

# Argus Insight: Hydrogen



## Continental drift: Hydrogen policy gap

The early days of the decarbonised hydrogen industry is seeing a gap emerging between Europe and the US for low-carbon (blue) hydrogen. This policy gap could affect trade, burden US producers with extra costs and undermine decarbonisation efforts. But it is not too late to close it.

The ramifications run wider than H<sub>2</sub> markets alone, with knock-on effects in manufactured exports, given the EU's proposed Carbon Border Adjustment Mechanism.

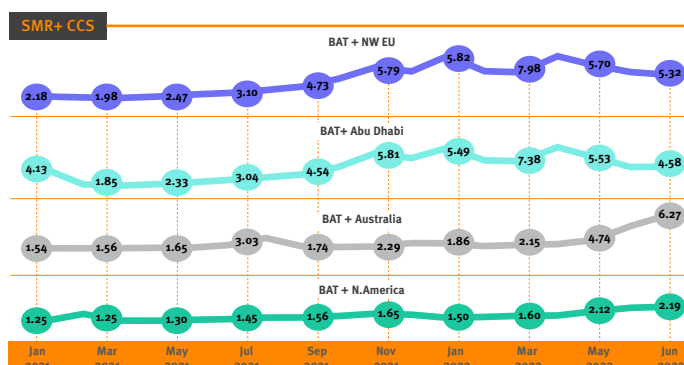
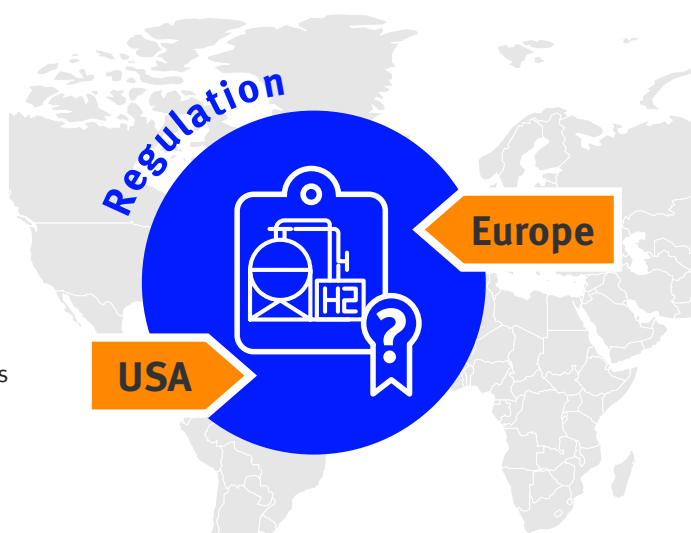
Since the outbreak of the conflict in Ukraine, the US has stepped into European energy markets in a big way. It supplies almost 50pc of the EU's LNG imports. Should it wish to do the same in future, the latest proposals from the US Department of Energy (DOE) appear to be setting up a roadblock.

Broadly speaking, natural gas is natural gas, liquefied or not, so is highly substitutable. But decarbonised hydrogen exports will need to compete not only on landed cost, as with LNG, but on the carbon intensity of its production.

Any divergence between these economic blocs on policy governing future energy markets is a matter for serious consideration.

### Highly Competitive

The mention of hydrogen brings Australia and exotic desert locations immediately to mind. Yet America is quietly extremely competitive, with costs of production for 90pc decarbonised hydrogen almost 60pc lower than that of Europe's (\$2.19/kg vs \$5.32 respectively). See the *Argus* hydrogen taxonomy [here](#).



Low-cost natural gas underpinning America’s current LNG export boom makes BAT+ (90pc decarbonised) hydrogen from steam methane reformers cheaper than any location except for Russia.

For fully decarbonised hydrogen from renewable electrolysis, the US may not lead but it is in the vanguard. While Australia has a cost advantage, it has a geography handicap to overcome, as well as enticing northeast Asian markets to service. Oman is far closer, but 47¢/kg less is hardly a spread to induce quaking and could be trumped by availability alone.

From a cost perspective America is off to a roaring start both for domestic hydrogen uptake, as well as for potential exports.

**American exceptionalism**

US hydrogen demand dwarfs all individual western countries and is almost double that of the EU27 and UK combined. That gigantism could understandably prompt a degree of isolationism in policy creation.

America’s drive to decarbonise domestic hard-to-abate industries, as well as the hydrogen industry itself is coming from a slightly different place than the Europeans. The current US Biden administration has only recently realigned the country with the Paris climate change accords, after all.

This difference has been compounded as Europe suddenly rediscovers the need for energy security. This has served to accelerate its renewable energy build-out and subsequent hydrogen coupling.

**Is American hydrogen policy missing a trick?**

As things stand, the US DOE is looking to weigh hydrogen carbon intensity at the system-boundary of the production site (page 5, para 1 of DOE announcement). For its part, Europe is looking to assess it on a full lifecycle basis, including upstream emissions.

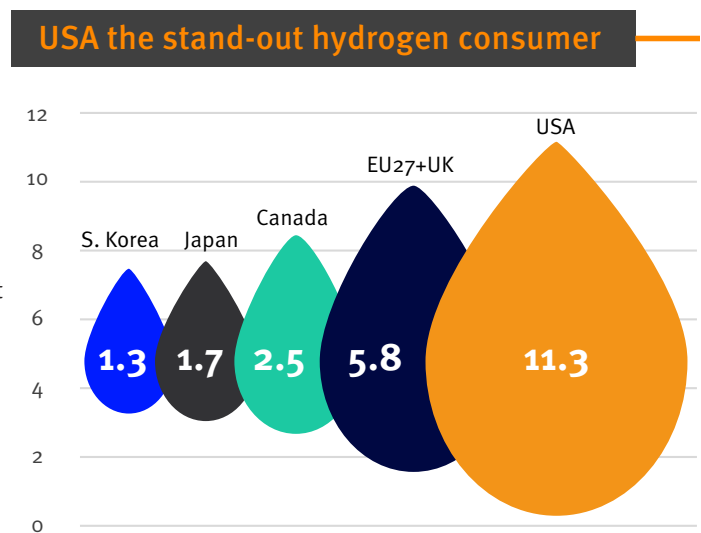
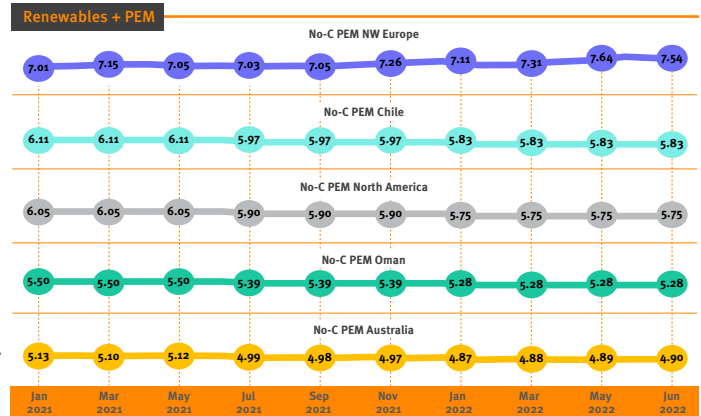
The difference is significant. Policy divergence will shift the US burden of “proof of provenance” away from broad-based compliance with national mandates, toward the private sector. Exporters to Europe will have to run two carbon accounting books — one domestic and one overseas.

Worse, full lifecycle assessment provides a strong driver for operations to plug leaky infrastructure, so American companies facing criteria varying by market will see ambiguous price signals.

US drift from Europe on this regard is notable precisely because other export markets are placing an emphasis on seeking to harmonise standards with Europe to ensure product fungibility. Australia, for example, is working to align closely with the development of European hydrogen standards, to ensure its readiness to “export sunshine”. Europe’s near neighbours in north Africa will be sure to do so as well.

On one hand, the argument may appear moot, with European countries like Germany explicitly looking toward “no-carbon” hydrogen imports, produced from renewable-fed electrolysers, via schemes such as H2Global.

But it is difficult to believe in the realpolitik of commodity markets that if enough decarbonised — fossil-derived, with carbon capture and storage — hydrogen is available, that these will not be considered for import into the 2030s.



### Not the only difference

Another area of divergence lies upstream. The Biden administration's multi-trillion Build Back Better (BBB) budget appears terminally stalled, although a sizeable element may yet make it through.

A total of \$550bn was earmarked to combat climate change via renewables funding. In its original form, it notably lacked a reference to "additionality", which has been prominent in European legislation. Green hydrogen producers in America could "capture" pre-installed renewable capacity.

The EU's additionality clauses are meant to ensure that the new hydrogen economy does not end up cannibalising renewable installations of the past decade.

Does BBB's failure to pass offer the silver lining of a chance to address that original omission?

Hydrogen split from water via electrolyzers fed by renewable energy produces no carbon at point of production, nor at point of consumption. That's an unmitigated climate win, if new renewables are brought on to service the electrolyzers.

### Winning on merit

Renewable energy costs have sunk lower far faster than many predicted, sitting low on the merit order with no marginal cost i.e., producing extra power units for nothing, subject to wind and sun conditions.

But if existing renewable power is diverted toward hydrogen production, that gap must be filled. Realistically that will be done by currently out-of-the-money fossil fuel generators. This could mean no-carbon green hydrogen producers having the perverse effect of intensifying grid carbon emissions per megawatt hour.

Carbon-free electrolytic hydrogen is best brought onstream along with new renewables deployment, allowing the grid to continue decarbonising, as well as power and other hard-to-abate sectors.

### Coming together

Adding an additionality clause to new hydrogen funding will prevent the chance of "hydrogen capture" of previously installed renewables. There have been notable takeovers of US renewable assets recently. While one would hope that these aren't rational selfish actor moves to exploit differences between jurisdictions, this loophole is easily closed.

The hydrogen economy offers higher grid penetration from renewable infrastructure, without the problems of variability, after all. So, its advent should spark more roll-out, not a diversion of existing supplies.

Regarding full-lifecycle analysis, the DOE's document states that it is subject to change, so this divergence may yet close. The benefits of doing so are threefold: acting as a spur to American natural gas producers to reduce carbon equivalent intensity of production (stop-up methane leaks), to increase international product fungibility and to reduce accounting costs for US energy exporters.

But putting aside regional differences in intensity of motivation for decarbonisation, both parties seek the same results and in a fracturing world, allies aligning standards is both a tacit signal of solidarity and an act tying economies more closely together. Moreover, for the primary goal, decarbonisation is a path best travelled with as much company as possible.

To see what *Argus* is doing in this sector, a contact form is available [here](#). To further discuss subject discussed in this Insight Paper, please contact Tim Hard, Senior Vice President Energy Transition at [HFF@argusmedia.com](mailto:HFF@argusmedia.com)

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