Green bond investor report

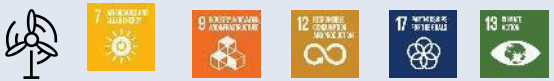
September 2020

VATTENFALL

Vattenfall’s green bond framework

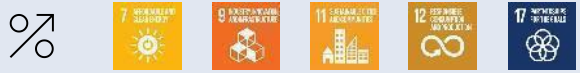
Use of proceeds - eligible categories with examples of technologies

Renewable energy and related infrastructure



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

Energy efficiency



- Hydro power
- Smart grids/meters
- Fossil-free[1] district heating and cooling
- Energy recovery

Electrification of transport and electrification of heating

- Infrastructure for electric vehicles
- Power to Heat

Industry projects

- Activities enabling the transformation to fossil-free[1] production

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

VATTENFALL

Green bond investor report

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

Category	Project/country	Type	Capacity/ impact	Est. CO_2 reduction (ktonnes)[1]	Vattenfall's share	Start/ completion	Total investment	Of which Green Bond/spent SEK million[2]
Renewable energy and related infrastructure	Kriegers Flak/ Denmark	Wind offshore	605 MW	440	100%	2019/ 2021	7,700 MDKK	1,529
	Wieringemeer/ Netherlands	Wind onshore	180 MW	215	100%	2018/ 2020	220 MEUR	1,178
	Wieringermeer Extension/ Netherlands	Wind onshore	118 MW	140	100%	2019/ 2020	174 MEUR	881
Industry projects	HYBRIT/Sweden	Pilot project	Fossil-free steel	–	33%	2019/ 2021	858 MSEK	211
Total								**3,799**
Not yet used								6,648[3]
Grand total								**10,447**

[1] Production from onshore wind estimated to 2.6 GWh/MW installed, from offshore wind to 3.5 GWh/MW installed, and from solar to 1.0 GWh/MW installed. Resulting production is compared against grid average emission factors. Actual production factors and savings will vary. Figures are p.a.
[2] Pertains to actual payments to third parties. No acquisition costs or retroactive payments are included. Converted to SEK using year-end exchange rate as per 31 December 2019.
[3] We estimate to be fully invested by mid-2021.

Dark green shading by CICERO

Governance: Excellent

"Vattenfall is deeply committed to contribute to a green transition towards a low carbon society in the longer run. In addition to subscribing to UN Compact and other sustainability guidelines, Vattenfall has clear and ambitious targets when it comes to reducing energy consumption and CO_2 emissions"

Project categories

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

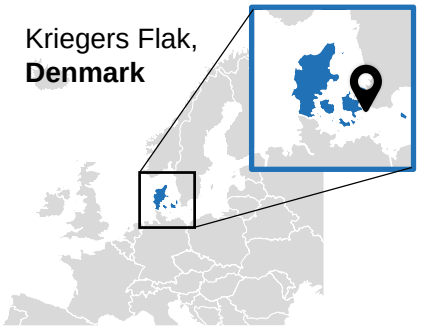
	Categories	Green shading
	Renewable energy and related infrastructure	Dark Green
	Energy efficiency	Medium to Dark Green
	Electrification of transport and heating	Dark Green
	Industry projects	Dark Green

Project deep dive – Kriegers Flak

UN SDG's

Overview

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



Key data

Capacity	605 MW
Country	Denmark
Technology type	Wind offshore
Turbine model	Siemens Games Turbines 8.4 MW
Ownership	100% Vattenfall
Total Investment (SEK million[1])	10,700
Green bond/spent (SEK million[2])	801
Estimated CO_2 reduction[3]	440 ktonnes p.a.
Completion	2021

Project Timeline

2016: Winning of tender

2017: Siemens Gamesa wins the turbine tender

2018: Remaining tender packages signed

2019-2021: Construction and installation

2021: Commissioning

[1] Year end exchange rate as per 31 December 2019

[2] Pertains to actual payments to third parties. No acquisition costs or retroactive payments are included. Converted to SEK using year-end exchange rate as per 31 December 2019

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

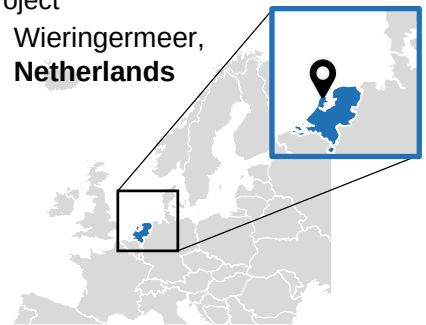
Project deep dive - Wieringermeer

UN SDG's

Overview

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

Wieringermeer, **Netherlands**



Key data

Capacity	303 MW
Country	Netherlands
Technology type	Wind onshore
Turbine model	Nordex N117/3600
Ownership	100%
Total Investment (SEK million[1])	4,100
Green Bond/spent (SEK million[2])	1,073
Estimated CO_2 reduction[3]	355 ktonnes p.a.
Completion	2020

Project Timeline

2017: 10 year power supply agreement with Microsoft for its datacenter in the Netherlands

2017: Increased the ownership in Wieringermeer wind farm with the acquisition of an additional 32 turbines

2020: Completion

[1] Year end exchange rate as per 31 December 2019
[2] Pertains to actual payments to third parties. No acquisition costs or retroactive payments are included. Converted to SEK using year-end exchange rate as per 31 December 2019
[3] Production from onshore wind estimated to 2.6 GWh/MW installed. Actual production factors and savings will vary

Project deep dive – HYBRIT

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

UN SDG's

HYBRIT FOSSIL-FREE STEEL

A joint initiative by LKAB SSAB VATTENFALL

What is HYBRIT?

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

Why is this important?

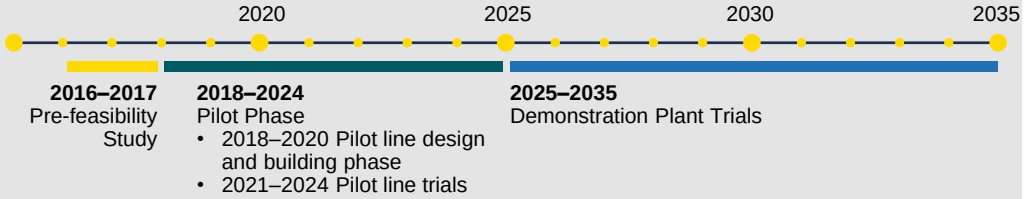
- The steel industry is one of the highest CO_2-emitting industries, accounting for 7% of global and 10% of Swedish total CO_2 emissions
- Steel demand is set to grow due to population and urbanisation → carbon footprint of the industry needs to be addressed

Financing and timeline

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

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

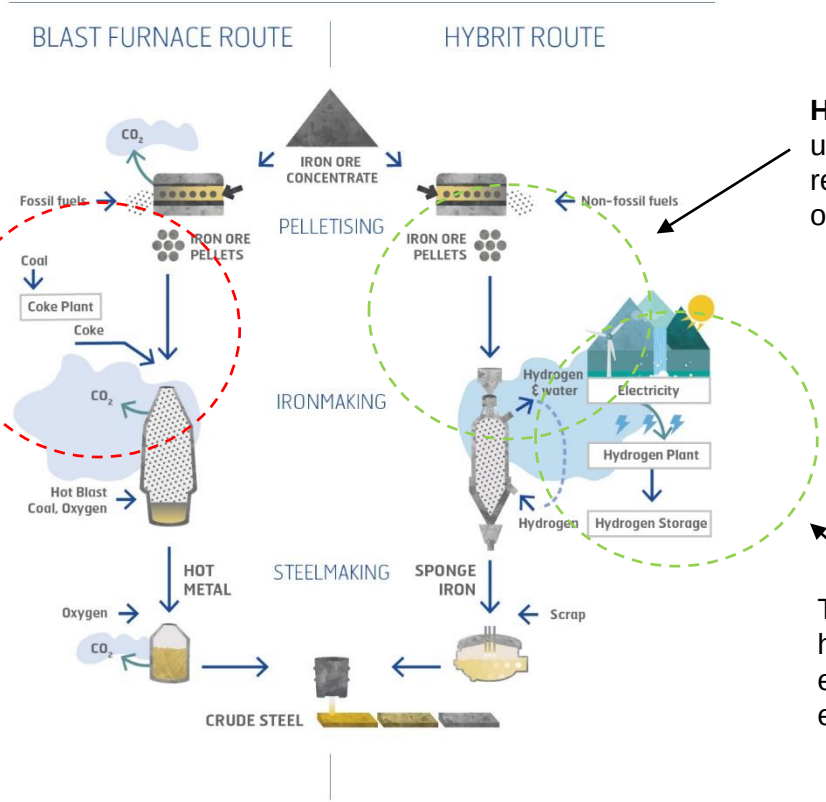
Main project phases



Project deep dive – HYBRIT

HYBRIT enables the decoupling of carbon dioxide and energy

Traditional ore-based steelmaking: Reduction reactions in ironmaking represent around 85 to 90 per cent of the total CO_2 emissions



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

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