

Australia's Hydrogen Ramp-Up

Germany Trade & Invest H₂-Update

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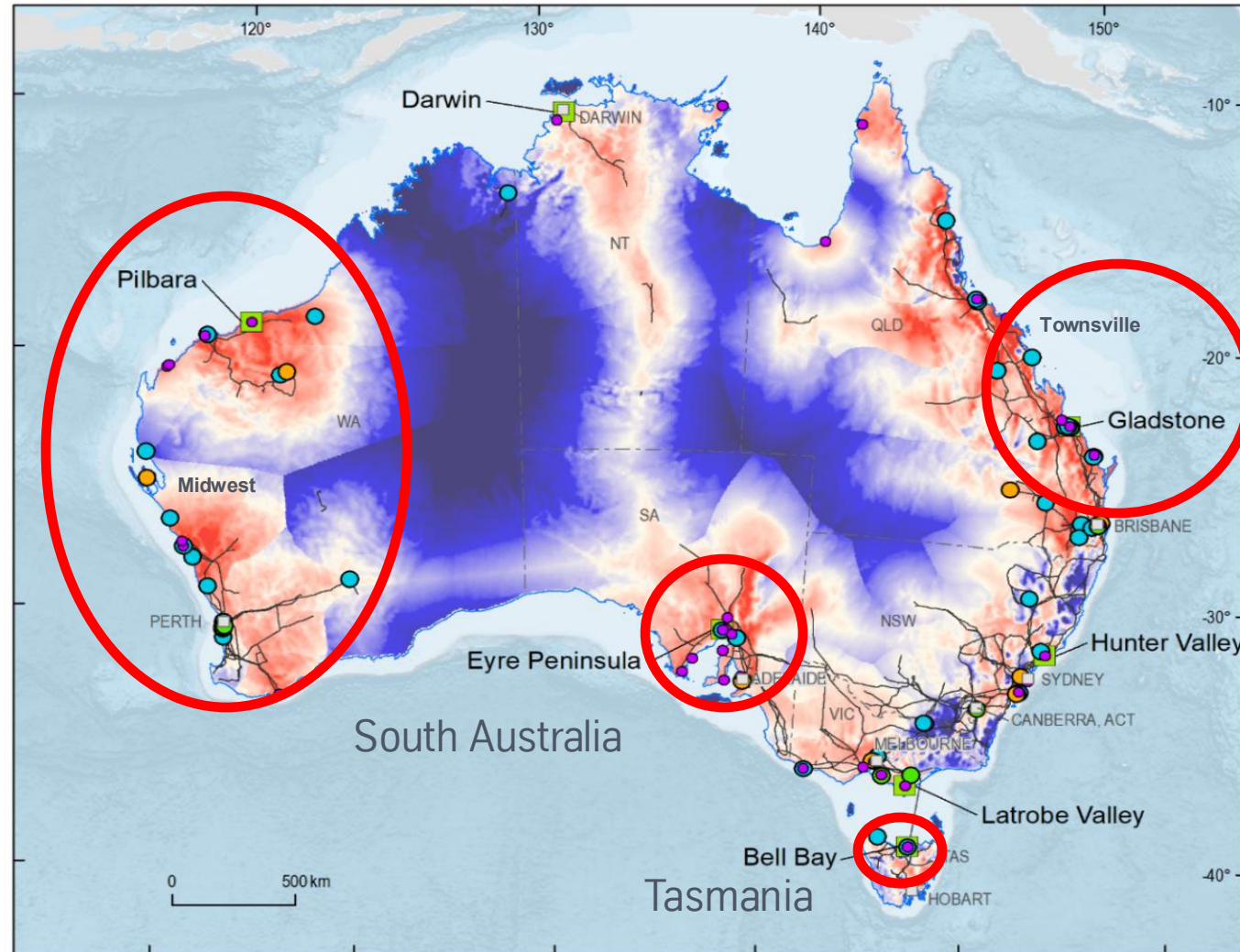
Why is Australia a continent?



High H₂ production suitability from hybrid wind/solar

Australian economy
focussed on export of
minerals and fuels

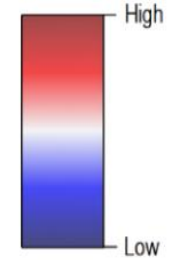
Western Australia
Iron ore
Lithium
Natural Gas (LNG)
Gold
Grain



Source: compiled by Geoscience Australia, October 2021. Pipeline routes are sourced from the GPInfo petroleum database. Please note this scenario may not reflect future market and technology developments.

MEGIS 21014-19

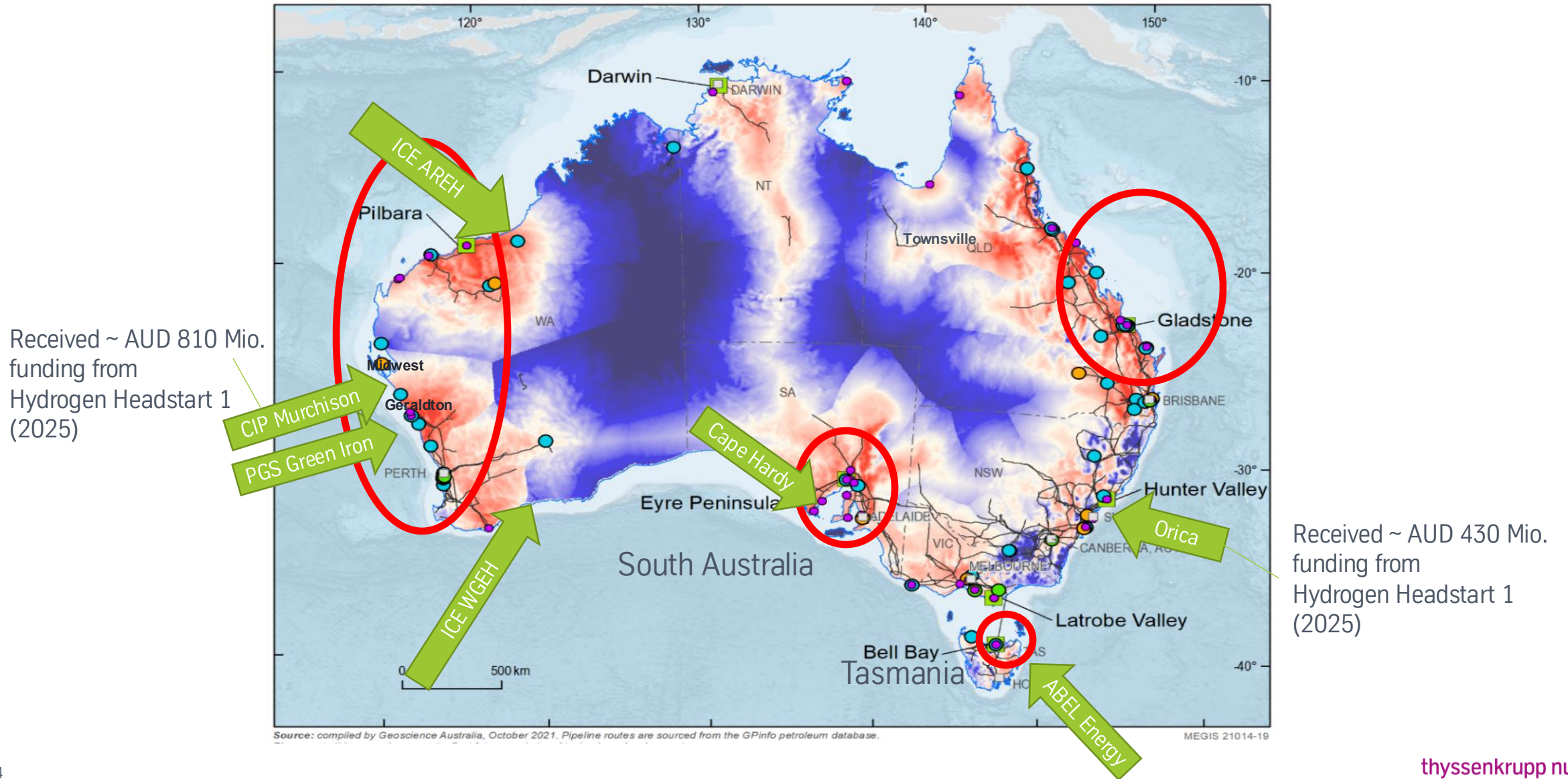
Hybrid wind and solar hydrogen
production suitability



Queensland
Metallurgical Coal

Selected relevant gH2 projects in Australia

Multi 100 MW and GW scale projects in feasibility stage: green ammonia, methanol, iron



Renewable hydrogen: Lessons learned and the importance of industry support

ARENA: 17 October 2025



Australian Government
Australian Renewable
Energy Agency

ARENA

ARENA has sharpened its **focus to sectors where hydrogen ... can make the most impact:** green ammonia, iron and steel, alumina, and long-distance heavy transport like shipping and aviation.

... getting renewable hydrogen to commercial scale will take time, innovation, and ongoing support. Bridging the commercial gap and supporting first-movers... is core to ARENA's mandate. ... This includes the Hydrogen Production Tax Incentive (2 AUD/kg).

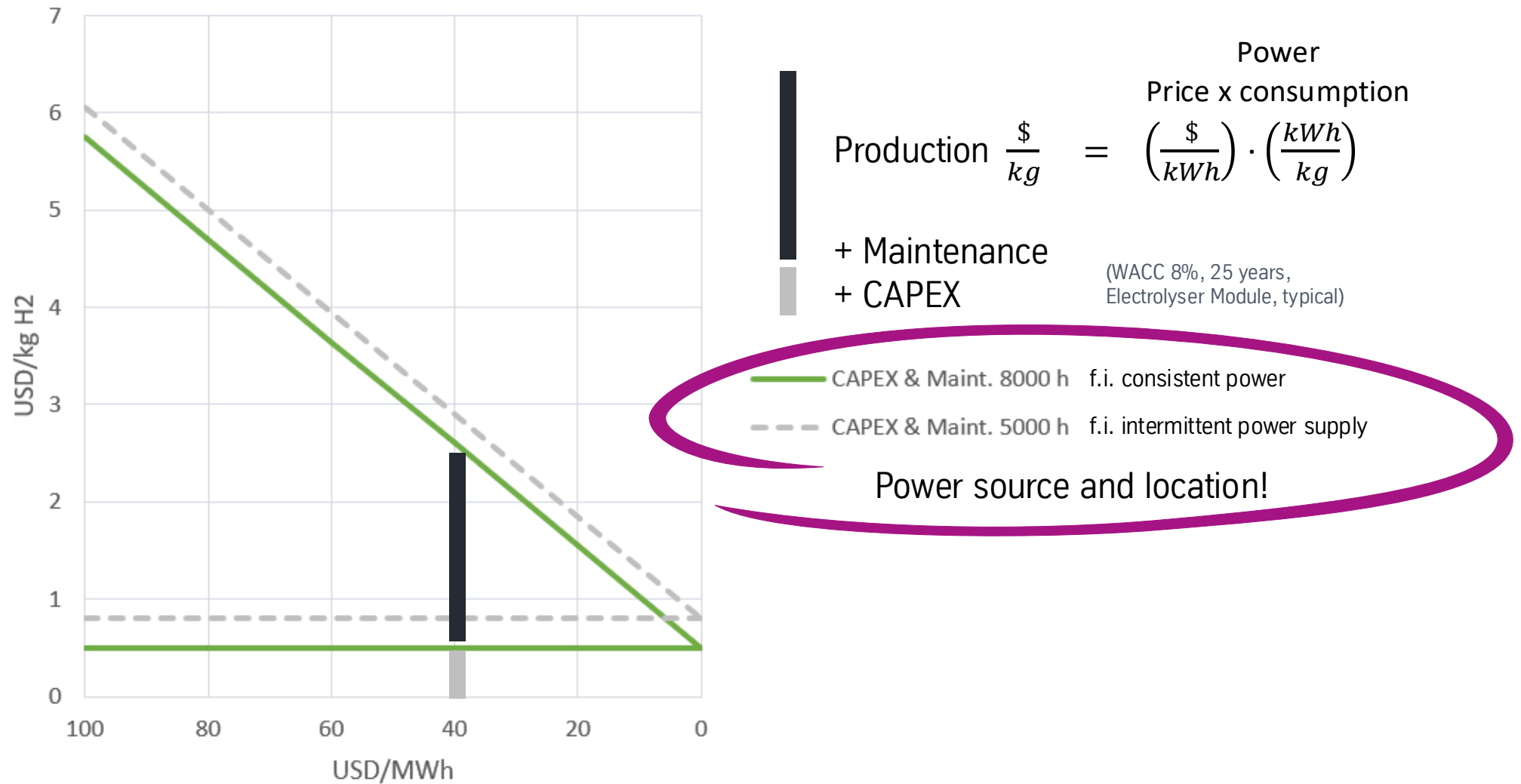
The recently launched second Hydrogen Headstart funding round is designed to ...

focus on projects that target high-priority use cases that aim to reduce the cost of hydrogen production through:

- Smarter plant design and construction
- More efficient electrolyzers
- Flexible operations to lower electricity costs
- Proving infrastructure for end uses like green ammonia, iron, steel, alumina, and heavy transport

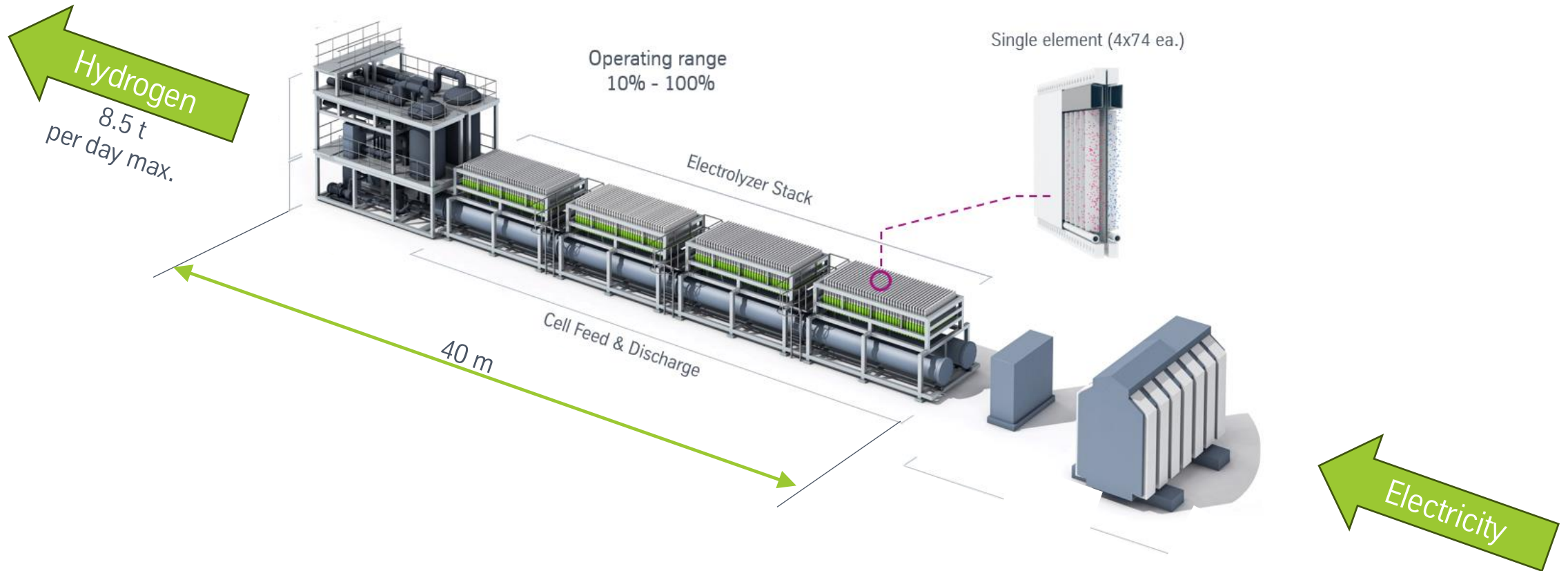
Demand is a challenge: While there is interest from international trading partners like Japan, Korea, and Singapore, there is **global discourse around the willingness to pay a 'green premium'** across the board... Strong decarbonisation targets both here and overseas are helping, but the market is still developing

Minimum cost of hydrogen – price of electricity is decisive



Indicative figures only

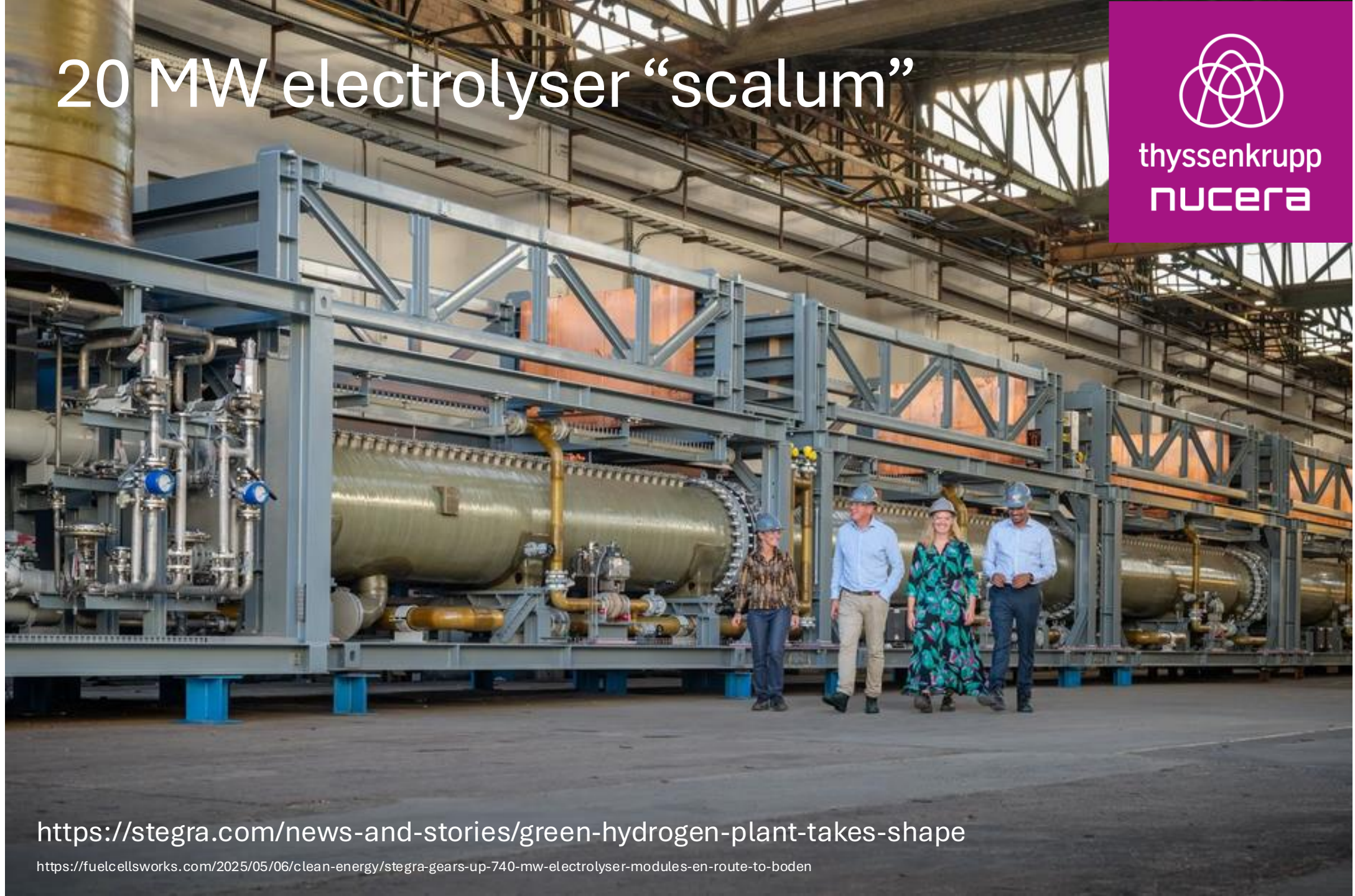
thyssenkrupp nucera is the leading industrial scale electrolyser supplier: 20 MW module “scalum”



20 MW electrolyser “scalum”



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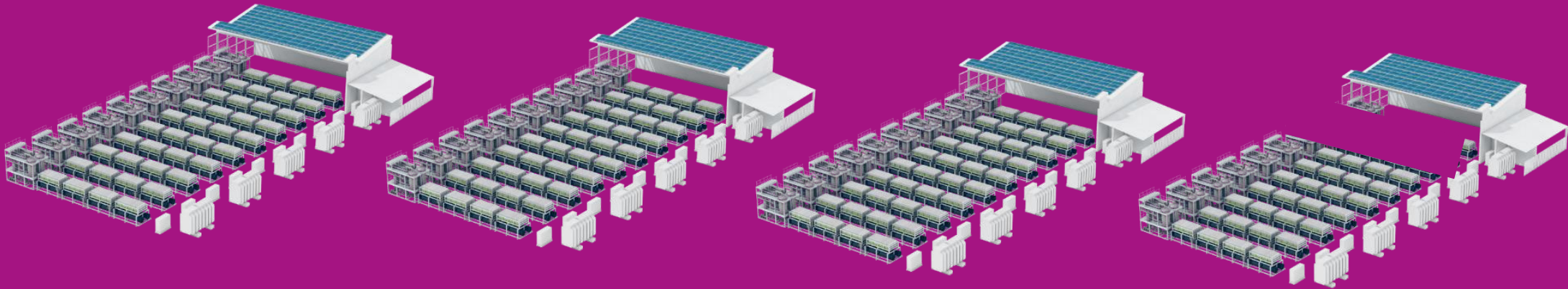
<https://stegra.com/news-and-stories/green-hydrogen-plant-takes-shape>

<https://fuelcellsworld.com/2025/05/06/clean-energy/stegra-gears-up-740-mw-electrolyser-modules-en-route-to-boden>

20 MW electrolyser “scalum”

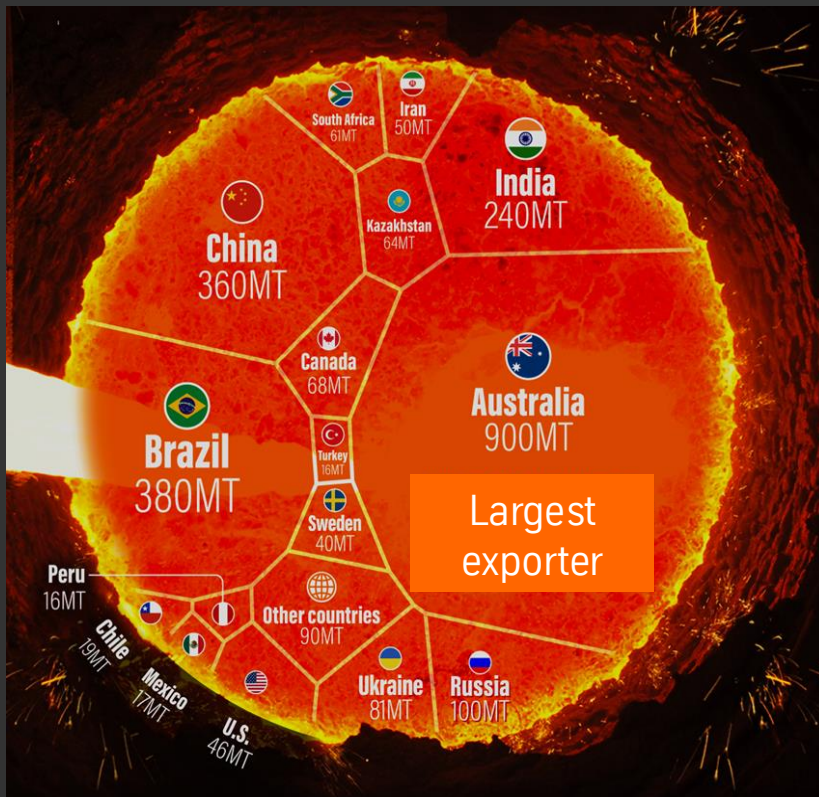


Example: 740 MW (= 37 x 20 MW) industrial scale electrolyzers
(Stegra- Green Steel Plant, Sweden)



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Australia: largest iron ore producer – can it be processed to green iron?



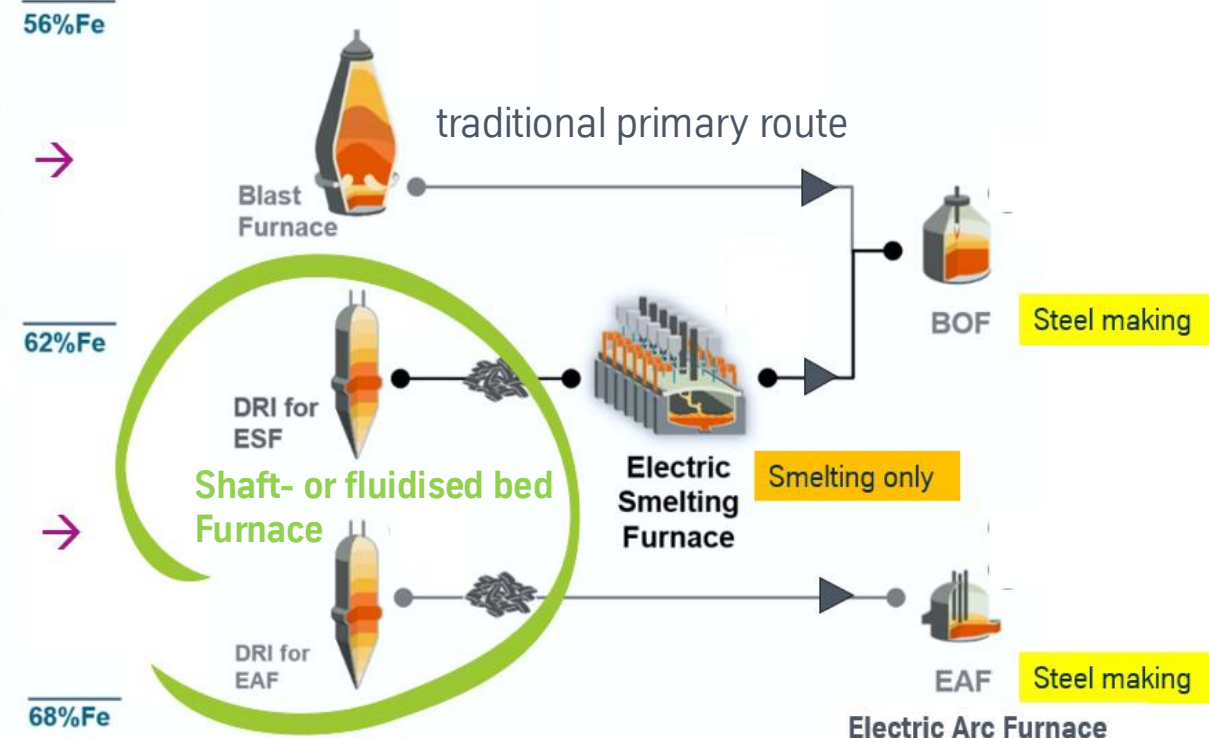
Source: United States Geological Survey

- > 80 % of Australian iron ore exports go to China
- Global annual steel production: ~ 1,900 Mt (> 50% in China)
 - ~ 70% via Primary Blast Furnace route with > 2 t CO₂ per t_{steel}
 - Rest: Recycling steel scrap via Electric Arc Furnace
 - Direct Reduced Iron (DRI) production today: ~ 140 Mtpa

Direct shipping ore f.i. hematite



Pellets (processed ore) f.i. magnetite



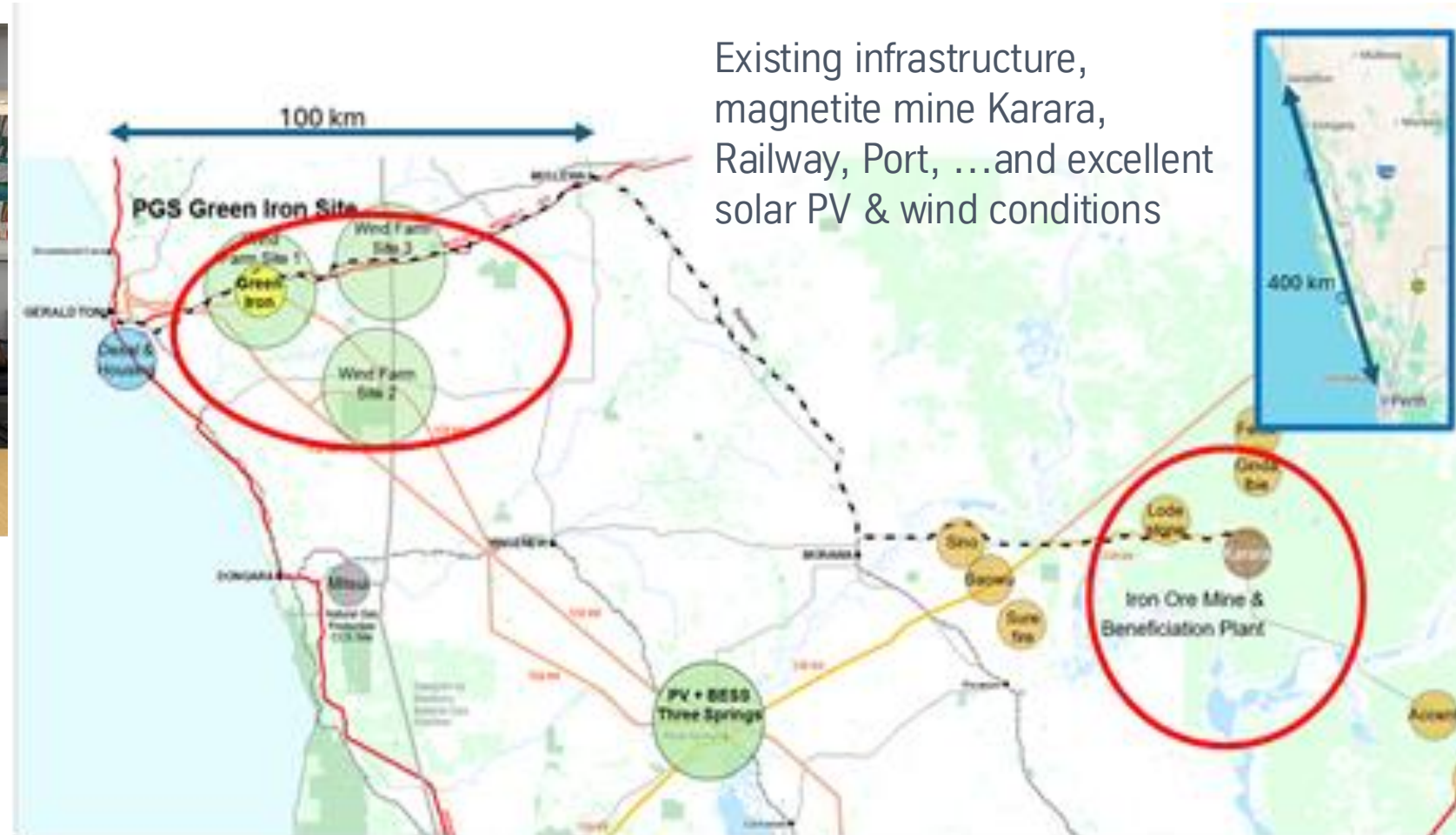
PGS Mid West Green Iron Project – Feasibility Study

2.5 Mtpa Green HBI - 1.4 GW electrolysis



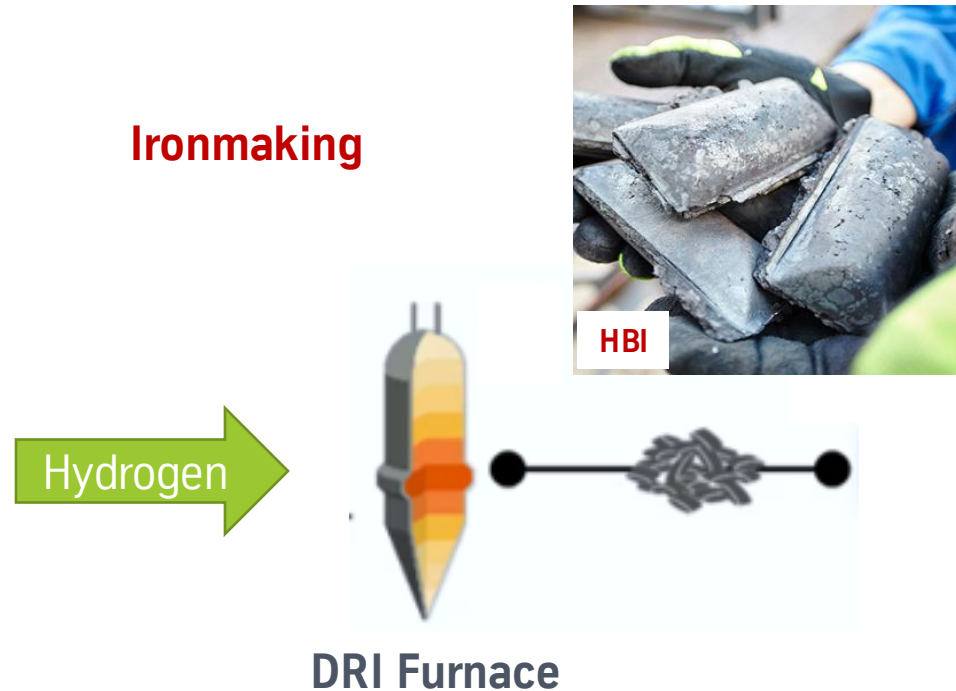
PGS, tk materials trading, tk nucera, SMS group, KfW Bank

Perth, 12th Sep 2025:
thyssenkrupp Materials Trading signs
MOU for Offtake of green HBI, in
presence of WA Premier Roger Cook



Shipping hot briquetted iron (HBI) to steel plants?

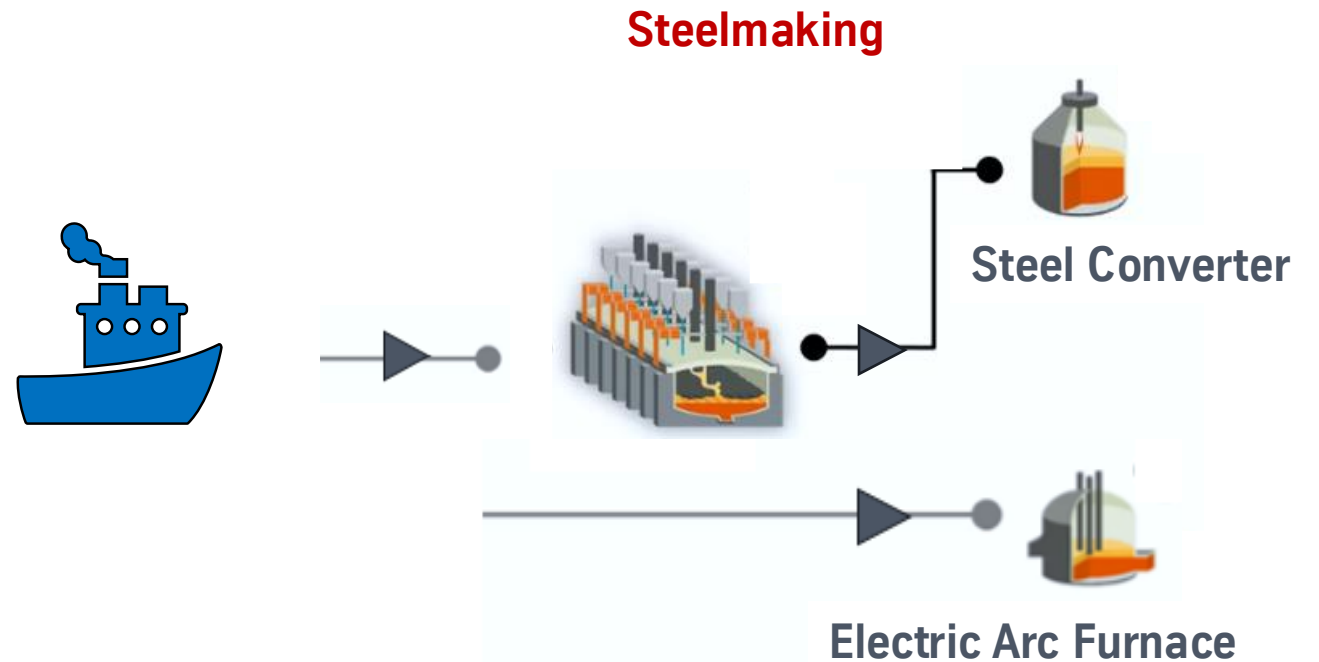
Splitting the “integrated” steelmaking value chain



Location of ironmaking:

$\sim 4,000 \text{ kWh/t}_{\text{iron}}$

Renewable, low cost electricity for iron making ($> 54 \text{ kg H}_2/\text{t}_{\text{iron}}$) and preheating H_2



Location of steelmaking:

$\sim 700 \text{ kWh/t}_{\text{iron}}$

Electricity and fossil fuels for reheating HBI ~ 200 + melting $\sim 500 \text{ kWh/t}$

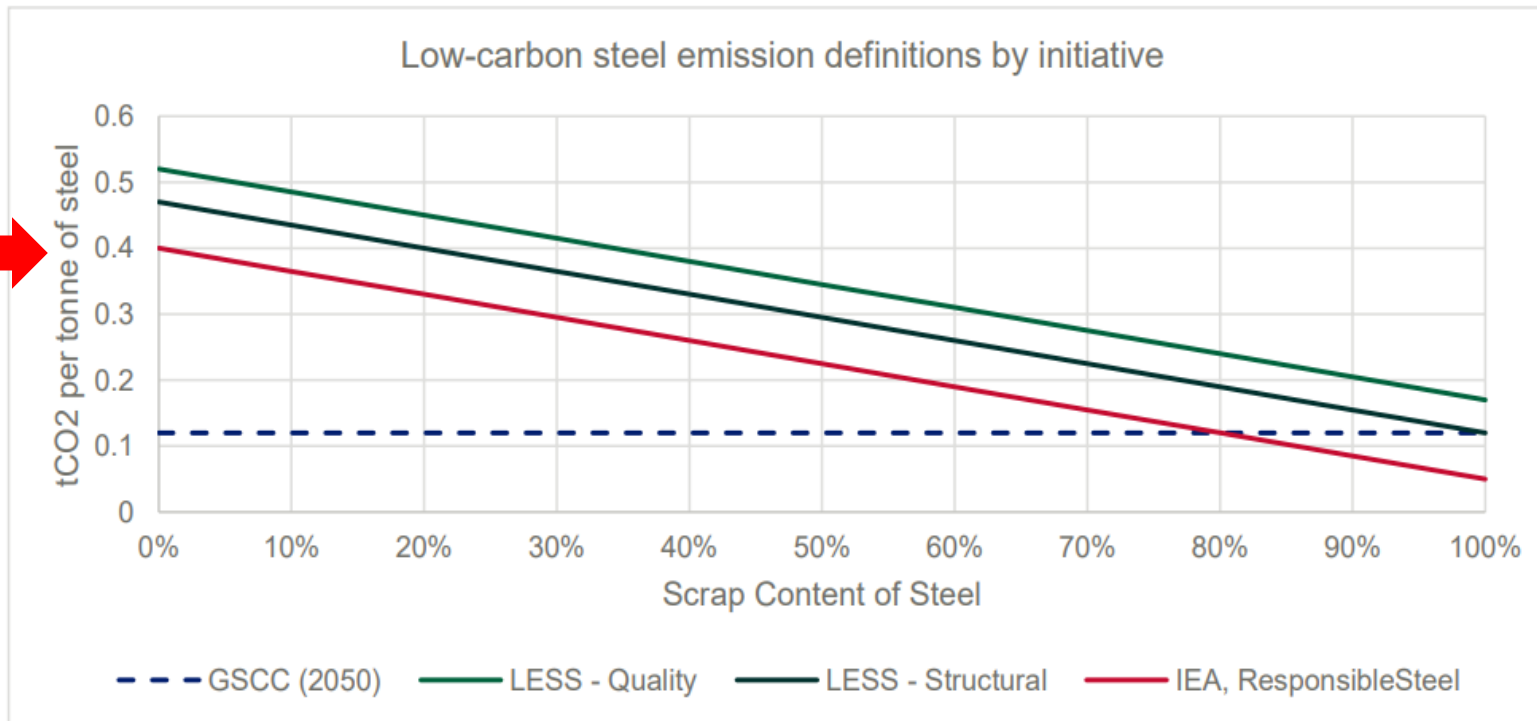
What is low-carbon steel ? – no binding rules in existence

There are 5 major initiatives applicable to the US and Europe

- (i) IEA's Near-Zero and Low-Emissions Steel,
- (ii) Science-Based Targets Initiative (SBTi),
- (iii) ResponsibleSteel,
- (iv) The Low Emissions Steel Standard (LESS, Germany),
- (v) The Global Steel Climate Standard (GSCC).

The emissions accounting rules vary greatly between frameworks

- in system boundaries,
- how credits are allocated, and
- how co-products are treated.



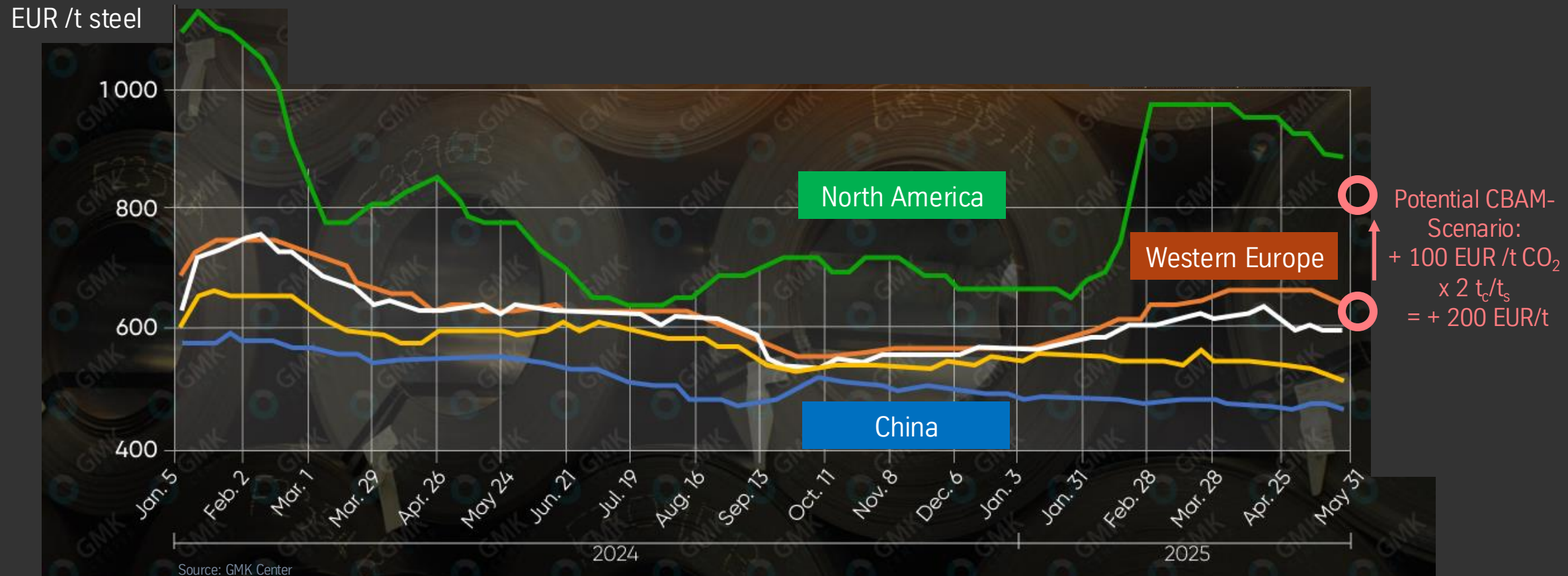
Source: GSCC, LESS, IEA, ResponsibleSteel, L&G

Source: Nucor, L&G (Sep 2025): Forging steel's future: Scrap's leading role in low-carbon steelmaking in the US and Europe

These rules need to be aligned to

- avoid in-consistencies in reported emissions and
- enhance comparability across products, companies and regions.

Challenge: 1 kg steel costs less than
1 liter of bottled mineral water!



Thank you!



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