



Hydrogen Economy Opportunities and limitations: international status

Dr Jose M Bermudez, Energy Technology Analysts – Hydrogen and Alternative Fuels

AFRY Webinar

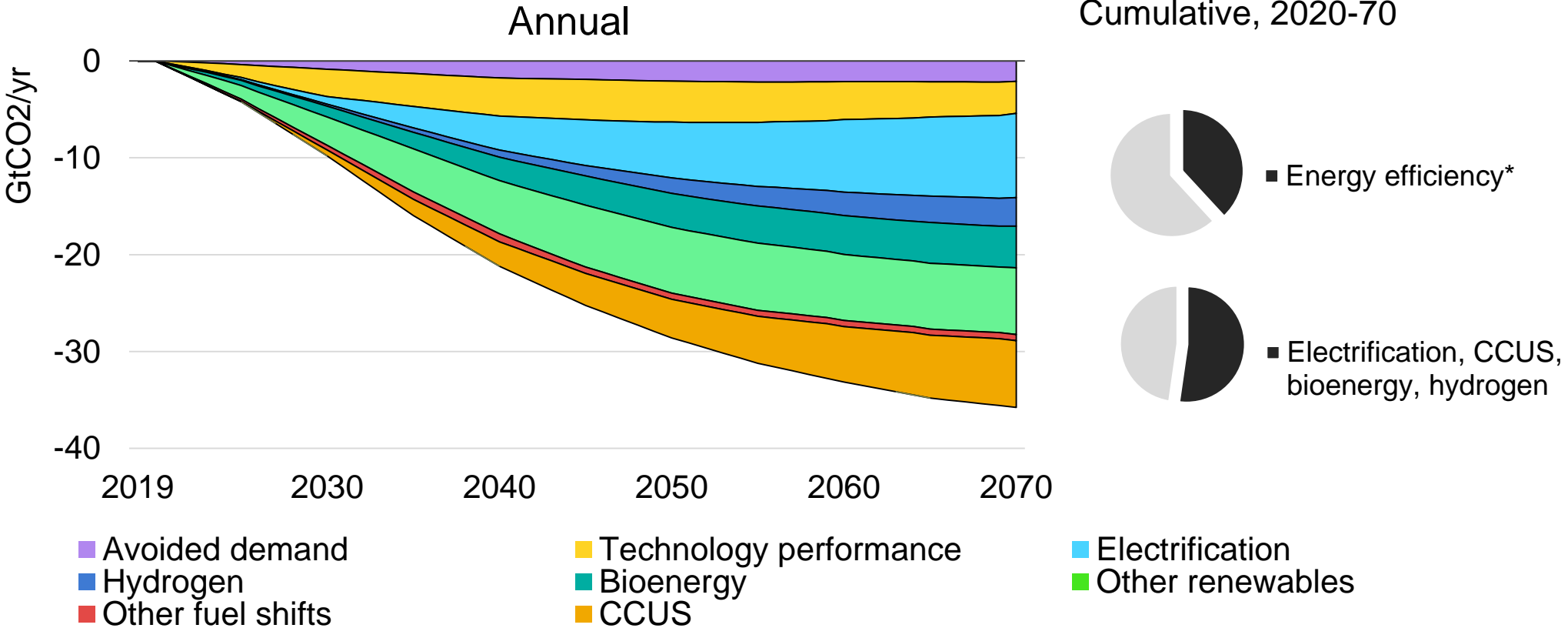
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Hydrogen – A common element of our energy future?

- 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 such as 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
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Decarbonising the energy system

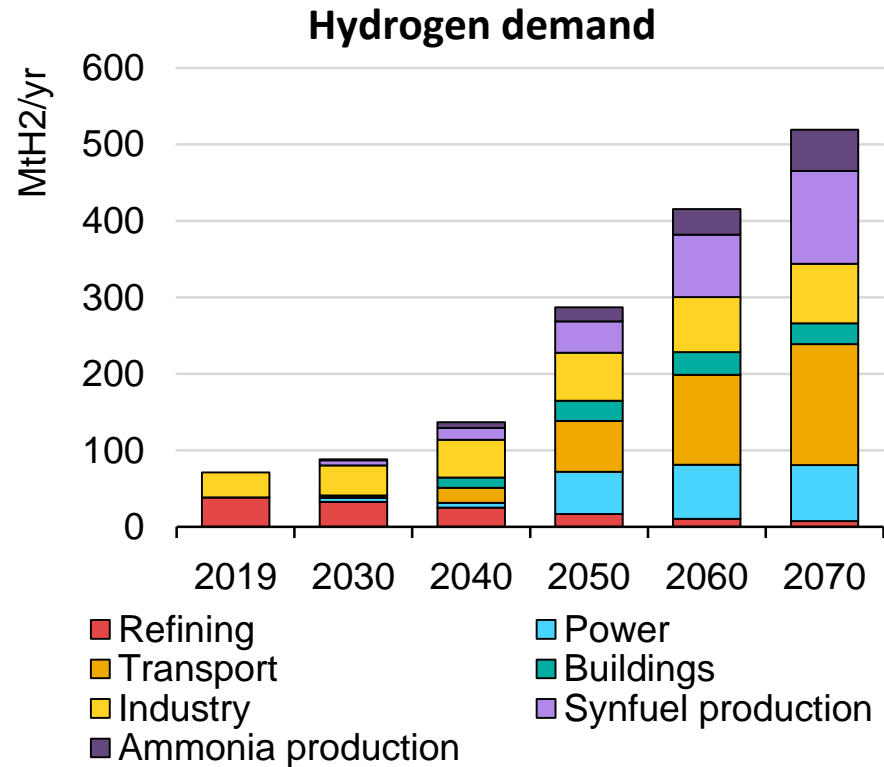
Global energy sector CO2 emissions reductions by measure in the SDS relative to the STEPS, 2019-70



Low-carbon hydrogen and hydrogen-derived fuels contribute 6% of cumulative emissions savings by 2070, relative to the Stated Policies Scenario.

Hydrogen use should grow and expand into new applications

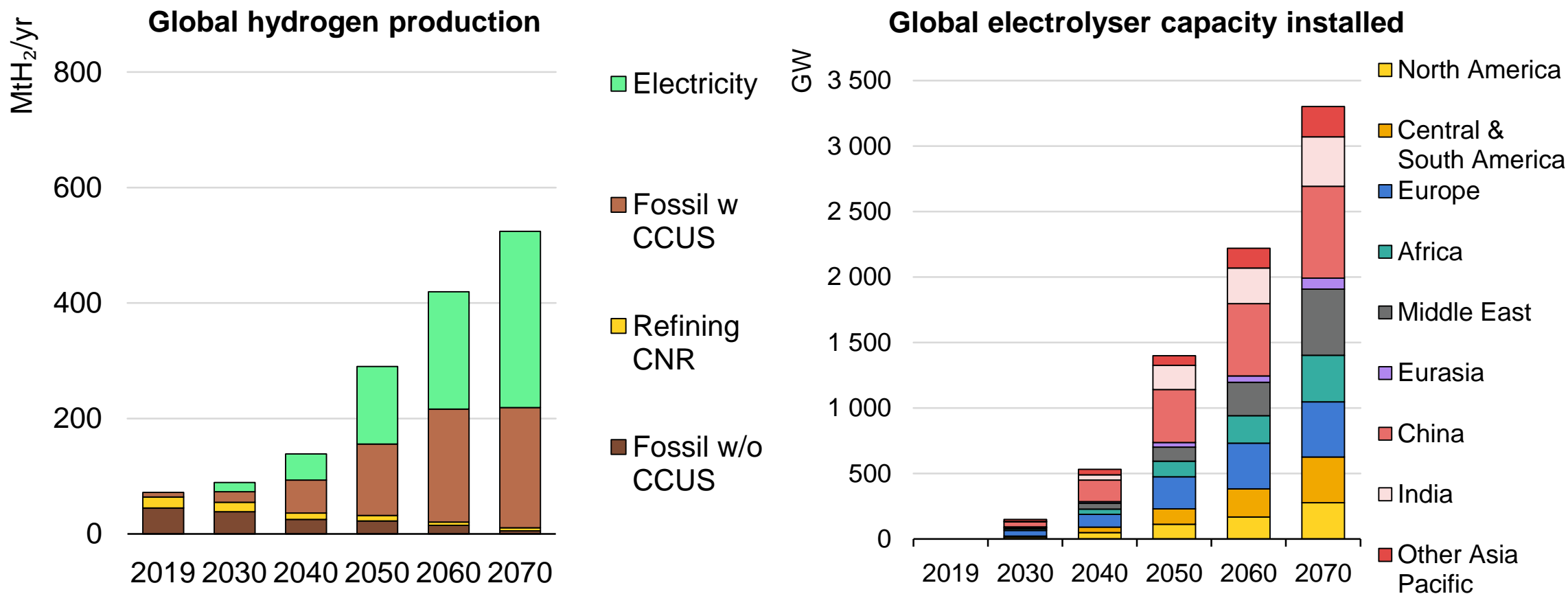
Hydrogen demand by sector and share of hydrogen in final energy demand in SDS



In the SDS, hydrogen demand grows 7-fold by 2070. Hydrogen and derived fuels account for 13% of global final energy demand, mostly used in transport and industry.

Cleaning hydrogen production

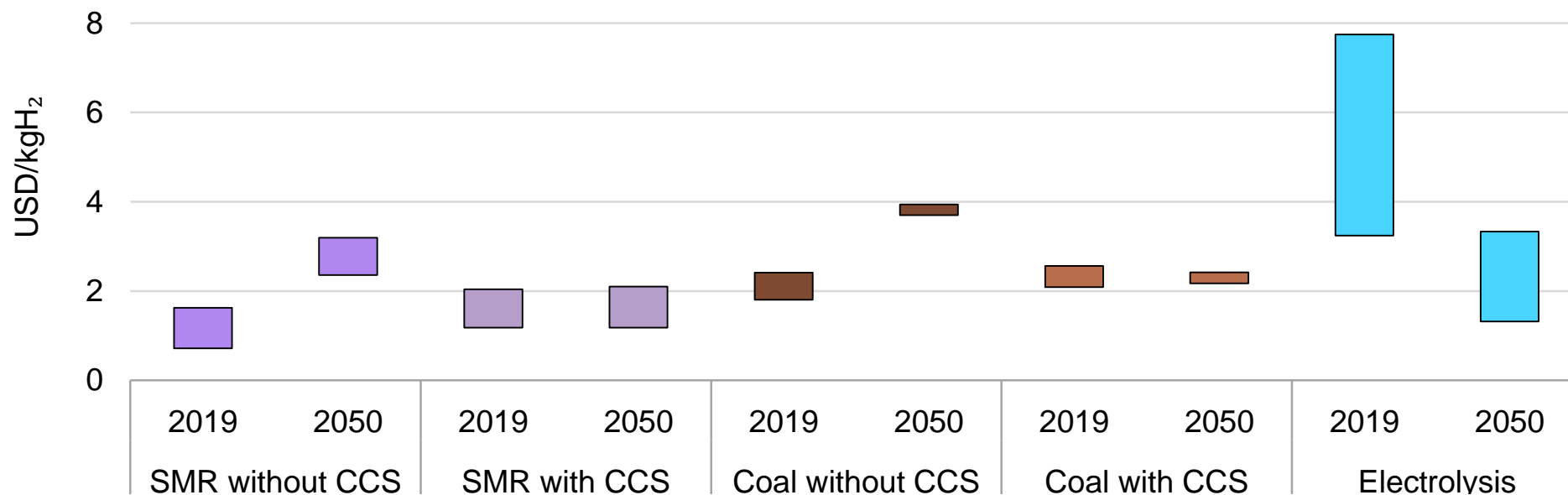
Global hydrogen production by technology and electrolyser capacity installed in SDS, 2019-70



In the SDS, almost all hydrogen production is based on low-carbon technologies. Electrolysis capacity should expand from current 200MW to more than 3300GW by 2070

Scale up can make low-carbon hydrogen competitive

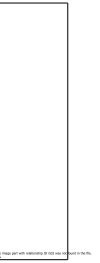
Current and projected levelised cost of hydrogen



Hydrogen produced from electrolysis powered by renewables can become competitive with conventional fossil generation in several parts of the world

Four key opportunities for scaling up hydrogen to 2030





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