Promotion of Green Hydrogen and PtX in South Africa

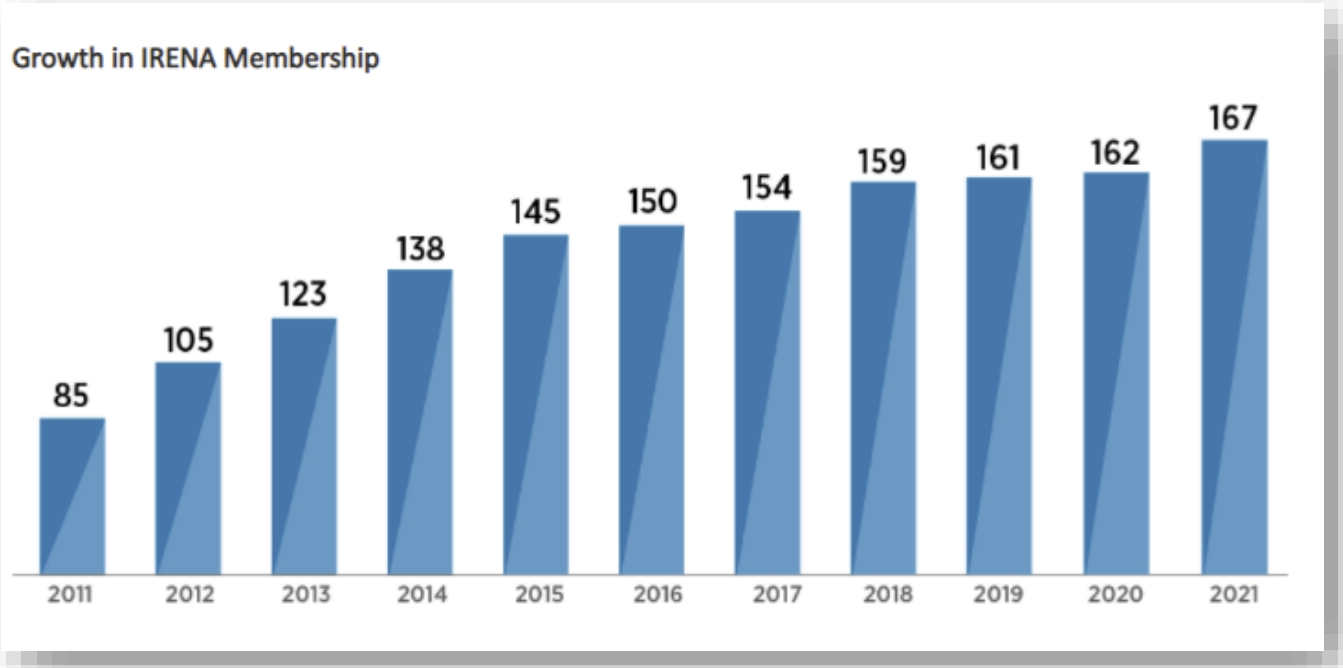
Global Overview of Green Hydrogen

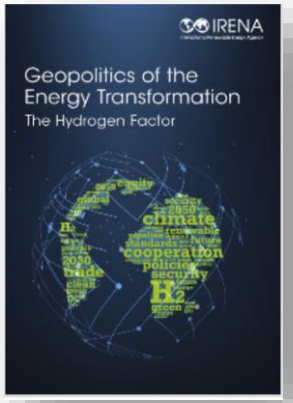
Expert Exchange Event Series Webinar #1 (GIZ, SANEDI, RENAC)

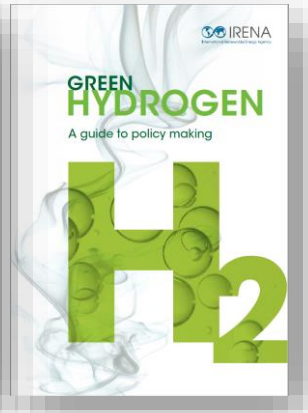
Barbara Jinks – Programme Officer, green gas delivery and use

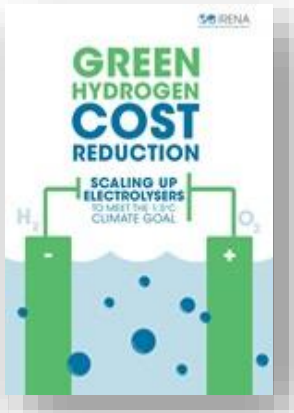
15 March 2022, online

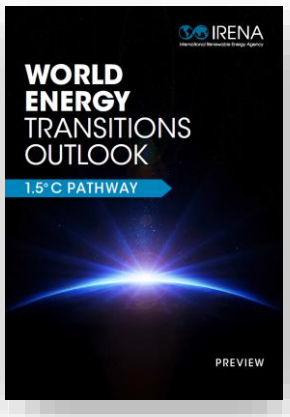
Who is IRENA?











Global coverage, mandated to:

Promote renewable energy.

Policy advice through scientific analysis, collaboration and dialogue.

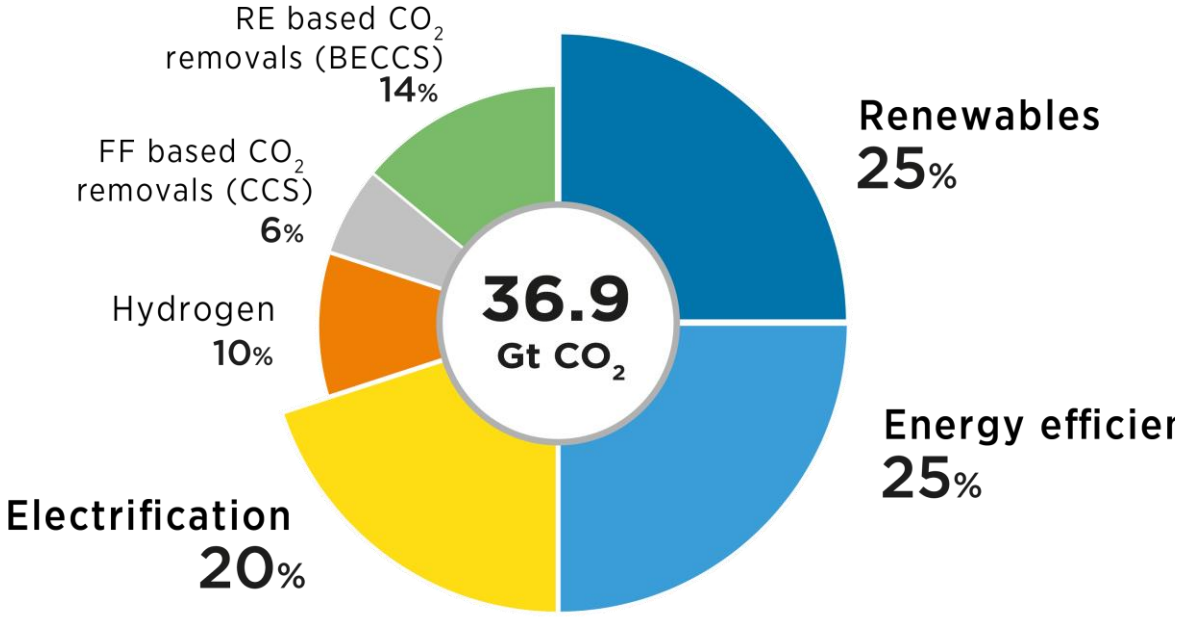
Green gas team aims to increase awareness and dialogue on green gases (green hydrogen, biomethane, synthetic methane)

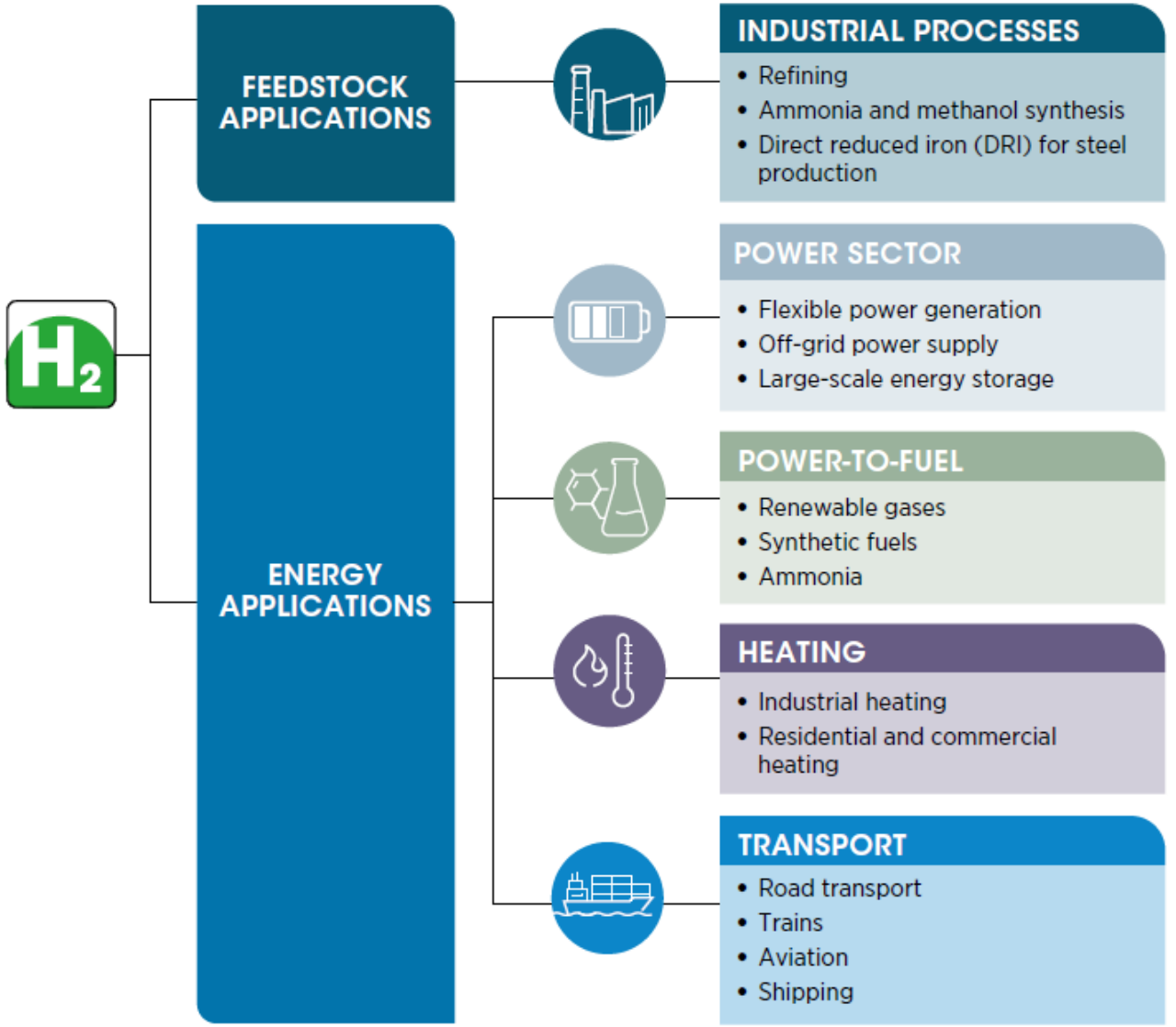
- Molecules essential for successful energy transition
- Gas business and infrastructure have key role in energy transition

IRENA involved with all 21 global public/private initiatives on green hydrogen

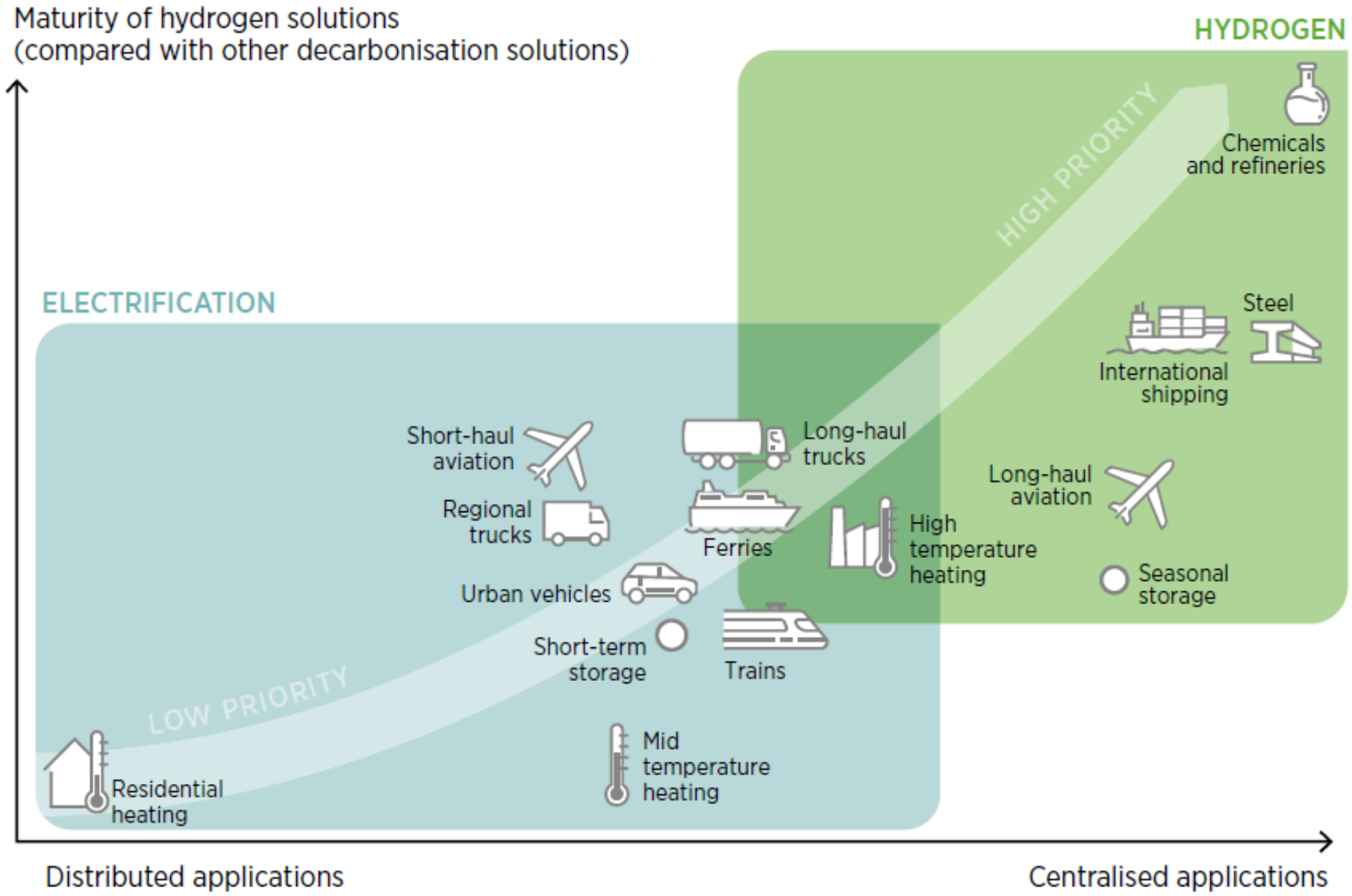
Why is green hydrogen needed?

Six components of the energy transition strategy - CO2 abatement





Where should governments prioritise clean hydrogen?

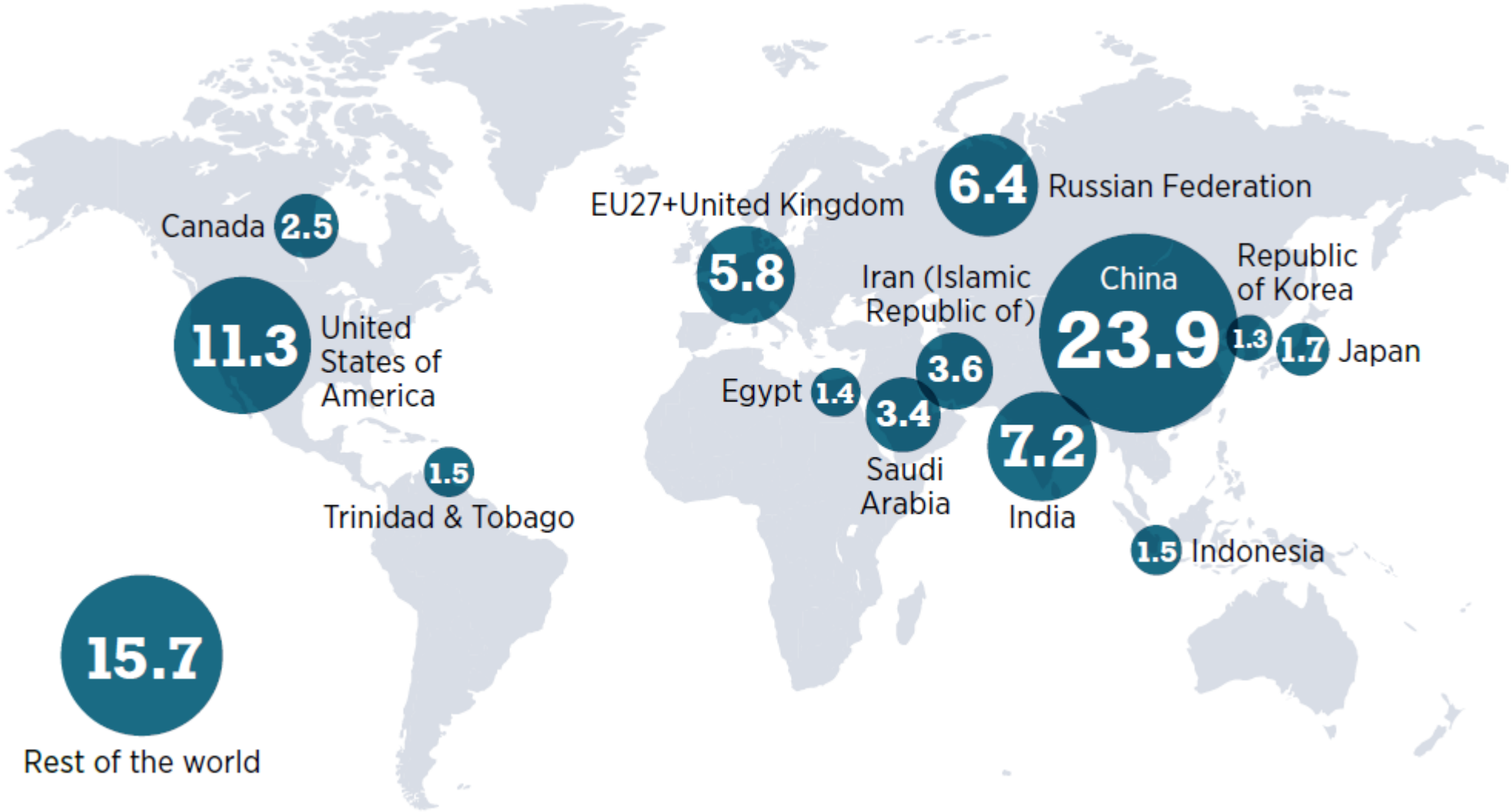


Over 30 UN Energy Compacts for green hydrogen

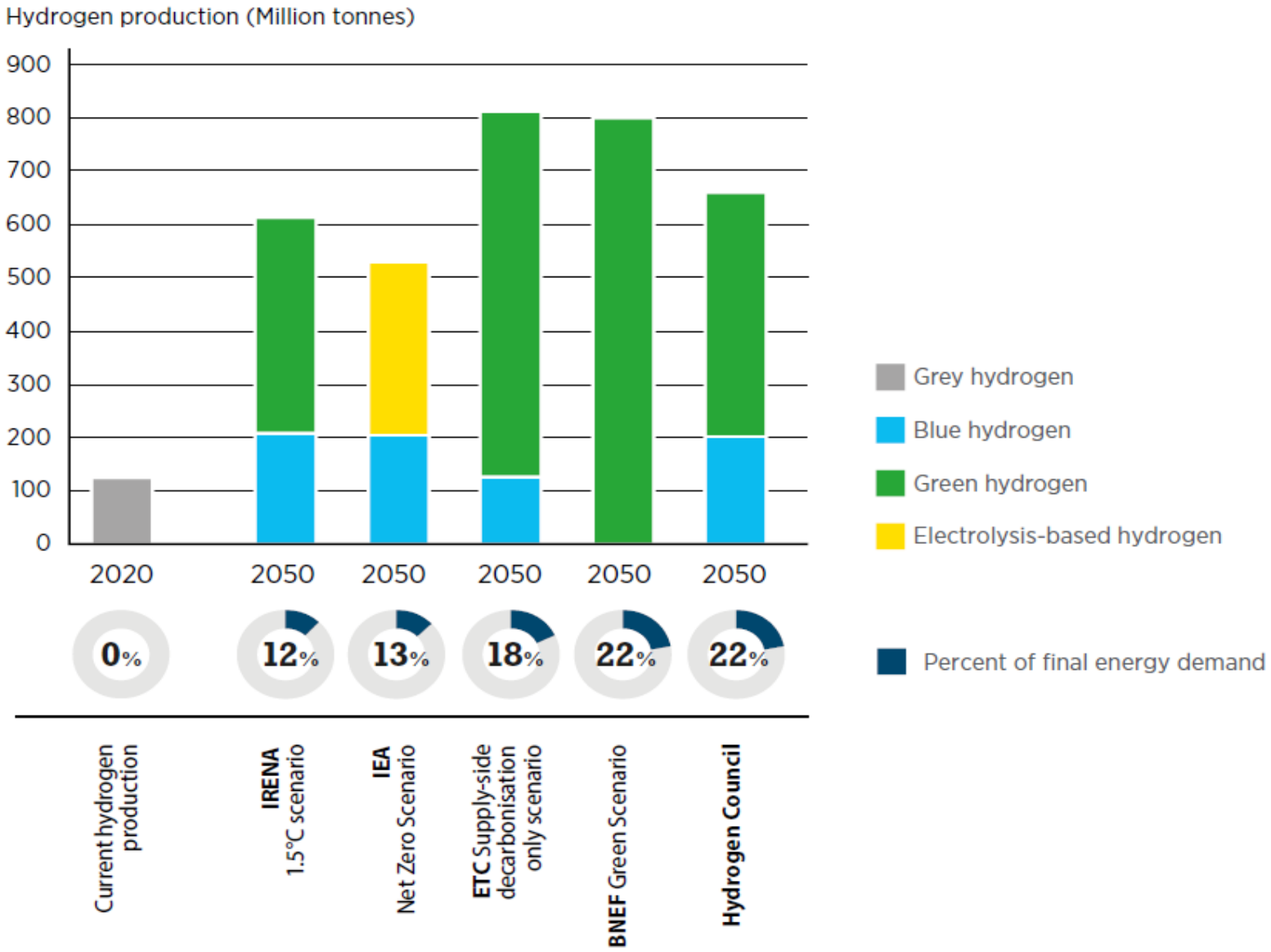
- 129 GW new electrolyser capacity by 2030

What is the current hydrogen consumption?

Million tonnes pa in 2020



How much hydrogen is needed by 2050?

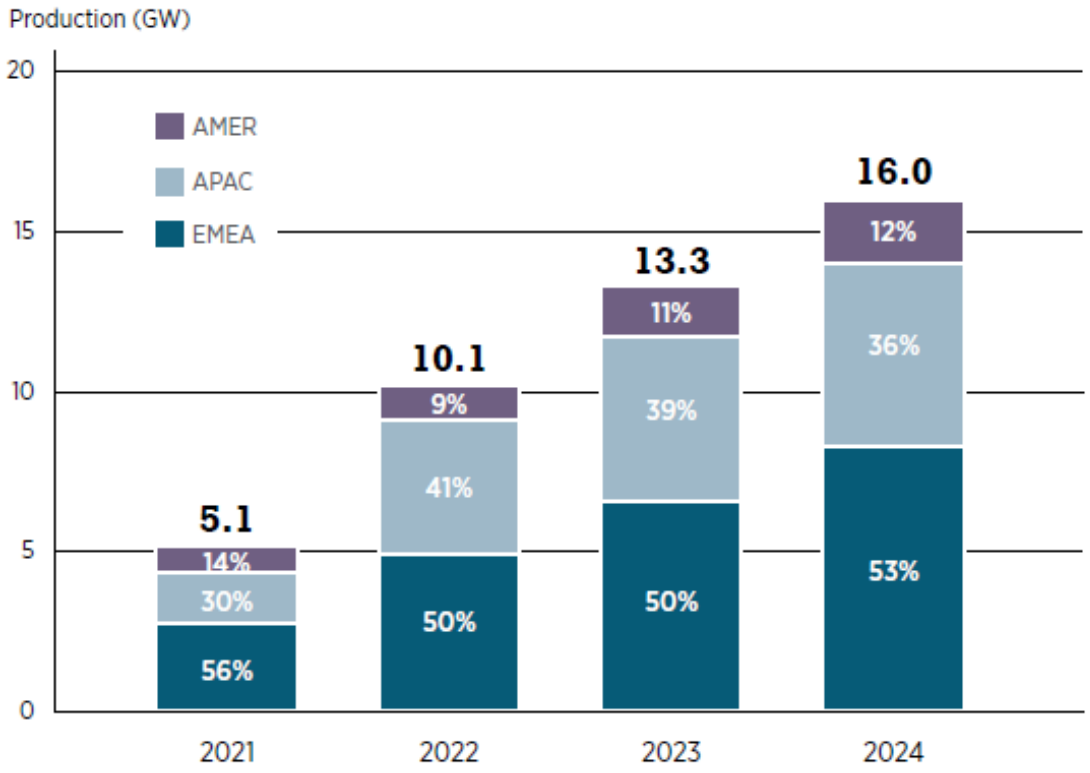


Converging estimates:

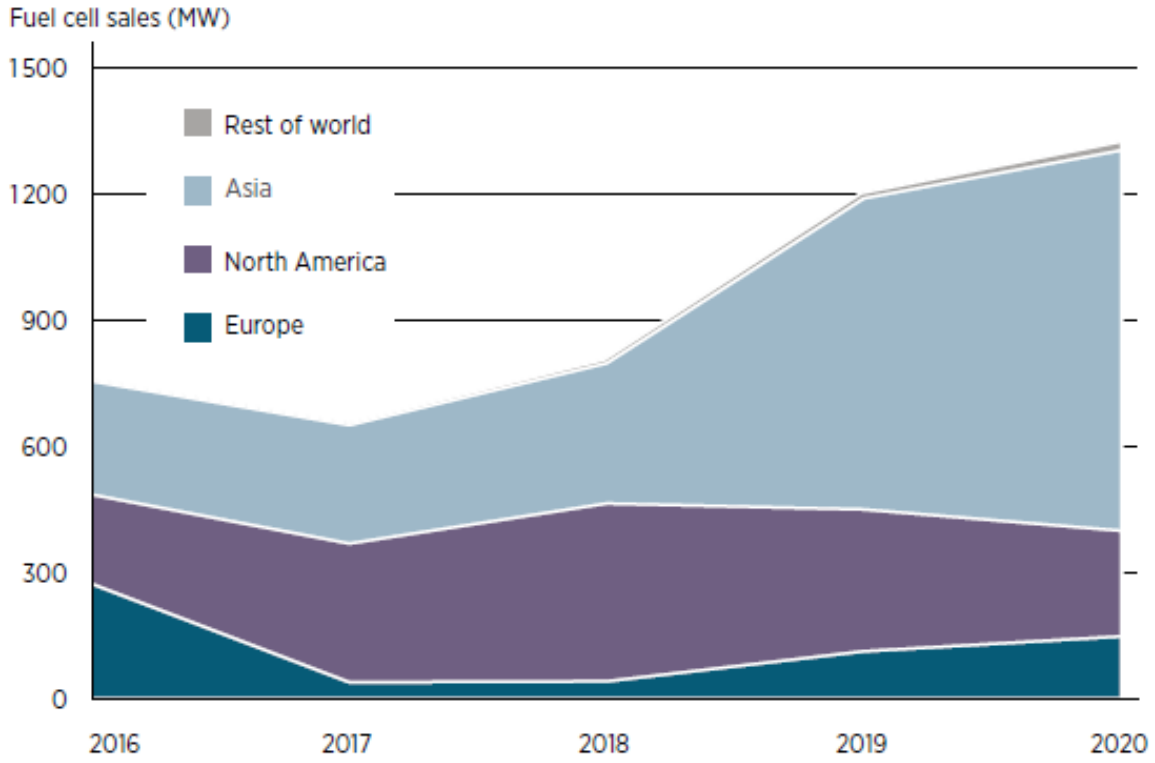
- 5-800 MT clean H2 needed in 2050
- 4-6 times the current market

What is the current global electrolyser manufacturing capacity?

Estimated, 2021-2024

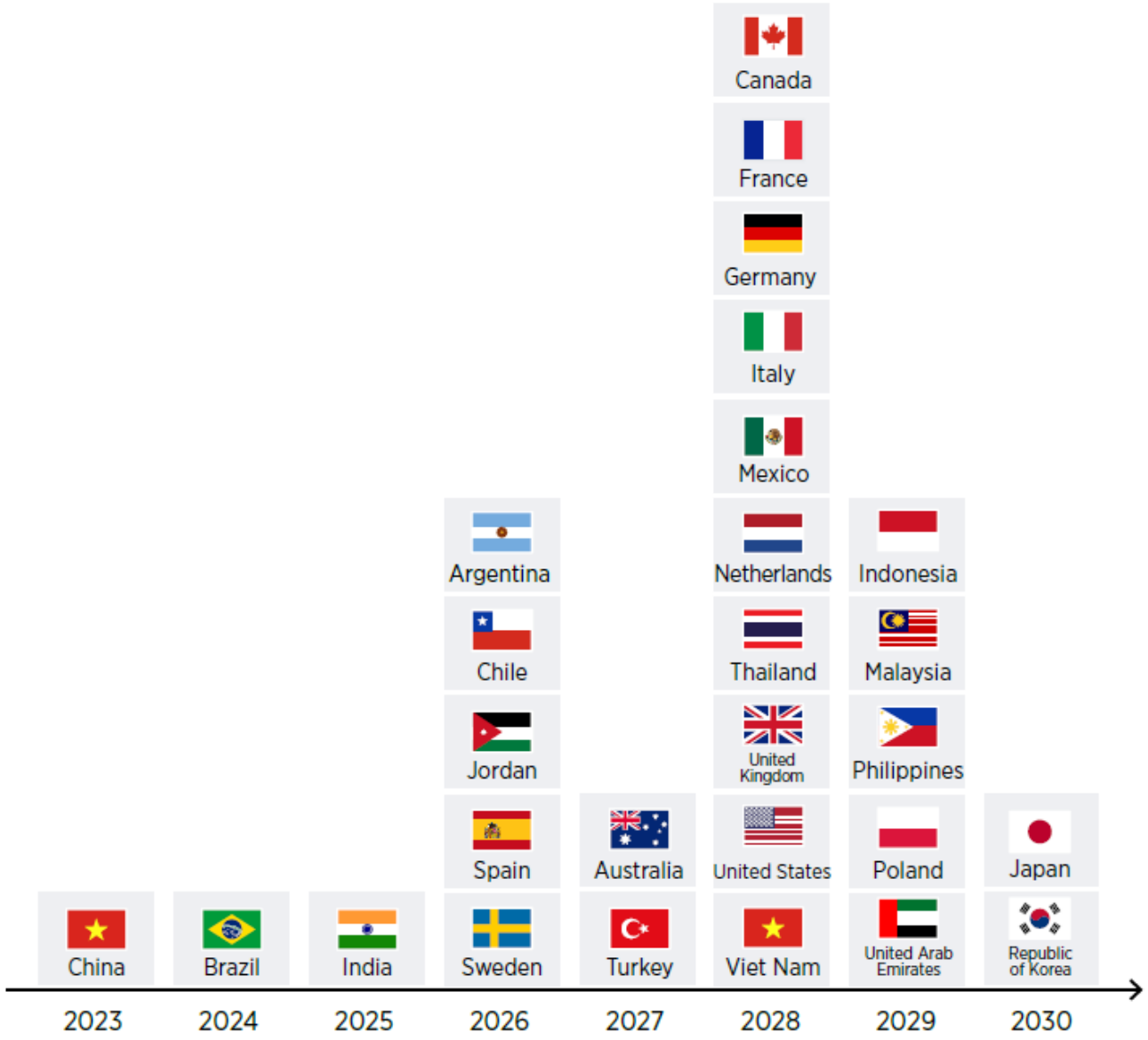


Based on investment plans



Fuel cell sales by region of adoption, 2016-2020

Who is planning to produce cost-competitive green hydrogen?

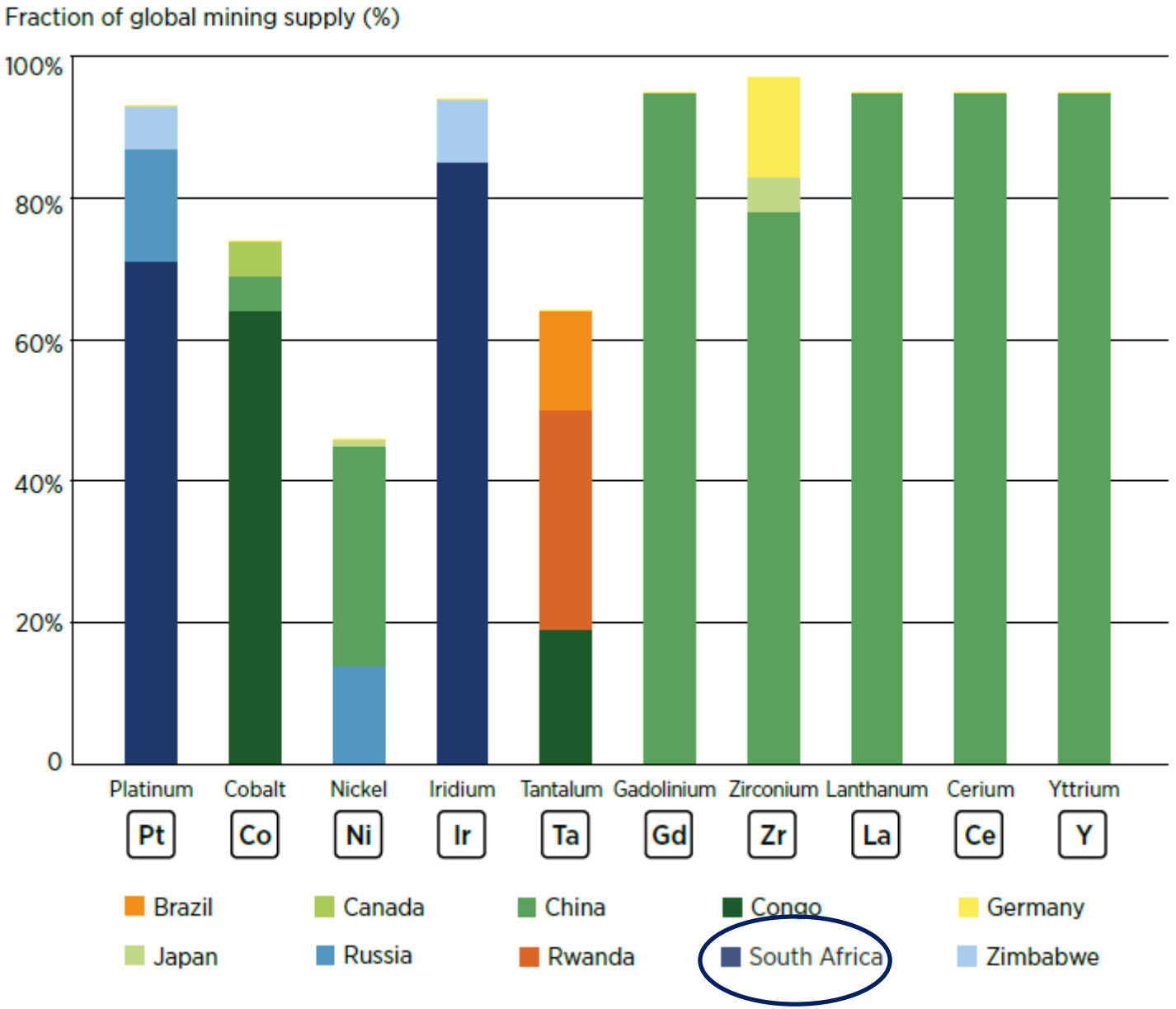


And how can we reduce the cost?

- Innovation (incl materials)
- Scale up manufacturing
- Scale up modules
- Learning-by-doing

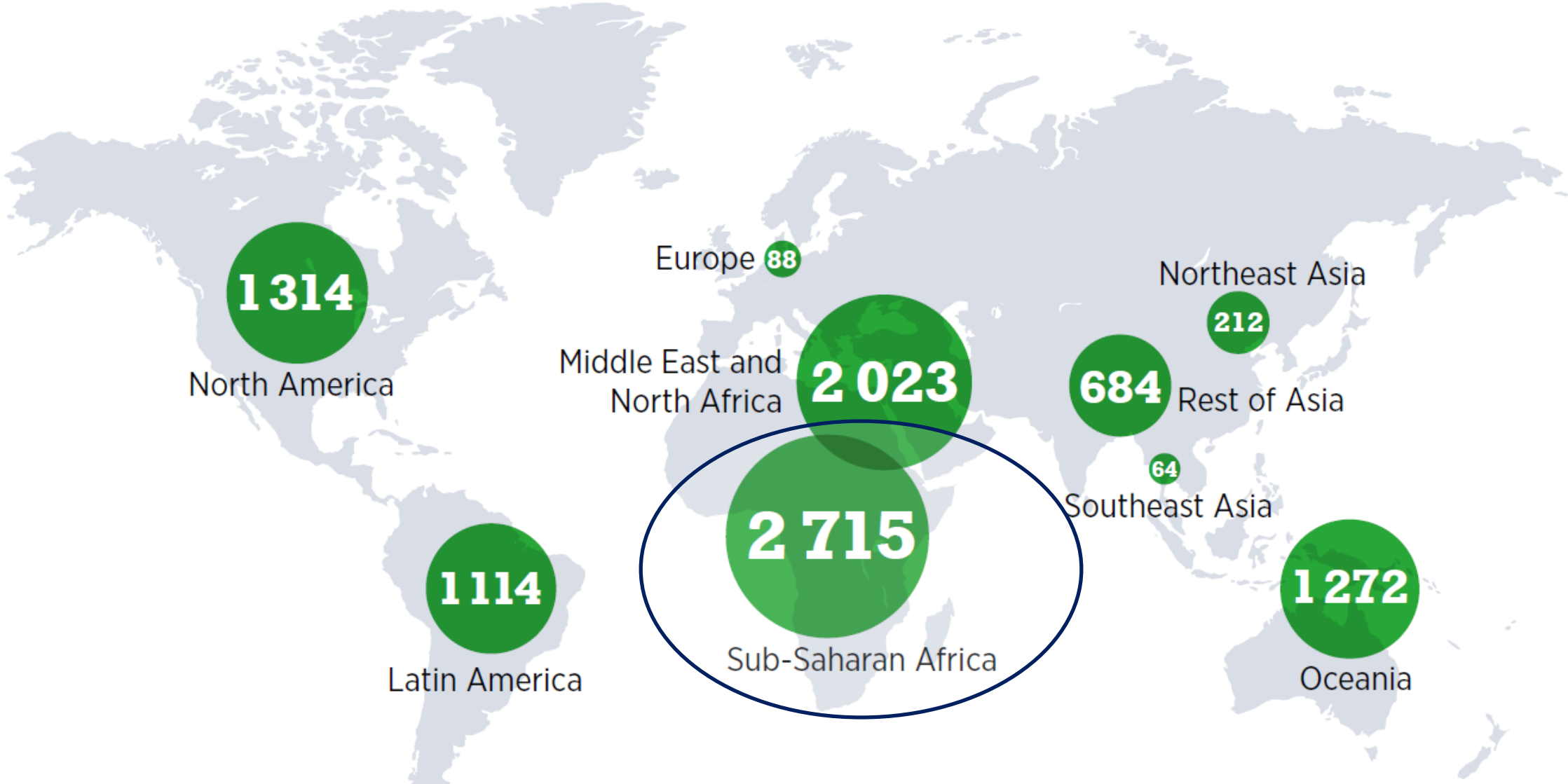
Electrolysers can become 40% cheaper in the short-term (2030) and up to 80% longer term.

Who are the top producers of critical materials for electrolysers?

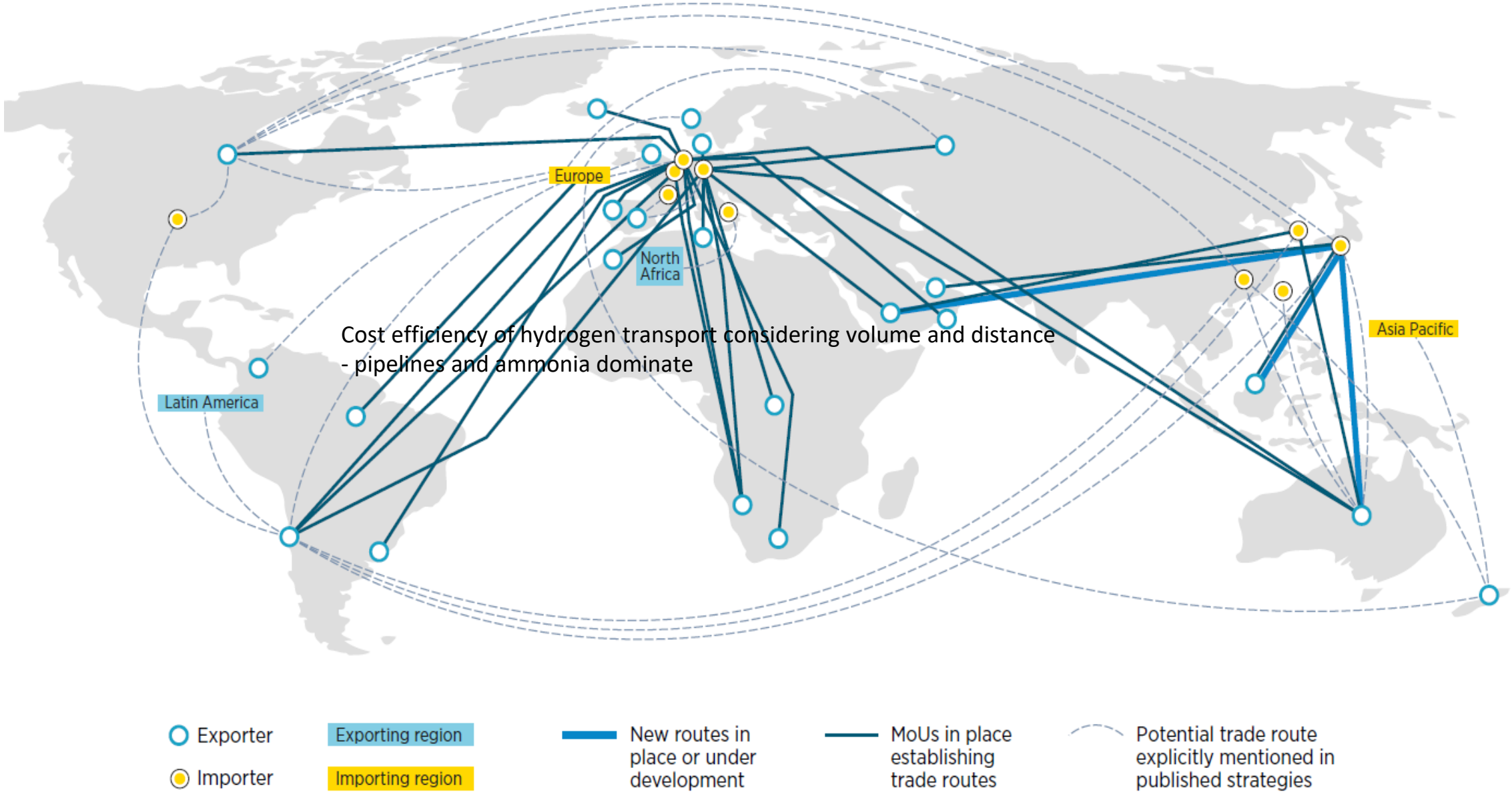


Where is the potential to produce green hydrogen?

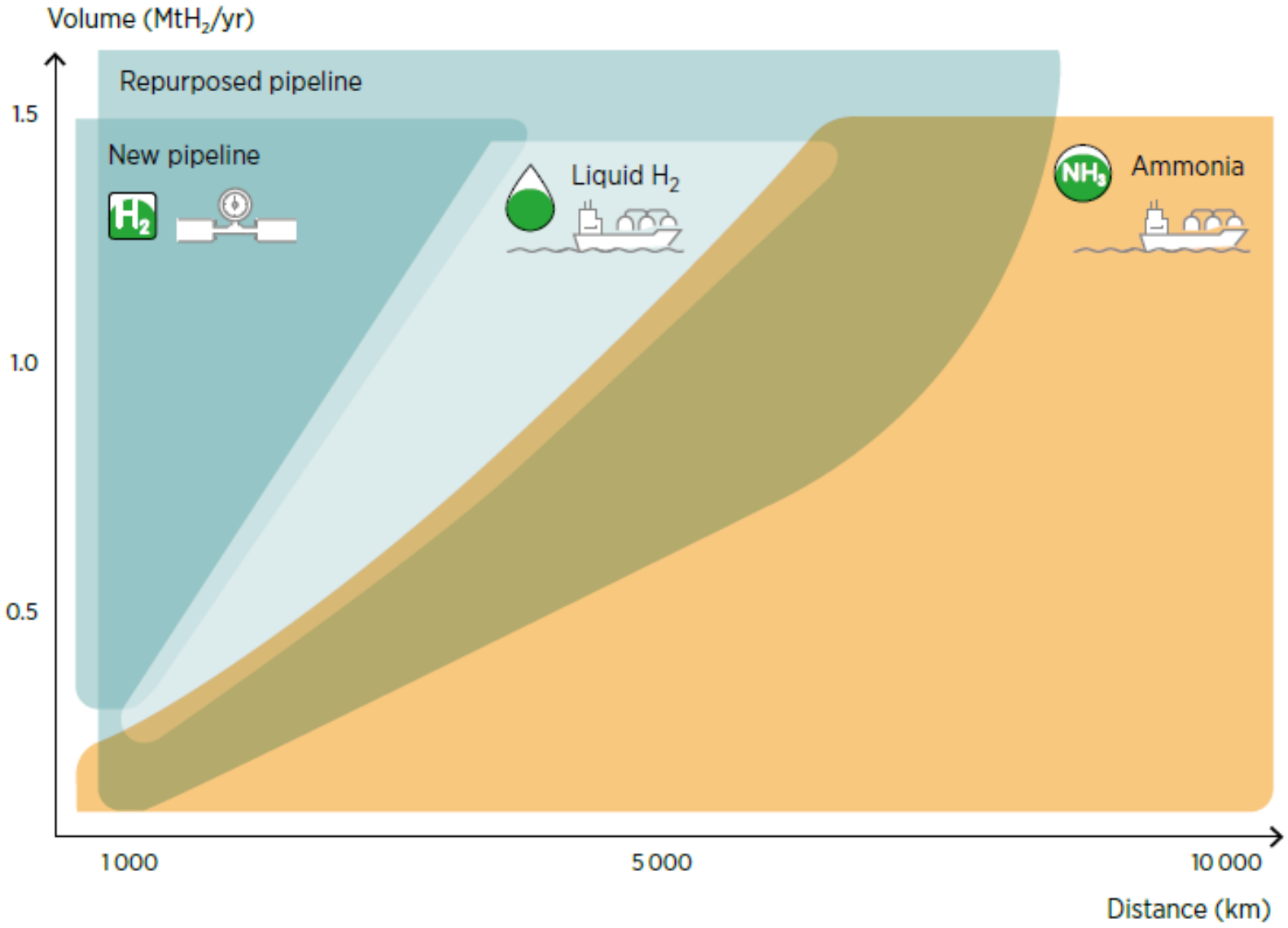
Under USD 1.5/kg by 2050 (EJ)



Where are likely hydrogen trade routes, plans and agreements?

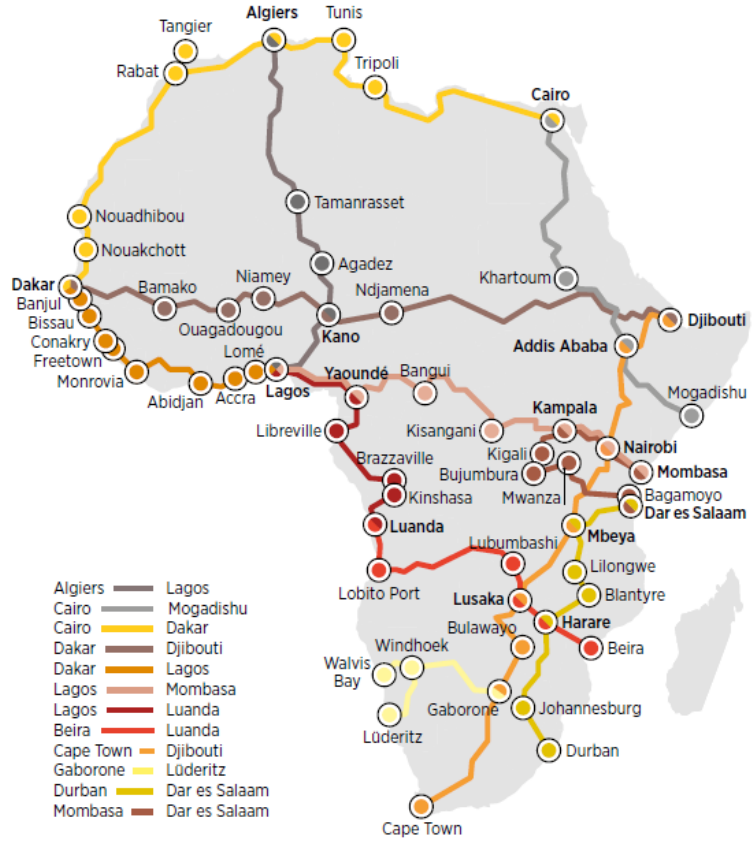


Pipeline or ship?



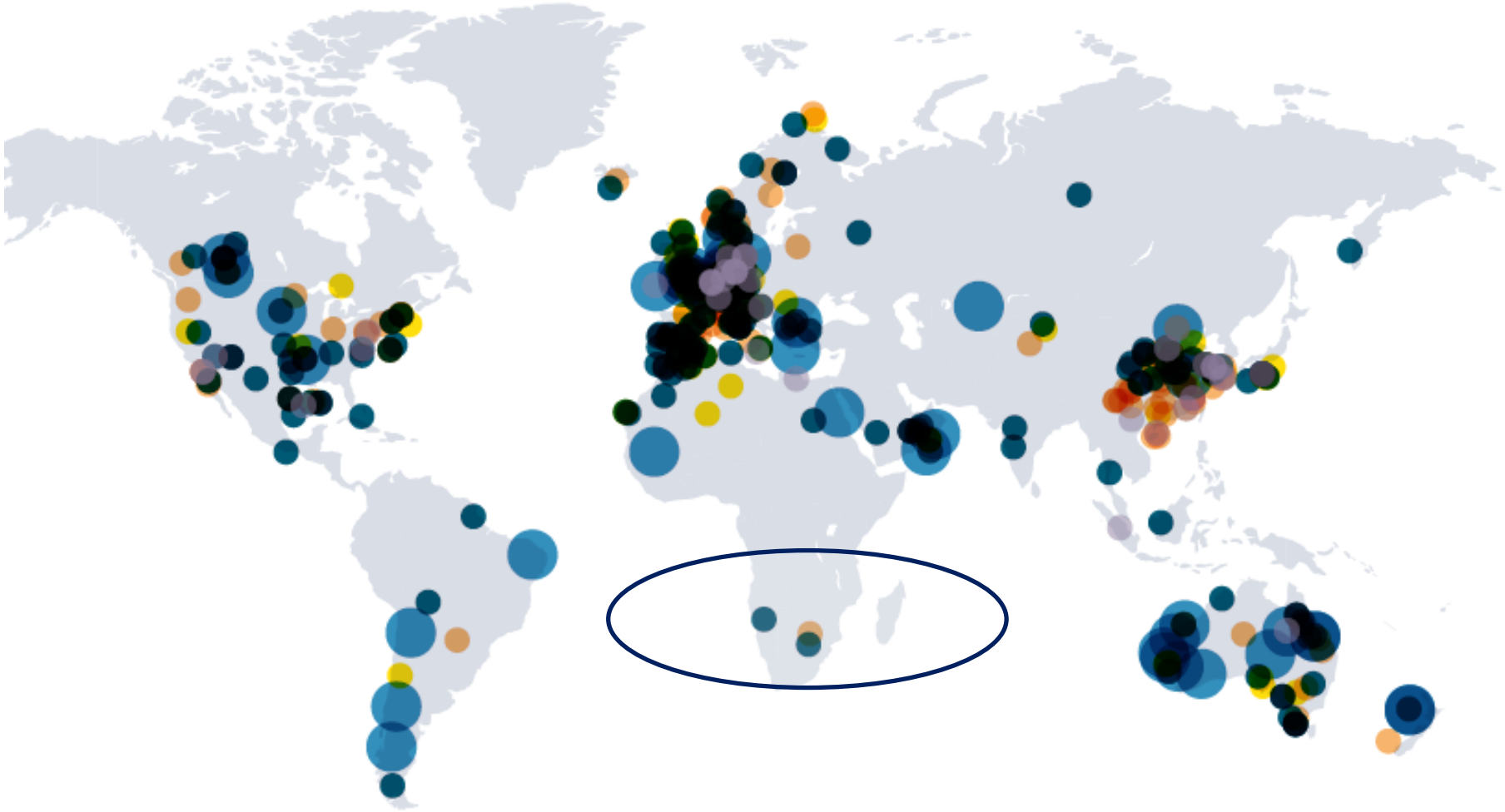
Source: IRENA

Where are the existing gas grids?



Where is current investment in clean hydrogen projects?

Nov 2021



221 large-scale industrial usage
Refinery, ammonia, methanol, steel and industry feedstock

133 transport
Trains, ships, trucks, cars and other hydrogen mobility applications

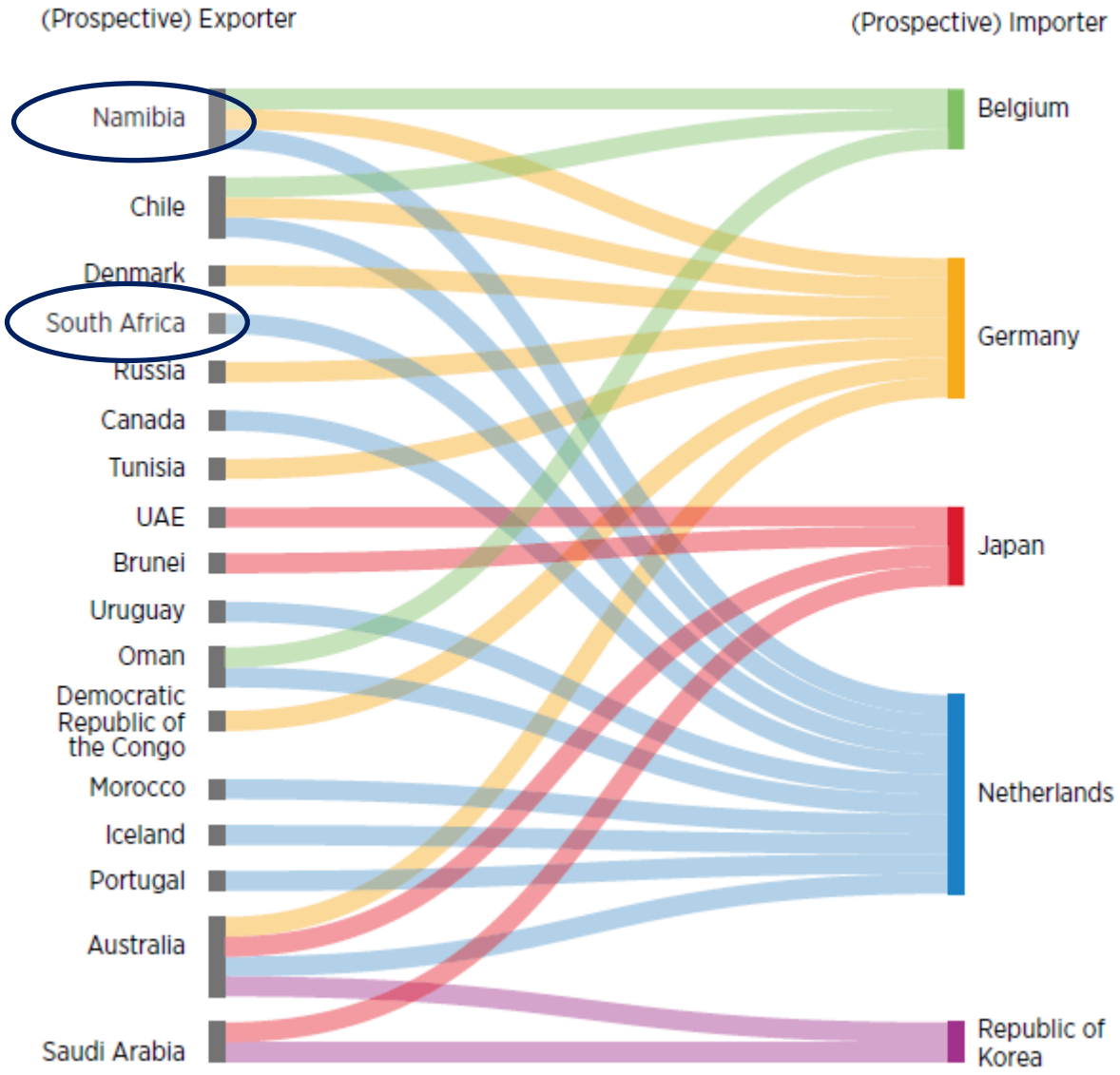
74 integrated H_2 economy
Cross-industry and projects with different types of end uses

51 infrastructure projects
H_2 distribution, transportation, conversion and storage

43 giga-scale production
Renewable H_2 projects >1 GW and low-carbon H_2 projects > 200 ktpa

Where are key country bilateral trade agreements and MOUs?

Nov 2021



Policy Considerations

- **Global demand** for hydrogen derivatives is rising.
- **South Africa has large potential** to be a key player in green hydrogen development.
- **Hydrogen is part of a much bigger energy transition picture;** its development and deployment strategies should not be pursued in isolation.
- **Policy makers should consider broader impacts of hydrogen** development on sustainable socio-economic development to ensure positive, long-lasting outcomes.
- **Setting the right priorities for hydrogen use** will be essential for its rapid scale-up and long-term contribution to decarbonisation efforts.
- **International co-operation is necessary** to devise a transparent hydrogen market with coherent standards and norms that contribute to climate change efforts meaningfully.
- **Geopolitical risks can be mitigated** by reducing unnecessary energy consumption across many final uses.

Barrier Objectives

Supported by Accenture

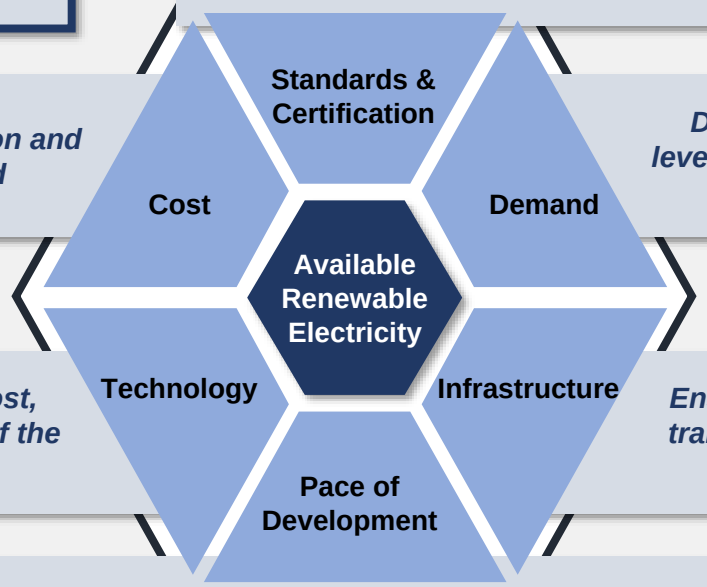
Enabling measures to overcome barriers to hydrogen market development

Significant ramp up and deployment of renewable generation through ambitious targets, incentives and energy system design

Ensure clarity on standards both through a certification scheme and for development of assets across the value chain

Remove critical cost and regulatory barriers for production and deploy mechanisms to accelerate hydrogen demand

Drive critical mass demand through major hydrogen projects leveraging efficient allocation of capital, long-term certainty and sectoral targets for uptake



Focus on innovation and R&D to enable improvement on cost, efficiency and durability of the electrolyser and de-risking of the technology steps for global hydrogen trade

Ensure early ramp up of infrastructure development, including transport, storage, conversion and re-conversion facilities and repurposing of the existing natural gas infrastructure

Accelerate scale-up of electrolyser manufacturing and electrolyser sizes driving economies of scale

Available renewable electricity is the fundamental enabler to the Green Hydrogen market

IRENA
International Renewable Energy Agency

Thank you for your attention

www.irena.org

www.twitter.com/irena

www.facebook.com/irena.org

www.instagram.com/irenaimages

www.flickr.com/photos/irenaimages

www.youtube.com/user/irenaorg