	Vattenfall has formed an environmental fund with seven other hydro power companies which will invest SEK 10 billion over a 20-year period to improve the aquatic environment in Sweden.

Going beyond our own production maximises CO_2 impact

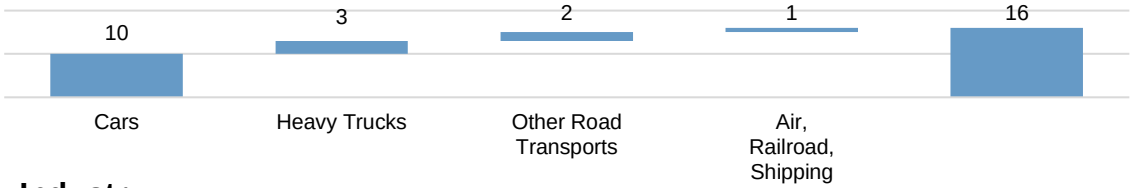
All parts of society need to adjust – electrifying transports and industry is key to enable a fossil-free life

Total green house gas emissions Sweden[1] (2018) 52 $MtCO_2e$



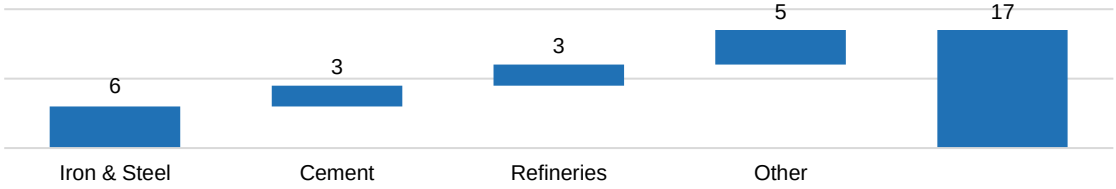
Transports

$MtCO_2e$



Industry

$MtCO_2e$



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

VATTENFALL

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

Developing the world's first fossil-free steel

HYBRIT FOSSIL-FREE STEEL

VATTENFALL

Cooperation in large scale bio-diesel production

preem

VATTENFALL

Northern Europe's largest charging network for e-vehicles

InCharge

VATTENFALL

Electrification of mines and smelters

BOLIDEN

KAUNIS IRON

VATTENFALL

Co-operation for e-mobility

SL VOLVO

VATTENFALL

Green guaranteed energy delivery large customers, e.g.

Microsoft BOSCH BASF

VATTENFALL

Support of a major enterprise for battery production in Sweden

northvolt

VATTENFALL

The world's first fossil-free motorcycle

cake

VATTENFALL

Powering sustainable datacenters

NODE POLE

VATTENFALL

Developing flexible solutions for grid stability

eramet GRÄNGES NOBIAN

VATTENFALL

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

Top material topics

1. Reducing CO_2 emissions and phasing out fossil fuels
2. Investing in renewable energy
3. Providing affordable 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	9	11	12	13	17
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, CO_2 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

Biodiversity – examples of actions

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

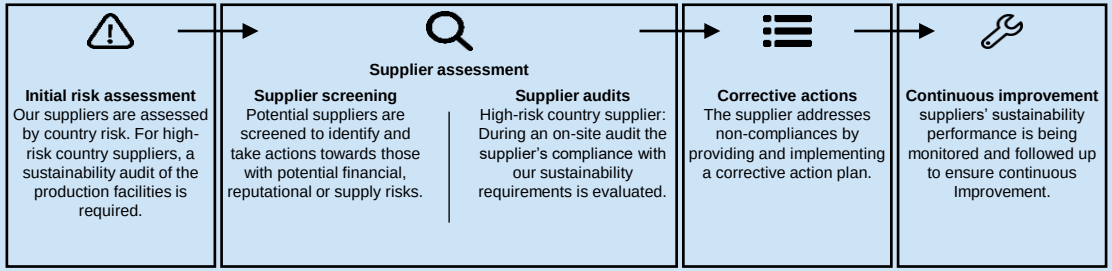
Business area	Aim		Examples
Hydro power	Identify new solutions to reduce environmental impact of hydro power production Biotope restoration and species protection Knowledge building activities includes both research and pilot studies Preserve and manage biodiversity and enhance recreation values		"Laxeleratorn" is a unique, large-scale laboratory for hydro power-related environmental and hydraulic experiments that was inaugurated in 2018. It combines knowledge of biology and hydraulics to find solutions that allow and attract fish to safely pass by the power plant with the smallest possible effect on operations. In 2019, the main projects focused on innovation for downstream fish migration such as bubble curtains and flexible nets to avoid turbine passage. 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.
Offshore wind power	Limit impacts on the marine environment Reduce impact on and contribute to conservation of fauna		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.
Power distribution	Maintenance of habitats and protecting species		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.

Sustainability throughout the supply chain

Key activities in our sustainable supply chain work

- **New supplier risk assessment tool** provides a more precise risk categorization of our supplier base covering environmental, social, human rights, business and governance risks.
- **Deep-dives conducted** on full value chain of new, exposed, or high-risk product categories, investigating environmental and social risks and opportunities
- **Counterparty onboarding approach** ensures quality due diligence and enables strategic resource allocation throughout Vattenfall
- **Platform for best practice sharing** enables faster integration of sustainability criteria into all types of contracts
- **Education and awareness raising** both internally and with suppliers on general and high-risk issues, via tools, trainings, and improved guidance documents

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



Sustainable supply chain across four primary sourcing and purchasing streams (2020 data)

	Number of suppliers	Primary products	Primary countries	Number of site audits conducted	% new suppliers that have undergone social/environmental assessments	% new suppliers from high-risk countries that have undergone social/environmental assessments
Goods and services	~31,000	Diverse	Sweden, Germany, Netherlands	4	100%	NA*
Commodity fuels	~40	• Coal (C) • Gas (G) • Biomass (B)	• C: Russia, USA • G: Russia • B: Baltic states	34 (external audits)	100%	NA*
Heat fuels	~100	Biomass, waste	Primarily (60-100%) local to country of use	1	67%	NA*
Nuclear fuel	~10	Uranium	Namibia, Canada, Australia, Kazakhstan and Russia	4	No new suppliers	NA*

*Not applicable. No new suppliers from high risk countries

For more info: See page 167-168 in Vattenfall's Annual- and Sustainability Report 2020

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 CO_2 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)[1].

Climate change affects Vattenfall

Today, the world is about 1 ºC 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.

1 For more info see page 69 in the Annual- and sustainability report 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

95.8 TWh of electricity sold in 2020

25,600 connected charging points for electric vehicles

Key data

	FY 2020	FY 2019
Net sales (SEK bn)	86.3	89.9
External net sales (SEK bn)	84.7	87.3
Underlying EBIT[1] (SEK bn)	2.1	1.3
Sales of electricity (TWh)	95.8	89.5
- of which, private customers	26.3	28.0
- of which, resellers	8.0	6.5
- of which, business customers	61.5	55.0
Sales of gas (TWh)	52.1	54.2
Net Promoter Score (NPS) relative[2]	+2	+1

[1] Operating profit excluding items affecting comparability

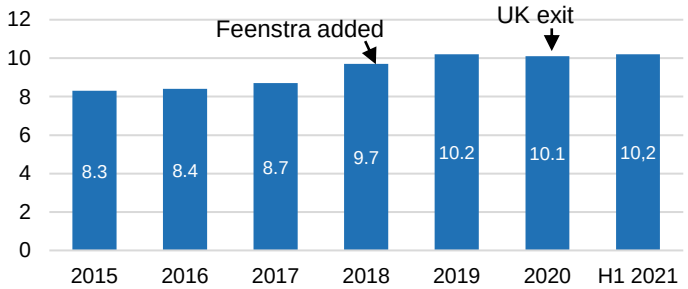
[2] NPS is a tool for measuring customer loyalty and for gaining an understanding of customers' perceptions of Vattenfall's products and services

Customers & Solutions

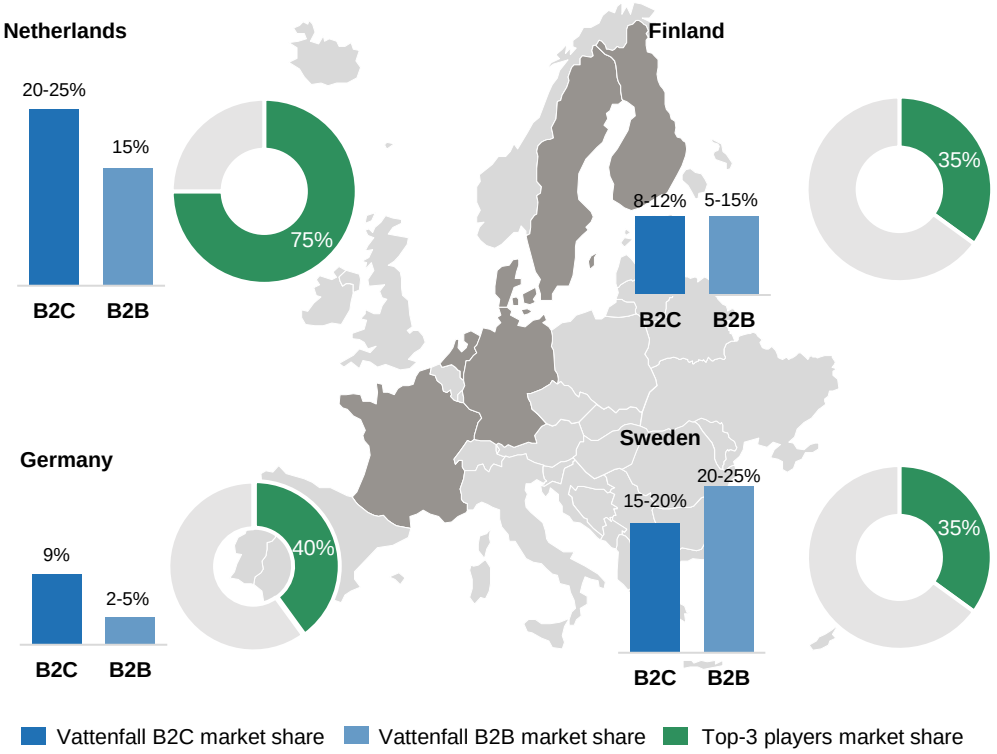
Market overview

- 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[1] electricity contracts) and in the Netherlands (3.8 million[1] electricity and gas contracts)
- In Germany we supply electricity and gas to retail customers (3.9 million[1] 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 in France also of gas.

Customer contracts (total), in millions



Vattenfall and top-3 players market share, main markets



1 Year-end 2020 numbers

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

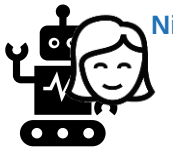
>8m Dutch citizens uses WhatsApp daily → WhatsApp launched as an additional customer service channel in 2019

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

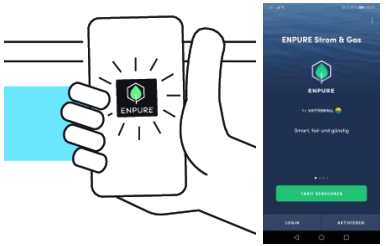
Customer Service via WhatsApp

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 CO_2 neutral, reaching tens of thousands of customers



E-mobility – enabling the electrification of transports

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

InCharge

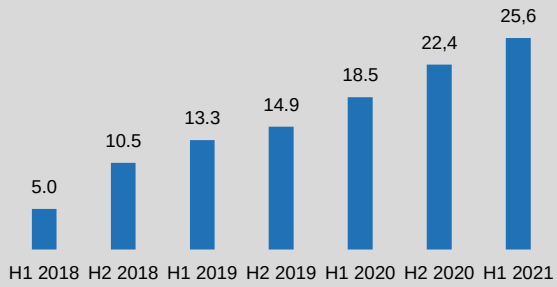
InCharge is fully owned by Vattenfall but grows together with our partners. We take care of all the details with end-to-end services, offering everything from infrastructure and hardware installation to software and connected services – all backed up with expertise and advice.

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.

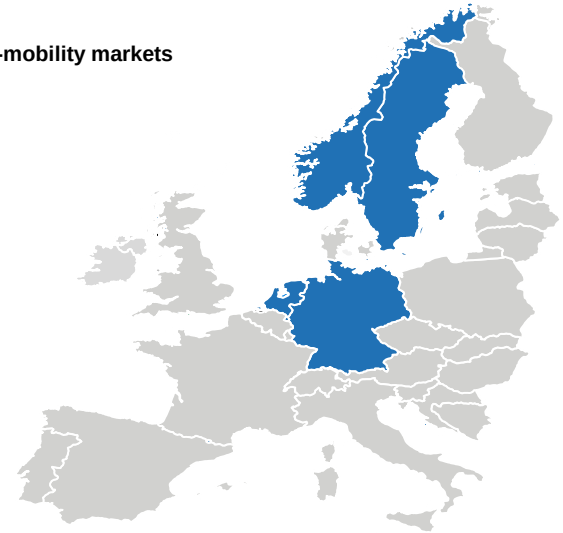
The e-mobility market is rapidly developing, and new players are shaping their roles in the value chain. Vattenfall therefore needs to be innovative and agile, taking advantage of the multitude of services our organisation as well as our partners can offer.

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.

Number of charging points (thousand)



E-mobility markets



Partners (examples)

bp, ARAL, McDonald's, Volvo, Hyundai, Taxi Stockholm 150000, Trafineo, City of Amsterdam, Athlon, aimo, tanka, Castrol, We share, SchipholTaxi, Deloitte., Göteborg Energi, GESOBAU

For more info: See page 34-35 in Vattenfall's Annual- and Sustainability Report 2019

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

5.5 GW nuclear power

11.5 GW hydro power

5.6 SEK bn services revenues

8 GW PPAs under management

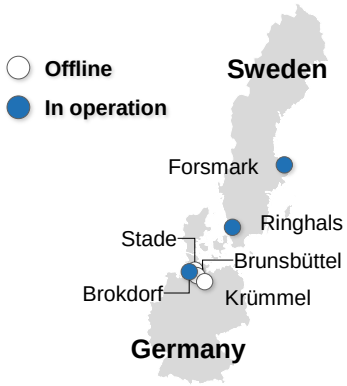
Laxede power plant, Sweden

Key data

	FY 2020	FY 2019
Net sales (SEK bn)	90.1	102.4
External net sales (SEK bn)	36.6	38.4
Underlying EBIT[1] (SEK bn)	14.7	15.4
Electricity generation (TWh)	79.0	89.2
- of which, nuclear	39.3	53.3
- of which, hydro	39.7	35.7
Customer sales of electricity (TWh)	20.0	27.0
- of which, resellers	17.9	22.8
- of which, business customers	2.1	4.2

[1] Operating profit excluding items affecting comparability

Nuclear power



Vattenfall's nuclear power plants

- Vattenfall owns eleven nuclear reactors. Seven reactors are located in Sweden (four at Ringhals, three at Forsmark), and three in Germany (Brunsbüttel, Krümmel and minority stakes in Brokdorf and Stade)
- Five of our reactors are in commercial operation in Sweden and one reactor; Brokdorf, is in commercial operation in Germany (to be closed by year-end 2021)
- Vattenfall's power generation in 2020 amounted to 39.3 TWh (53.3). Combined availability was 76.4 % (87.8%)

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%	Sydkraft Nuclear Power AB (29.6%)	Ringhals 1: 1976; Ringhals 2: 1975; Ringhals 3: 1981; Ringhals 4: 1983	Ringhals 2: 2019; Ringhals 1: 2020	In operation	Ringhals 1 & 2: Shutdown, in pre-decommissioning planning
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 2021
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

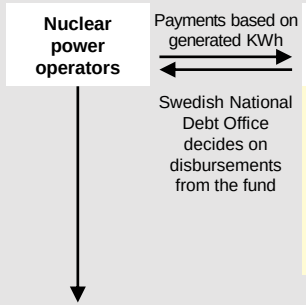
In Sweden

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 Waster 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



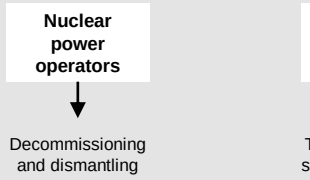
Financial implications	EBIT	Funds from operations (FFO)	Adjusted net debt (AND)
Valuation of nuclear provisions	Provision value depreciated over operating life-time of nuclear power plant	N/A	Included in AND
Payments to the Swedish Nuclear Waste Fund	No impact	Negative impact through payment to the Swedish 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

116 SEK billion[1]

Germany



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 activities	N/A	Negative impact	AND neutral

[1] Remaining costs based on the latest calculation (plan 2019).
[2] Decommissioning and dismantling are the responsibility of the nuclear power operators and are not included in SKB's operations.

Hydro power

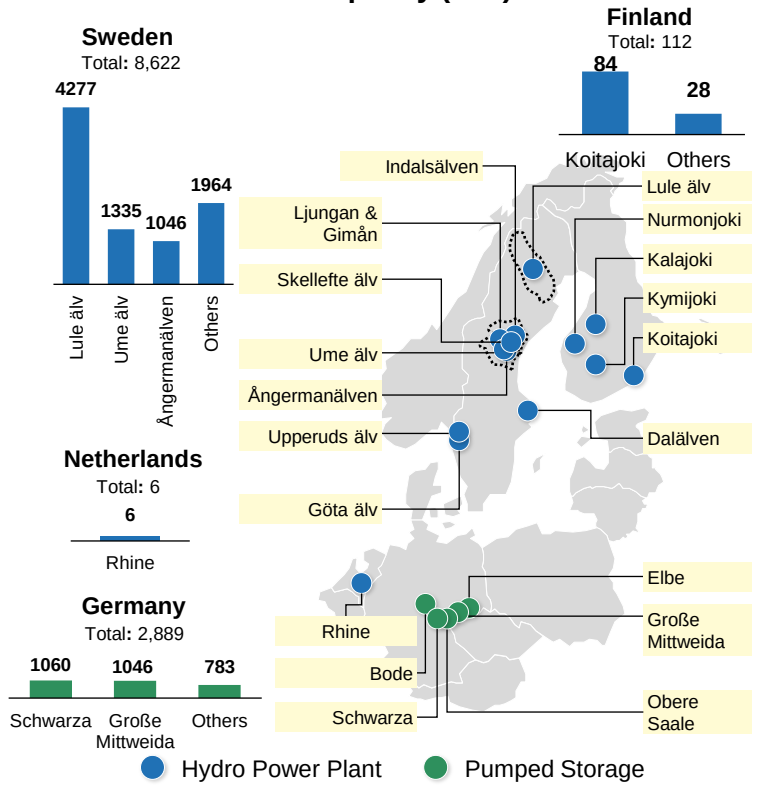
Hydro overview

- We own and operate hydro power plants, most of which are located in Sweden (79 sites). Additional sites are located in Germany (pumped storage, 8 sites), Finland (9 sites) and the Netherlands (1 site). In 2020, Vattenfall's hydro power capacity of 11.5 GW generated 39.7 TWh (35.7)
- 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	604	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

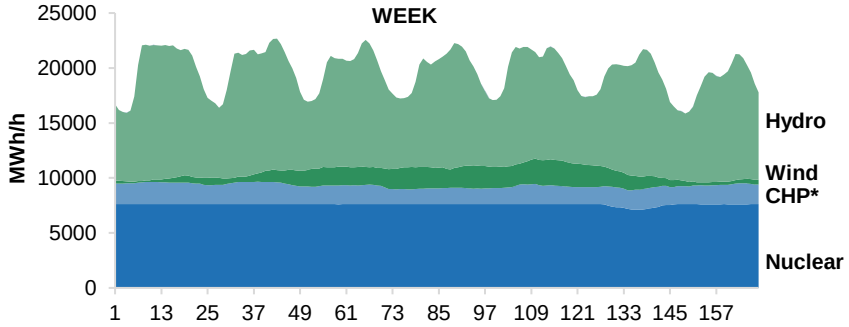
River stream installed capacity (MW)

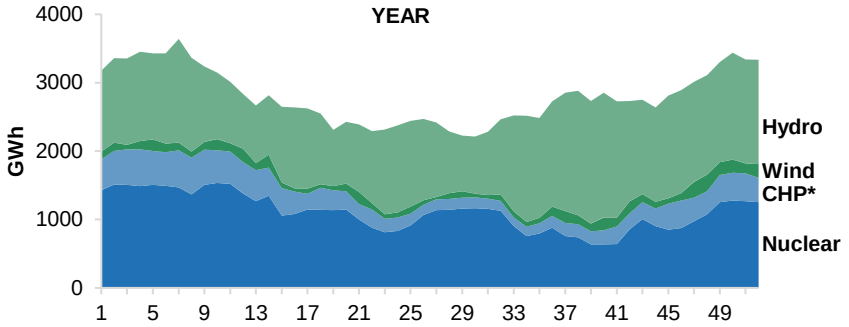


The inherent flexibility of Vattenfall's hydro power visualised

Intrahourly fluctuations	Hourly fluctuations	Daily fluctuations	Seasonal fluctuations	Yearly fluctuations
Balancing and Intraday	*Intraday & Day Ahead markets/ contracts*	*Day Ahead markets/ contracts*	*Forwards, markets for futures*	*Forwards, markets for futures*
Hydro	Hydro	Hydro	Hydro	Hydro

Up and downward regulation





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 CO_2 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)

*Combined heat and power plant (CHP)

Sample deals on Corporate PPAs and PPAs

CPPA: ~1 TWh	AG Barr	22 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, BOSCH	60 GWh	Vattenfall will provide solar power to Deutsche Telekom from a 50 MW solar farm over a tenor of 10 years and to Bosch from a 10 MW solar farm for 12 years. Both solar farms are located in North-East Germany.
PPA: ~ 8 GW	Energy Infrastructure Partners, ENERCON	253 MW	Vattenfall has signed a 6-year agreement with Energy Infrastructure Partners and Enercon regarding balancing services and market access for the windfarm Markbygden Phase II North
	Windpark Zeewolde	300 MW	Vattenfall has signed a 15-year purchase agreement for renewable electricity from the Zeewolde onshore wind farm in the Netherlands

German nuclear settlement

Progress update

Financial effect of the nuclear settlement

Million EUR	Jan-Mar 2021	Apr-Jun 2021	Jul-Sep 2021	Total
Sale of 20.1 TWh production rights in 2021	139	94	121	**354**
Compensation from the German government		1,606		**1,606**
Reversal of sold production rights 2019-Q1 2021		-608	-121	**-729**
Total	**139**	**1,092**		**1,231**

Comments

- Germany's Bundestag (the lower house of Parliament) approved the agreement to compensate nuclear plant operators for losses incurred due to the country's nuclear phase-out
- The law was signed by federal president of Germany and published in Bundesgesetzblatt on 10 August 2021
- The law is coming into effect on 31 October 2021
- Transaction to take place in November 2021, and thus will affect FFO in Q4

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

1.6 GW installed onshore wind capacity

> 1 GW solar and batteries pipeline

Installation of wind turbine at Ormonde offshore wind farm, UK

Key data

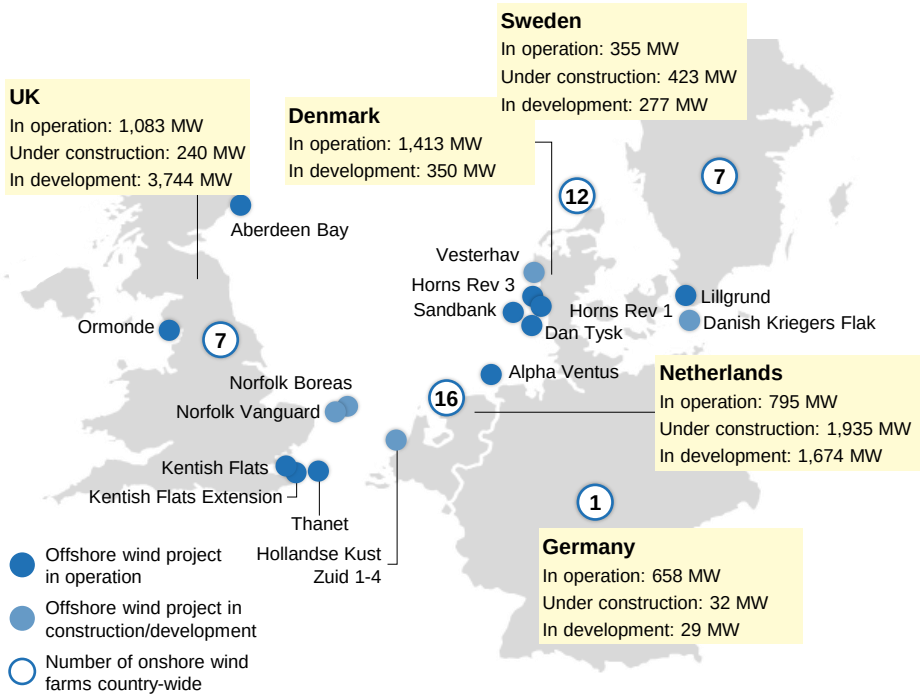
	FY 2020	FY 2019
Net sales (SEK bn)	13.6	13.5
External net sales (SEK bn)	6.9	6.6
Underlying EBIT[1] (SEK bn)	4.0	4.2
Electricity generation (TWh)	10.8	9.5
Investments (SEK bn)	5.8[2]	9.2

[1] Operating profit excluding items affecting comparability
[2] Excluding investments in projects under develop-to-sell assumptions

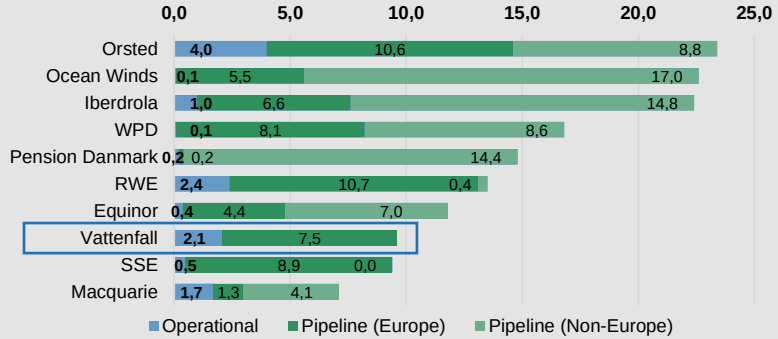
A leader in the European renewables transition

Strong position within offshore wind and extensive European pipeline ahead

Geographical overview – we develop, construct and operate wind and solar PV farms in our core European markets[1]



Capacity of top 10 Global Offshore Players (GW)[2]



[2] 4cOffshore database as of July '21; Net capacity (i.e. only showing owned capacity)

Under construction and pipeline[1]

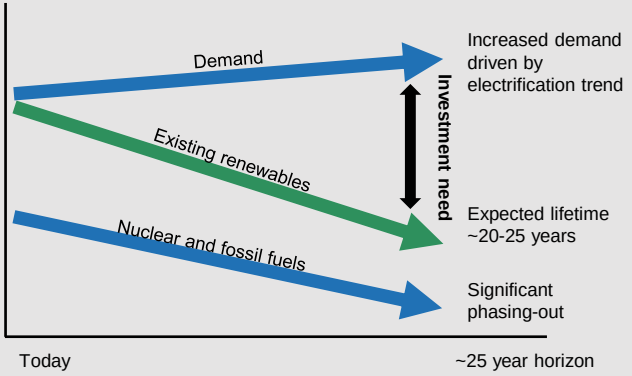
~ 3 GW	> 4 GW	~ 2 GW	~ 200 MW
Wind projects under construction	Wind projects in mature stage development	Solar PV projects in development	Batteries pipeline

[1] As of August 2021

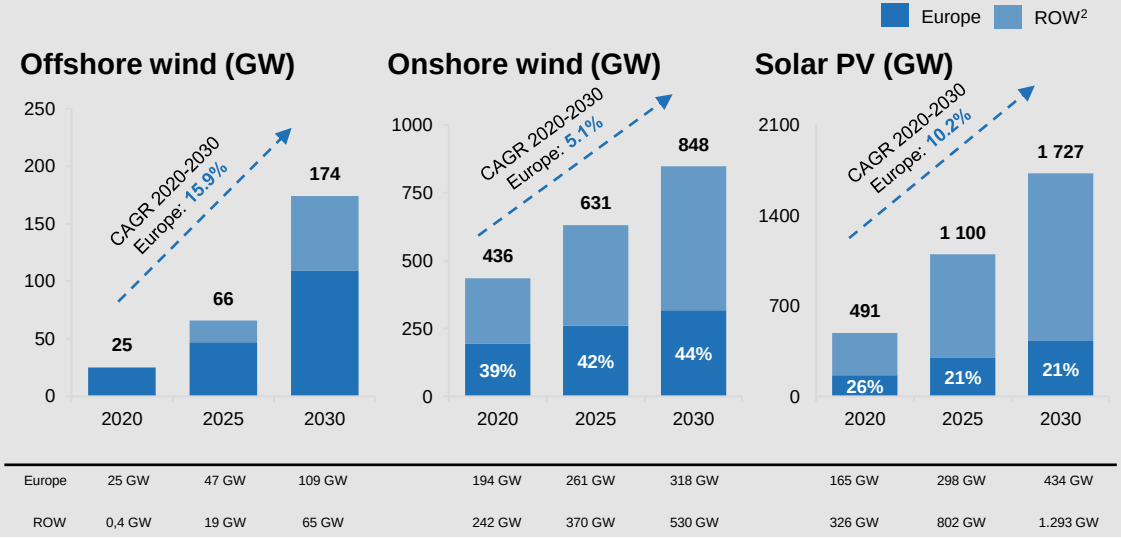
Europe continues to be a highly attractive growth market

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 2030[1]

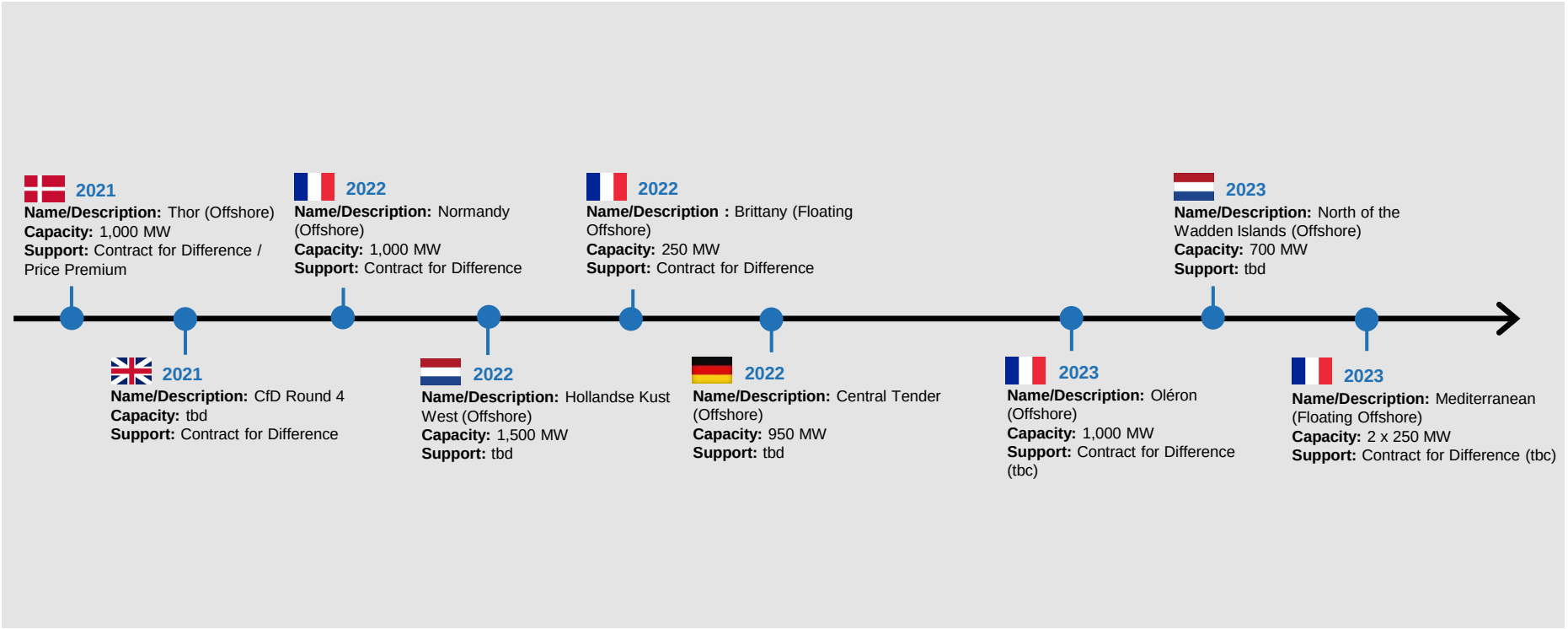


	Offshore wind (GW)			Onshore wind (GW)			Solar PV (GW)		
	2020	2025	2030	2020	2025	2030	2020	2025	2030
Europe	25 GW	47 GW	109 GW	194 GW	261 GW	318 GW	165 GW	298 GW	434 GW
ROW	0,4 GW	19 GW	65 GW	242 GW	370 GW	530 GW	326 GW	802 GW	1.293 GW

[1] Source: Wood Mackenzie, cumulated capacity; Solar numbers extrapolated 27+
[2] ROW excludes China

Pipeline of opportunities supports Vattenfall ambitions

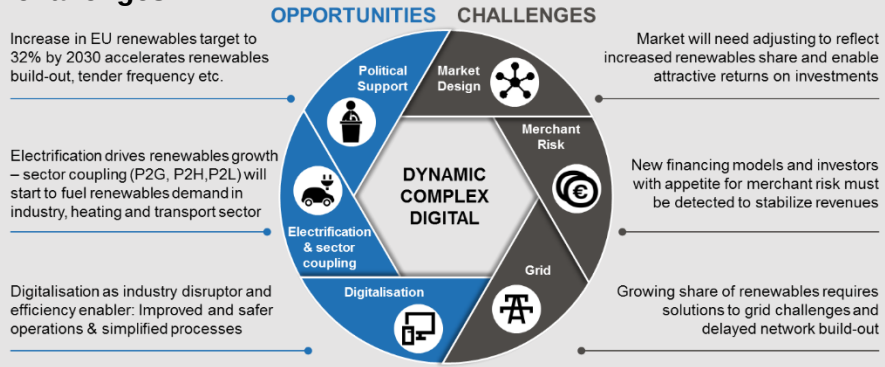
Several upcoming offshore wind tenders in relevant markets



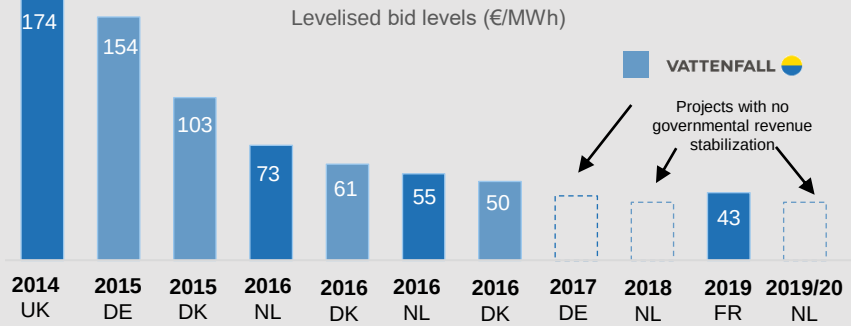
Maturing renewables - challenges and opportunities

LEC development will be key going forward

Maturing renewables industry creates opportunities and challenges



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



…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

…while our good reputation helps securing corporate PPAs

Princess Ariane

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 PV (7 MW)

Partner: Patronale

Deal structure: sale of 100% stake in operating solar PV 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

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:	• 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	• 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:	• The eligible producer receives premium from the TSO Energinet.dk equivalent to the difference between the spot market price and the fixed support income	• Depends on the type of technology and date of commissioning
	Contracts for Difference (CfD)	Founding year: 2014 Status: In force Eligible technology:	• 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 to the two to RE generator • If Strike price < market price: Then RE generator must pay the difference to the CfD counterparty	• CfD contracts are awarded for a period of 15 years
	ROC scheme	Founding year: 2002 Status: In force Eligible technology:	• 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	• ROC is issued for a period of 20 years • RO scheme is closed for generating capacity after 31st March 2017
	MEP[1]/ SDE+ / SDE++	Founding year: 2011 Status: In force Eligible technology[2]:	• Provides a feed-in-premium subsidy that covers the financial gap between the cost of the subsidised sustainable technology and the cost of the fossil alternative, for instance 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 overall budget: SDE+ €4 billion and SDE++ €5 billion, 2021 overall budget: SDE++ €5 billion	• The premium is paid for a period of up to 15 years • SDE++ will be further broadened with more differentiation in the current technologies and with other CO_2 abatement options
	EEG	Founding year: - Status: In force Eligible technology:	• 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	• Market premium is paid for a period of 20 years
	The Electricity Certificate System	Founding year: 2003 Status: In force Eligible technology:	• 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	• 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

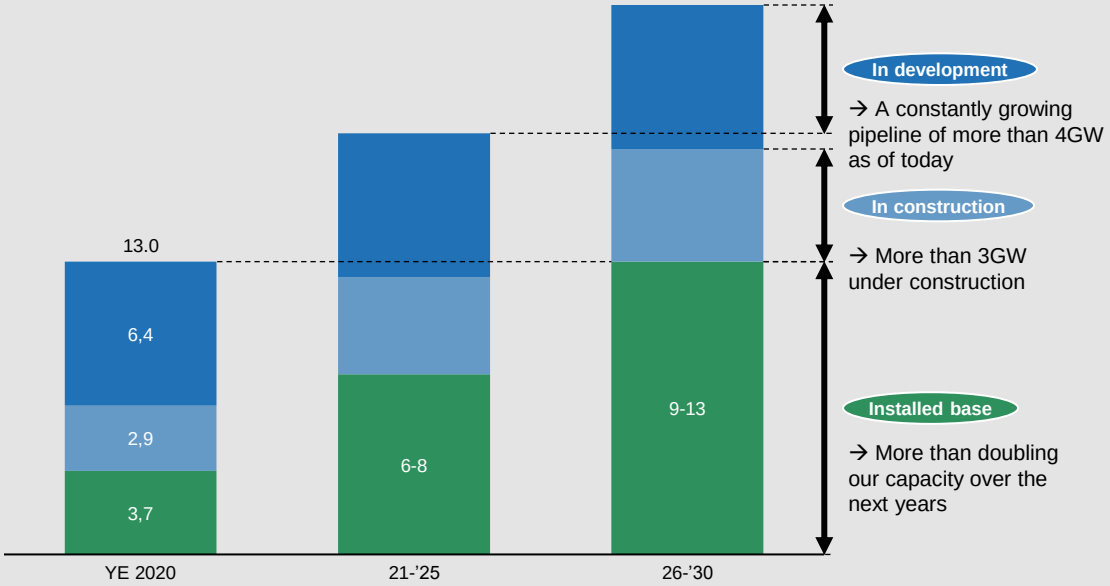
[1] Older version of the SDE+ scheme

[2] Including other renewable sources and CO_2 abatement technologies such as biomass, geothermal, aqua thermal, CCS, heat pumps, e-boilers, hydrogen, etc

Pipeline of opportunities supports Vattenfall ambitions

Many projects in pipeline[1] and several upcoming tenders in relevant markets

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



Highlights 21-30

- Jaap Rodenburg 2
- South Kyle
- Hollandse Kust South

- Vesterhav projects
- Norfolk Projects
- Windplan Blauw

1 Pipeline includes wind, solar and batteries

Wind & Solar - Installed capacity (MW[1]) Q2 2021

	Solar	Onshore	Offshore	Total
United Kingdom	5	391	687	1.083
Denmark	0	237	1.170	1.407
The Netherlands	70	576	0	647
Sweden	0	218	110	328
Germany	3	19	636	658
Total (MW)	**78**	**1.442**	**2.603**	**4.122**

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
Höge Väg (50%)	37
Hjuleberg (50%)	36
Juktan (50%)	29
Installed capacity (MW)	**328**

Denmark – FIT scheme	
Kriegers Flak	605
Horns Rev 3	407
Horns Rev 1 (60%)	158
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
Ejsing (97%)	7
Lyngmose	5
Installed capacity (MW)	**1.407**

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(+)	
Princess Ariane	298
Princess Alexia	122
Haringvliet	38
Slufterdam	29
Haringvliet	18
Eemmeerdijk	17
Irene Vorrink	17
Nieuwe Hemweg	13
Hoofdplaatpolder (70%)	10
Reyndersweg (50%)	9
Echteld	8
Moerdijk	8
De Bjirmen	6
Oom Kees (12%)	6
Oudendijk	5
Mariapolder	5
Hiddum Houw	4
Eemshaven	6
Velsen	2
Enkhuizen	2
Hemweg	2
Diemen	1
Decentral Solar installations	21
Installed capacity (MW)	**647**

[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	Owner-ship (%)	Com-missioning	Current status
NL	Hollandse Kust Zuid 1-4	1.520	-	X	-	50,5	2023	Onshore works ongoing, Partnering with BASF
NL	Wieringermeer	185	SDE+	X	15 yrs	100	2019/2020	Completed construction
NL	Wieringermeer ext.	118	SDE+	X	15 yrs	100	2021	Commissioning ongoing
NL	Moerdijk	27	SDE+	X	15 yrs	100	2021	Commissioning ongoing
NL	Haringvliet	22	SDE+	X	15 yrs	100	2021	Commissioning ongoing
NL	Nieuwe Hemweg	13	SDE+	X	15 yrs	100	2021	Completed construction
NL	Ny Hiddum Houw	19	SDE+	X	15 yrs	100	2022	Under construction
UK	South Kyle	240	-	N/A	-	100	2022	Under construction
NL	Jaap Rodenburg	30	SDE+	X	15 yrs	100	2021	Under construction
NL	A16	20	SDE+	X	15 yrs	100	2022	Under construction
SE	Blakliden + Fäbodberget	353	Certs	N/A	-	30	2022	Under construction
SE	Grönhult	67	Certs	N/A	-	100	2023	FID received in Q1 2021
NL	Haringvliet	38	SDE+	X	15 yrs	100	2020	Completed construction
DE	Kögel cluster	28	EEG	(X)		100	2021	Construction ongoing
NL	Haringvliet	12	FCR*			100	2021	Completed construction
In construction		**2.692**						
UK	Norfolk projects	3.600	CfD		15 yrs	100	2027-2029	Planning consent revoked, redetermination process in planning.
DK	Vesterhav	344	FIT	X	50.000hrs	100	2023/2024	Irrevocable permit received, preparing for FID Q4 2021
NL	Windplan Blauw	57	SDE+	X	15 yrs	100	2023	Preparing for FID
In development (in mature stage)		**4.001**						

Offshore
Onshore
Solar
Batteries

** FCR - Frequency Response Regulation*

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 / targets
- Heat generation & distribution systems are a platform to integrate other energy solutions, e.g. cooling, e-mobility, wind and solar
- In the UK a new agreement was signed to supply low carbon heat to another area[2] of 21,000 homes the UK government will fund its development
- Vattenfall is investigating the sale of its gas-fired power plant Magnum in Eemshaven in the Netherlands

Highlights

> 5,500 km heat grids in operation

8.7 GW heat capacity[1]

5.9 GW electricity capacity[1]

1.9 million heat related end customers

< 0.5% churn rate

Key data

	FY 2020[3]	FY 2019[2]
Net sales (SEK bn)	23.3	31.4
External net sales (SEK bn)	13.5	15.9
Underlying EBIT[4] (SEK bn)	1.0	0.6
Electricity generation (TWh)	22.8	31.7
Sales of heat (TWh)	13.8	17.1

[1] w/o Moorburg

[2] Including the district heating business in Hamburg until September 2019 which accounted for SEK 0.7 bn of Underlying EBIT, 1.1 TWh of electricity generation and 2.5 TWh of heat sales.

3 Excluding the district heating business in Hamburg (sold in September 2019) and Hemweg 08 power plant, closed in Dec 2019

4 Operating profit excluding items affecting comparability

Heat

Overview of markets and installed capacity

The Heat operating segment includes VF's heating & condensing businesses. Our core business is district heating, where we have growing end customer base[1] in large metropolitan areas like Berlin, Amsterdam, Uppsala & London. In the UK, Vattenfall has secured several contracts to supply low carbon district heating and help decarbonise the real estate sector. The first project in the UK is planned to be operational in 2023. The condensing business consists of gas-fired power plants in the Netherlands.

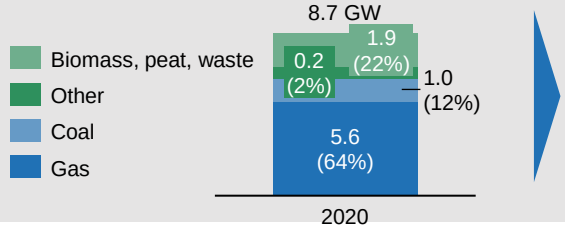
Heat cluster 2020

	Heat (TWh)	Power (TWh)
Germany	9.5	6.1
Sweden	2.6	0.1
Netherlands	1.7	-
Total	**13.8**	**6.2**

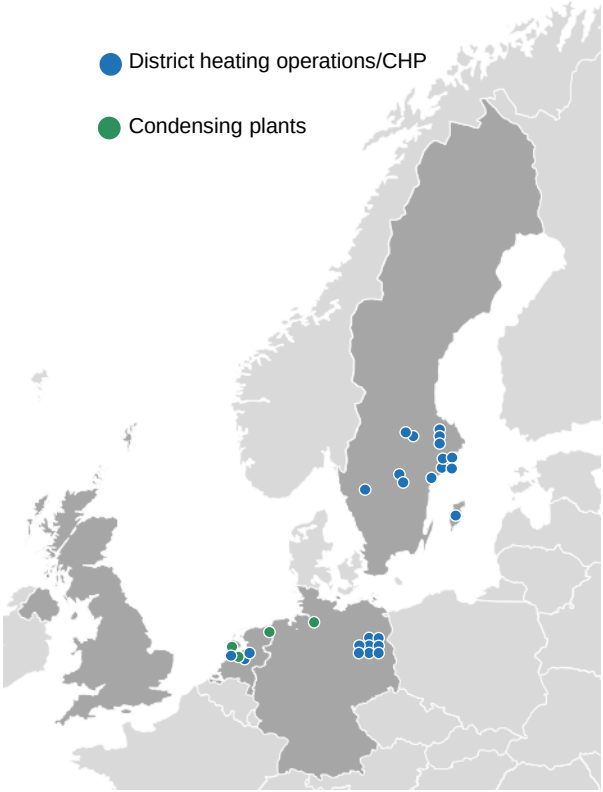
Condensing cluster 2020

	Heat (TWh)	Power (TWh)
Germany	0.1	1.9
Netherlands		14.7
Total		**16.6**

Installed capacity by GW heat



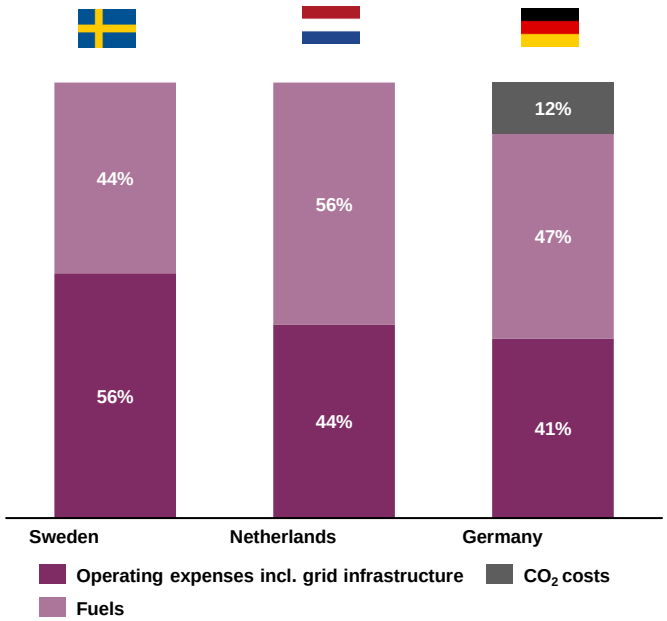
Transformation into fossil-free heat supply by 2040+



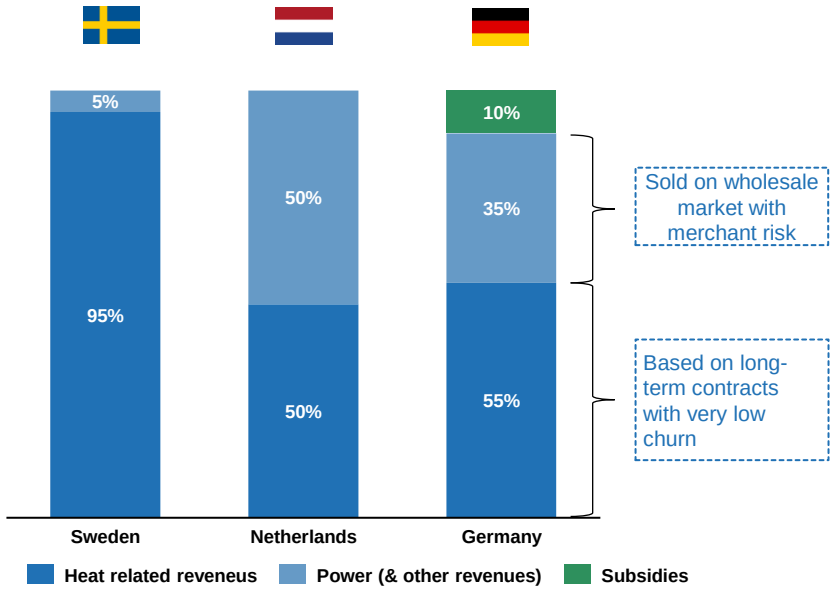
District heating revenue and cost structure per market

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

Political support for district heat across our markets

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

As of 2021-09-09

	Market maturity[1]	Political support	Competitiveness	Concession based	Price setting (heat)	Typical customer contract length
	"European Climate Law"	2030 climate target**: -55% net GHG[4] emission (compared to 1990 levels);** 2050 target: EU-wide climate neutrality **|**				
	„Fit for -55% package" tabled 14 July 2021	Increased **requirements for heating/cooling and buildings sector: share of renewables, phase out coal, demand reduction/energy efficiency | energy system integration;** CO_2 pricing, power-to-heat, increased positive perception for DHC (details to be investigated); Hydrogen one priority area.				
	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 Green heat funding program by federal ministry in preparation	**Highly competitive** Low primary energy factor for new houses Reliable and comfortable delivery of city heating	No	Price escalation formula for heat	up to10 years
	Mature + Transition to Green	Natural gas phase out boosts renewable district heating. New subsidy schemes for connecting existing houses	**Competitive pricing** against natural gas due to Heat Act, but because of the connection costs it's still cheaper today to stick to the gas boiler. Competitive in relation to heat pumps.	Mainly concession based, a typical term is then 30 years[3]	Heat supply via district heating has to be cheaper than pure gas-fueled boiler solutions. Other (maximum) tariffs are based on average sector costs	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

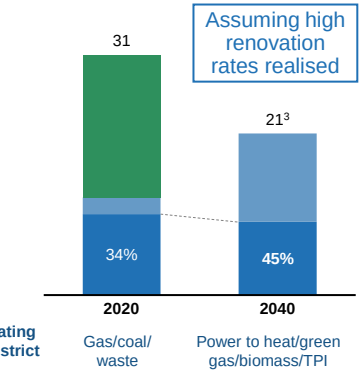
[1] Referring to how established the technology is on the market and the future growth prospects
[2] District heating market share of 30% in metropolitan areas follows governmental goal to reach low carbon heat supply by 17% district heating UK wide
[3] The other type of contract is the heat delivery contract. Contracts are then building-specific with a typical contract length of 10 years
[4] GHG: greenhouse gas emissions

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

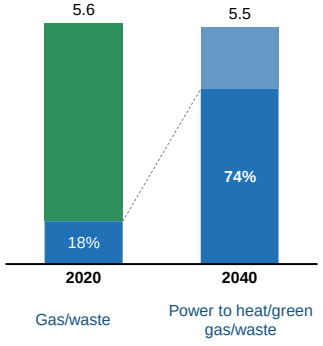
Berlin



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

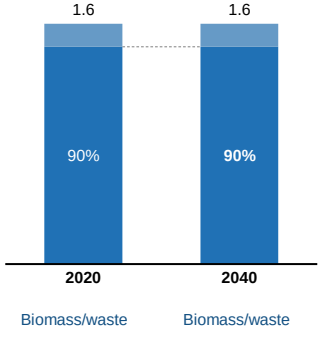
Amsterdam[1]



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

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

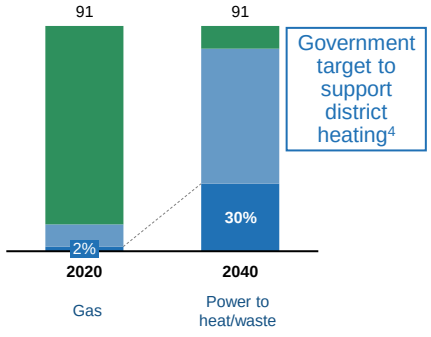
Uppsala[2]



Mature market with dominant market share of district heating

Stable heat demand – population growth offset by energy efficiency measures

London & Edinburgh



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

Stable heat demand – population growth offset by energy efficiency meaures

District Heat | Electricity, Renewables & Other | Fossil

[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

Overview of largest heat and condensing plants

Germany

Power and heat plants	Fuel	Capacity heat (MW)	Capacity electricity (MW)
Lichterfelde		609	300
Klingenberg		760	164
Reuter West		758	564
Marzahn		924	288
Mitte		680	444
Wilmersdorf		340	184
Charlottenburg		300	144
Moabit		247	123
Reuter		219	36
Scharnhorststraße		167	1
Buch		104	12,5
Lange Enden		111	4
Wallenroder Str.		106	6
Köpenick		47	11
Treptow		39	-
Friedrichshagen		29	-
Blankenburger Str		19	1
Altglienicke		25	1
Moorburg[1]		30	1,520

The Netherlands

Power and heat plants	Fuel	Capacity heat (MW)	Capacity electricity (MW)
Magnum		-	1,410
Velsen		-	725
Diemen		615	684
Hemweg 9		-	440
IJmond		-	144
Almere Hogering		175	-
Almere Stad		112	-
Schuytgraaf		60	-
Duiven Westervoort		59	
Waalsprong		41	
Vrije Universiteit		27	
Lelystad		25	12
Arena Hoterbergweg		20	

Sweden

Power and heat plants	Fuel	Capacity heat (MW)	Capacity electricity (MW)
Uppsala		907	130
Storvreta		18	
Jordbro		279	20
Idbäcksverket		234	35
Gotland		131	-
Motala		109	4
Vänersborg		80	-
Craboverket		79	-
Lyviksverket		66	-
Bollmora		50	-
Knivsta		45,5	-
Ekobacken		35	-
Fisksätra		23	-

Biomass Coal Gas Steam

[1] Coal-fired generation at Moorburg has been discontinued as of year-end 2020

Distribution

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Distribution

Leading owner and operator of electricity distribution grids in Sweden

Overview

- Largest operator of regional electricity distribution grids in Sweden and top-3 position in local grids
- 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 grids using both demand and supply side flexibility

Highlights[1]

900 000 household and business customers

>131,000 km of electricity grids

SEK 5.5 billion in investments 2020

SEK 53 billion RAB

Key data[1]

	FY 2020	FY 2019
Net sales (SEK bn)	12.0	11.8
External net sales (SEK bn)	11.4	11.3
Underlying EBIT[1] (SEK bn)	4.3	3.9
Investments (SEK bn)	5.5	5.1
SAIDI[2] (minutes/customer)		
Sweden	148	439[3]
SAIFI[4] (number/customer)		
Sweden	2.0	2.4
RAB		
Sweden	55.1	46.9

[1] Excluding the Berlin grid business which was sold on July 1, 2021
[2] Operating profit excluding items affecting comparability
[3] SAIDI: System Average Interruption Duration Inde

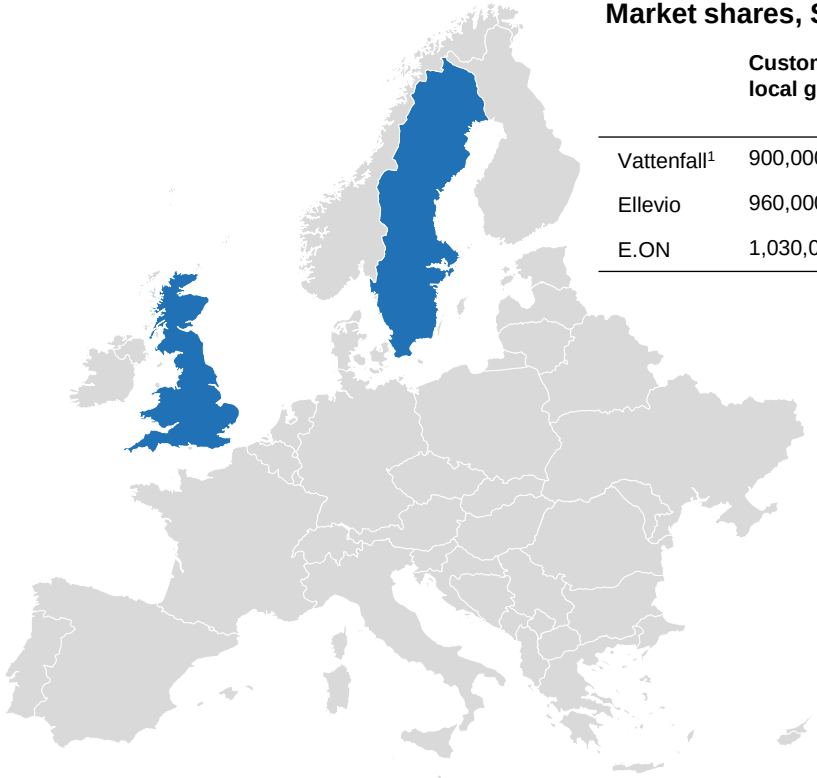
[3] SAIDI in 2019 for was driven by the storm “Alfrida”
[4] SAIFI: System Average Interruption Frequency Index

Distribution

Market and business overview

In brief

- Vattenfall's Distribution business owns and operates electricity distribution grids in Sweden.
- Approximately 900 000 business and household customers[1]
- A new business unit for operation and ownership of new grids in the UK was established in 2017. Vattenfall is one out of 14 established IDNOs[4] in the UK
- On 1 July 2021, Vattenfall sold the electricity grid company Stromnetz Berlin GmbH to the State of Berlin



Market shares, Sweden

	Customers local grids	Markets share regional grid[2]	Market share local grid[3]
Vattenfall[1]	900,000	53%	16%
Ellevio	960,000	22%	17%
E.ON	1,030,000	23%	19%

[1] Excluding Vattenfall's subsidiaries Gotlands Elnät and Västerbergslagens Elnät
[2] Based on volume of transited energy excluding grid losses
[3] Based on number of contracts

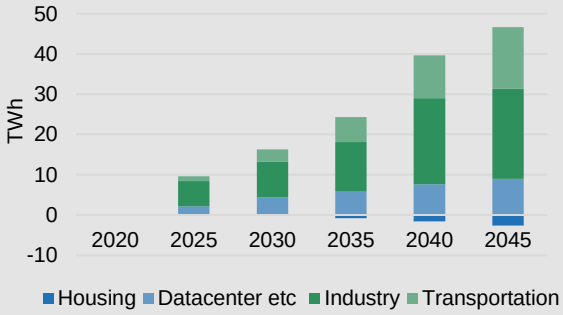
Energy transition to spur dramatic growth in electricity demand in Sweden

Electrification, growth in renewable production capacity and ageing assets call for large grid 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 and battery factories are also likely to have a significant impact
- Efficiency improvements in the residential sector only have a small mitigating effect on total demand

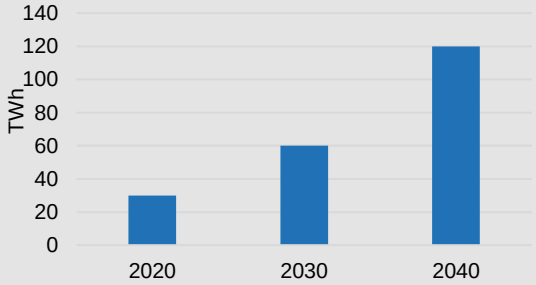
Forecast – Change in electricity demand (Sweden)[1]



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 grid capacity

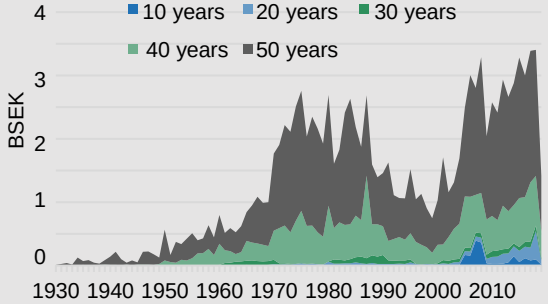
Forecast – wind power generation (Sweden)[2]



Existing grid assets are increasingly in need of reinvestments

- There was a large build out of grid 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 grid to accommodate more renewable energy and electrification

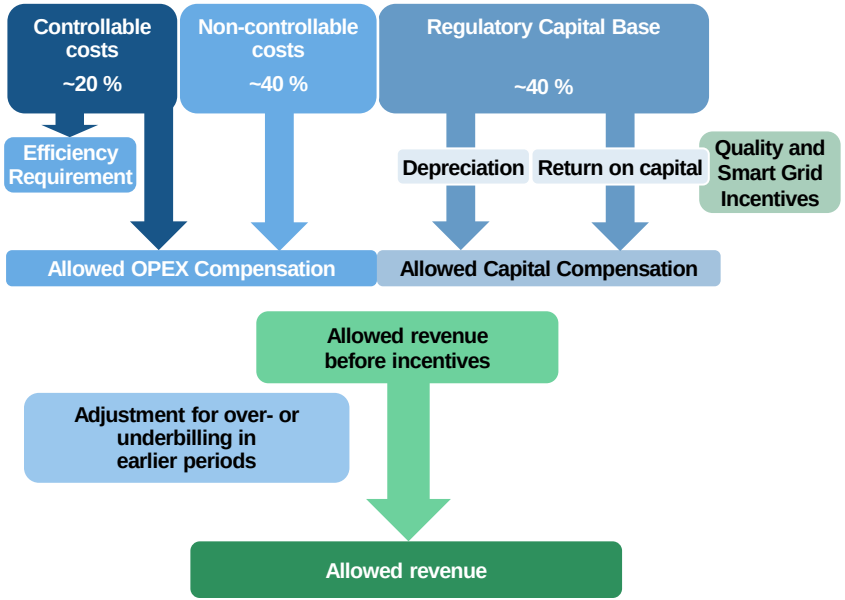
Asset age structure – Vattenfall Eldistribution[3]



[1] Source: Nepp, Färdplan för fossilfri el, Aug 2019
[2] Source: Svensk vindenergi, Färdplan 2040, Dec 2020
[3] Asset base per 2020-01-01

Allowed revenue framework

Schematic overview - allowed revenue Sweden



Legal process

- In February 2021, the Adminstrative Court in Linköping ruled in favour of the electricity grid companies
- The verdict has been appealed by the Energy Markets Inspectorate (Ei) to the Court of Appeals
- If the appeal is accepted, the legal process could proceed up to two or three more years[1]

1 Assuming a scenario where the process goes on all the way to the Supreme Administrative Court.

Smart solutions for optimising the energy system

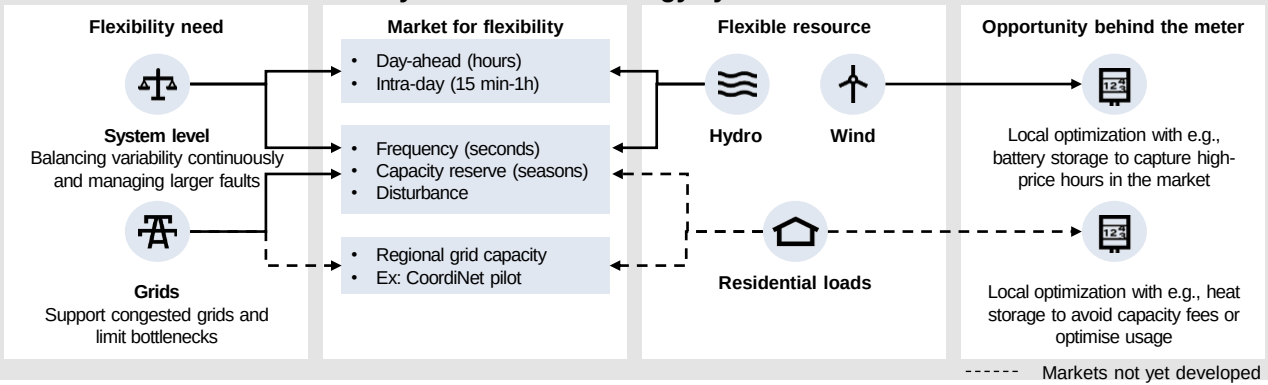
Addressing the shortage of grid capacity in the short- and medium term

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 grid as well as developing the existing grid 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 grid and analyse electricity consumption in real time, to help alleviate grid 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

For more info: See page 54-55 in Vattenfall's Annual- and Sustainability Report 2019

Financial performance

H1 2021 numbers

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Vattenfall H1 Results 2021

Financial highlights

Key data

SEK bn	H1 2021	H1 2020
Net Sales	80.5	79.4
EBITDA	38.3	25.2
Underlying operating profit (EBIT)	17.3	13.0
EBIT	29.6	5.3
Profit for the period	23.6	-1.6
Funds from Operations (FFO)	21.4	16.7
Cash flow operating activities	35.2	7.4
Net debt	32.3	71.6
Adjusted net debt	104.5	140.3
Adjusted net debt/EBITDA[1] (times)	1.8	3.0
Financial targets		
ROCE[1] (≥8%)	14.5	6.1
FFO/adjusted net debt[1] (22-27%)	38.1	25.5

Key developments

- Net sales increased by SEK 1.0 bn to SEK 80.5 bn due to higher spot prices and higher sales volumes in the Nordics and Germany
- Underlying EBIT increased by SEK 4.3 bn mainly due to increased earnings in segment Power Generation due to higher achieved prices in the Nordics, higher nuclear and hydro power generation and higher realised trading result. Higher contribution from Heat also had a positive impact, mainly due to the closure of Moorburg
- Profit for the period increased to SEK 23.6 bn, mainly due to the agreement on compensation for the closure of nuclear power in Germany. Profit in 2020 negatively affected by impairments (mainly Moorburg)
- ROCE increased to 14.5% mainly due to the agreement on compensation for the closure of nuclear power. ROCE H1 2020 negatively affected by impairments
- FFO/Adjusted net debt increased to 38.1%, mainly due to a significant decrease in adjusted net debt largely driven by a positive net change in margin calls for commodity hedging activities

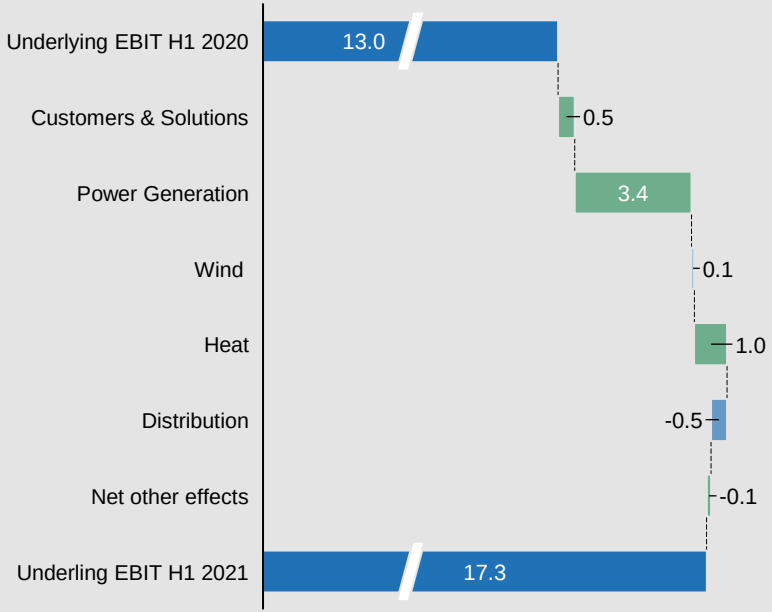
[1] Last 12-month values

Development of underlying EBIT H1 2021

Increase from Power Generation, Heat and Customers & Solutions partly offset by lower earnings in Distribution

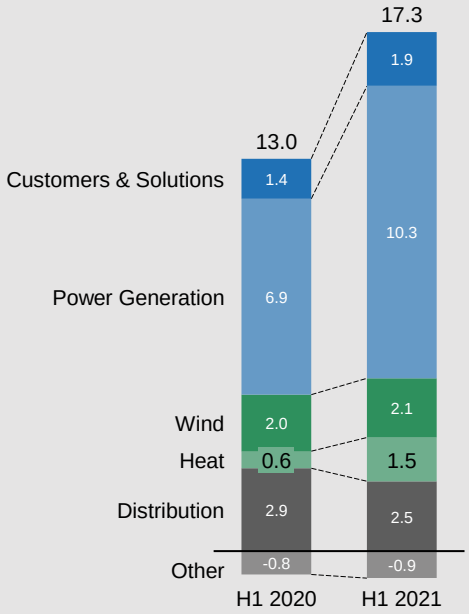
Change in H1 2021 vs. H1 2020

SEK bn



Breakdown per operating segment

SEK bn

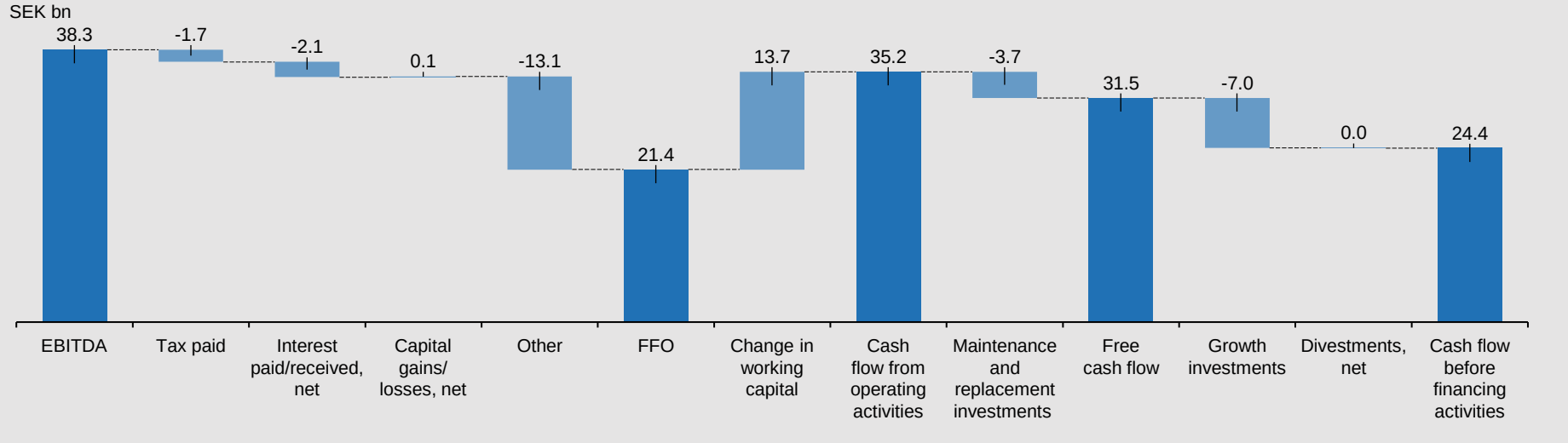


Highlights

- Customers & Solutions: increased customer base and lower average temperatures in the Netherlands and Germany
- Power Generation: higher achieved prices in the Nordics, higher nuclear and hydro power generation and a higher realised trading result
- Wind: higher electricity prices and new capacity offset by lower wind speeds
- Heat: closure of the Moorburg plant as well as higher sales of heat owing to lower temperatures and a growing customer base
- Distribution: lower gross margin in the Swedish operations, mainly due to price reductions in local networks, higher costs for the transmission networks and network losses caused by higher electricity prices

Cash flow development H1 2021

Positive working capital development mainly related to changes in margin calls



Main effects

- Change in working capital mainly related to a positive net change in margin calls for commodity hedging activities (SEK 23.6 bn) driven by increased market prices. Seasonal effects in the Customers & Solutions and Heat operating segments (SEK -3.5 bn), increase in inventories (SEK -2.9 bn) and changes related to CO_2 emission allowances (SEK -1.9 bn) had offsetting impact
- Other adjustments (SEK -13,1 bn) include non-cash items included in EBITDA, mainly the compensation for the closure of Nuclear power in Germany (expected to be received in Q4) and changes in fair value of commodity derivatives
- Growth investments mainly related to wind power

Hedging, debt and funding

H1 2021 numbers

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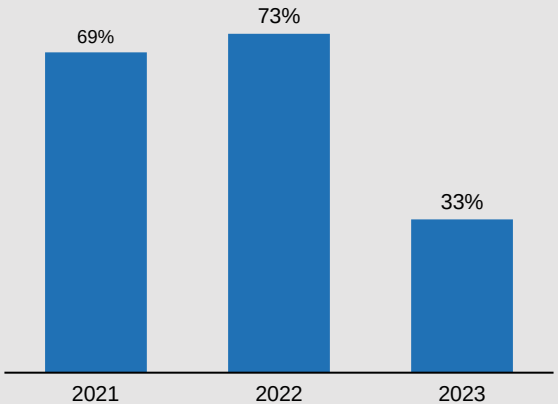
Price hedging

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 Nordic[1] hedge ratio (%) and indicative prices



Average indicative Nordic hedge prices in EUR/MWh

2021	2022	2023
28	28	27

Achieved prices[2] - Nordic portfolio

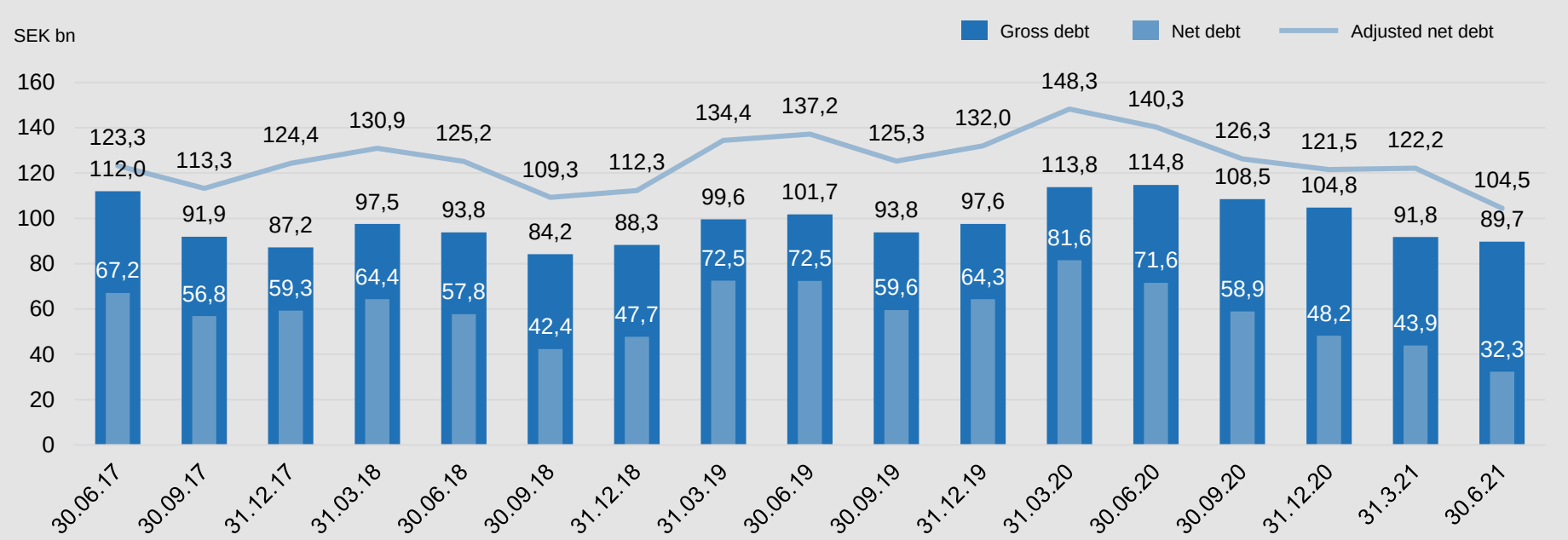
YTD 2021	YTD 2020	Q2 2021	Q2 2020	FY 2020
30	28	27	30	31

Sensitivity analysis – Continental[3] portfolio

Market quoted	+/- 10% price impact on future profit before tax, MSEK[4]			
	2022	2023	2024	Observed yearly volatility
Electricity	+/- 413	+/- 1,556	+/- 1,329	19% - 24%
Coal	-/+ 5	-/+ 20	-/+ 11	20% - 21%
Gas	-/+ 104	-/+ 860	-/+ 678	15% - 24%
CO_2	-/+ 19	-/+ 430	-/+ 370	40% - 42%

[1] Nordic: SE, DK, 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



Net debt decreased by SEK 15.8 bn compared with the level at 31 December 2020. Adjusted net debt decreased to SEK 104.5 bn, SEK 17.0 bn lower compared with the level at 31 December 2020. For the calculation of adjusted net debt, see slide 88.

Reported and adjusted net debt

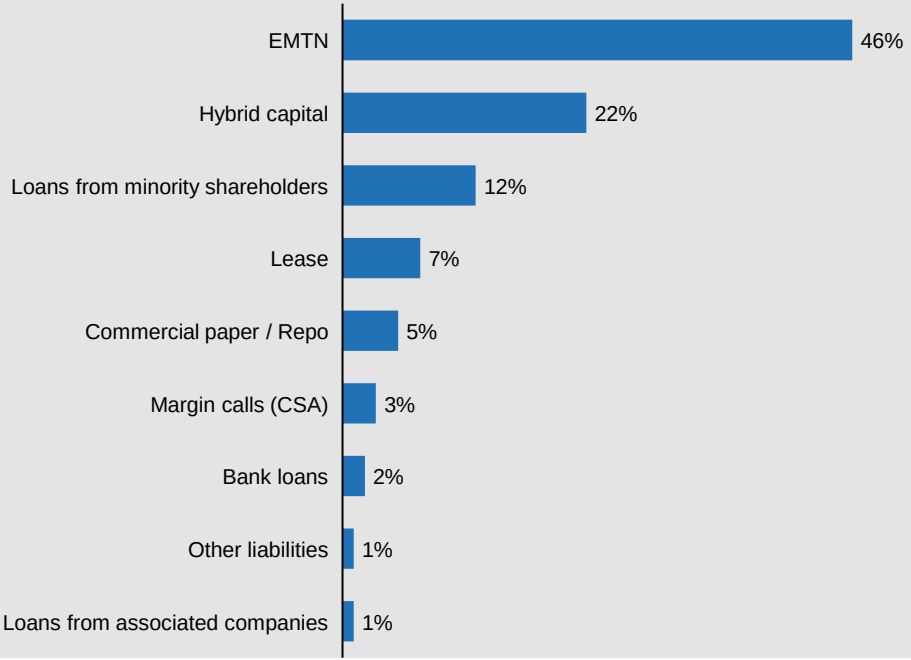
Reported net debt (SEK bn)	30 Jun. 2021	31 Dec. 2020
Hybrid capital	-20.0	-19.3
Bond issues and liabilities to credit institutions	-43.4	-49.6
Commercial papers and Repos	-4.5	-13.3
Liabilities to associated companies	-1.0	-0.7
Liabilities to minority shareholders	-11.0	-10.9
Lease liabilities	-6.1	-6.0
Other liabilities	-3.8	-4.9
Total interest-bearing liabilities	**-89.7**	**-104.8**
Reported cash, cash equivalents & short-term investments	57.0	56.2
Loans to minority owners of foreign subsidiaries	0.4	0.4
Net debt	**-32.3**	**-48.2**

Adjusted net debt (SEK bn)	30 Jun. 2021	31 Dec. 2020
Total interest-bearing liabilities	-89.7	-104.8
50% of Hybrid capital	10.0	9.7
Present value of pension obligations	-39.2	-43.8
Wind & other environmental provisions	-11.2	-10.6
Provisions for nuclear power (net)	-39.2	-37.8
Margin calls received	2.9	4.1
Liabilities to minority owners due to consortium agreements	11.0	10.9
Adjustment related to assets/liabilities held for sale	-1.9	0.0
= Adjusted gross debt	**-157.2**	**-172.3**
Reported cash, cash equivalents & short-term investments	57.0	56.2
Unavailable liquidity	-4.3	-5.4
= Adjusted cash, cash equivalents & short-term investments	**52.7**	**50.8**
= Adjusted net debt	**-104.5**	**-121.5**

Breakdown of gross debt

Total debt: SEK 89.7 bn (EUR 8.9 bn)

External market debt: SEK 77.7 bn (EUR 7.7 bn)

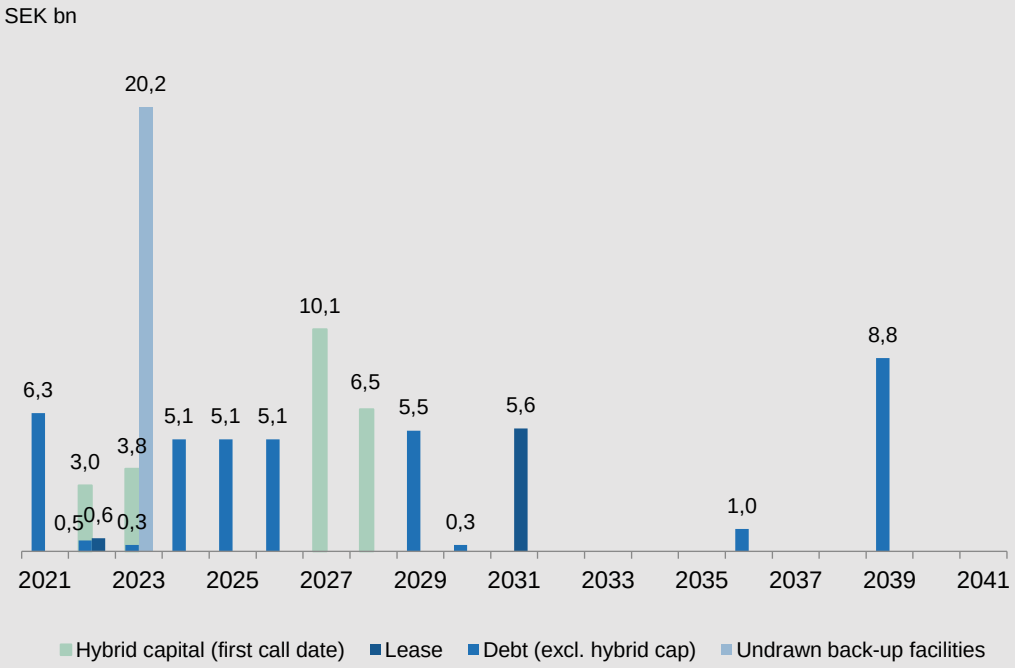


Debt issuing programmes	Size (EUR bn)	Utilization (EUR bn)
EUR 10bn Euro MTN	10.0	3.4
EUR 4bn Euro CP	4.0	0.6
Total	14.0	4.0

- 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 profile[1]



	30 Jun. 2021	31 Dec. 2020
Duration (years)	4.7	3.8
Average time to maturity (years)	6.5	5.1
Average interest rate (%)	2.8	3.4
Net debt (SEK bn)	32.3	48.2
Available group liquidity (MSEK)	52.7	50.8
Undrawn committed credit facilities (MSEK)	20.2	23.1

Cumulative maturities excl. undrawn back-up facilities

	2021-2023	2024-2026	From 2027
Debt incl. hybrid capital	14.5	15.3	37.9
% of total	*21%*	*23%*	*56%*

[1] Short term debt (Repo's and Commercial paper: 4.5), loans from associated companies, minority owners, margin calls received (CSA) and valuation at fair value are excluded. Currency derivatives for hedging debt in foreign currency are included

Liquidity position

Group liquidity	SEK bn
Cash and cash equivalents	20.5
Short term investments	36.5
Reported cash, cash equivalents & short term investments	**57.0**
Unavailable liquidity[1]	-4.3
Available liquidity	**52.7**

Committed credit facilities	Facility size, EUR bn	SEK bn
RCF (maturity Nov 2023)	2.0	20.2
Total undrawn		**20.2**

Debt maturities[2]	SEK bn
Within 90 days	2.0
Within 180 days	6.9

[1] German nuclear "Solidarvereinbarung" 1.2 SEK bn, Margin calls paid (CSA) 2.2 SEK bn, Insurance "Provisions for claims outstanding" 0.8 SEK bn
[2] Excluding loans from minority owners and associated companies

Nuclear provisions

Reactor[1]	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: 38.6**	**Total Ringhals: 38.6[2]**	
Forsmark 1	984	1980	66.0			
Forsmark 2	1,120	1981	66.0			
Forsmark 3	1,170	1985	66.0	**Total Forsmark: 33.9**	**Total Forsmark: 22.4**	
Total Sweden	**6,974**	**-**		**77.9[3]**	**63.9[3]**	**42.9[4]**
Brunsbüttel	771	1977	66.7	11.6	7.7	
Brokdorf	1,410	1986	20.0	0	3.6	
Krümmel	1,346	1984	50.0	7.0	7.0	
Stade[5]	640	1972	33.3	0	0.9	
Total Germany	**4,167**	**-**	**-**	**18.6**	**19.2**	
Total SE & DE	**11,141**			**96.5**	**83.1**	

[1] Five reactors are in commercial operation in Sweden; Ringhals 3 & 4 and Forsmark 1, 2 & 3. Brokdorf is in commercial operation in Germany (to be closed by year-end 2021)
[2] Vattenfall is 100% liability of Ringhals decommissioning, while owning only 70.4%
[3] Total provisions in Sweden (IFRS accounting) include provisions of SEK 0.6 bn (pro rata SEK 0.5 bn considering share in Studsviksfonden) related to Ågesta, and SEK 4.8 bn (pro rata SEK 2.4 bn considering share in Studsviksfonden) related to SVAFO
[4] Vattenfall's share of the Nuclear Waste Fund. IFRS consolidated value is SEK 51.0 bn.
[5] Stade is being dismantled

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Investor webpage / Financial reports & presentations

Financial calendar

28 October 2021	Interim report January-September 2021
3 February 2022	Year-end report 2021
29 March 2022	Annual- and Sustainability report 2021 (preliminary)
28 April 2022	Annual General Meeting
29 April 2022	Interim report January-March 2022
22 July 2022	Interim report January-June 2022