

Response to “How Green is Blue Hydrogen” by Howarth (Stanford) and Jacobson (Cornell)

Background

Several news outlets have reported on a study published 12 August in the academic journal - *Energy Science & Engineering*. The authors claim full life cycle greenhouse gas emissions from burning blue hydrogen were more than 20% greater than emissions using conventional natural gas and its GHG intensity was only marginally lower than grey hydrogen. Based on this analysis, the authors conclude “there is really no role for blue hydrogen in a carbon-free future.”

There are several concerns about the assumptions used in the study:

1. Use of 3.5% fugitive methane emissions in comparison to the IEA’s 1.7% global average leakage rate and Shell and other IOC targets of 0.20% methane emissions intensity.
2. Study uses global warming potential for methane of 20 years (86x). GWP-100 (30x) is the standard for reporting of non-CO₂ emissions in existing regulatory and reporting schemes, including the prevailing way in which the IPCC reports GHG emissions.
3. The Steam Methane Reforming process used by the study does not reflect state-of-the-art hydrogen production with low capture rates and level of integration.

Public response

The study received immediate and widespread coverage, predominantly in UK, US, and Europe. Coverage largely dropped off after the first few days, with a few stories appearing in the weeks following. The online debate (LinkedIn/Twitter) – largely among academics, industry experts, and some companies with interest in blue hydrogen – is ongoing.

Several responses in favor of blue hydrogen were given both by well-regarded academics (M. Romano, Politecnico di Milano), and institutes like TNO and H-Vision (NL), Sintef (Norway) S&P Global Platts and the Carbon Capture Storage Association and UK Climate Change Committee (UK).

Shell’s response in the short-term

We will not respond proactively to the study in the media. We will:

- 1) Continue referring media and stakeholders to the published positions/responses by credible third parties (academics/ scientists and organisations).
- 2) Use upcoming external milestones/speaking engagements to reinforce credible messaging, sharing our hydrogen narrative and methane emissions performance (examples below).
- 3) Support targeted local response/engagement activities per below.

NL & Europe

- Continue to leverage H-Vision consortium actions. H Vision is liaising with authorized scientist / professors (such as Ad van Wijk and Paulien Herder from TU Delft professors) to prepare and submit a constructive article in response to the article in Trouw.
- Shell speaking/media opportunities:
 - ECHB speaking on 2 panels on 3/4 Sept at International Union for Conservation of Nature conference, both with climate focus. E Brinton speaking at Politico event on hydrogen on 7 Sept. Both can reference blue hydrogen as part of required strategy to meet climate goals.
 - ECMW article in Euractive (plus social media) supporting EU Methane Policy on 13 Sept.

UK

- Reference and redirect media to CCSA and UK Climate Change Committee responses.
- Shell speaking/media opportunities:
 - ECMW can use upcoming off the record GTKY with new FT senior energy correspondent to share positive proof points e.g. our new hydrogen projects, advocacy for methane regulation.
 - In late October, expect Shell's Acorn CCS and hydrogen project to be selected to get fast track support by UK Government. Use opportunity to dispel myths about blue hydrogen.

North America

- Monitor media and assess.
- Shell speaking/media opportunities:
 - Support for upcoming EPA rule on methane emissions expected Sept/Oct.
 - ECMW at Columbia Uni panel on energy infrastructure on 4 Oct will outline case for hydrogen.

Asia-Pacific

- Shell speaking/media opportunities:
 - Proactive opportunity to position blue hydrogen at end September in media interview with ECMW and T Nunan with Sydney Morning Herald/The Age (collective reach of 14 million, educated, energy engaged audiences). Both papers are particularly active in reporting on climate change, progress towards net zero targets and the energy transition.

MENA

- Growing interest in hydrogen - focus of upcoming flagship conferences.
- Shell speaking/media opportunities:
 - S Hill, P Bogers presenting at EXPO and ADIPEC in Oct/Nov. Opportunity to reinforce key messages on gas/LNG, methane emissions and address misinformation on blue hydrogen.

Shell's response – mid-term

We expect increased academic papers and media interest on viability of blue hydrogen as part of the broader climate and energy transition debate. Shell will continue to measure media interest as well as government responses. So far, there is government support for blue hydrogen (EU Fit for 55 package, UK hydrogen strategy, Australia hydrogen Guarantee of Origin scheme). The blue hydrogen debate is interconnected with methane emissions, viability of CCS (cost and technology) and gas as a transition fuel.

Rather than responding to each individual paper, we will identify opportunities to emphasis positive proof points and strategic messaging, in line with a consistent global narrative that is adapted and expanded on locally as appropriate.

We will update our hydrogen, methane and CCS narrative, policy, and advocacy strategy:

- Hydrogen – highlight the necessary role of blue hydrogen in the transition for infrastructure and to decarbonize industry. Amplify Shell's investment in integrated green hydrogen chains.
- Methane - further proof points on Shell's performance, leverage Shell's leadership in advocacy for EU and USA methane regulation, engage with third parties – EDF, IEA, Methane Guiding Principles– to address methane emissions performance. Continue work to improve confidence in our methane

emissions data, including measurement through our collaborations with GHGSAT, VIIRS (Flaring satellite) via OGCI and the implementation of OGMP2.0 reporting framework.

- CCS – address cost, technology (capture rate efficiency) and safety concerns and misinformation.