



Seizing the hydrogen opportunity

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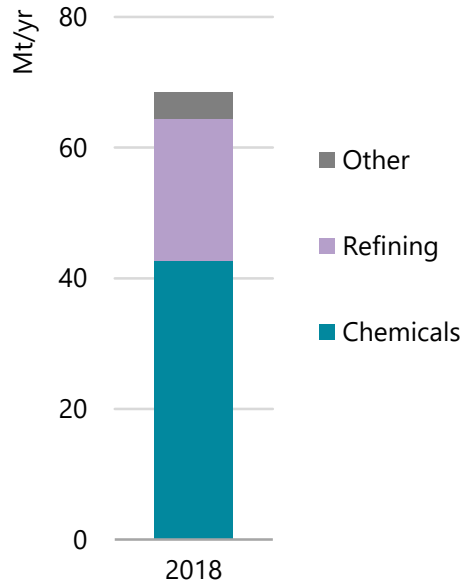
Hydrogen Energy Ministerial, Tokyo, 25 September 2019

Context

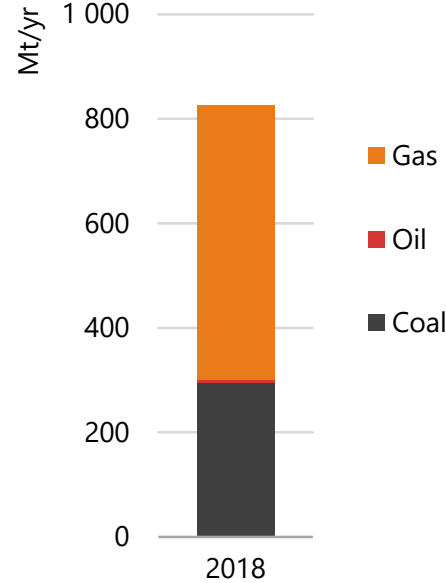
- Hydrogen momentum continued growing since the first Hydrogen Energy Ministerial; as announced then, the IEA released a major report on hydrogen to G20 on request of Japan
- Hydrogen can help overcome many difficult energy challenges
 - **Integrate more renewables**, including by enhancing storage options & tapping their full potential
 - **Decarbonise 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

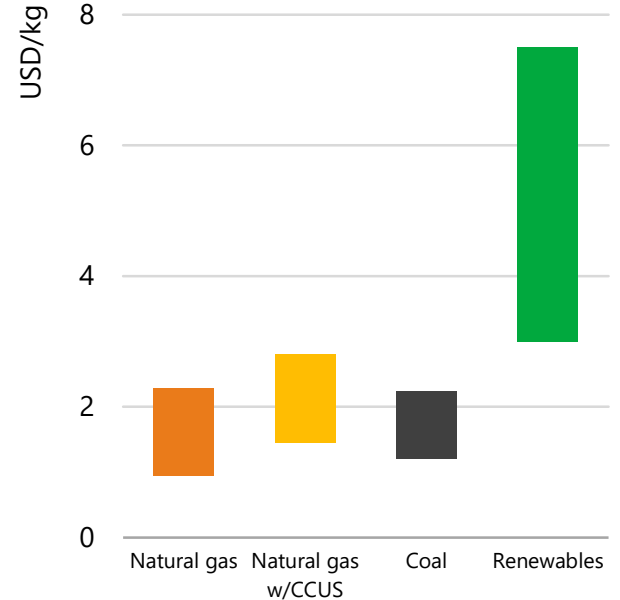
Hydrogen production



CO₂



Hydrogen production costs, 2018

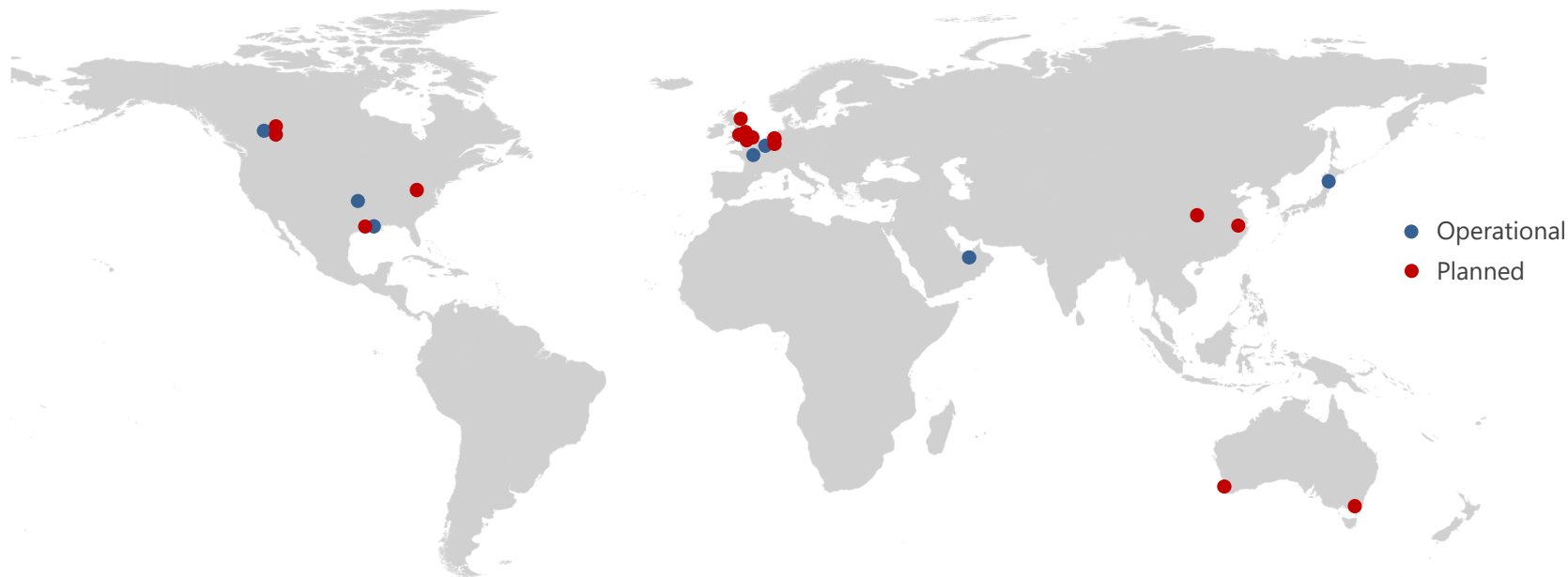


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Dedicated hydrogen production is concentrated in very few sectors today, and virtually all of it is produced using fossil fuels, as a result of favourable economics.

Hydrogen production with CO₂ capture is coming online

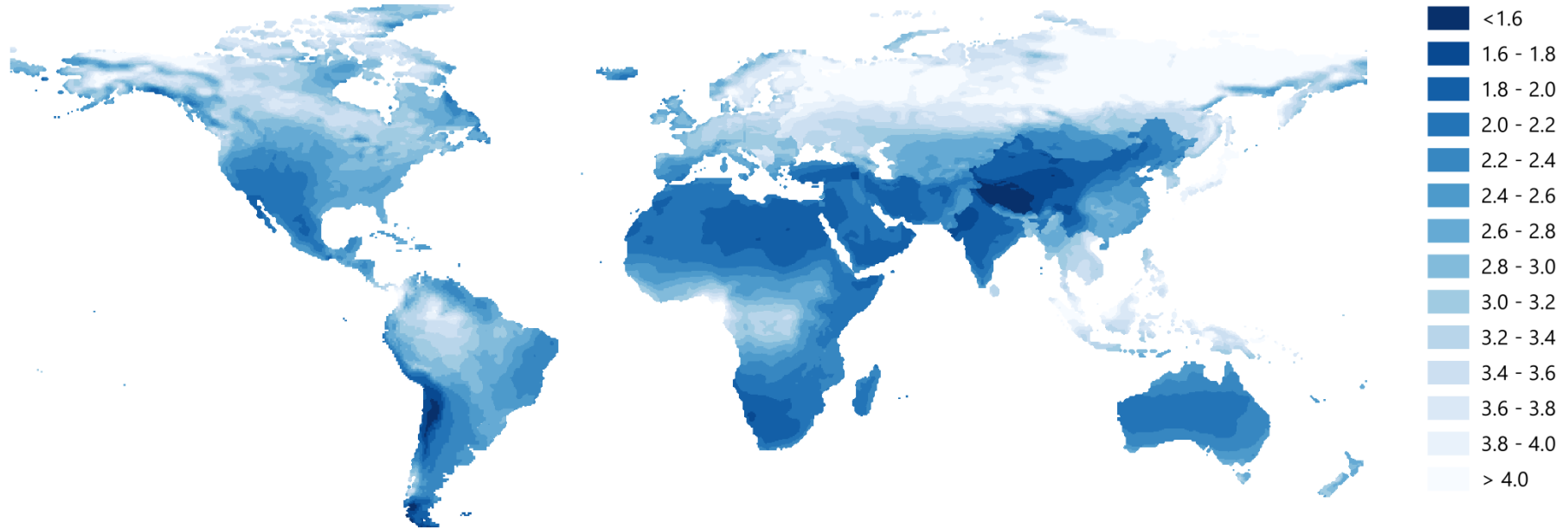
Facilities with hydrogen production and CCUS



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.

Four key opportunities for scaling up hydrogen to 2030



Conclusions

- The next 10 years are critical for commercialising hydrogen – the IEA's four near-term opportunities offer a springboard for wider deployment
- Establishing a role for hydrogen in long-term energy strategies and setting targets helps guide future expectations for industries and other stakeholders
- Costs of hydrogen production & use need to fall through economies of scale and R&D
- Critical role for governments to eliminate unnecessary regulatory barriers and harmonise standards to reduce hurdles for project development
- IEA will continue to lead the work on hydrogen with governments & industry, tracking progress towards deployment and assessing technology costs

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