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Will hydrogen technologies get us to Net Zero?

24th February 2021

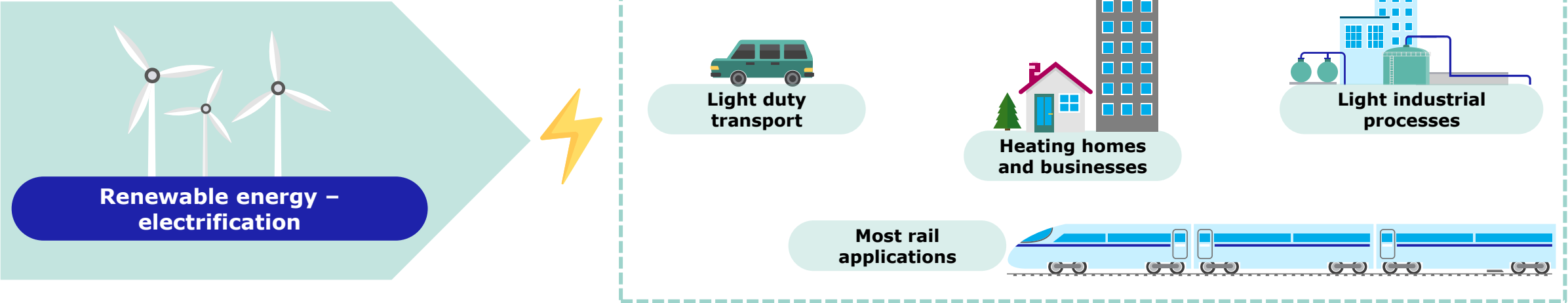
Jane Toogood, Sector Chief Executive, Johnson Matthey

**A world that's
cleaner and
healthier;
today and
for future
generations**



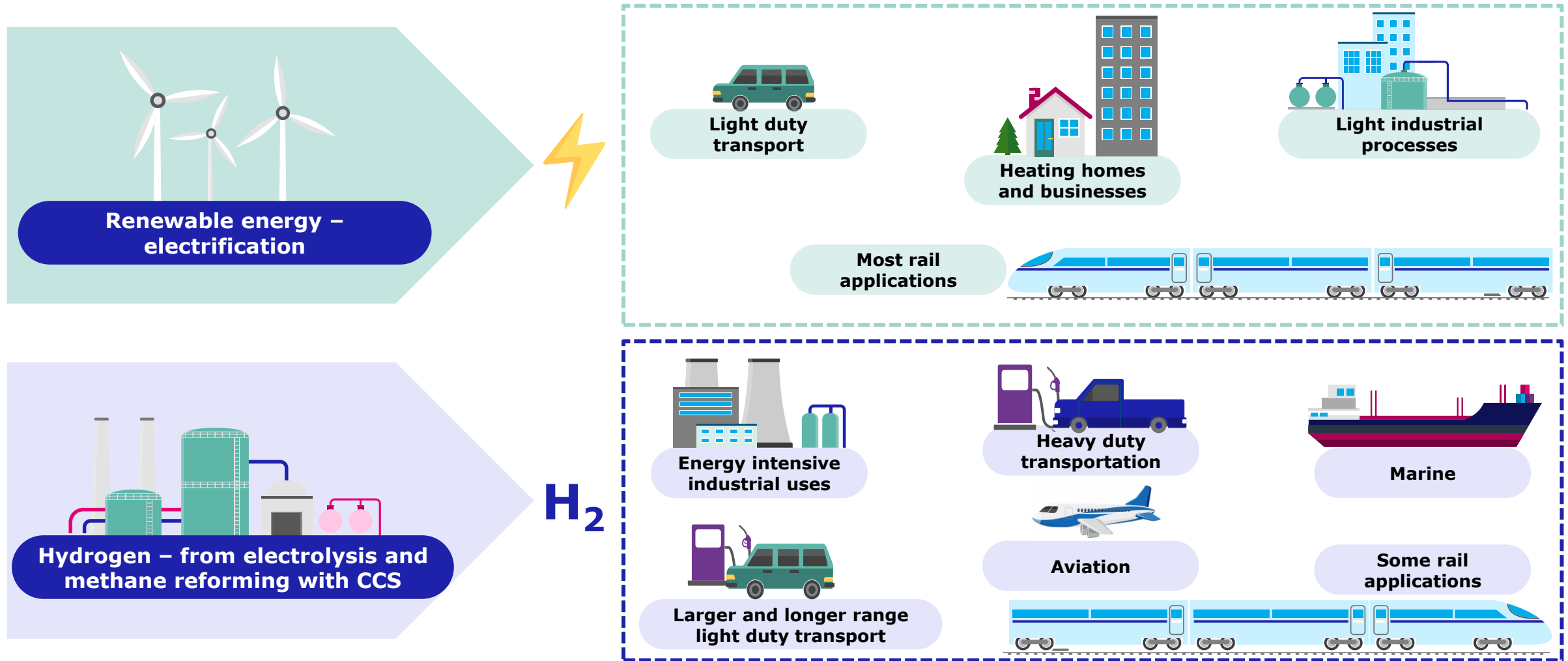
Clean electricity will play a critical role in decarbonisation

We should use renewables to electrify what makes sense – it's often the most energy efficient route



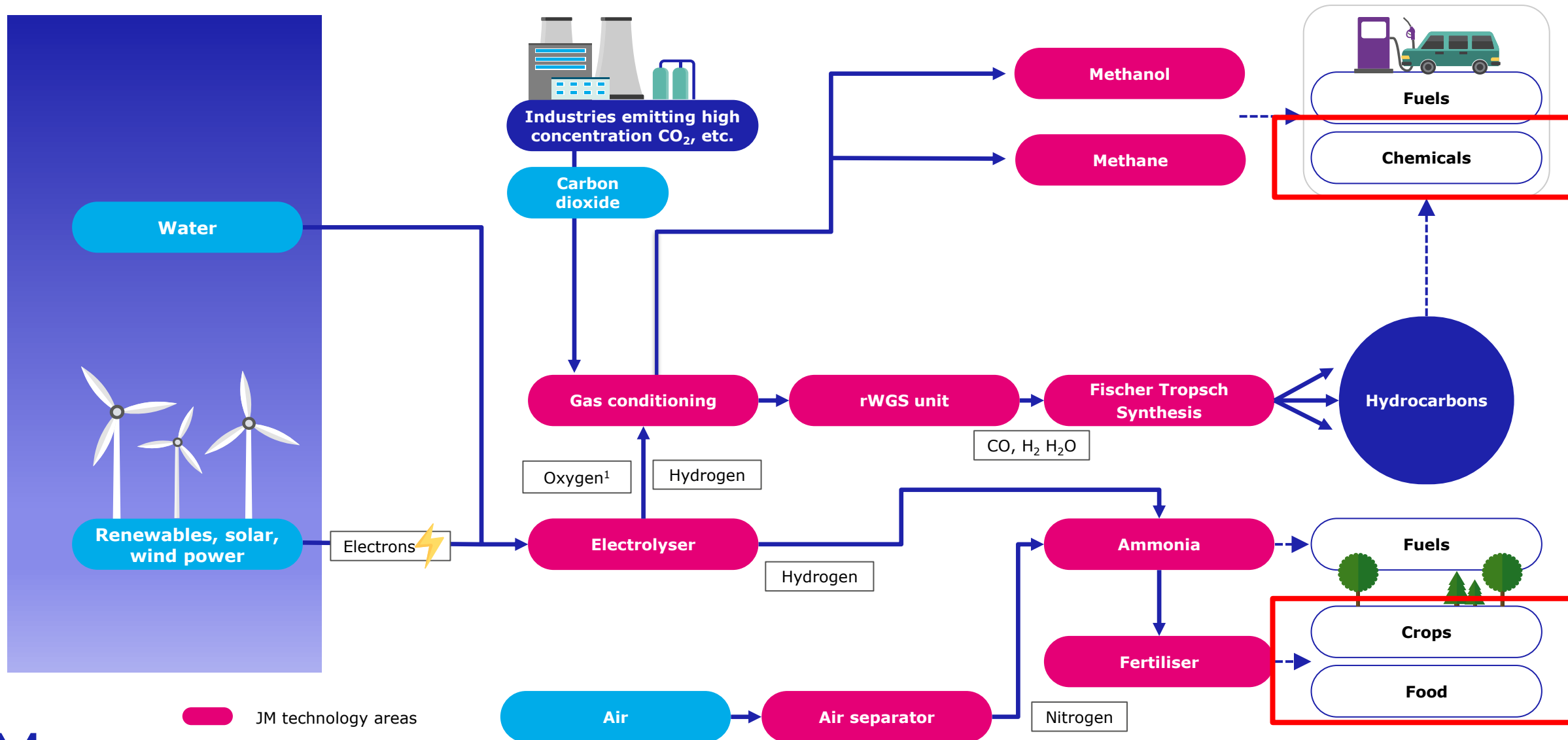
Clean hydrogen will play a critical role in decarbonisation

Particularly in hard-to-abate sectors. Hydrogen is transitioning from a chemical feedstock into an energy vector – storing and transporting renewable energy for a range of applications



Turning green hydrogen into chemical building blocks: a vision

Upgrading renewable feedstocks (e.g. biomass, CO₂) into the sustainable fuels and chemicals of the future

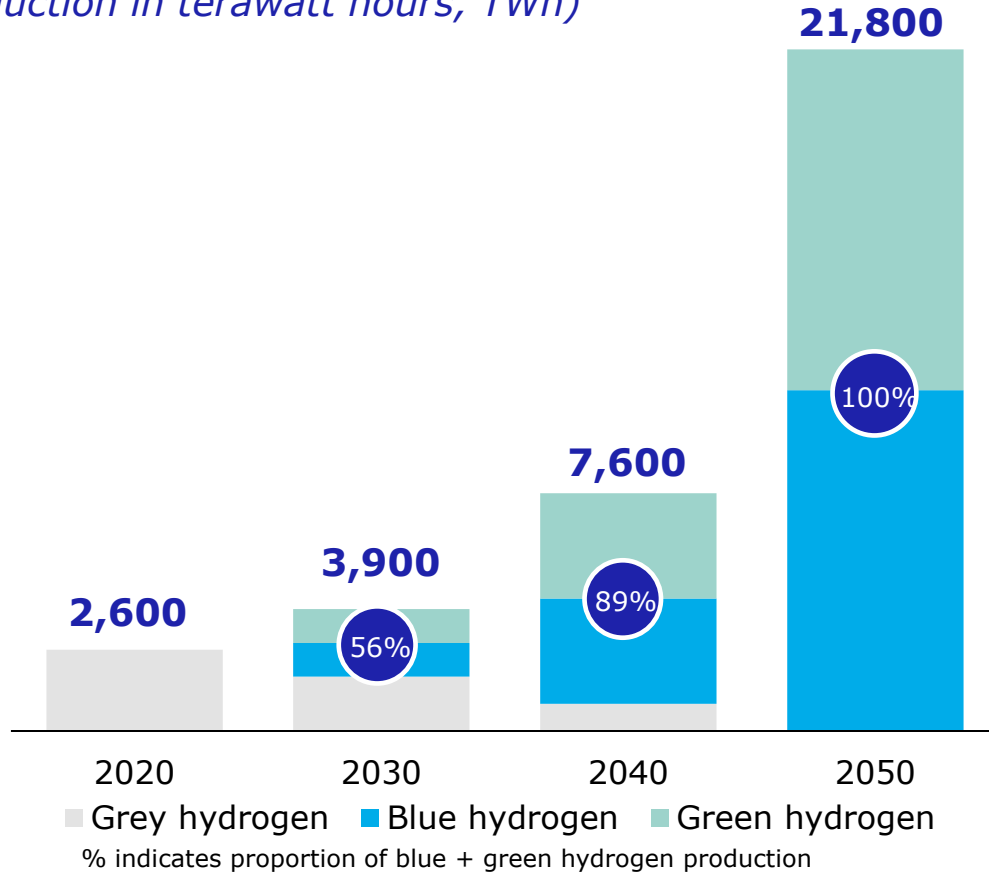


We are going to need a lot more H₂ in future – and it must be clean

Both Blue and Green H₂ will be used as enabling business models are introduced

Split of hydrogen production methods

(Production in terawatt hours, TWh)



Grey share declines with future carbon tax

Blue adoption driven by geology (carbon storage locations), infrastructure (pipelines) and high cost of alternative routes to low carbon hydrogen

Green adoption driven by geography, declining cost of renewable energy and incentives

Sources: Hydrogen Council, "Hydrogen, Scaling up" report, 2017, (total hydrogen demand); Johnson Matthey, IEA, BP (split of hydrogen production methods).

The UK has some world leading initiatives to demonstrate clean H₂ at scale



HyNet

North West England

Trialling decarbonised hydrogen as a fuel and feedstock

Phase 1: 80kt (350MW) of hydrogen p.a. Equivalent to world scale hydrogen plant

Used in industry, homes and transport



Gigastack

North East England

Renewable hydrogen from electrolysis of water using off-shore wind

100 MW electrolyser linked to Hornsea Two offshore wind farm

Potential to supply up to 30% of the Phillips 66 Humber Refinery hydrogen demand

Great opportunity for the UK to learn by doing and drive further innovation - but we need to act quickly or we will become followers

Global H₂ market estimated at \$2.5tn in 2050¹

UK targeting 5GW of clean H₂ (Green and Blue) by 2030

Strongly supports new skills development and levelling-up of UK communities



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Q&A
