

New production technologies

## Three key variables impact renewable hydrogen costs the most

Relationship between levelized cost of renewable H<sub>2</sub> (\$/kg), levelized cost of electricity, electrolyzer cost and electrolyzer capacity factor\*

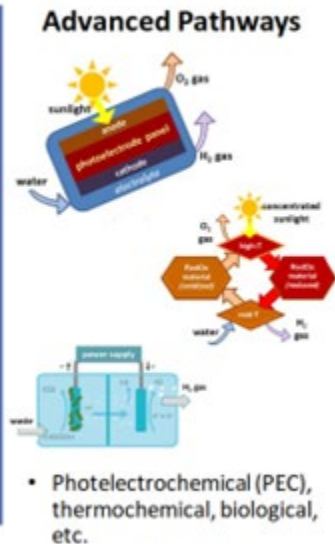
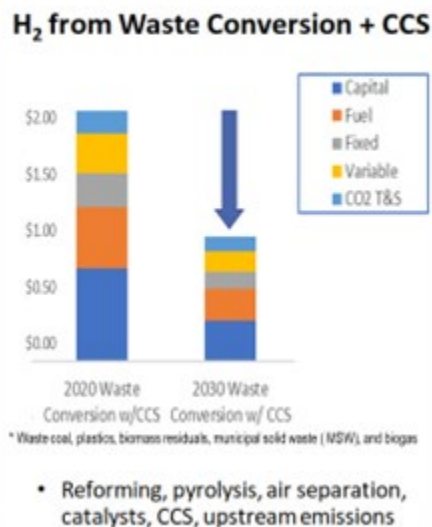
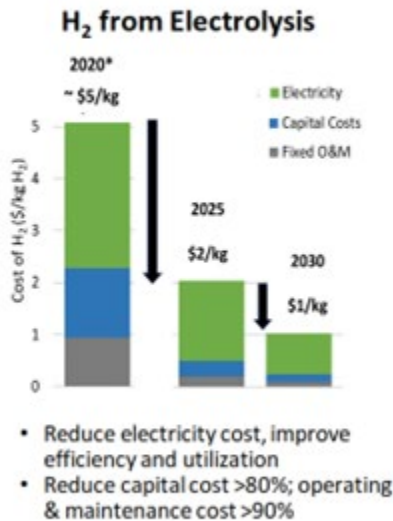
		Capex = \$1,000/kW						Capex = \$500/kW						Capex = \$100/kW						
		10	20	40	60	80	100	10	20	40	60	80	100	10	20	40	60	80	100	
LCOE (\$/MWh)	Capacity factor (%)	0	>\$4	>\$4	<\$3	<\$2	<\$2	<\$1	<\$4	<\$2	<\$1	<\$1	<\$1	<\$1	<\$1	<\$1	<\$1	<\$1	<\$1	<\$1
	20	>\$4	>\$4	<\$4	<\$3	<\$3	<\$2	>\$4	<\$3	<\$2	<\$2	<\$2	<\$2	<\$2	<\$2	<\$2	<\$2	<\$1	<\$1	
	40	>\$4	>\$4	>\$4	<\$4	<\$4	<\$4	>\$4	<\$4	<\$3	<\$3	<\$3	<\$3	<\$3	<\$3	<\$2	<\$2	<\$2	<\$2	
	60	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	<\$4	<\$4	<\$4	<\$4	<\$4	<\$4	<\$3	<\$3	<\$3	<\$3	
	80	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	<\$4	<\$4	<\$4	<\$4	<\$4	
	100	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	>\$4	

Three key factors have the greatest impact on the cost of H<sub>2</sub> made from renewable electricity.\*

- Electricity cost:** the cheaper the electricity feeding the electrolyzer, the lower the cost of the H<sub>2</sub> produced.
- Electrolyzer cost:** the cheaper the electrolyzer cost, the cheaper H<sub>2</sub> it can produce.
- Capacity factor:** this is a measure of the percentage of time the electrolyzer is operating. The more it operates, the cheaper the H<sub>2</sub>.

Source: BloombergNEF. \* Other factors impacting H<sub>2</sub> cost include electrolyzer efficiency and financing. The tables above assume western alkaline electrolyzers with 2020, 2030 and 2050 efficiency and financing assumptions respectively from 1H 2021 Hydrogen Levelized Cost Update ([web](#) | [terminal](#)).

## All pathways with potential for "1 1 1" being assessed



\*2020 Baseline: PEM (Polymer Electrolyte Membrane) low volume capital cost ~\$1,500/kW, electricity at \$50/MWh. Pathways to targets include capital cost < \$300/kW by 2025, < \$150/kW by 2030 (at scale). Assumes \$50/MWh in 2020, \$30/MWh in 2025, \$20/MWh in 2030