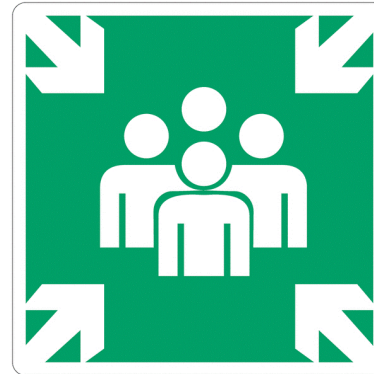
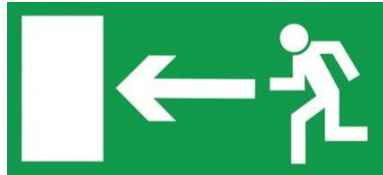




# Welcome to Ringhals

# Säkerheten främst

Vänligen notera var närmaste nödutgångar, brandsläckare, samlingsplats och hjärtstartare finns



A photograph of the Ringhals power plant at sunset. The sky transitions from a deep blue at the top to a bright orange and red near the horizon. The power plant's silhouette is visible against the orange sky, with several large cylindrical structures and a tall chimney. The plant is situated on the bank of a body of water, which reflects the colors of the sunset. In the foreground, there are dark silhouettes of trees and a wooden fence.

# Ringhals

## The largest power plant in Sweden

Energiforsk seminar, 190924, Sofia Johansson

# This is Vattenfall

Vattenfall's main markets are  
Nordics, Germany, Netherlands

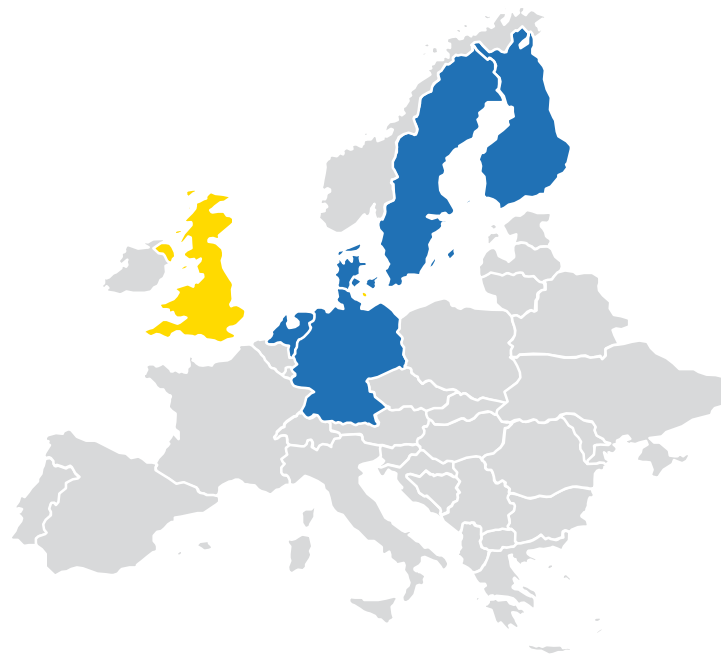
Vattenfall also has operations in:  
United Kingdom

Vattenfall's main products are  
Electricity, Heat, Gas

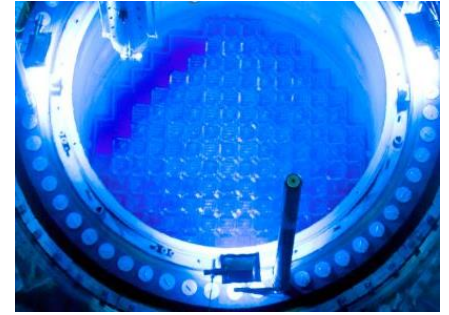
Vattenfall works in all parts of the value chain  
Production, distribution, trading and sales

Vattenfall produces electricity and heat from  
six energy sources  
Hydro, Nuclear, Coal, Wind, Biomass and  
Gas

100%-owned by the Swedish state



# Nuclear power is important



We will help power our customers to live free from fossil fuels within one generation



# Energy from Vattenfall



## WIND

Vattenfall will continue to expand offshore wind in the North Sea countries and onshore in prioritised markets.



## COAL

Vattenfall has sell its lignite power plant in Germany. This is a step in the transition towards a more sustainable production.



## BIOMASS

Vattenfall will increase co-firing of biomass in existing coal-fired plants to reduce CO2 emissions.



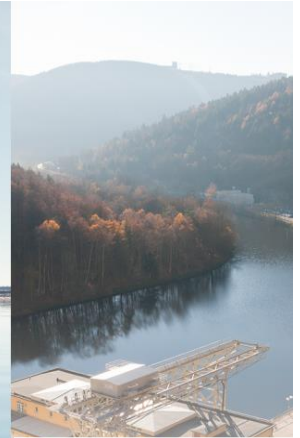
## GAS

Vattenfall will maintain its current portfolio and will monitor the potential for growth.



## NUCLEAR

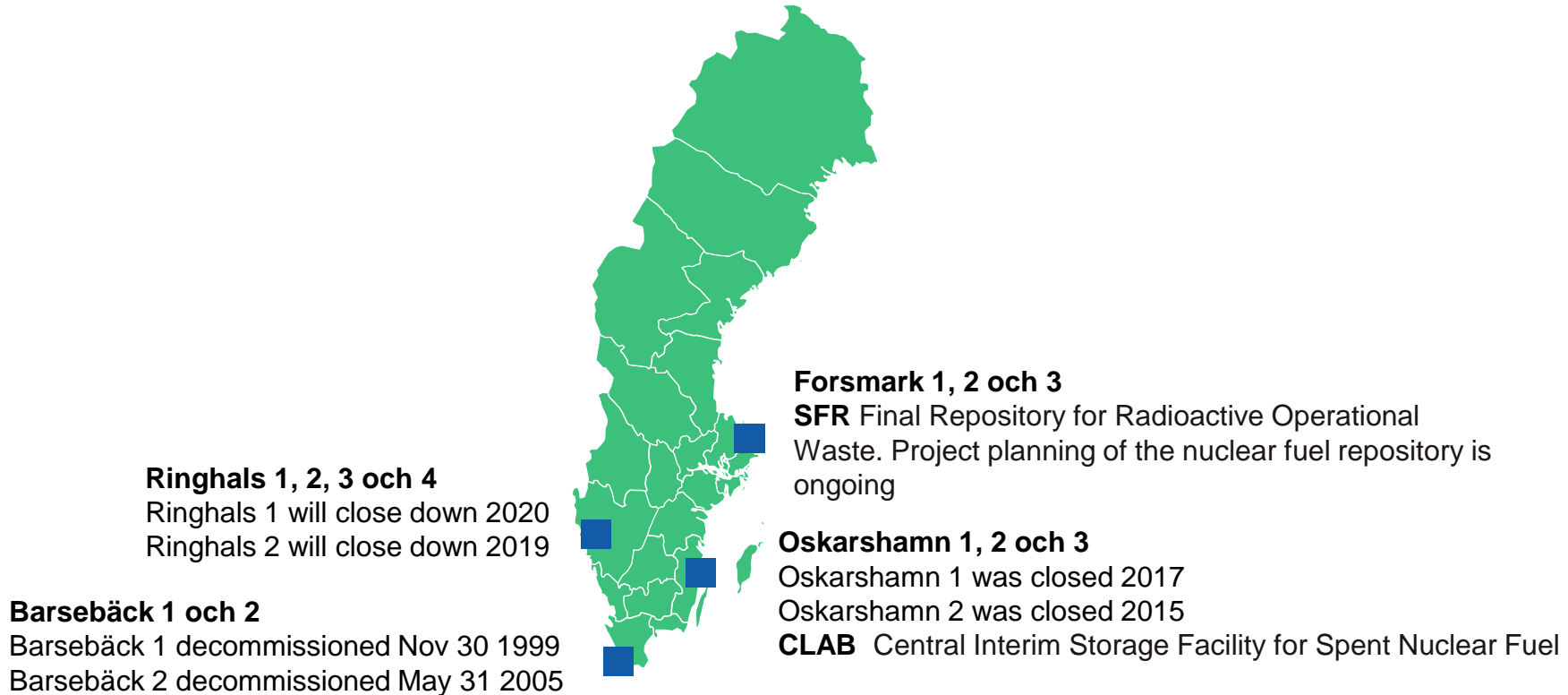
Vattenfall aims to maintain its current nuclear positions in Sweden. A decision has been taken to phase out Ringhals 1, 2020 and Ringhals 2, 2019.



## HYDRO

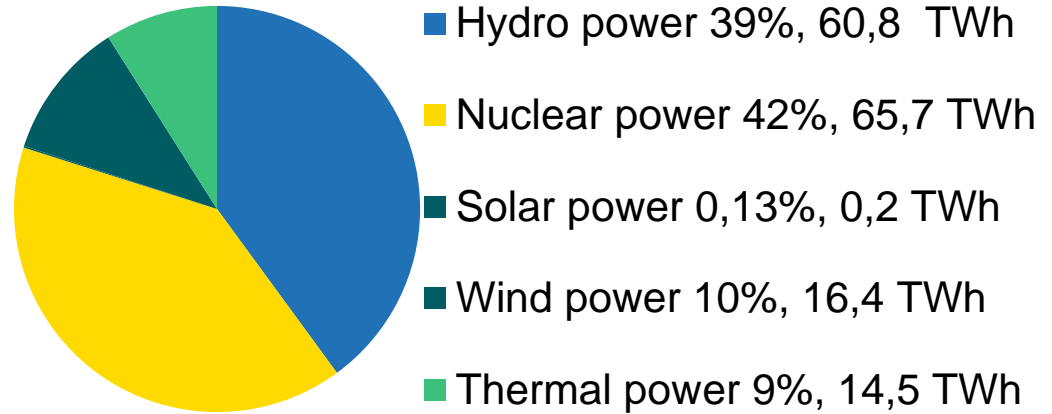
Vattenfall is investing in improvements of existing power plants and exploring options for growth.

# Nuclear power plants in Sweden



# The electricity of 2018 in Sweden

Consumption	140,6 TWh
Production	157,6 TWh
Net export	17 TWh
Ringhals	30 TWh, 19 %



Source: Energiföretagen 2019

# Ringhals – the largest power plant in Sweden



# Ringhals AB

- Owners: Vattenfall (70,4 %)  
Sydkraft Nuclear Power (29,6 %)
- Production capacity: approx. 30 TWh/year
- Installed power: 3951 MW
- No. of employees: 1313 (January 1, 2019)
- Covers approx. 20 per cent of the total demand for electricity in Sweden

## Vision

Our electricity in demand, every day, all year



# Ringhals 1&2 – shutdown

Ringhals 2 will close in December 31 2019

Ringhals 1 will close in December 31 2020

Decision taken depending on the low electricity prices and high power tax.



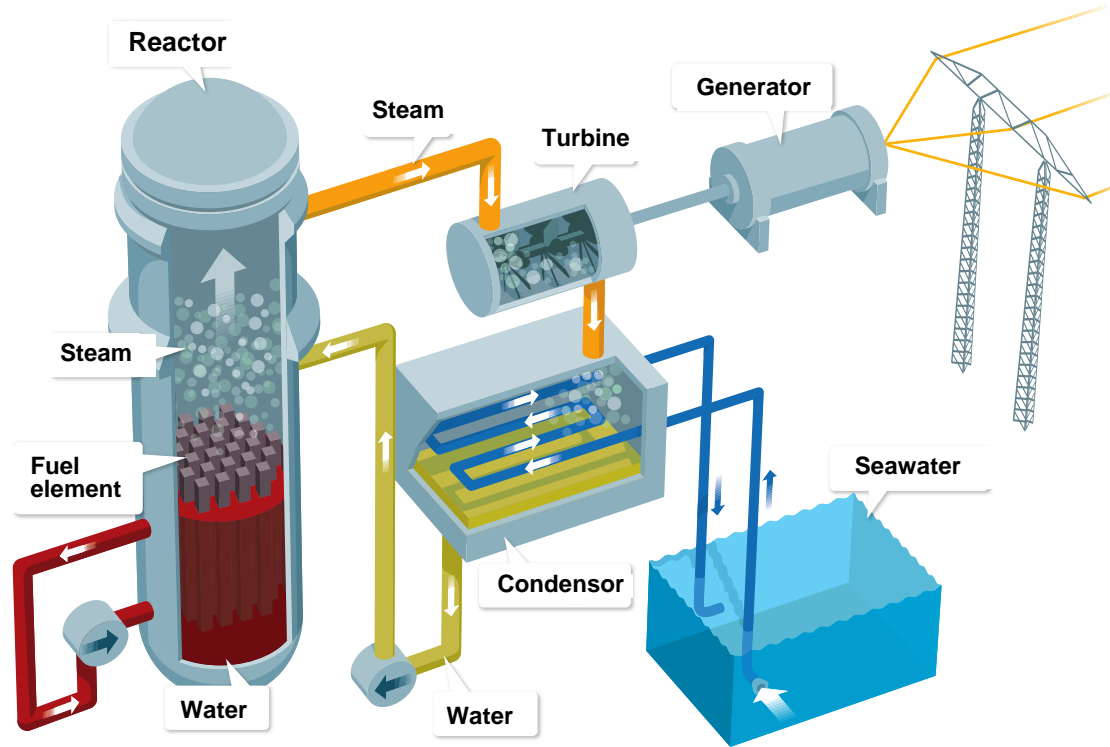


2019-09-25

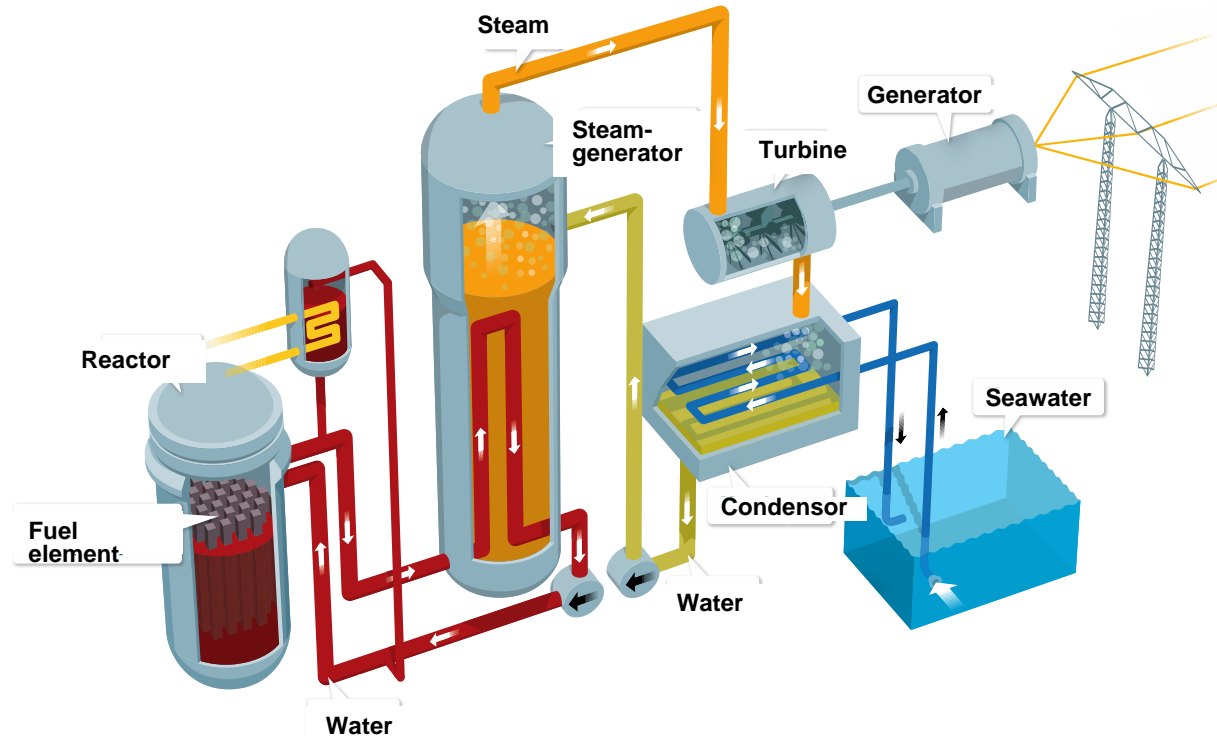
© Ringhals AB

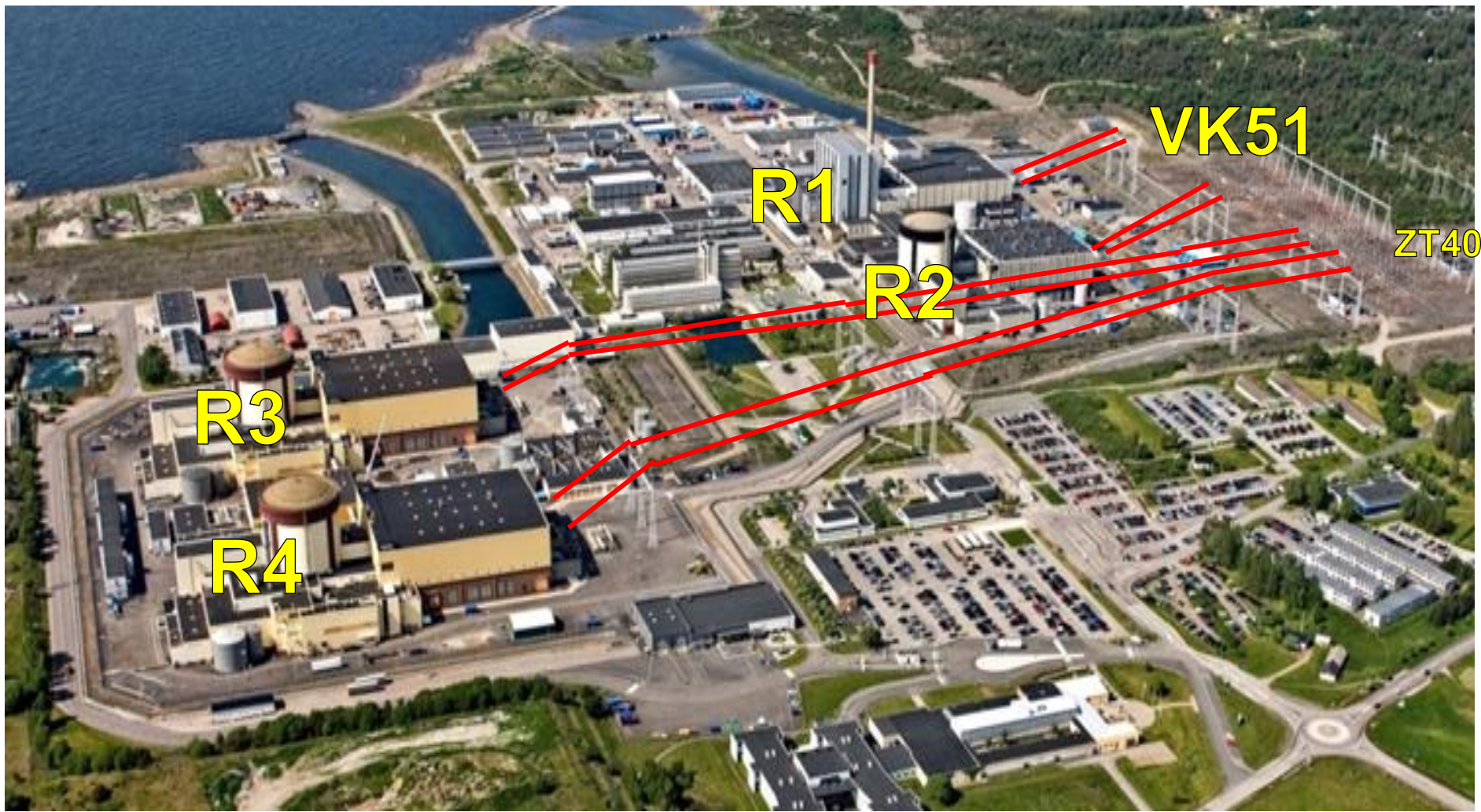
**VATTENFALL** 

# Boiling Water Reactor, BWR



# Pressurized Water Reactor, PWR







# Nuclear power in the world 2018

453 reactors in operation in 30 countries  
58 under construction

USA: 99 in operation

France: 58 in operation

Sweden: 8 in operation

Construction in Finland, The Far East,  
China and Russia.

Nuclear power stands for 10% of the total electricity  
produced in the world.

Source: IAEA, 2019



# Ringhals 2018

Net output (electrical): 30 170 GWh  
19 % of the electricity produced in Sweden

