
Scaling Up Clean Hydrogen In a Climate-Aligned and No-Regrets Manner

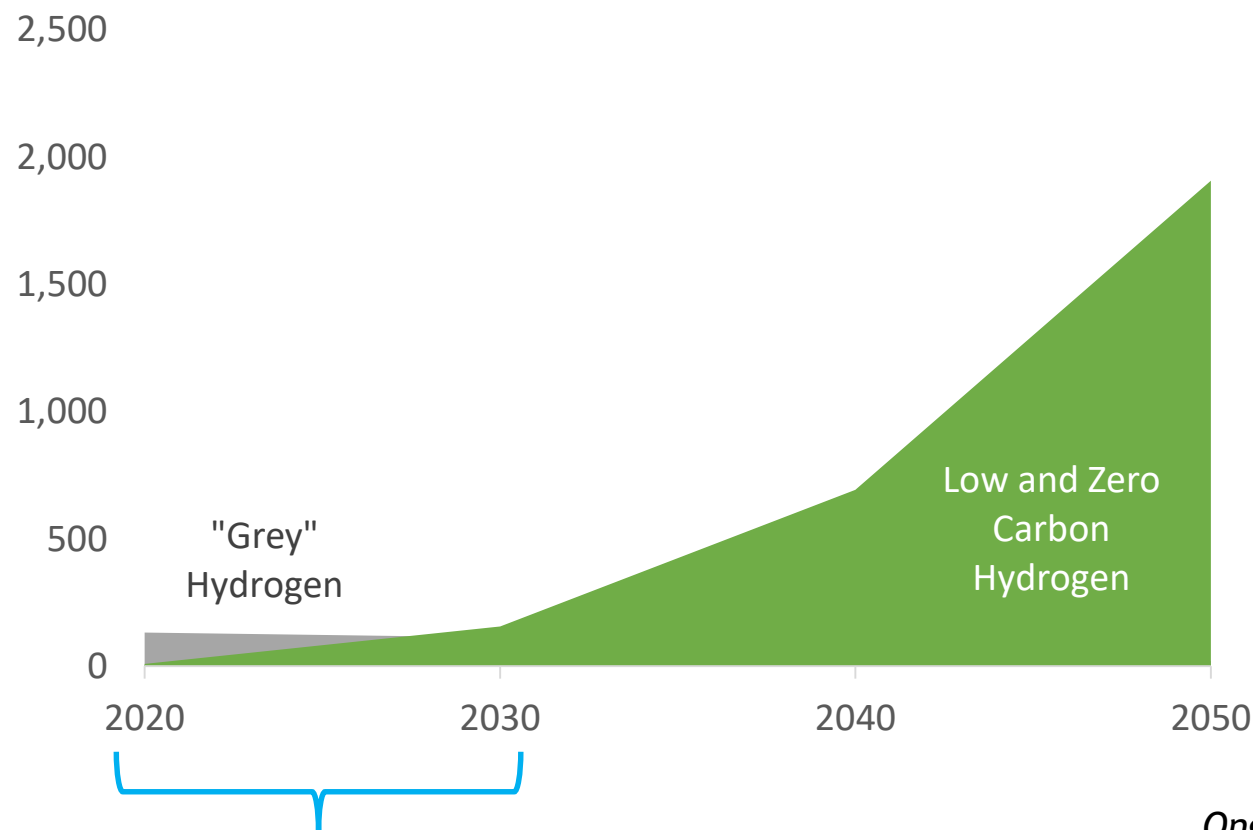
EESI Congressional Briefing



April 2022

In Pathways to Net-Zero, Clean Hydrogen Production Ramps Up After 2030

Hydrogen Supply (TWh)



Lay Solid and Climate-Aligned Foundations

Ongoing NRDC Net-Zero Analysis;
Preliminary Results

Bring it Back to the Holistic Picture: This is Not About Hydrogen

Hydrogen scale-up should not be for hydrogen's sake;

Hydrogen deployment should be done with a view to support the most affordable, efficient and community-safe transition to a clean economy.

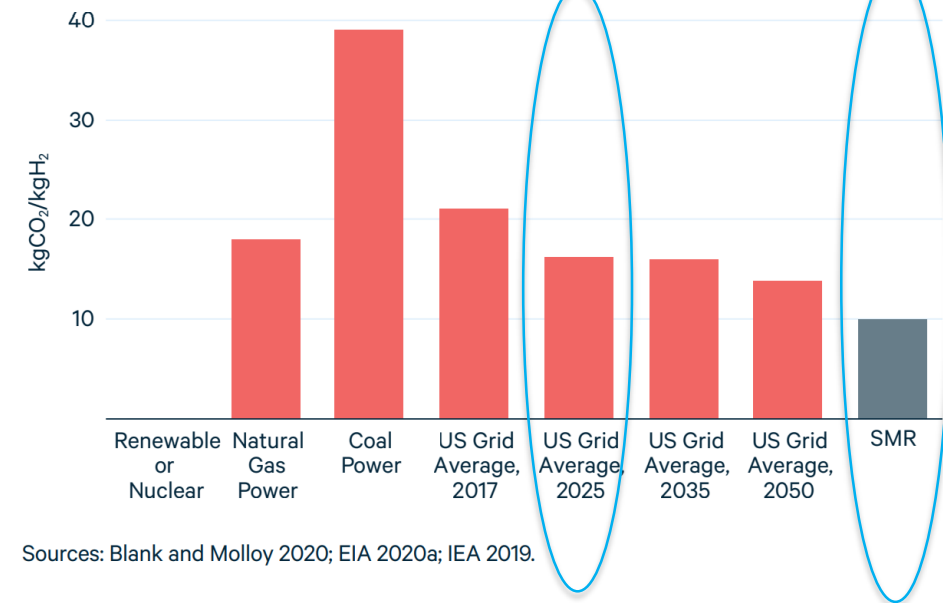
Hydrogen Production is Energy Intensive and Can Be Highly Emitting Absent Policies and Regulations



The Department of
Ecology & Evolutionary Biology

**Prof Howarth
provided view of
'blue' hydrogen;
may be worse than
gas or coal**

Figure 3. CO₂ Emissions from Electrolysis, by Power Source



Sources: Blank and Molloy 2020; EIA 2020a; IEA 2019.

Hydrogen Use is Generally Inefficient; Indiscriminate Deployment Can Increase Costs

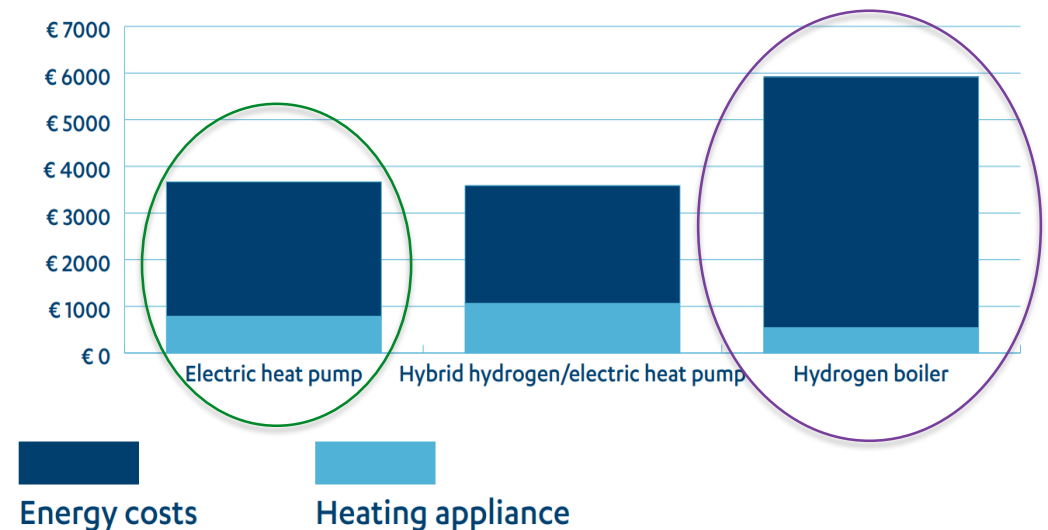
Green hydrogen takes over five times more energy to produce heat compared to electrification

Number of wind turbines needed to cover heating demand in the UK
where one symbol = 1,500 turbines



Source: Energy Monitor analysis of [Committee on Climate Change](#) and [Renewable UK](#) figures. This is illustrative for the UK assuming all gas used for heating is substituted with green hydrogen or using heat pumps. In reality not only wind power would be used to provide the electricity.

Annual cost of heating a single family home in Poland in the period 2025-2040 with different heating systems



Source: *Goodbye gas: heat pumps will be the cheapest green heating option for consumers; BEUC, The European Consumer Organisation*

Hydrogen Leakage Can Have Detrimental Climate Consequences



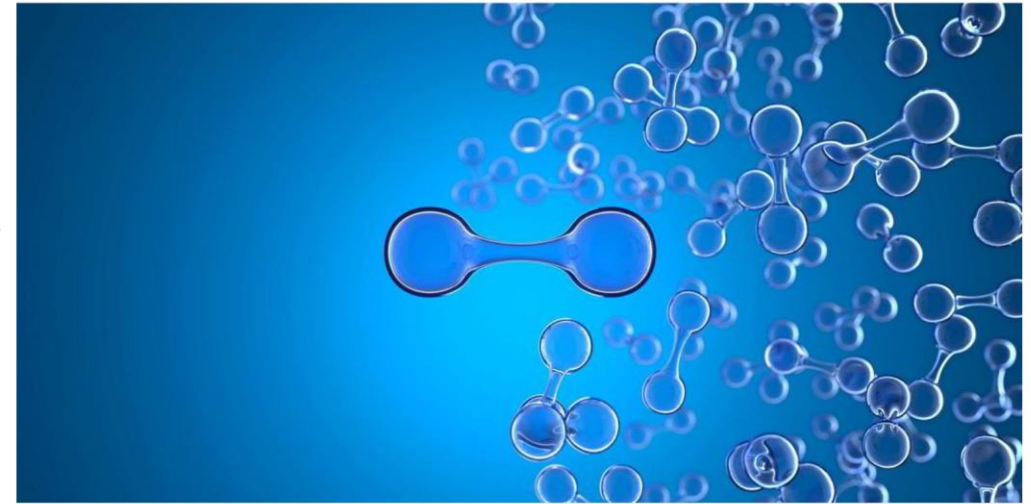
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For hydrogen to be a climate solution, leaks must be tackled



Hydrogen ‘twice as powerful a greenhouse gas as previously thought’: UK government study

Report highlights importance of preventing leakage from future H2 infrastructure

8 April 2022 14:43 GMT *UPDATED 11 April 2022 9:46 GMT*

By [Leigh Collins](#)

CLIMATE-ALIGNED
AND
NO-REGRETS SCALE



Rigorous and Climate-Aligned “Clean” Hydrogen Production Standards

- Rigorous accounting of GHGs arising both at the site of hydrogen production and upstream of production;
- DOE and EPA “Clean” Hydrogen Standard (IIJA)
- States “Clean Hydrogen” Standards
- Rigorous verification mechanisms
- Low limit on GHG emissions, ensuring deployment of only the lowest-emitting and climate-aligned hydrogen resources.

Focus on No-Regrets and Targeted Demand Creation

- Rigorous evaluation of hydrogen's highest-value applications, those aligned with the most efficient pathways to net-zero GHGs by 2050;
- Target:
 - Existing hydrogen users (refineries, fertilizer plants)
 - New hard-to-abate applications where hydrogen is projected to be a major climate solution (steel, maritime shipping)
- DOE Hydrogen Hubs
- Public procurement standards ("green" steel)
- Minimum quotas for clean hydrogen in existing hydrogen uses and hard-to-abate applications (e.g., European Commission, Germany, Spain, India)
- Better DOE RDD&D prioritization to advance hydrogen use in priority, hard-to-abate sectors where its use remains pre-commercial (steel, maritime shipping, aviation)

Caution and Further Reflection Concerning Hydrogen Transport Infrastructure

- Significant uncertainties relating to the costs and implications of the widespread repurposing of natural gas pipelines to hydrogen as well as building new hydrogen pipelines;
- Hydrogen leakage risks are likely high during transport
- Advance hydrogen use in clusters/hubs to minimize hydrogen transport infrastructure
- Scientific and transparent assessments of the future hydrogen landscape and need (or lack thereof) of extensive pipeline infrastructure (DOE and academia)
- DOE and global RD&D concerning hydrogen leakage detection and repair, and development of leakage measurement, verification and reporting protocols

Robust and Proactive Outreach to Labor and Environmental Justice Groups

- Equity considerations - both health and labor- permeate the hydrogen space;
- Hydrogen production and use can produce high levels of air pollution (NOx emissions when combusted)
- Some hydrogen applications may have safety risks that require further assessment and solution development
- Proactive and meaningful engagement with EJ and labor communities
- High labor standards across the hydrogen value chain and workforce training programs
- Rigorous and strict health and safety standards for all hydrogen use cases

THANK YOU

