

A man with glasses and a grey sweater is charging a dark-colored car at a charging station. He is looking back over his shoulder towards the camera. The background shows a modern building with large windows.

# Welcome to Vattenfall Capital Markets Day

28 November 2023

# Programme

- 12:00-13:00    **Lunch**
- 13:00-13:05    **Welcome and introduction** – Andreas Regnell, SVP Strategic Development, Isabelle Tandan, Investor Relations Officer
- 13:05-13:25    **Strategic outlook** – Anna Borg, President and CEO
- 13:25-13:45    **Discussion on the theme for today; is the energy transition stalling?**  
Anna Borg, President & CEO  
Andreas Regnell, SVP Strategic Development  
Annika Viklund, SVP Distribution  
Anna-Karin Stenberg, SVP Markets  
Martijn Hagens, SVP Customers & Solutions and Heat
- 13:45-14:10    **Financial perspective** – Kerstin Ahlfont, CFO
- 14:10-14:20    **Q&A**
- 14:20-14:45    **Nuclear – Today and in the future** – Desirée Comstedt, VP SF Fleet Development
- 14:45-15:00    **Coffee**
- 15:00-15:30    **Offshore wind** – Helene Biström, SVP Wind
- 15:30-15:50    **Panel discussion - Decarbonisation of our own operations and beyond**  
Martijn Hagens, SVP Customers & Solutions and BA Heat  
Helle Herk-Hansen, Head of Environment  
Ilka Baert, Head of Sustainable Supply Chain Management
- 15:50-16:05    **Q&A**
- 16:05-16:15    **Concluding remarks** – Anna Borg, President and CEO
- 16:15-16:30    **Press conference**
- 16:15-17:00    **Drinks reception**





# Strategic outlook

**Anna Borg**  
President and CEO



## The world in 2023



### Ukraine's Slow Offensive Buys Putin and Worries Allies

- European officials fret that US support may fade amid election
- Russia sees advantages in lengthy war, Prigozhin's death



### U.S.-China Tensions Over Taiwan Put Pressure on Europe

The EU is finding it harder to avoid taking a position on a potential military conflict



### *In Europe, Few Even Want to Talk About Trump Part 2*

The prospect of a second presidential term for Donald J. Trump has many officials worried about alliance cohesion, NATO and the war in Ukraine.



## The world in 2023



Worsening euro zone business downturn reignites recession fears



Europe's economy enters technical recession as households struggle with cost-of-living crisis

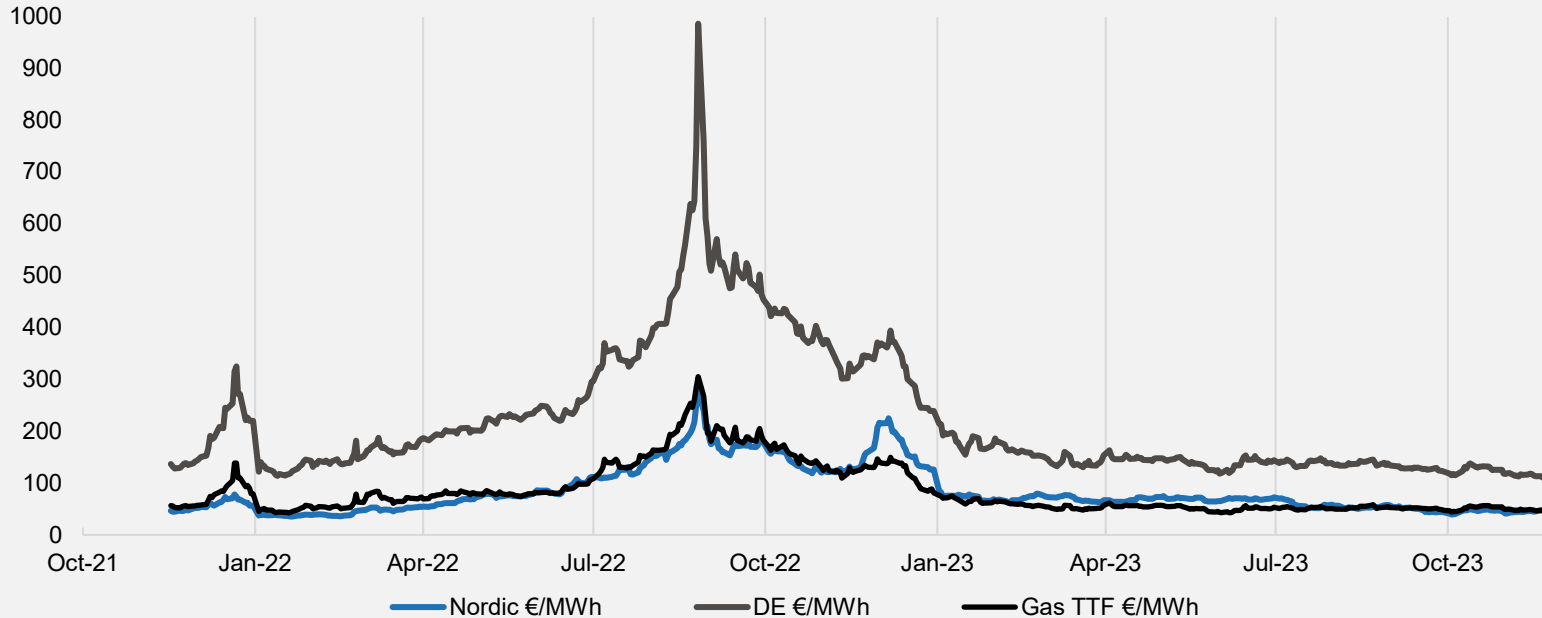


ECB raises interest rates to highest level since euro launched

## Group Strategic Direction

# Electricity prices are currently almost back to pre-crisis levels, but high volatility expected

EUR/MWh



# Vattenfall should be a leader in the energy transition

**Enabling fossil  
freedom that  
drives society  
forward ...**

**... making it  
possible to  
move, make, and  
live fossil free**

**... as a profitable  
energy business**



# Sustainability drives our strategy, shaping our ambitions and growth

**-51%**

Emission intensity  
reduction since 2017

2022

**1.5°C**

Target for own  
emission reductions  
**SBTi Certified**

2030

**Net Zero**

Emissions in our  
full value chain  
**SBTi Certified**

2040



**Strong track  
record as a leader  
in European  
offshore**

**Nordic nuclear and  
hydro – backbone  
of our electricity  
generation**

**Increasing focus  
on flexibility  
across all markets**

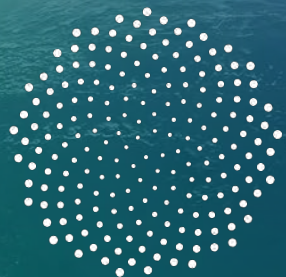
**Established  
onshore wind  
and growing  
solar developer**

# New Nuclear









# First Movers Coalition





## First Movers Coalition

# Members and commitments

### Aluminum – 14 members

- Apple
- Ball Corp
- Bang & Olufsen
- CBA
- Constellium
- Ford Motor Company
- General Motors
- Hydro
- Logitech
- Novelis
- PepsiCo
- Speira
- Trafigura
- Volvo Group

### Aviation – 26 members

- Airbus
- American Express GBT
- Apple
- Autodesk
- Aveva
- Bain & Company
- Bank of America
- Boeing
- Boom
- Boston Consulting Group
- Deloitte
- Delta Airlines
- Deutsche Post DHL Group
- Eni
- EY
- FedEx
- Fortescue Metals Group
- Lufthansa Group Nokia
- PwC
- Rio Tinto
- Salesforce
- Schneider Electric
- United Airlines
- University of Michigan
- Vattenfall

### Carbon Removal – 10 members

- AES
- Alphabet
- Boston Consulting Group
- Drax
- EGA
- Microsoft
- Mitsui O.S.K. Lines
- Salesforce
- SwissRe
- Trafigura

### Cement & Concrete – 7 members

- CCC
- Etex
- General Motors
- RMZ
- Vattenfall
- Ørsted
- ZGF Architects

### Shipping – 14 members

- A.P. Møller – Mærsk
- Agility
- Aker Biomarine
- Amazon
- BHP
- Fortescue Metals Group
- Höegh Autoliners
- Logitech
- Mitsui O.S.K. Lines
- Rio Tinto
- Schneider Electric
- Trafigura
- Western Digital
- Yara International

### Steel – 25 members

- Aker Solutions
- Alfa Laval
- Bharat Forge
- Consolidated Contractors Group
- Ecolab
- EGUI
- Enel
- Engie
- Ford Motor Company
- Fortescue Metals Group
- General Motors
- Iberdrola
- Invenergy
- Johnson Controls
- Mahindra
- Mainstream Renewable Power
- Marcegaglia
- Ørsted
- ReNew Power
- Scania
- Trane Technologies
- Vattenfall
- Vestas
- Volvo Group
- ZF Friedrichshafen AG

### Trucking – 15 members

- Agility
- Cemex
- Dalmia Cement
- Fortescue Metals Group
- Heidelberg Cement
- Holcim
- National Grid
- Norge Mining
- PepsiCo
- Rio Tinto
- Scania
- SSAB Swedish Steel
- Toll Group
- Vattenfall
- Volvo Group



**Working for fossil freedom**



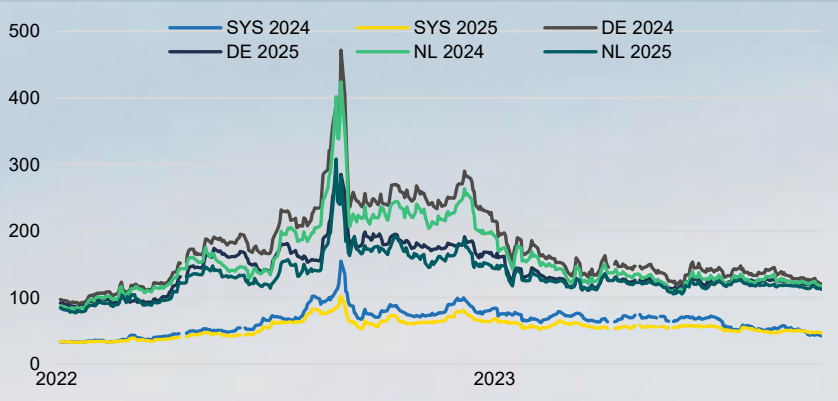
A woman with short dark hair, wearing a beige trench coat over a white shirt and blue jeans, stands by a waterfront. She is smiling slightly and looking towards the camera. The background shows a city skyline across a body of water under a cloudy sky.

# Financial perspective

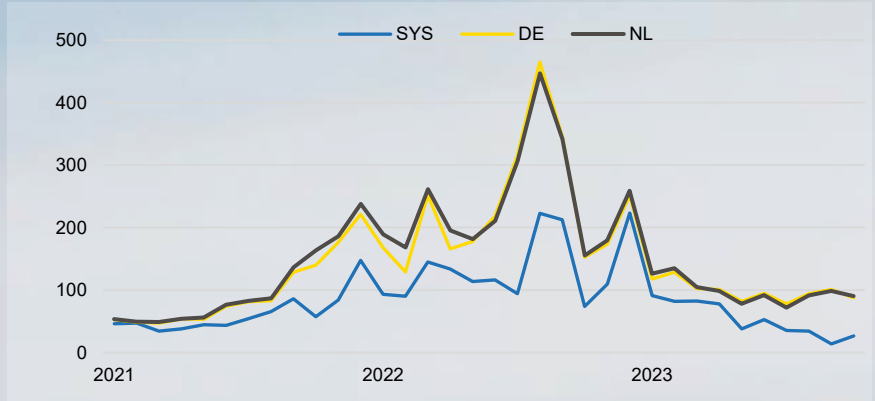
Kerstin Ahlfont  
CFO

# Challenging operating environment as volatility and uncertainty remains

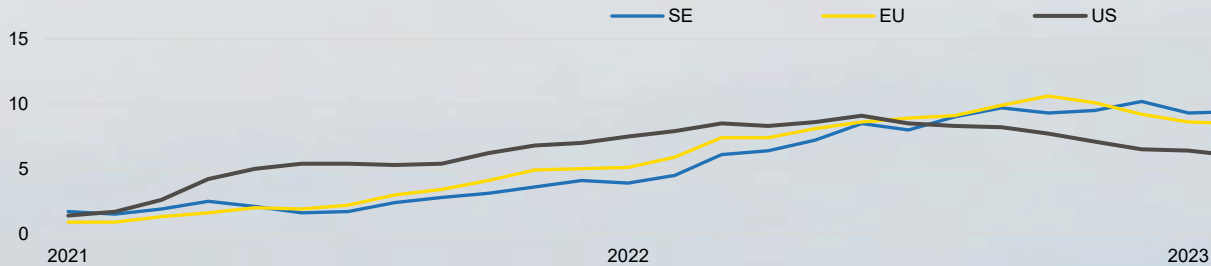
Electricity futures price development Jan 2022 – Oct 2023



Average monthly spot prices, Jan 2021 – Oct 2023



Inflation development 2021 – Oct 2023



Financial perspective

# Robust financial position despite hurdles

ROCE <sup>1,2</sup>	Underlying ROCE <sup>1</sup>	Target <sup>2</sup>
-4.6%	9.8%	> 8%

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FFO/AND <sup>1</sup>	Target
30.9%	22-27%

Footnote:

- 1) Based on Q3 results
- 2) Based on reported EBIT

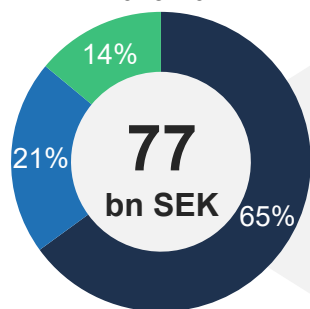


# Navigating through the hurdles

1.

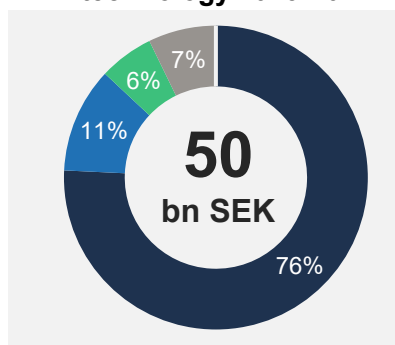
## Managing an increased cost base and investment plan

Investment plan  
2023-2024



- Growth, 50 bn SEK
- Maintenance, 16 bn SEK
- Replacement, 11 bn SEK

Growth capex per  
technology 2023-2024



- Wind power, 38 bn SEK
- Heat supply, 6 bn SEK
- Electricity distribution, 3 bn SEK
- Other, 4 bn SEK

2.

## Managing higher volatility

Indicative Nordic hedge prices and volume hedge ratio  
(SE,DK,FI) as per 30 September 2023

	2023	2024	2025
EUR/MWh	30	47	51
Hedge ratio (%)	55	50	35

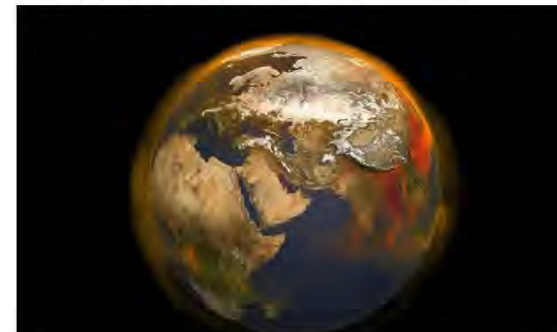
Vattenfall continues to invest in our integrated and diversified business model

Financial perspective

# So, is the energy transition stalling?

## Climate-heating gases reach record highs, UN reports

**World Meteorological Organization sees 'no end in sight to the rising trend', largely driven by fossil fuel burning**



📌 Nasa's three-dimensional portrait of the greenhouse gas methane, showing it arising from a diversity of sources on the ground and how it moves through the atmosphere. Photograph: Nasa/Scientific Visualization Studio/EPA

The abundance of climate-heating gases in the atmosphere reached record highs in 2022, the UN's World Meteorological Organization (WMO) has reported.

The WMO said "there is no end in sight to the rising trend", which is largely driven by the burning of fossil fuels.

The concentration of carbon dioxide, the main greenhouse gas, is now 50% higher than before the start of the Industrial Revolution.

The Earth has not experienced similar levels of CO<sub>2</sub> for 3-5 million years, when the global temperature was 2-3C warmer and sea level was 10-20



# Thank you

Kerstin Ahlfont



# Nuclear – today and in the future

Desirée Comstedt  
Vice President SF Fleet  
Development

Nuclear – today and in the future

# Existing reactors

Nuclear – today and in the future

# Prolonged operation of existing reactors

**No set end  
of operation**

**Operated as  
long as they are  
safe and cost-  
efficient**

**We investigate  
the possibility of  
operation until  
the 2060s**





Nuclear – today and in the future

# Power uprate

**Ongoing work  
to increase the  
power of Forsmark  
1 with 100 MW**

**We evaluate  
possibilities to  
increase the power  
of Forsmark 3**

Nuclear – today and in the future

# Increased interest for nuclear in Sweden

**Interest  
from  
customers**

**New  
technology  
solutions**

**Strong  
public  
support**

**Increased  
demand**

**Security  
of supply**

Nuclear – today and in the future

# And in Europe

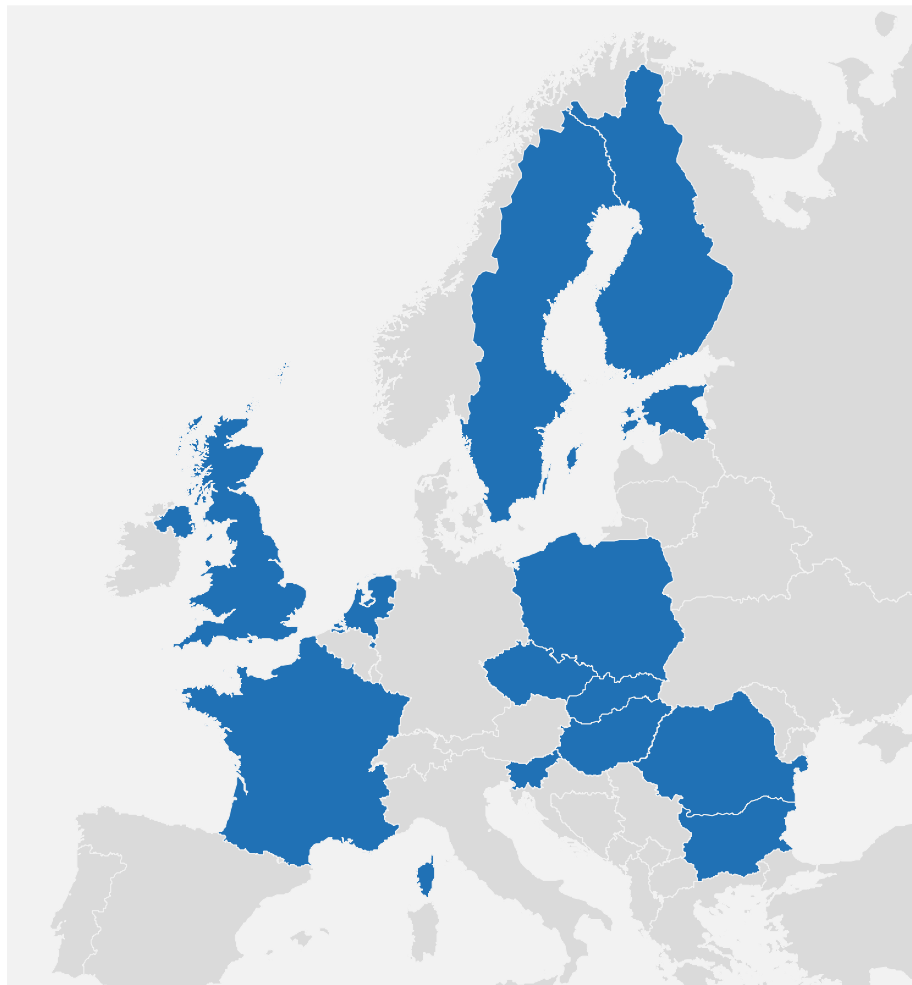
**Interest  
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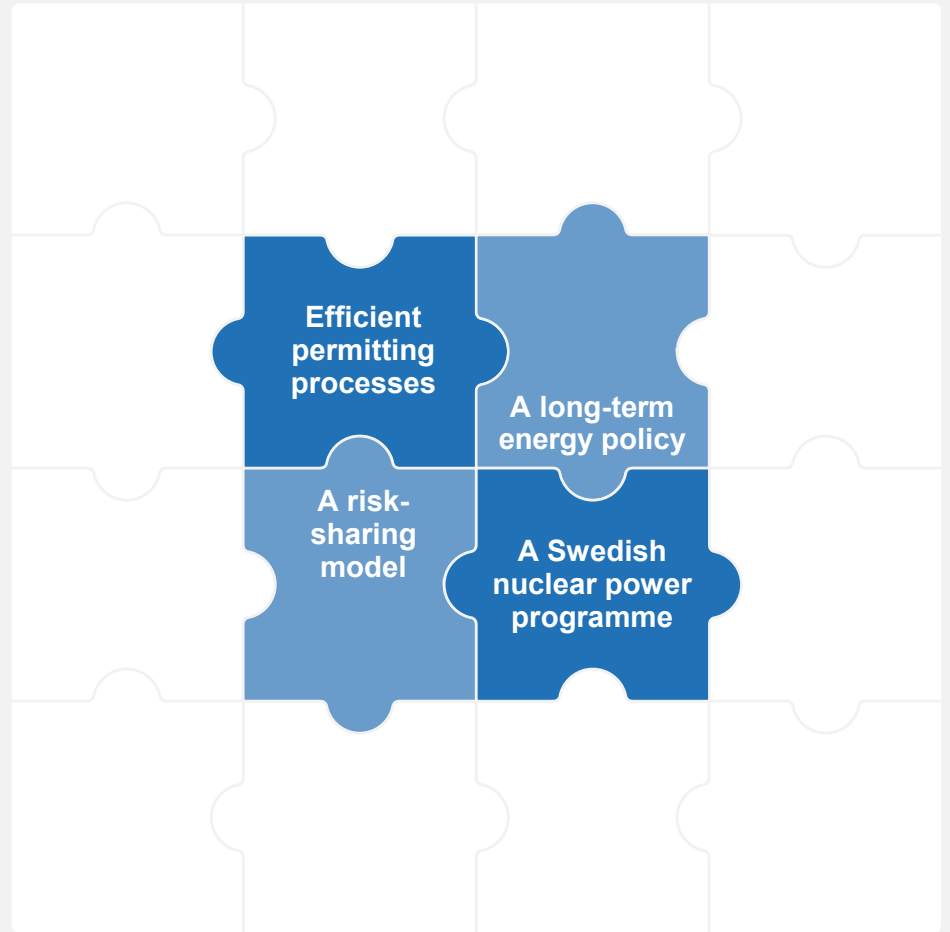




Nuclear – today and in the future

# How to overcome challenges of being first – New nuclear requires a national mobilisation

Investing in nuclear power is a commitment to society that goes beyond individual investment decisions





# Political stability



## International experience

Highlights the importance of stable political framework and conditions that do not change over time



## Clear national ambition

Shows ambition for suppliers and indicates that Sweden is a market that should be prioritized



## Clear & stable framework

Investors need to know what conditions will apply in the market when the reactor is completed

A Swedish nuclear power programme

# Need for a government organisation



Conditions for a nuclear power programme are different today – all the conditions must be in place



**Act as a hub  
for all authorities**

**Creating access to national &  
international supply chains**

**Support vocational schools,  
colleges and universities**



A Swedish nuclear power programme



# Must include more than one reactor

A nuclear power programme can be divided into three phases



**Construction of the first reactors** (1-2 reactors)



**Developing a viable fleet** (~3-4 GW)



**Develop according to needs of the market/society** (> 4 GW)

Phase 1: high risks and costs

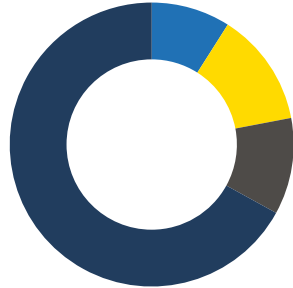
In order to benefit from the experience and development, several reactors need to be built in close succession



# The first reactors will have special risks

In order for the financial costs to be manageable, the risks need to be shared

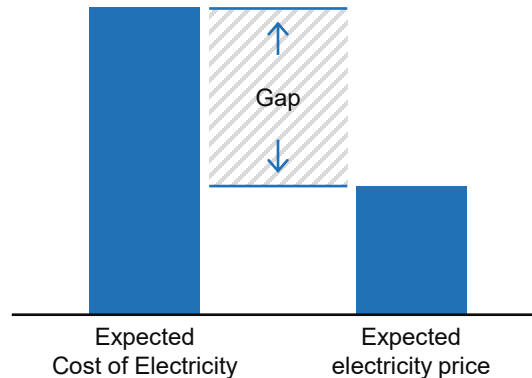
Order of magnitude of the components of the electricity price for new nuclear power



- Fuel & Back-end
- OPEX
- CAPEX
- Cost of capital

NEA: "Unlocking Reductions in the Construction Costs of Nuclear" 2020 (9% real discount rate)

Higher costs and risks for the first reactors in a program create a large gap between expected revenue and cost



## International experience

Today, new nuclear power is not built anywhere in the world on purely commercial terms (without the risk being shared with a state)

## A risk-sharing model

# International examples of risk-sharing



**UK: Hinkley Point**



**UK: Sizewell**



**Poland**



**France**



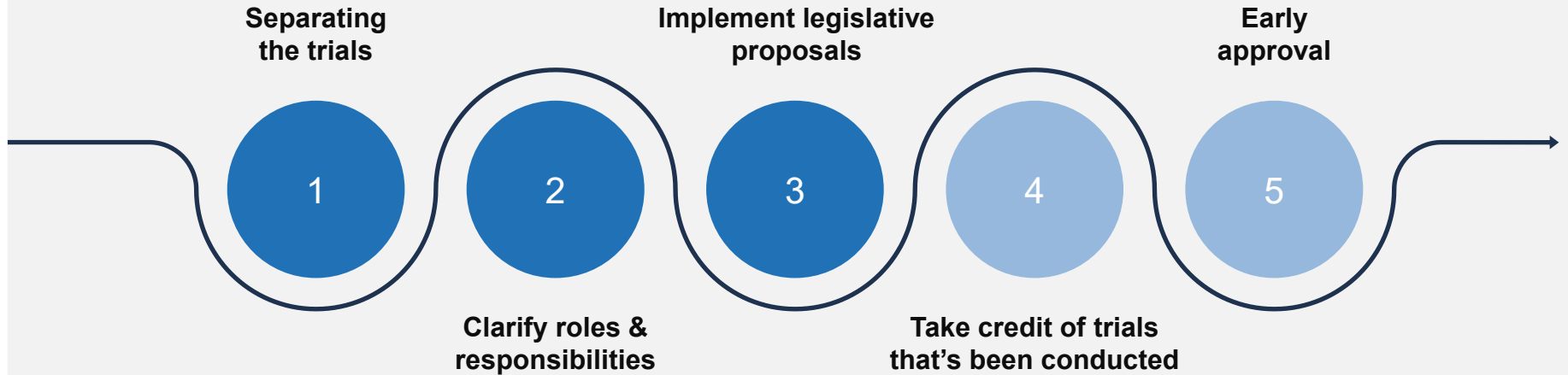
**Finland**

Model	Contracts for Difference (CfD)	Regulated Asset Base (RAB)	Special Purpose Vehical	State program	Turn key: Fixed price with state guarantee
<b>Short description</b>	CfD is an agreement between the state and the electricity supplier on a fixed price for electricity from a specified installation for a fixed period of time.	The state guarantees a return on investment and operating costs, similar to the regulated return given to electricity grids.	The state starts a SPV the purpose of building the reactor and operating organisation. The SPV is gradually sold off by the state before the start of operations.	The state provides funds and guarantees to secure the developer's financial position at the same time as market changes ensure income for the operating company.	The supplier guarantees a fixed price for the construction of the reactor and associated buildings, which is backed by strong guarantees (govt).
<b>Risk-sharing</b>	Covers market risk but not construction risk, reason why the British changed model to RAB for Seizwell C.	An RAB would cover the market risk as well as most of the construction risk.	The state takes the project and the construction risk, while the future owner company takes the market risk.	The state and citizens take all the risk.	The supplier takes the construction risk while the owner company takes the market risk and own costs associated with delays in the project.





# The road to a predictable and efficient permitting process



The possibility of commissioning in the early 30's

# The feasibility study continues

## Overview of key activities in 2023



Evaluate vendor offering via RFP



Preparing & starting public consultations

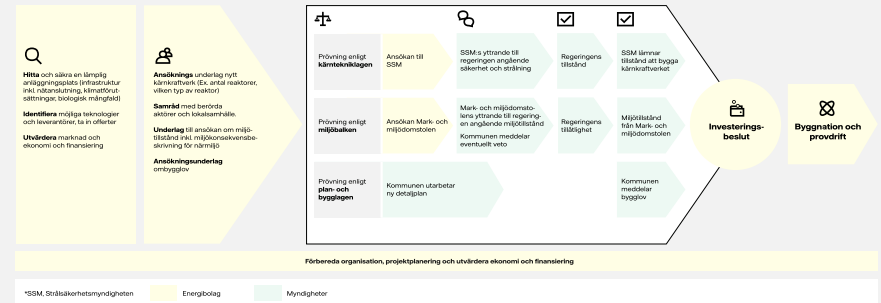


Preparation for environmental impact assessment



Securing land by buying property on the peninsula

## Permit process



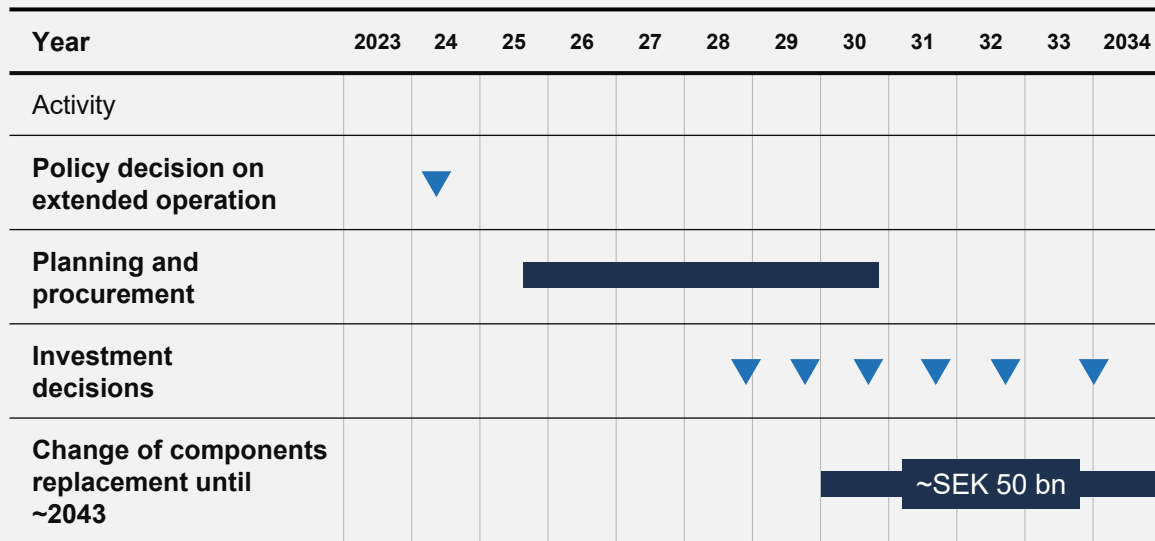
Document development is underway to prepare three applications in accordance with;

- The Nuclear Activities Act
- The Environmental Code
- The Planning and Building Act

Nuclear – today and in the future

# The way forward

## Timeline for prolonged operations



Final negotiation with the selected supplier will begin after all permits have been granted, when we know what we will build



There won't be a significant amount of capex until all permits have been granted



## Comparison SMR vs LSR – synthesis

**SMR has less impact on our balance sheet, offers lower risks, and better match demand increase – however, technology still unproven**

### Feasibility vs risks

	SMR	LSR
Availability of capital	+	-
Size of project (complexity and risk)	+	-
Need for risk sharing (magnitude of money)	+	-
Ability to match with demand increase (cost of redundancy)	+	-
Technology readiness level – certainty of timing to COD	-	+



# Thank you


Desirée Comstedt

A photograph of an offshore wind turbine in the foreground, with its three blades extending across the frame. In the background, a large offshore construction platform with a crane is visible on the sea under a hazy sky. The overall scene is in shades of blue and grey, with a soft, diffused light.

# Offshore Wind

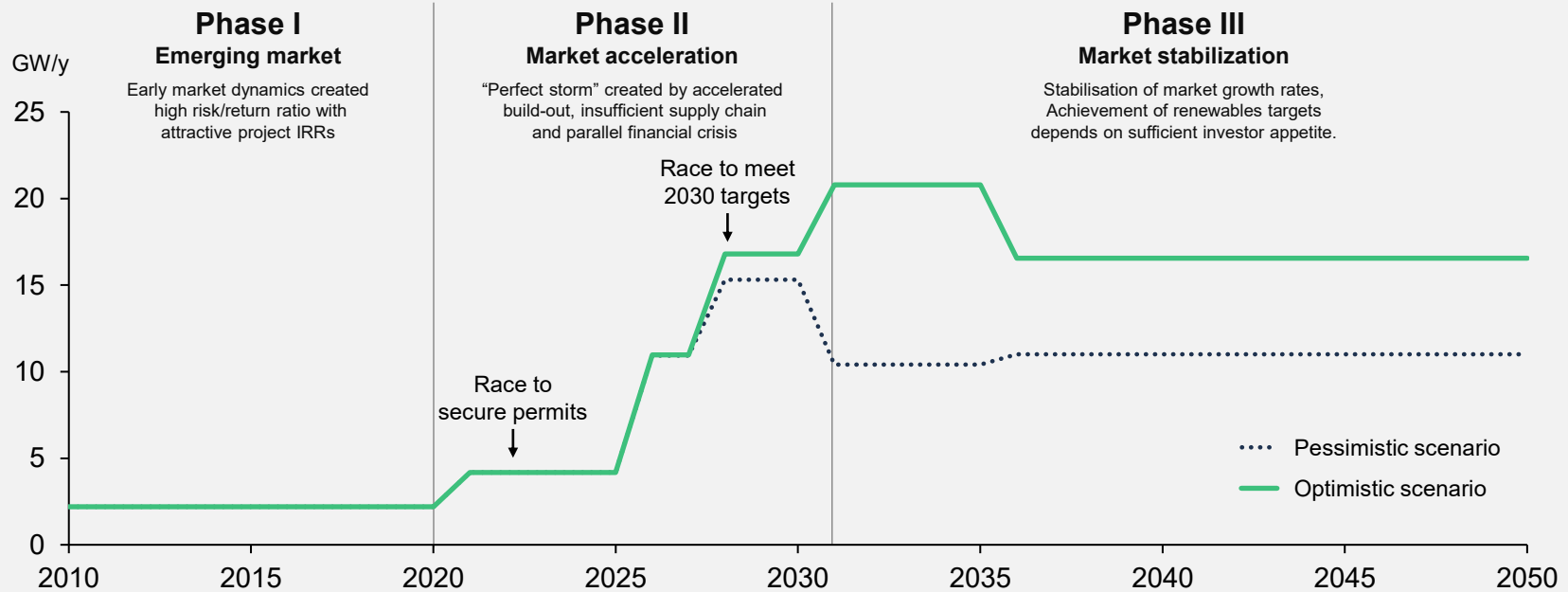
Helene Biström



A photograph of an offshore wind farm under construction. In the foreground, the blue tower and nacelle of a wind turbine are visible on the right. In the background, a large construction vessel with a crane is positioned in the blue sea, with several vertical piles being installed. The sky is a pale, hazy blue.

**European Offshore Wind build out  
must accelerate to meet 2030 targets  
– market turmoil may lead to delay**

# Annual Average Offshore Wind Build-Out in North West Europe\*



\* Excl. repowering, Germany, NL, Belgium, France, UK, Nordics Optimistic scenario based on IHS "Green Case". Pessimistic scenario based on IHS "Planning Case", Sept/Nov 2023

# Vattenfall believes in long-term attractiveness

Short term

## Perfect storm

### Challenges

- Rising inflation and supply chain crunch
- Increased cost of capital
- Changing competitive field
- Customers de-coupling from wholesale markets (PPAs, investments)
- Government actions uncertain to ensure profitability of projects

### Implications

- Pressure on margins
- High level of uncertainty
- Projects are stopped

Long term

## Market Stabilization

### Characteristics of attractive market

1. **Growth rates will be high and stabilize** for Offshore Wind build-out after 2030/35
2. Offshore wind market **dynamics will stabilize**
  - Easing of supply chain constraints
  - Clarity about market design
  - Clarity about competitive behaviour, especially Oil and Gas
3. Regulators will **ensure returns high enough** to secure investor appetite, e.g.
  - Sufficient electricity / CO<sub>2</sub> pricing, or
  - Governmental support schemes (i.e. CfDs)
4. Demand for green electrons will remain high driven by **electricity revolution**
5. Renewables development and production will enable **utilities to support industry** on decarbonization journey

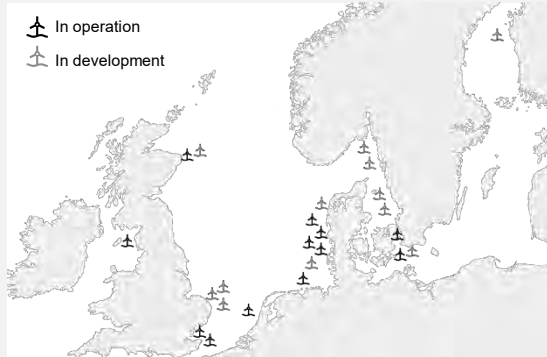
The question is

**how quickly offshore build-out can be delivered, and whether price levels will enable a just energy transition**



# Strong foundation enables a prudent approach in light of increased risks

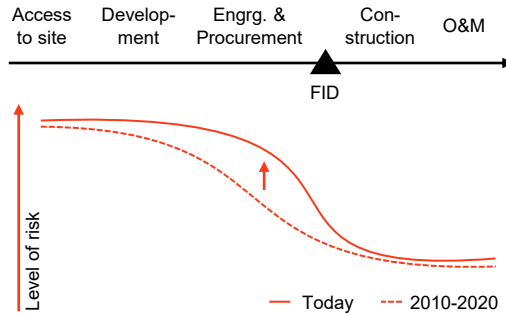
## Vattenfall was an early mover



Low-price access to projects, and acceptance of high technology development risk, resulted in:

- Highly profitable running fleet
- Low-cost pipeline
- Experienced organization & track record
- Trust with suppliers, regulators and off-takers

## Project risks have increased



Pre-FID risks increased:

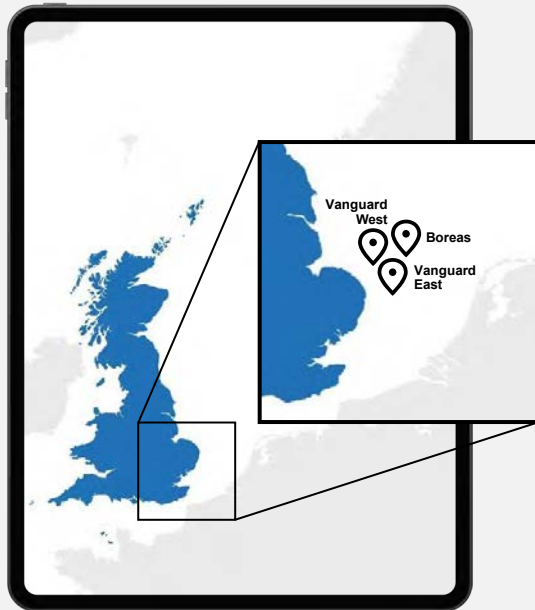
- Upfront payments and commitments pre-Final Investment Decision (FID)
- Counterparty risks
- Unclear revenues and government support

## Adopting prudent approach

### Existing pipeline enables Vattenfall to be selective in current market

e.g. avoid high pre-FID cost

# The Norfolk cluster is highly attractive from its fundamental parameters



## Key data

Capacity	3x 1.4 GW
Distance to shore	47 km at closest point
Water depth	up to 45 m
Boreas	Stopped
Vanguard W & E	Fully consented, Commissioning 2028-2030

## One of the world's largest offshore Wind zones

- Norfolk zone is a major building block for **UK's energy transition**
- Vattenfall is **investigating options** for the development of the **whole Norfolk Zone**
- **Parameters of Allocation Round 6** are crucial for the **progress of Norfolk projects**

# Short-term: Vattenfall will manage risks and contribute to stabilize market

## 1. Avoid investments in unprofitable renewables projects

Vattenfall will only invest, if risk is acceptable and level of revenues / cost provide a decent profitability

Continue to innovate to increase profitability

## 2. Manage risks carefully

Cautious approach along project lifecycle

Balance merchant and de-risked revenue streams in renewables fleet

## 3. Contribute to market stabilization

Influence regulators to ensure support reflects present market conditions

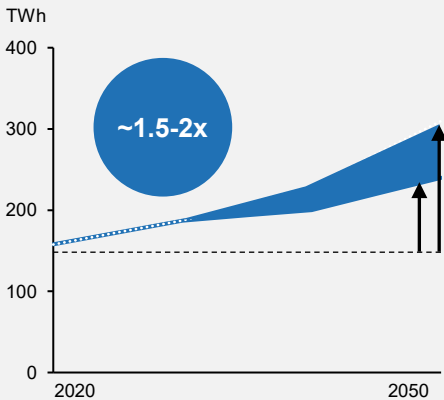
Create alliances with customers, peers and suppliers, to re-establish resilient value chains

Continue to communicate open and transparently (e.g. Norfolk Boreas)

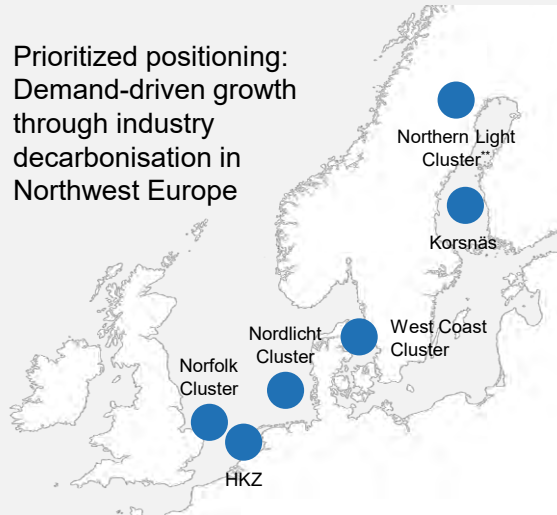
# Long-term: Regional champion in Offshore Wind in Northwest Europe

## Connect new demand with renewables pipeline

Increased electricity demand in all core markets (Example: Sweden')



Prioritized positioning: Demand-driven growth through industry decarbonisation in Northwest Europe



## Role as Industry Decarboniser

### 1. Leverage integrated-utility position and regional footprint...

- Access and trust towards partners and authorities
- Fossil free flex, i.e. Hydro, pumped storage
- Competencies in optimization and trading

### 2. To partner with energy-intensive industry

- Strong brand value
- Leadership in sustainability
- Financial resilience

### 3. Creating options for above average IRRs.

- Increase chance to secure Offshore Wind permits
- Reduce merchant risk by securing local demand

\*Source: Governmental targets and country-specific net zero scenario studies \*\*Focus on Onshore Technology but similar market positioning



# Integrated offering of different fossil free technologies towards industry clients

Sweden and Germany most attractive markets for additional onshore renewable growth

## Germany

**Increase of national Renewable targets** by 50% for Wind and 100% for Solar, **strong Flex need** to balance high share of volatile feed-in

**New policies introduced** to support build out

**Attractive revenue streams and returns** available through subsidies and PPA market

## Sweden

**Power demand might more than double** by 2045

**Onshore & Offshore Wind main supply** pre-2035, nuclear following later

**Regulatory context improving**

**Vattenfall well positioned** as early mover in industry decarbonization (HYBRIT)



Vattenfall

# Well positioned for complex renewable hybrid parks offshore and on land to secure a stable electricity supply

Combining different generation and flex technologies

Technical and commercial optimization

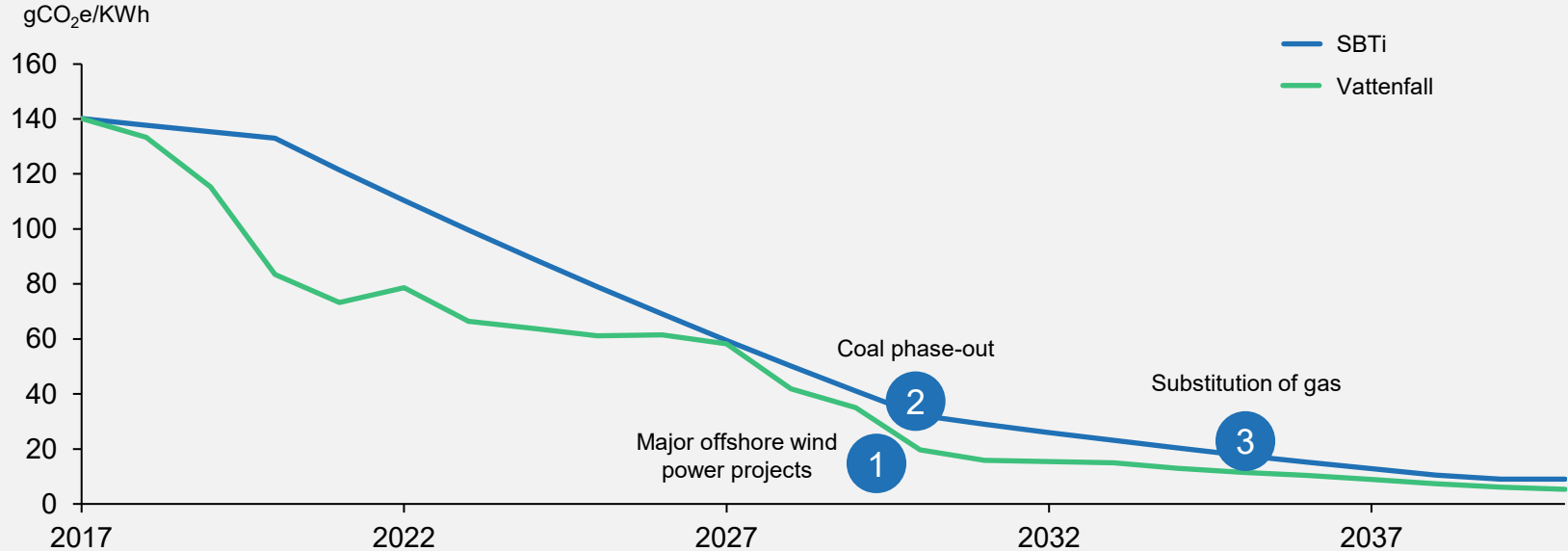
Supporting system integration, grid stability & balanced load profile



# Thank you

Helene Biström

# The road to net zero emissions





# Vattenfall Heat Sweden

Lovisa Fricot Norén  
Vice President BU Heat  
Sweden

Jonas Nilsson  
Head of Generation  
Uppsala

Business areas



Customers  
& Solutions



Power  
Generation



Wind



Heat



Distribution

# Heat

One of Europe's leading players in district heating

Building and operating district heating assets and grids in 4 countries and ~ 25 cities

District heating enables considerable carbon reduction in cities where we operate



~ **5,600 km**  
heat grids in operation



~ **2 million**  
heat related end customers



~ **14.1 TWh**  
sales of heat in 2022







< **0.5%**  
churn rate



~ **16.6 TWh**  
electricity generation in 2022

## Market characteristics

	Concession based	Regulated price setting	Typical customer contract length
UK 	Yes	Yes	30 years
DE 	No	Yes	up to 10 years
NL 	Yes	Yes	15-25 years
SE 	No	No	Until further notice

# Heat Sweden

## Key Data\*

**District heating** 2 800 GWh

**Electricity** 180 GWh

**Steam** 120 GWh

**District cooling** 70 GWh

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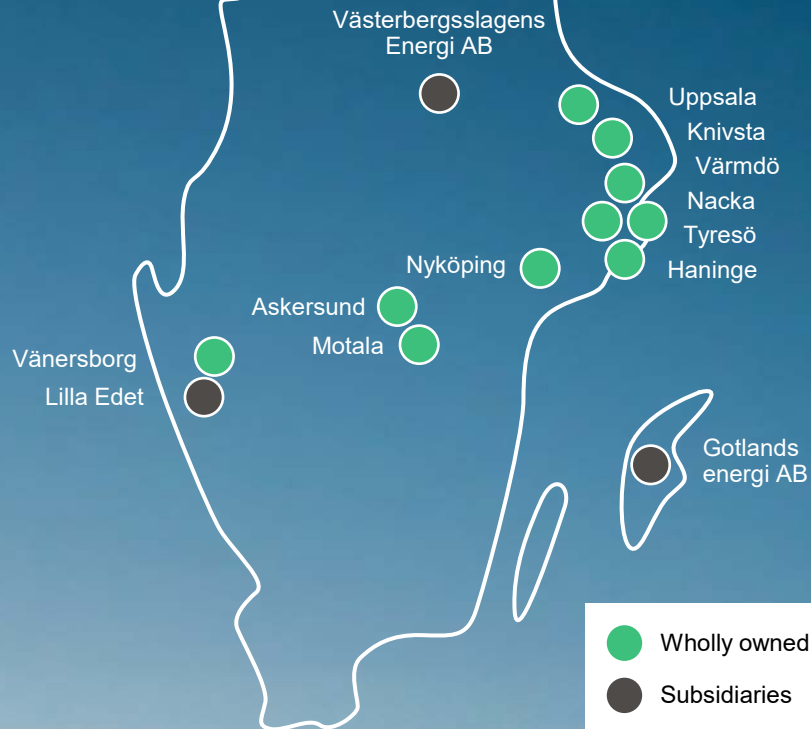
**B2B customers** 3 600

**B2C customers** 11 700

**End consumers** 450 000

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**Employees** 468



\* Volumes and number of customers as per year end 2022



# Swedish heat market facts

Total Swedish heating market

**~100 TWh**

**~100 bn SEK**

Annual turnover



**District heating**  
of heat volumes



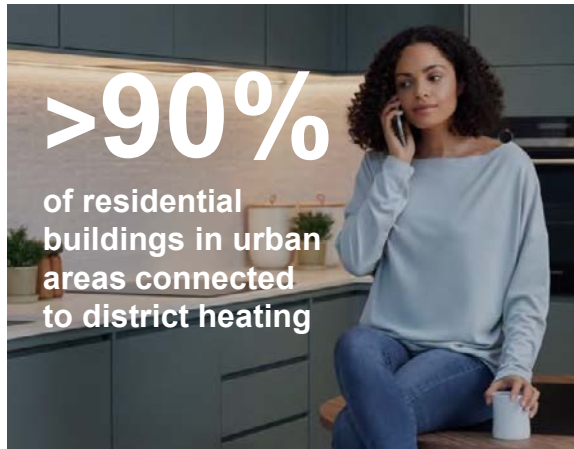
District heating continuous growth

**1955-2010**

thereafter small decline in volumes

**>90%**

of residential  
buildings in urban  
areas connected  
to district heating



**~220 district heating grids**  
across 290 municipalities



**Heat pumps**  
main competitor  
to district heating



**Lightly regulated**  
market



**4th largest player**  
with 2.8 TWh heat sold

# District Heating

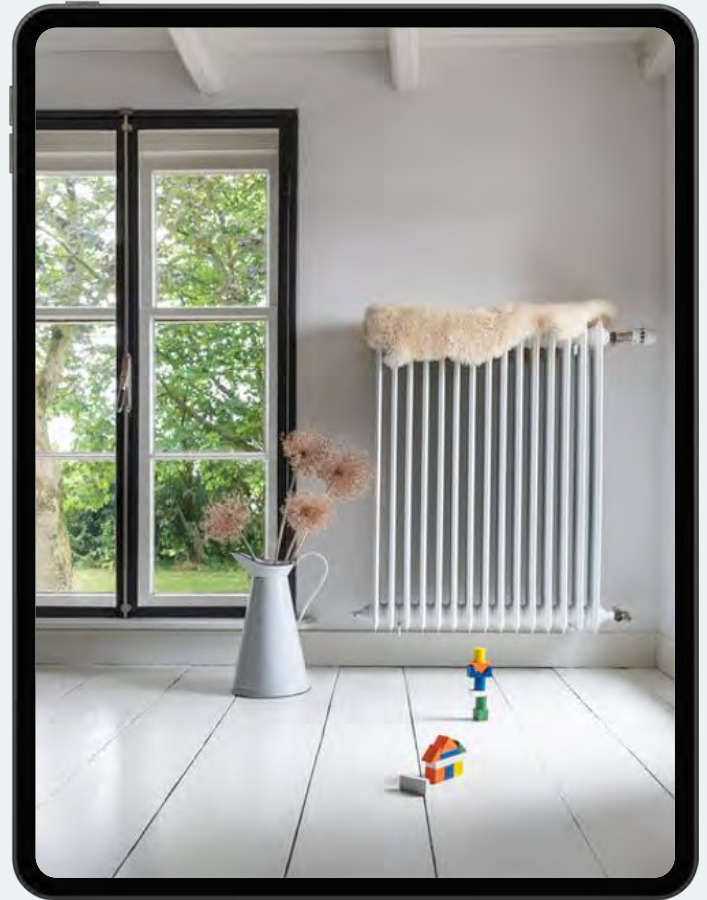
## – a central part of the circular economy

**Circular** by using recycled and renewable fuels as well as recovery of waste heat

**Integrated energy system** where district heating and electrification go hand in hand

**Climate smart** through fossil free fuels and the sights set for negative emissions

**Cooperation** with stakeholders and **innovation** are key



# Our journey towards Net Zero

**-51%**

Emission intensity  
reduction since 2017

2022

**1.5°C**

Target for own  
emission reductions  
**SBTi Certified**

2030

**Net Zero**

Emissions in our  
full value chain  
**SBTi Certified**

2040

# District Heating – from fossil to renewable



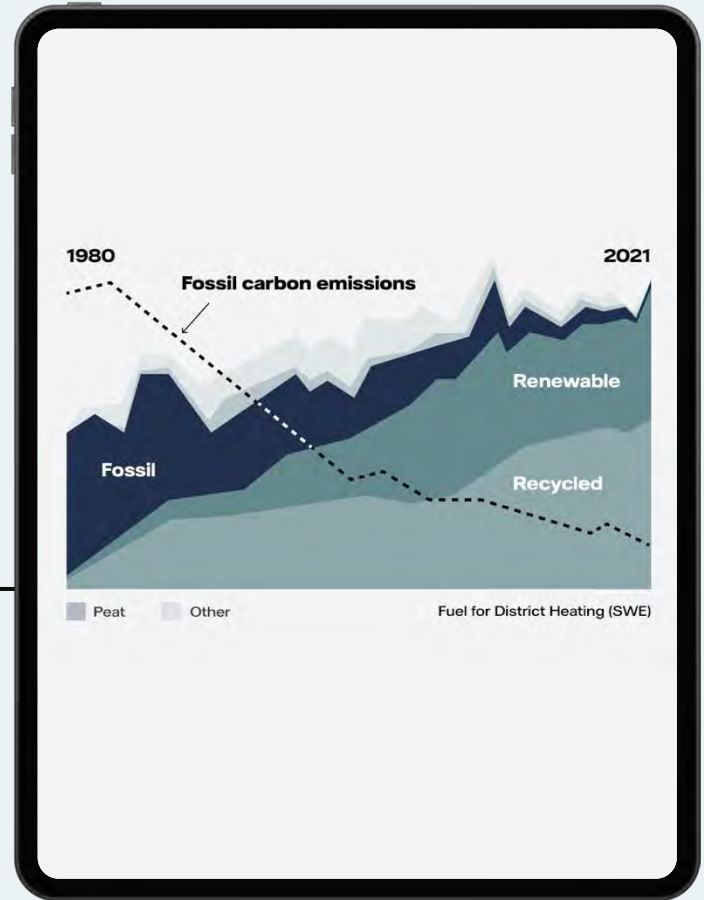
**Then**  
polluted city,  
lots of individual  
fossil burners



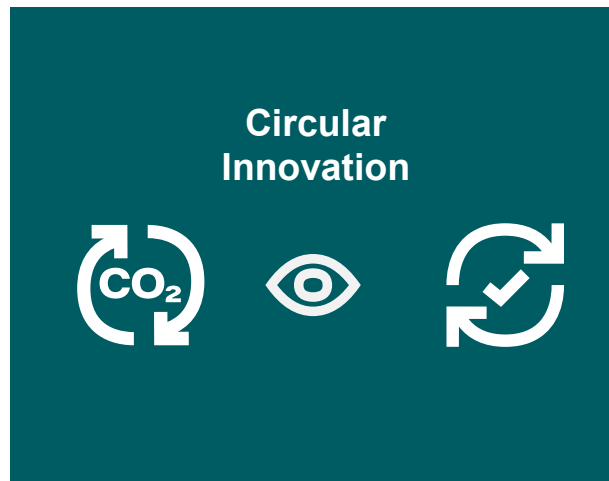
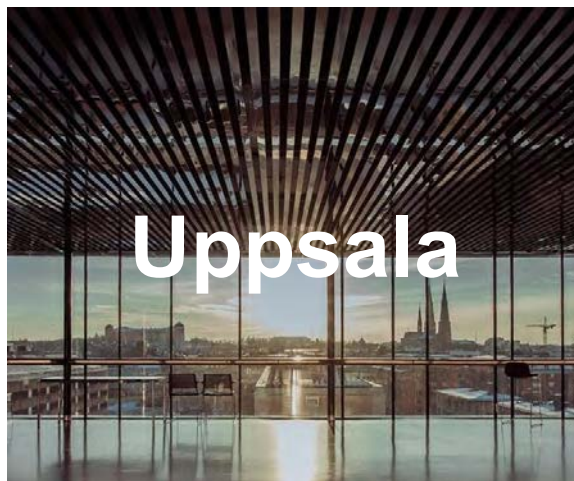
**Now**  
better air quality  
and reduced  
emissions



**Soon**  
**100%**  
fossil free  
heating



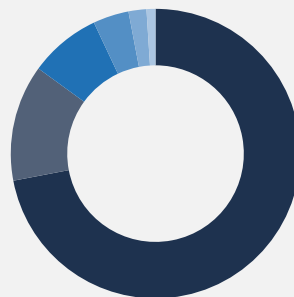
Total investment programme of  
**SEK 3.5 billion**  
to phase out fossil fuels



Carpe Futurum



Fuel mix 2022



Waste 65%  
Biomass 25%  
Electricity 4%  
Waste heat 3%  
Bio oil 2%  
Fossil oil 1%

We supply heat to

**90%**

of the city of Uppsala





# Thank you

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& Jonas Nilsson