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EPA drops hydrogen from US power plant decarbonisation plans

- Uncertainty and cost over hydrogen is a concern
- Date for gas power plants to capture emissions moved to 2032 from previous 2035 timeframe
- Litigation expected

The US environmental watchdog has pulled back on plans to permit hydrogen as one of two methods to cut emissions among the country's power plants – a move which has been backed by industry commentators in the US and Europe.

New landmark rules published by the US Environmental Protection Agency (EPA), which mandate deep carbon emission reductions from existing gas and coal-fired power plants cited potential concerns over the uncertainty of the availability of hydrogen and costs of the gas by 2030, two years short of the rules taking effect.

Instead, the EPA suggests reductions via installation of carbon capture and storage (CCS) technologies by 2032 and removes hydrogen as a "best system of emissions reduction".

Noting "uncertainties" identified in relation to specific criteria to evaluate low-GHG hydrogen co-firing, the EPA said in notes to its rules that while the combustion of hydrogen has zero emissions, its production "can entail a range of GHG emissions, from low to high, depending on the production method".

Noting that hydrogen production can be resource-intensive, time-consuming, and face enormous regulatory hurdles, Benjamin Dierker, executive director at nonprofit think tank, Alliance for Innovation and Infrastructure, said these issues may have featured in the EPA's thinking.

"While I do not have inside information on the EPA's thinking, these factors likely serve as the basis and background thinking that is informing such a view. It would be unfortunate to de-prioritise hydrogen itself when there are favorable alternative methods to produce it that are actually greener, more cost effective, and faster," Dierker said.

Dierker also noted the difference between centralised hydrogen production, which he says is "the primary way policymakers have thought about it" and distributed hydrogen production.

"Centralised production, and even green hydrogen utilising electrolysis requires extensive additional infrastructure like renewable energy farms/plants, transmission infrastructure, pipelines, and storage facilities. By contrast, distributed techniques utilise existing infrastructure and avoid the cost and emissions of building new infrastructure, which also saves as much as 10 years," he said.

A UK-based industry source agreed with the EPA's reading of uncertainty over hydrogen availability by 2030.

"The suggestion that there won't be enough green (or indeed any sort of low carbon hydrogen)

by around 2030 is absolutely correct. In the past there had been way too much over optimism about the prospects and speed of ramp up for hydrogen, so it's good that realism is now dawning," the source said.

But there are other concerns over the utilisation of hydrogen that have to be taken into account by industry.

"The challenge of hydrogen use in power generation is it's very low round-trip efficiency compared to batteries – at best 40% (and often less) for hydrogen, compared to around 90% for batteries. That means that the only role for hydrogen is long-duration energy storage beyond the capability of batteries," the source added.

US divided

The EPA's rules, set out over more than 1,000 pages, explain administrator Michael Regan's rationale around multiple actions to support the country's Clean Air Act, addressing greenhouse gas emissions from fossil fuel-fired power units.

The rules aim to combat emissions from the power plants, which represent 25% of the total GHG emissions in the US, according to the EPA.

But while climate change lobbyists fully support the move, industry is to be divided in the US.

The Competitive Enterprise Institute, a non-profit libertarian think tank, says the new rule is expected to drive up energy prices and make energy altogether less reliable.

Marlo Lewis, CEI senior fellow, said in a 25 April statement the EPA's rule would require baseload coal power plants that don't choose to close early (before 2039) to capture 90% of carbon emissions by 2030. "The final rule extends the 90% CCS deadline until 2032. That does not change any utility's bottom line. It just means existing baseload coal power plants have two more years to sell the furniture and pack their boxes," Lewis said.

The EPA's final rule also moved the deadline for gas power plants to capture emissions, up to 2032 from the previous 2035 timeframe. "So even fewer new natural gas power plants will be built," Lewis added.

Some also expect legal challenges to the new rules. The EPA's move to classify CCS as best among emission reduction methods, could likely feature in litigation, according to lawyers from law firm Holland & Hart.

"To date, most CCS in the United States has been used for enhanced oil recovery and not carbon storage. While the rulemaking anticipates that the [power plant] units will shut down instead of deploying CCS technology the law still requires BSER classifications to be based on deployed technologies." the lawyers including Doug Benevento, Andrew Revelle, Emily Schilling, Aaron Tucker, and Andrew Wheeler said said in an online comment following the EPA's publication of its new rule. - PS

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