



# Potential for an international hydrogen and ammonia market

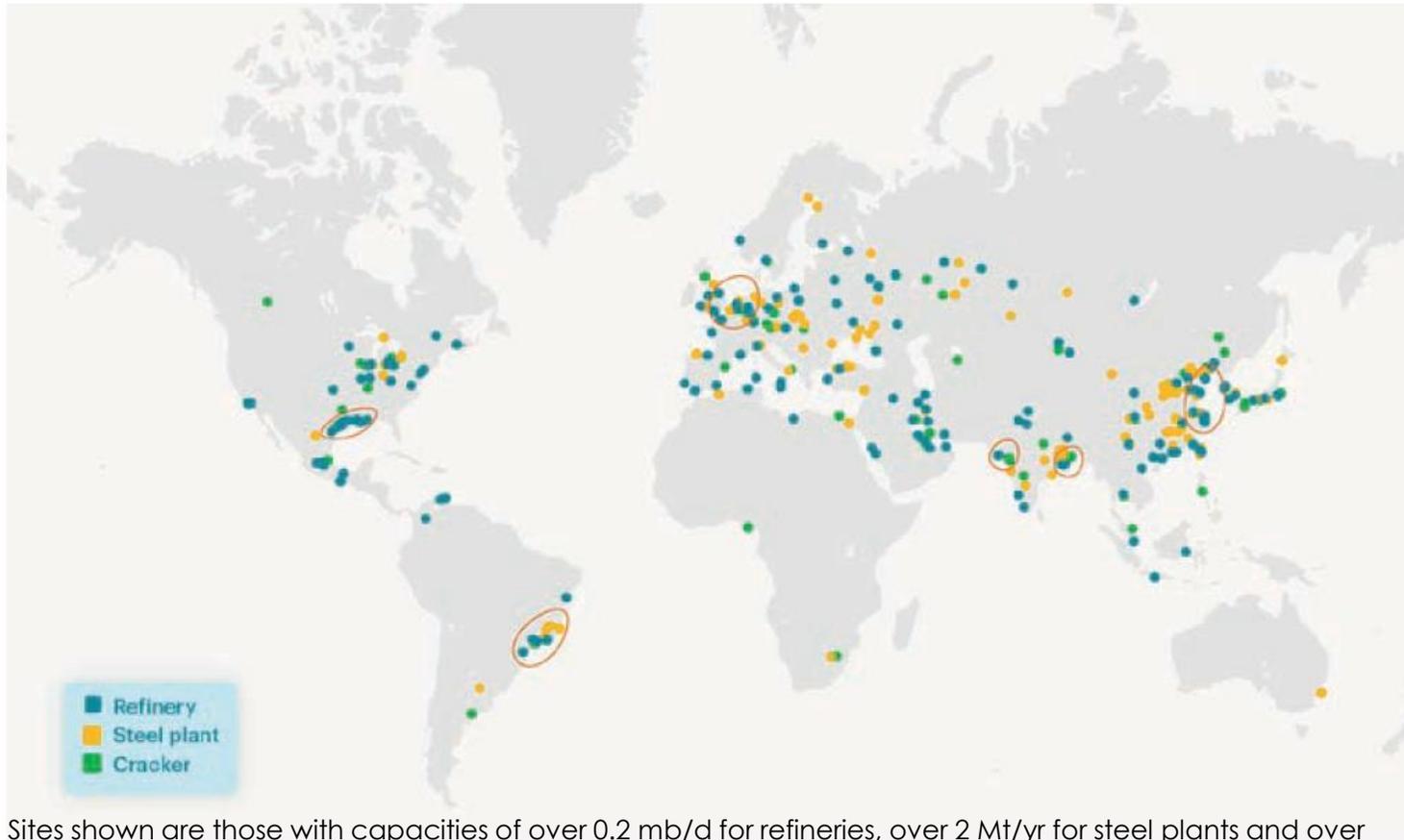


April 2021



# International H<sub>2</sub> & NH<sub>3</sub> Market: Where are the **demand centers** located?

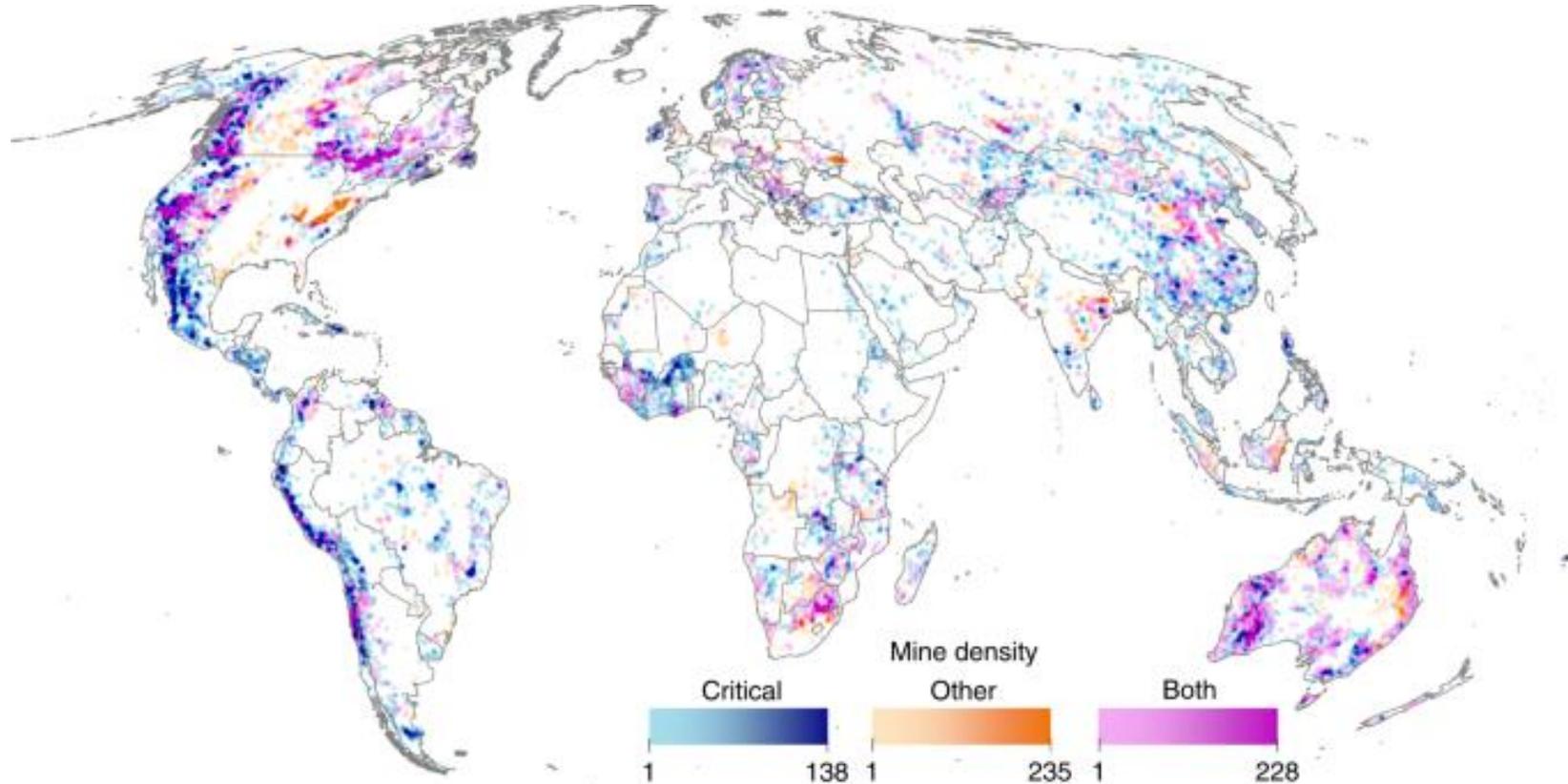
## Global distribution of existing refining, steelmaking and chemical cracking plants



Sites shown are those with capacities of over 0.2 mb/d for refineries, over 2 Mt/yr for steel plants and over 0.3 Mt/yr for steam crackers

# International H2 & NH3 Market: Where are the **demand centers** located?

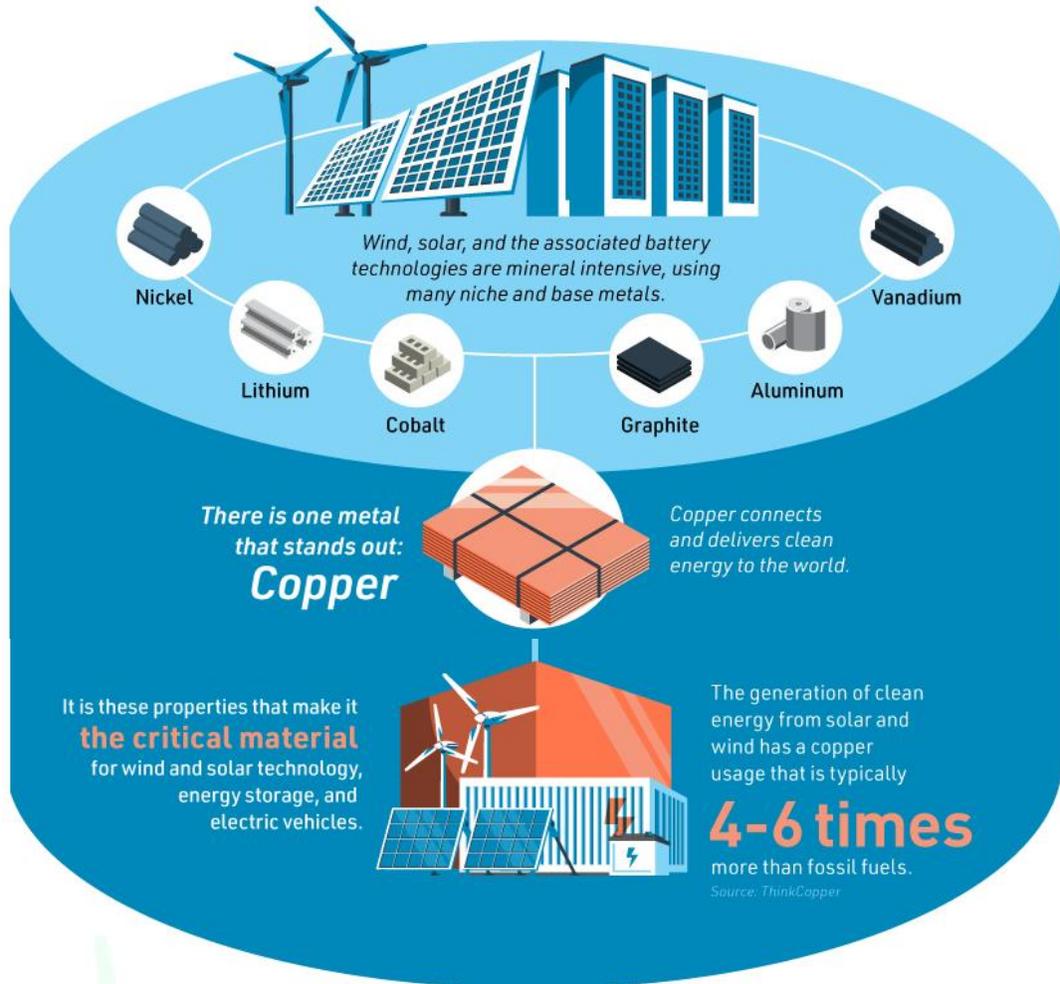
Global mining areas and their density



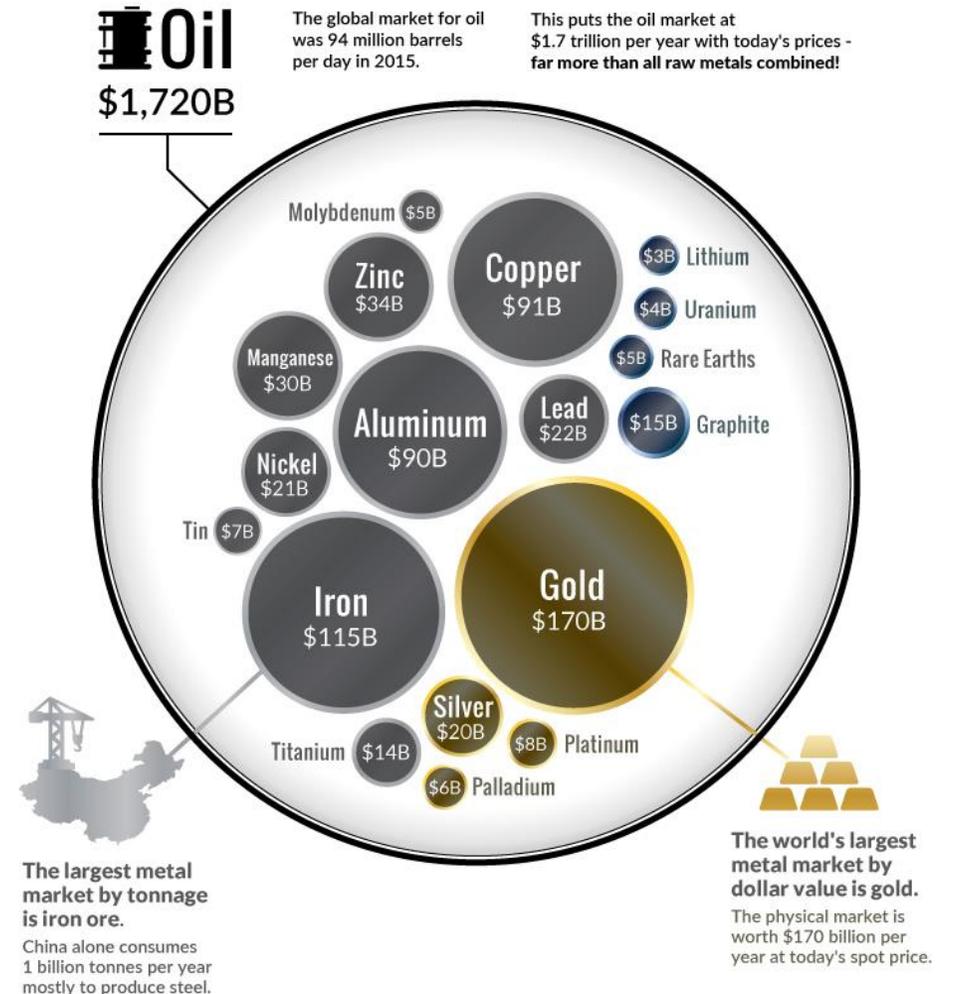
Mining areas with properties targeting materials **critical for renewable energy technology and infrastructure** are shown in **blue**, areas with properties targeting **other materials** are shown in **orange**, and those targeting both **commodity** types are shown in **pink**. Color shading (light to dark) indicates the density of mining areas.

# International H2 & NH3 Market: What is the **roll of the Mining Industry?**

With Energy Transition comes a new need for materials

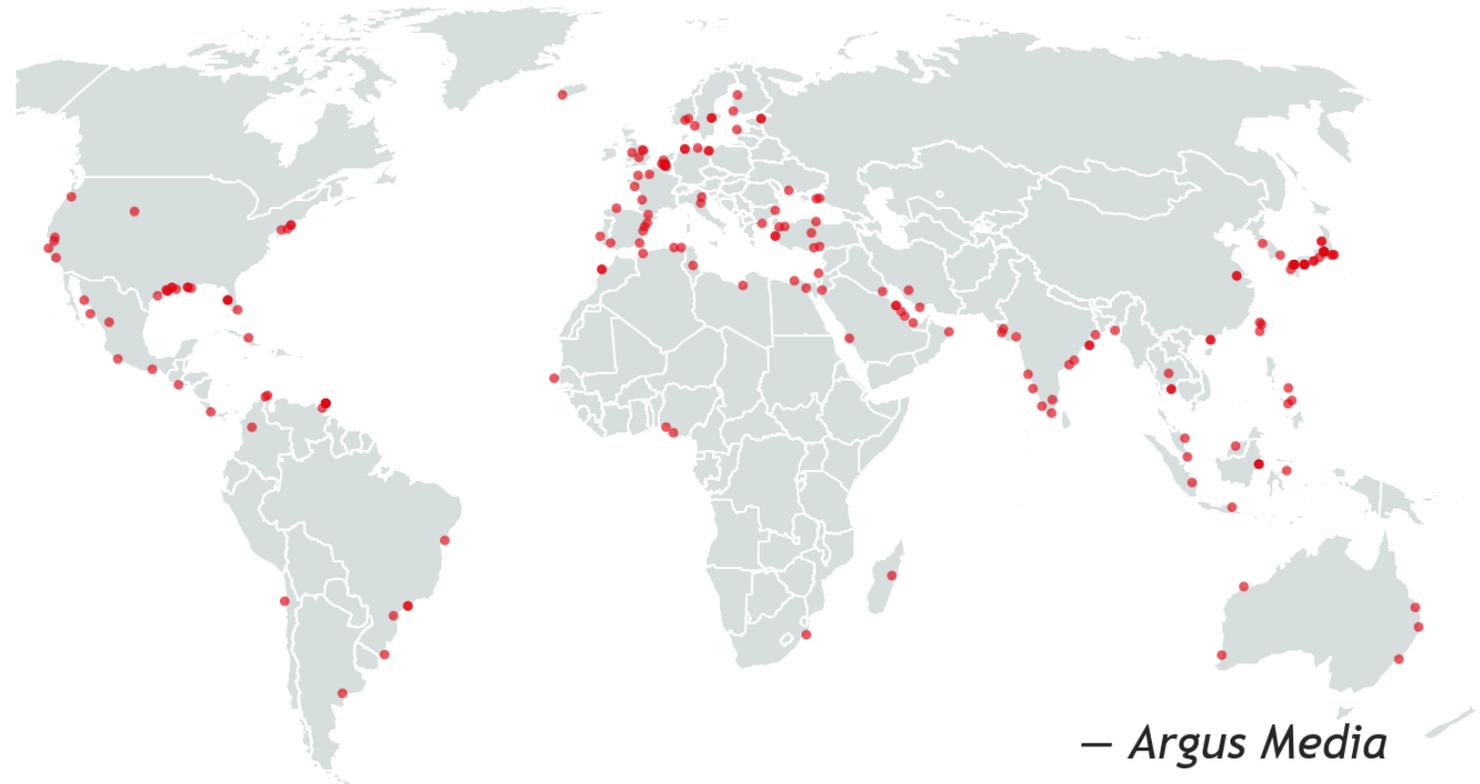


The Oil Market is bigger than all raw materials market combined



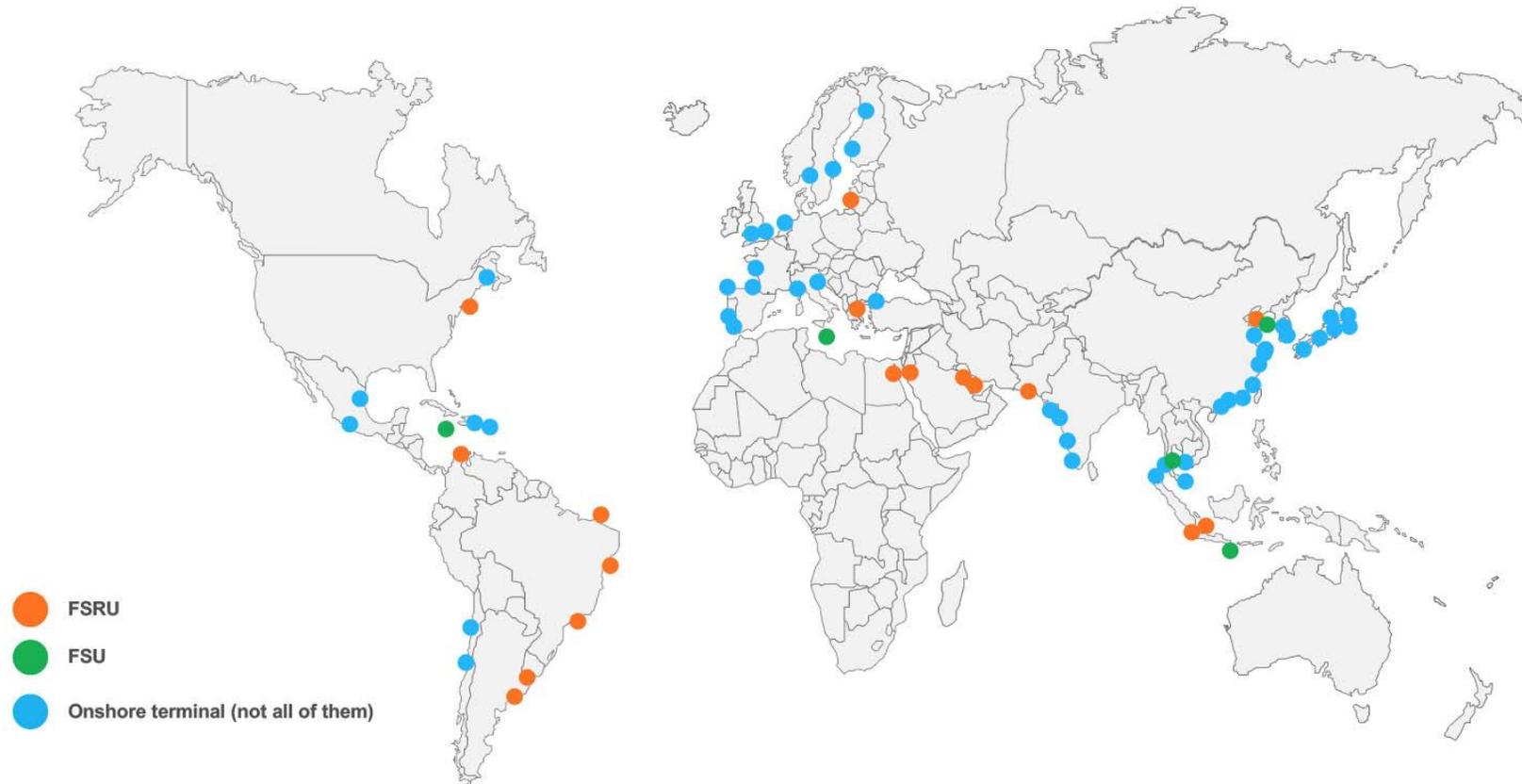
# International H2 & NH3 Market: Where is the **existing infrastructure** located?

Global distribution of existing Ammonia Export & Import Ports



# International H2 & NH3 Market: Where is the **existing infrastructure** located?

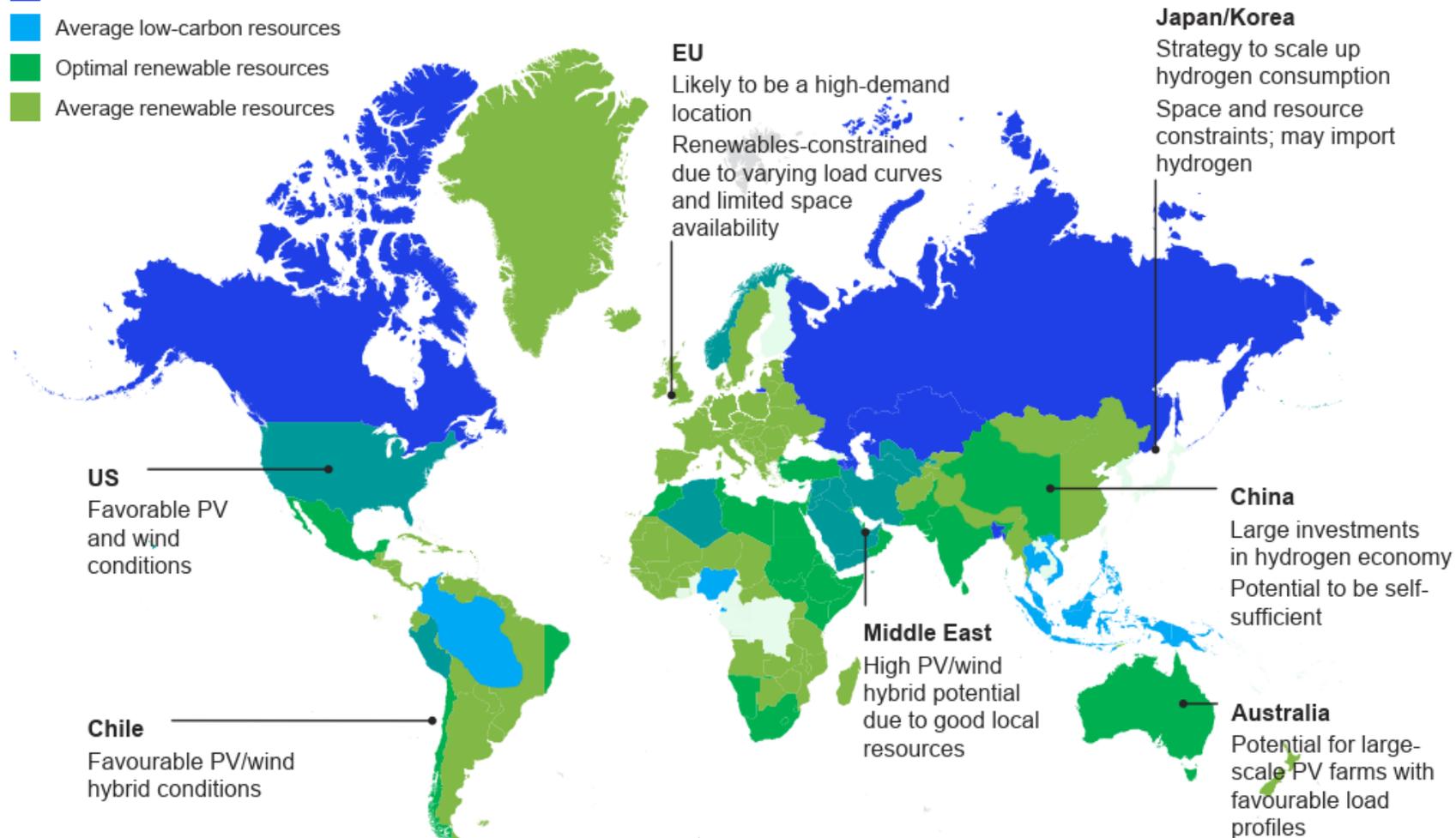
LNG terminals worldwide



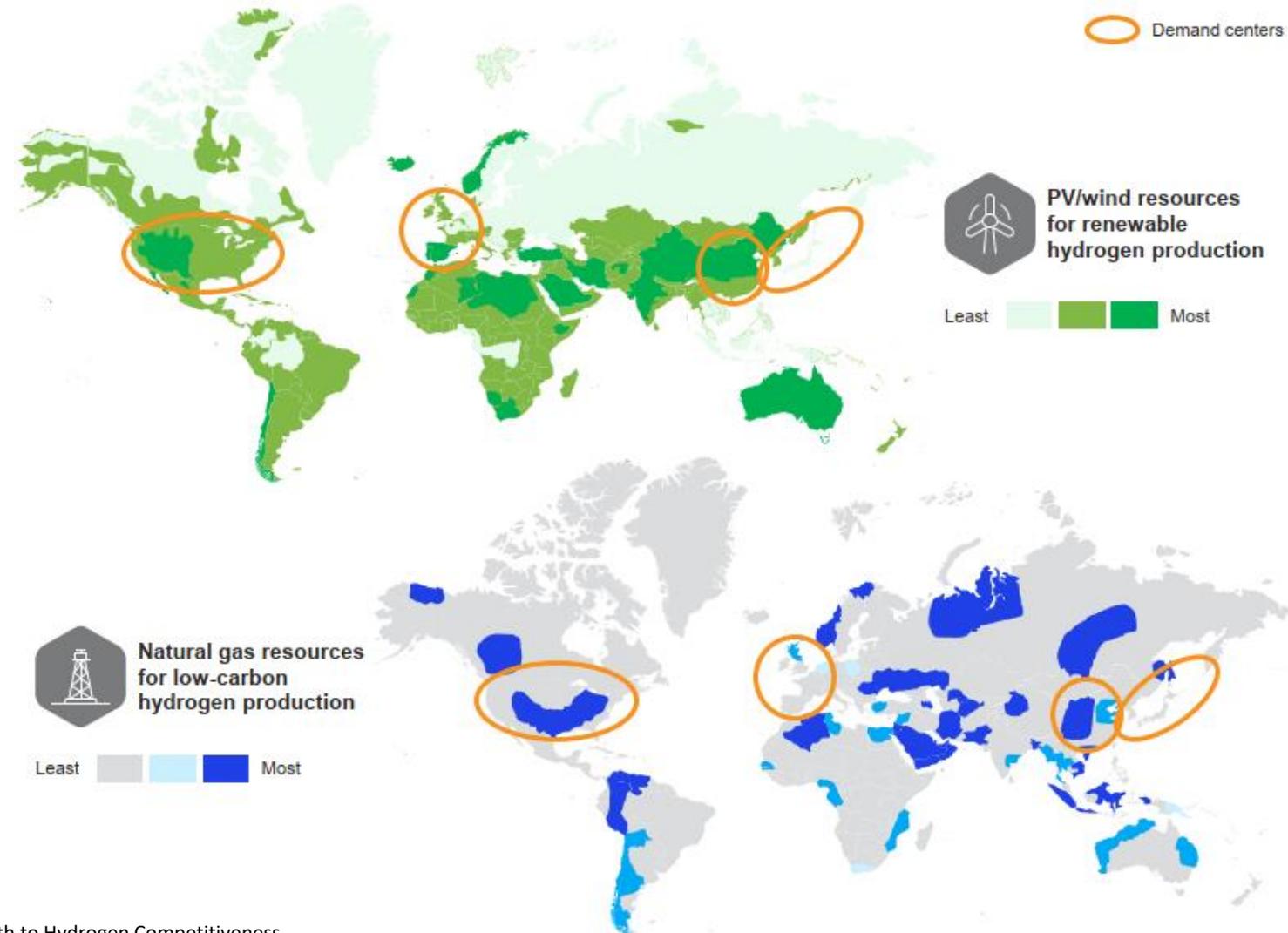
# International H2 & NH3 Market: Where are going the **production hubs** to be located?

- Optimal renewable and low-carbon resources
- Optimal low-carbon resources
- Average low-carbon resources
- Optimal renewable resources
- Average renewable resources

## Hydrogen production potential across regions



# International H2 & NH3 Market: What **countries will export H2 and/or NH3?**

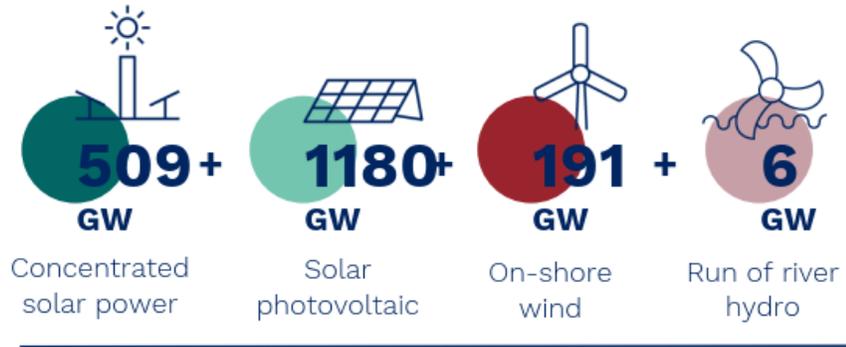


# International H2 & NH3 Market: Chile as a **Renewable H2 & NH3 Exporter**



# International H2 & NH3 Market: Chile as a **Renewable H2 & NH3 Exporter**

## A country rich in the energies of the future



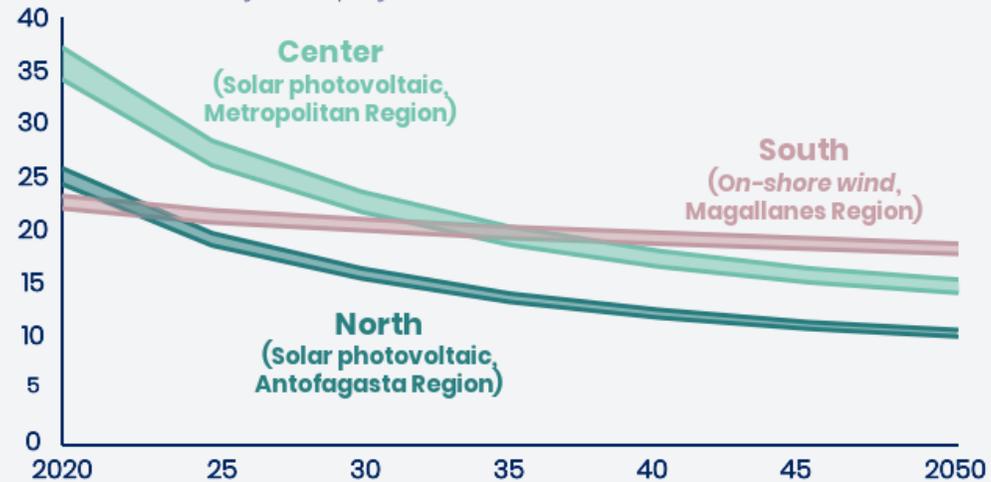
**1.800+ GW**

**of renewable energy potential amounts to 70 times current installed capacity**

The solar and wind power sectors are quickly maturing. In the past 6 years, Chile has increased the generation capacity from these sources five-fold and, by 2030, 70% of the power grid is expected to be renewable. The increasing investment in these energies, as well as in energy storage and transmission infrastructure, is a clear indicator of a decisive transition to a more sustainable power system.

## Levelized cost of renewable electricity (USD/MWh)

Source: McKinsey & Company.



**The most powerful solar radiation on the planet is found in Chile's North.**

Capacity factors of 35% can be achieved in monofacial solar photovoltaic plants with 1-axis tracking.



**Solar generation in the central part of Chile is already more competitive than fossil-powered electricity generation.**

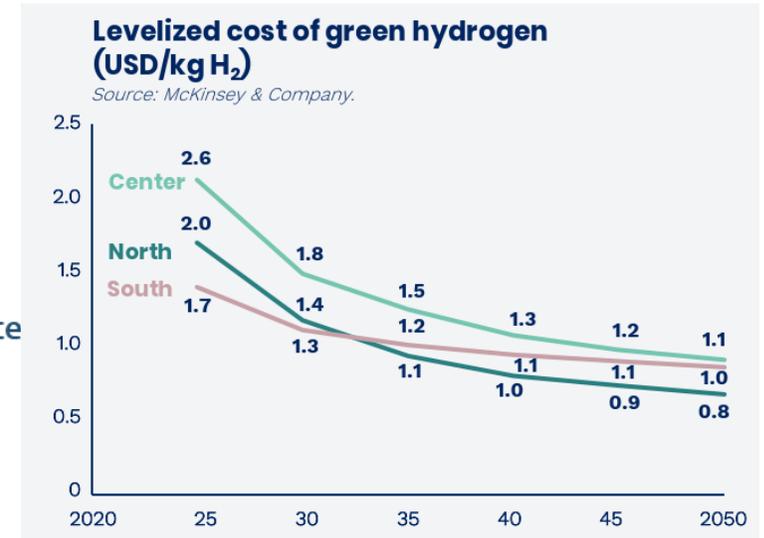
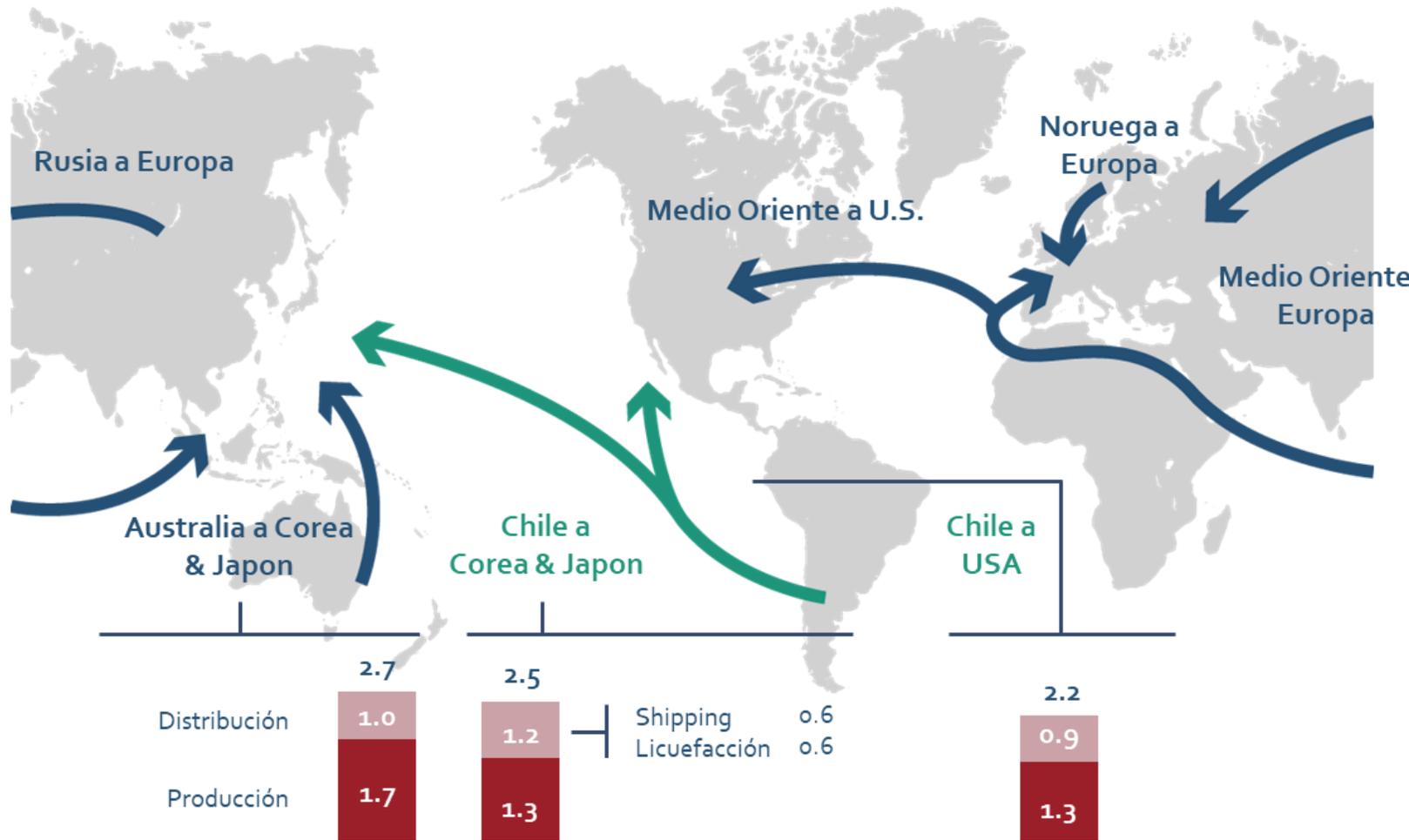
This renewable potential is located close to large consumption centers, gas grids, and logistical hubs, such as ports and distribution centers.



**Winds in the far South end of the country blow with the same power on land as off-shore.**

120-meter-high wind turbines are able to achieve capacity factors of over 60% on-shore, equivalent to off-shore performance in other countries.

# International H2 & NH3 Market: Chile as a **Renewable H2 & NH3 Exporter**

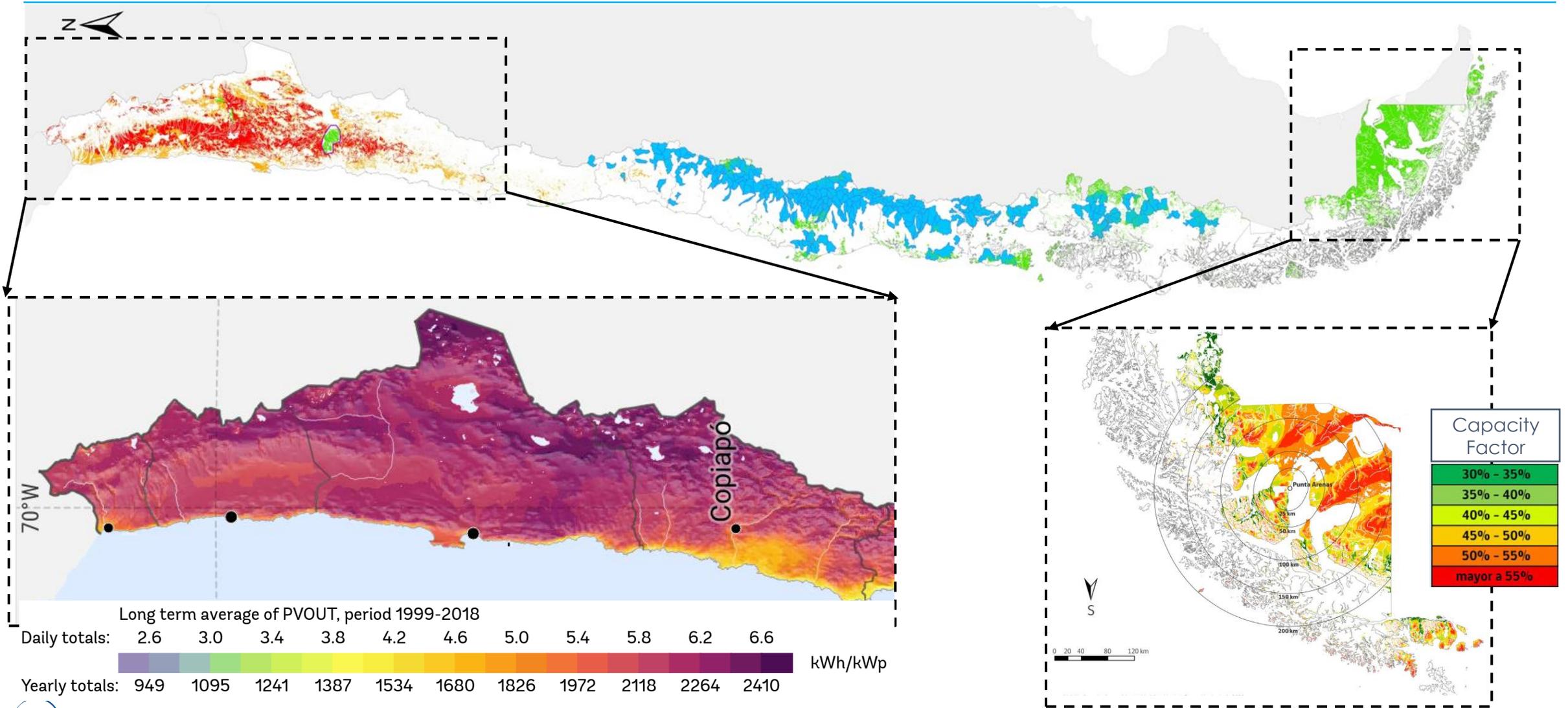


Green hydrogen produced in the Atacama Desert and in the Magallanes Region will achieve the lowest levelized cost of production\* on the planet by 2030. The quality and abundance of the renewable resources found in these regions will enable a large-scale competitive production.

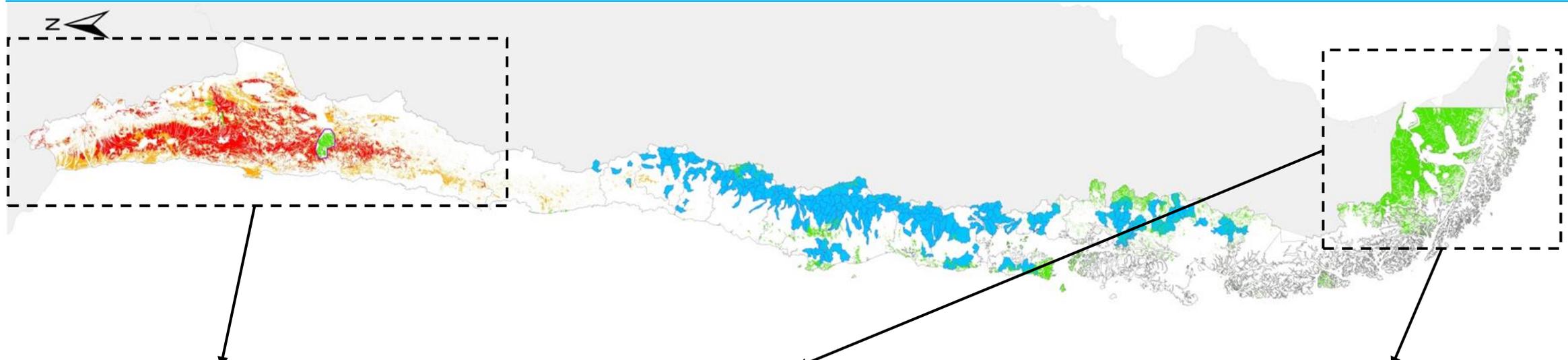
\*Does not consider compression, transport, and distribution costs, which vary according to the end-use of hydrogen.

Source: McKinsey & Company.

# International H2 & NH3 Market: Chile as a **Renewable H2 & NH3 Exporter**



# International H2 & NH3 Market: Ongoing **H2 and NH3 Projects** in Chile



Green Hydrogen for Ammonium Nitrate

<https://www.engie.cl/enaex-engie-la-transicion-hacia-el-cero-carbono-en-la-mineria-chilena/>



Green Hydrogen for Ammonia Export

<https://www.austriaenergy.com/docs/hnh-energy-project/>

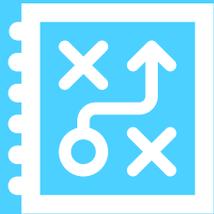


Green Hydrogen for eFuels

<https://www.hif.cl>



# OUR CONSULTING SERVICES



## STRATEGIC ADVICE

- Go-to-market & entry strategies
- Market studies
- Roadmaps
- Strategic alliances
- Value chain analysis.
- Alliances & competition



## M&A AND INVESTMENT SUPPORT

- Merge & Acquisitions
- Investment strategies
- Strategic due diligence
- Technical due diligence
- Market due diligence
- Business plans
- Public funding



## POLICY AND REGULATORY SUPPORT

- Economic studies
- Impact analysis ex-ante & ex-post
- Analysis of regulatory frameworks
- Workshops & Trainings



## PROJECT DEVELOPMENT ASSISTANCE

- Techno-economic (pre) feasibility studies
- Business case analysis
- Project finance
- Consortium support & management
- PMO

# CONTACT US



**Hans KULENKAMPFF**

**Manager Chile**

[hans.kulenkampff@hincio.com](mailto:hans.kulenkampff@hincio.com)

