



The fossil-free journey from a technical perspective

Joachim Larsson

Chief Technology Officer – Europe Division



Fossil-free steel



► Why?

► Who?

► What?

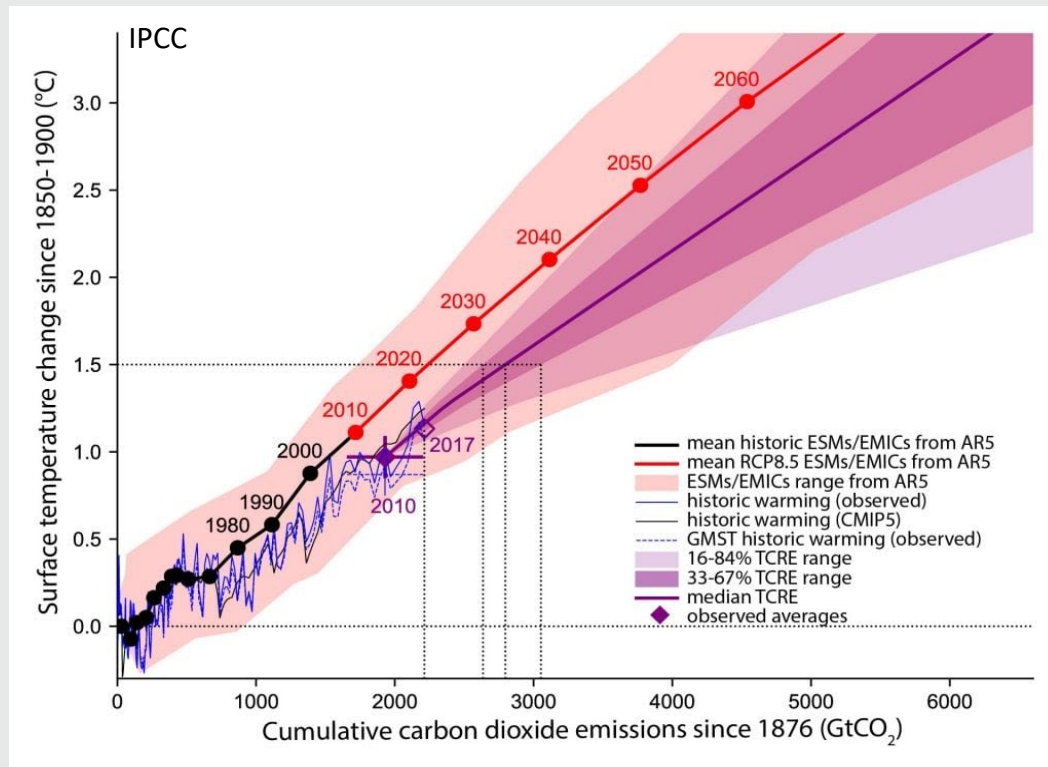
► How?

► Where?

► When?

Earth warming pace is unsustainable!

Cumulative CO2 emissions since 1876 vs. Earth temperature change, GtCO2 and Celsius



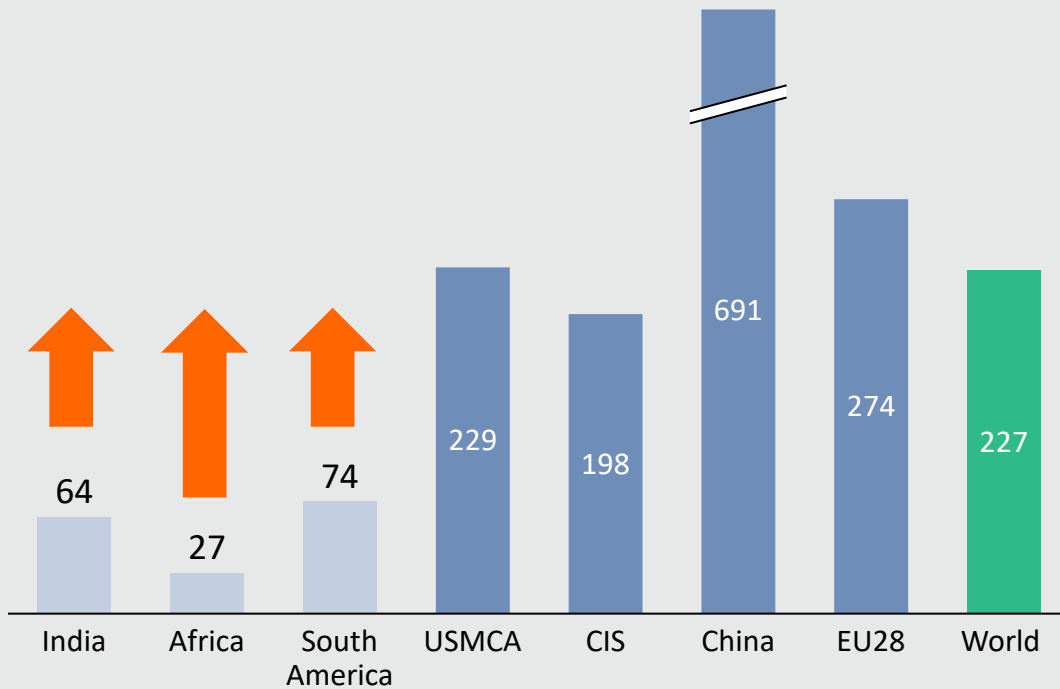
Source: IPCC



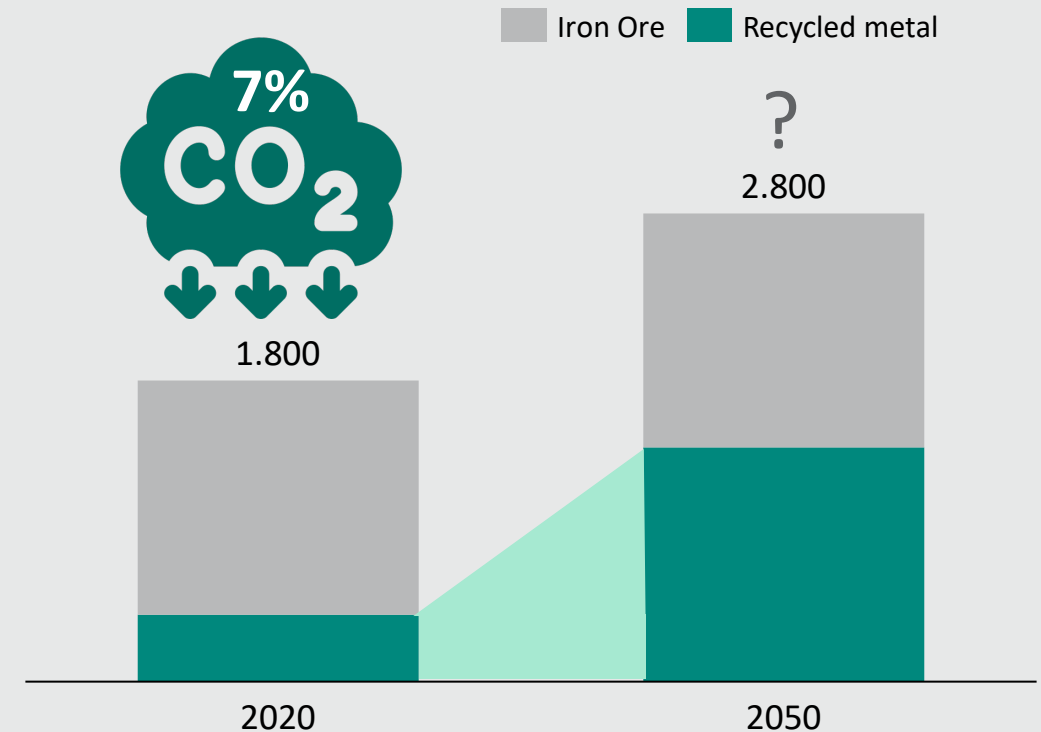


Today, 7% of Global CO2 emissions come from steel

2020: Apparent steel consumption per capita, kg/capita



Global steel demand and CO2 contribution, mt & % share



SSAB is taking the lead!

From steel product ...



... to customers product



What is the offer?



- ✓ 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



- ✓ 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

What is the offer?

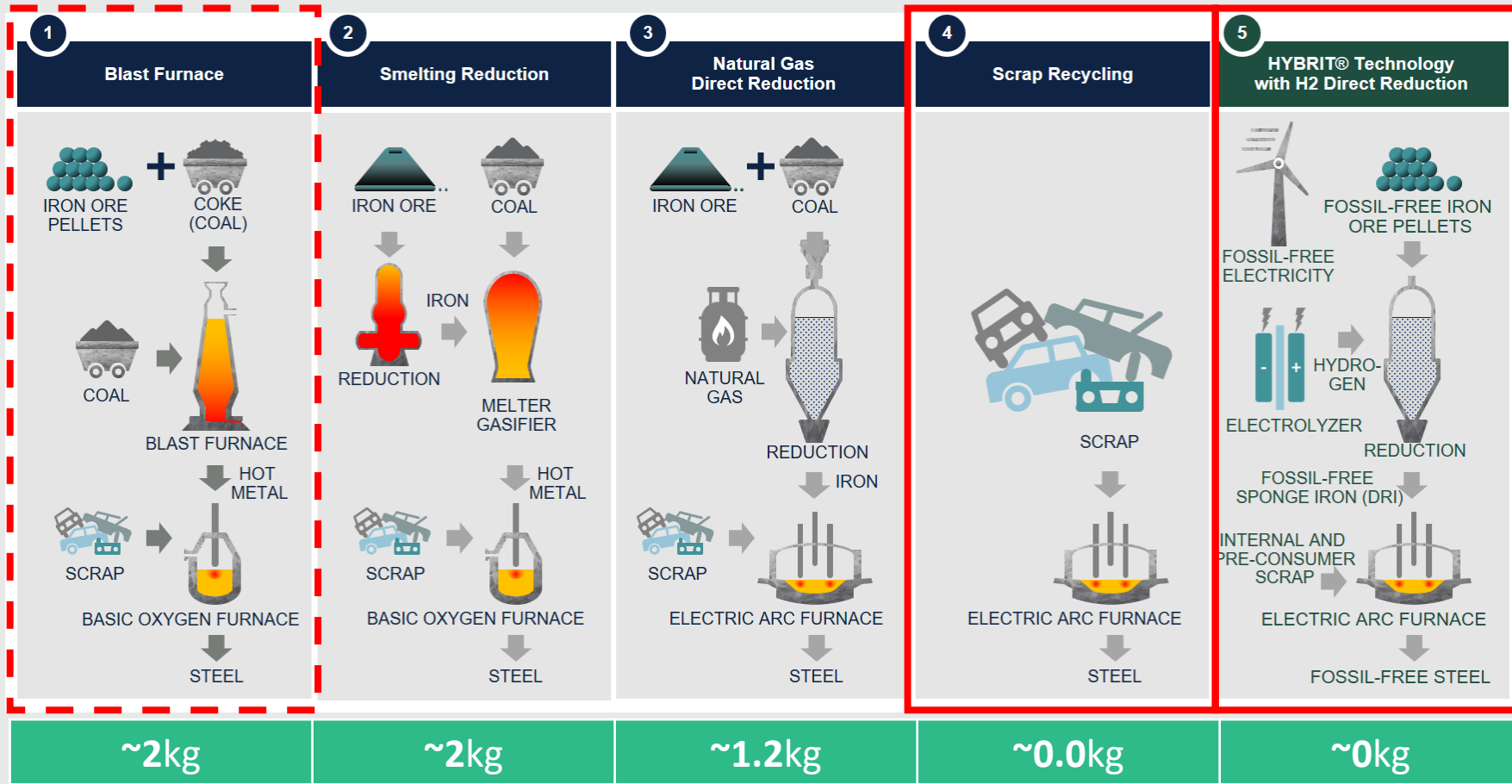


Carbon emission in operations
including purchased energy (Scope 1-2):
0.0 kg CO₂e emissions per kg steel (target).

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 raw material
(Scope 1-3 Upstream): 0.3 kg CO₂e emissions per kg steel (target).

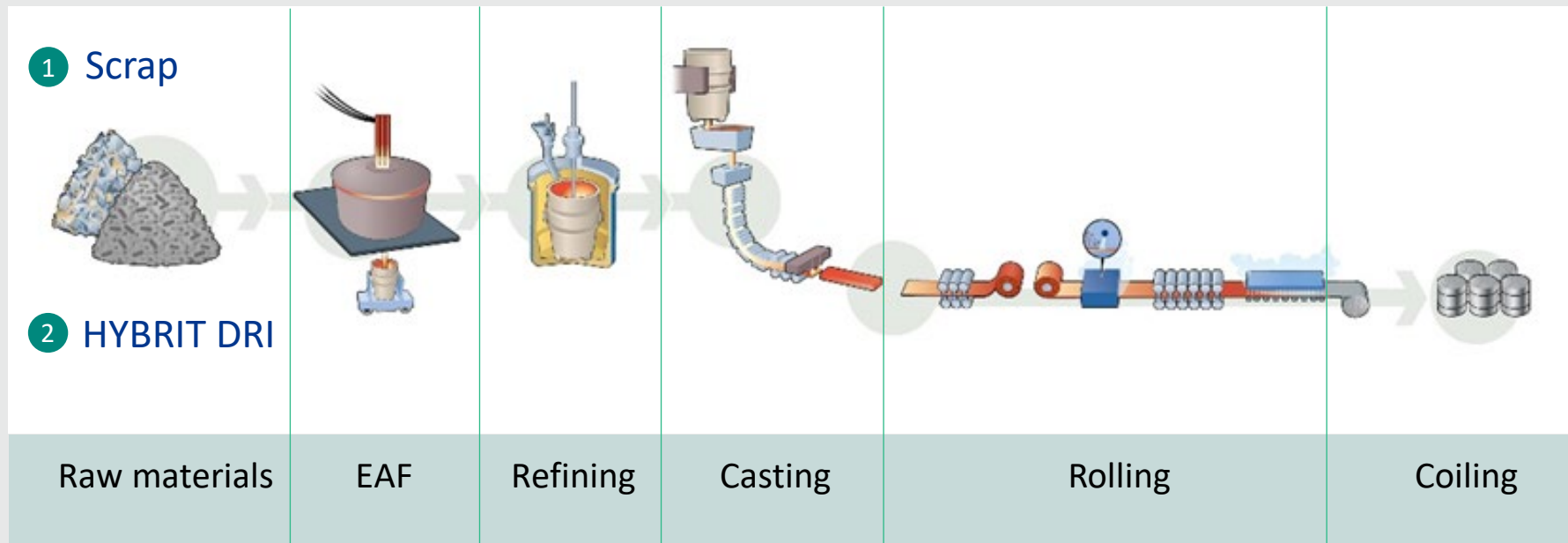
How is the steel produced?



Kg emissions
per 1kg of
steel
(Scope 1 and 2)

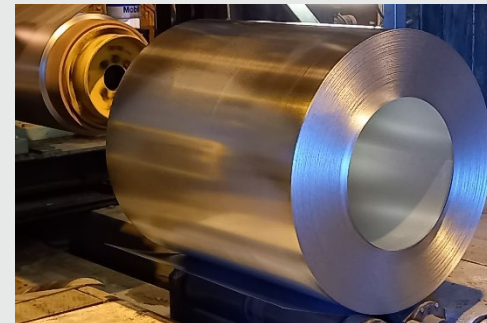
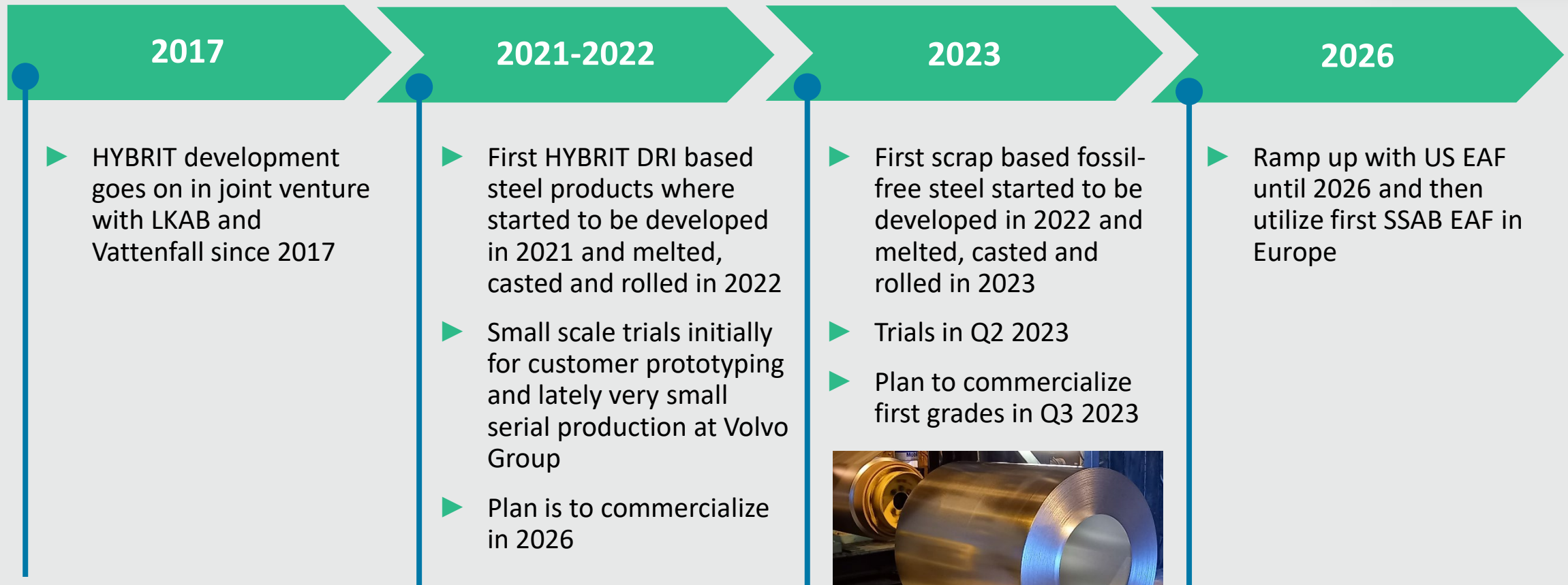
”Mini-mill”: What is the production process?

Illustration of the future production process from the mini-mills



Fossil Free energy throughout the production process + Biofuel + Biogas

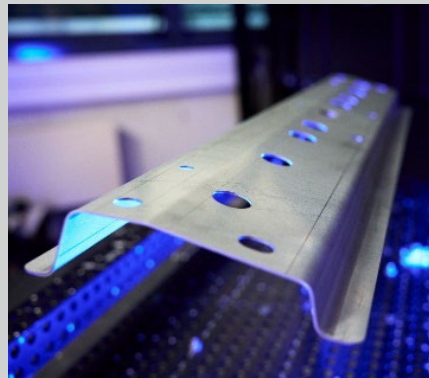
How do we develop fossil-free steel grades?



Early use of fossil-free steel



Mercedes-Benz



Seat cross-member for EV

- Fossil-free partnership
- Proof of concept in Docol CR 1500M-EG Fossil-free
- Same properties as serial material

FORVIA



Front seat side member

- Fossil-free partnership
- Proof of concept in Docol CR 1000CP-UC Fossil-free
- Same properties as serial material



Heavy truck frame rails

- Fossil-free partnership
- Docol HR 600MC fossil-free
- Same properties as in serial material



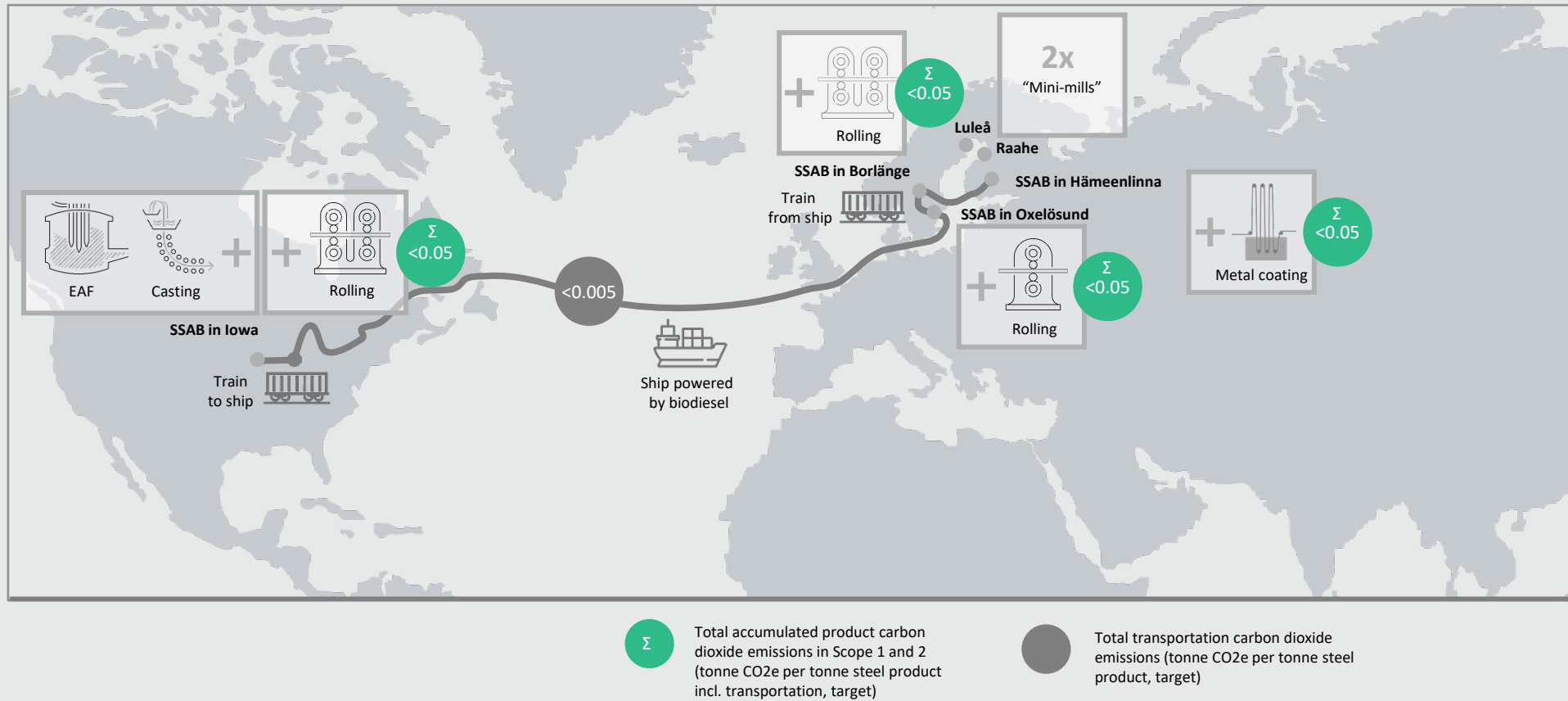
Polestar



“Project 0”

- Fossil-free partnership
- Joint cooperation in development of climate neutral vehicle by 2030

Where?



When?



- **2017** HYBRIT, Hydrogen Breakthrough Ironmaking Technology
- **2023** SSAB Zero™, first commercial zero emission steel grades
- ~**2026** EAF in Oxelösund, ramp-up fossil-free steel production in Europe
- ~**2030** New Nordic Strip Mill system (“mini-mills”)

SSAB has since long been focusing on upgrading customer applications by High-Strength Steels and continues improvements of our production processes

Key takeaways



- The SSAB fossil-free transformation is already ongoing
- We are confident with the chosen technology
- Environmental permissions and allocation of electricity supply set the pace at the moment