

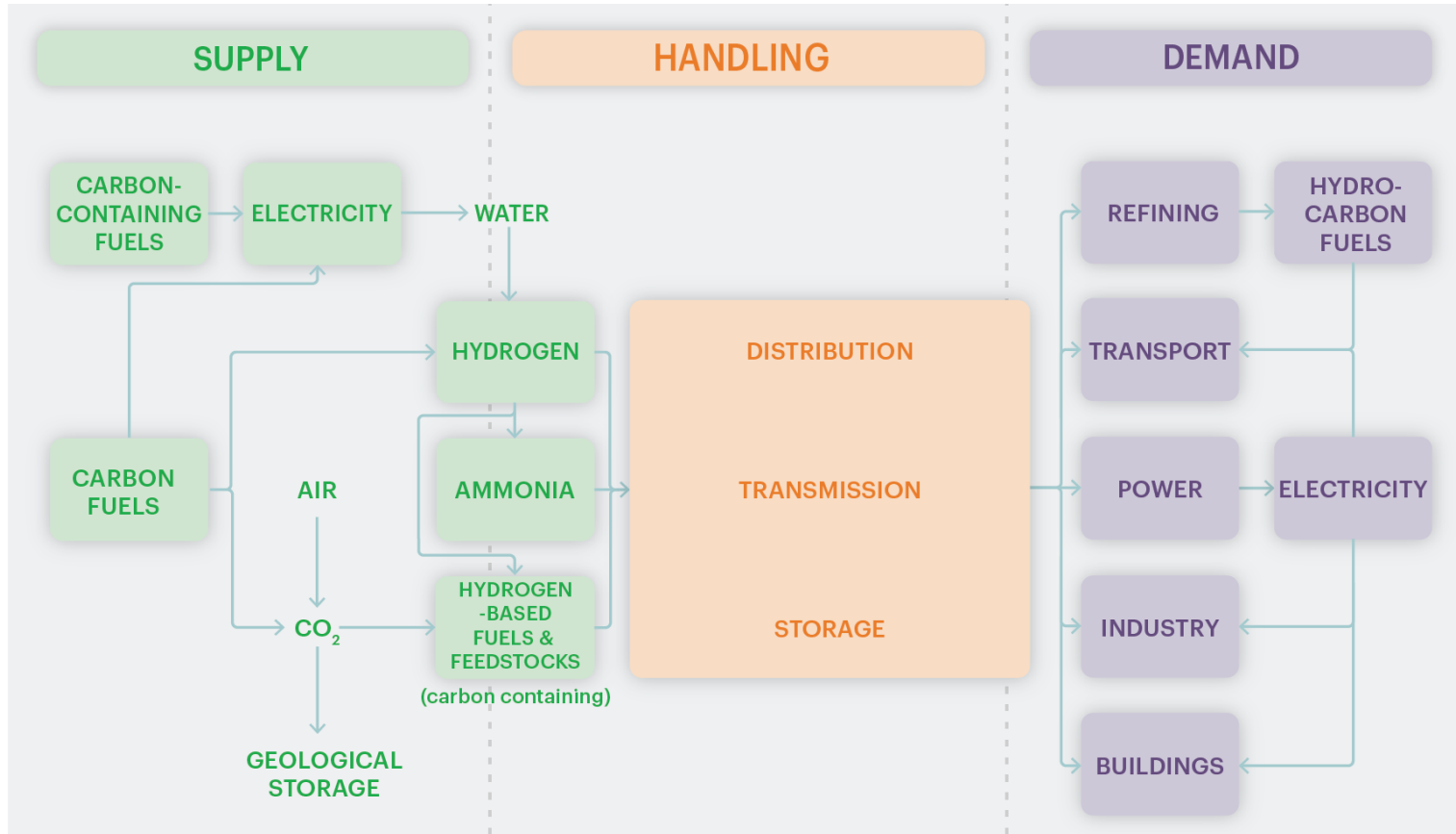


The Future of Hydrogen

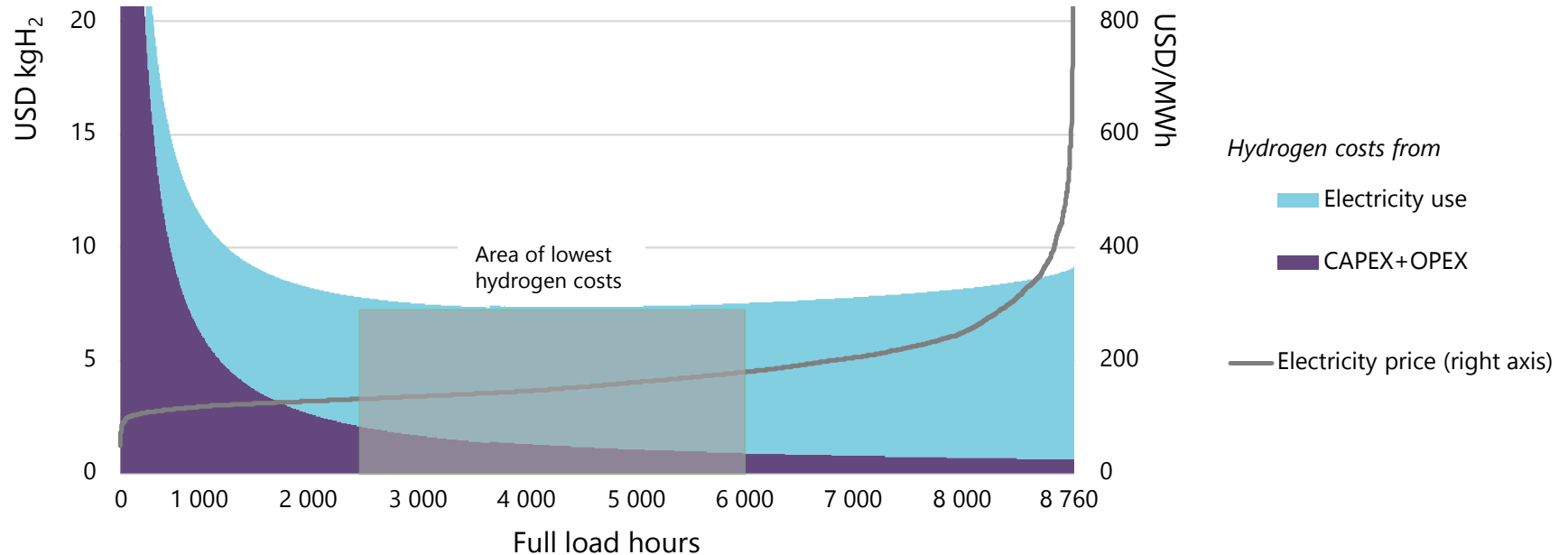
Uwe Remme, Energy Policy Division

Sixth Annual EPRI-IEA Challenges in Electricity Decarbonisation Expert Workshop
Paris, 18 October 2019

Many opportunities for hydrogen – which are most promising?



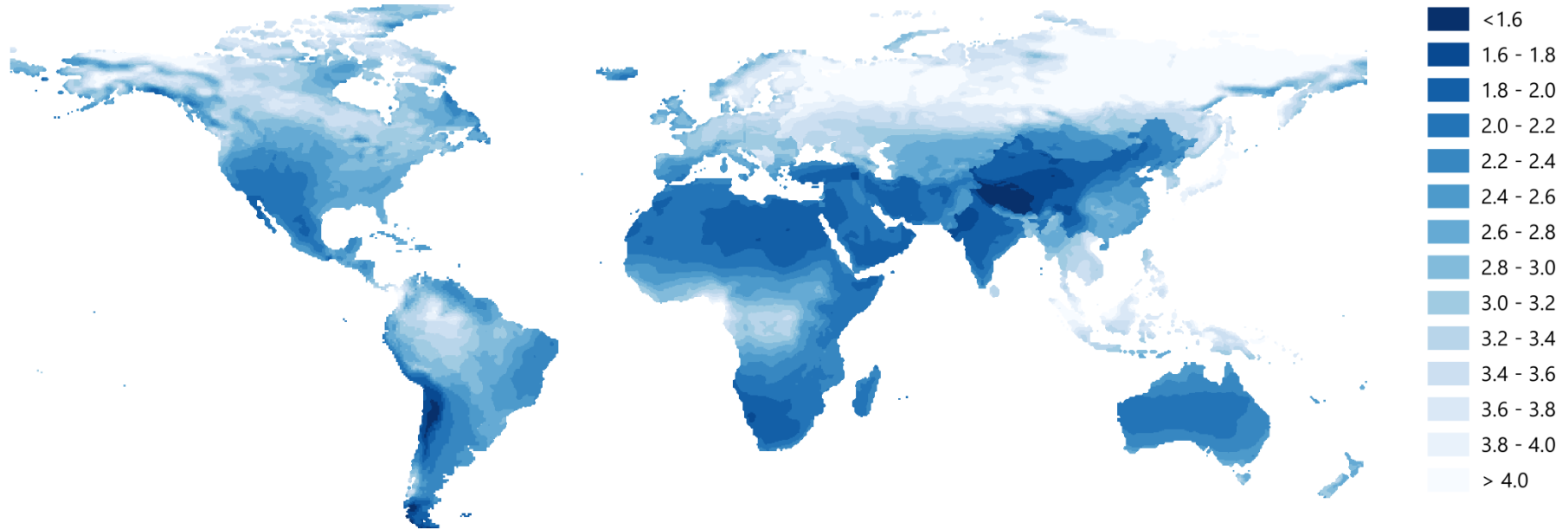
A sweet spot for electrolytic hydrogen production



Higher utilisation rates reduce the impact of CAPEX, but for grid-connected electrolyzers this means higher electricity prices; the lowest hydrogen costs are achieved in mid-load operation.

Renewables hydrogen costs are set to decline

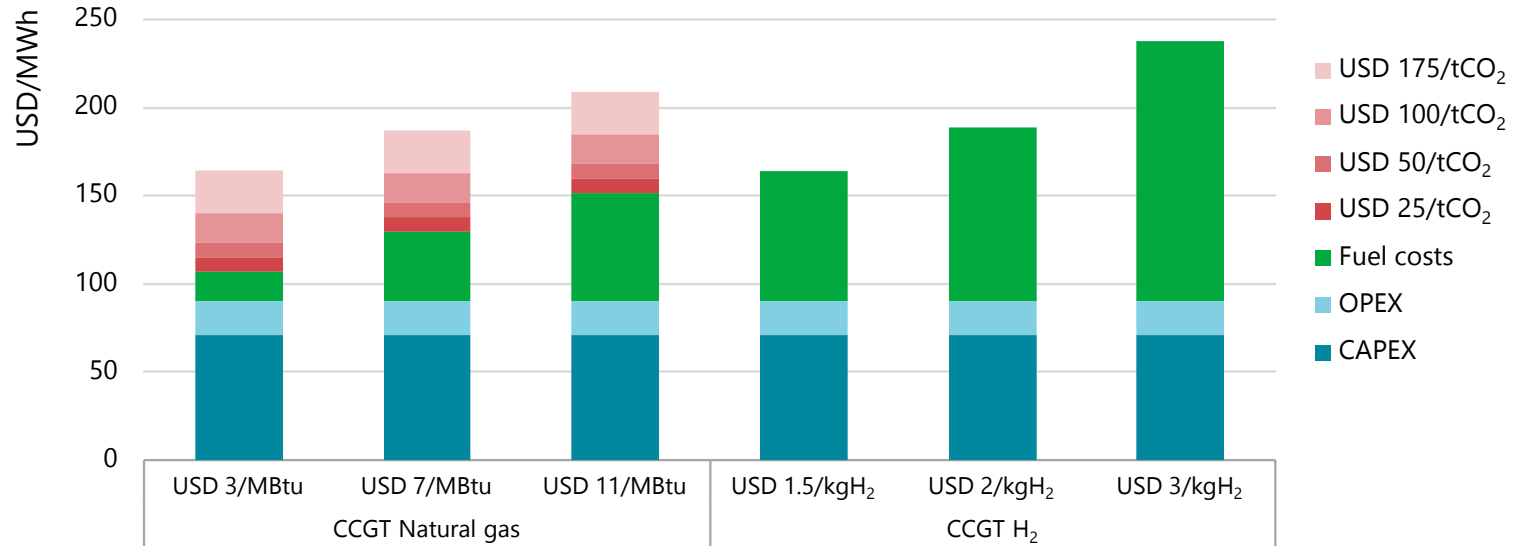
Long-term hydrogen production costs from solar & wind systems



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

Flexible power generation

Levelised cost of electricity generation at 15% load factor



Whether hydrogen-based power generation for load balancing can compete against natural gas depends on regional hydrogen, natural gas and CO₂ prices.

Hydrogen for large-scale and seasonal energy storage



Moss Bluff (Texas)
Salt cavern hydrogen
147 GWh

Ammonia storage tank
150 GWh storage capacity



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**Annual residential
electricity demand of a
city with a population
of 100,000 in Germany**

Hydrogen for large-scale and seasonal energy storage



Moss Bluff (Texas)
Salt cavern hydrogen
147 GWh

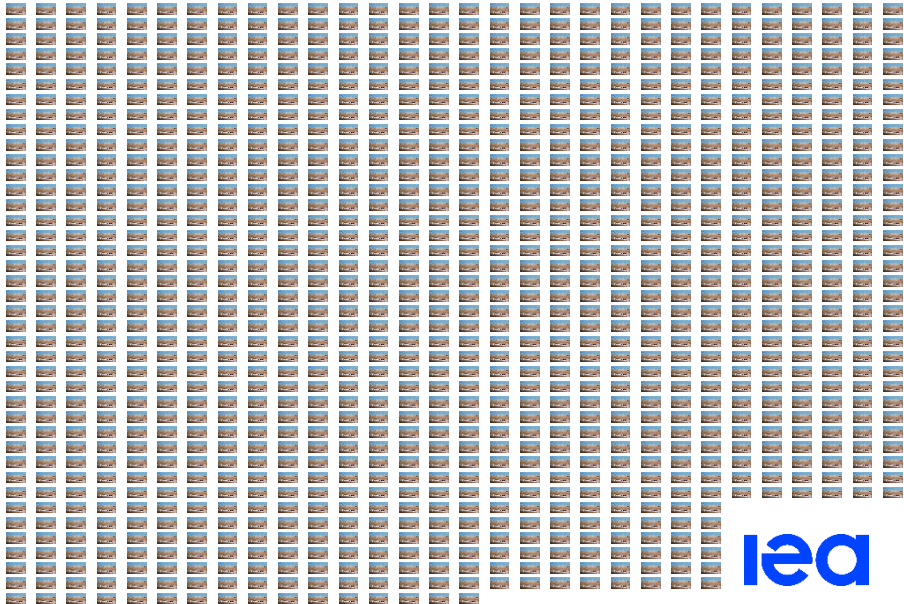
Ammonia storage tank
150 GWh storage capacity



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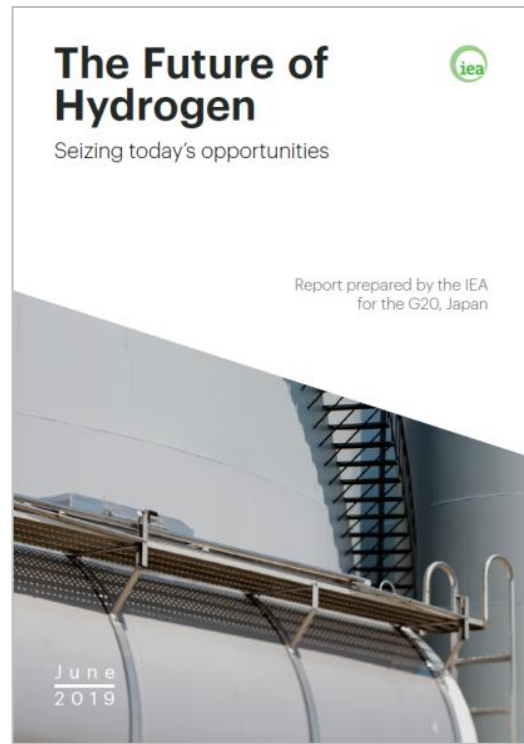
1150 x

Hornsedale Power Reserve
(Australia)
129 MWh



Four key opportunities for scaling up hydrogen to 2030





www.iea.org/hydrogen2019/