Energy Transition Dialogues

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Ultra-Low Cost Solar Key to Competitive Hydrogen Price

We need a step change in the costs of building wind and solar farms to provide the cheap electricity that low-cost green hydrogen requires. If we can achieve both, we can produce hydrogen at a cost competitive with fossil fuels. This is why Australian Renewable Energy Agency (ARENA) has chosen ultra-low cost solar as one of our strategic priorities. The costs of solar, over $1000 per kilowatt to install, delivering electricity at an effective cost of around $50-60 per MWh, needs to decrease by ⅔ to generate electricity at an effective cost of $15-20 per MWh. Wind has an important complementary role to play but the potential cost reductions are not as significant as for solar. If we cannot achieve ultra-low cost solar electricity then we cannot have cheap green hydrogen.

Understand hydrogen's competitors

Hydrogen will only have a role to play if it is more cost effective than the alternative solution for each end use case. If battery electric vehicles are more cost effective than equivalent hydrogen fuel cell vehicles, then battery electric wins. If electric heat pumps are more cost effective than hydrogen for heating our homes, then heat pumps win. The bad news for hydrogen is that its biggest competitor is also its biggest input cost: electricity. Cheap electricity is a requirement for cheap hydrogen but hydrogen also competes against electricity in many end uses, notably transport and heating. Where a process or end use can be cost effectively electrified, then electricity is the preferred solution and hydrogen is unlikely to play a major role. Rather, it is those areas of heavy industry that require high temperatures or where hydrogen is a useful feedstock that will most naturally and readily support hydrogen. The good news is, unlike natural gas which is subject to the global commodity cycle and can experience significant price volatility, hydrogen is a manufactured item with high upfront capital costs and low operating costs. So as the technology improves, costs come down and are locked in, so are not subject to the same volatility common for fossil fuels like oil and gas. ■

Source: ARENA

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