



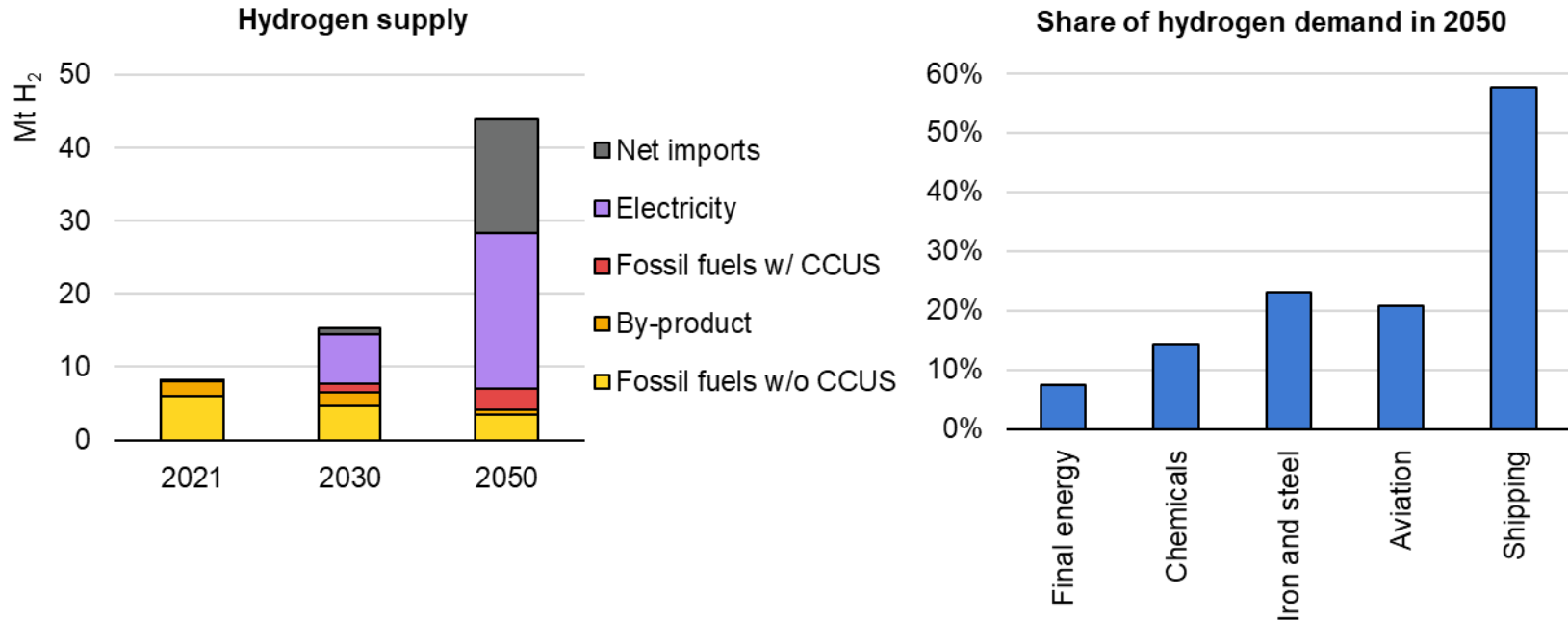
Potentials and limitations of hydrogen in the decarbonisation of the European energy system

Dr. Timur Gül, Chief Energy Technology Officer, IEA

6th Franco-German Energy Forum, 11 October 2023

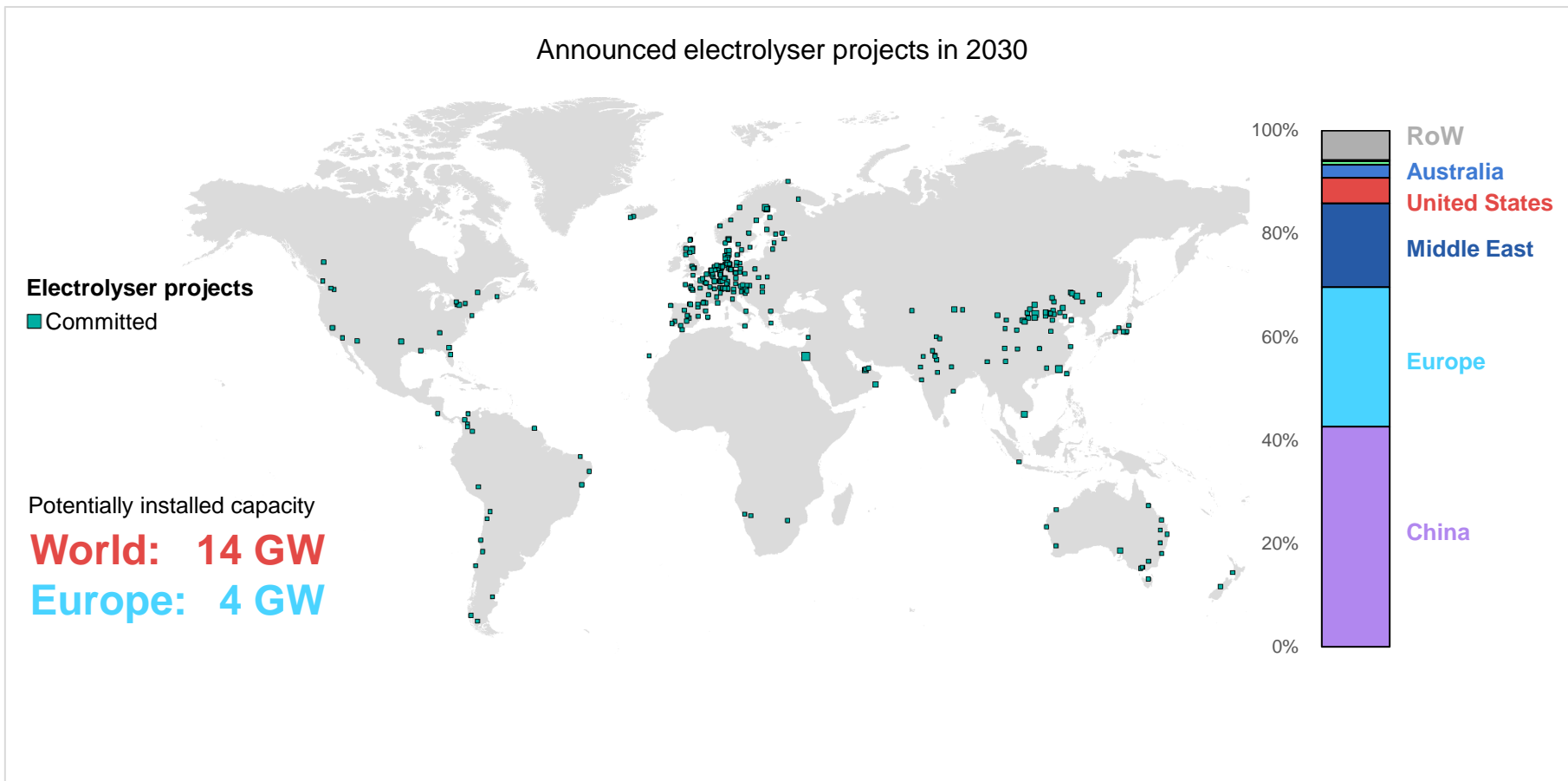
Role of hydrogen in decarbonising the European energy sector

Hydrogen supply and demand shares in Europe in the Announced Pledges Scenario

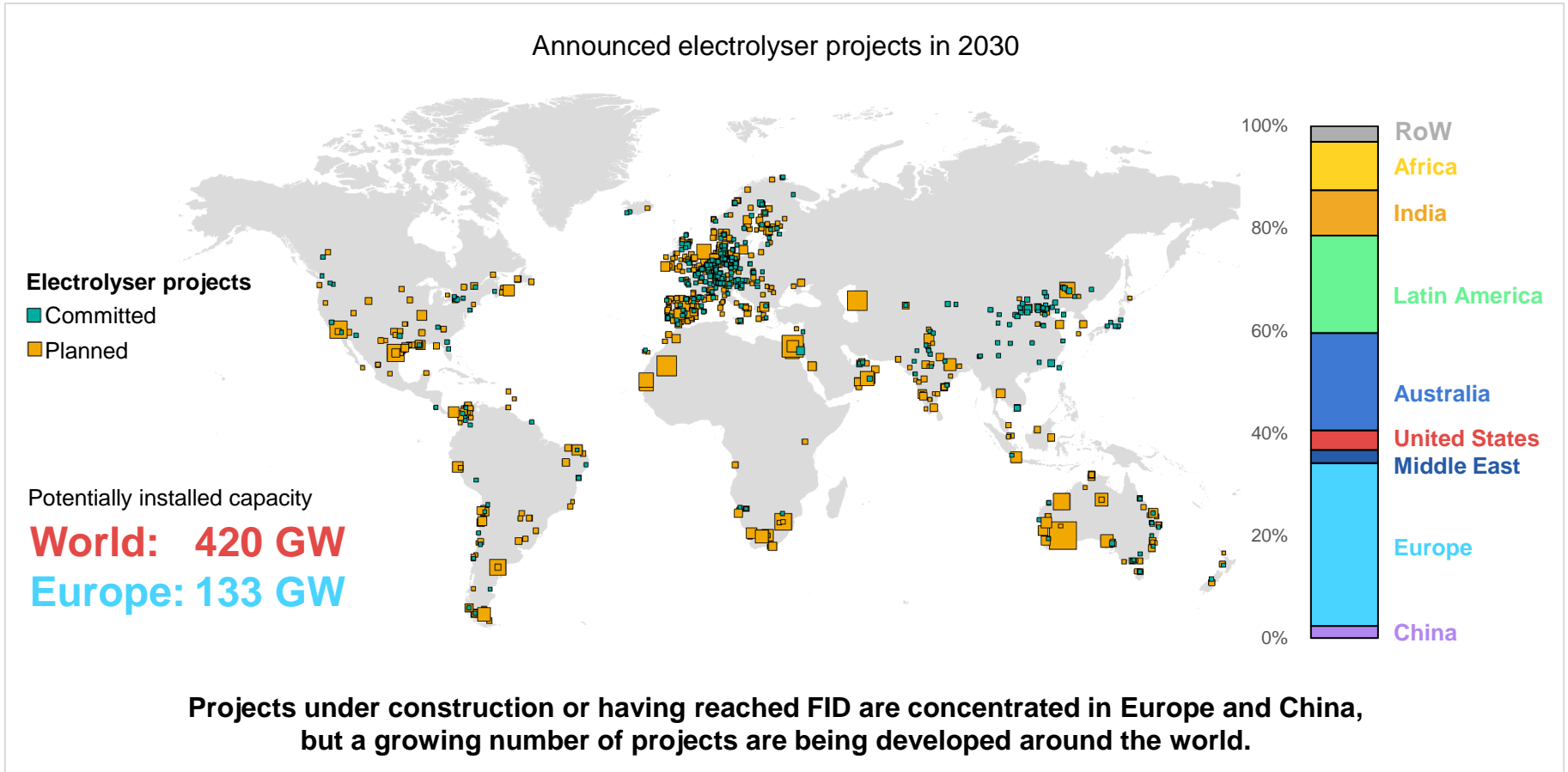


Hydrogen covers around 7% of total final energy demand in Europe in 2050 and plays an important role in decarbonising long-distance transport and heavy industry.

Geographical diversity of electrolyser projects is increasing

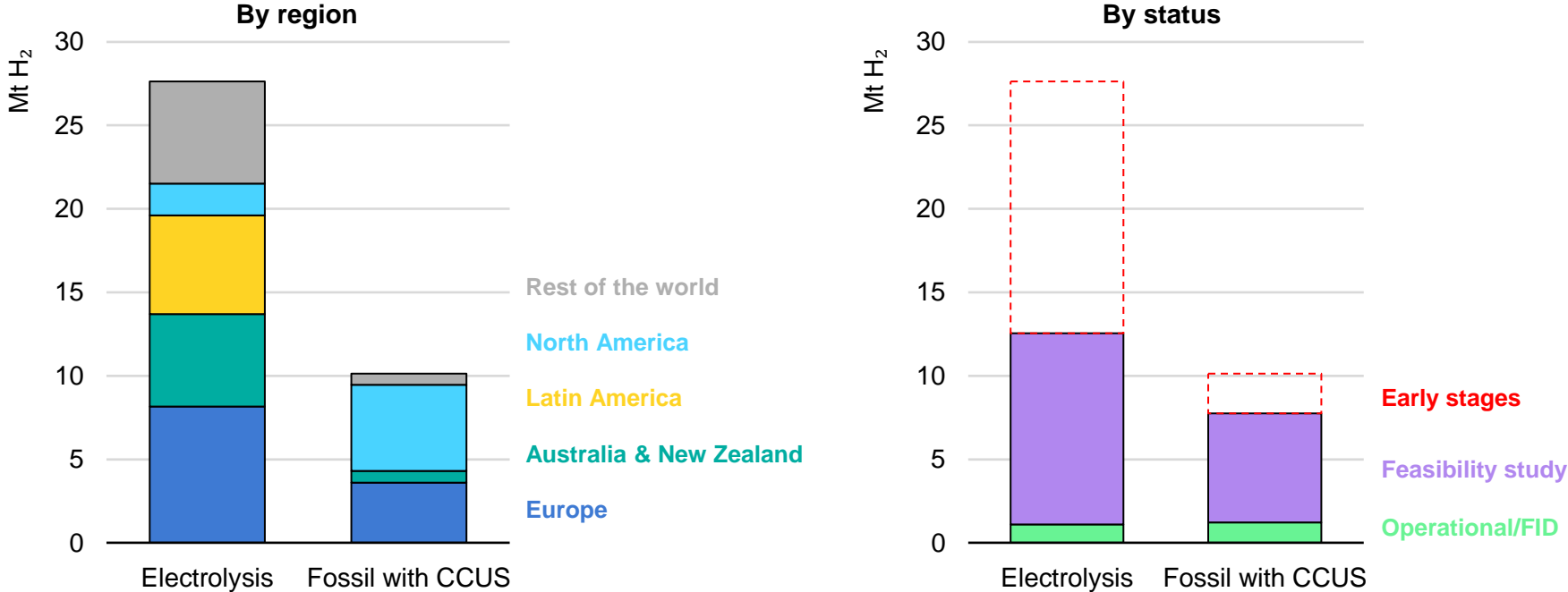


Geographical diversity of electrolyser projects is increasing



Production routes are evolving differently

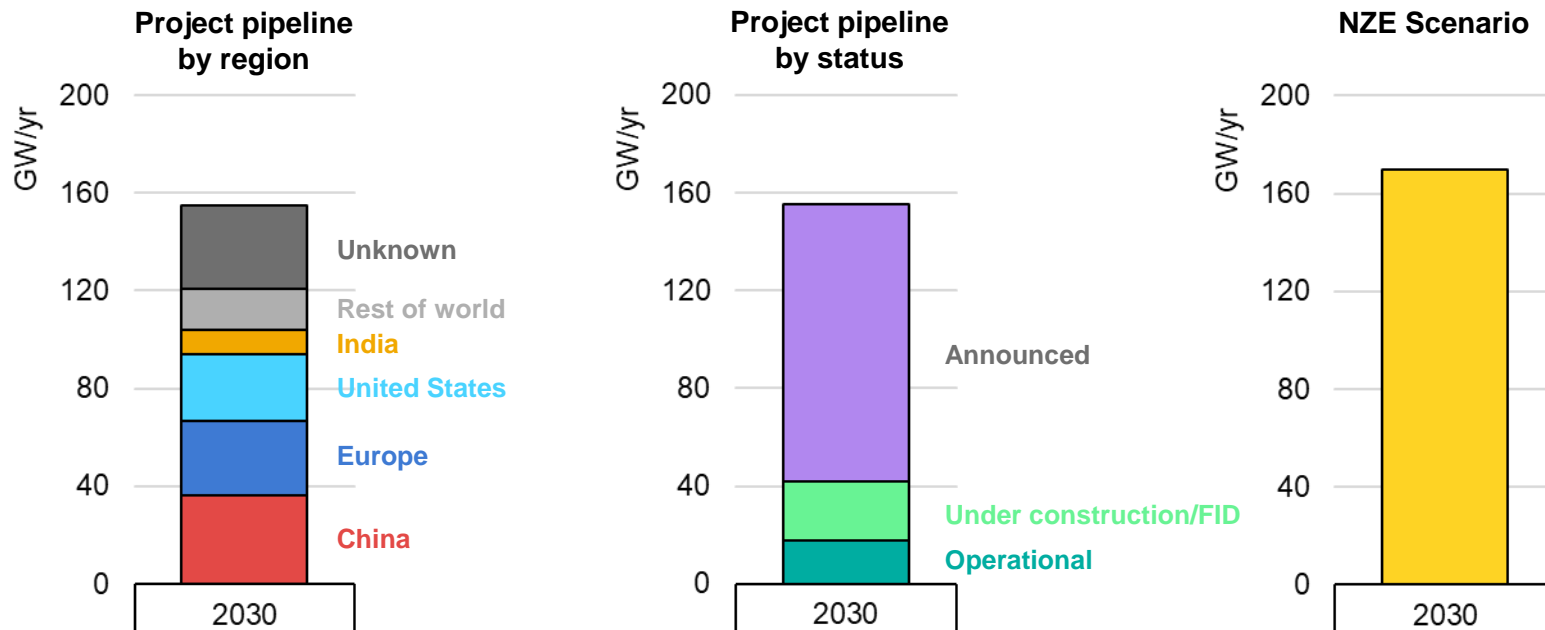
Low-emission hydrogen production in 2030 based on announced projects



Announced low-emission hydrogen projects of 38 Mt could meet government targets to produce 35 Mt by 2030. However, only 4% have reached final investment decision or are under construction.

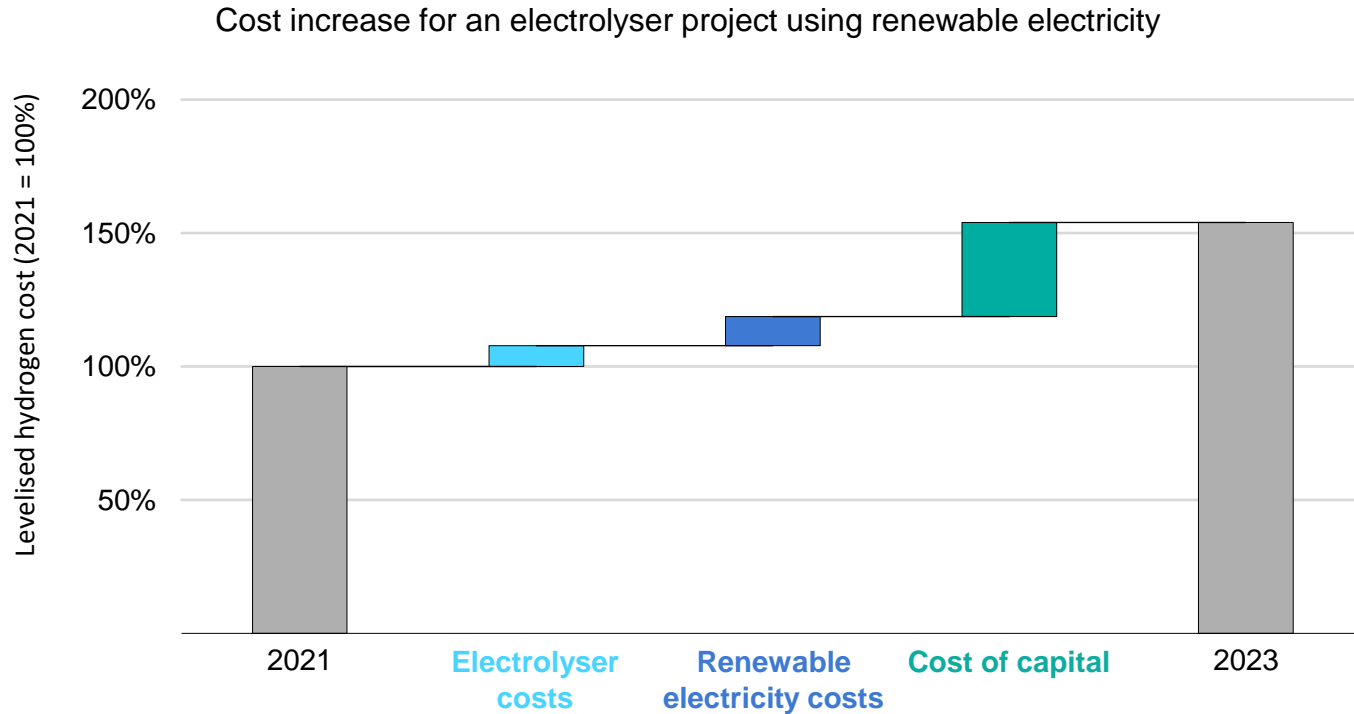
The supply chain for electrolyser manufacturing is scaling up

Electrolyser manufacturing capacity by region and status based on announced projects and in the NZE Scenario, 2030



Today China accounts for around half of global manufacturing capacity of almost 20 GW, but based on announced projects its share could decline to a quarter by 2030 due ramp up in other parts of the world, including Europe.

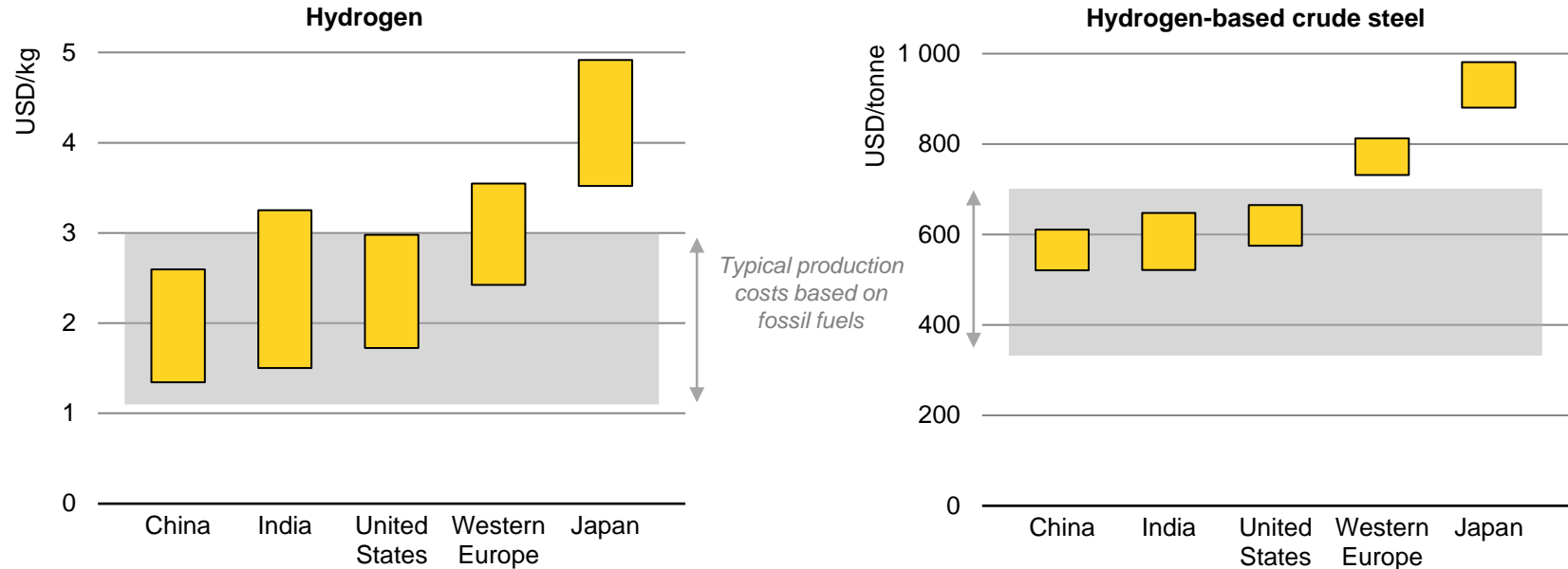
Costs for low-emission hydrogen projects are increasing



Inflation is having a strong impact on the costs of hydrogen production from proposed electrolyser projects, potentially impacting the economics of projects under development and delaying investment decisions.

Competitiveness is a key consideration for industrial strategies

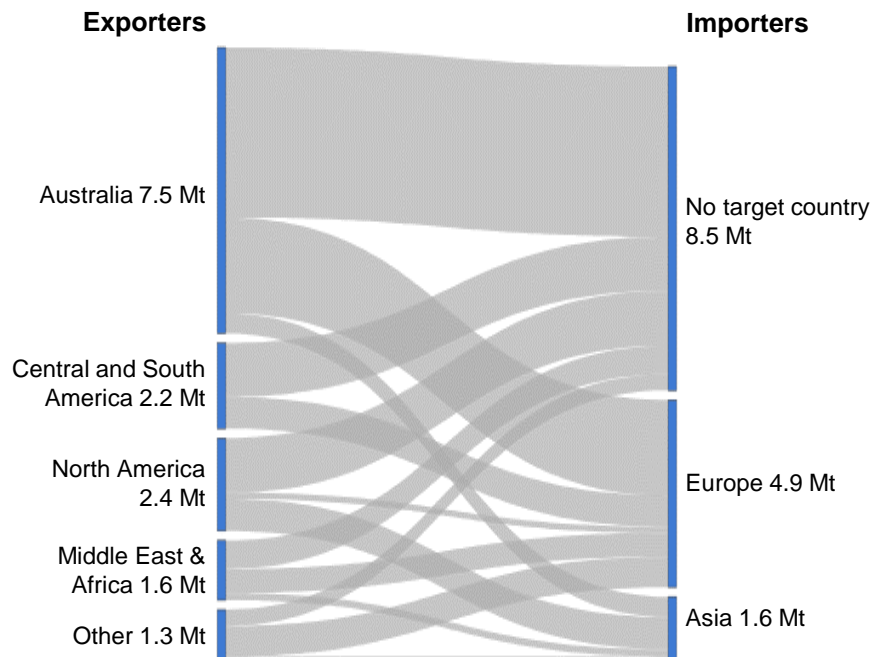
Production costs using electrolysis and variable renewables in the Announced Pledges Scenario, 2030



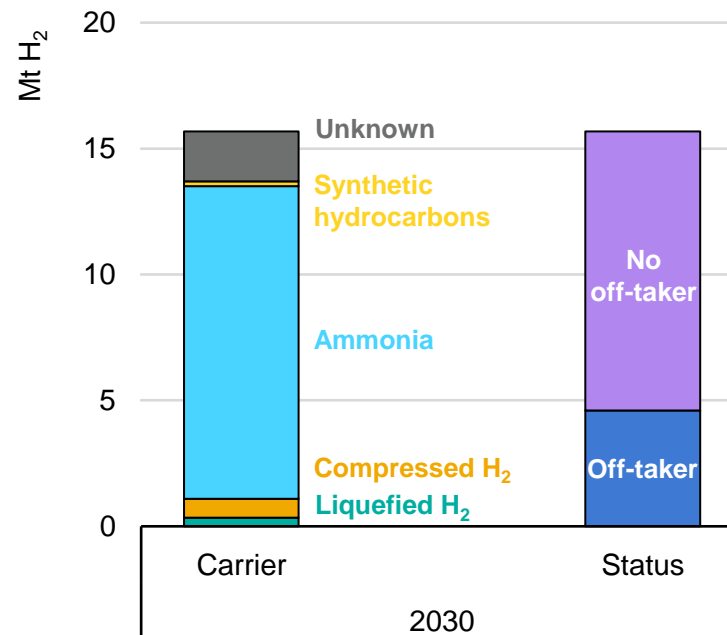
Climate goals and innovation policy are driving new project announcements for energy intensive commodities, but persistent cost competitiveness gaps indicate the need for strategic partnerships and international collaboration.

Interest in hydrogen trade is growing, but barriers remain

Announced low-emission hydrogen trade flows in 2030



Low-emission hydrogen trade



Planned hydrogen exports could reach 16 Mt by 2030, though almost all projects are at early stages and less than one-third have identified a potential off-taker.

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