

# Corporate Factbook

12 May 2022



VATTENFALL

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# This is Vattenfall


## In Brief


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

 **7.1 Million**  
Electricity customers

 **1.8 Million**  
Heat customers

 **1 000 000<sup>1</sup>**  
Electricity grid customers

 **2.4 Million**  
Gas customers

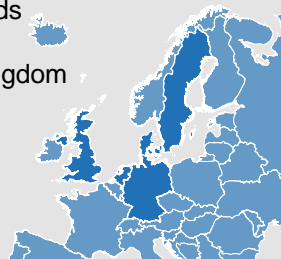
 **18,835**  
Employees

## Activities in the Value Chain ● Active ● Inactive

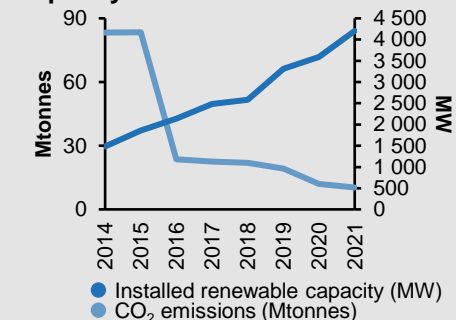


## Main markets

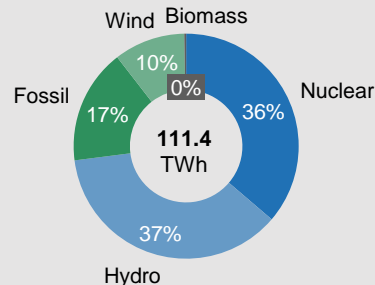
- Sweden
- Germany
- Netherlands
- Denmark
- United Kingdom



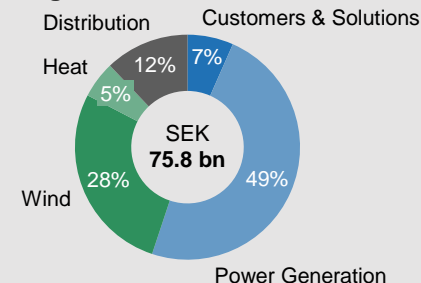
## CO<sub>2</sub> emissions & renewable capacity



## Electricity generation breakdown by technology, 2021

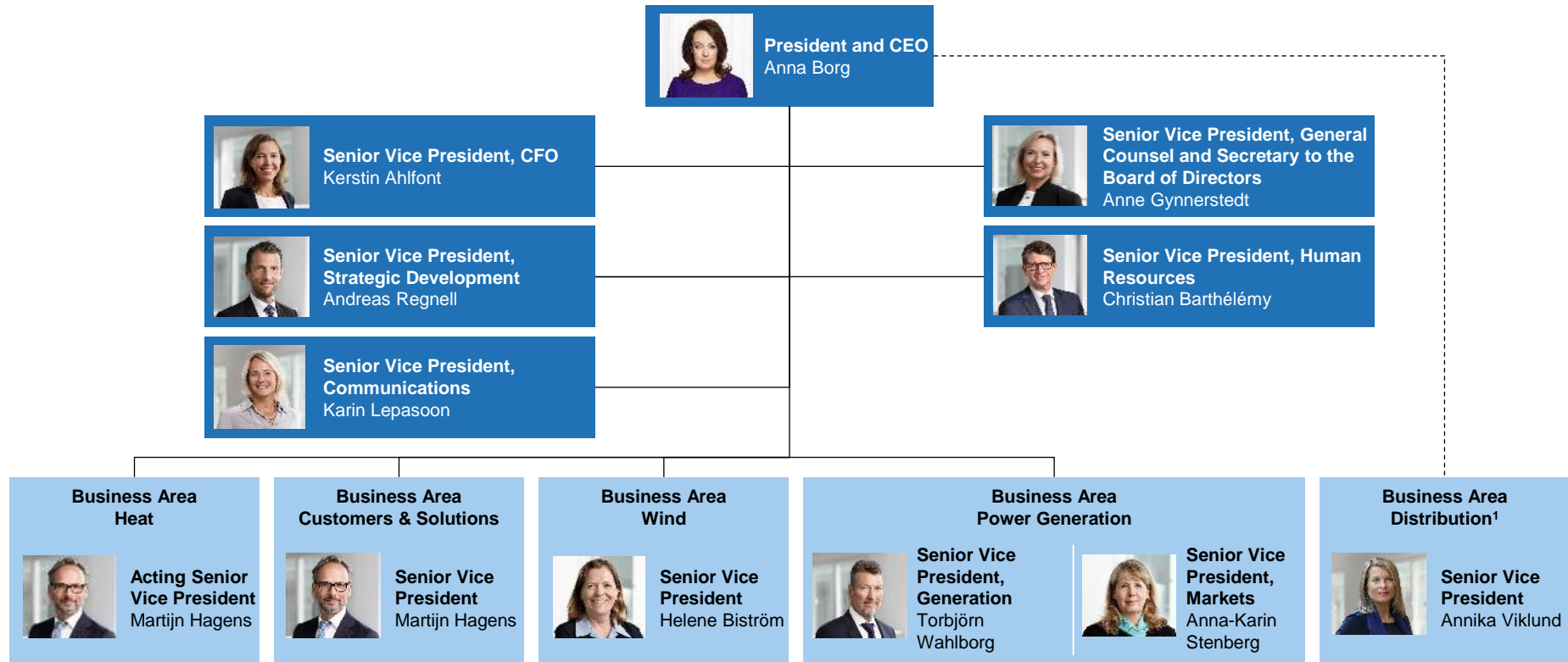


## EBITDA breakdown by segment, 2021



<sup>1</sup> Excluding the Berlin grid business which was sold to the city of Berlin on July 1st, 2021

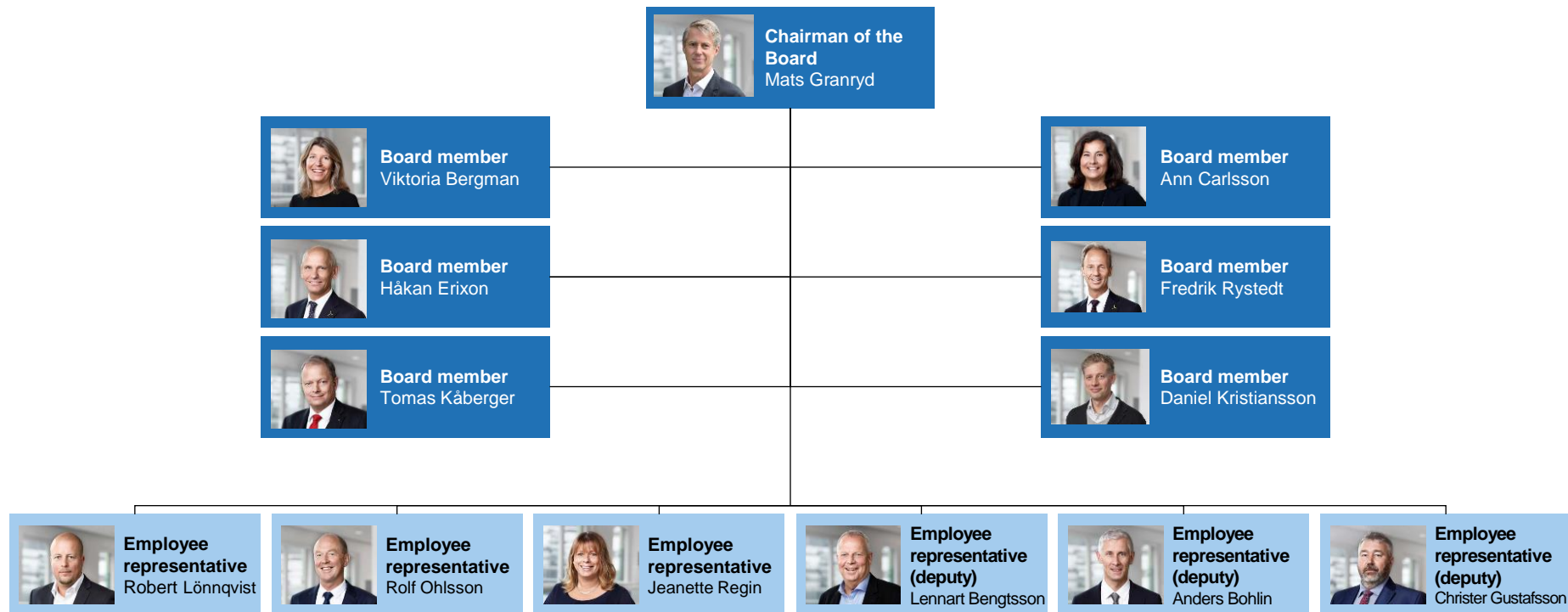
# Vattenfall Executive Group Management



For more info: see page 102-103 in the Annual- and Sustainability Report 2021

<sup>1</sup> The electricity distribution operations are unbundled from Vattenfall's other operations in accordance with Swedish and British legislation. The head of Business Area distribution is therefore not a member of the EGM.

# Vattenfall Board of Directors



For more info: see page 100-101 in the Annual- and Sustainability Report 2021

# 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 2021

## 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 2021<sup>1</sup>

Customers and Solutions	3,213
Power Generation	7,260
Wind	1,279
Heat	3,126
Distribution	2,366
Other <sup>2</sup>	2,731

<sup>1</sup> Full-time equivalents

<sup>2</sup> Pertains mainly to Staff Functions and Shared Service Centres

## Customers & Solutions

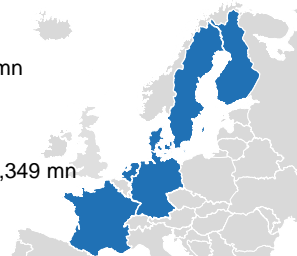
**Responsible for sales of electricity, gas and energy services in all of Vattenfall's markets**

- A market leader in Sweden with nearly 900,000 electricity contracts
- A market leader in the Netherlands with 4.6 million electricity and gas contracts
- A total of 4.3 million electricity and gas contracts in Germany with a 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 28,700 EV charging points in Sweden, Germany and the Netherlands

**Net Sales:** SEK 106,560 mn  
(34% of total<sup>3</sup>)

**EBITDA:** SEK 3,241 mn  
(4% of total)

**Underlying EBIT<sup>4</sup>:** SEK 2,349 mn  
(7% of total)



## Power generation

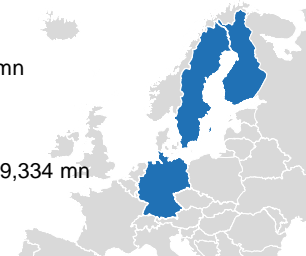
**Responsible for Vattenfall's hydro and nuclear power operations, maintenance services business, and optimisation and trading operations, including certain large business customers**

- 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 40.9 TWh from hydro power and 40.4 TWh from nuclear power
- Provides professional asset optimisation services and market access, and a leading player in PPA markets in northwest Europe

**Net Sales:** SEK 126,318 mn  
(40% of total<sup>3</sup>)

**EBITDA:** SEK 42,053 mn  
(55% of total)

**Underlying EBIT<sup>4</sup>:** SEK 19,334 mn  
(60% of total)



<sup>3</sup> Calculation excludes eliminations

<sup>4</sup> Operating profit excluding items affecting comparability

# Operating segment overview FY 2021 (Cont'd)

## Wind

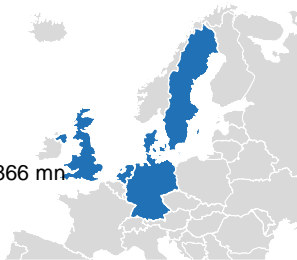
**Responsible for development and operation of Vattenfall's wind farms as well as large-scale and decentralised solar power and batteries**

- 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 2.7 GW under construction and over 3.6 GW in mature-stage development
- 11.2 TWh of electricity generated in 2021
- Front-runner in innovative solutions in solar & batteries, such as colocation with wind farms and shared infrastructure

**Net Sales:** SEK 20,872 mn  
(7% of total<sup>1</sup>)

**EBITDA:** SEK 13,534 mn  
(18% of total)

**Underlying EBIT<sup>2</sup>:** SEK 7,866 mn  
(24% of total)



## Heat

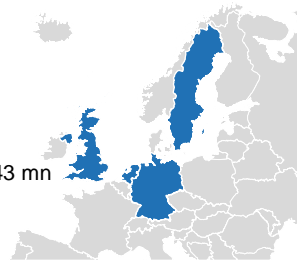
**Responsible for Vattenfall's heat operations including sales, decentralised solutions and gas-fired condensing**

- 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

**Net Sales:** SEK 34,759 mn  
(11% of total<sup>1</sup>)

**EBITDA:** SEK 2,842 mn  
(4% of total)

**Underlying EBIT<sup>2</sup>:** SEK -343 mn  
(-1% of total)



## Distribution

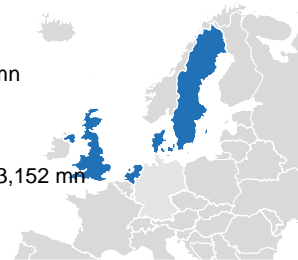
**Responsible for Vattenfall's electricity distribution operations in Sweden, Germany (Berlin) and the UK**

- Leading operator of regional electricity distribution grids and top-3 position in local grids in Sweden
- Approximately 1,000,000 business and private customers in Sweden
- Unit for operation and ownership of new grids in the UK established in 2017. The unit has around 40 contracts including one of the largest all electric development sites in UK, Edinburgh park.

**Net Sales:** SEK 17,262 mn  
(6% of total<sup>1</sup>)

**EBITDA:** SEK 5,911 mn  
(8% of total)

**Underlying EBIT<sup>2</sup>:** SEK 3,152 mn  
(10% of total)



<sup>1</sup> Calculation excludes eliminations

<sup>2</sup> Operating profit excluding items affecting comparability



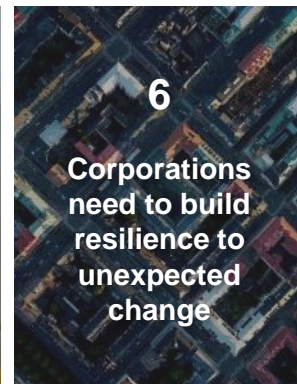
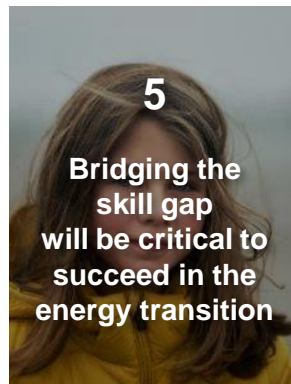
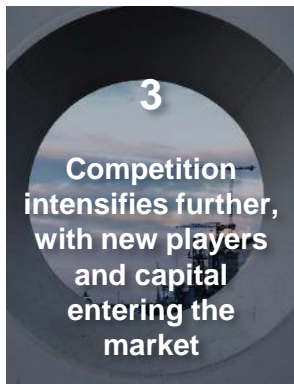
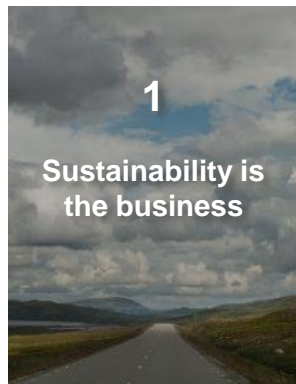
# Financial characteristics per operating segment

Operating segment	Key drivers for earnings	Characteristics of earnings and cash flow
<b>Customers &amp; Solutions</b>	Difference in sourcing costs compared to sales price (gross margin) and development in the customer base	Track record of stable earnings
<b>Power Generation</b>	A function of spot price, generation volume, hedge ratio and hedge level	Large outright power price exposure is offset by hedging activities, thereby reducing volatility
<b>Wind</b>	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
<b>Heat</b>	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.
<b>Distribution</b>	Largely a function of regulatory asset base (RAB), regulatory WACC, and the efficiency of the operations	Stable



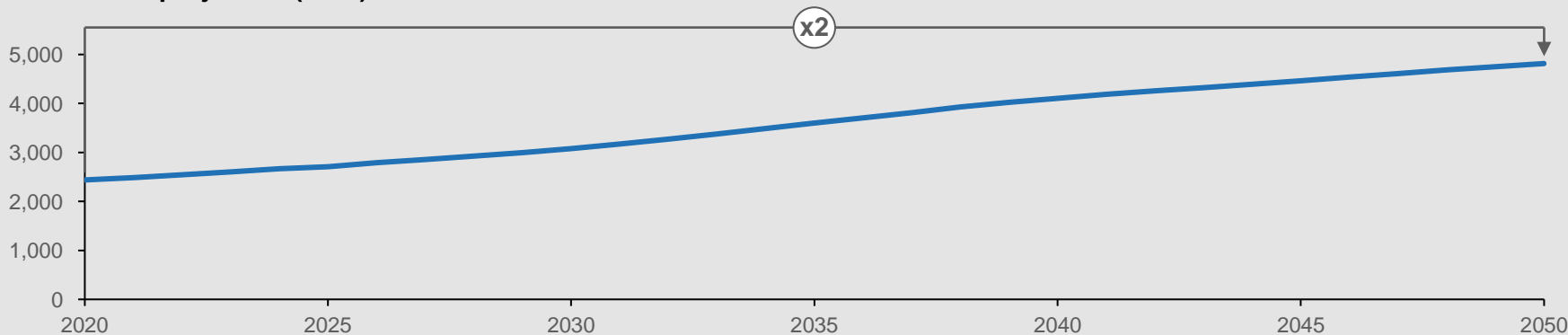
# Our beliefs about the future

Most important trends that we monitor, leverage and navigate to successfully deliver on our strategy



# Energy transition accelerates - power demand to double

Power demand projection (TWh)<sup>1</sup>



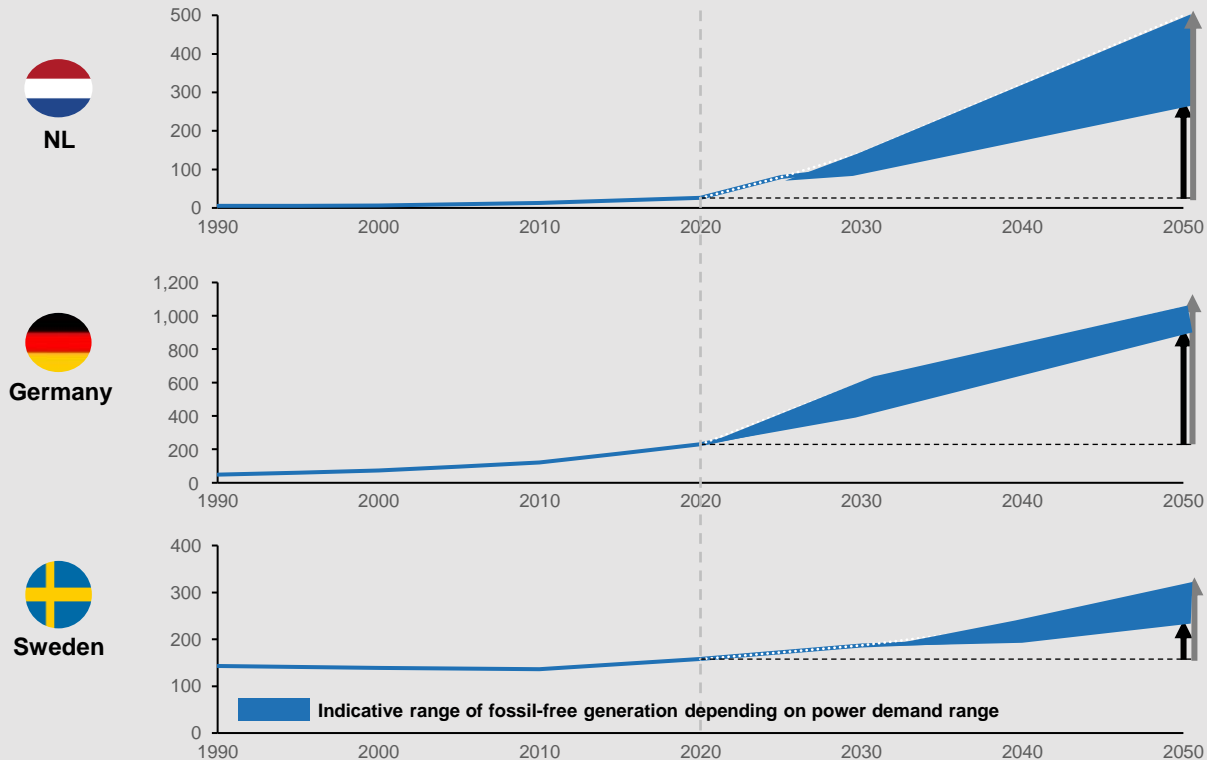
- The electrification revolution is beginning to pick up pace and will only accelerate
  - Power demand across main markets set to double
  - At the same time, fossil capacity needs to be phased out
  - Strong impact on the need for fossil-free electricity generation and electrical infrastructure
- All fossil-free technologies will be needed to enable the transition

<sup>1</sup> Power demand projection for Sweden, Germany, Netherlands, UK, Norway, Finland, Denmark, Poland, Belgium, Switzerland and Austria  
Source: Country-specific net zero scenario studies

# Fossil-free electricity enables the transition

Starting points in terms of current fossil-free generation differ widely across markets

Historic and required future fossil-free production, high & low range, TWh



2050

~10-20x

~4-5x

~1.5-2x

# A strategy based on an “integrated utility logic”

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

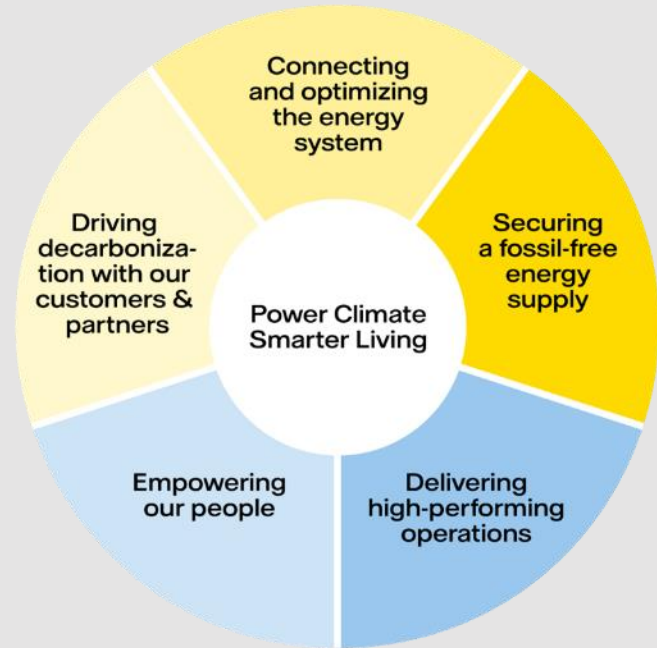
We believe being active in the whole value chain is strategically important:

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



# Strategic targets 2025

Strategic focus area	Strategic targets to 2025	Actual 2021	Actual 2020	Progress	Comments
Driving decarbonisation with our customers & partners	Net Promoter Score <sup>1</sup> (Absolute): <b>+18</b>	+10	+7 <sup>2</sup>		Higher NPS mainly owing to the Customers & Solutions operating segment as a result of strong performance in Germany and the Netherlands
Securing a fossil-free energy supply	CO <sub>2</sub> Emissions Intensity <sup>3</sup> : <b>≤86 gCO<sub>2</sub>e/kWh</b>	79	97		Improvement due to lower fossil-based generation, including closure of Moorborg coal-fired power plant at the end of 2020
Empowering our people	Lost Time Injury Frequency (LTIF): <b>≤1.0</b>	1.7	1.8		Ongoing initiatives to improve safety, including common H&S strategy and framework for follow-up throughout the organisation
	Employee Engagement Index: <b>≥75%</b>	75	74 <sup>4</sup>		Improved result puts Vattenfall among the highest ranked organisations well above industry average
Delivering high-performing operations	FFO/Adjusted Net Debt: <b>22-27%</b>	171.2%	28.8%		Significant increase mainly due to decrease in adjusted net debt largely driven by a positive net change in margin calls for commodity hedging activities
	ROCE: <b>≥8%</b>	22.2%	5.8%		Outcome well above target, impacted by compensation for closure of nuclear power in Germany, unrealised changes in market value of energy derivatives and inventories as well as capital gain from sale of Stromnetz Berlin

<sup>1</sup> NPS absolute target is calculated with a weighting of 80% from Customers & Solutions and 20% from Heat resembling size of customer basis

<sup>2</sup> No outcome for business unit Heat Berlin in 2020, similar level as in 2019 assumed

<sup>3</sup> Targeting 86 gCO<sub>2</sub>/kWh by 2025 puts us on a “1.5°C” trajectory by 2030 according to Science Based Target levels

<sup>4</sup> The value has been adjusted compared with previously published information due to change in methodology

# Financial targets

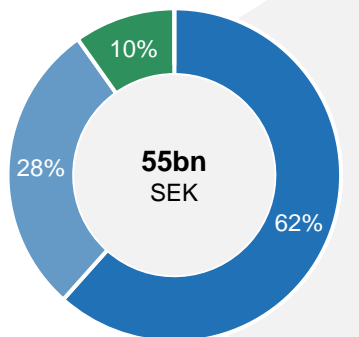
Financial targets	Targets over a business cycle <sup>1</sup>	FY 2021	FY 2020	Comment
<b>Profitability</b>	Return on capital employed: ≥8% <sup>2</sup>	22.2%	5.8%	Return on capital employed increased to 22.2%, which is well above the target of 8%, impacted by compensation for closure of nuclear power in Germany, unrealised changes in market value of energy derivatives and inventories as well as capital gain from sale of Stromnetz Berlin
<b>Capital structure</b>	FFO/adjusted net debt: 22%–27%	171.2%	28.8%	FFO/adjusted net debt increased to 171.2% in 2021. Significant increase mainly due to decrease in adjusted net debt largely driven by a positive net change in margin calls for commodity hedging activities.
<b>Dividend policy</b>	Dividend: 40%–70% of the year's profit after tax	SEK 23.4 bn	SEK 4.0 bn	The Board of Directors has proposed a dividend of SEK 23.4 billion

<sup>1</sup> 5–7 years

<sup>2</sup> The key ratio is based on EBIT and average capital employed

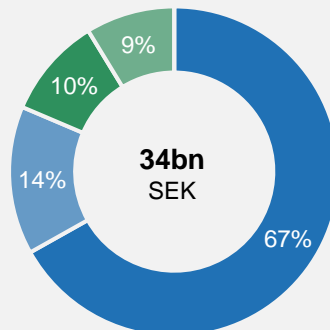
# Investment plan 2022-2023

**Total capex  
2022-2023**



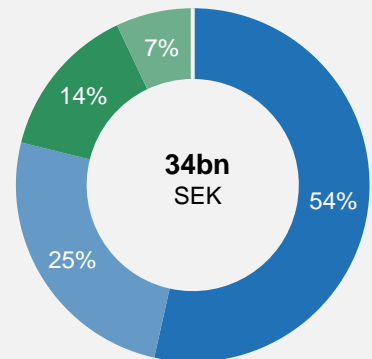
- Growth, 34 bn SEK
- Maintenance, 16 bn SEK
- Replacement, 6 bn SEK

**Growth capex per  
technology 2022-2023**



- Wind power, 23 bn SEK
- Heat supply, 5 bn SEK
- Electricity distribution, 3 bn SEK
- Other<sup>1</sup>, 3 bn SEK

**Growth capex per country  
2022-2023**



- The Netherlands, 18 bn SEK
- Denmark, 9 bn SEK
- Sweden, 5 bn SEK
- Germany and other, 2 bn SEK<sup>2</sup>

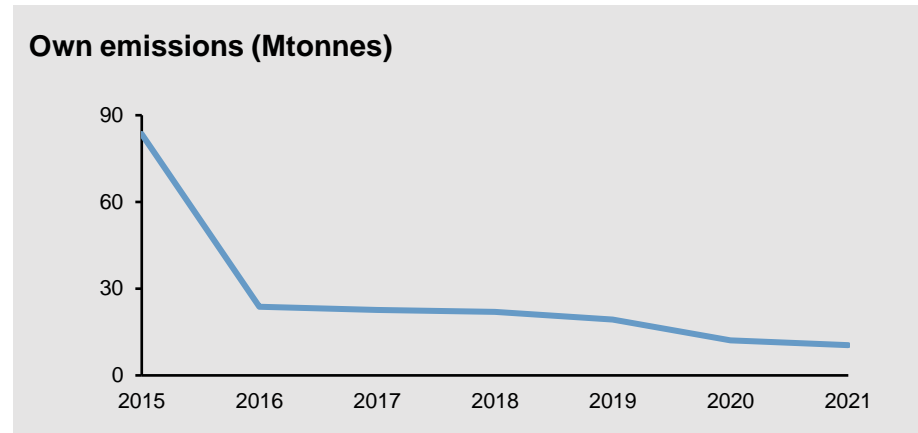
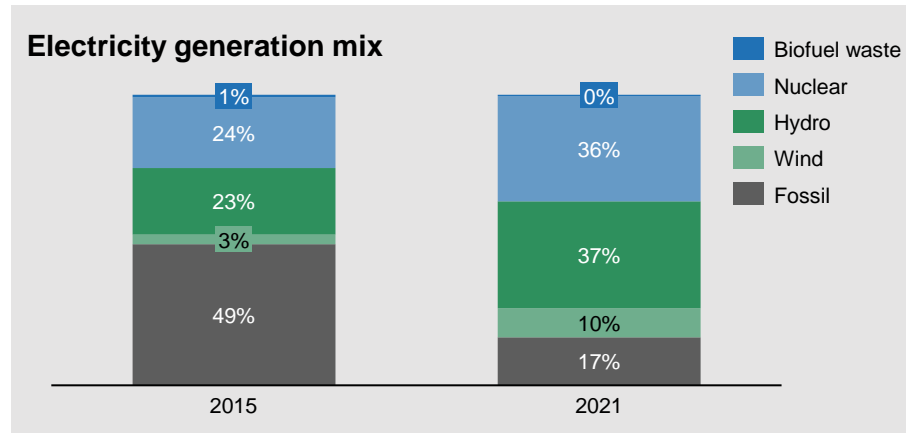
<sup>1</sup> Mainly charging solutions, solar and battery projects, decentralised solutions and the HYBRIT project

<sup>2</sup> Germany (SEK 3 billion) and other (SEK -1 billion). Other countries mainly relate to France and the UK, negative value owing to expected income from partnerships and from projects developed for sale.



# Significant shift in production portfolio

With dramatic effects on our emissions profile



## Milestones

2017 - Phase out of lignite with closure of Klingenberg CHP plant in Berlin, Germany and Pen y Cymoedd inaugurated as then the largest onshore wind farm in Wales

2018 - Phase out of peat in Uppsala, Sweden and the start of SamEnergi (third party integration of commercial heat surpluses to district heating networks)

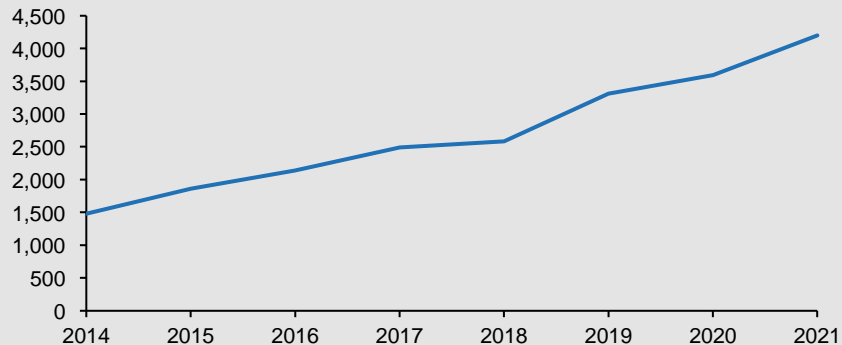
2019 - Closure of coal-fired Hemweg-8 power plant in Amsterdam (NL)

2020 - Closure of coal-fired Moorburg power plant in Hamburg (DE) and opened Princess Ariane Wind Farm, the largest Dutch Onshore wind farm

2021 - Kriegers Flak in Denmark operational as Scandinavia's largest wind farm

# Build-up of renewable capacity and a strong pipeline ahead

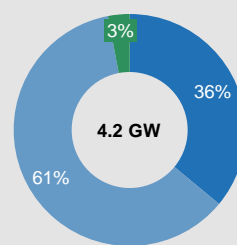
Development installed renewable capacity 2014-2021



- Strong growth in wind: 4.2 GW installed capacity (19% growth year-over-year)
- Aim to strengthen project pipeline further by own development, bidding for, or acquiring additional attractive projects in wind and solar
- And continue to be industry-leading in Levelised Energy Cost (LEC)

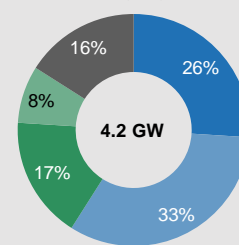
Renewable capacity in operation, year-end 2021

Split by generation type



■ Onshore ■ Offshore ■ Solar

Split by geography



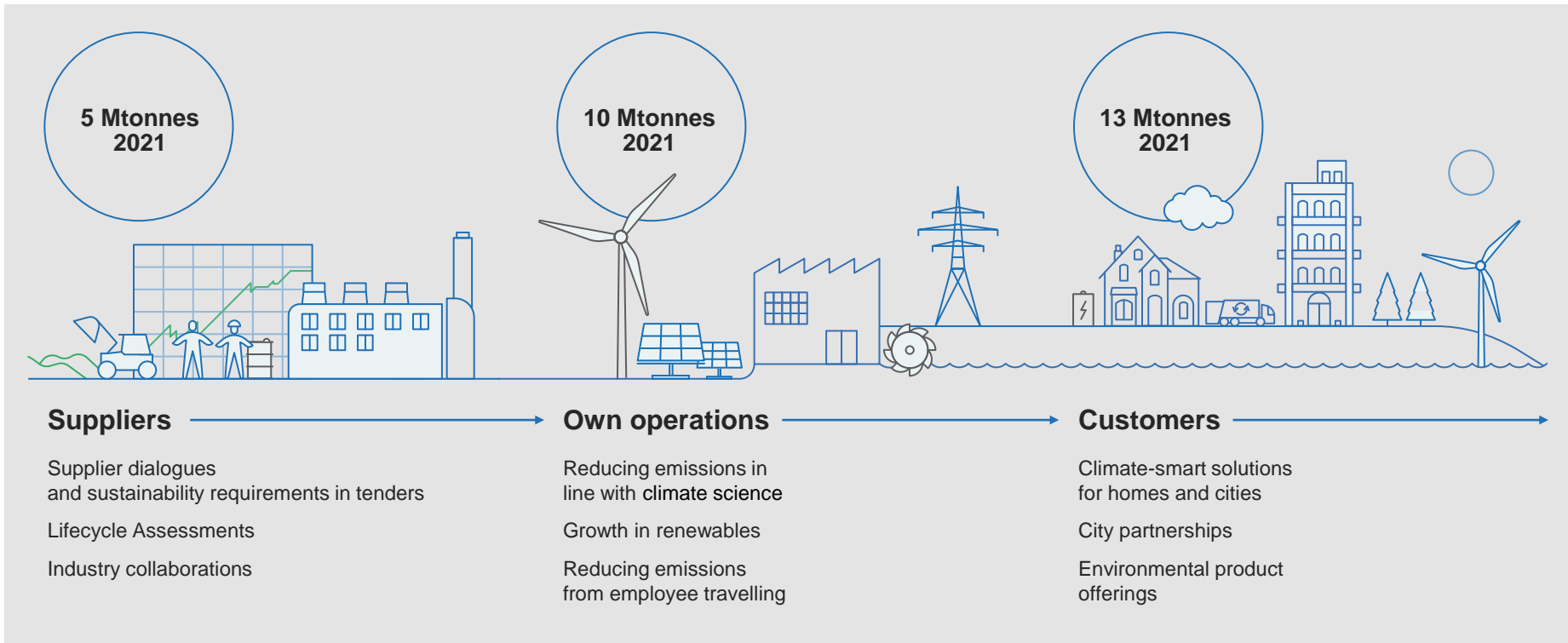
■ UK ■ DK ■ NL ■ SE ■ DE

## Projects under construction and pipeline:

- >2 GW Wind projects under construction
- ~4 GW Wind projects in mature-stage development
- ~2 GW Solar projects in development
- ~500 MW Batteries pipeline

# Cutting CO<sub>2</sub> emissions throughout the value chain

Examples of actions



# Current CO<sub>2</sub> emissions and reduction targets

## Suppliers

Mtonnes CO<sub>2</sub>e

0.002  
Business  
travel

1.0  
Capital goods,  
goods and  
services

3.8  
Fuel and  
waste  
incl. transport

Scope 3 Other indirect emissions

## Own operations

Mtonnes CO<sub>2</sub>e

10.3  
Fuel combustion  
from owned or  
controlled sources

0.1  
Purchased  
electricity, heat  
and steam

Scope 1+2 Direct and indirect emissions

## Customers

Mtonnes CO<sub>2</sub>e

12.9  
Use of sold  
products

Scope 3 Other indirect emissions

## Targets<sup>1</sup>

2030 Capital goods, goods and services:  
–50% in emissions intensity

–77% in emissions intensity

Use of sold goods: –33% in absolute  
emissions

2040 Net zero across the full value chain<sup>2</sup>

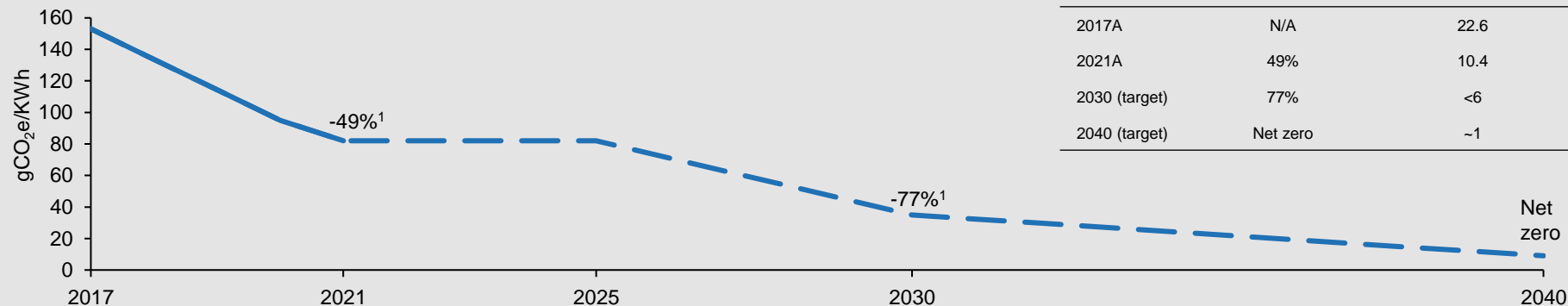
<sup>1</sup> Base year 2017 except for suppliers emissions that have base year 2020

<sup>2</sup> Remaining emissions (<5%) will be neutralised by carbon removals

# The road to net zero emissions

Vattenfall's targets align with the 1.5°C-scenario according to the Science Based Target initiative (SBTi)

**Trajectory for CO<sub>2</sub> emissions intensity (Scope 1 + 2), 2017-2040**



## Key priorities

- Complete phase-out of coal by 2030
- Ambition to commission four times our 2020 wind and solar capacity by 2030 → would bring Vattenfall's total commissioned capacity to over 16 GW
- Phase-out of natural gas to require a combination of all fossil-free technologies, such as biomass, waste heat, green hydrogen, large-scale heat pumps and heat storage

<sup>1</sup> Base year 2017

For more info: see page 10-13 in the Annual- and Sustainability Report 2021

# Raising our climate ambition

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

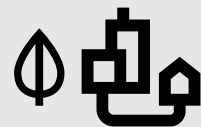
## Our ambitions to reach our 2030 commitment<sup>1</sup>

 **2X**

Electricity distributed in our grid

**>125 TWh**


Fossil-free electricity produced<sup>2</sup>

 **+30%**

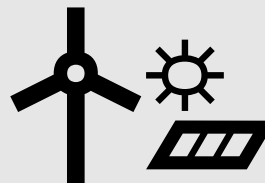
More customers with low or no carbon heat

 **-50%**

CO<sub>2</sub> reductions in procurement of goods & services

 **25X**

More e-mobility charge points in operation

 **X4**

Commissioned solar & wind capacity added<sup>2</sup>






<sup>1</sup> Base year 2020. Fossil-free electricity production was 93.0 TWh in 2021

<sup>2</sup> Not considering future ownership structure of added wind and solar production

# 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
 <b>CDP</b> <small>DISCLOSE. INSPIRE. ACTION.</small>	The leading system globally for disclosing environment data for investors, companies, cities, states and regions	Score A-: top 26% of all rated companies	December 2021
 <b>ecovadis</b>	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 companies assessed in the energy sector	April 2022
 <b>ISS ESG</b>	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
 <b>MSCI</b>	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 29% of companies assessed in the sector.	September 2021
 <b>SUSTAINALYTICS</b> <small>a Morningstar company</small>	ESG rating mainly for the investment community. Uses a two-dimensional materiality framework that measures a company’s exposure to industry specific material risks and how well a company is managing those risks.	ESG risk rating: Medium 23.9 (strong management score and high exposure). Top-13% of companies in subindustry	February 2022

# Credit ratings overview



**Long term rating: A3<sup>1</sup>**

**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+<sup>1</sup>**

**Short term rating: A-2**

**Outlook: Positive**

***Latest publication: 26 November 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.”



# Vattenfall credit highlights

A leading European energy company with activities across the value chain

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

100 per cent owned by the Swedish State

Regulated and predictable cash flow from electricity distribution and district heating

Leading towards sustainable production

**VATTENFALL**



A significant transformation has already happened

Significant growth in renewable production and climate smart energy solutions

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

# Green financing



VATTENFALL

# Vattenfall's green bond framework

Use of proceeds - eligible categories with examples of technologies

## Renewable energy and related infrastructure



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

## Electrification of transport and electrification of heating



- Infrastructure for electric vehicles
- Power to Heat

## Energy efficiency



- Hydro power
- Smart grids/meters
- Fossil-free<sup>1</sup> district heating and cooling
- Energy recovery

## Industry projects



- Activities enabling the transformation to fossil-free<sup>1</sup> production

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

# Green bond investor report

Investments under Vattenfall's Green Bond Framework, as of year-end 2021

Category	Project/country	Type	Capacity/ impact	Est. CO <sub>2</sub> reduction (ktonnes) <sup>1</sup>	Vattenfall's share	Start/ completion	Total investment	Of which green bond spent SEK million <sup>2</sup>		
								2019-2020	2021	Total
Renewable energy and related infrastructure	Kriegers Flak/ Denmark	Wind offshore	604 MW	300	100%	2019/2021	7,600 MDKK	2,414	6,398	8,812
	Princess Ariane (retained) <sup>3</sup> /Netherlands	Wind onshore	180 MW	175	100%	2018/2020	220 MEUR	1,154	194	3,940
	Princess Ariane (sold) <sup>3,4</sup> /Netherlands	Wind onshore	118 MW	115	0%	2018/2020	174 MEUR	1,089	-1,089	0
	Hollandse Kust Zuid /Netherlands	Wind offshore	1,500 MW	2,000	50.5%	2020/2023	2,600 MEUR	14	2,311	2,325
Industry projects	HYBRIT/Sweden	Pilot project	Fossil-free steel	–	33%	2019/2021	858 MSEK	283	118	401
<b>Total</b>								<b>4,954</b>	<b>7,932</b>	<b>12,886</b>
Not yet used										9,038
<b>Grand total</b>										<b>21,925</b>

<sup>1</sup> 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

<sup>2</sup> 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 2021

<sup>3</sup> The project was formerly called Wieringermeer and Wieringermeer extension

<sup>4</sup> Sold in December 2021. Funds returned to portfolio.

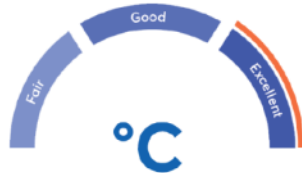
# Dark green shading by CICERO

## 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<sub>2</sub> emissions”*



## Project categories

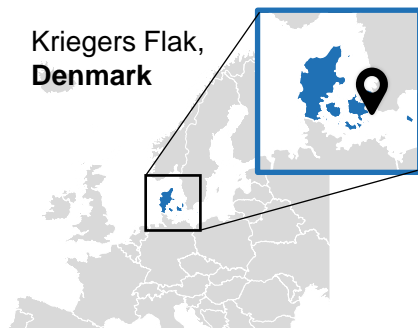
*“The Green Bond Principles are clearly fulfilled when it comes to the types of projects to be financed through the Green Bond, the selection process, the management of the proceeds and the reporting”*

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

## 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



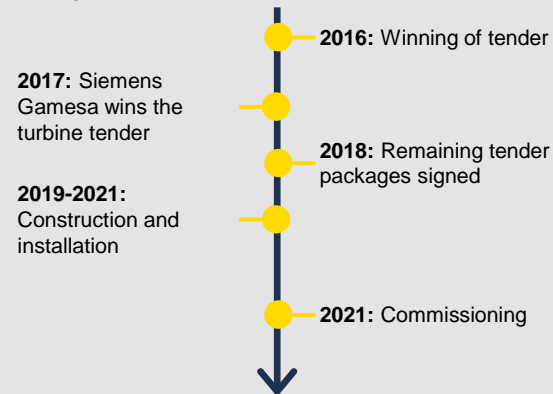
## Key data

<b>Capacity</b>	605 MW
<b>Country</b>	Denmark
<b>Technology type</b>	Wind offshore
<b>Turbine model</b>	Siemens Gamesa Turbines 8.4 MW
<b>Ownership</b>	100% Vattenfall
<b>Total Investment (SEK million<sup>1</sup>)</b>	10,260
<b>Green bond/spent (SEK million<sup>2</sup>)</b>	8,640
<b>Estimated CO<sub>2</sub> reduction<sup>3</sup></b>	440 ktonnes p.a.
<b>Completion</b>	2022

## UN SDG's



## Project Timeline



<sup>1</sup> Year end exchange rate as per 31 December 2020

<sup>2</sup> 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

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

# Princess Ariane

## Overview

- Princess Ariane is the largest onshore wind farm in the Netherlands
- The project was completed in 2021
- The electricity generated by the wind farm is used to power a nearby data centre, saving approximately 350 ktonnes of CO<sub>2</sub> emissions per year



## Key data

<b>Capacity</b>	298 MW
<b>Country</b>	The Netherlands
<b>Technology type</b>	Wind onshore
<b>Turbine model</b>	Nordex N117 3.6 MW
<b>Ownership</b>	100% Vattenfall
<b>Total Investment (SEK million<sup>1</sup>)</b>	3,940
<b>Green bond/spent (SEK million<sup>2</sup>)</b>	3,940
<b>Estimated CO<sub>2</sub> reduction<sup>3</sup></b>	355 ktonnes p.a.
<b>Completion</b>	2021

## UN SDG's



## Project Timeline



<sup>1</sup> Year end exchange rate as per 31 December 2020

<sup>2</sup> 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

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

# Hollandse Kust Zuid

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

UN SDG's



**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.

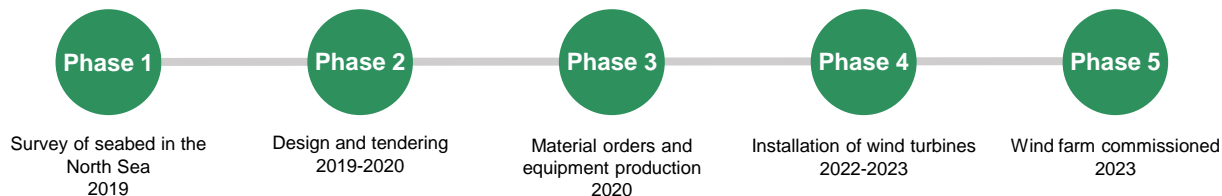
## OUR WINNING FORMULA

- 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/ 25.2% Allianz / 24.3% BASF

## TIMELINE



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



# HYBRIT

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

UN SDG's



A joint initiative by



## What is HYBRIT?

- HYBRIT – short for Hydrogen Breakthrough Ironmaking Technology – is a joint venture between Vattenfall, SSAB (steel) and LKAB (mining and minerals)
- The aim is to create a completely fossil-free value chain from mine to finished steel, with fossil-free pellets, fossil-free electricity and hydrogen.
- In 2021 the world's first fossil-free steel was manufactured and delivered to a customer. Around 100 tonnes have been made so far.

## Why is this important?

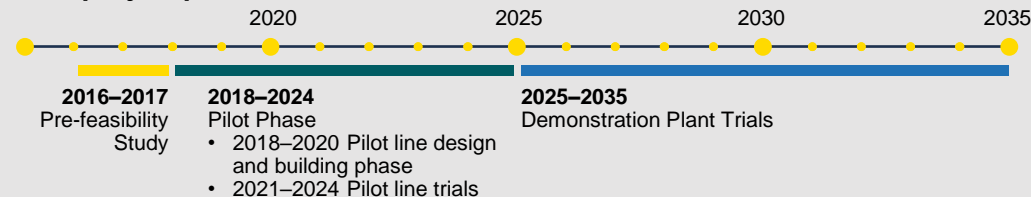
- The steel industry is one of the highest CO<sub>2</sub>-emitting industries, accounting for 7% of global and 10% of Swedish total CO<sub>2</sub> emissions
- Steel demand is set to grow due to population and urbanisation → carbon footprint of the industry needs to be addressed

## 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.

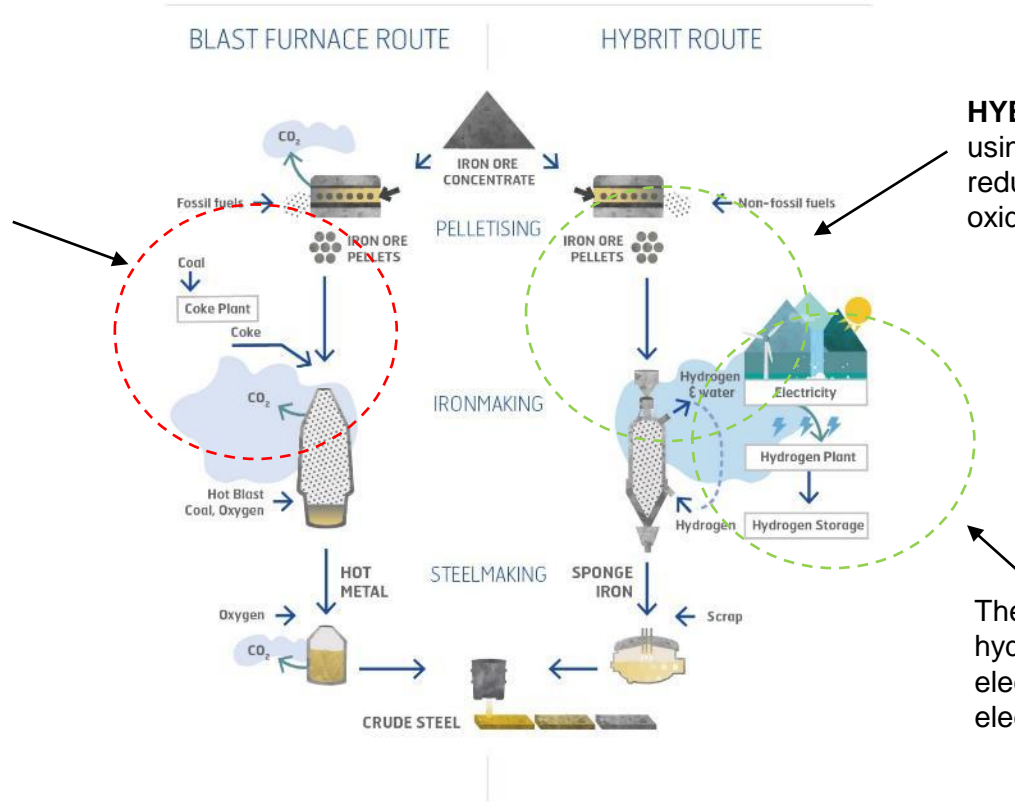
## Main project phases



# 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<sub>2</sub> 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<sub>2</sub>

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

# Sustainability deep-dives

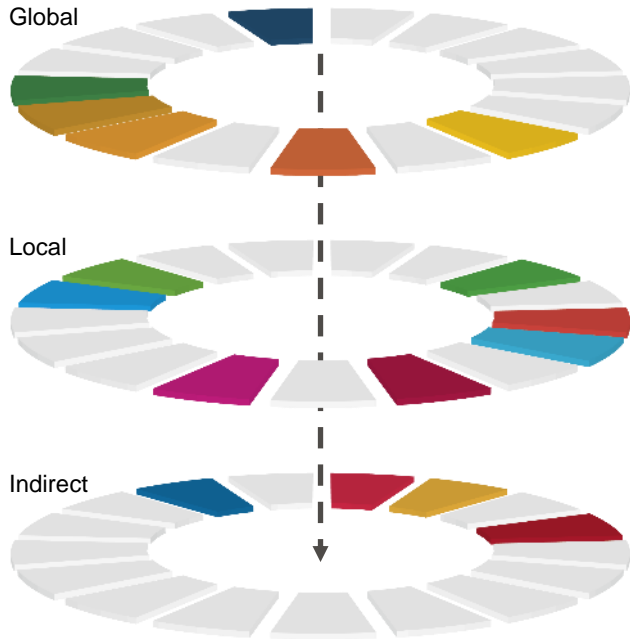


VATTENFALL

# 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)

## SUSTAINABLE DEVELOPMENT GOALS



### 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 7.2

**Target:** By 2030, substantially increase the share of renewable energy in the global energy mix.

**Example:** Vattenfall is investing in various renewable energy sources and technologies such as wind farms, solar parks and battery storage for a robust pipeline of clean and affordable energy. Currently operating 4.2 GW of renewable energy installed capacity.



### SDG 12.2 & SDG 12.5

**Target:** By 2030, achieve sustainable management and efficient use of natural resources.

**Target:** By 2030, substantially reduce waste generation through prevention, reduction, recycling and reuse.

Vattenfall's heat operations are focusing on using excess heat from various third parties, such as the Belvedere waste-to-energy plant in the UK, where heat losses from the plant will be fed into a local district heating network.

**Example:** More than 99% of residual products from our combustion plants are sold, mainly to the construction industry, for re-use.



### SDG 9.4

**Target:** By 2030, upgrade infrastructure and retrofit industries to make them sustainable.

**Example:** By replacing and upgrading the flood gates of a centenary hydro power dam, Lilla Edet, with a low-carbon cement, Vattenfall improves the handling of high-water flows and reduce CO2 emissions.



### SDG 13.1

**Target:** Strengthen resilience and adaptive capacity in relation to climate-related hazards and natural disasters.

**Example:** 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.



### SDG 11.6

**Target:** By 2030, reduce the adverse environmental impact of cities

**Example:** Vattenfall has set an ambition to operate 0.5 million charging points by 2030 further enabling the electrification of transport and reducing tailpipe emissions in and around cities.



### SDG 17.17

**Target:** Encourage and promote effective public, public-private and civil society partnerships, building on the experience and resourcing strategies of partnerships.

**Example:** The completion of three transformer stations to support the regional grid in Gävleborg County highlight the importance of public-private collaborations to Vattenfall in achieving industrial decarbonation projects, like fossil-free data centers.

# 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<sub>2</sub> 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 AFFORDABLE & SUSTAINABLE	9 A FOSTER, INCLUSIVE & DEVELOPING SOCIETY	11 ZERO HAZARDOUS & POLLUTANT WASTE	12 PROGRESSIVE & SUSTAINABLE DEVELOPMENT	13 HEALTHY PEOPLE	17 SUSTAINABLE ECONOMY
Reducing CO <sub>2</sub> emissions	✓	✓	✓	✓	✓	✓
Providing affordable energy	✓		✓			
Investing in renewable energy	✓	✓	✓	✓	✓	✓
Minimising non-CO <sub>2</sub> emissions		✓		✓		
Protecting nature and biodiversity				✓		
Providing affordable, stable and flexible grid infrastructure	✓	✓				
Developing sustainable solutions for customers and partners		✓	✓	✓		✓

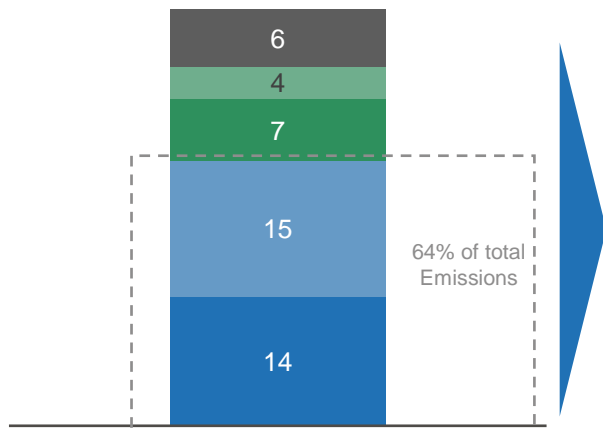
Between May and June 2020, over 2,900 stakeholders from Vattenfall's main markets have rated the most material topics based on importance and significance of impact on the environment, society, or economy. Few take away things are mentioned below,

- Vattenfall's strategy remains in line with stakeholder's expectations. Covid-19 has had little impact on expectations
- Affordability, CO<sub>2</sub> 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

# Going beyond our own production maximises CO<sub>2</sub> impact

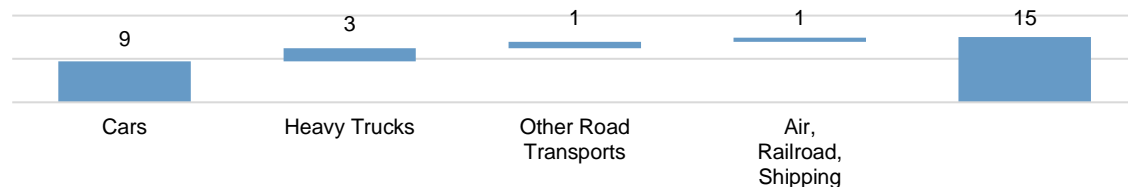
All parts of society need to adjust – electrifying transports and industry is key to enable a fossil-free life

**Total green house gas emissions  
Sweden<sup>1</sup> (2020) 46 MtCO<sub>2</sub>e**



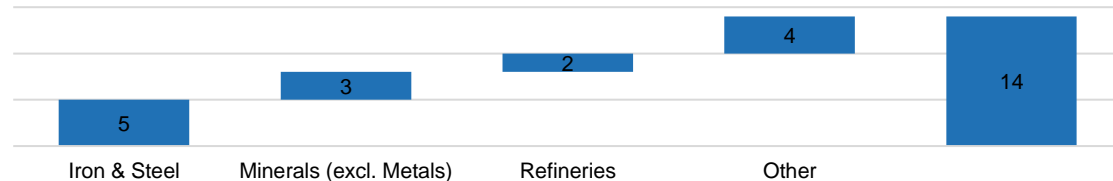
## Transports

MtCO<sub>2</sub>e



## Industry

MtCO<sub>2</sub>e



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

<sup>1</sup> Source: Swedish Environmental Protection Agency

# Industrial partnerships for a fossil-free society

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



VATTENFALL 

Cooperation in large scale bio-diesel production



VATTENFALL 

Northern Europe's largest charging network for e-vehicles



VATTENFALL 

Electrification of mines and smelters



VATTENFALL 

Co-operation for e-mobility



VATTENFALL 

World's first synthetic sustainable aviation fuel



VATTENFALL 

Green guaranteed energy delivery large customers, e.g.



VATTENFALL 

Support of a major enterprise for battery production in Sweden



VATTENFALL 

The world's first fossil-free motorcycle



VATTENFALL 

Powering sustainable datacenters



VATTENFALL 

Developing flexible solutions for grid stability



VATTENFALL 

Excess heat from algae cultivation to heat households



VATTENFALL 

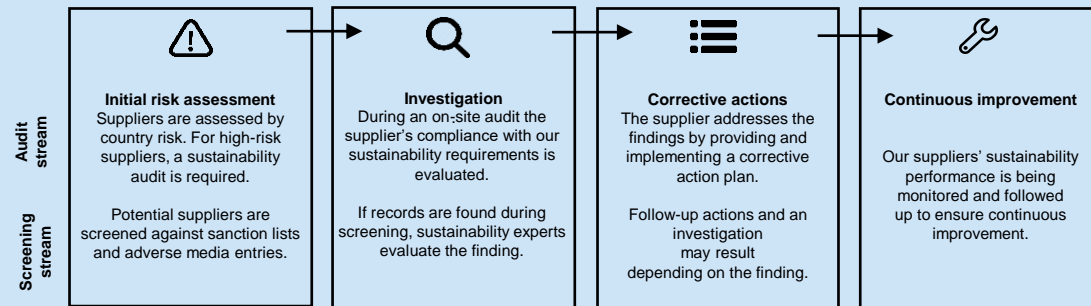


# Promoting responsible business practices throughout the supply chain

## Key improvements in supply chain sustainability

- **Supplier Risk Assessment Tool Light** developed to improve initial risk assessment of new suppliers based on product/service, country and spend and apply targeted mitigation measures
- **“Candy Shop”**, an online user-driven platform for best practice sharing on how to integrate sustainability requirements in tenders, including requirements on circularity, CO2 and human rights
- **Code of Conduct for Supplier and Partners** updated to ensure an accurate reflection of Vattenfall's values and legislative landscape with major improvements on climate impact, high risk minerals, remediation mechanisms and broadening the scope to partners
- **Supplier Risk Assessment Tool** produced a granular risk categorisation of our existing supplier base in 2020, resulting in several follow-up measures such as sustainability requirements in tender and awareness raising sessions in 2021
- **Manage Counterparty Screening Initiative**, a Group initiative to align processes across Vattenfall for initial and continuous assessment of counterparties

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



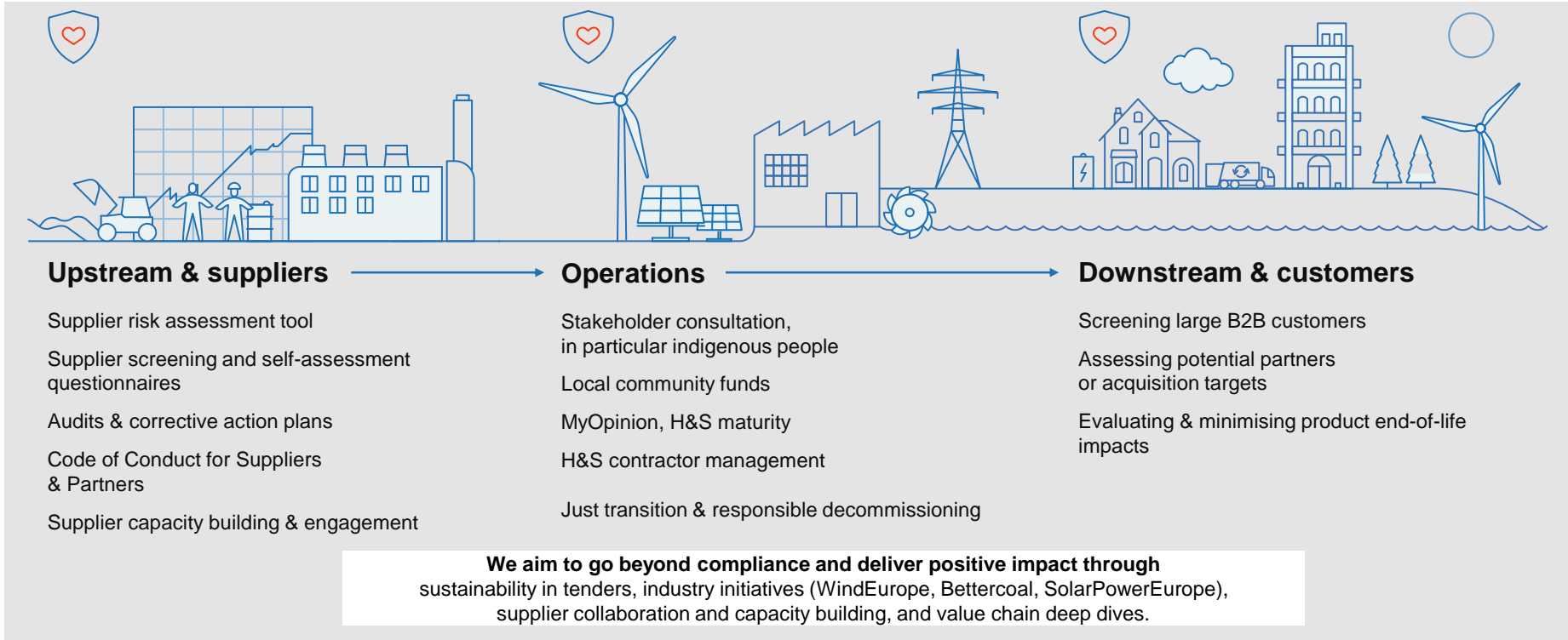
## Sustainable supply chain across four primary sourcing and purchasing streams (2021)

	Number of suppliers	Primary countries	Number of site audits conducted	% new suppliers that have undergone social/environmental assessments
Goods and services	~20,200	Sweden, Germany, Netherlands	3	100%
Waste & biomass	~200	Sweden, Germany, Norway	5	100%
Coal	~10	Russia <sup>1</sup> , USA	3	No new suppliers
Nuclear fuel	~10	Canada, Australia, Kazakhstan and Russia <sup>2</sup>	0	No new suppliers

**For more info:** See page 86-87 in Vattenfall's Annual- and Sustainability Report 2021  
 1 As of March 2022, Vattenfall intends to not make any new hard coal purchases from Russia until further notice.

# Respect for human rights throughout our value chain ensures we create value in a sustainable way

Tools, processes and actions to respect human rights



# A holistic view of Vattenfall's net impact

Using Upright's net impact assessment<sup>1</sup> to quantify both positive and negative impacts of our activities




Impact	Negative	Score	Positive	Comment
<b>Society</b> <div> <div>Jobs</div> <div>Taxes</div> <div>Societal infrastructure</div> <div>Societal stability</div> <div>Equity and human rights</div> <div>Society (total)</div> </div>	-	3.9	3.9	<b>Vattenfall's largest impact comes from providing essential societal infrastructure.</b> Mainly driven by power generation, heat production and distribution businesses, as these activities are crucial for keeping societies running. In addition, Vattenfall contributes positively to society through taxes paid, employment and dividends to the Swedish state.
<b>Knowledge</b>	-1.0	-0.8	0.2	<b>Vattenfall uses is scarce human capital through employing a highly talented and educated workforce.</b> Vattenfall also has a minor positive contribution to knowledge creation through innovation and R&D activities in the energy sector.
<b>Health</b>	-0.1	-0.1	-	<b>Vattenfall's impact on human health is relatively limited.</b> The negative impact Vattenfall does have is related to physical diseases from particulate matter emissions from burning fossil fuels.
<b>Environment</b> <div> <div>GHG emissions</div> <div>Non-GHG emissions</div> <div>Scarce natural resources</div> <div>Biodiversity</div> <div>Waste</div> <div>Environment (total)</div> </div>	-2.4	0.8	3.2	<b>Vattenfall has a significant impact on the environment.</b> Positive impacts related to both greenhouse gas (GHG) and non-GHG emissions are driven by non-fossil power generation – mainly hydro, nuclear and wind power – replacing the use of fossil energy sources. Negative impacts on emissions are driven by power and heat production with fossil fuels. Natural resource use, such as uranium or nuclear waste generation, are visible on the negative environmental side. The impacts on biodiversity are mainly driven by hydro, among other activities.
<b>Net impact ratio</b>		<b>52%</b>		

<sup>1</sup> <https://www.uprightproject.com/>

See more on page 73 in the Annual and Sustainability report 2021

# Biodiversity – examples of actions

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

Business area	Aim	Examples
Hydro power	Identify new solutions to reduce environmental impact of hydro power production	 <p>"Laxelatorn" is a unique, large-scale laboratory for hydro power-related environmental and hydraulic experiments that was inaugurated in 2018. It combines knowledge of biology and hydraulics to find solutions that allow and attract fish to safely pass by the power plant with the smallest possible effect on operations. In 2019, the main projects focused on innovation for downstream fish migration such as bubble curtains and flexible nets to avoid turbine passage.</p> <p>We are investigating how we can use machine learning to identify and count animal species and how environmental DNA (eDNA i.e. the residual DNA left in the ambient environment by plants and animals) can be used to quickly identify species in our hydro operations. This would be less resource-intensive than the process is today and make it easier to evaluate the effect of measures like fish compensation programmes.</p>
	Biotope restoration and species protection	
	Knowledge building activities includes both research and pilot studies	
	Preserve and manage biodiversity and enhance recreation values	
Offshore wind power	Limit impacts on the marine environment	 <p>Many R&amp;D projects are conducted at the European Offshore Wind Deployment Centre (EOWDC) located in Aberdeen Bay, Scotland. A first project was conducted during construction of the Aberdeen Bay offshore wind farm, where a new type of jacket foundation was used, so-called suction buckets. Instead of monopiles driven into the seabed, giant upside-down buckets paired with jacket substructures anchor the wind turbines to the seabed. The method is virtually noiseless, which reduces the disturbance to marine life.</p>
	Reduce impact on and contribute to conservation of fauna	
Power distribution	Maintenance of habitats and protecting species	 <p>Clearance work for power lines opens meadow-like fields for threatened and rare species, like the butterfly marsh fritillary. With GIS mapping and field inventories performed during 2018, important biodiversity hotspots have been identified, and adjusted clearance plans have been developed accordingly. A pilot project outside Stockholm uses goats instead of machines to clear the landscape, which favours biodiversity.</p>

# 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<sub>2</sub> 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)<sup>1</sup>.



## Climate change affects Vattenfall

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

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



## Ensuring security of supply and resilient operations

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

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

<sup>1</sup> For more info see page 67 and 175 in the Annual- and sustainability report 2021

# 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



**10.5 million** customer contracts in Europe



**96.1 TWh** of electricity sold in 2021



**28,700** connected charging points for electric vehicles



## Key data

	FY 2021	FY 2020
Net sales (SEK bn)	106.6	86.3
External net sales (SEK bn)	102.3	84.7
Underlying EBIT <sup>1</sup> (SEK bn)	2.3	2.1
Sales of electricity (TWh)	96.1	95.8
- of which, private customers	26.8	26.3
- of which, resellers	7.9	8.0
- of which, business customers	61.4	61.5
Sales of gas (TWh)	56.0	52.1
Net Promoter Score (NPS) <sup>2</sup>	+15	+12

<sup>1</sup> Operating profit excluding items affecting comparability

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

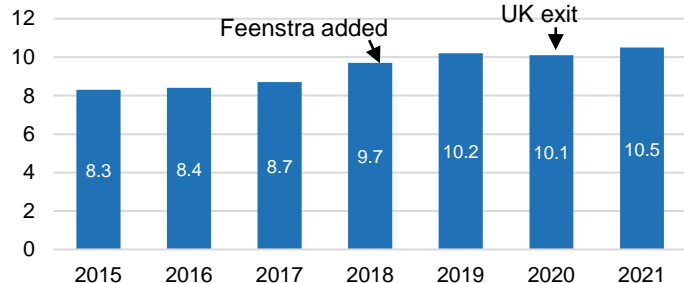


# Customers & Solutions

## Market overview

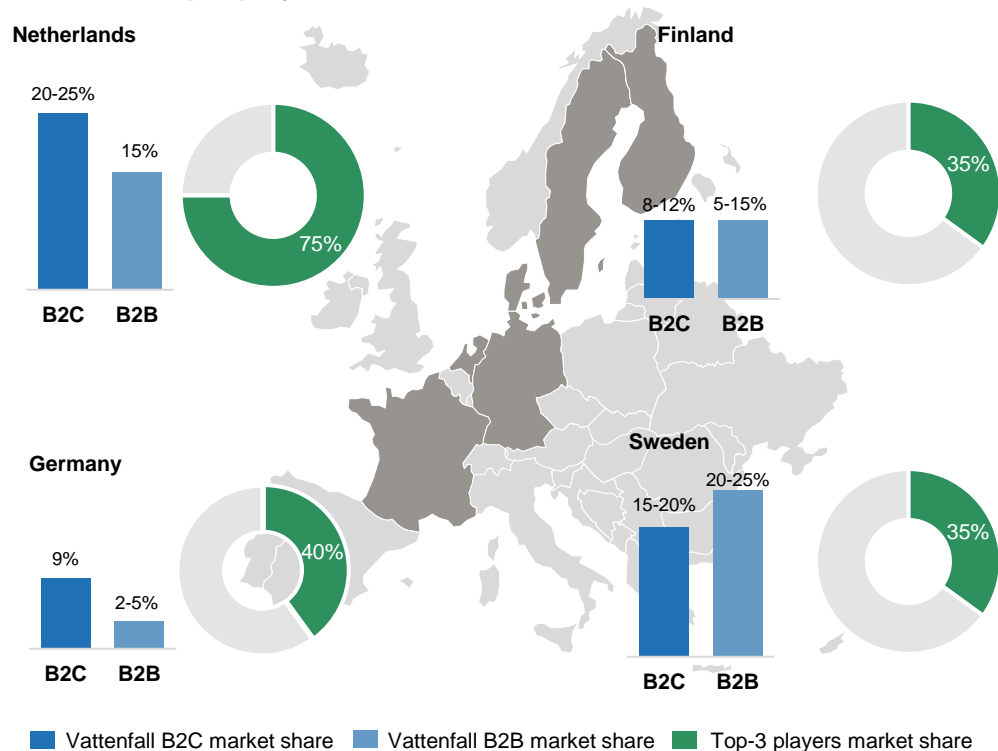
- Customers & Solutions supplies electricity, gas and energy solutions to retail and business customers, with 10.5 million customer contracts
- We are one of the market leaders in the retail and business segments in Sweden (~900,000<sup>1</sup> electricity contracts) and in the Netherlands (4.6 million<sup>1</sup> electricity and gas contracts)
- In Germany we supply electricity and gas to retail customers (4.3 million<sup>1</sup> 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



<sup>1</sup> Year-end 2021 numbers

## Vattenfall and top-3 players market share, main markets



# 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

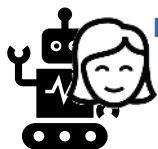
>8m Dutch citizens uses WhatsApp daily → WhatsApp launched as an additional customer service channel in 2019

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



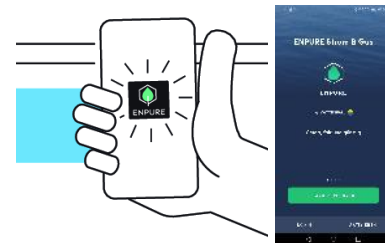
Customer Service via WhatsApp

## 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<sub>2</sub> 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



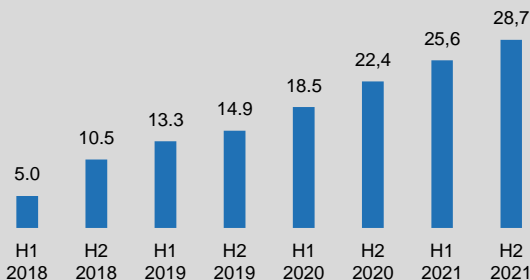
InCharge is fully owned by Vattenfall but grows together with our partners. We take care of all the details with end-to-end services, offering everything from infrastructure and hardware installation to software and connected services – all backed up with expertise and advice.

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.

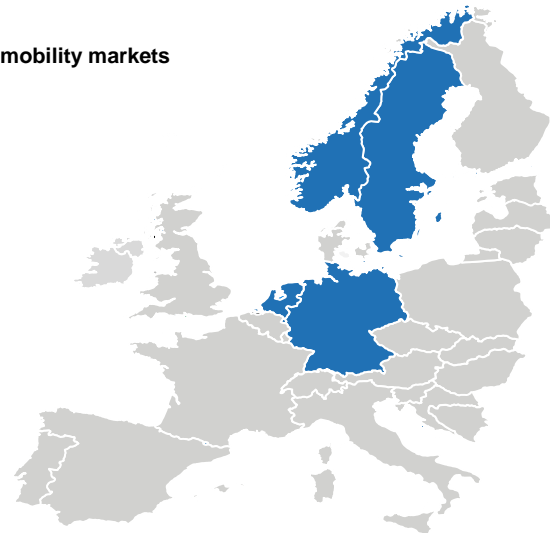
The e-mobility market is rapidly developing, and new players are shaping their roles in the value chain. Vattenfall therefore needs to be innovative and agile, taking advantage of the multitude of services our organisation as well as our partners can offer.

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)



# 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



**7.2 GW** PPAs under management



Laxede power plant, Sweden

## Key data

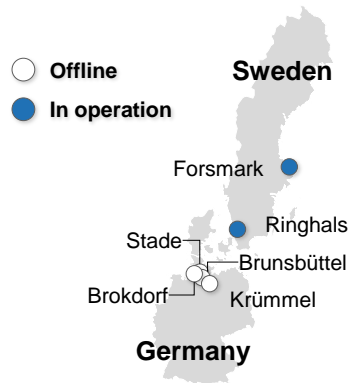
	FY 2020	FY 2020
<b>Net sales (SEK bn)</b>	126.3	90.1
<b>External net sales (SEK bn)</b>	40.3	36.6
<b>Underlying EBIT<sup>1</sup> (SEK bn)</b>	19.3	14.7
<b>Electricity generation (TWh)</b>	81.3	79.0
- of which, nuclear	40.4	39.3
- of which, hydro	40.9	39.7
<b>Customer sales of electricity (TWh)</b>	22.2	20.0
- of which, resellers	17.5	17.9
- of which, business customers	4.7	2.1

<sup>1</sup> 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 four in Germany (Brunsbüttel, Krümmel and minority stakes in Brokdorf and Stade)
- Five of our reactors are in commercial operation in Sweden
- Our last operational nuclear asset in Germany, Brokdorf, was decommissioned in year-end 2021
- Vattenfall's power generation in 2021 amounted to 40.4 TWh (39.3). Combined availability was 84.8% (76.4%)



## 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	2021	Offline	Decommissioned in 2021

# The financing system for post-operational nuclear costs

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

## In Sweden

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

## In Germany

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

## Sweden

Nuclear power operators	Payments based on generated kWh	Swedish Nuclear Waste Fund	Financial implications	EBIT	Funds from operations (FFO)	Adjusted net debt (AND)
	Swedish National Debt Office decides on disbursements from the fund	The fair value of the Vattenfall Group's share in the Swedish Nuclear Waste Fund was SEK 53 billion as of 31 December 2021	<b>Valuation of nuclear provisions</b>	Provision value depreciated over operating life-time of nuclear power plant	N/A	Included in AND
			<b>Payments to the Swedish Nuclear Waste Fund</b>	No impact	Negative impact through payment to the Swedish Nuclear Waste Fund	Increase fund balance (offset AND)
			<b>Decommissioning activities</b>	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<sup>1</sup>

Final repository

Decommissioning and dismantling<sup>2</sup>

Encapsulation

Intermediate storage (Clab)

Other

39%

27%

16%

11%

8%

## Germany

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

<sup>1</sup> Remaining costs based on the latest calculation (plan 2019), figure from year-end 2020.

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

# Hydro power

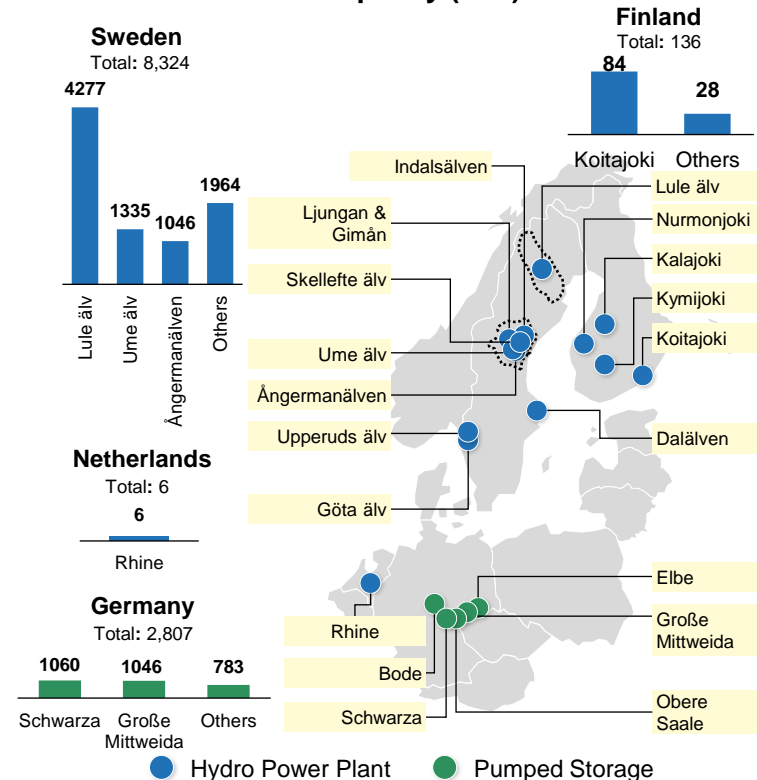
## Hydro overview

- 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 40.9 TWh (39.7)
- 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

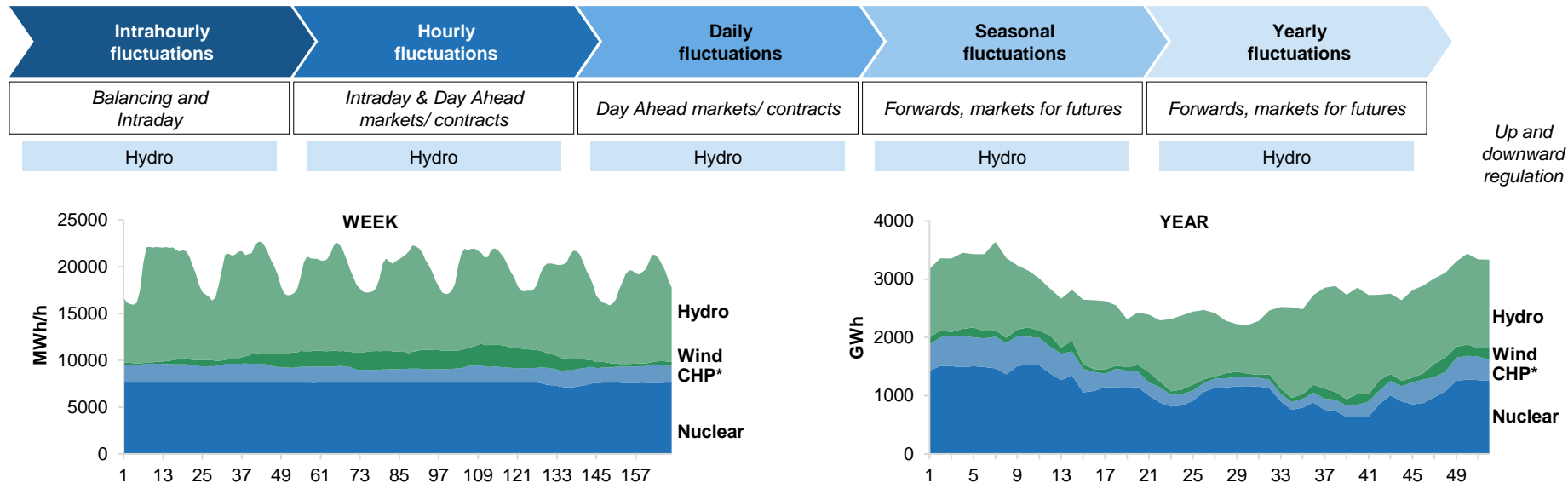
	Project	Turbine Type	Installed Capacity (MW)	Country	River	Vattenfall ownership share	Commission Year
Hydro Power	Harsprånget	Francis	871	Sweden	Lule älv	100%	1951
	Letsi	Francis	486	Sweden	Lule älv	100%	1967
	Messaure	Francis	463	Sweden	Lule älv	100%	1963
	Porjus	Francis	430	Sweden	Lule älv	100%	1915
	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



## 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<sub>2</sub> emissions has contributed to significant growth in installed capacity of renewable energy sources. However, the intermittent nature of these energy sources makes it necessary to have back-up capacity. Flexible hydro power can offer its huge reservoirs of stored water as a giant “green” battery for the Nordic region and other markets (with the help of interconnectors)

# Sample deals on Corporate PPAs and PPAs

<b>CPPA:</b> ~1 TWh		 22 GWh	<p>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).</p>
		 909 GWh	<p>Vattenfall has signed a 10 year agreement with Microsoft to power its international data center operations in the Netherlands from an adjacent wind farm.</p>
		 60 GWh	<p>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.</p>
<b>PPA:</b> ~ 7 GW		 253 MW	<p>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</p>
		 300 MW	<p>Vattenfall has signed a 15-year purchase agreement for renewable electricity from the Zeewolde onshore wind farm in the Netherlands</p>

# 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



**2.6 GW** installed offshore wind capacity



**1.6 GW** installed onshore wind capacity



**>2 GW** solar and batteries pipeline



Installation of wind turbine at Ormonde offshore wind farm, UK

## Key data

	FY 2021	FY 2020
Net sales (SEK bn)	20.9	13.6
External net sales (SEK bn)	7.8	6.9
Underlying EBIT <sup>1</sup> (SEK bn)	7.9	4.0
Electricity generation (TWh)	11.2	10.8
Investments (SEK bn)	12.6 <sup>2</sup>	5.8 <sup>2</sup>

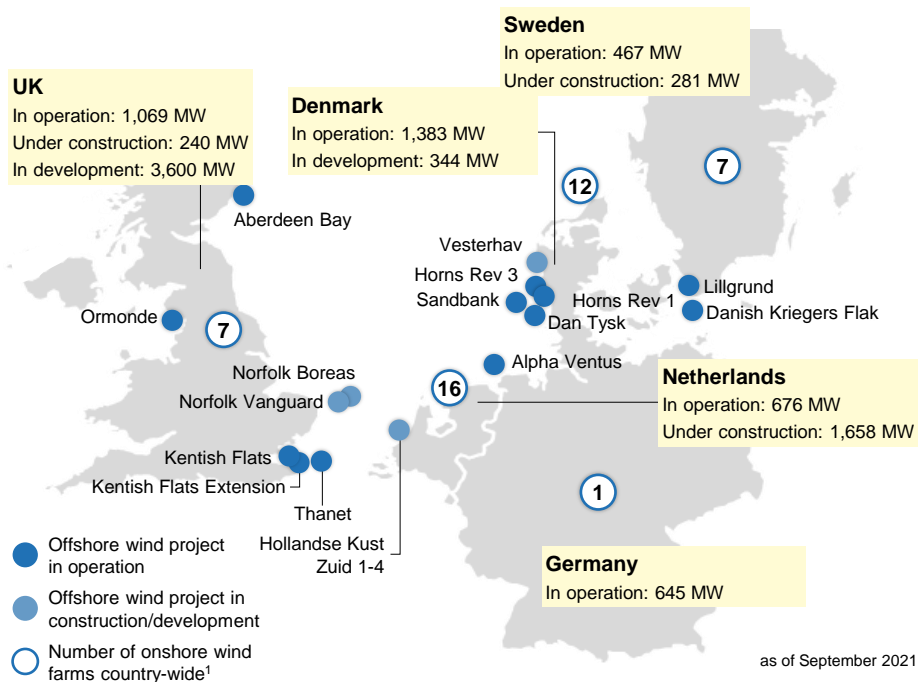
<sup>1</sup> Operating profit excluding items affecting comparability

<sup>2</sup> Excluding investments in projects under develop-to-sell assumptions

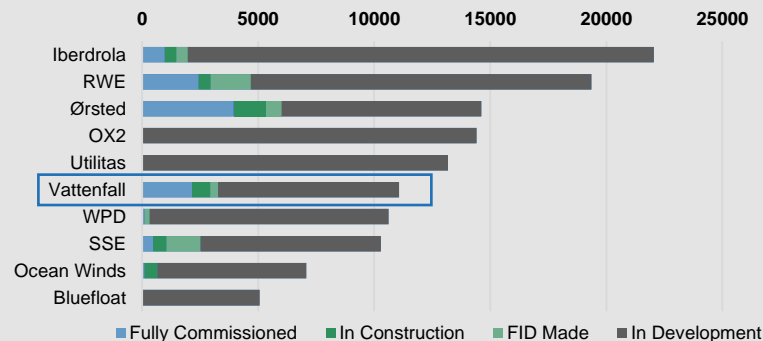
# A leader in the European renewables transition

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<sup>1</sup>**



**Capacity of top 10 European Offshore Players (MW)<sup>2</sup>**



<sup>2</sup> 4cOffshore database as of Mar '22; Net capacity (i.e. only showing owned capacity)

## Under construction and pipeline<sup>1</sup>

> 2 GW

Wind projects  
under  
construction

> 4 GW

Wind projects  
in mature stage  
development

~ 2 GW

Solar PV  
projects in  
development

~ 500 MW

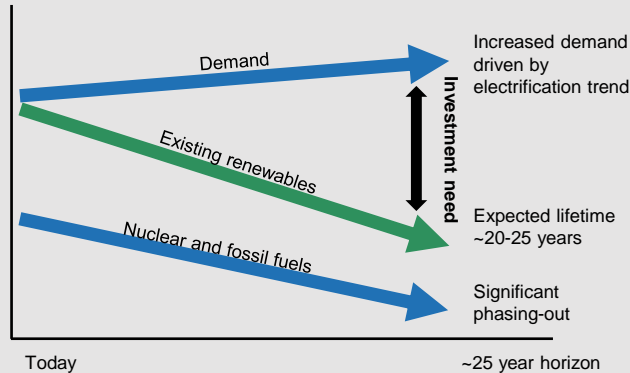
Batteries  
pipeline

<sup>1</sup> As of March 2022

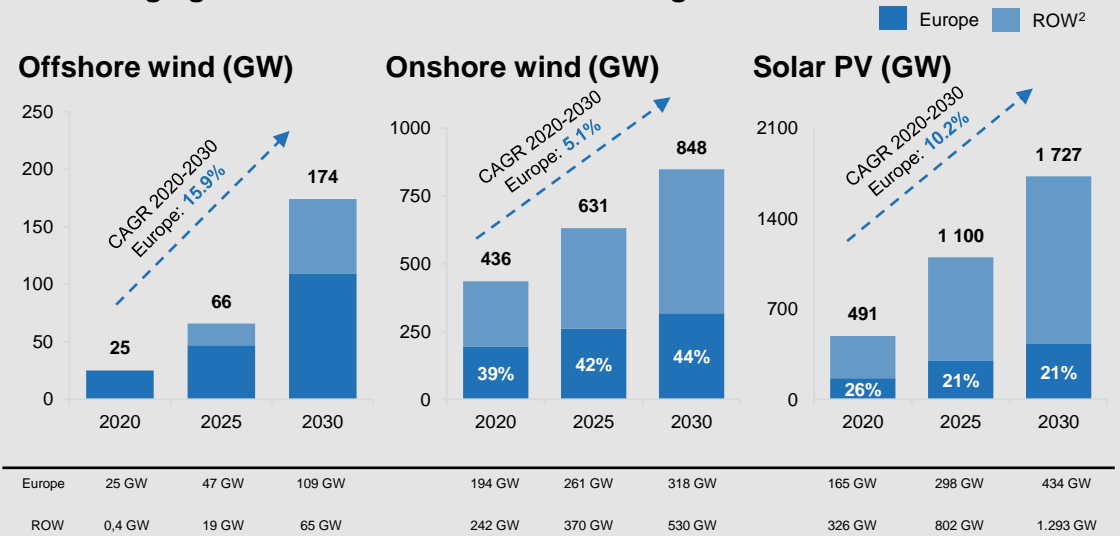
# Europe continues to be a highly attractive growth market

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<sup>1</sup>

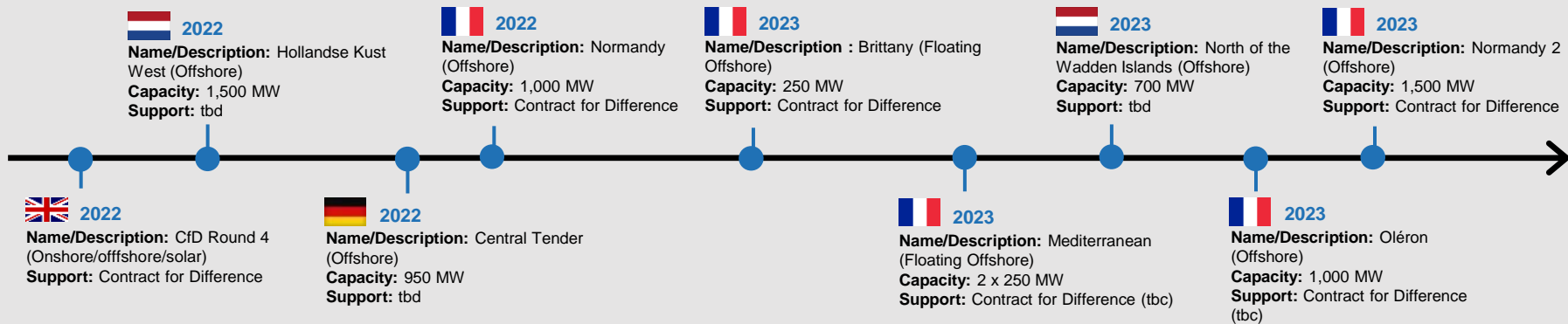


<sup>1</sup> Source: Wood Mackenzie, cumulated capacity; Solar numbers extrapolated 27+

<sup>2</sup> ROW excludes China

# Pipeline of opportunities supports Vattenfall ambitions

Several upcoming offshore wind tenders in relevant markets\*



\* Listed by expected award date

# Milestones from 2017 to date

Vattenfall Business Area Wind has shaped the renewables industry

2017 >

## Sandbank

288 MW offshore wind farm in Germany commissioned



## Pen y Cymoedd

Vattenfall's biggest UK onshore wind farm (228 MW) and one of the largest batteries operational (22 MW)



## Wieringermeer ext.

Decision to expand Dutch onshore windfarm to 295 MW



< 2019

## Aberdeen Bay

Deployment of most powerful, commercially available WTG (8.8 MW)



## Hollandse Kust Zuid 1&2

First "zero-subsidy" tender win for up to 760 MW



< 2018

## Haringvliet

First hybrid onshore & solar PV project close to construction start



## Hollandse Kust Zuid 3&4

Second "zero-subsidy" tender win for up to 760 MW



2020 >

## Princess Ariane

Commissioning of largest Dutch onshore wind farm (301 MW)

2021 >

## Kriegers Flak

Commissioning of Scandinavia's largest offshore wind farm (604 MW)



# 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



## **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)

**Partners:** 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:** under construction

**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



## **Hollandse Kust Zuid (NL)**






**Status:** under construction

**Specs:** offshore wind (1,500 MW)

**Partners:** BASF and Allianz

**Deal structure:** sale of 49.5% stake in post-FID project

# Overview of regulatory regimes

Country	Name	Founding year/ Status/Technology	Overview	Time period
	Contracts for Difference (CfD)	Founding year: - Status: In force Eligible technology:	<ul style="list-style-type: none"> <li>A settlement price is guaranteed for offshore power provider. The support is based on the difference between agreed and market price</li> <li>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</li> </ul>	<ul style="list-style-type: none"> <li>Maximum of 20 years (after the wind farm has been connected to the grid)</li> </ul>
	Feed-in premium tariffs (FIT)	Founding year: 2009 Status: In force Eligible technology:	<ul style="list-style-type: none"> <li>The eligible producer receives premium from the TSO Energinet.dk equivalent to the difference between the spot market price and the fixed support income</li> </ul>	<ul style="list-style-type: none"> <li>Depends on the type of technology and date of commissioning</li> </ul>
	Contracts for Difference (CfD)	Founding year: 2014 Status: In force Eligible technology:	<ul style="list-style-type: none"> <li>A Contract for Difference (CfD) is a private law contract between a RES-E generator and the CfD Counterparty – Low Carbon Contracts Company (LCCC)</li> <li>The CfD is based on a difference between the market price and an agreed “strike price”</li> <li>If Strike price &gt; market price: Then CfD counterparty must pay the difference between the two to RE generator</li> <li>If Strike price &lt; market price: Then RE generator must pay the difference to the CfD counterparty</li> </ul>	<ul style="list-style-type: none"> <li>CfD contracts are awarded for a period of 15 years</li> </ul>
	ROC scheme	Founding year: 2002 Status: In force Eligible technology:	<ul style="list-style-type: none"> <li>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</li> <li>Renewable Obligation Certificates are issued to renewable energy producers for every MWh of renewable electricity produced</li> </ul>	<ul style="list-style-type: none"> <li>ROC is issued for a period of 20 years</li> <li>RO scheme is closed for generating capacity after 31<sup>st</sup> March 2017</li> </ul>
	MEP <sup>1</sup> / SDE+ / SDE++	Founding year: 2011 Status: In force Eligible technology <sup>2</sup> :	<ul style="list-style-type: none"> <li>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, e.g. difference between wholesale electricity prices and cost of electricity from renewable sources</li> <li>The budget is based on an auction system, where the lowest bidder receives the premium</li> <li>Total budget SDE++ 2022: at least € 8 billion</li> <li>Cap of 35 TWh subsidised production of wind and solar in 2030 is likely to be reached in 2022 or 2023. Thus SDE++ will no longer be available (new grants) for wind and solar after this. Alternative instruments might then be introduced to replace the SDE++</li> </ul>	<ul style="list-style-type: none"> <li>The premium is paid for a period of up to 15 years</li> </ul>
	EEG	Founding year: - Status: In force Eligible technology:	<ul style="list-style-type: none"> <li>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</li> <li>Bids are based on floating market premium</li> <li>Market Premium: reference value of the respective renewable energy plant minus its technology-specific market value</li> </ul>	<ul style="list-style-type: none"> <li>Market premium is paid for a period of 20 years</li> </ul>
	The Electricity Certificate System	Founding year: 2003 Status: In force Eligible technology:	<ul style="list-style-type: none"> <li>The demand for certificates is regulated by a quota system, which is fixed in proportion to total electricity use (energy intensive industry is exempted)</li> <li>The electricity producer receives a certificate for each MWh from renewable sources and sell it to electricity consumers in open market</li> <li>Sweden and Norway have shared common electricity certificates since 2012</li> </ul>	<ul style="list-style-type: none"> <li>Aims to add 18TWh by 2030</li> <li>Sweden officially plans to continue the green certificate subsidy scheme until 2030, and is also considering to phase out onshore by 2021</li> </ul>

<sup>1</sup> Older version of the SDE+ scheme

# Wind & Solar - Installed capacity (MW<sup>1</sup>) Q4 2021

	Solar	Onshore	Offshore	Total
United Kingdom	0	383	686	1,069
Denmark	0	213	1,170	1,383
The Netherlands	74	602	0	676
Sweden	0	357	110	467
Germany	2	7	636	645
<b>Total (MW)</b>	<b>77</b>	<b>1,562</b>	<b>2,602</b>	<b>4,241</b>



## 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

**Installed capacity (MW) 1,069**

## Sweden – certificate scheme

Blakliden + Fäbodberget	139
Lillgrund	110
Stor-Rotliden	78
Högbjör-Kärsås (50%)	38
Höge Väg (50%)	37
Hjuleberg (50%)	36
Juktan (50%)	29

**Installed capacity (MW) 467**

## 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
Bajlum (89%)	15
DræbyFed	9
Ejsing (97%)	7
Lyngmose	5

**Installed capacity (MW) 1,383**

## Germany – EEG scheme

DanTysk (51%)	288
Sandbank (51%)	288
alpha ventus (26%)	60
Westküste (20%)	7
Decentral Solar installations	2

**Installed capacity (MW) 645**

## The Netherlands – MEP/SDE(+)

Princess Ariane	298 <sup>2</sup>
Princess Alexia	122
Jaap Rodenburg	38
Haringvliet	38
Slufterdam	29
Haringvliet	18
Eemmeerdijk	17
Irene Vorrink	17
Nieuwe Hemweg	13
Echteld	8
Moerdijk	27
Oom Kees (12%)	6
Oudendijk	5
Hiddum Houw	4
Eemshaven	6
Velsen	2
Hemweg	2
Diemen	1
Decentral Solar installations	25

**Installed capacity (MW) 676**

<sup>1</sup> Capacity in operation: total capacity of the wind farms that Vattenfall has an ownership in.

Minority shares included as 100%

<sup>2</sup> One turbine remains to be installed

# Main renewables projects in our 5 core countries

Country	Name	Capacity (MW)	Support scheme	Awarded	Duration of support	Ownership (%)	Commissioning	Current status
NL	Hollandse Kust Zuid 1-4	1,520	-	X	-	50.5	2023	Offshore works started, Partnering with BASF
NL	Haringvliet	22	SDE+	X	15 yrs	100	2021	Commissioning ongoing
NL	Ny Hiddum Houw	19	SDE+	X	15 yrs	100	2023	Under construction
UK	South Kyle	240	-	N/A	-	100	2022	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	-	0 <sup>1</sup>	2023	FID received in Q1 2021
DE	Kogel cluster	28	EEG	(X)		100	2021	Completed construction / Approved TG5
NL	Windplan Blauw	77	SDE+	X	15 yrs	58	2023	FID received in Q3 2021
DK	Vesterhav	344	FIT	X	50.000hrs	100	2023/2024	FID received in Q4 2021
UK	Battery@Ray	20	-		-	100	2022	FID received in Q4 2021
<b>In construction</b>		<b>2,710</b>						
UK	Norfolk projects	3,600	CfD		15 yrs	100	2027-2029	Development consent in 12-2021, preparing for CfD bid
<b>In development (in mature stage)</b>		<b>3,600</b>						

■ Offshore
 ■ Onshore
 ■ Solar
 ■ Batteries

<sup>1</sup> The project has been sold but Vattenfall will build and operate the wind farm

# Heat



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# Heat

One of Europe's leading players in district heating

## Overview

- One of Europe's leading players in district heating in metropolitan areas
- Building and operating district heating assets and grids in 4 countries and 24 cities
- 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, energy from waste, wind and solar
- In the UK, construction of Vattenfall's first district heating network is under construction and is planned to be operational in 2023

## Highlights



**> 5,500 km** heat grids in operation



**~ 9 GW** heat capacity



**~ 8 GW** electricity capacity



**1.8 million** heat related end customers



**< 0.5%** churn rate



## Key data

	FY 2021	FY 2020
Net sales (SEK bn)	34.8	23.3
External net sales (SEK bn)	14.7	13.5
Underlying EBIT <sup>1</sup> (SEK bn)	-0.3	1.0
Electricity generation (TWh)	19.0	22.8
Sales of heat (TWh)	15.6	13.8

<sup>1</sup> 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 in 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 condensing business consists of gas-fired power plants in the Netherlands.

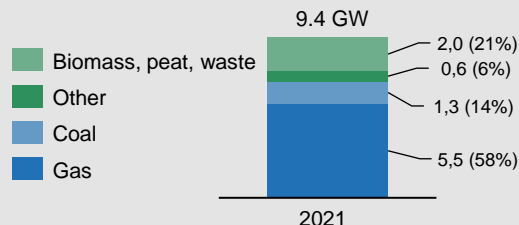
### Heat cluster 2021

	Heat (TWh)	Power (TWh)
Germany	10.3	6.7
Sweden	3.2	0.2
Netherlands	1.9	-
<b>Total</b>	<b>15.4</b>	<b>6.9</b>

### Condensing cluster 2021

	Heat (TWh)	Power (TWh)
Germany	0.1	0.1
Netherlands		11.6
<b>Total</b>		<b>11.7</b>

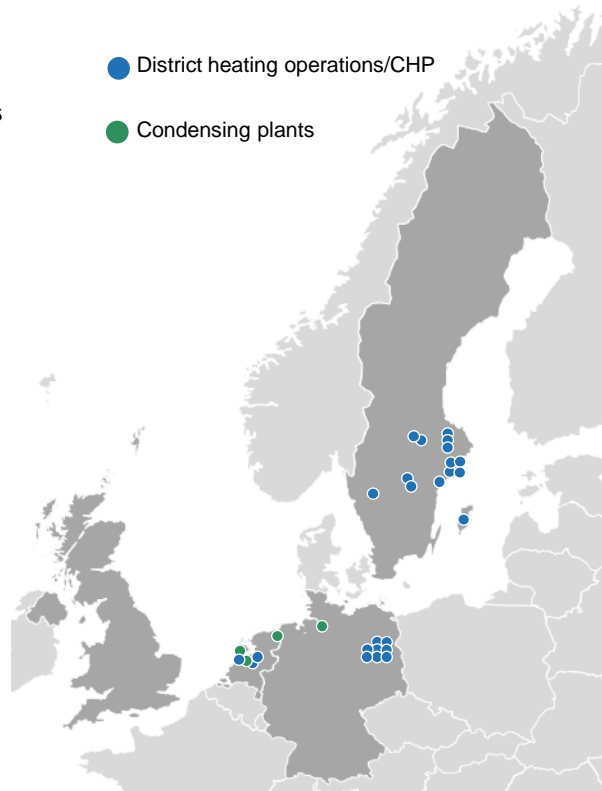
### Installed capacity by GW<sub>heat</sub>



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

● District heating operations/CHP

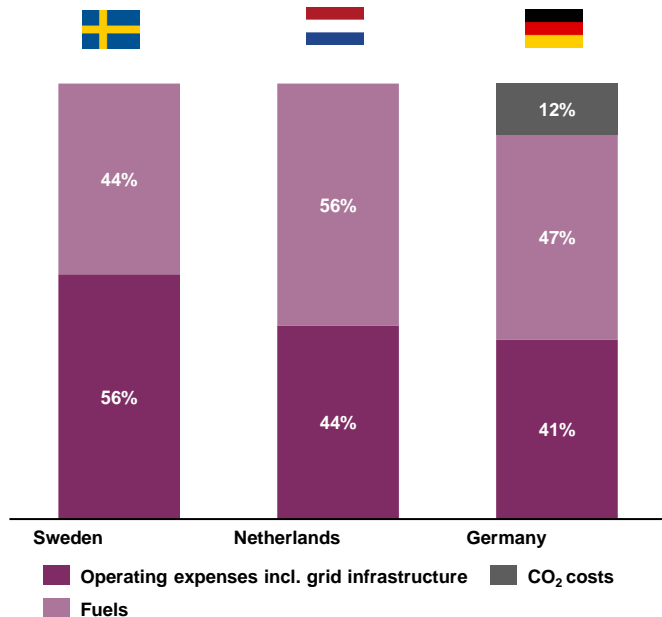
● Condensing plants



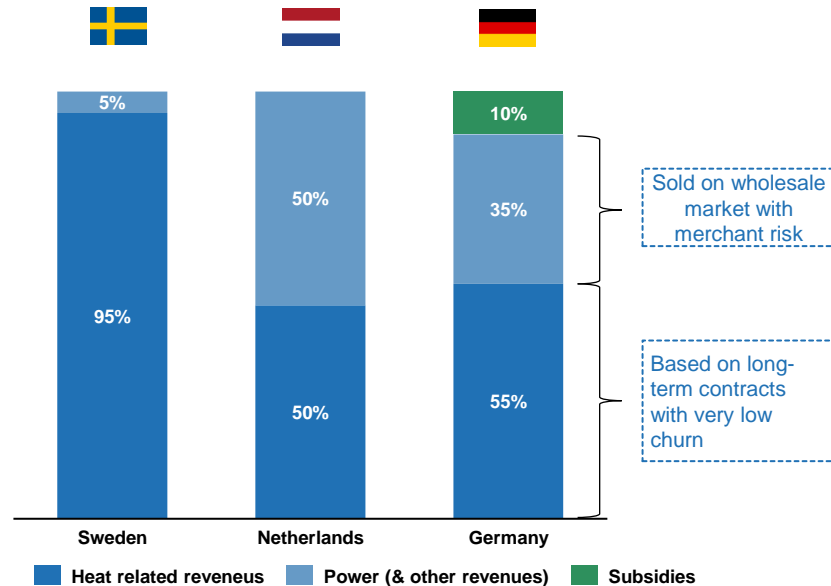
# District heating revenue and cost structure per market

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

Cost split (indicative)<sup>1</sup>



Revenue split (indicative)








<sup>1</sup> 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 <sup>1</sup>	Political support	Competitiveness	Concession based	Price setting (heat)	Typical customer contract length
	<p><b>"European Climate Law"</b> 2030 climate target: <b>-55% net GHG<sup>4</sup> emission (compared to 1990 levels)</b>; 2050 target: EU-wide climate neutrality  </p> <p><b>„Fit for -55% package“</b> tabled 14 July 2021 Increased <b>requirements for heating/cooling and buildings sector: share of renewables, phase out coal, demand reduction/energy efficiency   energy system integration</b>; CO<sub>2</sub> pricing, power-to-heat, increased positive perception for DHC (details to be investigated); Hydrogen one priority area.</p>					
	Young	Low carbon district heating market share 30% by 2030 in metropolitan areas <sup>2</sup> (2% today)	<b>Highly competitive</b> 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	<b>Highly competitive</b> Low primary energy factor for new houses Reliable and comfortable delivery of city heating	No	Price escalation formula for heat	up to 10 years
	Mature + Transition to Green	Natural gas phase out boosts renewable district heating. New subsidy schemes for connecting existing houses	<b>Competitive pricing</b> 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 <sup>3</sup>	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	<b>Competitive position</b> that is being challenged by heat pumps	No	No heat price regulation	Until further notice

<sup>1</sup> Referring to how established the technology is on the market and the future growth prospects

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



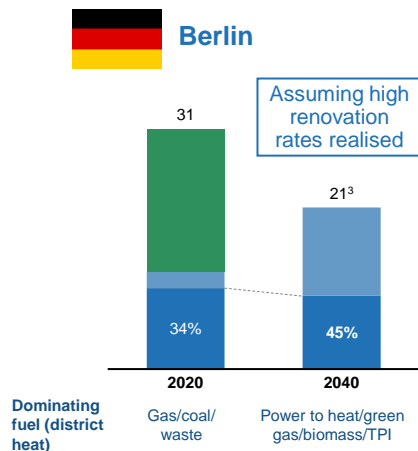
<sup>3</sup> The other type of contract is the heat delivery contract. Contracts are then building-specific with a typical contract length of 10 years

<sup>4</sup> GHG: greenhouse gas emissions

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

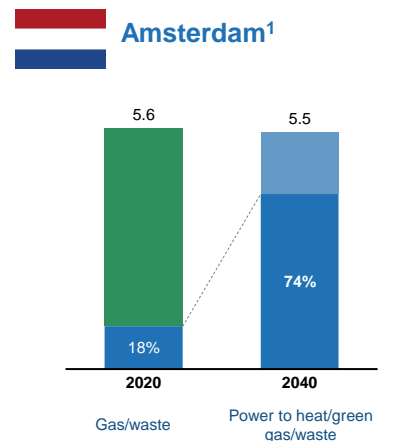
... with a stable trend in Berlin and Uppsala as population growth is offset by energy efficiency measures

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



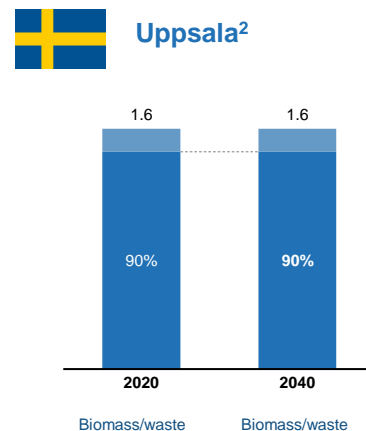
Rapid phase out of coal and totally fossil free by 2040+

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



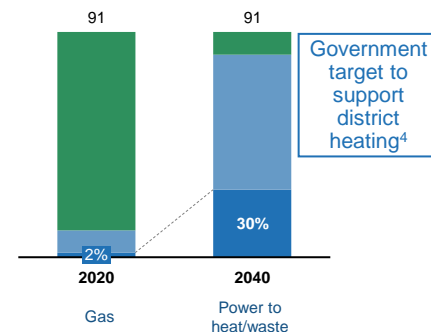
Gas boiler phase out set to spur dramatic increase in district heating

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



Mature market with dominant market share of district heating

Stable heat demand – population growth offset by energy efficiency measures



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

Stable heat demand – population growth offset by energy efficiency measures

■ District Heat ■ Electricity, Renewables & Other ■ Fossil

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



















<sup>2</sup> Simplified reflecting Uppsala demand (= 42% of Heat Sweden supply)

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















<sup>4</sup> 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	288
Klingenberg		760	164
Reuter West		878	564
Marzahn		924	256
Mitte		680	444
Wilmersdorf		120	0
Charlottenburg		300	144
Moabit		247	123
Reuter		219	36
Scharnhorststraße		167	1
Buch		137	12,5
Lange Enden		111	4
Märkisches Viertel		106	6
Köpenick		47	11
Treptow		39	-
Friedrichshagen		29	-
Blankenburger Str		19	1
Altglienicke		25	1

## 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		105	144
Almere Hogering		175	-
Almere Stad		112	-
Schuytgraaf		60	-
Duiven Westervoort		59	-
Waalsprong		41	-
Lelystad		25	12
Arena Holterbergweg		20	-
Boris Pasternak		19	-
Amsterdam Driehoek		120	-

## Sweden

Power and heat plants	Fuel	Capacity heat (MW)	Capacity electricity (MW)
Uppsala		1062	130
Storvreta		15	-
Haninge Tyresö		252	19
Nyköping		208	25
Gotland		143	-
Motala		104	4
Vänersborg		90	-
Ludvika		79	-
Fagersta		66	-
Knivsta		45	-
Gustavsberg		43	-
Fisksätra		16	-
Askersund		11	-

 Biomass
  Coal
  Gas
  Steam

# 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

## Highlights<sup>1</sup>



**One million** household and business customers



**>132,000 km** of electricity grids



**SEK 6 billion** in investments 2021



**SEK ~60 billion** RAB



## Key data<sup>1</sup>

	FY 2021	FY 2020
Net sales (SEK bn)	17.3	21.6
External net sales (SEK bn)	14.6	17.0
Underlying EBIT <sup>1</sup> (SEK bn)	3.1	5.3
Investments (SEK bn)	6.0	7.6
SAIDI <sup>2</sup> (minutes/customer)		
Sweden	112	148
SAIFI <sup>4</sup> (number/customer)		
Sweden	1.8	2.0
RAB		
Sweden (SEK bn)	60	55

<sup>1</sup> Excluding the Berlin grid business which was sold on July 1, 2021

<sup>2</sup> Operating profit excluding items affecting comparability

<sup>3</sup> SAIDI: System Average Interruption Duration Index

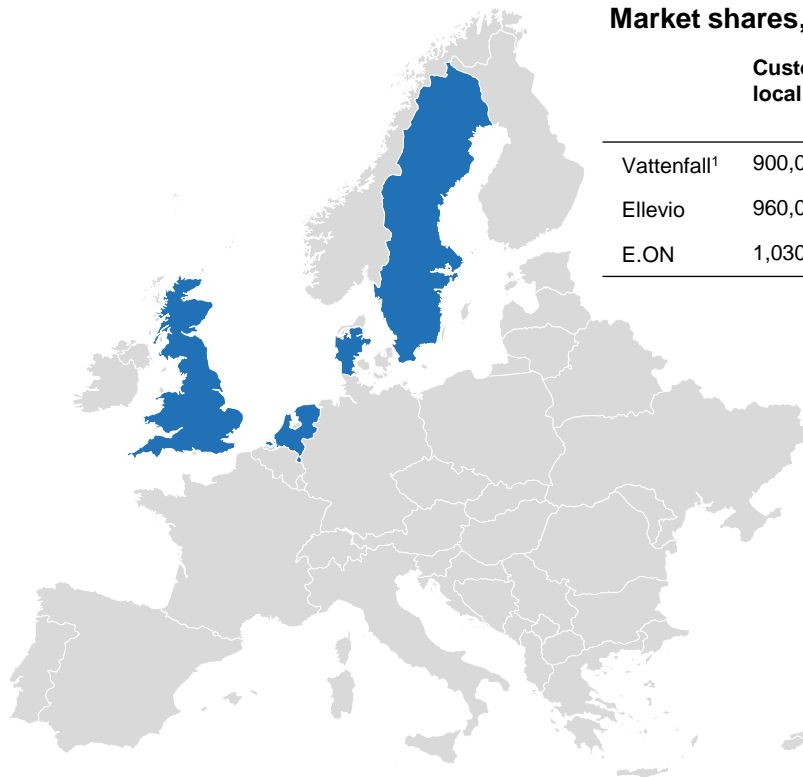
<sup>4</sup> SAIFI: System Average Interruption Frequency Index

# Distribution

## Market and business overview

### In brief

- Vattenfall's Distribution business owns and operates electricity distribution grids in Sweden
- Approximately one million business and household customers
- Unit for operation and ownership of new grids in the UK established in 2017. The unit has around 40 contracts including one of the largest all electric development sites in UK, Edinburgh park
- On 1 July 2021, Vattenfall sold the electricity grid company Stromnetz Berlin GmbH to the State of Berlin.
- Offers Power-as-a-Service (PaaS), which is an established business for Vattenfall in Sweden and the UK. The Dutch and Danish markets were entered in early 2021.



### Market shares, Sweden

	Customers local grids	Markets share regional grid <sup>2</sup>	Market share local grid <sup>3</sup>
Vattenfall <sup>1</sup>	900,000	52%	16%
Ellevio	960,000	23%	17%
E.ON	1,030,000	22%	19%

<sup>1</sup> Based on number of customers 2021, excl Vattenfall's subsidiaries Gotlands Elnät and Västerbergslagens Elnät

<sup>2</sup> Based on volume of transited energy excluding grid losses 2021

<sup>3</sup> Based on number of contracts 2021

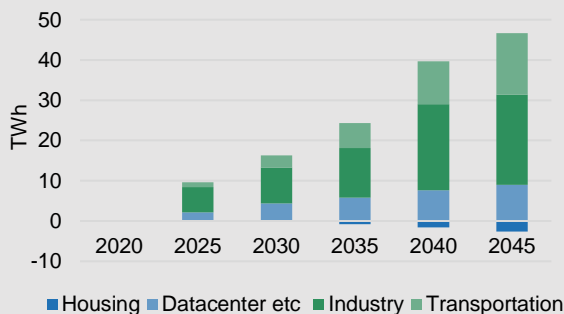
# Energy transition to spur dramatic growth in electricity demand in Sweden

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)<sup>1</sup>



<sup>1</sup> Source: Nepp, Färdplan för fossilfri el, Aug 2019

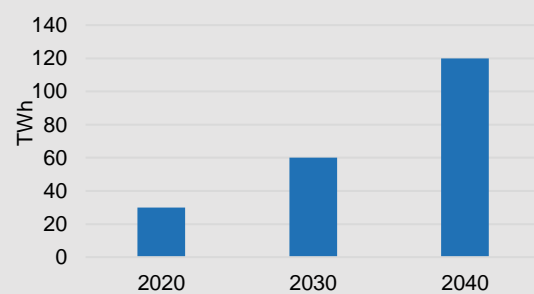
<sup>2</sup> Source: Svensk vindenergi, Färdplan 2040, Dec 2020

<sup>3</sup> Asset base per 2020-01-01

## Installed wind capacity continues to grow

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

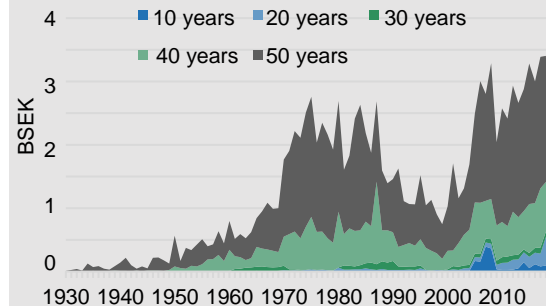
Forecast – wind power generation (Sweden)<sup>2</sup>



## Existing grid assets are increasingly in need of reinvestments

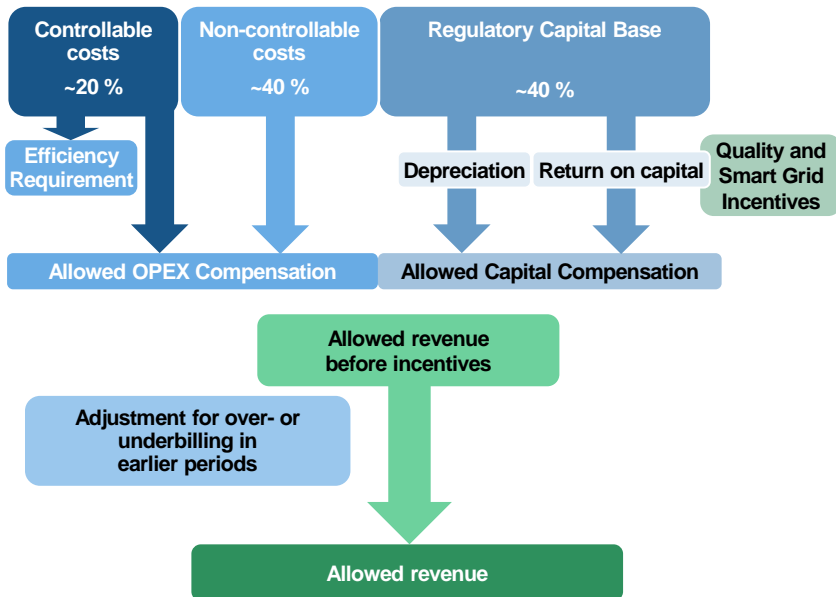
- There was a large build out of grid assets in 1970-1990. These assets are now reaching the age when they need to be reinvested in
- This is in addition to the need of new investments in the grid to accommodate more renewable energy and enable for electrification

Asset age structure – Vattenfall Eldistribution<sup>3</sup>



# Allowed revenue framework

## Schematic overview - allowed revenue Sweden



## Legal process

- In February 2021, the Administrative Court in Linköping ruled in favour of the electricity grid companies
- The verdict was appealed by the Energy Markets Inspectorate (Ei) to the Administrative Court of Appeals
- The Administrative Court of Appeals announced a trial permit in the end of November



# Smart solutions for optimising the energy system

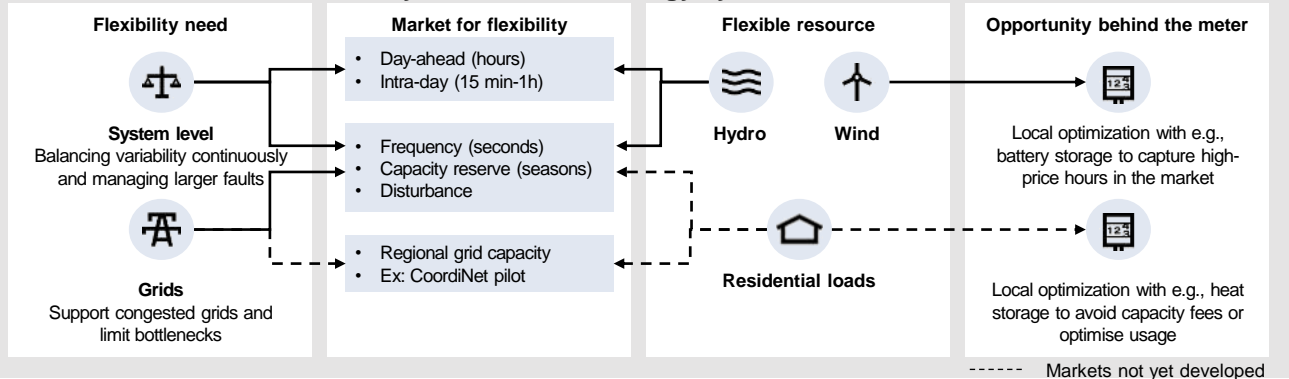
Addressing the shortage of grid capacity in the short- and medium term

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<sub>heat</sub> power-to-heat plant that can take local excess renewable electricity – which would otherwise be shut off to maintain frequency – and use it to provide district heating for more than 30,000 Berlin residents

# Financial performance

FY 2021 numbers



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# Vattenfall FY Results 2021

## Financial highlights

### Key data

SEK bn	FY 2021	FY 2020
Net Sales	180.1	158.8
EBITDA	75.8	46.5
Underlying operating profit (EBIT)	31.2	25.8
EBIT	60.3	15.3
Profit for the period	48.0	7.7
Funds from Operations (FFO)	46.1	35.0
Cash flow operating activities	100.1	41.7
Net debt	-44.7	48.2
Adjusted net debt	26.9	121.5
Adjusted net debt/EBITDA (times)	0.4	2.6
<b>Financial targets</b>		
ROCE ( $\geq 8\%$ )	22.2	5.8
FFO/adjusted net debt (22-27%)	171.2	28.8

### Key developments

- Net sales increased by SEK 21.3 bn to SEK 180.1 bn due to higher spot prices and higher sales volumes in the Nordics and Germany
- Underlying EBIT increased by SEK 5.4 bn mainly due to increased earnings in segment Power Generation due to increased nuclear and hydro power generation and higher realised trading result. The Wind segment also contributed positively due to higher prices and new capacity
- Profit for the period increased to SEK 48.0 bn, mainly due to the agreement on compensation for the closure of nuclear power in Germany, changes in market value for energy derivatives and inventories and capital gain from sale of Stromnetz Berlin
- ROCE increased to 22.2% mainly due to changes in market value for energy derivatives and inventories, the agreement on compensation for the closure of nuclear power in Germany and the capital gain from Sale of Stromnetz Berlin. ROCE FY 2020 was negatively affected by impairments
- FFO/Adjusted net debt increased to 171.2%, mainly as a result of a significant decrease in adjusted net debt largely driven by a positive net change in margin calls for commodity hedging activities

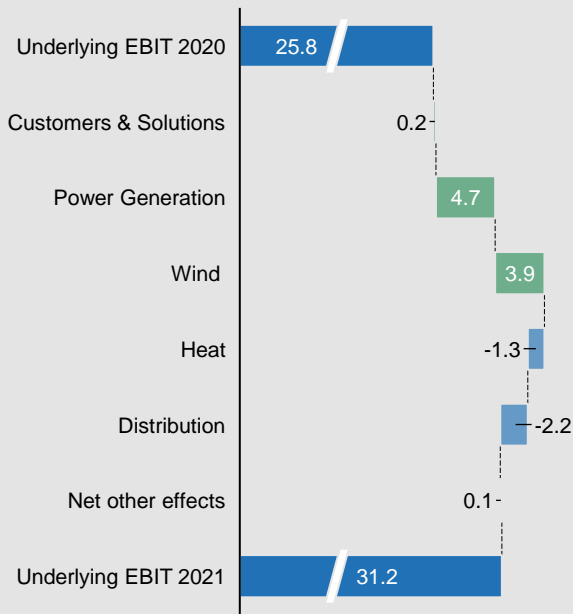


# Development of underlying EBIT FY 2021

Increase from Power Generation and Wind partly offset by lower earnings in Heat and Distribution

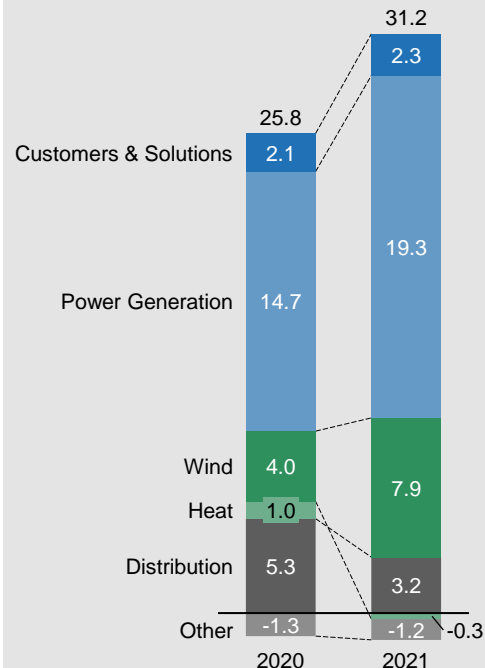
## Change in FY 2021 vs. FY 2020

SEK bn



## Breakdown per operating segment

SEK bn

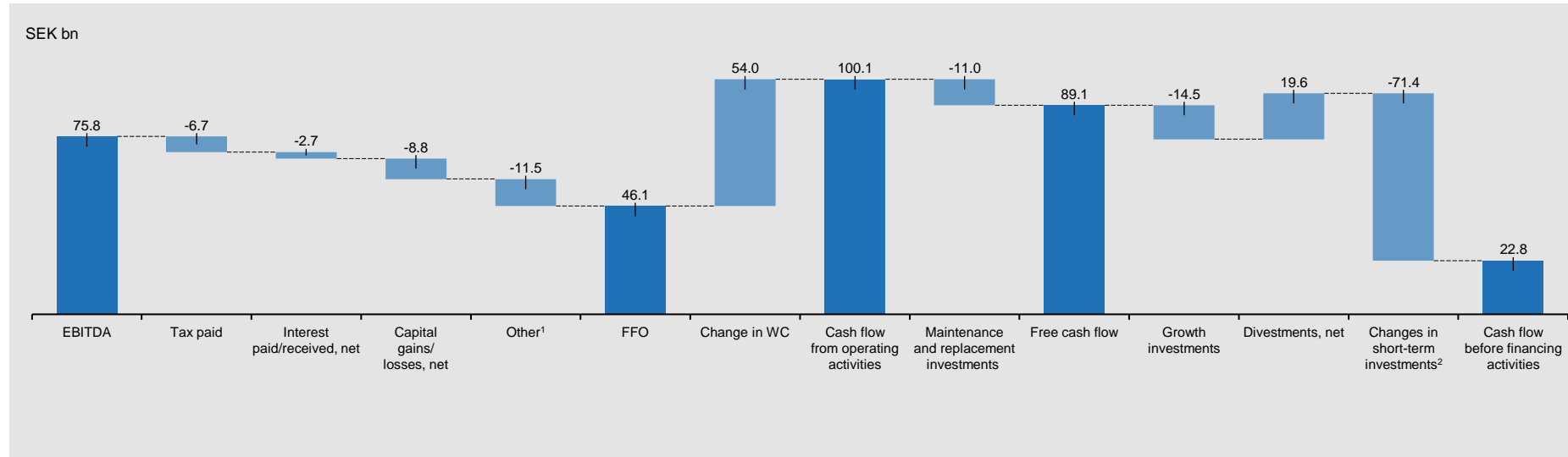


## Highlights

- Customers & Solutions: increased customer base and lower average temperatures in the Netherlands and Germany
- Power Generation: higher nuclear and hydro power generation, increased contribution from pumped hydro storage in Germany and a higher realised trading result
- Wind: higher electricity prices and new capacity, partly offset by lower wind speeds
- Heat: higher gas and CO<sub>2</sub> prices led to lower clean spark spreads
- 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 FY 2021

Positive working capital development mainly related to changes in margin calls



## Main effects

- Change in working capital mainly driven by changes related to net change in margin calls received for commodity hedging activities (SEK 88.0 bn) following sharp price increases for gas and electricity on the Continent. Increase in inventories (SEK -23.1 bn), increase in operating receivables in the Customers & Solutions operating segment (SEK -4.4 bn) and changes related to CO<sub>2</sub> emission allowances (SEK -3.4 bn) had an offsetting impact
- Changes in short-term investments are mainly related to inflows from margin calls and include commercial papers, repo's, bonds and margin calls paid

<sup>1</sup> "Other" includes non-cash items included in EBITDA, mainly changes in fair value of commodity derivatives

<sup>2</sup> Change from Financing activities to Investing activities

# Hedging, debt and funding

FY 2021 numbers

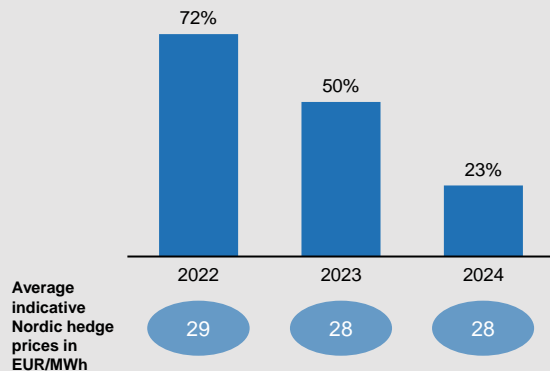


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# Price hedging

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<sup>1</sup> hedge ratio (%) and indicative prices



Achieved prices<sup>2</sup> - Nordic portfolio, EUR/MWh

FY 2021	FY 2020	Q4 2021	Q4 2020
31	31	35	31

Sensitivity analysis – Continental<sup>3</sup> portfolio

Market quoted	+/- 10% price impact on future profit before tax, MSEK <sup>4</sup>			Observed yearly volatility
	2022	2023	2024	
Electricity	+/- 1,270	+/- 977	+/- 555	24% - 53%
Coal	-/+ 43	-/+ 42	-/+ 27	39% - 51%
Gas	-/+ 455	-/+ 1,681	-/+ 964	21% - 64%
CO <sub>2</sub>	-/+ 78	-/+ 561	-/+ 503	42% - 43%

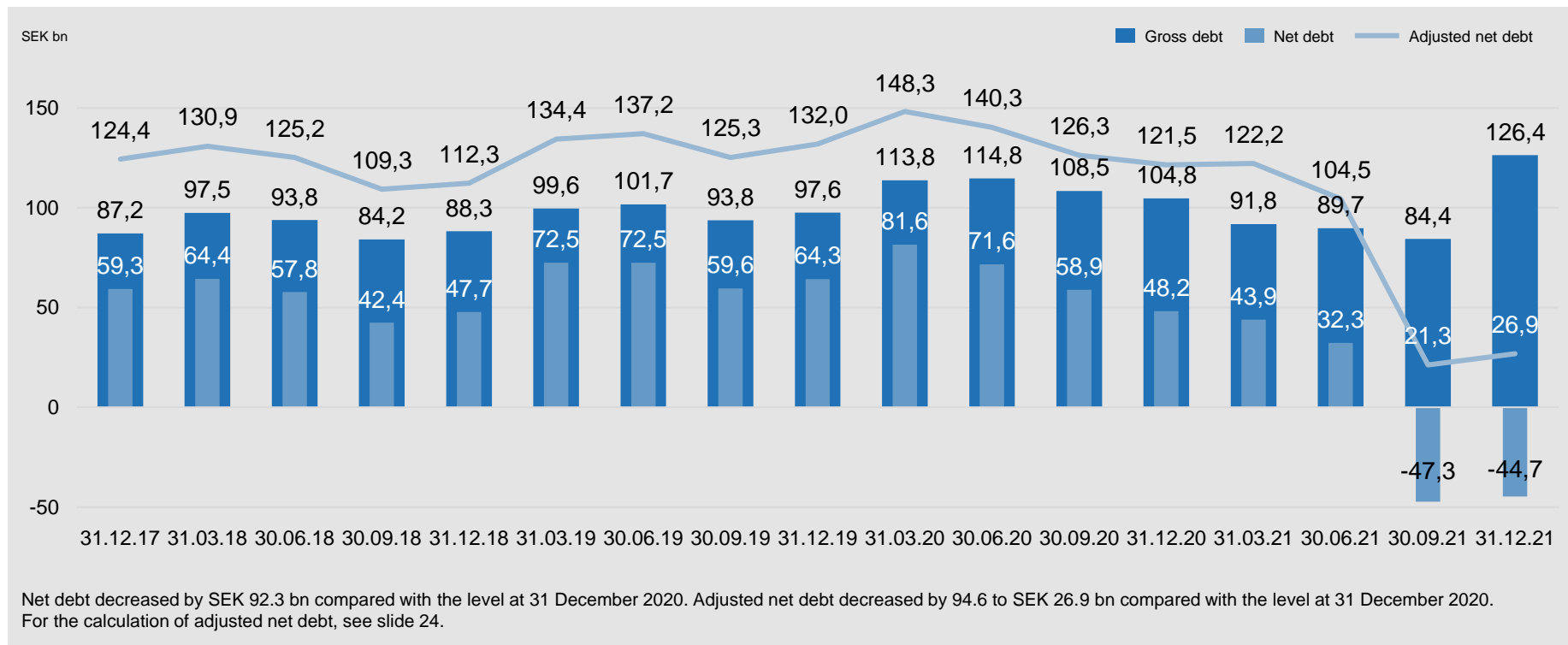
<sup>1</sup> Nordic: SE, DK, FI

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

<sup>3</sup> Continental: DE, NL, UK.

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

# Debt development

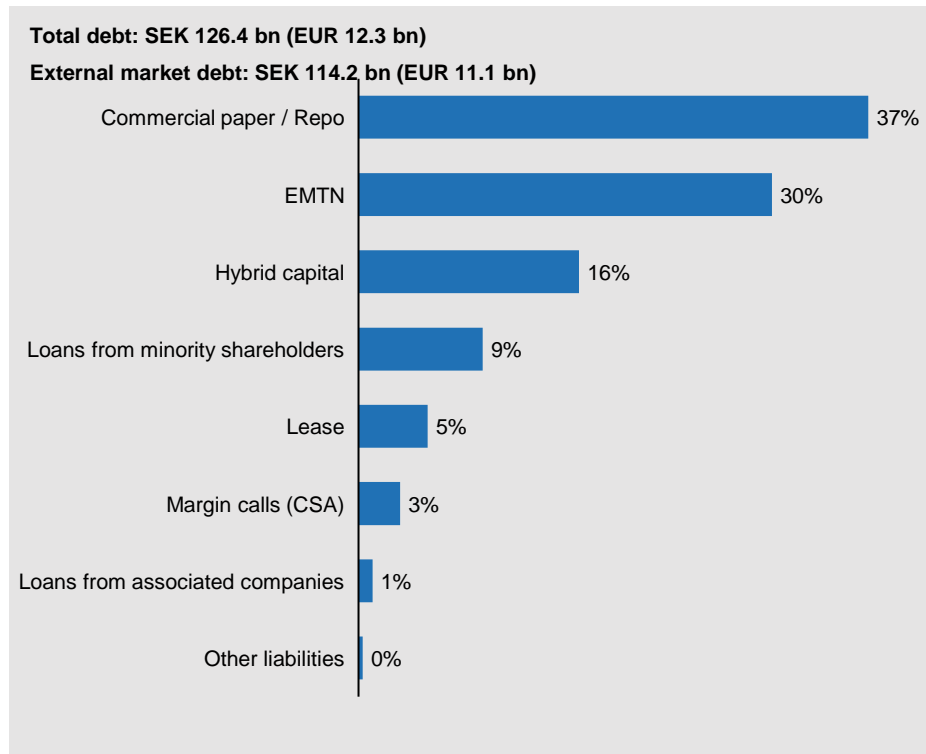




# Reported and adjusted net debt

Reported net debt (SEK bn)	30 Jun. 2021	31 Dec. 2020	Adjusted net debt (SEK bn)	30 Jun. 2021	31 Dec. 2020
Hybrid capital	-20.0	-19.3	Total interest-bearing liabilities	-89.7	-104.8
Bond issues and liabilities to credit institutions	-43.4	-49.6	50% of Hybrid capital	10.0	9.7
Commercial papers and Repos	-4.5	-13.3	Present value of pension obligations	-39.2	-43.8
Liabilities to associated companies	-1.0	-0.7	Wind & other environmental provisions	-11.2	-10.6
Liabilities to minority shareholders	-11.0	-10.9	Provisions for nuclear power (net)	-39.2	-37.8
Lease liabilities	-6.1	-6.0	Margin calls received	2.9	4.1
Other liabilities	-3.8	-4.9	Liabilities to minority owners due to consortium agreements	11.0	10.9
<b>Total interest-bearing liabilities</b>	<b>-89.7</b>	<b>-104.8</b>	Adjustment related to assets/liabilities held for sale	-1.9	0.0
Reported cash, cash equivalents & short-term investments	57.0	56.2	<b>= Adjusted gross debt</b>	<b>-157.2</b>	<b>-172.3</b>
Loans to minority owners of foreign subsidiaries	0.4	0.4	Reported cash, cash equivalents & short-term investments	57.0	56.2
<b>Net debt</b>	<b>-32.3</b>	<b>-48.2</b>	Unavailable liquidity	-4.3	-5.4
			<b>= Adjusted cash, cash equivalents &amp; short-term investments</b>	<b>52.7</b>	<b>50.8</b>
			<b>= Adjusted net debt</b>	<b>-104.5</b>	<b>-121.5</b>

# Breakdown of gross debt

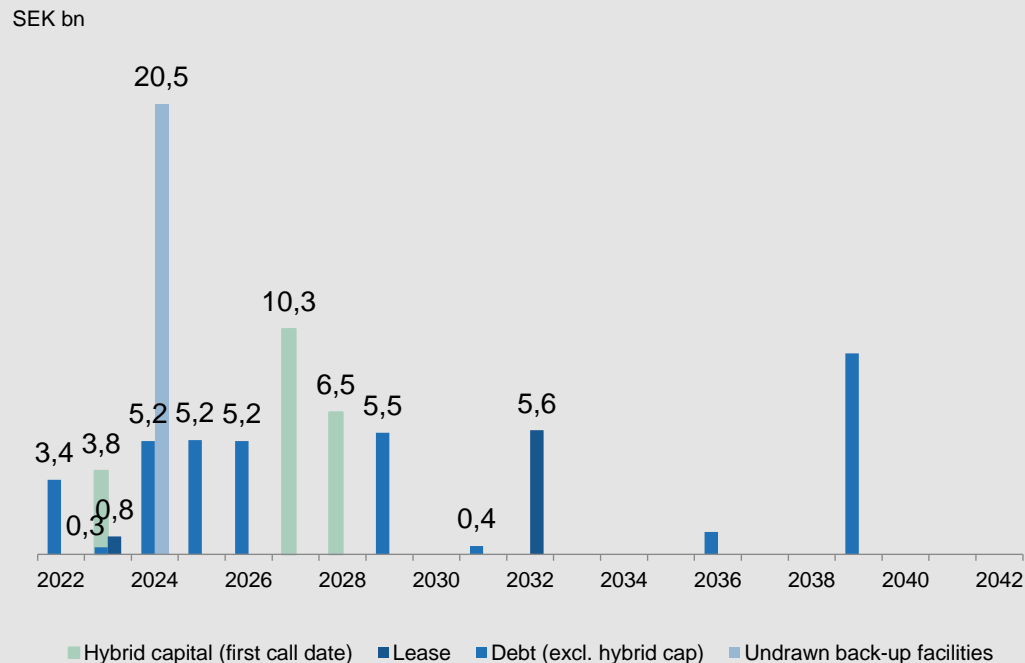


Debt issuing programmes	Size (EUR bn)	Utilization (EUR bn)
EUR 10bn Euro MTN	10.0	3.0
EUR 4bn Euro CP	4.0	2.7
Total	14.0	5.7

- 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

<sup>1</sup> EMTN= Euro Medium Term Notes

# Debt maturity profile<sup>1</sup>



	31 Dec. 2021	31 Dec. 2020
Duration (years)	4.7	3.8
Average time to maturity (years)	6.8	5.1
Average interest rate (%)	2.9	3.4
Net debt (SEK bn)	-44.7	48.2
Available group liquidity (MSEK)	167.4	50.8
Undrawn committed credit facilities (MSEK)	20.5	23.1

## Cumulative maturities excl. undrawn back-up facilities

	2022- 2024	2025- 2027	From 2028
Debt incl. hybrid capital	13.5	20.7	28.2
% of total	22%	33%	45%

<sup>1</sup> Short term debt (Repo's and Commercial paper: 46.2), 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

<b>Group liquidity</b>	<b>SEK bn</b>	<b>Committed credit facilities</b>	<b>Facility size, EUR bn</b>	<b>SEK bn</b>
Cash and cash equivalents	68.2	RCF (maturity Nov 2023)	2.0	20.5
Short term investments	102.7	<b>Total undrawn</b>		<b>20.5</b>
<b>Reported cash, cash equivalents &amp; short term investments</b>	<b>170.9</b>			
		<b>Debt maturities<sup>2</sup></b>		<b>SEK bn</b>
Unavailable liquidity <sup>1</sup>	-3.4	Within 90 days		3.2
<b>Available liquidity</b>	<b>167.4</b>	Within 180 days		3.2

<sup>1</sup> German nuclear "Solidarvereinbarung" 1.0 SEK bn, Margin calls paid (CSA) 1.6 SEK bn, Insurance "Provisions for claims outstanding" 0.8 SEK bn

<sup>2</sup> Excluding loans from minority owners and associated companies

# Nuclear provisions

Reactor <sup>1</sup>	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	<b>Total Ringhals: 40.8</b>	<b>Total Ringhals: 40.8<sup>2</sup></b>	
Forsmark 1	984	1980	66.0			
Forsmark 2	1,120	1981	66.0			
Forsmark 3	1,170	1985	66.0	<b>Total Forsmark: 36.9</b>	<b>Total Forsmark: 24.4</b>	
<b>Total Sweden</b>	<b>6,974</b>	<b>-</b>		<b>81.3<sup>3</sup></b>	<b>67.3<sup>3</sup></b>	<b>44.6<sup>4</sup></b>
Brunsbüttel	771	1977	66.7	11.8	7.9	
Brokdorf	1,410	1986	20.0	0	3.6	
Krömmel	1,346	1984	50.0	7.1	7.1	
Stade <sup>5</sup>	640	1972	33.3	0	0.4	
<b>Total Germany</b>	<b>4,167</b>	<b>-</b>	<b>-</b>	<b>19.0</b>	<b>19.1</b>	
<b>Total SE &amp; DE</b>	<b>11,141</b>			<b>100.3</b>	<b>86.4</b>	

<sup>1</sup> Five reactors are in commercial operation; Ringhals 3 & 4 and Forsmark 1, 2 & 3.

<sup>2</sup> Vattenfall has 100% liability of Ringhals decommissioning, while owning only 70.4%

<sup>3</sup> Total provisions in Sweden (IFRS accounting) include provisions of SEK 0.6 bn (pro rata SEK 0.6 bn) related to Ågesta, and SEK 3.0 bn (pro rata SEK 1.6 bn) related to SVAFO

<sup>4</sup> Vattenfall's share of the Nuclear Waste Fund. IFRS consolidated value is SEK 53.1 bn.

<sup>5</sup> Stade is being dismantled

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## Financial calendar

**22 July 2022**      Interim report January-June 2022  
**27 October 2022**      Interim report January-September 2022

**8 February 2023**      Year-end report 2022