

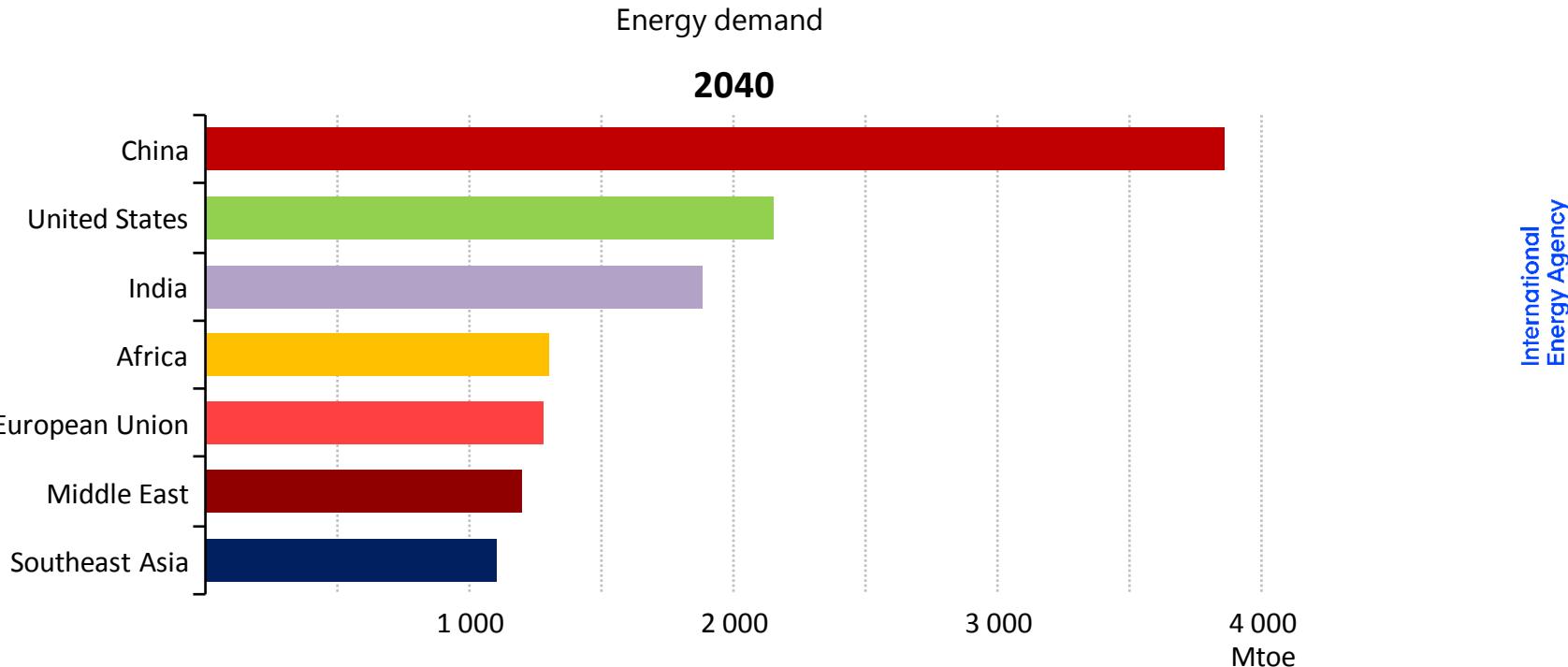


Sector coupling and the hydrogen opportunity

Dr. Timur Gül, Head Energy Technology Policy Division, IEA

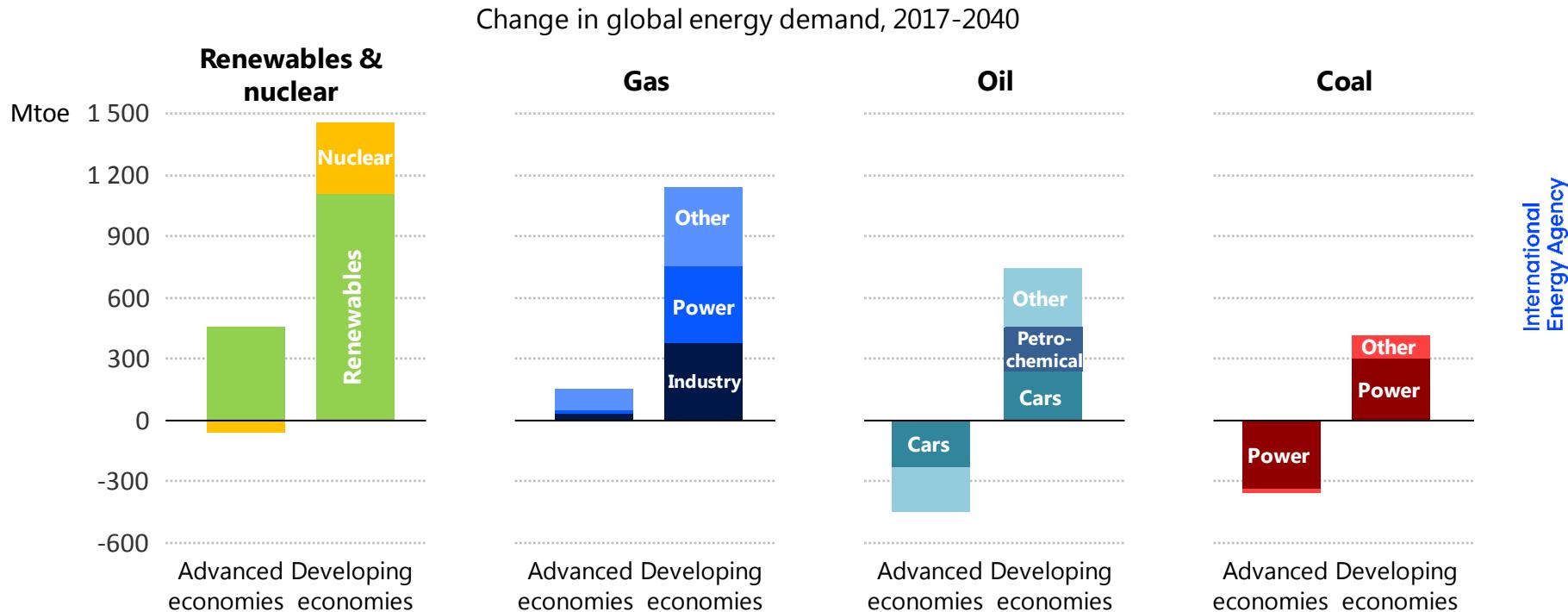
Austria, 18 September 2019

The new geography of energy



In 2000, more than 40% of global demand was in Europe & North America and some 20% in developing economies in Asia. By 2040, this situation is completely reversed.

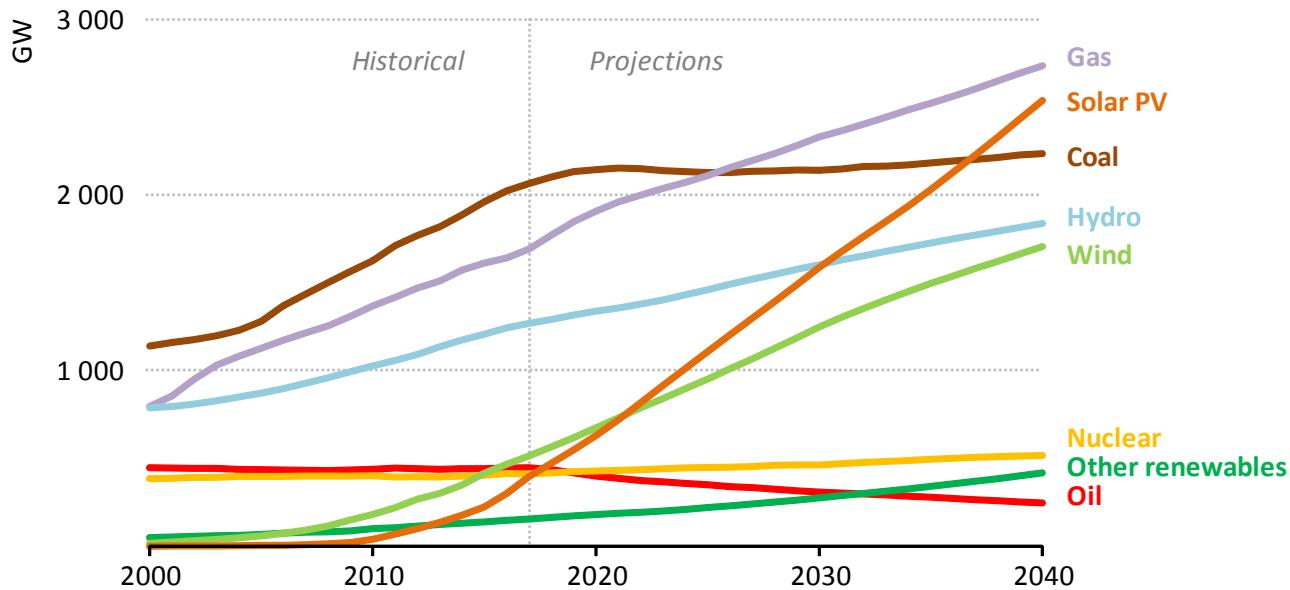
Fuelling the demand for energy



The increase in demand would be twice as large without continued improvements in energy efficiency, a powerful tool to address energy security & sustainability concerns

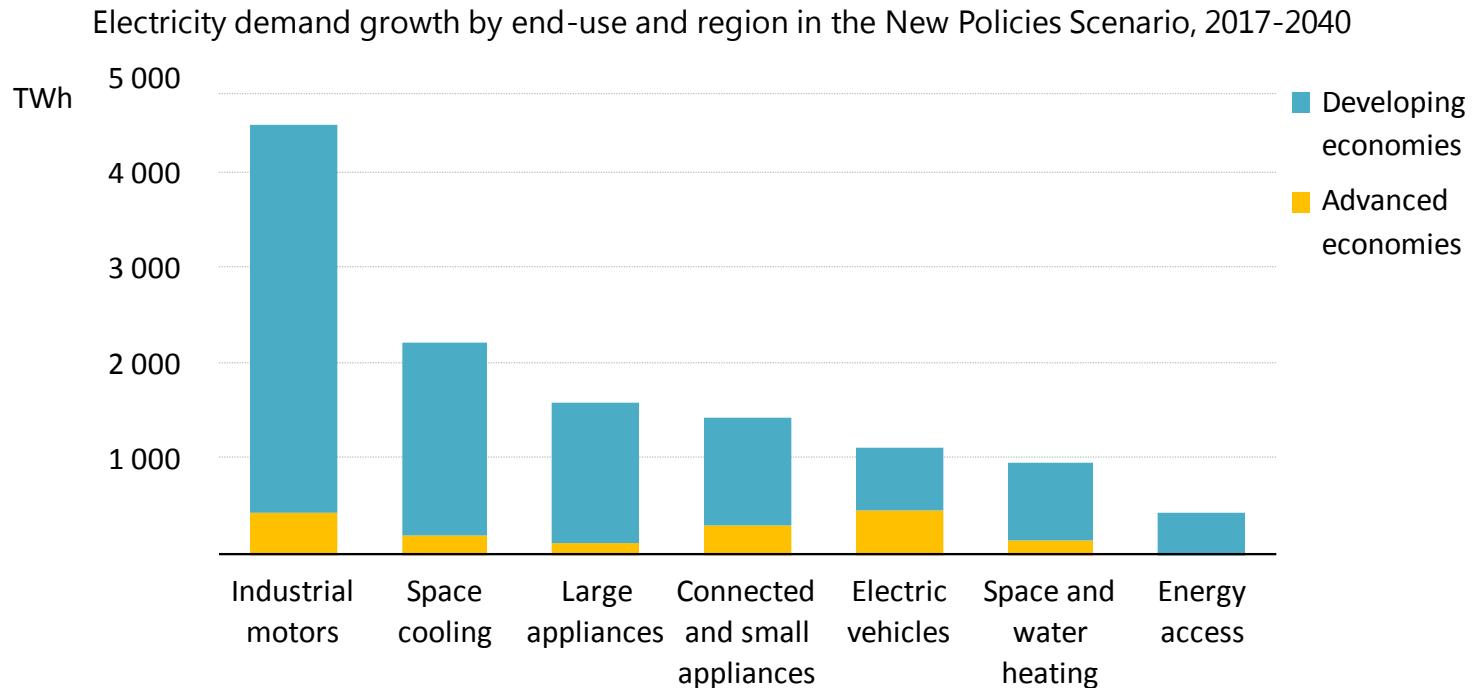
A power sector in transformation

Installed global power generation capacity by source in the New Policies Scenario



Renewables make up two-thirds of all capacity additions worldwide to 2040, capturing 70% of power plant investment

Electricity use is growing in many areas



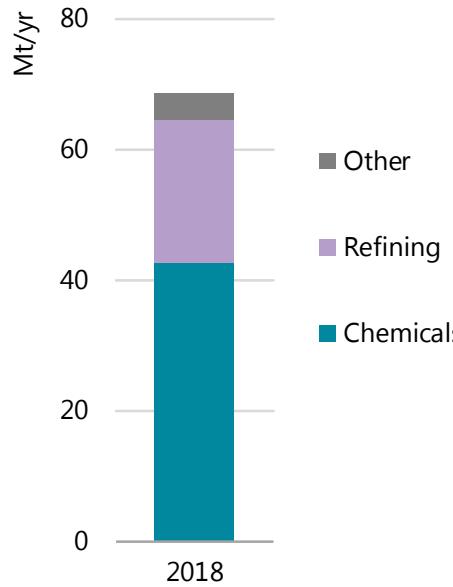
Industrial motors account for a third of the world's appetite for increased electricity while providing electricity access to an additional 680 million people accounts for only 3%

Hydrogen – A common element of our energy future?

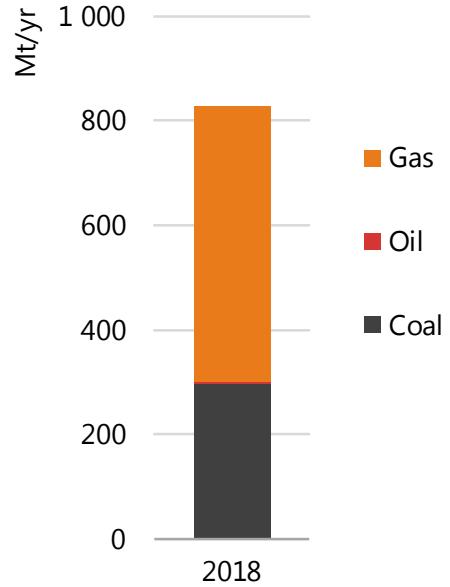
- Momentum currently behind hydrogen is unprecedented, with more and more policies, projects and plans by governments & companies in all parts of the world
- Hydrogen can help overcome many difficult energy challenges
 - **Integrate more renewables**, including by enhancing storage options & tapping their full potential
 - **Decarbonize hard-to-abate sectors** – steel, chemicals, trucks, ships & planes
 - **Enhance energy security** by diversifying the fuel mix & providing flexibility to balance grids
- But there are challenges: **costs** need to fall; **infrastructure** needs to be developed; **cleaner hydrogen** is needed; and **regulatory barriers** persist

Hydrogen is already part of the energy mix

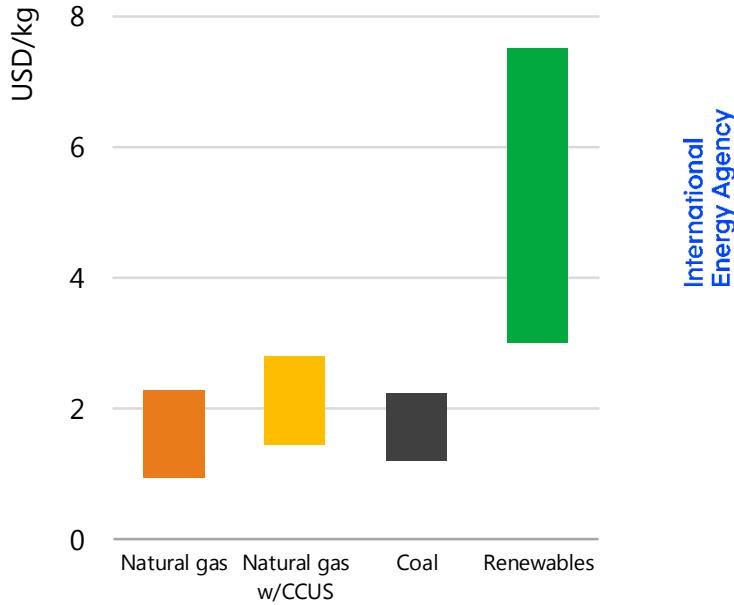
Hydrogen production



CO₂



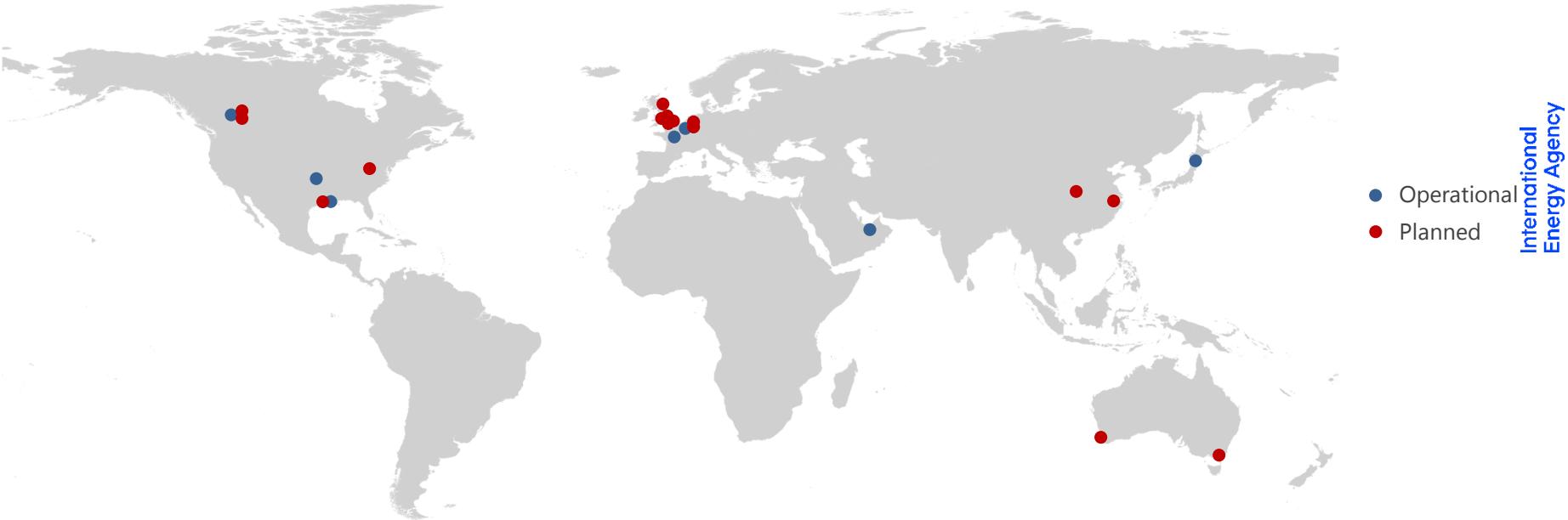
Hydrogen production costs, 2018



International Energy Agency

Dedicated hydrogen production is concentrated in very few sectors today, and virtually all of it is produced using fossil fuels, as a result of favourable economics.

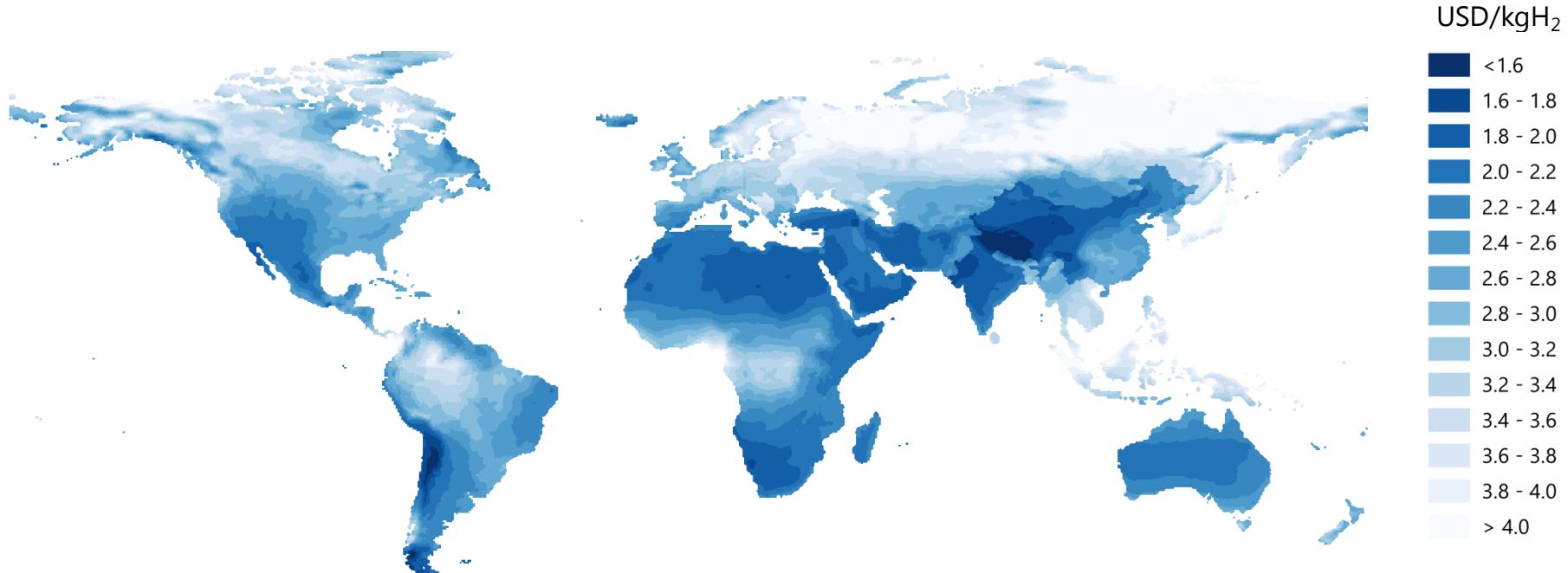
Hydrogen production with CO₂ capture is coming online



Low-carbon hydrogen from fossil fuels is produced at commercial scale today, with more plants planned. It is an opportunity to reduce emissions from refining and industry.

Renewables hydrogen costs are set to decline

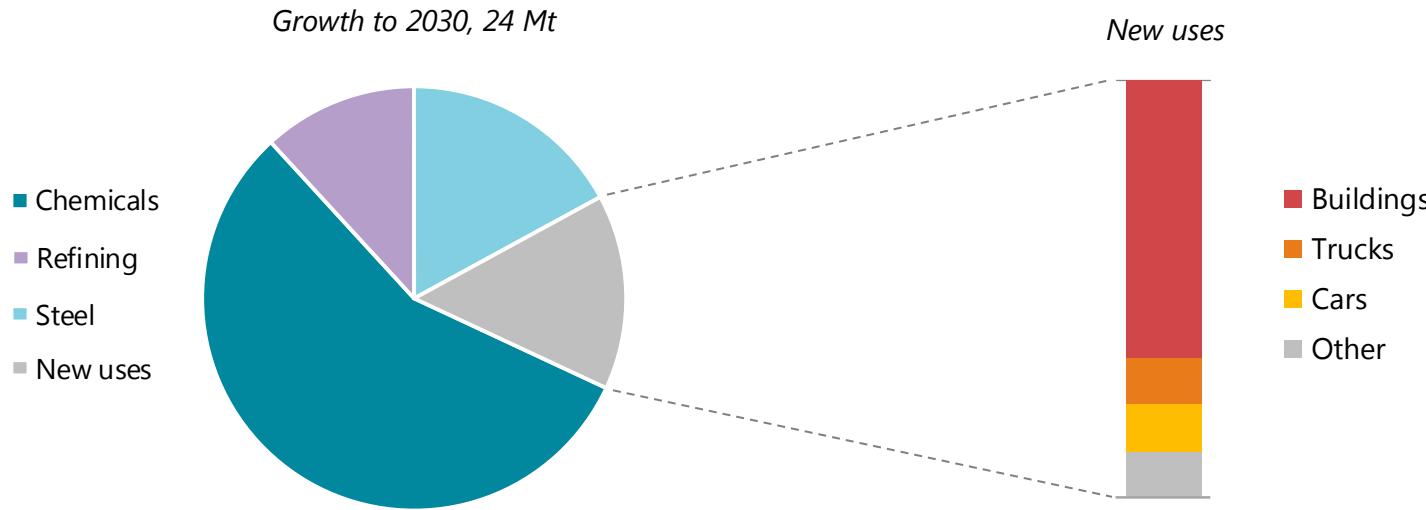
Long-term hydrogen production costs from solar & wind systems



The declining costs of solar PV and wind could make them a low-cost source for hydrogen production in regions with favourable resource conditions.

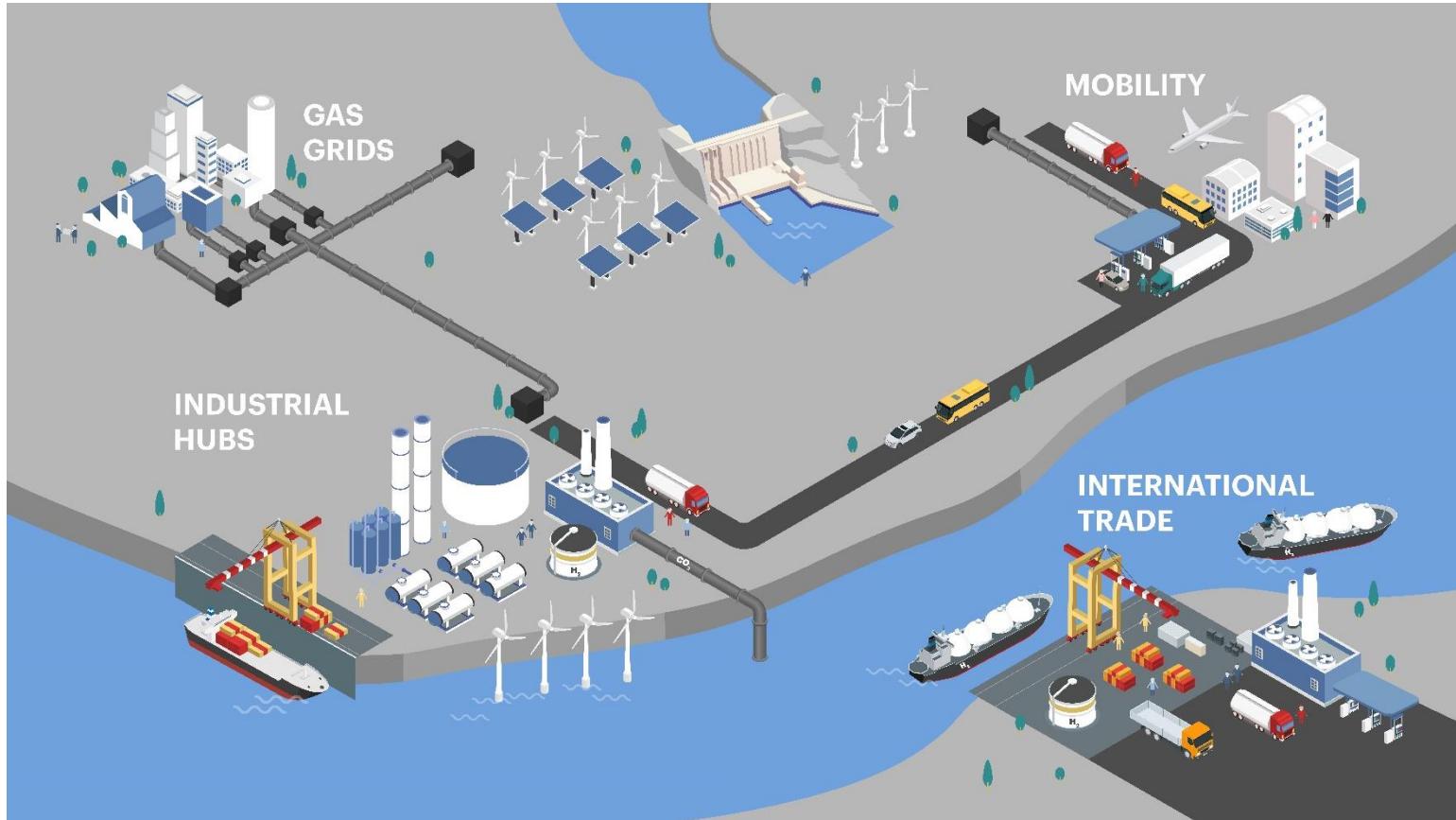
The challenge to 2030: expand hydrogen beyond existing applications

Growth in hydrogen use based on announced policies, 2018-2030



Dependable demand from current industrial applications can be used to boost clean hydrogen production; policies & industry targets suggest increasing use in other sectors, but ambition needs to increase.

Four key opportunities for scaling up hydrogen to 2030



iea

IMPRESSUM

**Energiekonferenz energy2050
„Bridging the Gap: Sektorenkopplung
Industrie-Verkehr-Energie“
18. bis 20. September 2019 in Hof bei Salzburg**

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September 2019

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