



The role of P-t-H and P-t-X in the energy system

Dr Jose M Bermudez, IEA

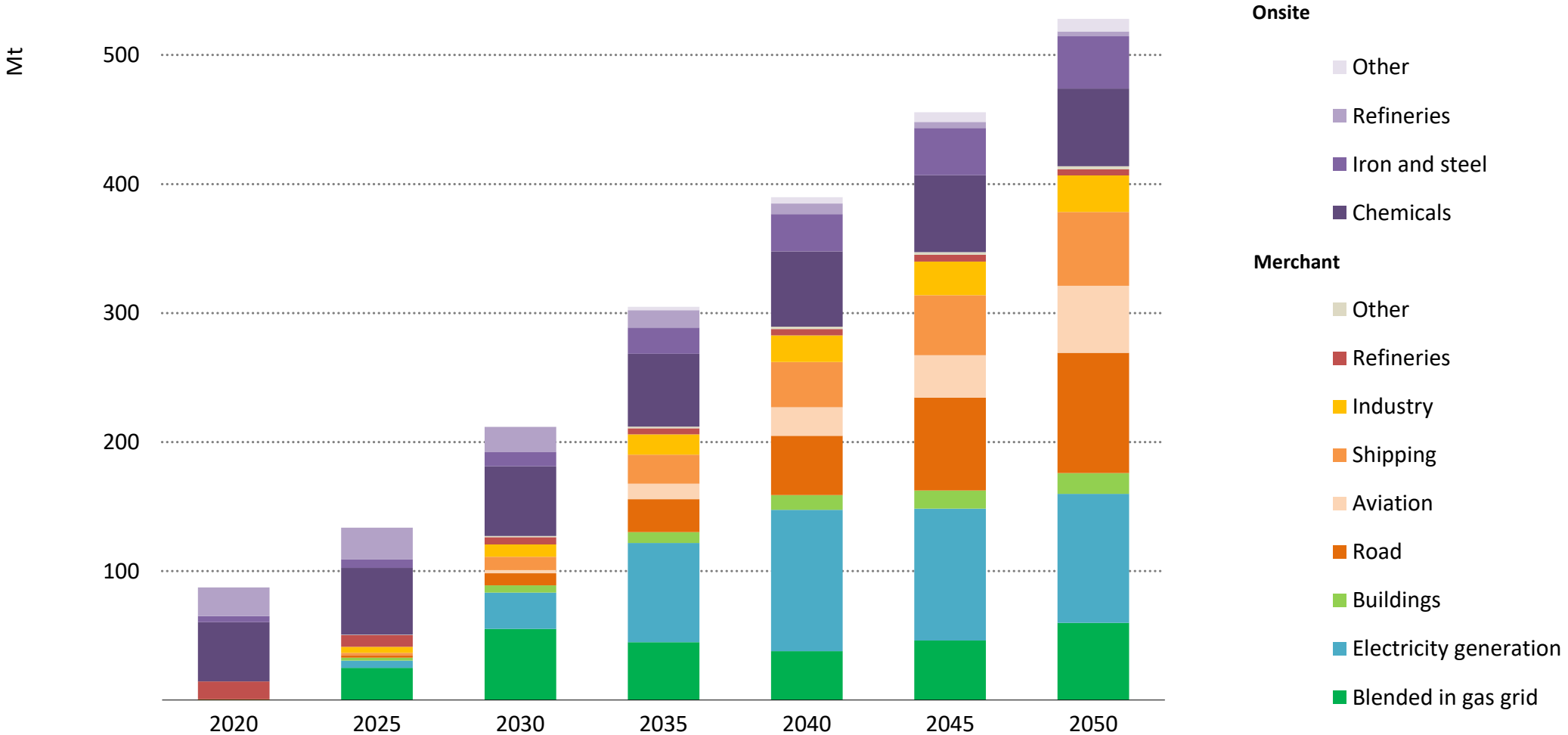
Hydrogen TCP PtX Workshop

1 July 2021

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

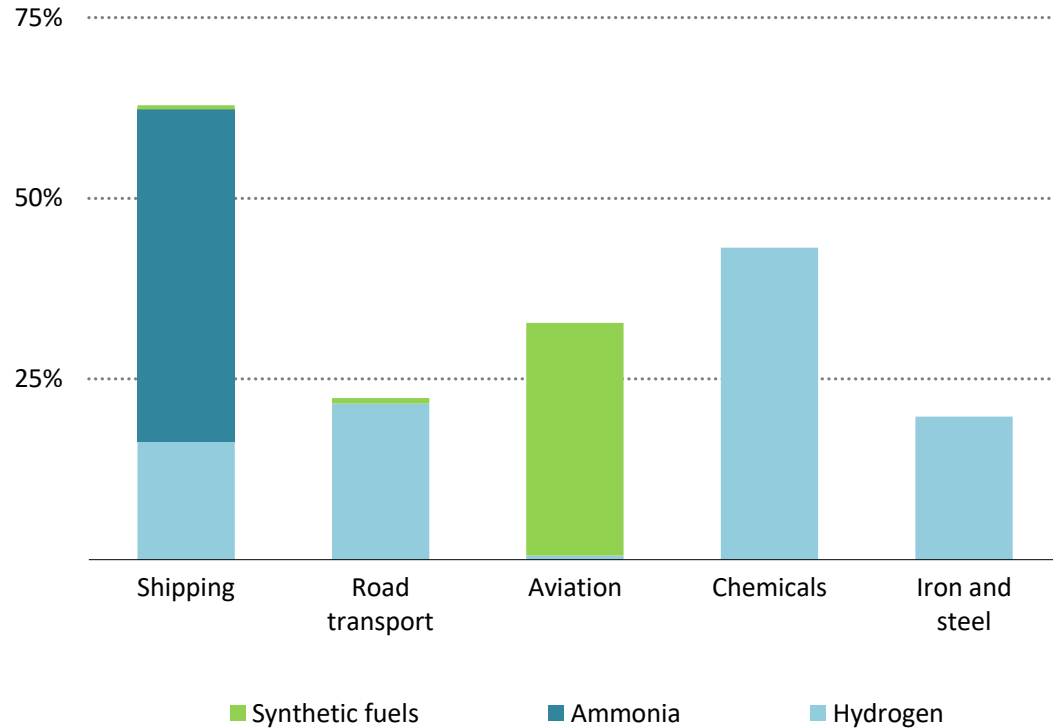
Hydrogen is a critical contributor to net-zero emissions goals



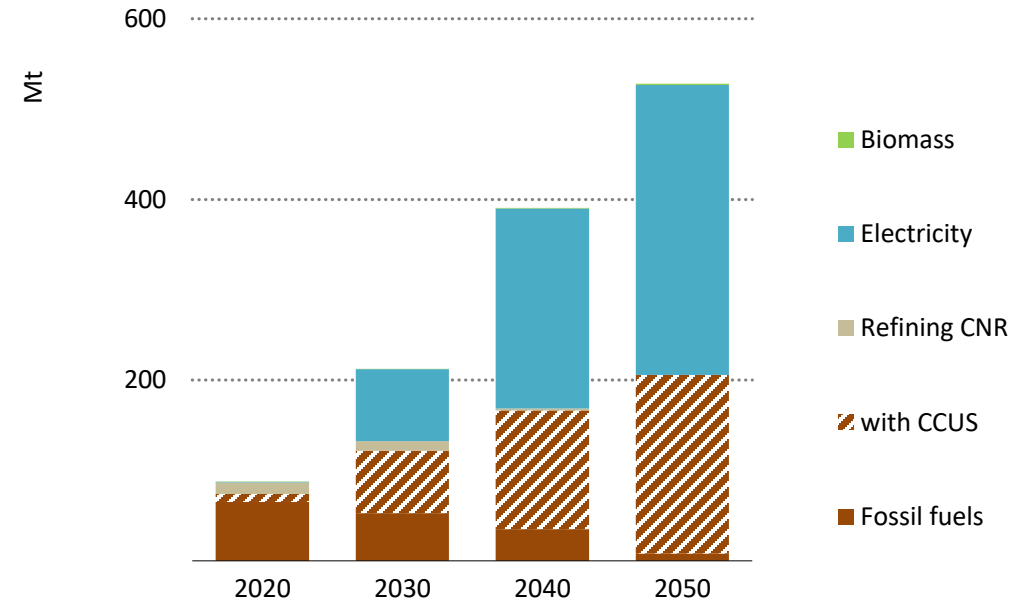
In the NZE scenario, the initial focus for hydrogen is to convert existing uses to low-carbon hydrogen; hydrogen and hydrogen-based fuels then expand across all end-uses

Hydrogen is a critical contributor to net-zero emissions goals

Share of hydrogen fuels by sector in 2050 in NZE



Global hydrogen production in NZE



Hydrogen production jumps sixfold by 2050 in the NZE scenario, driven by water electrolysis and natural gas with CCUS, to meet rising demand in shipping, road transport and heavy industry.

Electrolysis deployment linked to climate ambitions

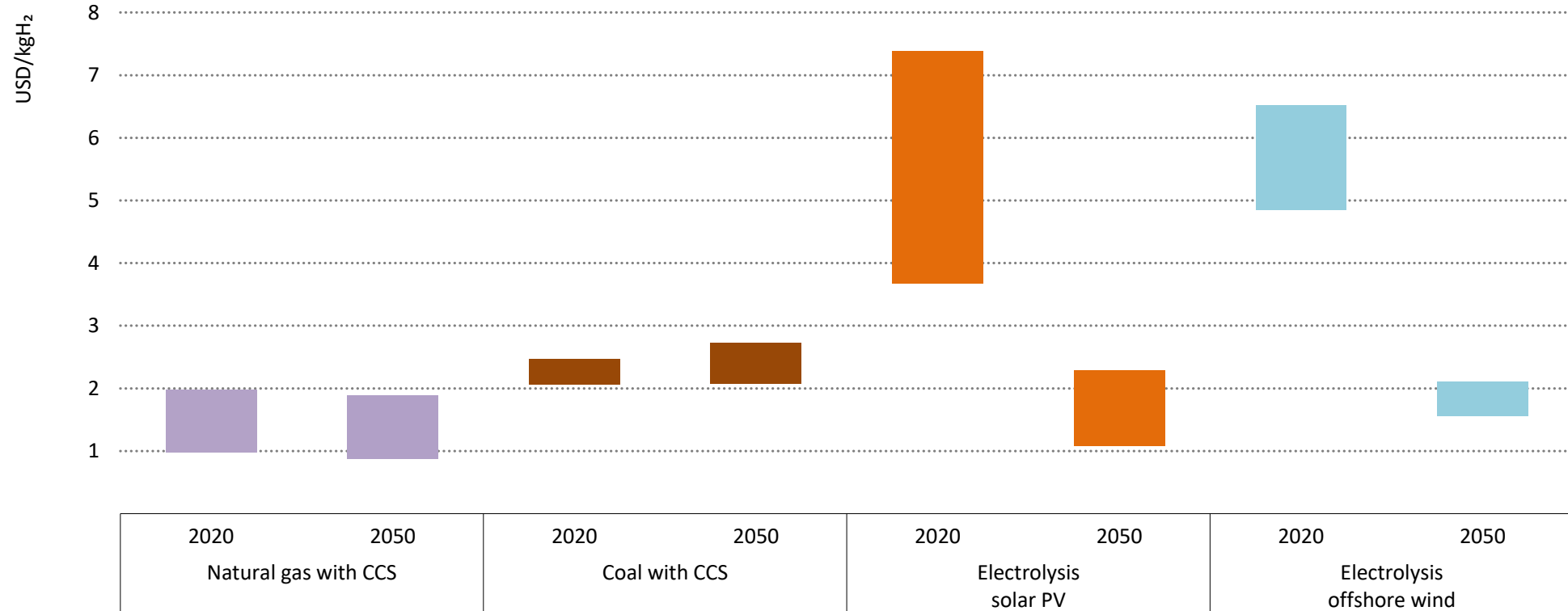
Global installed electrolysis capacity in SDS, 2019-70



Reaching net-zero emissions by 2050 requires a much faster deployment of electrolysis capacity

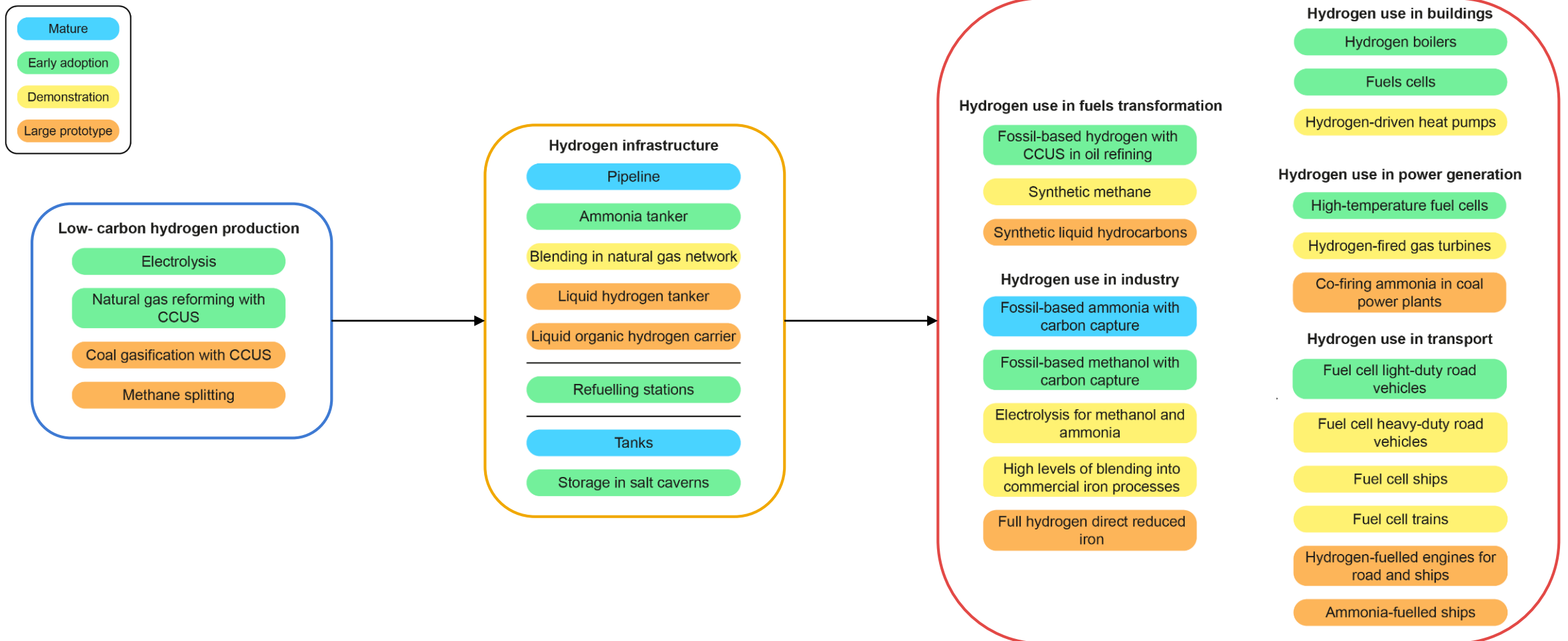
Low-carbon hydrogen production costs are falling

Hydrogen production costs by technology in the NZE



Production costs of renewable hydrogen could become competitive with hydrogen from fossil fuels with CCS, if large-scale deployment brings down costs.

Still a lot to do in innovation



A significant fraction of the full potential of hydrogen will remain untapped until key technologies across the whole supply chain are developed and demonstrated at commercial scale and then deployed.

Hydrogen at the IEA: what's next?

- Several projects under development. Some highlights:
 - ***Global Hydrogen Review***, Sept-Oct 2021
 - ***Tracking Clean Energy Progress – Hydrogen***, fall 2021 [TBC]
 - ***Clean Energy technology Guide***, fall 2021 [TBC]



Thank you for the attention

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