

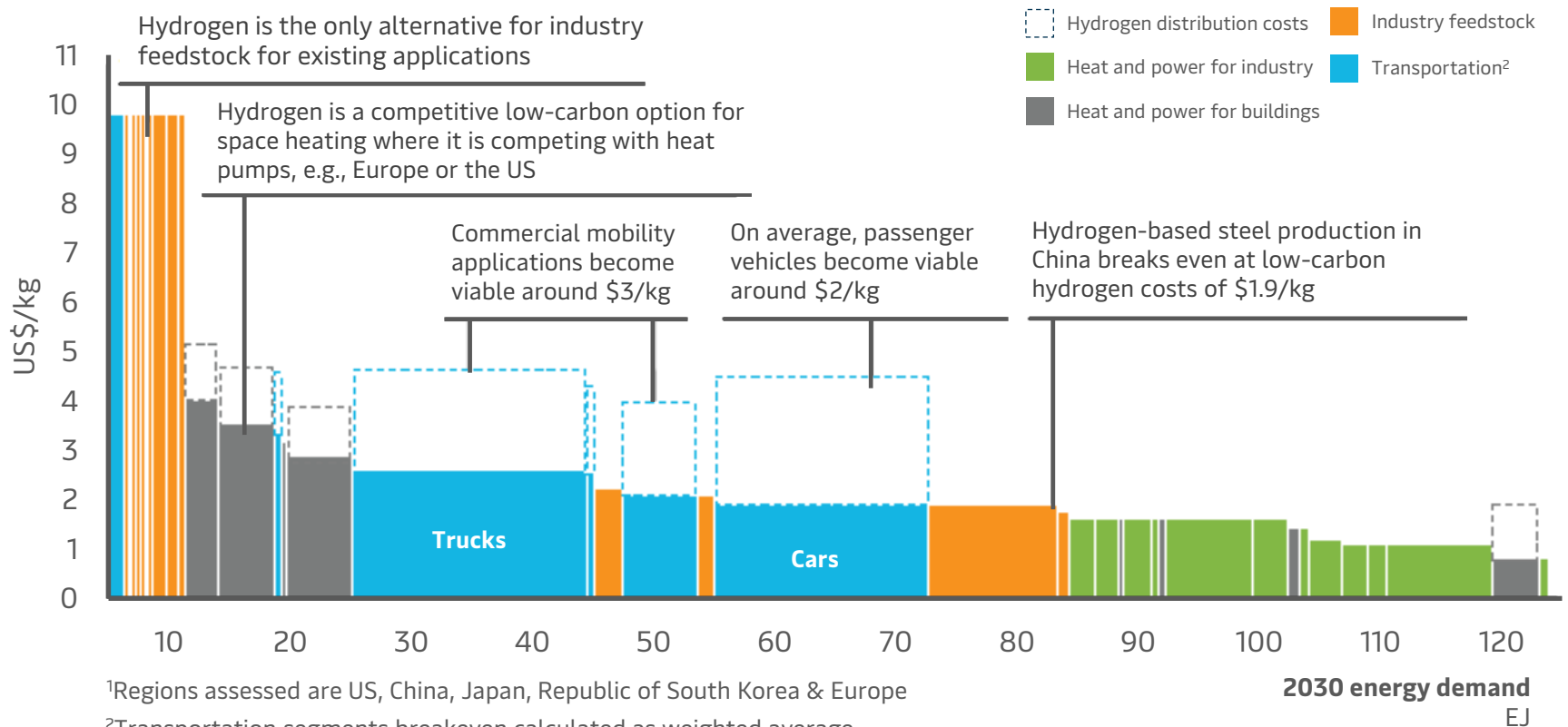
Hydrogen production break-even costs by end use application globally & anticipated cost built up in India

Part -3 (Hydrogen cost benchmarks, demand built-up, transport infra & market size evaluation for India)

Hydrogen production break-even costs by application

We estimated the break-even levels where hydrogen applications become competitive in comparison to low-carbon alternatives. We assessed four main regions, namely China, the US, the EU, and Japan/Korea, in detail. We find that hydrogen can unlock approximately 8 per cent of global energy demand with a hydrogen production cost of USD 2.50 per kg, while a cost of USD 1.80 per kg would unlock as much as roughly 15 per cent of global energy demand by 2030. This does not imply that hydrogen will satisfy all this energy demand by 2030, but it does showcase that hydrogen will have a significant role to play as a clean energy vector in the future energy mix.

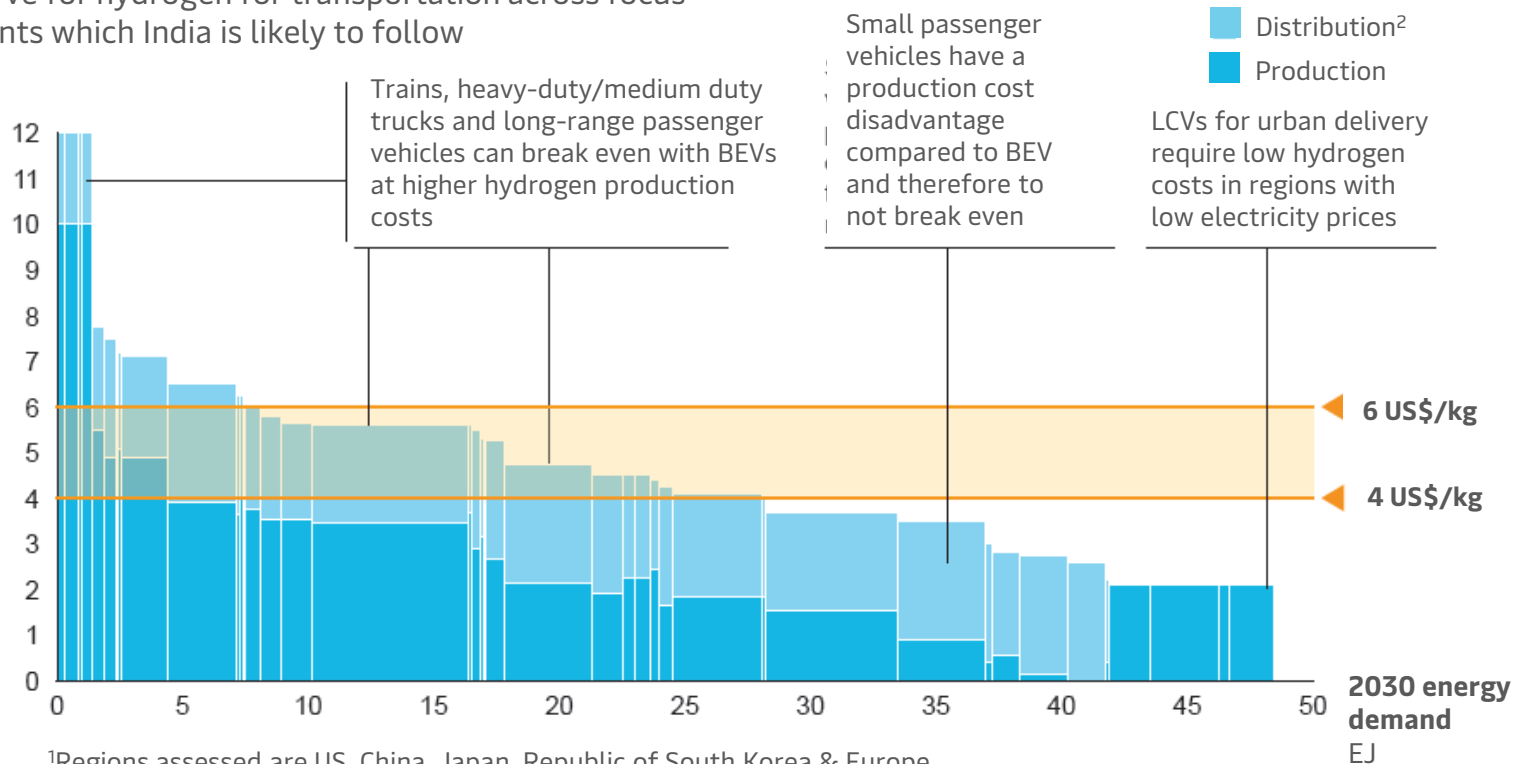
Exhibit Cost curve for hydrogen production which India is likely to follow



Hydrogen production break-even costs by application (contd.)

We find that hydrogen can meet a large share of the mobility energy demand by 2030. Even with hydrogen costs at the pump of USD 6 per kg – including production, distribution, and retail – the fuel can meet about 15 per cent of transport energy demand cost competitively by 2030. We expect this cost profile to become viable in most regions and use cases by 2030. If costs were USD 4 per kg at the nozzle, hydrogen could even meet more than 50 per cent of the mobility sector’s energy demand. Trucks, long-distance buses and large passenger vehicles are particularly competitive, as the cost of batteries required to secure the necessary range is very high for the battery alternatives.

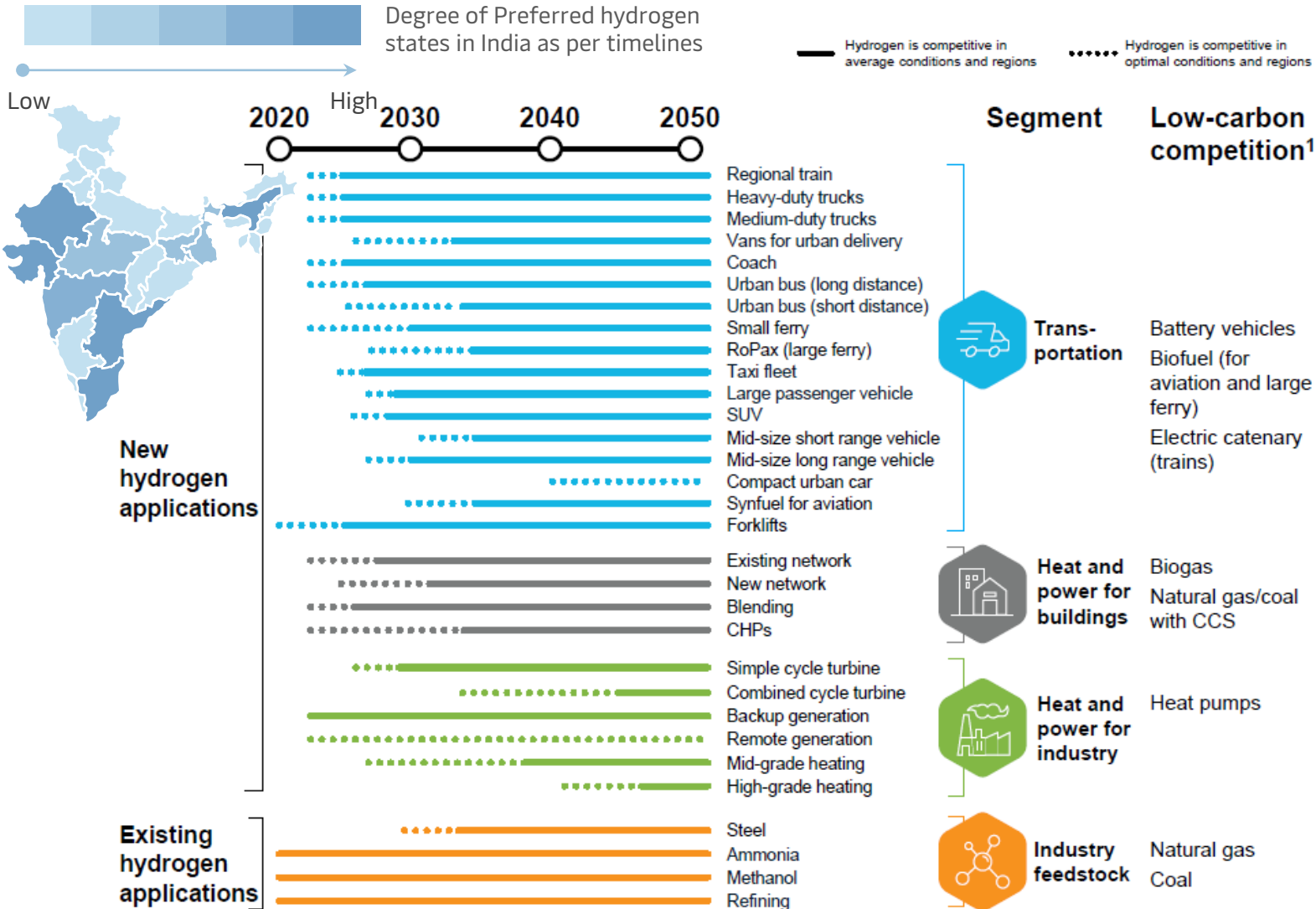
Exhibit Cost curve for hydrogen for transportation across focus regions¹ segments which India is likely to follow



¹Regions assessed are US, China, Japan, Republic of South Korea & Europe

²Transportation segments breakeven calculated as weighted average

Timelines for cost competitiveness for hydrogen in India



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