

Implementation of electrolysis for steel heating with large societal benefits

Presentation 2021-11-17, Göran Nyström

OVAKO

OVAKO: A world leader in steel circularity and carbon-neutrality



High-performing clean steels that enable large energy and CO₂ savings



100% carbon-neutral production and products with leading carbon footprint

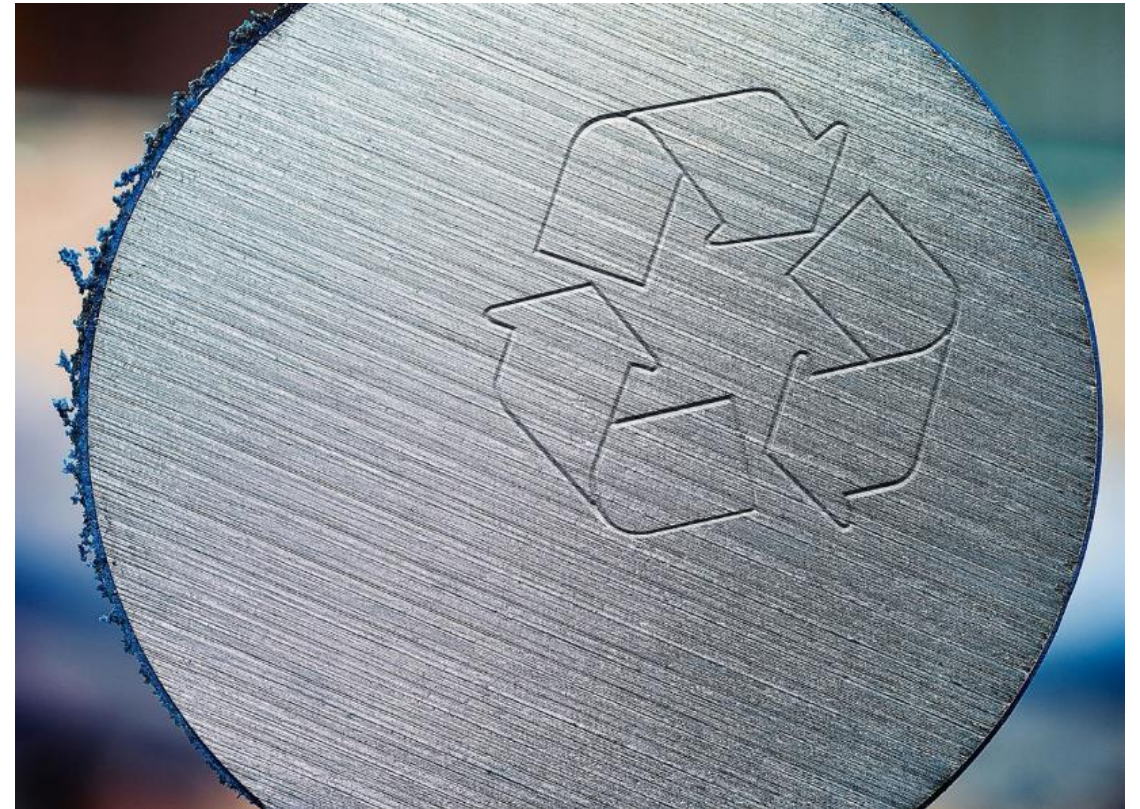
New from 2022



Products that are 97% scrap-based



Leadership in projects to further improve sustainability position



Steel company analysis Sept/Nov 2021

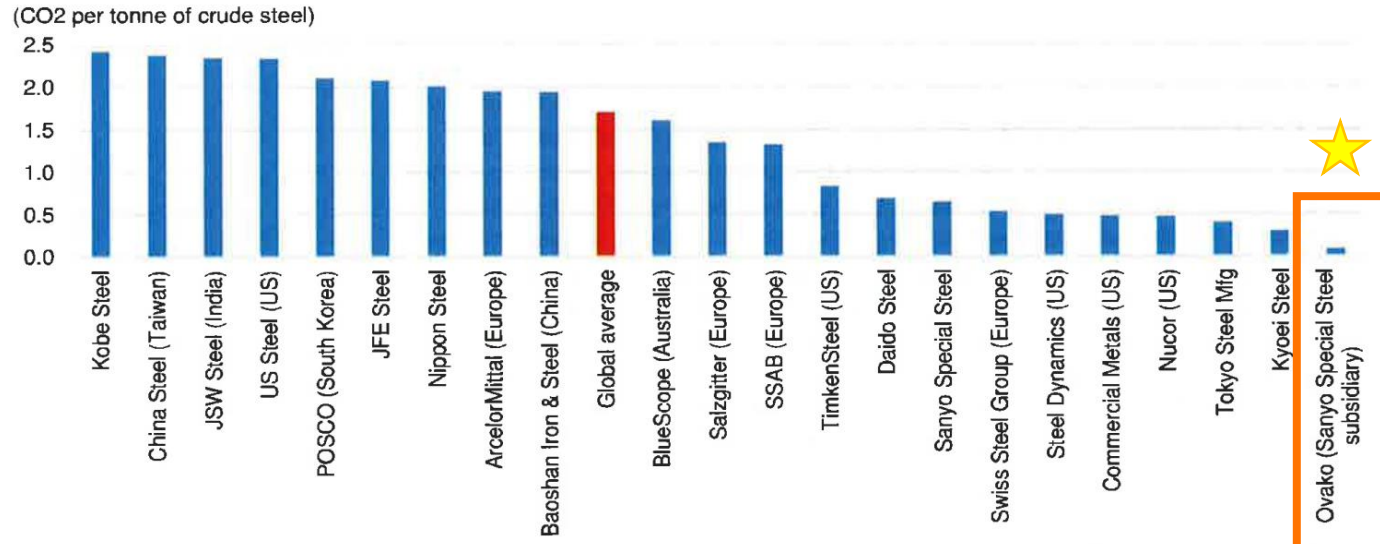
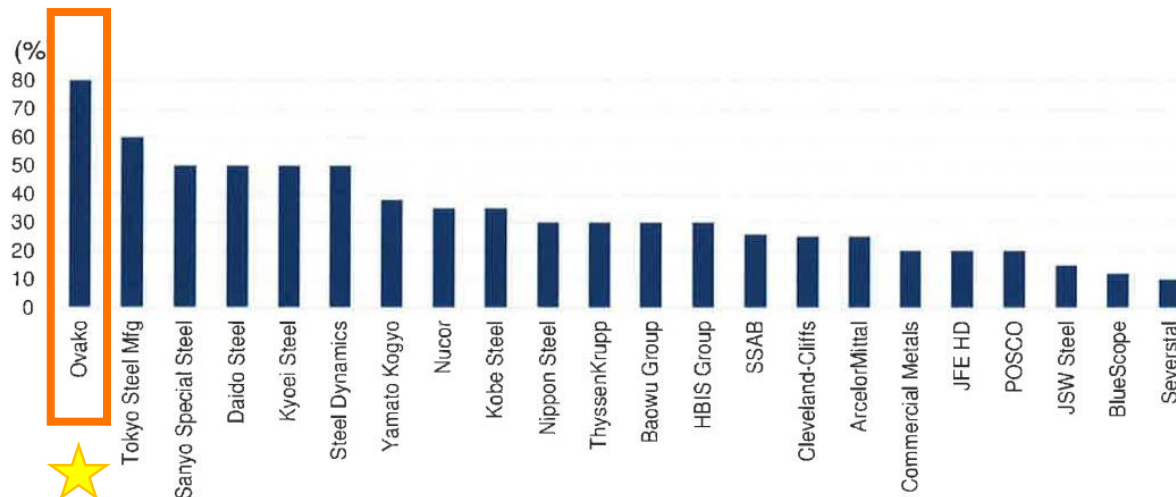


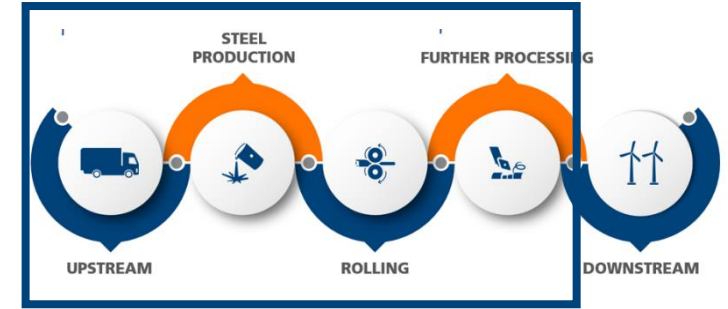
Fig. 3: CO2 emission reduction targets at major global steelmakers (through to around 2030)



Target for achieving carbon neutrality	
2050	2050
2050	2045
2050	2050
2050	2050
2050	2050
2050	NA
2050	NA
2050	NA
2050	NA
2050	NA
2050	NA
2050	NA
2050	2050
2050	2050
2050	2050
2050	2050
2050	2050
2050	2050
2022	NA
NA	2050
NA	NA
2050	2050
2050	2050



CO2 intensity: “Cradle-to-gate” - what the world should talk about



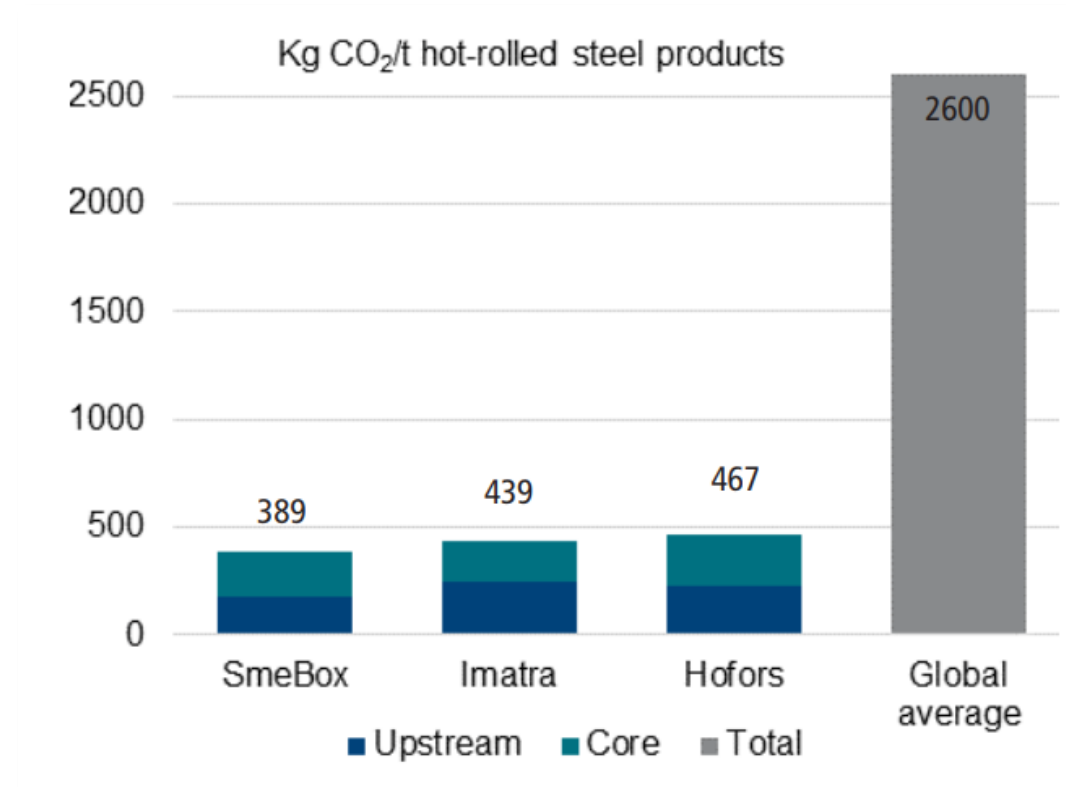
What is the scope for cradle-to-gate?

Answer: Scope 1+2 (Core), all production steps of Ovako for the product in question, adding also Scope 3 Upstream.

Scope 3 covers upstream emissions inherent in the product from e.g. alloys, scrap, lime.

For a product to be carbon neutral, upstream sources must also be included, and we have not yet taken that step, although we work very actively with our supplier base to find best sources for all incoming material.

With our Carbon Footprint Calculator we can give specific values for all products and alloys



Buying Ovako products saves 2 tonne of CO₂ per tonne of hot rolled bar compared to steel average

Volvo Cars press release 2021-11-10

Press Releases

Volvo Cars signs zero emission road transport declaration at COP26, reveals groundbreaking internal carbon pricing mechanism



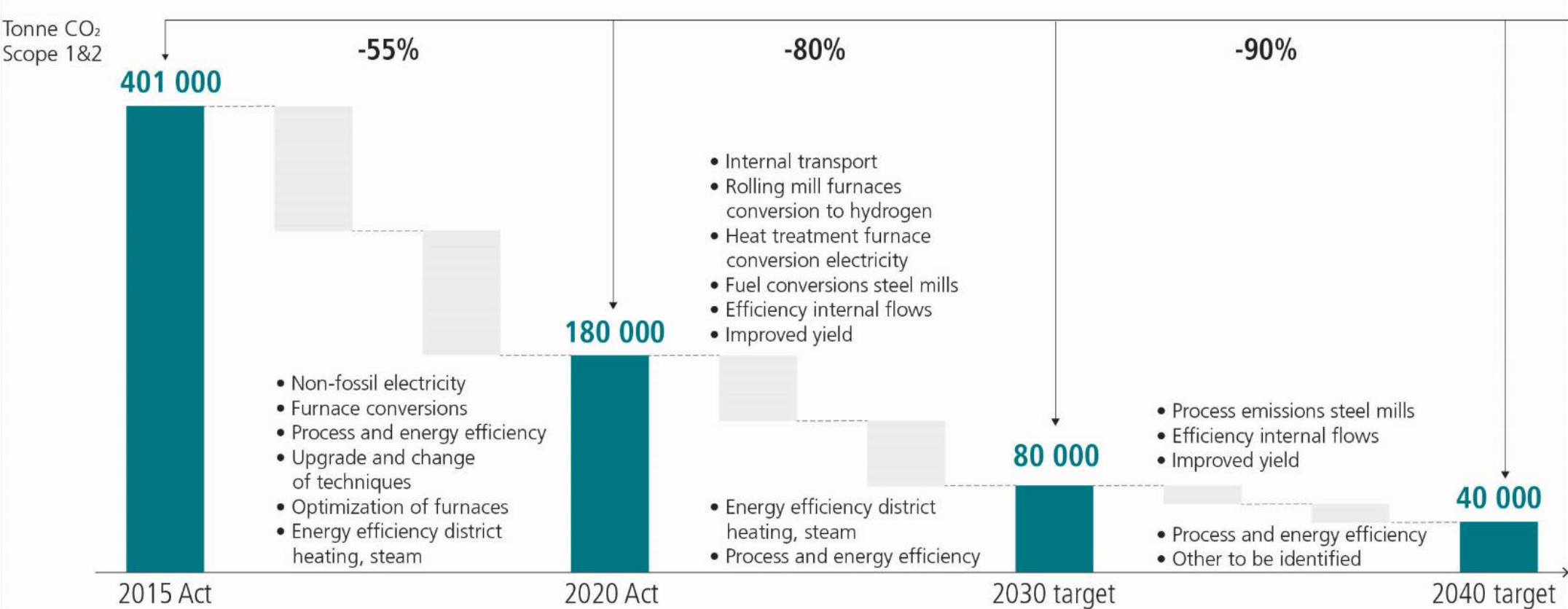
Nov 10, 2021 | ID: 290035

Volvo Cars chief executive Håkan Samuelsson will today join industry and government leaders to sign the Glasgow Declaration on Zero Emission Cars and Vans at the UN climate change conference COP26.

Simultaneously, to further accelerate its carbon footprint reduction, Volvo Cars today also announces the introduction of an internal carbon price of 1,000 SEK for every tonne of carbon emissions from across its entire business, in line with its ambition to become a climate neutral company by 2040.

On our way to Zero Carbon Emissions

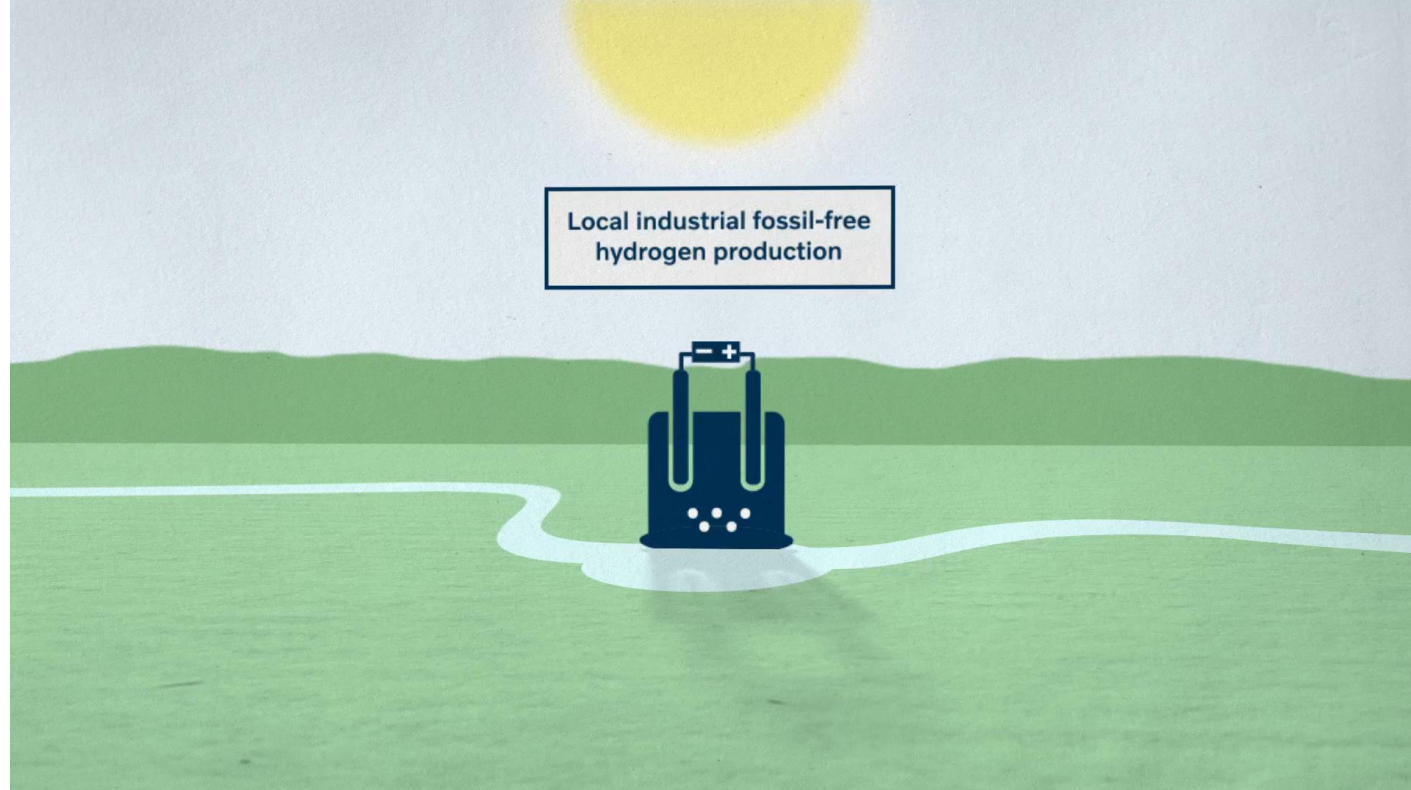
Scope 1&2, tonnes CO₂e, all production, fixed volume (2020)



Taking actions, setting priorities

Tonnes of CO2 eliminated per calendar time
Tonnes of CO2 eliminated per monetary unit
Tonnes of CO2 eliminated per kWh

2021-2022: First implementation of H2 for steel heating



[OVAKO.COM/H2](https://ovako.com/h2)

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HITACHI
Inspire the Next

H2green steel

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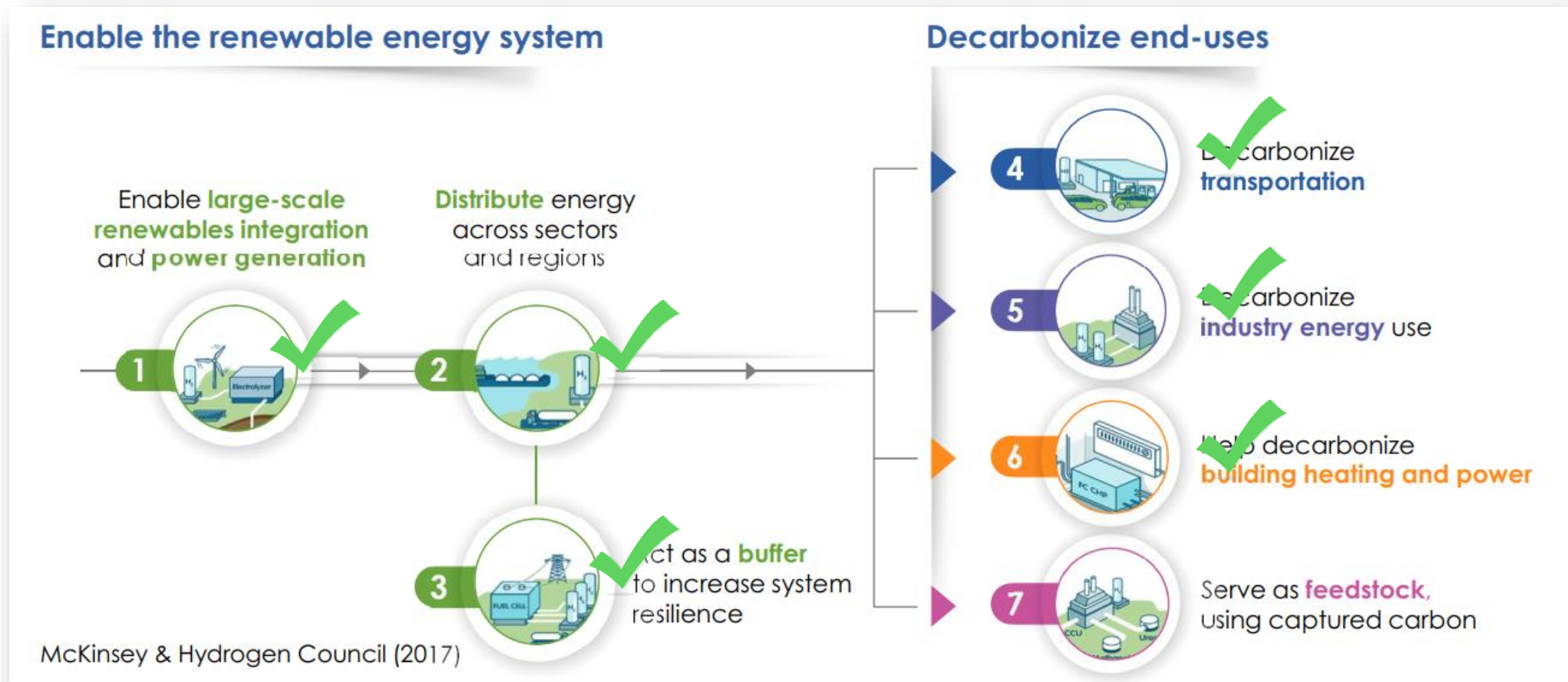


MED FINANSIELLT STÖD FRÅN  Energimyndigheten

June 2021: First full-scale hydrogen project launched

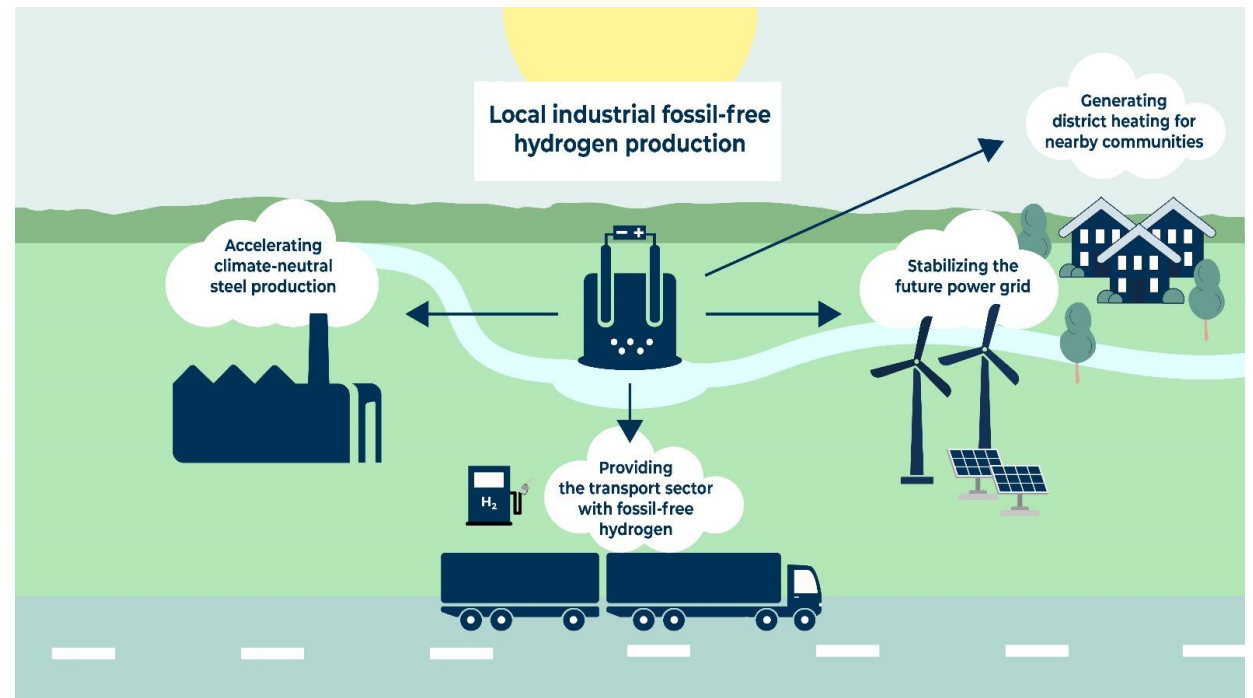
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Addressing most key areas in a “hydrogen economy” – Ovako is not simply an “off-taker”



A concept – not just a project

- Highly energy-efficient
- Highly CO₂-removal-efficient
- Scalable to many locations
- Strong opportunities for industrial synergy and “hydrogen valleys”
- Strong opportunities for power grid balancing
- First part already financed
 - Will be up and running 2022/2023
 - 20 MW electrolyzer covers 25% of potential development at one site only, out of which half of hydrogen could be available for third parties



- Key levers which enable the concept:
 - Potential large consumption of both H₂ and O₂, such as in heating furnaces
 - Large consumption of O₂ for other purposes
 - Full redundancy in existing LPG/LNG energy supply means true energy flexibility
- No storage or transport needed
- Highly efficient concept

