

A woman with long brown hair is shown in profile, looking out towards the ocean. The background is a blurred view of the sea with gentle waves. A white, curved graphic element separates the woman's face from the ocean background.

First in fossil-free steel

Dutch Steel Construction Day

October 2023

Jan Meier, SSAB

SSAB

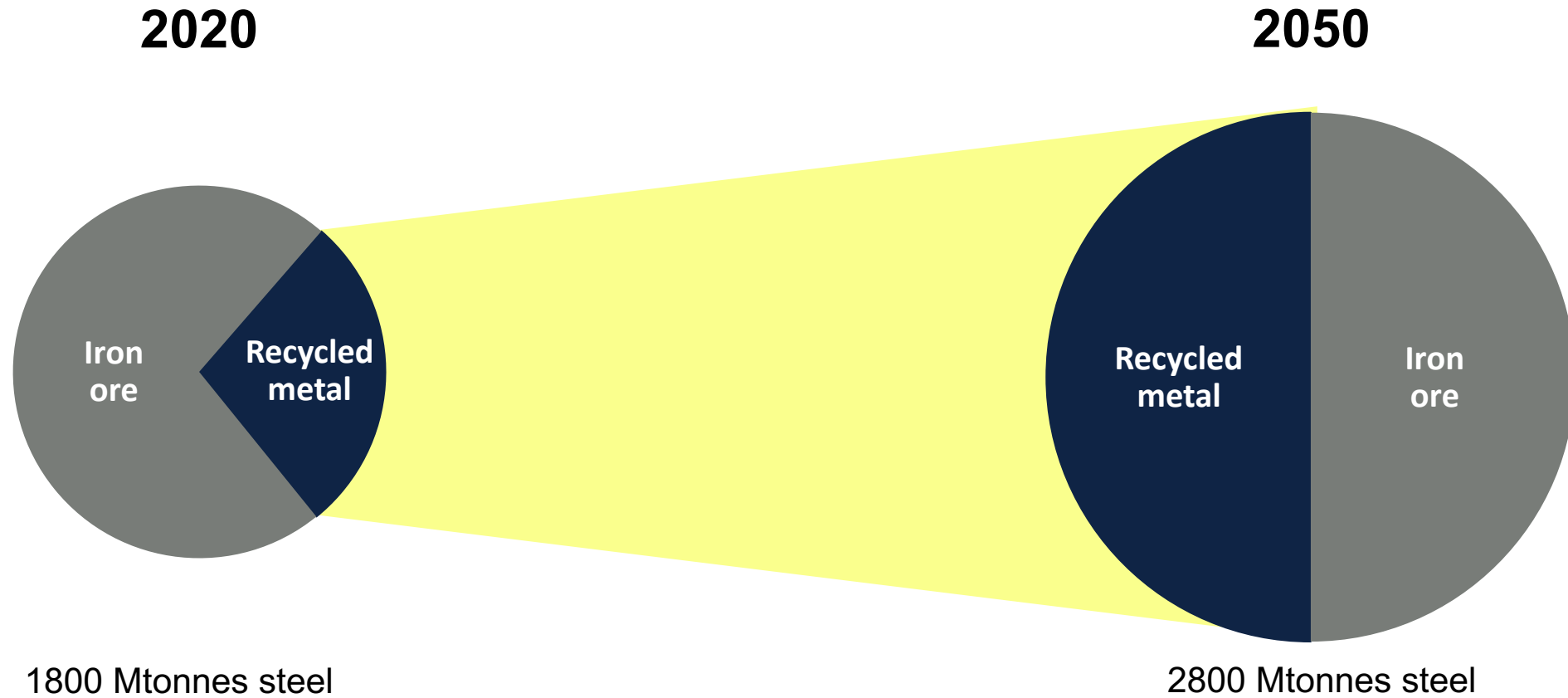
7%

The steel industry accounts for 7% of the global CO₂ emissions. Making it one of the biggest single industrial CO₂ emitters

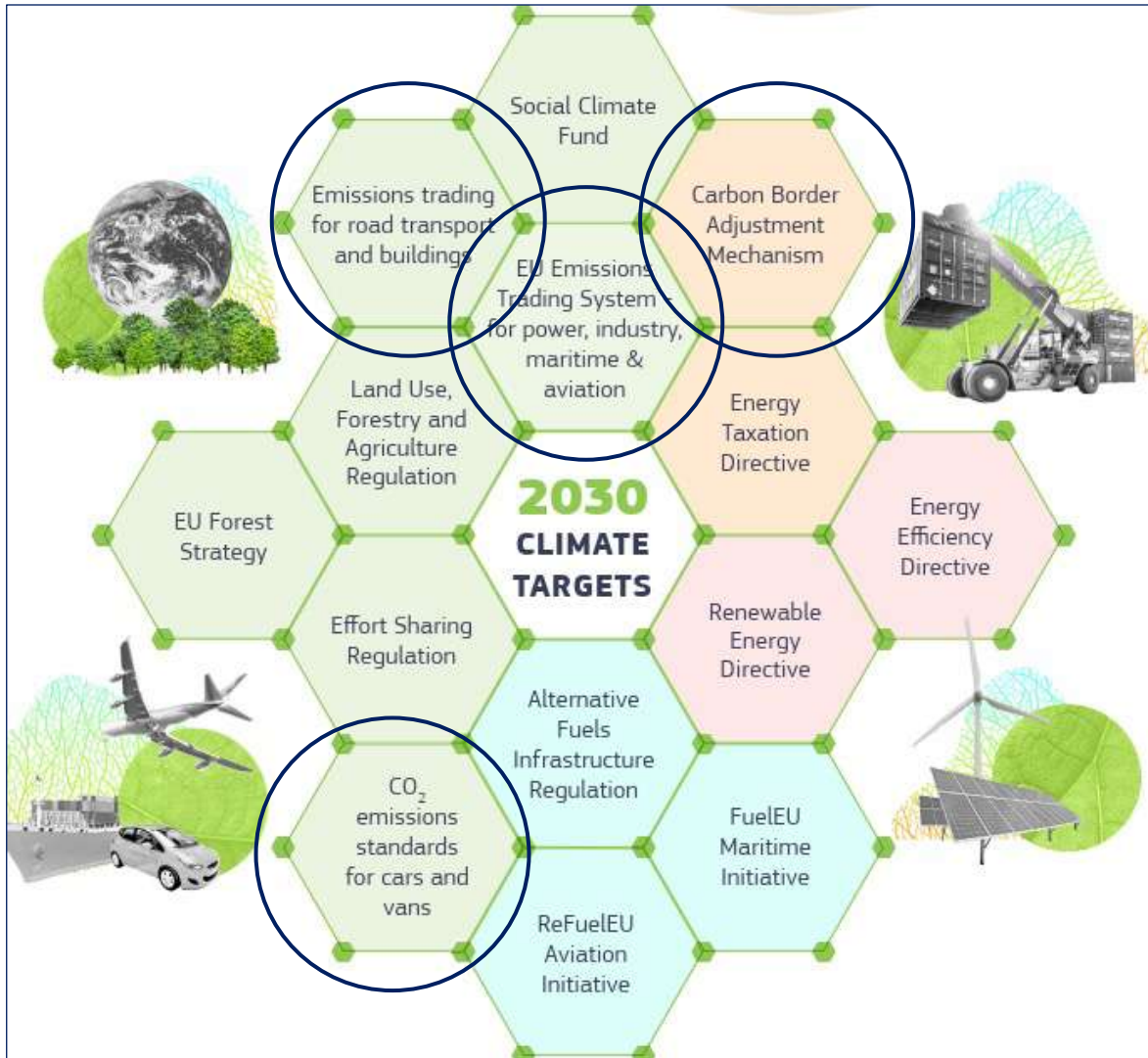


SSAB

Recycling will not be enough 50% iron ore-based steel will still be needed by 2050

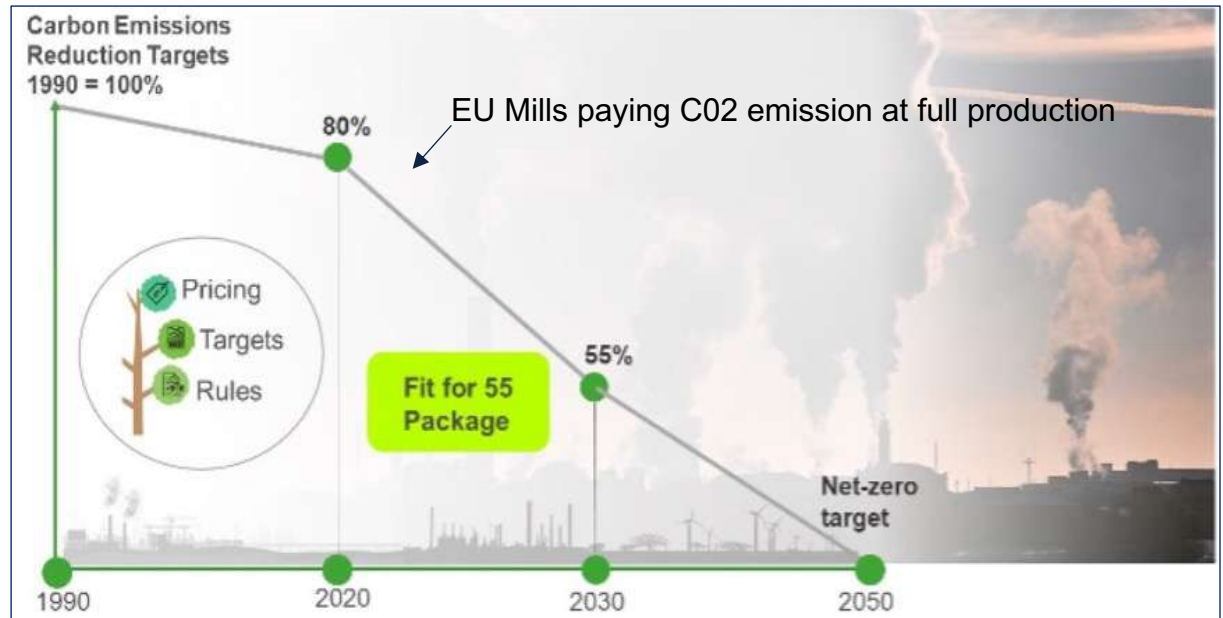


EU's Fit for 55: Delivering on the European Green Deal



FIT for 55 Package

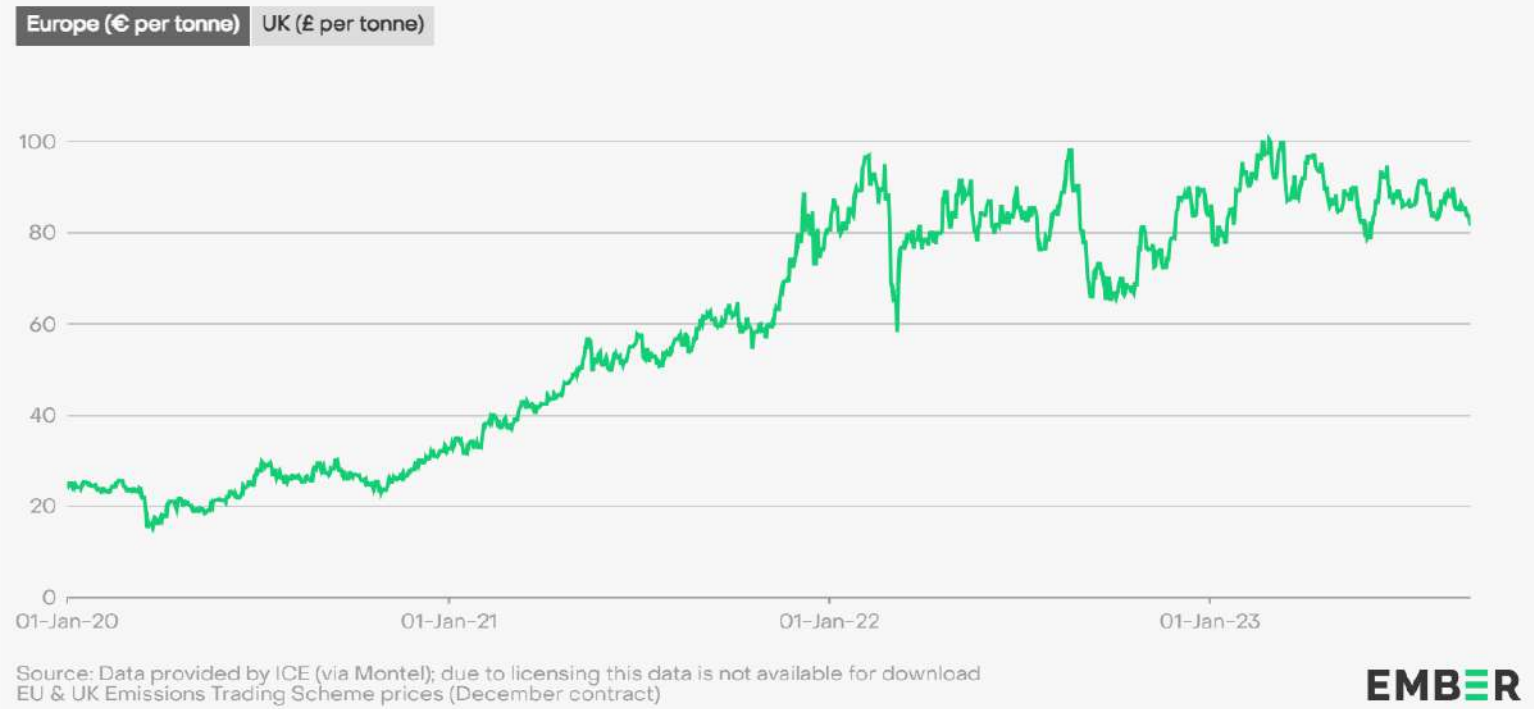
- Stricter revisions to several directives
- Less Free allowances
- Introduction of the CBAM



Co2 emissions rights – price development

The price of emissions allowances in the EU and UK

Cost per tonne of carbon dioxide produced (in £ or €)



► EUR/ton 87,- November 2023

► CRU estimate a price range of €150/ton towards 2034¹

The transformation
has started at
SSAB



SSAB leading the green transition of the steel industry



The Hybrit Pilot Plant

The HYBRIT joint venture between SSAB, LKAB and Vattenfall formed in 2017 – world-unique pilot plant in operation since 2020



Fossil Free HBI

Plan to reach commercial volume of 1.3 million tonnes fossil-free Hot Briquetted Iron (HBI) in 2026



World's first FF slab

World's first fossil-free steel rolled and delivered to Volvo Group in 2021



Volvo Dump truck in FF steel

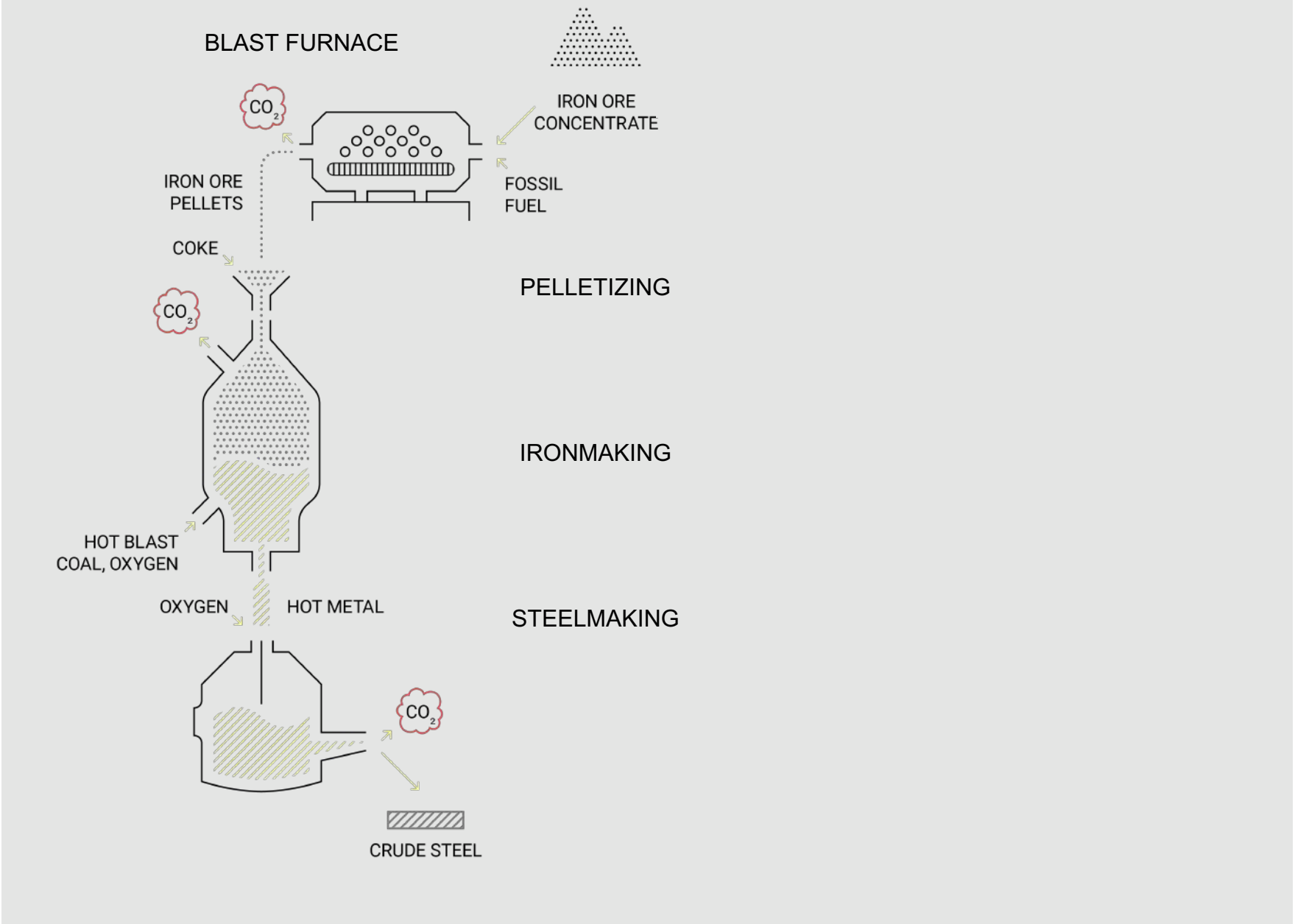
Partnerships for a fossil-free value chain

How to make fossil-free steel



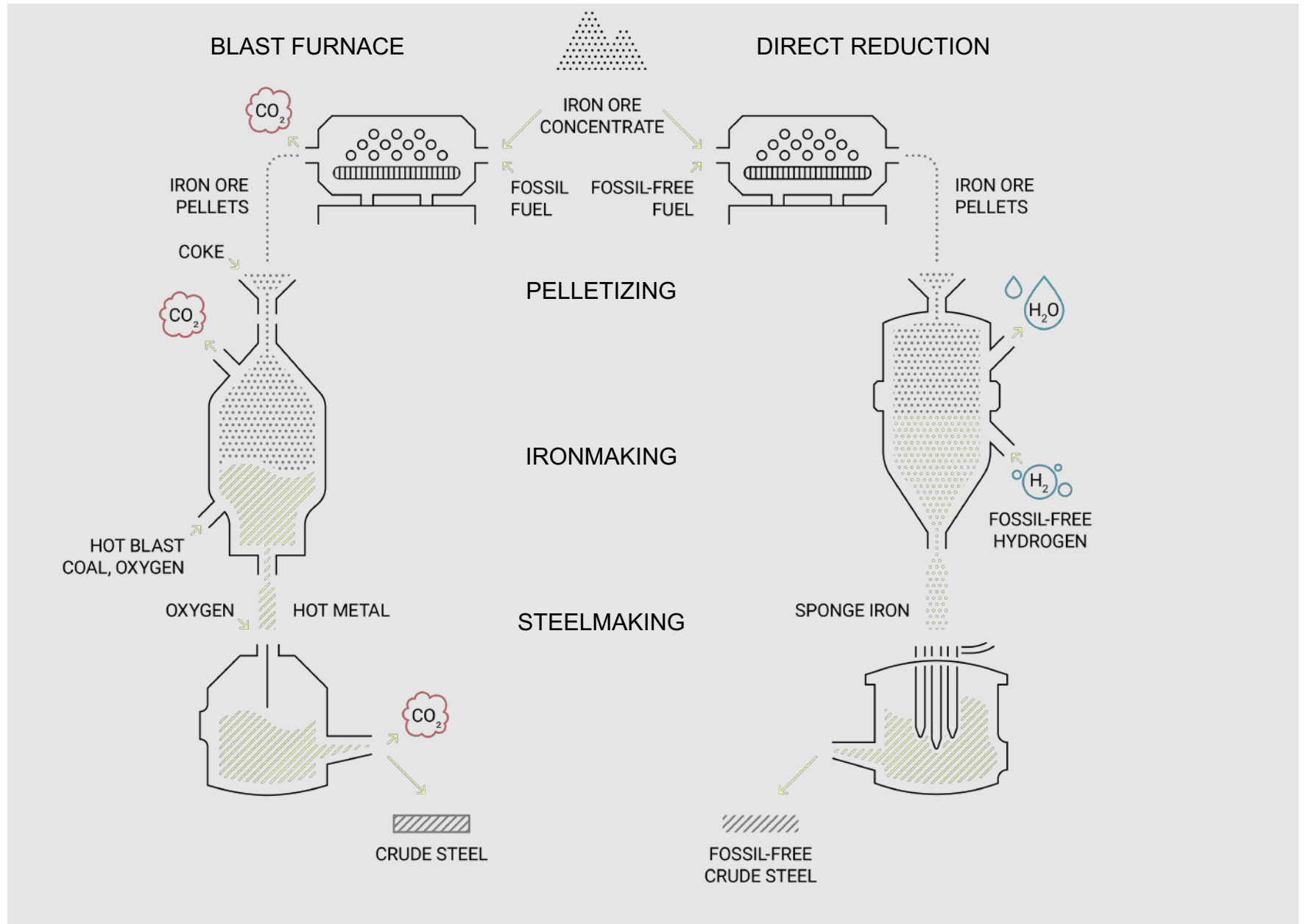
The HYBRIT technology

Two ways to make steel from iron ore today



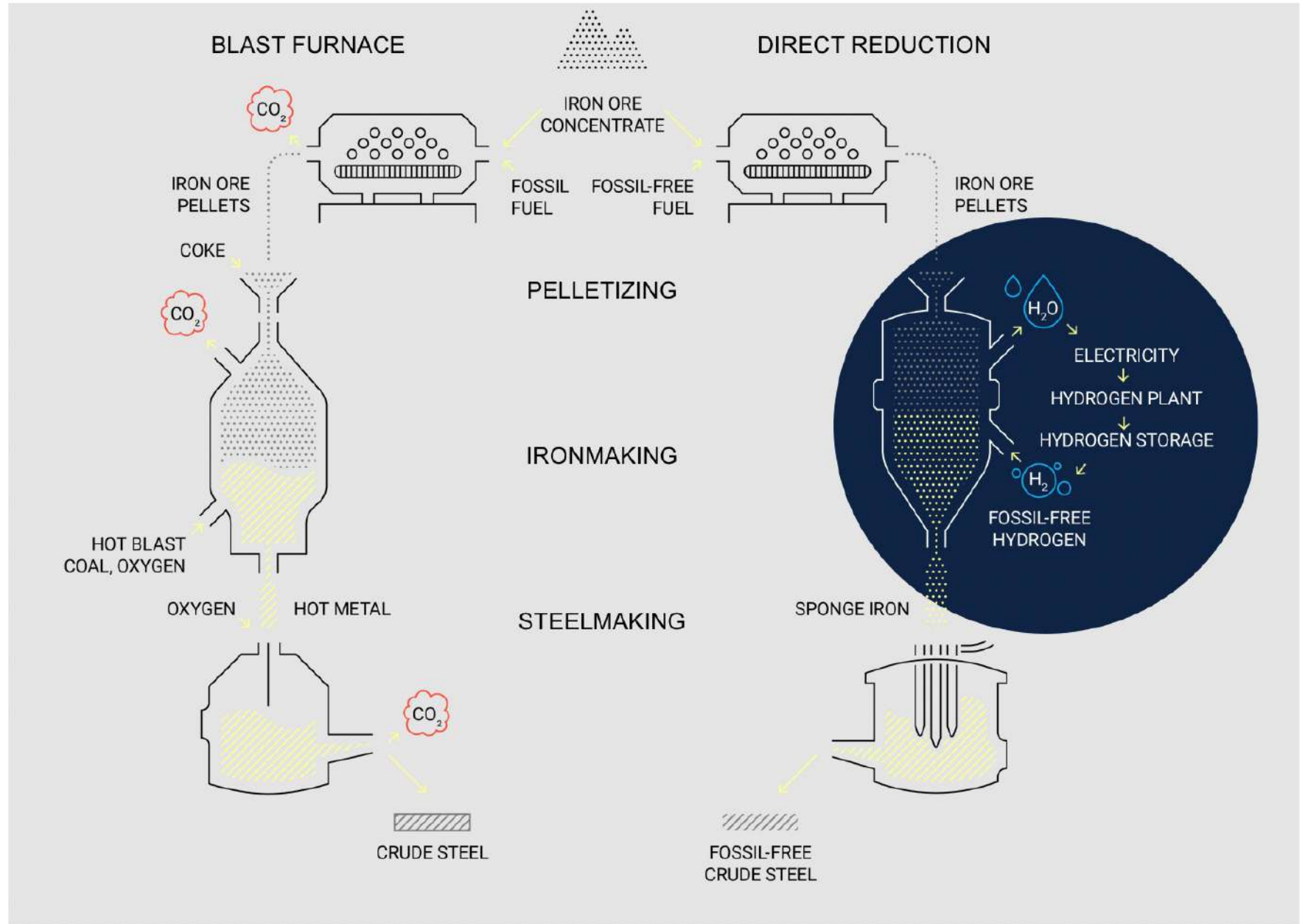
The HYBRIT technology

Two ways to make steel from iron ore today



The HYBRIT technology

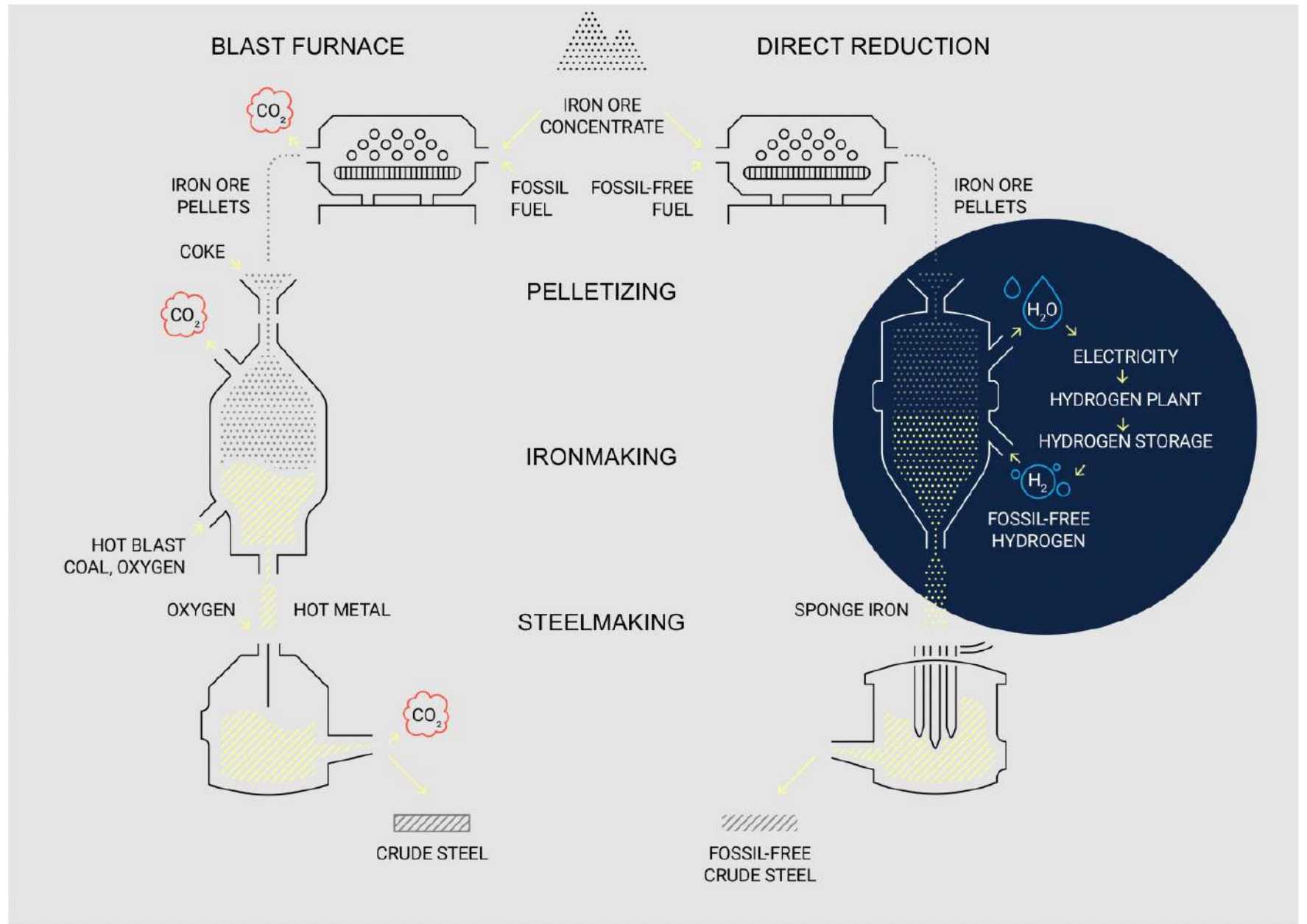
Fossil-free steel making



The HYBRIT technology

HYBRIT would eliminate ~90% of SSAB's total CO₂ emissions

- 2016-2017: Pre-feasibility study
- 2018-2024: Feasibility study & Pilot plan trials
- 2026 – Demonstration plants



Traditional versus HYBRIT technology

BLAST FURNACE

HYBRIT – Joint venture with Vattenfall and LKAB

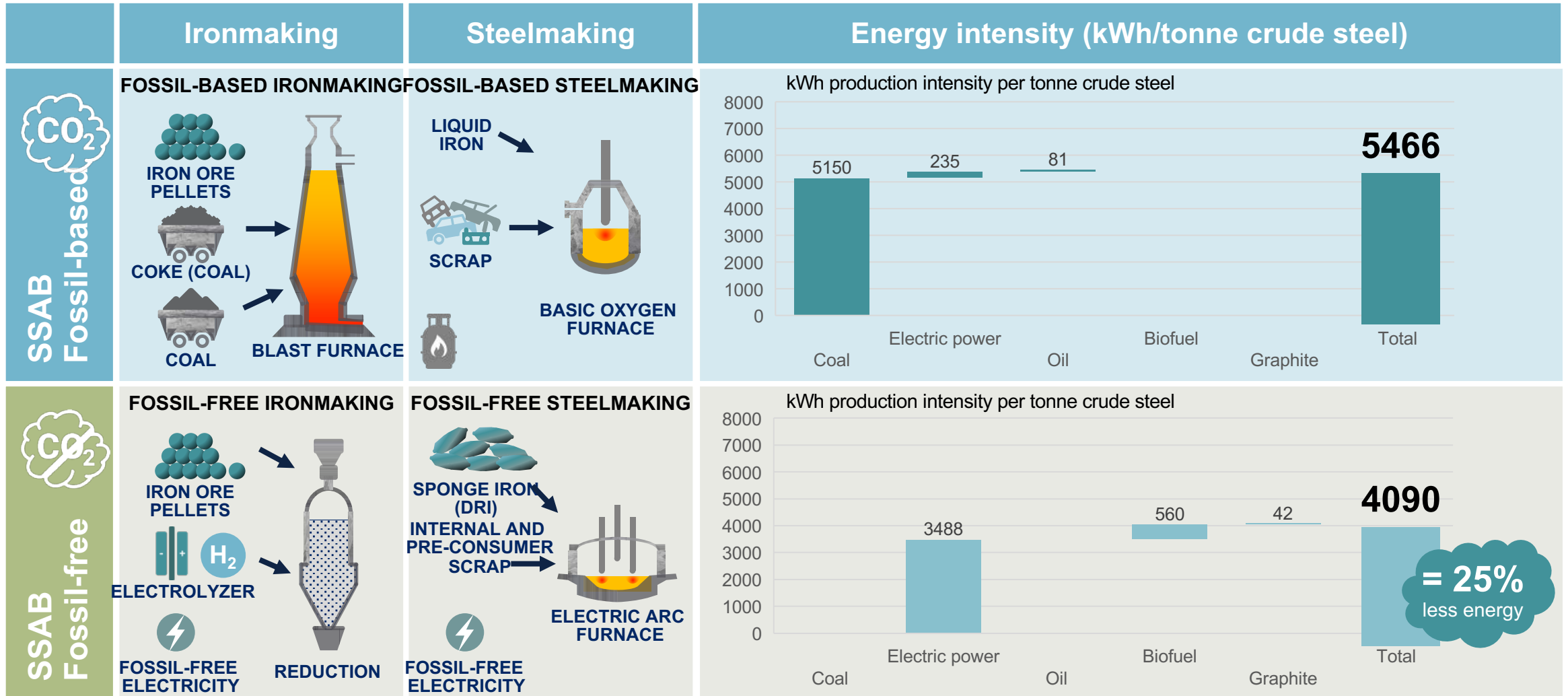
PRODUCTION INTENSITY
PER TONNE OF CRUDE STEEL

PRODUCTION INTENSITY
PER TONNE OF CRUDE STEEL

Global average	SSAB		HYBRIT	
<p>2,000 kg CO₂</p>	<p>1,600 kg CO₂</p> <p>81 kWh Oil</p> <p>5,150 kWh Coal</p> <p>235 kWh Electricity</p>		<p>25 kg CO₂</p> <p>42 kWh Graphite</p> <p>560 kWh Bio</p> <p>3,488 kWh Electricity</p>	

SSAB

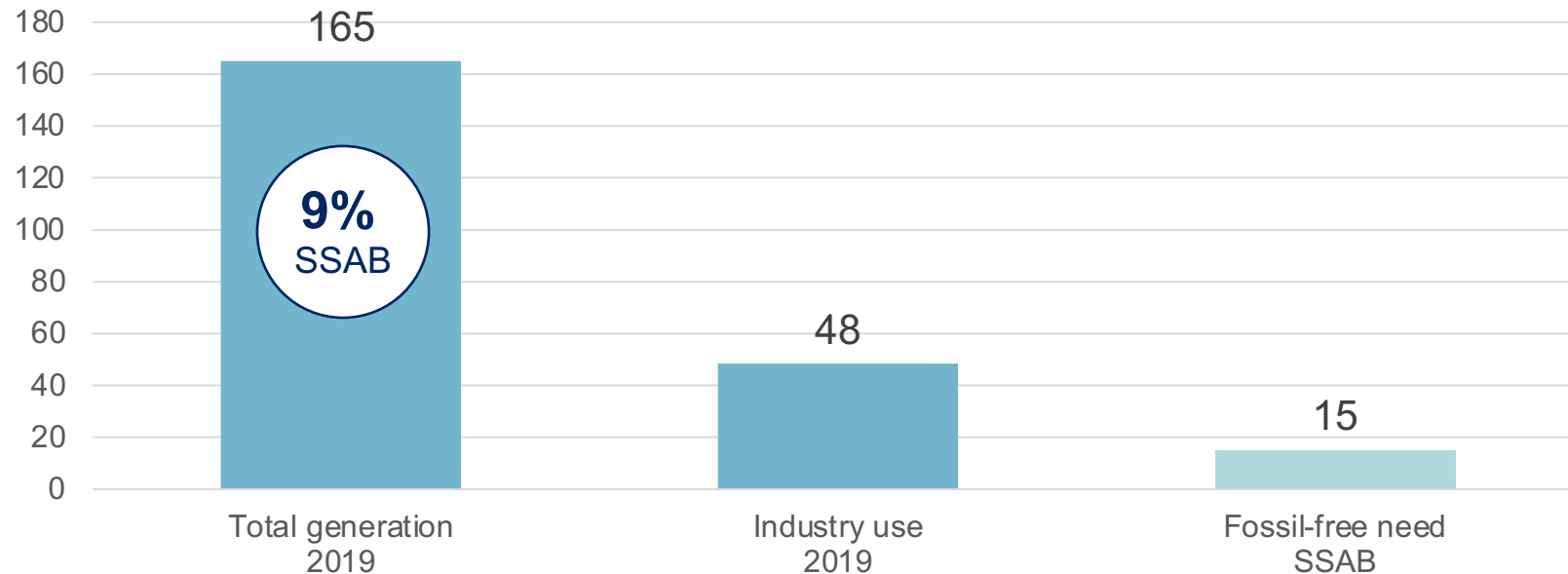
Fossil-free steel requires less energy



How much electricity is needed?

15 TWh

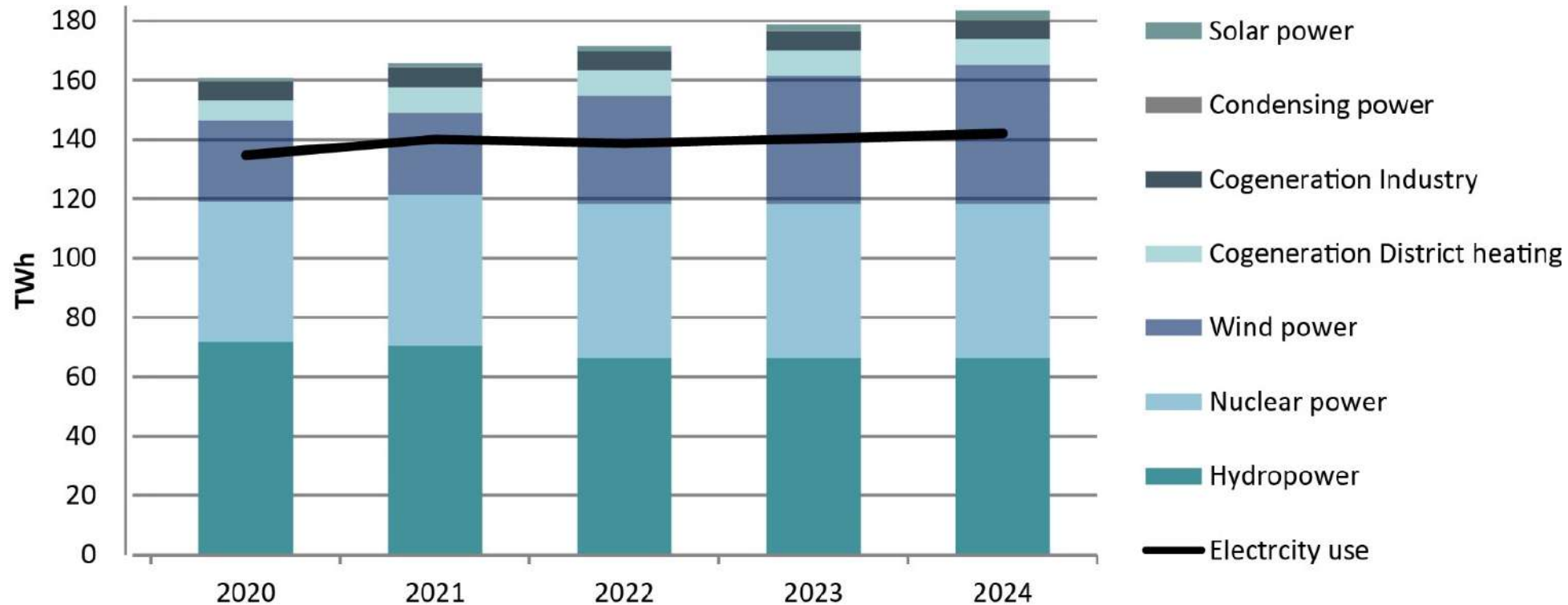
SSAB's fossil-free iron and steel production with HYBRIT® Technology will require 15 TWh electricity per year (Based on SSAB's crude steel volume in 2019). That corresponds to 9% of Sweden's electricity generation in 2019.



Electricity generation and use in Sweden (TWh)

How much electricity will be available?

The electricity production in Sweden will rise from 166 TWh (2021) to 184 TWh (2024) or +18 TWh. Wind power will grow from 27 TWh (2021) to 47 TWh (2024) or +71%.



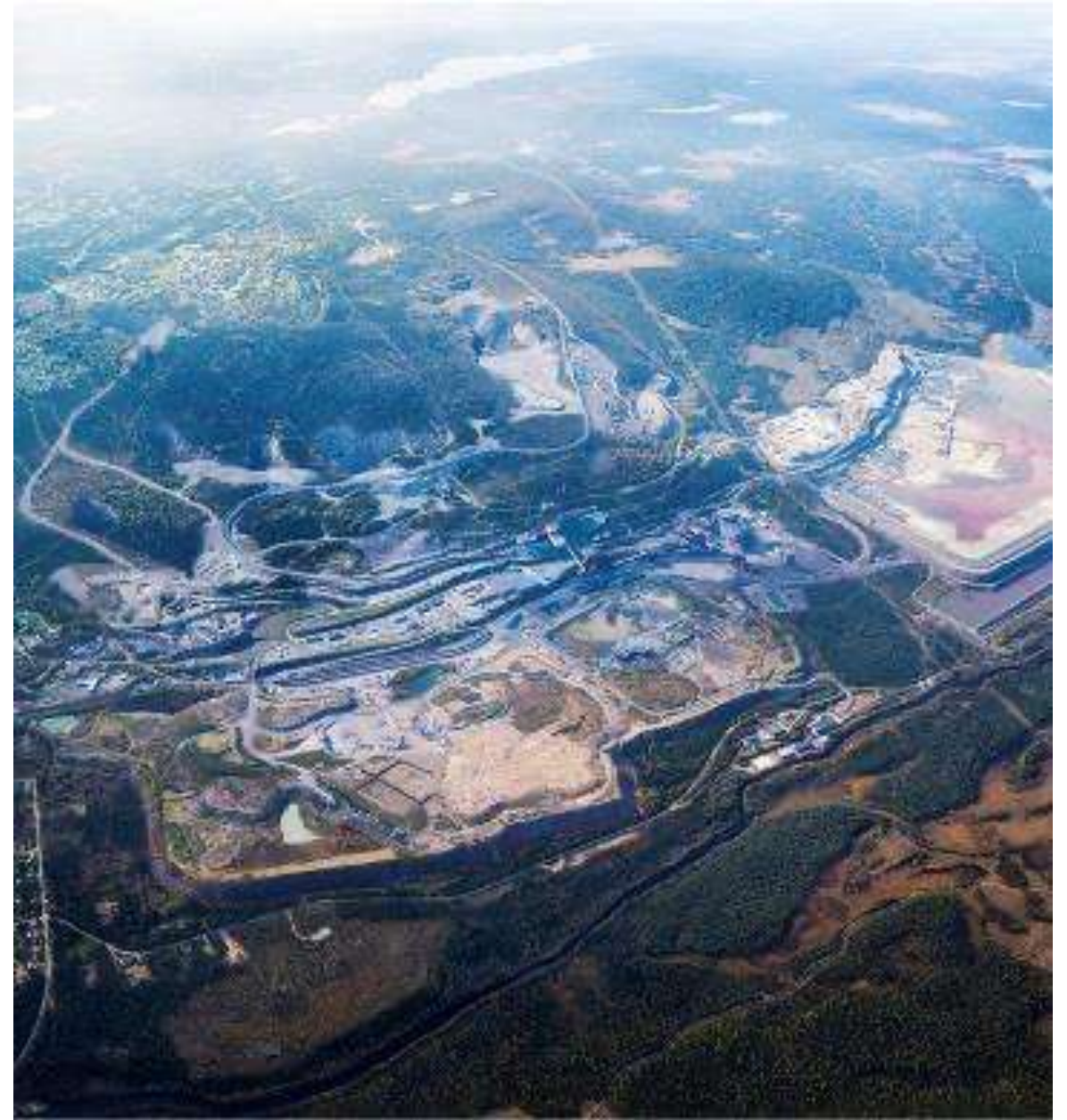
Net electricity production and use in Sweden for 2020 and prognosis for 2021-2024 (TWh)

PUBLIC

Source: Swedish Energy Agency. Kortsiktsprognos vinter 2022. ER 2022:02 (March 2022). <https://energimyndigheten.a-w2m.se/Home.mvc?ResourceId=205383>

World's first production plant for fossil-free sponge iron

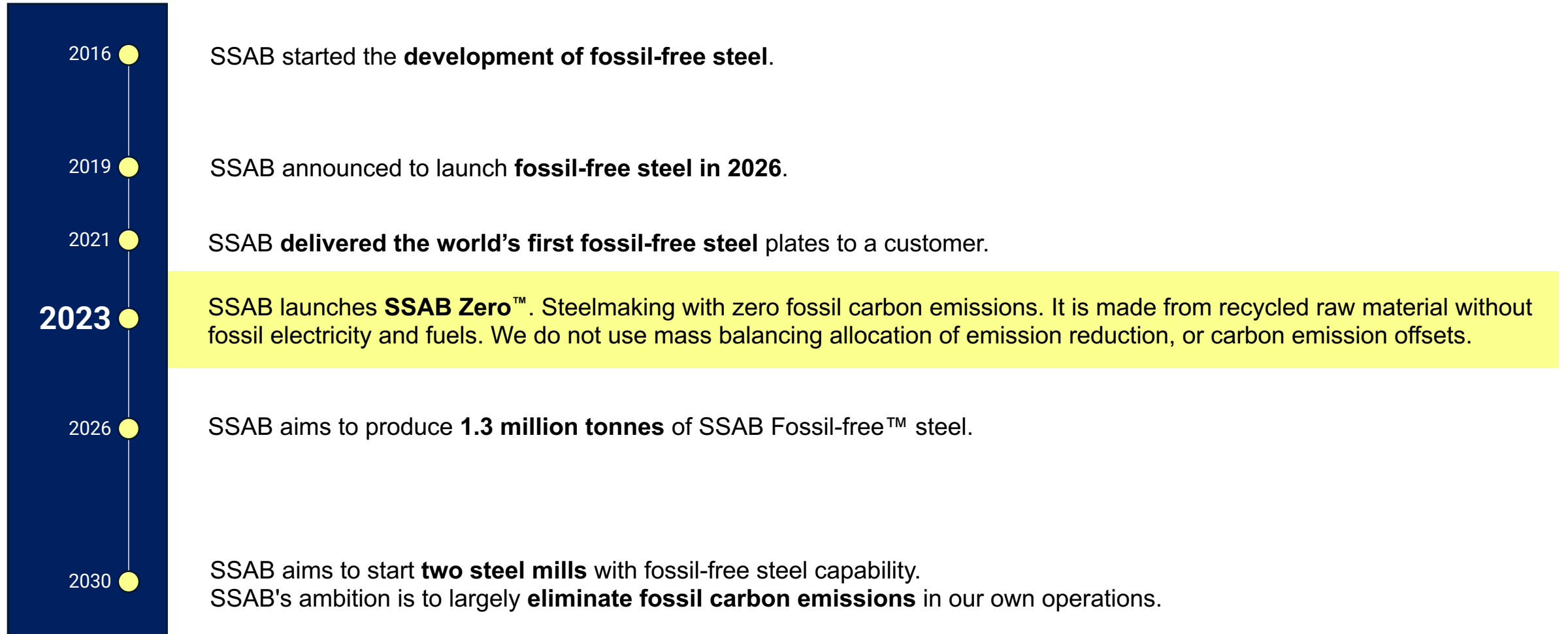
- Industrialization of HYBRIT technology
 - Gällivare, northern Sweden
- Demonstration plant will be ready in 2026
 - Capacity of 1.3 million tonnes of fossil-free sponge iron
 - Goal to expand production to 2.7 million tonnes by 2030
- Gällivare gives industrial synergies
 - Integration with iron pellet making
 - Transportation and logistics
 - Electricity supply and energy optimization



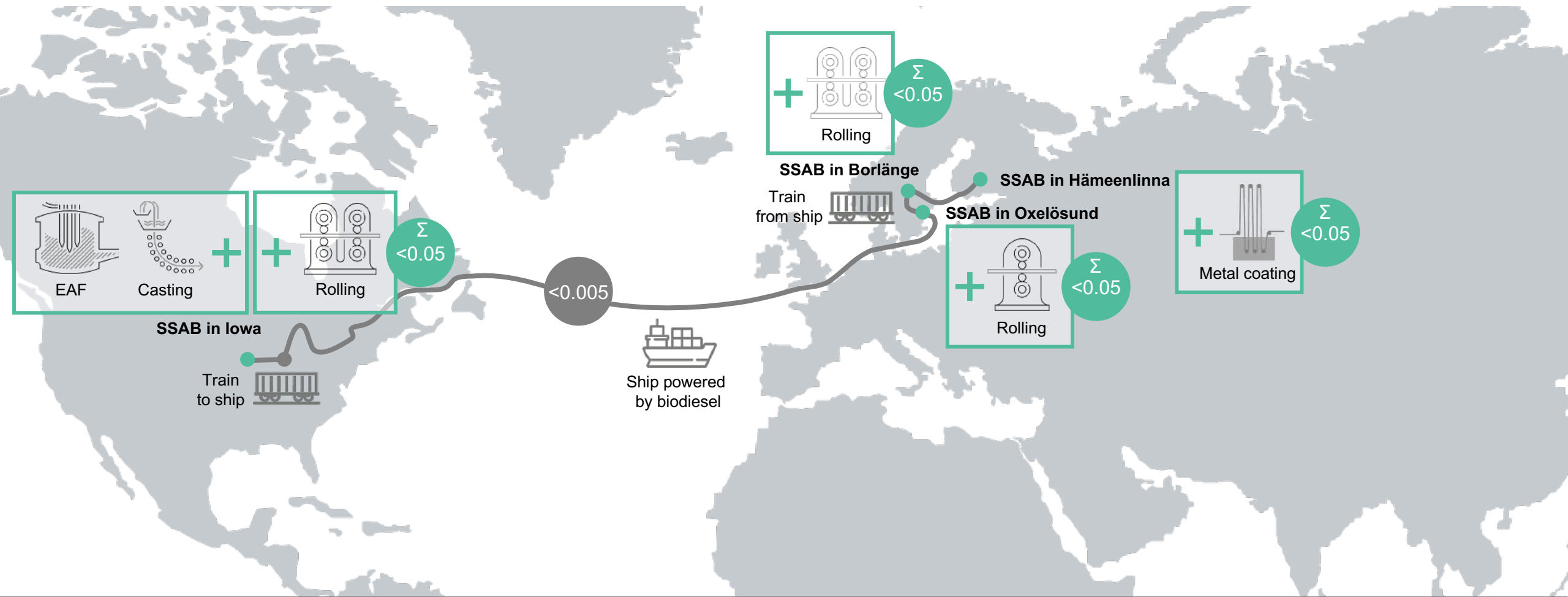
3. When to make fossil-free steel



The SSAB sustainable steel offer: Story milestones



SSAB Zero™ Production in 2023



Total accumulated product carbon dioxide emissions in Scope 1 and 2 (tonne CO₂e per tonne steel product incl. transportation, target)



Total transportation carbon dioxide emissions (tonne CO₂e per tonne steel product, target)

SSAB



- ✓ Fossil-free electricity
- ✓ Fossil-free fuels
- ✓ Fossil-free internal transports
- Fossil-free sponge iron based on the HYBRIT® technology
- ✓ Based on high-quality recycled steel



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Carbon emission in operations including purchased energy (scope 1-2 and transportation between SSAB sites):

0.0

kg CO₂e emissions per kg steel (target).

The emissions are not completely zero, but so small that we guarantee that it is less than 0.05 kg CO₂e emissions per kg steel, and thus rounded to 0.0.



Carbon emission in operations including purchased energy and iron ore (scope 1-2 and iron ore of scope 3 upstream):

0.0

kg CO₂e emissions per kg steel (target).

SSAB

True numbers

SSAB is **not** engaging in mass balancing **allocation of emission reduction**, where general carbon emission savings are allocated to achieve net zero or carbon neutral steel.

SSAB is **not** engaging in carbon **emission offsetting** activities, where investments in forest preservation are used to sell net zero or carbon neutral steel.

SSAB's Environmental Product Declarations (EPD)

- Independently verified documents
 - Transparent and comparable information about the life-cycle environmental impact
 - Using LCA methodology
- All product groups
 - Hot rolled steel plates
 - Hot rolled steel sheets and coils
 - Cold rolled steel sheets and coils
 - Metal coated steel sheets and coils
 - Color coated steel sheets and coils
 - Tubular products

- Registered in the International EPD® System
 - www.environdec.com and www.ssab.com
 - Ruukki Construction EPDs are also available for Roofing and Components in the Finnish RTS EPD



Keeping today's performance – fossil-free

- The mechanical properties of steel are created in the downstream processes and will be the same as they are today.
- The only difference is using fossil-free fuels and electricity.



Construction Industry Partners

Aiming for more sustainable building solutions together



Ruukki Construction

“The use of fossil-free steel is an important step for Ruukki in reaching our sustainability promise “Towards carbon-neutral buildings”. We are committed to developing our offering to help our customers to reduce carbon emissions.”
Sami Eronen, President at Ruukki Construction

“We will look for customers to partner with to create a fossil-free value chain until the end of the lifecycle of a building.”



Peab

“Peab has ambitious climate and environmental targets, and this is an important step for us to reach climate neutrality by 2045. Access to fossil-free steel will further increase our opportunities.”
Jesper Göransson, President and CEO at Peab.

“We already have several initiatives in place to reduce our climate impact – from our business model with locally produced community building to our growing family of ECO products. Access to fossil free steel will further increase our opportunities.”



Every steel supplier aims to develop green steel



A woman with long brown hair is shown in profile, looking out over a vast, blue ocean under a clear sky. The image is split diagonally, with the woman's face on the left and the ocean on the right. A white, rounded shape overlaps the woman's face and the ocean, containing the text 'Thank you'.

Thank you

A stronger,
lighter and more
sustainable world

SSAB