

DOCKETED

Docket Number:	25-IEPR-04
Project Title:	Hydrogen
TN #:	265044
Document Title:	Presentation - US Clean Hydrogen Market Outlook
Description:	4. Payal Kaur, BNEF.
Filer:	Raquel Kravitz
Organization:	Bloomberg NEF
Submitter Role:	Public
Submission Date:	7/28/2025 3:10:13 PM
Docketed Date:	7/28/2025

US Clean Hydrogen Market Outlook

Presented to California Energy
Commission

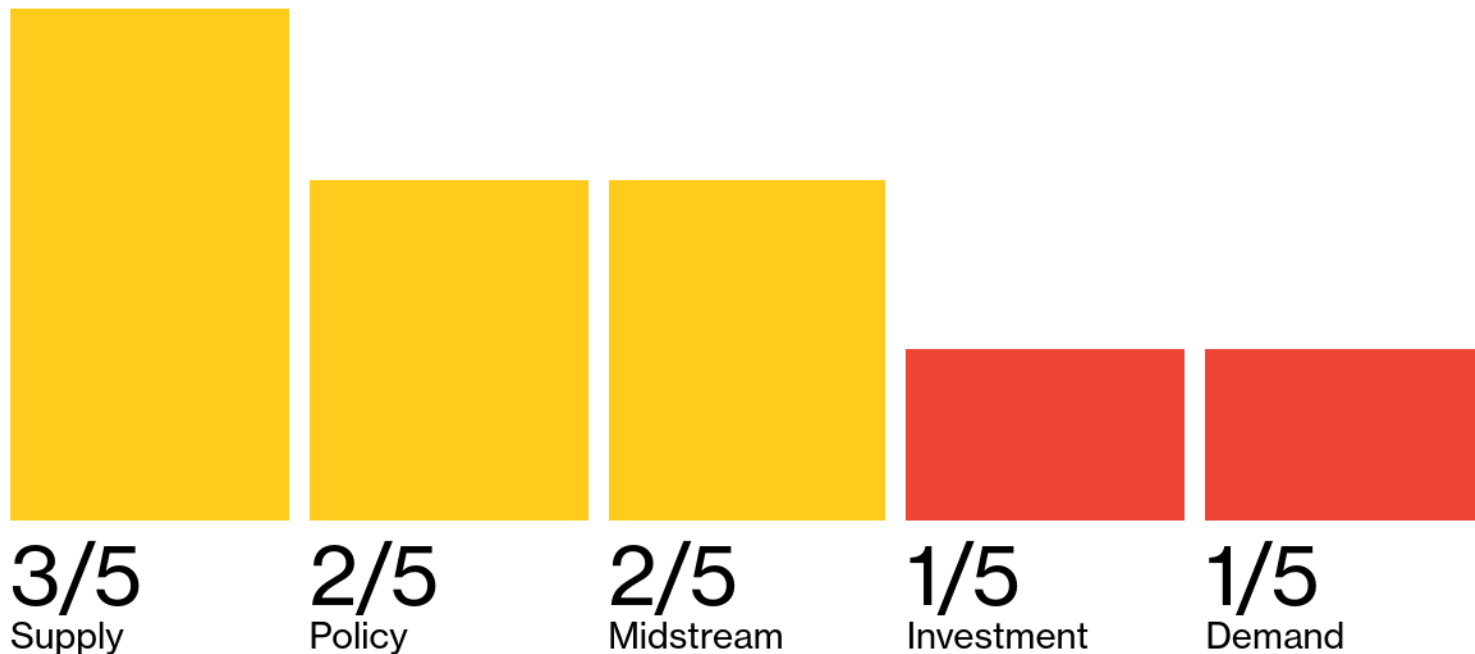
Payal Kaur

July 29, 2025



BloombergNEF

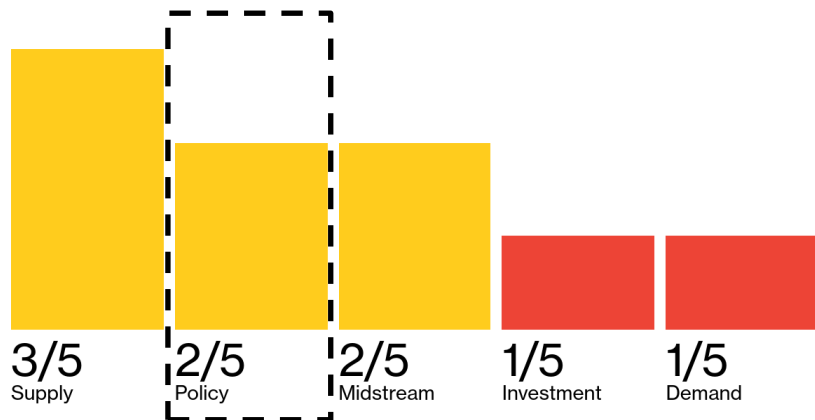
Hard times for hydrogen: BNEF's 1H 2025 H₂ sector scorecard (9/25)



Source: BloombergNEF. Note: 4-5 = on a good track, 2-3 = some progress, 0-1 = more work needed.

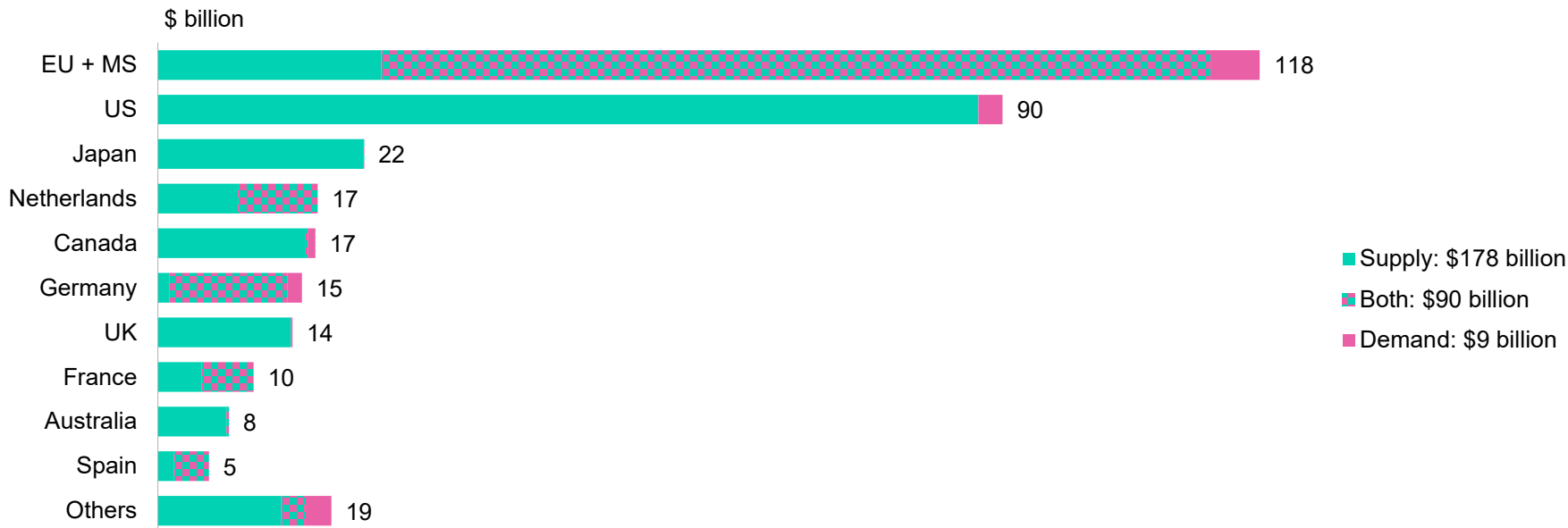
Policy

Uncertainty



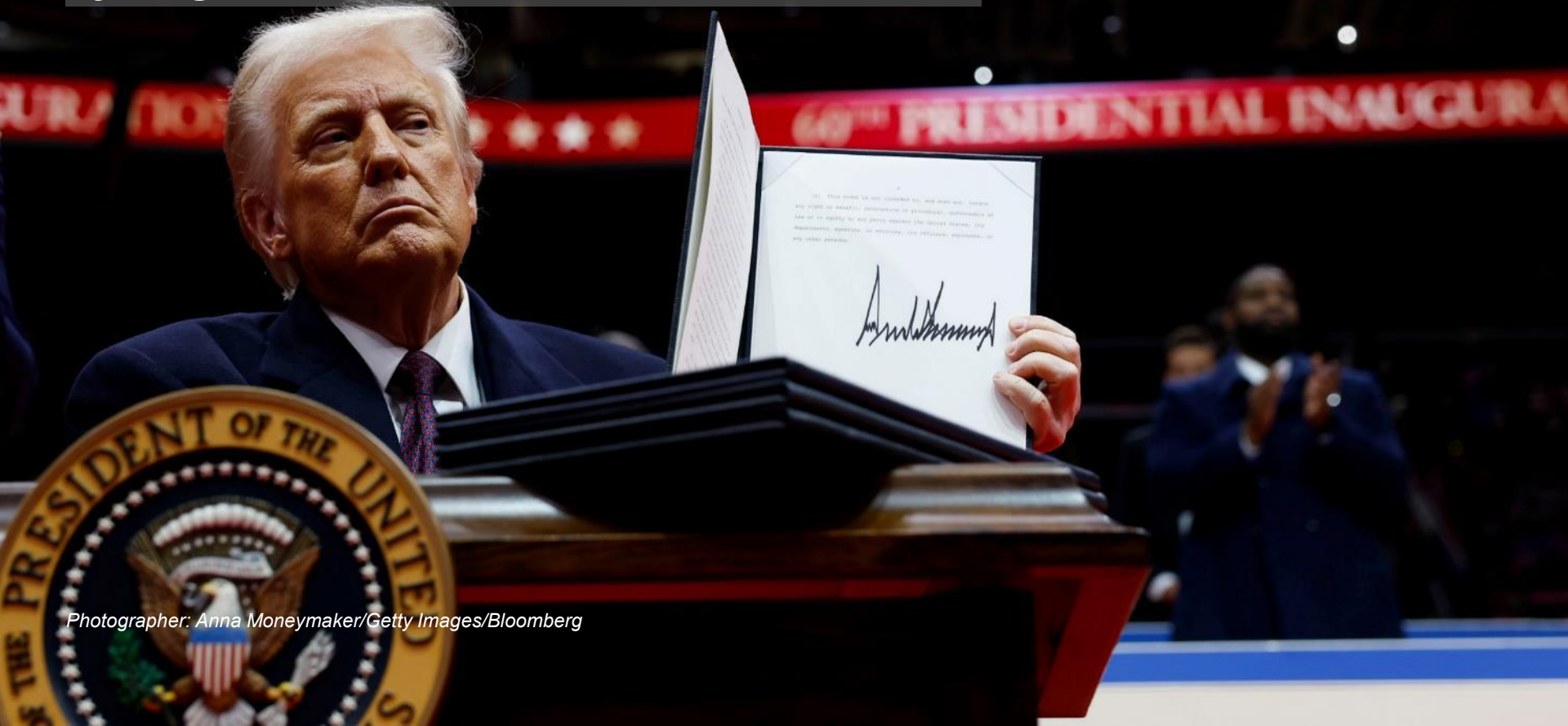
More than \$275 billion is available for clean hydrogen, but only a fraction goes to demand

Government support for hydrogen by market and target area



Source: BNEF Hydrogen Subsidies Tracker ([web](#) | [terminal](#)). Note: EU + MS = European Union plus its member states. 'Both' also includes support for hydrogen midstream (storage and transport). Data as of March 19, 2025.

Case study: US policy uncertainty has kept hydrogen developers in limbo

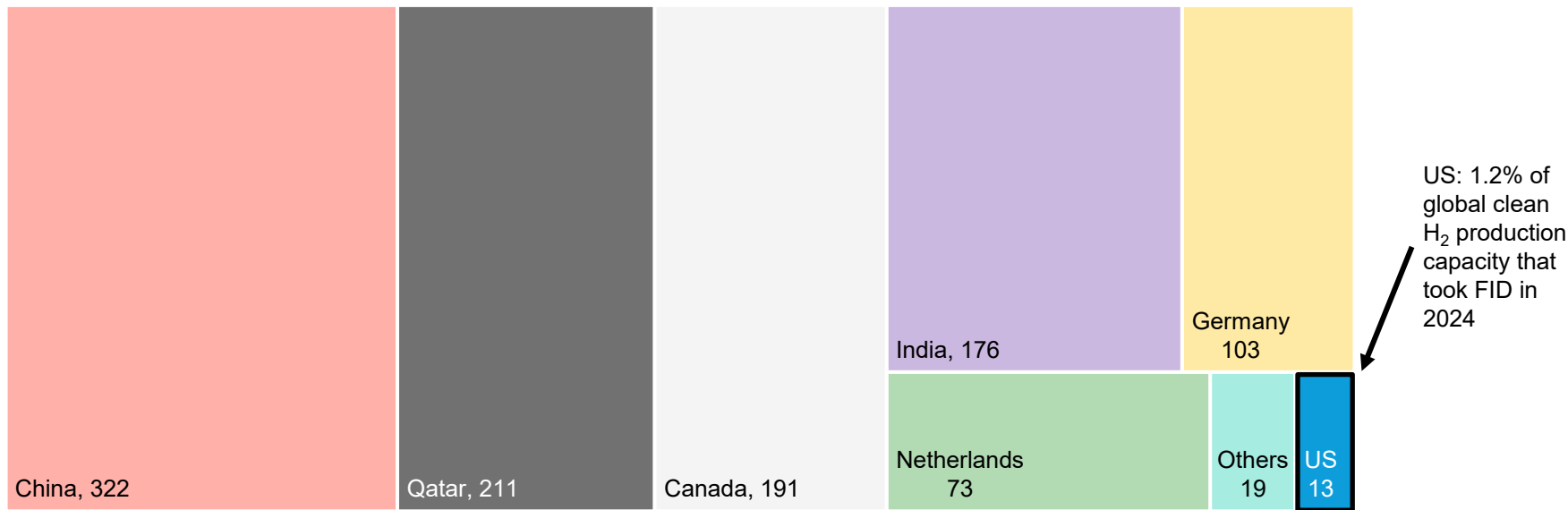


Photographer: Anna Moneymaker/Getty Images/Bloomberg

Case study: US policy uncertainty has kept hydrogen developers in limbo

Clean H₂ project capacity that closed financing in 2024, by market

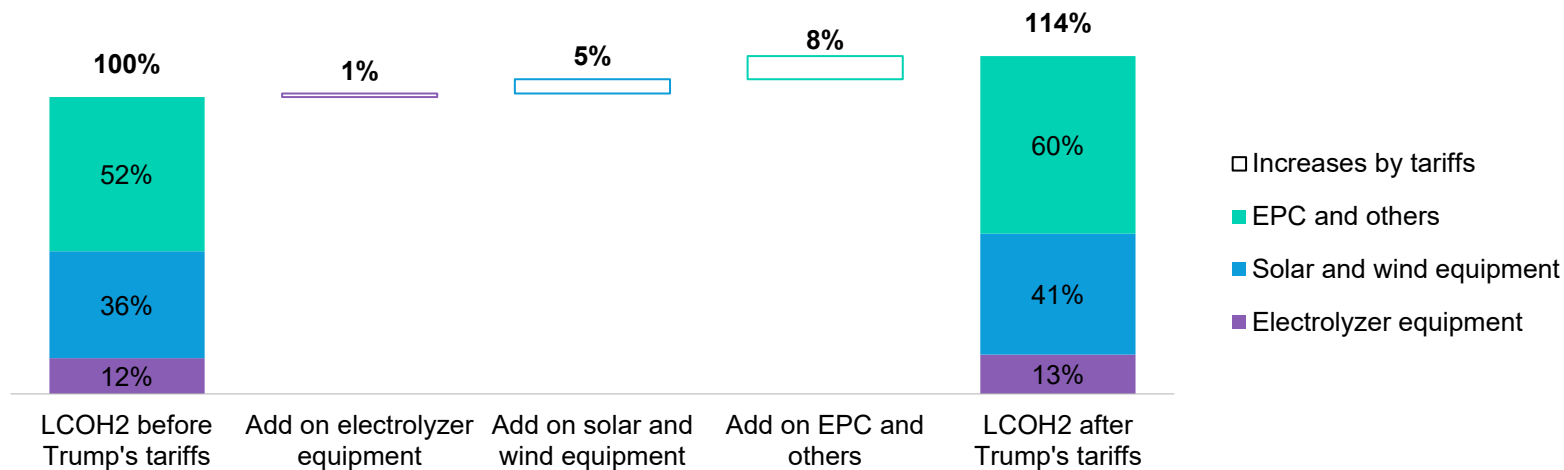
Thousand metric tons of hydrogen



Source: BloombergNEF

President Trump's tariffs could raise US green hydrogen costs by 14%

Impacts of Trump's new tariffs on green hydrogen costs in the US, 2025

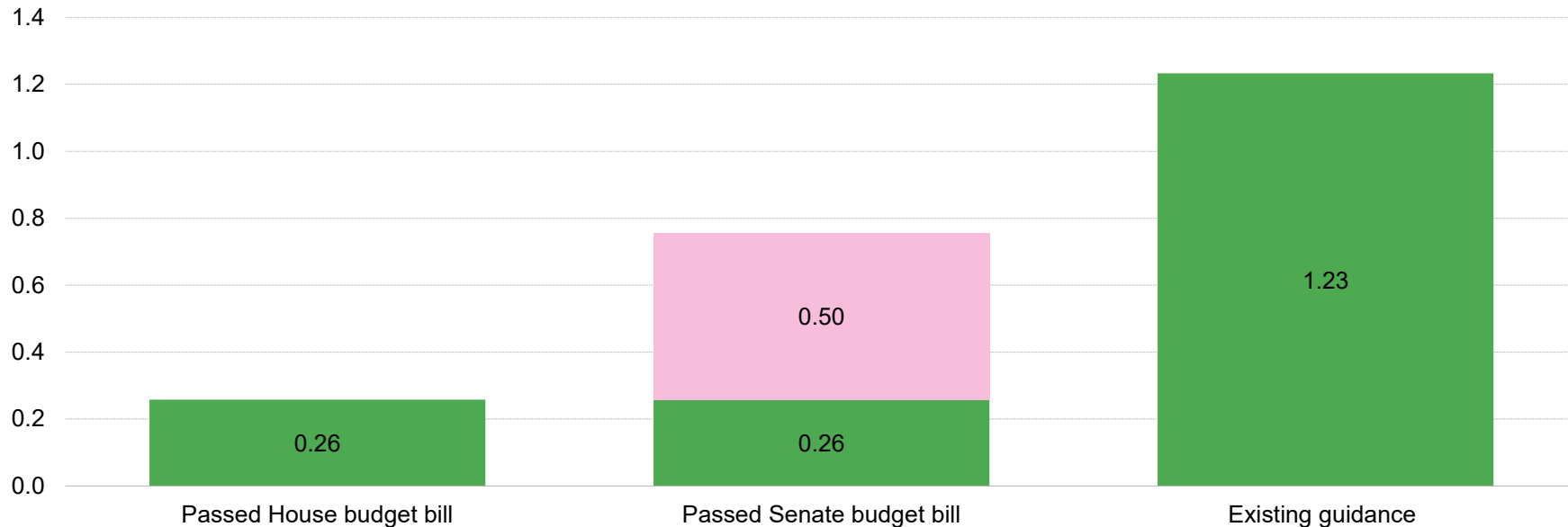


Source: BloombergNEF. Note: LCOH2 stands for levelized cost of hydrogen production. The year 2025 refers to when final investment decision (FID) is reached. Calculations of tariff impacts are based on announcements by April 8, 2025.

The “One Big Beautiful Bill” boosts blue hydrogen while taking a jab at green hydrogen

Green hydrogen production volumes eligible for 45V tax credit

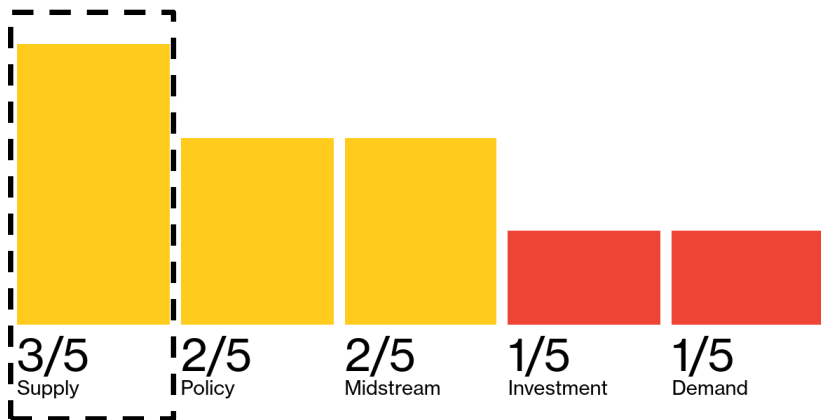
Million metric tons of hydrogen per year



Source: BloombergNEF. Note: Forecast is based on clean hydrogen projects in the optimistic scenario of BNEF's supply forecast as of May 2024

Supply

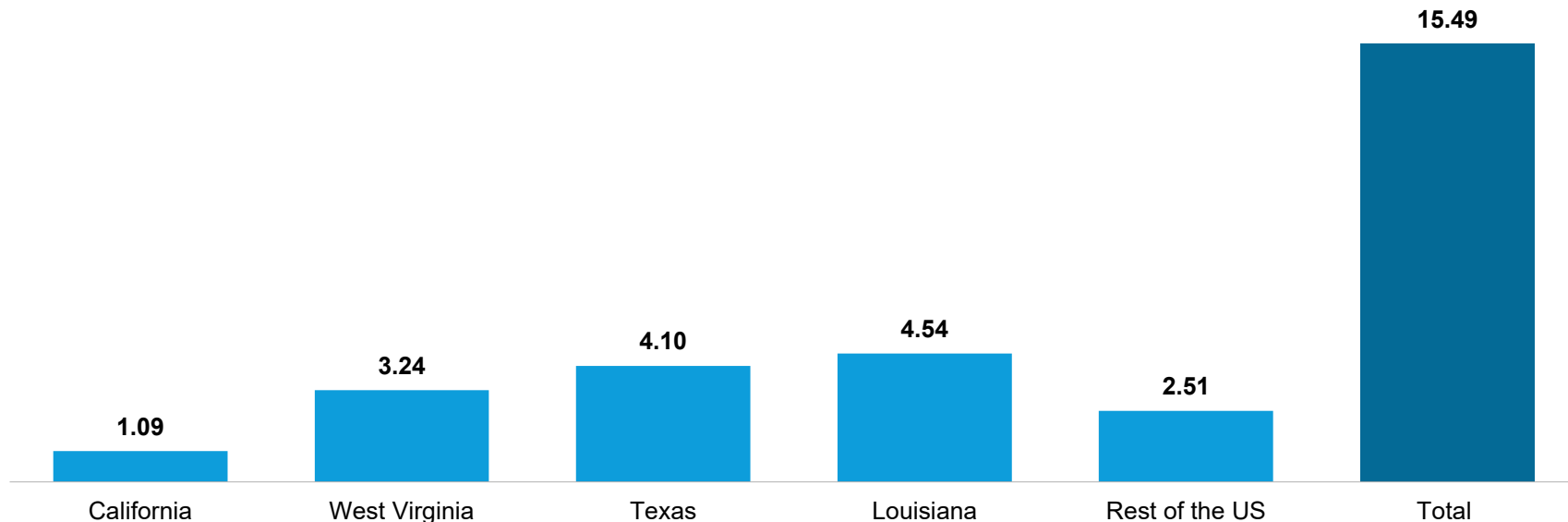
Lots of announced supply, but very little of it is materializing



California is in the top four states planning to produce clean hydrogen

Cumulative annual clean H₂ production announced to come online by state

Million metric tons of hydrogen per year

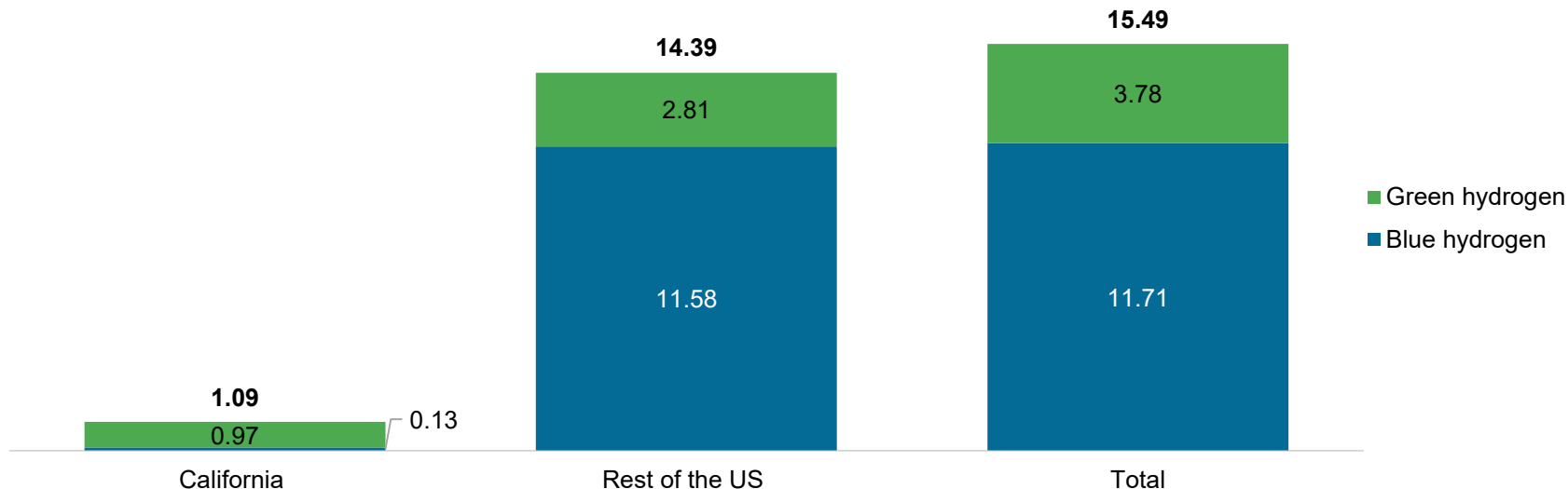


Source: BloombergNEF. Note: Data as of July 28, 2025.

California is planning for more green hydrogen production than blue hydrogen

Cumulative annual clean H₂ production announced to come online by state

Million metric tons of hydrogen per year



Source: BloombergNEF. Note: Data as of July 28, 2025.

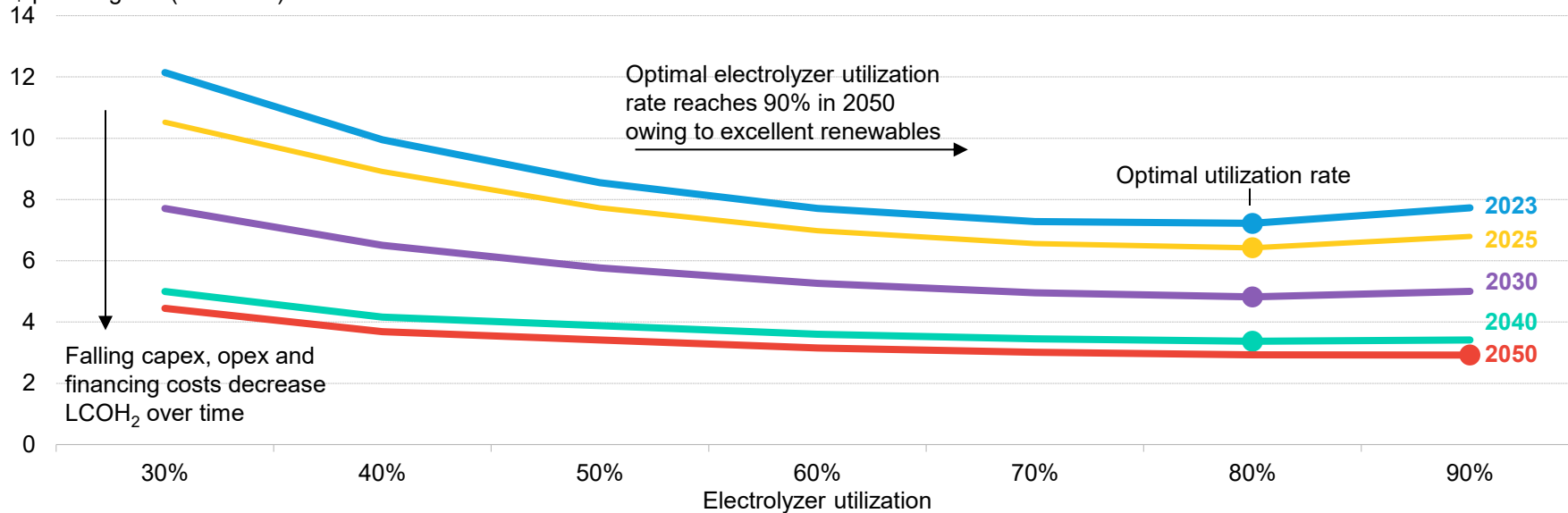
Costs and prices

Higher than anticipated

Texas has the lowest LCOH₂ among the three US states modeled due to strong renewables

LCOH₂ by electrolyzer utilization and financing year, Texas

\$ per kilogram (real 2023)

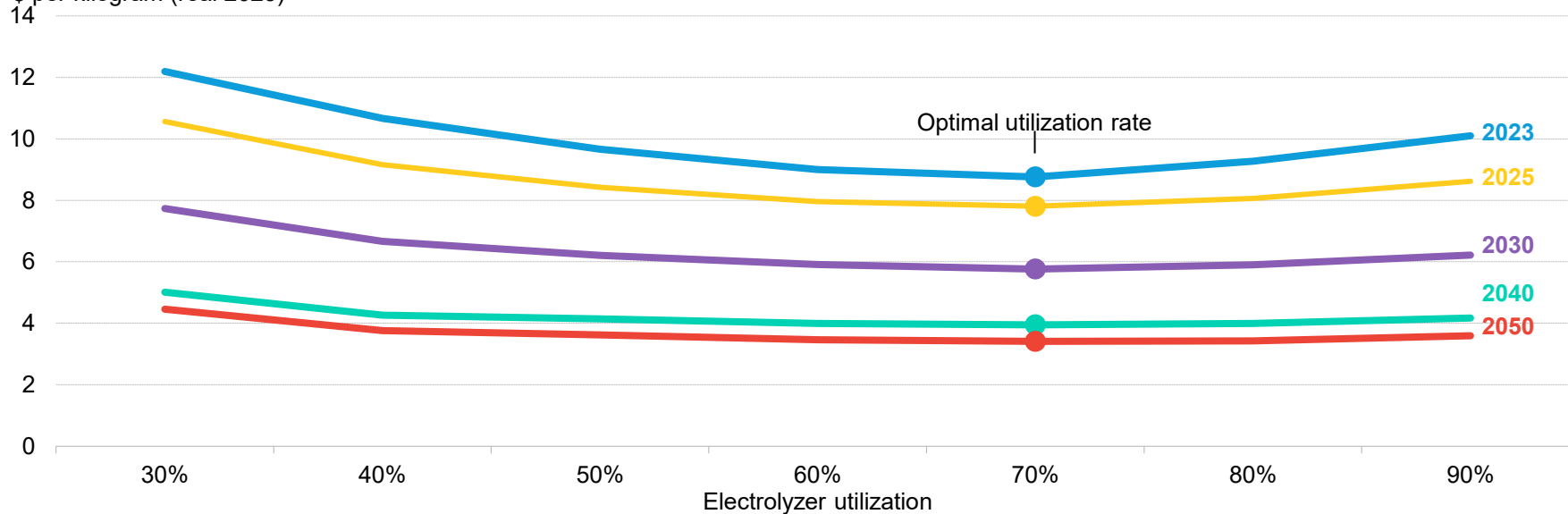


Source: BloombergNEF. Note: Years represent financing years. The colored circles represent the levelized cost of hydrogen production (LCOH₂) at the optimal utilization rate, which is the rate at which an electrolyzer produces the lowest LCOH₂. The utilization rate may vary based on coordinates input for the renewables.

Utah LCOH₂ is higher than Texas, lower than New York, reflecting solar and wind conditions

LCOH₂ by electrolyzer utilization and financing year, Utah

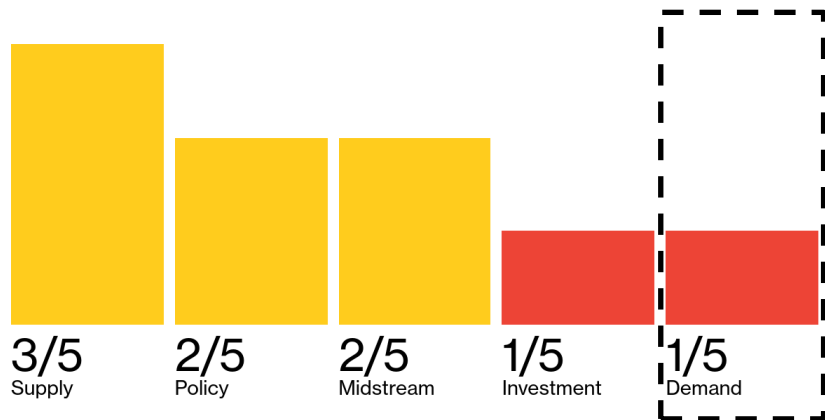
\$ per kilogram (real 2023)



Source: BloombergNEF. Note: Years represent financing years. The colored circles represent the levelized cost of hydrogen production (LCOH₂) at the optimal utilization rate, which is the rate at which an electrolyzer produces the lowest LCOH₂. The utilization rate may vary based on coordinates input for the renewables.

Demand

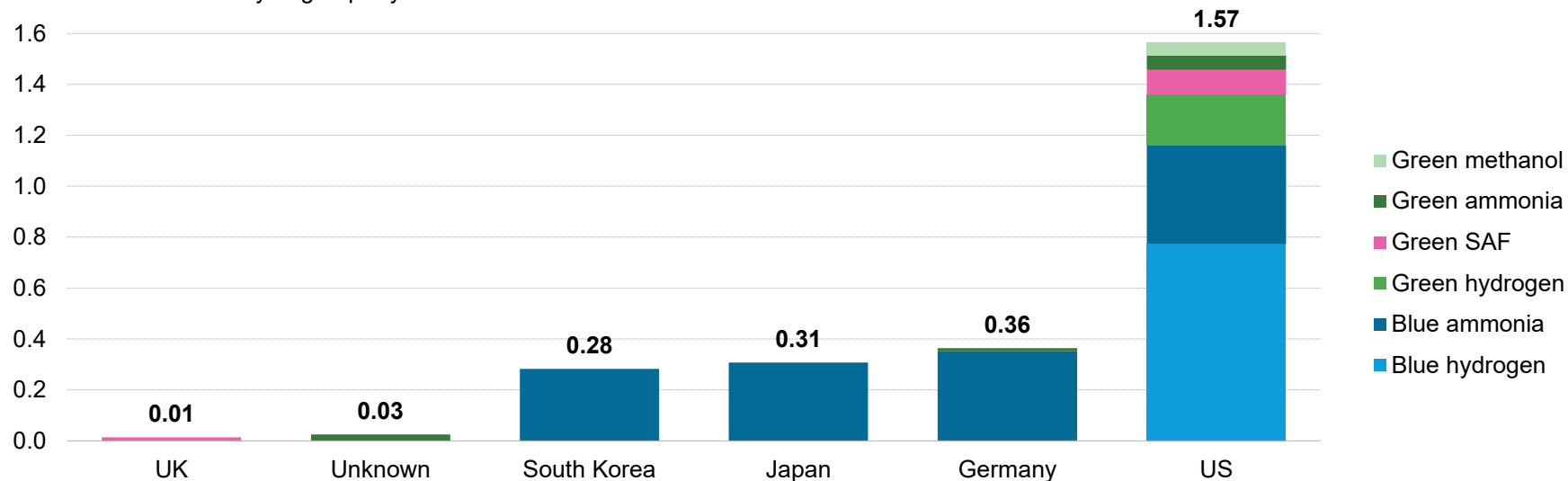
Binding offtake continues to remain elusive



US is supplying clean H₂ mainly for domestic use

Clean hydrogen offtake volumes by demand market

Million metric tons of hydrogen per year

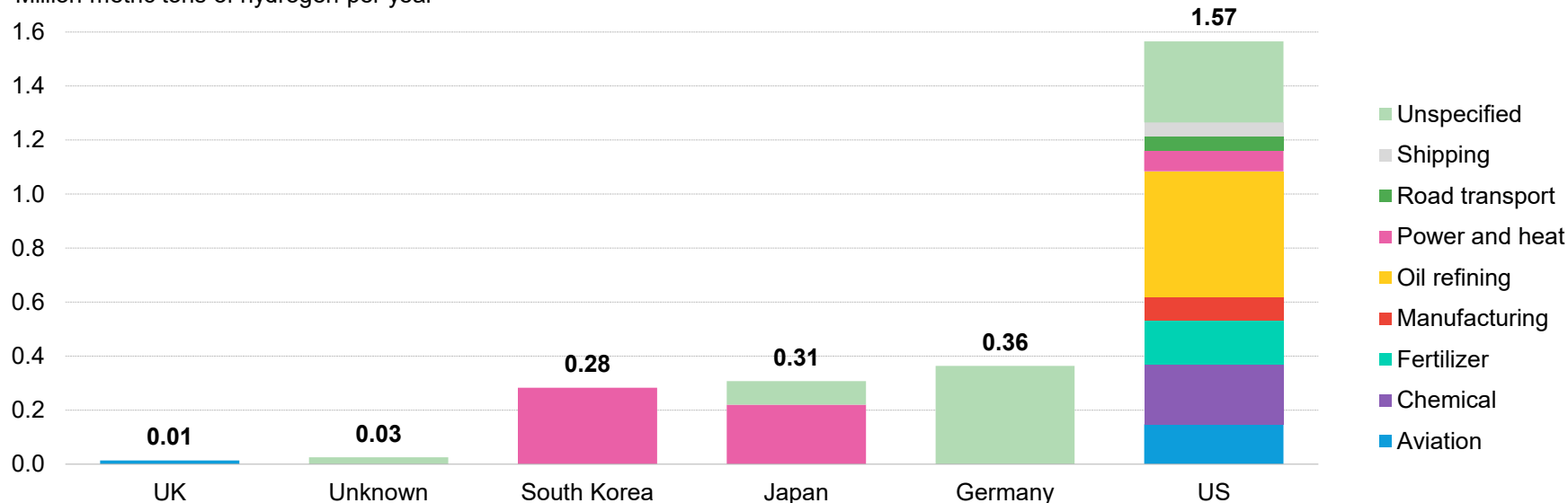


Source: BloombergNEF. Note: Data as of May 30, 2025. BNEF's Hydrogen Offtake Agreement Database only includes projects of at least 20 megawatts or 2,800 metric tons per year of capacity.

Offtake from US supply is largely for existing uses of H₂

Clean hydrogen offtake by demand market

Million metric tons of hydrogen per year

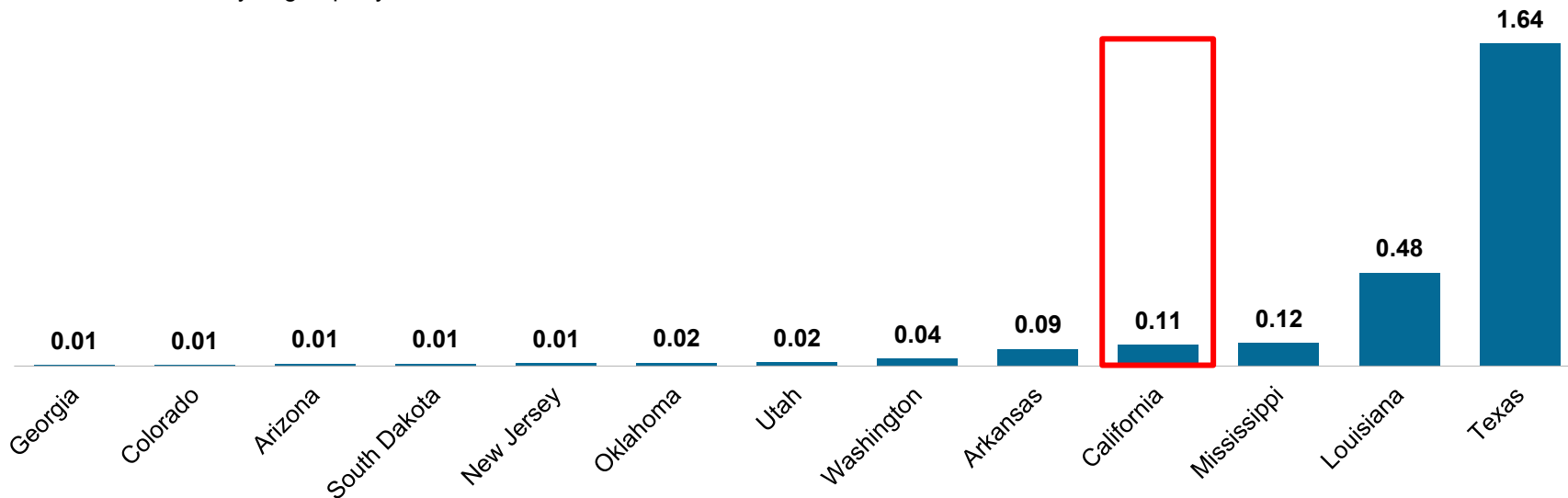


Source: BloombergNEF. Note: Data as of May 30, 2025. BNEF's Hydrogen Offtake Agreement Database only includes projects of at least 20 megawatts or 2,800 metric tons per year of capacity.

California is among the top five states with the most signed offtake

Clean hydrogen offtake by state

Million metric tons of hydrogen per year

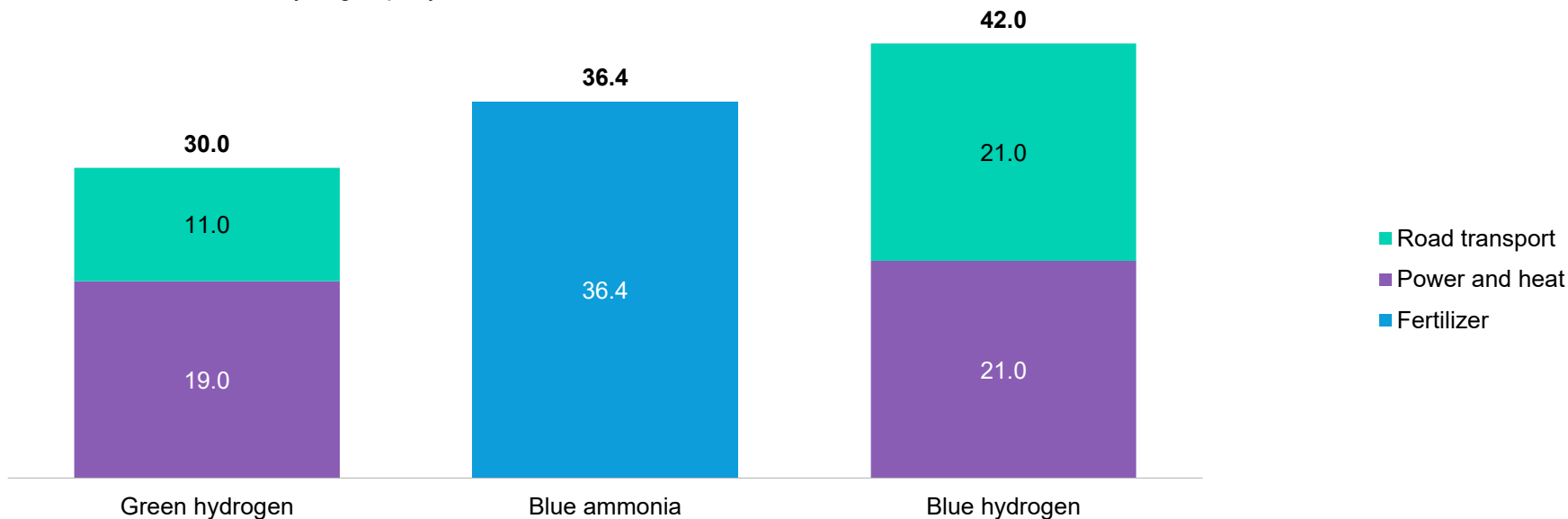


Source: BloombergNEF. Note: Data as of May 30, 2025. BNEF's Hydrogen Offtake Agreement Database only includes projects of at least 20 megawatts or 2,800 metric tons per year of capacity.

Power and heat is the largest end use for California clean hydrogen

Clean hydrogen offtake by state

Thousand metric tons of hydrogen per year



Source: BloombergNEF. Note: Data as of May 30, 2025. BNEF's Hydrogen Offtake Agreement Database only includes projects of at least 20 megawatts or 2,800 metric tons per year of capacity.

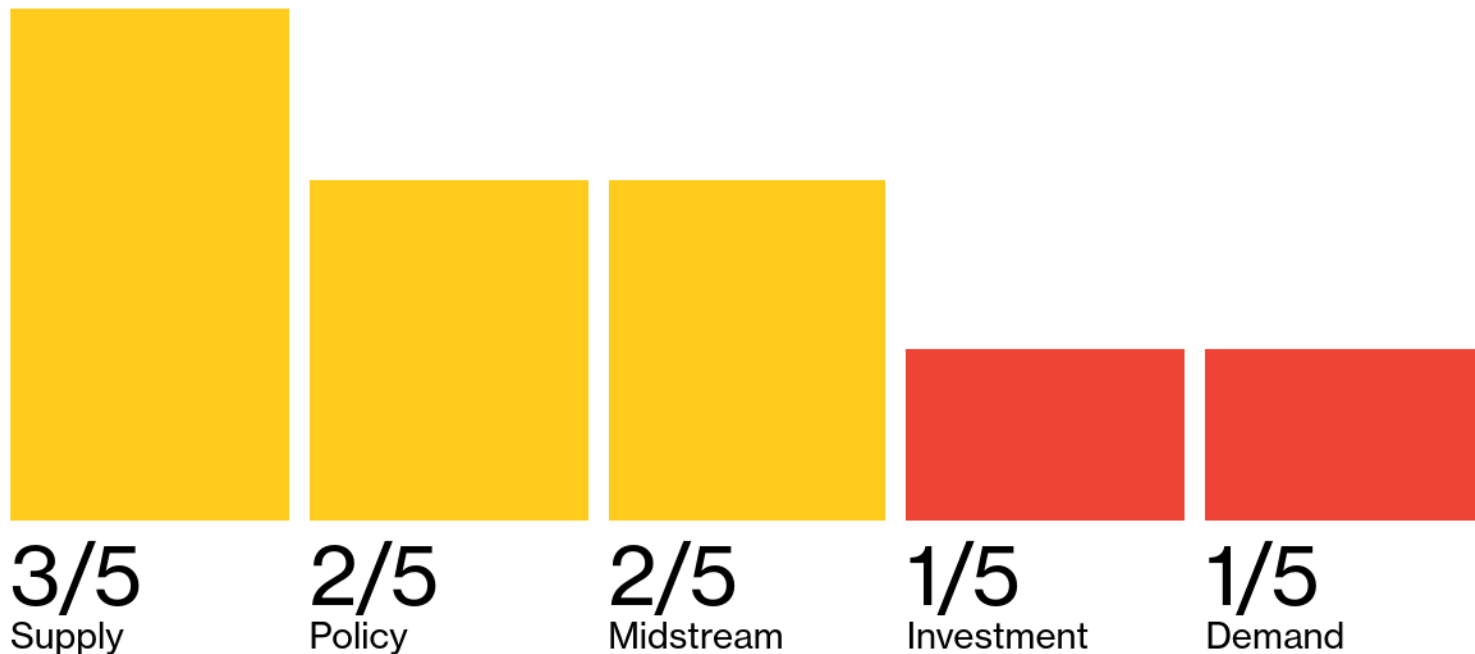
Most applications of clean H₂ have a mix of good and bad news

Key developments since BNEF's 1H 2024 Market Outlook

Sector		Tech readiness	Role in net zero*	Key developments since April 2024 (positive, mixed, negative)
Oil refining		Commercial	Unavoidable	Oil refineries have signed some of the largest offtake deals, including TotalEnergies' binding agreements with Air Products and RWE , and INEOS ' contract with RWE
Methanol (chemical)		Commercial	Unavoidable	Maersk launched a new venture to produce plastics using green methanol as a feedstock, while coal-chemical projects in China slowed down adoption of green H ₂
Ammonia (chemical)		Commercial	Unavoidable	Fertilizer traders Yara and Ameropa signed new offtake deals globally; fertilizer producers Pupuk Indonesia and CF Industries announced new green H ₂ projects
Steel		Commercially ready	Medium	New offtake deals for hydrogen-based steel were signed by Benteler and Amazon , but the deployment of green steel projects is at risk of delays (web terminal)
Shipping		Commercially ready	Large	Shipping companies are diversifying their clean fuel portfolio: Hapag-Lloyd signed an offtake deal with a Chinese project, while Maersk turned its eyes to LNG ships
Aviation		Pilot stage	Medium	Leading renewable fuel producer Neste canceled its hydrogen project in Finland, and German utility Uniper abandoned an e-SAF project in Europe
Power		Pilot stage	Small	Japan de-prioritized ammonia co-firing in its upcoming auction (web terminal); South Korea's hydrogen power auction ran into cost hurdles (web terminal)

Source: BloombergNEF. Note: *Role in net zero refers to clean hydrogen's role in each sector in BNEF's New Energy Outlook 2024 Net Zero Scenario (Figure 5.29). Large means hydrogen share in final energy consumption over 50%, while medium is between 20% and 50%, under 20% is small. SAF is sustainable aviation fuel.

Hard times for hydrogen: BNEF's 1H 2025 H₂ sector scorecard (9/25)



Source: BloombergNEF. Note: 4-5 = on a good track, 2-3 = some progress, 0-1 = more work needed.

Copyright and disclaimer

Copyright

© Bloomberg Finance L.P. 2025. This publication is the copyright of Bloomberg Finance L.P. in connection with BloombergNEF. No portion of this document may be photocopied, reproduced, scanned into an electronic system or transmitted, forwarded or distributed in any way without prior consent of BloombergNEF.

Disclaimer

The BloombergNEF ("BNEF"), service/information is derived from selected public sources. Bloomberg Finance L.P. and its affiliates, in providing the service/information, believe that the information it uses comes from reliable sources, but do not guarantee the accuracy or completeness of this information, which is subject to change without notice, and nothing in this document shall be construed as such a guarantee. The statements in this service/document reflect the current judgement of the authors of the relevant articles or features, and do not necessarily reflect the opinion of Bloomberg Finance L.P., Bloomberg L.P. or any of their affiliates ("Bloomberg"). Bloomberg disclaims any liability arising from use of this document, its contents and/or this service. Nothing herein shall constitute or be construed as an offering of financial instruments or as investment advice or recommendations by Bloomberg of an investment or other strategy (e.g., whether or not to "buy", "sell", or "hold" an investment). The information available through this service is not based on consideration of a subscriber's individual circumstances and should not be considered as information sufficient upon which to base an investment decision. You should determine on your own whether you agree with the content. This service should not be construed as tax or accounting advice or as a service designed to facilitate any subscriber's compliance with its tax, accounting or other legal obligations. Employees involved in this service may hold positions in the companies mentioned in the services/information.

The data included in these materials are for illustrative purposes only. The BLOOMBERG TERMINAL service and Bloomberg data products (the "Services") are owned and distributed by Bloomberg Finance L.P. ("BFLP") except (i) in Argentina, Australia and certain jurisdictions in the Pacific islands, Bermuda, China, India, Japan, Korea and New Zealand, where Bloomberg L.P. and its subsidiaries ("BLP") distribute these products, and (ii) in Singapore and the jurisdictions serviced by Bloomberg's Singapore office, where a subsidiary of BFLP distributes these products. BLP provides BFLP and its subsidiaries with global marketing and operational support and service. Certain features, functions, products and services are available only to sophisticated investors and only where permitted. BFLP, BLP and their affiliates do not guarantee the accuracy of prices or other information in the Services. Nothing in the Services shall constitute or be construed as an offering of financial instruments by BFLP, BLP or their affiliates, or as investment advice or recommendations by BFLP, BLP or their affiliates of an investment strategy or whether or not to "buy", "sell" or "hold" an investment. Information available via the Services should not be considered as information sufficient upon which to base an investment decision. Bloomberg makes no claims or representations, or provides any assurances, about the sustainability characteristics, profile or data points of any underlying issuers, products or services, and users should make their own determination on such issues. The following are trademarks and service marks of BFLP, a Delaware limited partnership, or its subsidiaries: BLOOMBERG, BLOOMBERG ANYWHERE, BLOOMBERG MARKETS, BLOOMBERG NEWS, BLOOMBERG PROFESSIONAL, BLOOMBERG TERMINAL and BLOOMBERG.COM. Absence of any trademark or service mark from this list does not waive Bloomberg's intellectual property rights in that name, mark or logo. All rights reserved. © 2025 Bloomberg.

BloombergNEF (BNEF) is a strategic research provider covering global commodity markets and the disruptive technologies driving the transition to a low-carbon economy.

Our expert coverage assesses pathways for the power, transport, industry, buildings and agriculture sectors to adapt to the energy transition.

We help commodity trading, corporate strategy, finance and policy professionals navigate change and generate opportunities.

The BloombergNEF logo is displayed in a large, bold, black sans-serif font. The letters 'B', 'N', and 'E' are significantly larger than the 'l', 'o', 'g', 'o' part of the word 'Bloomberg'. The background of the slide features a subtle grid of small dots.

Payal Kaur

pkaur91@bloomberg.net

Client enquiries:

Bloomberg Terminal: press <Help> key twice

Email: support.bnef@bloomberg.net

Learn more:

about.bnef.com | [@BloombergNEF](https://twitter.com/BloombergNEF)