

# US Clean Hydrogen Market Outlook

Green Hydrogen Summit USA

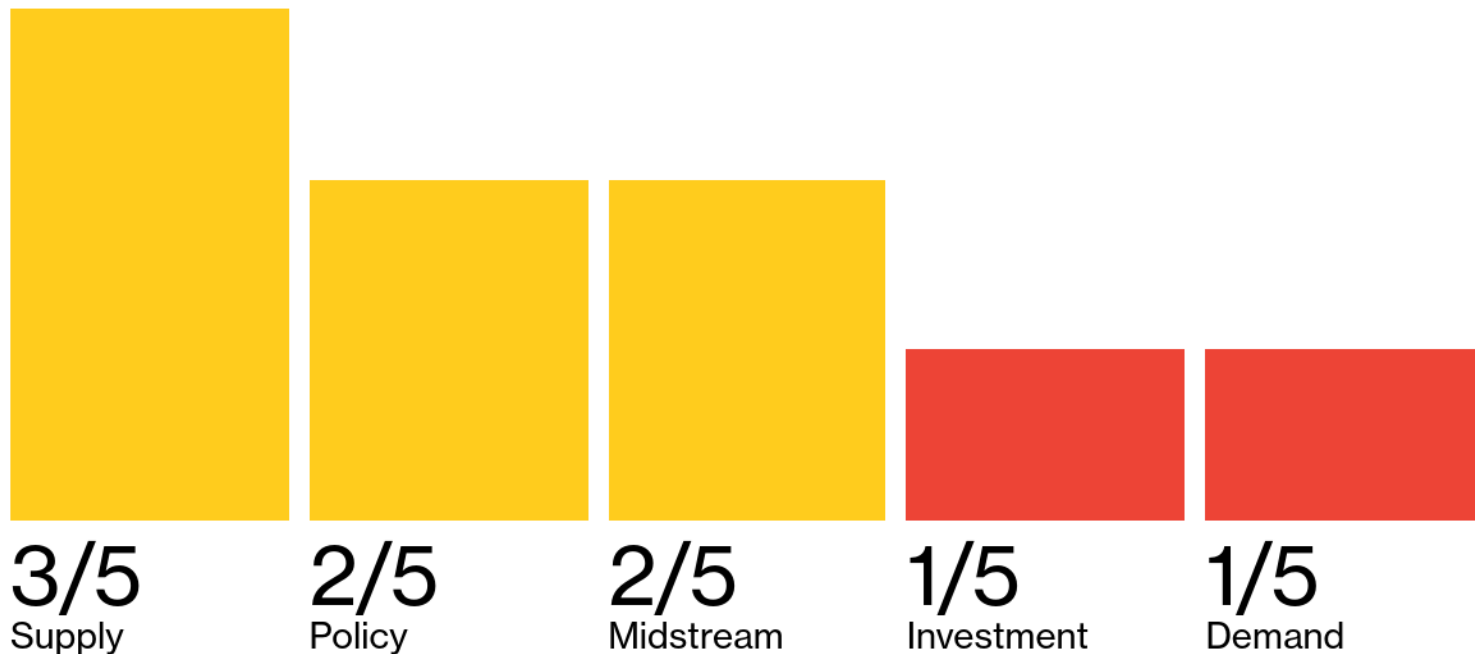
Payal Kaur

September 30, 2025



BloombergNEF

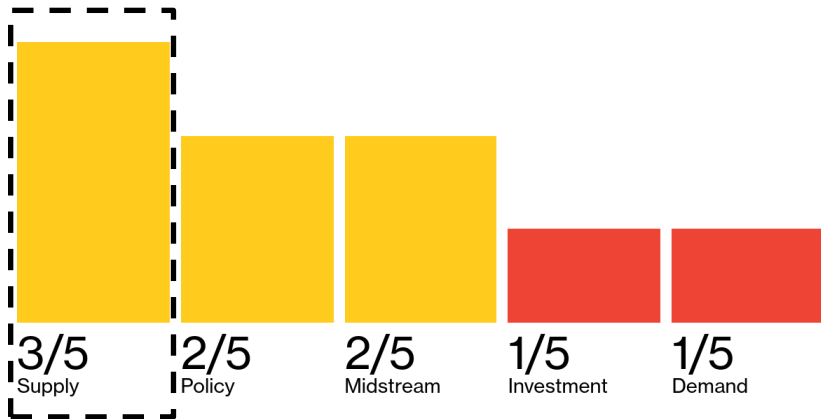
# Hard times for hydrogen: BNEF's 1H 2025 H<sub>2</sub> sector scorecard (9/25)



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

# Supply

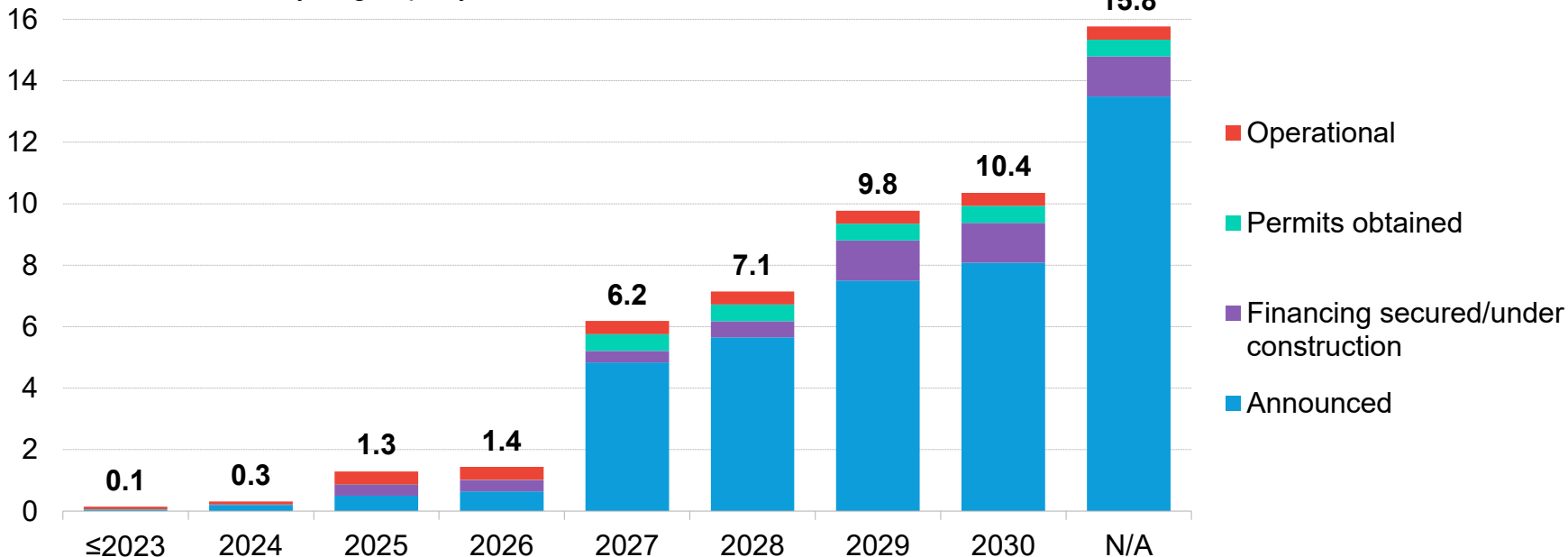
Lots of announced supply, but very little of it is materializing



# About 11% of planned US volumes are committed

## Cumulative annual clean H<sub>2</sub> production announced to come online, by year

Million metric tons of hydrogen per year

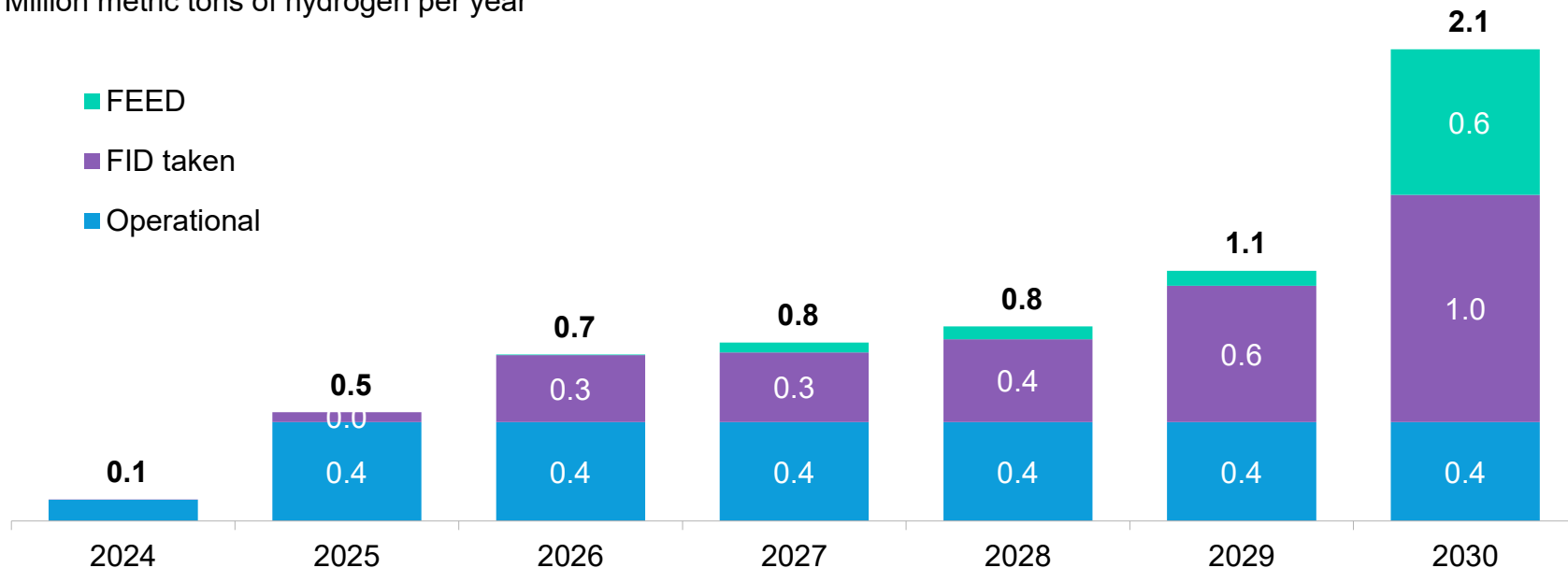


Source: BloombergNEF. Note: Data as of September 9, 2025.

# US leads global supply thanks to overseas demand for its blue H<sub>2</sub>

## Probability-adjusted US clean hydrogen supply forecast by project status

Million metric tons of hydrogen per year

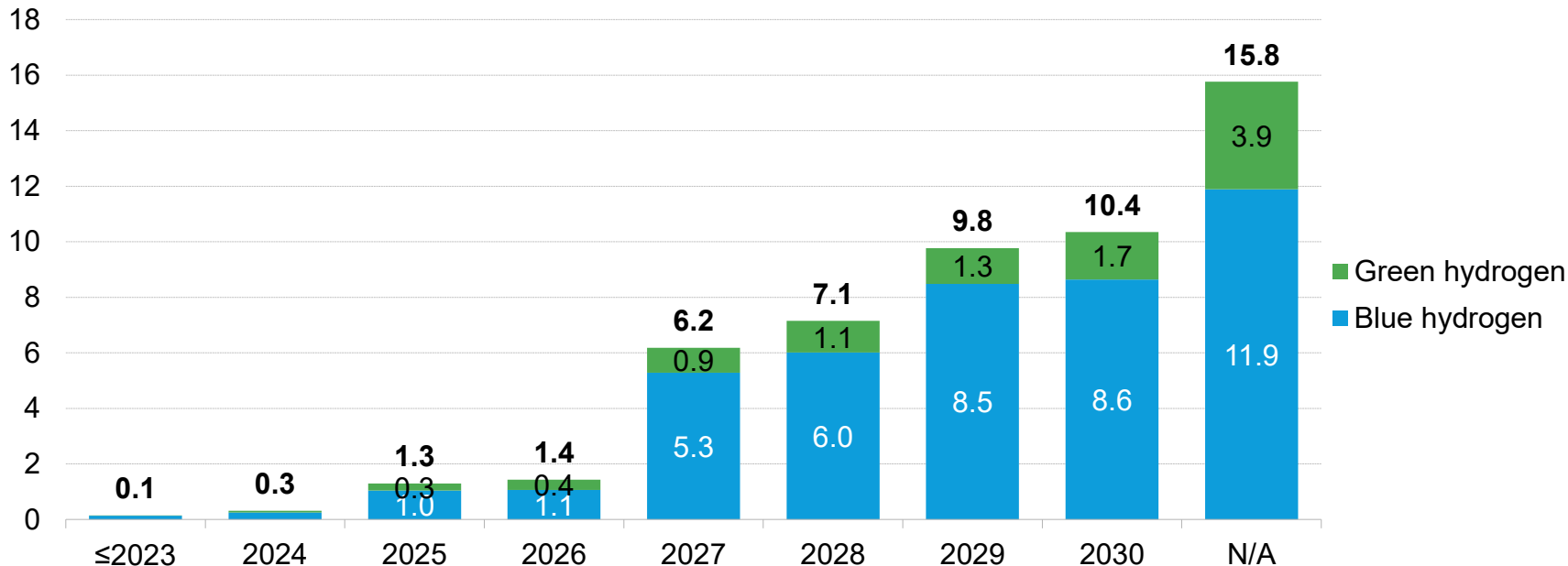


Source: BloombergNEF. Note: FEED is front-end engineering design. FID is final investment decision.

# Blue hydrogen dominates planned US volumes

## Cumulative annual clean H<sub>2</sub> production announced to come online, by year

Million metric tons of hydrogen per year

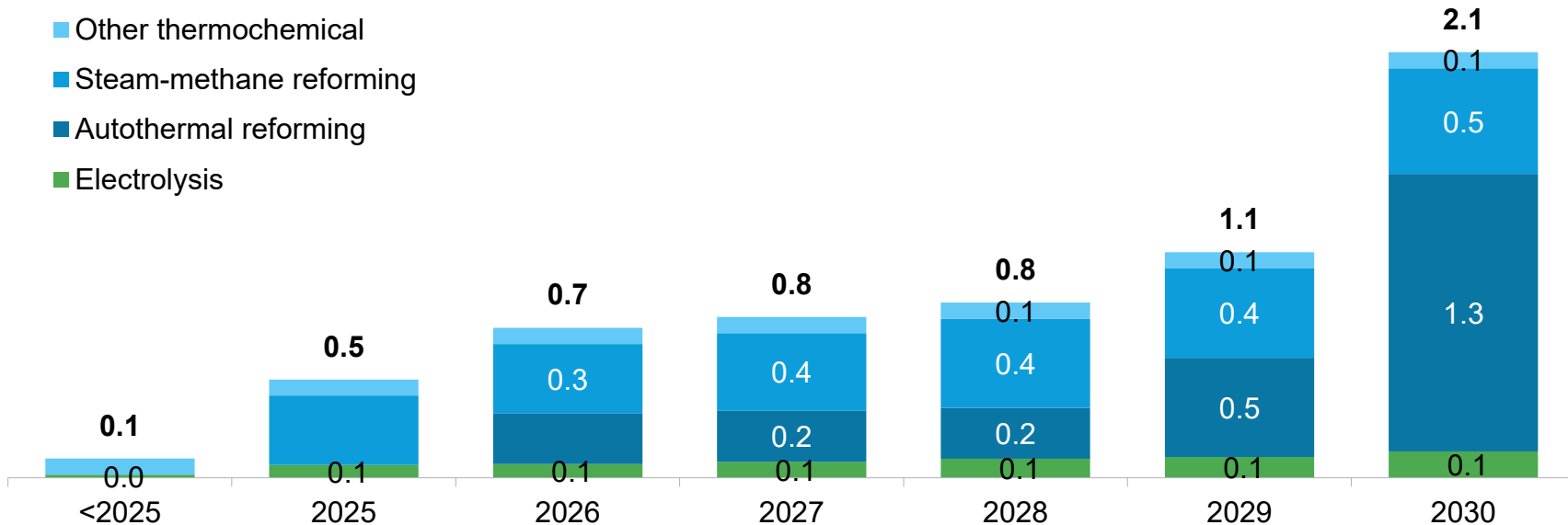


Source: BloombergNEF. Note: Data as of September 9, 2025.

# Blue hydrogen dominates forecast US volumes

## Cumulative annual clean H<sub>2</sub> production forecast to come online, by year

Million metric tons of hydrogen per year

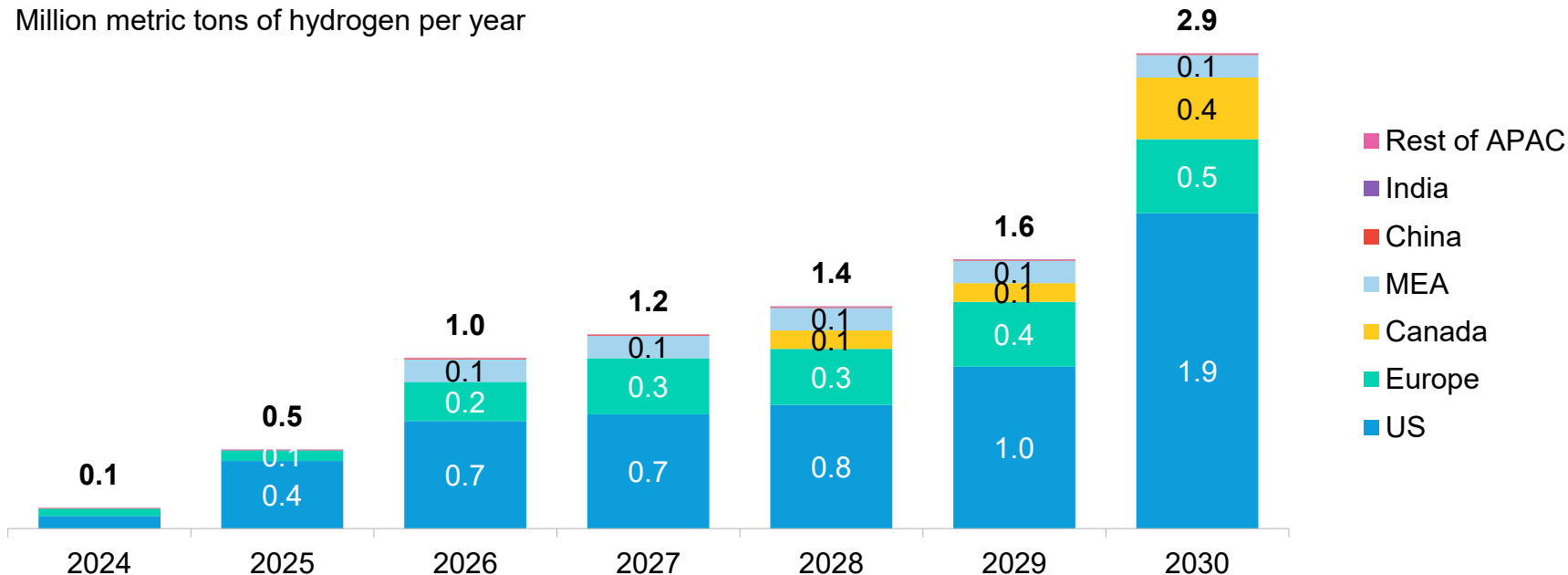


Source: BloombergNEF

# Blue H<sub>2</sub> supply is concentrated in North America due to tax credits and cheap gas

## Probability-adjusted thermochemical clean hydrogen supply forecast by market

Million metric tons of hydrogen per year

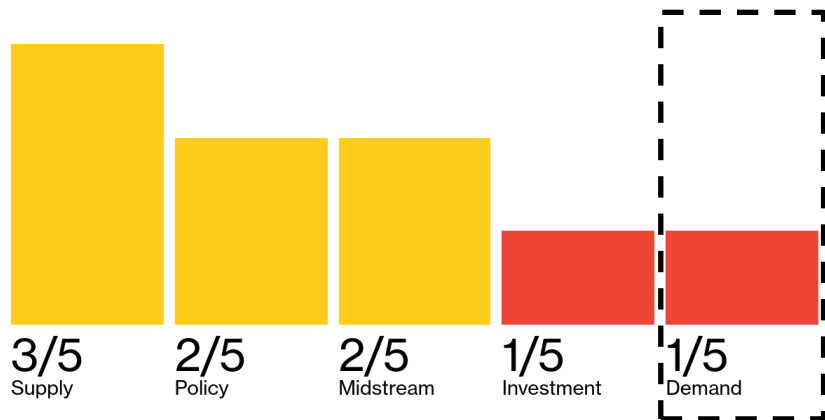


Source: BloombergNEF. Note: 'APAC' stands for Asia Pacific. 'MEA' stands for Middle East and Africa.



# Demand

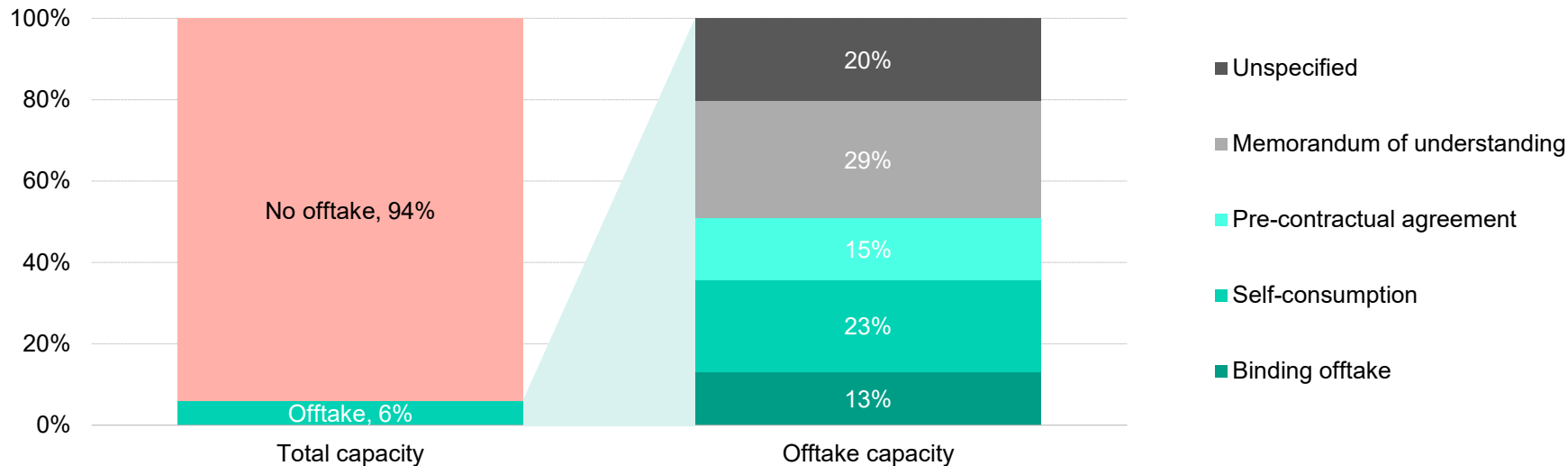
Binding offtake continues to remain elusive



# Only 13% of contracted H<sub>2</sub> offtake volume is binding

## Clean hydrogen offtake by agreement type

Share of total capacity, share of offtake capacity

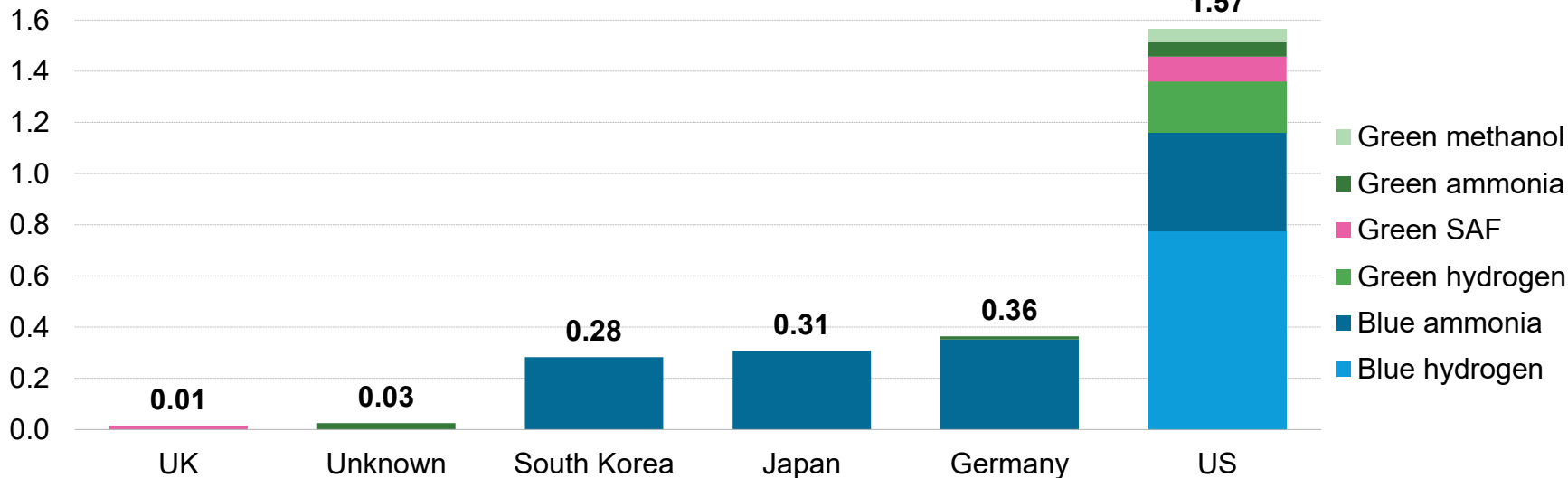


Source: BloombergNEF. Note: Data as of May 30, 2025. BNEF's Hydrogen Offtake Agreement Database only includes projects of at least 20 megawatts or 2,800 metric tons per year of capacity. Pre-contractual agreements include term sheets, letters of intent, and heads of agreements.

# US is supplying clean H<sub>2</sub> mainly for domestic use

## Clean hydrogen offtake volumes by demand market

Million metric tons per year

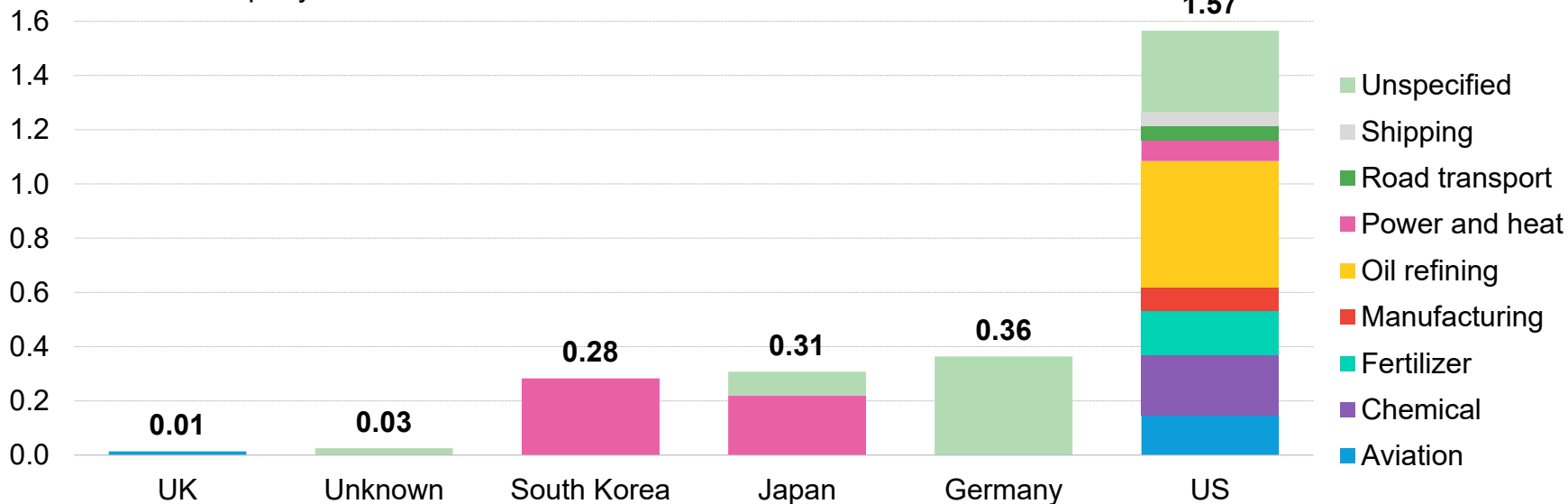


Source: BloombergNEF. Note: Data as of May 30, 2025. BNEF's Hydrogen Offtake Agreement Database only includes projects of at least 20 megawatts or 2,800 metric tons per year of capacity.

# Offtake from US supply is largely for existing uses of H<sub>2</sub>

## Clean hydrogen offtake by demand market

Million metric tons per year

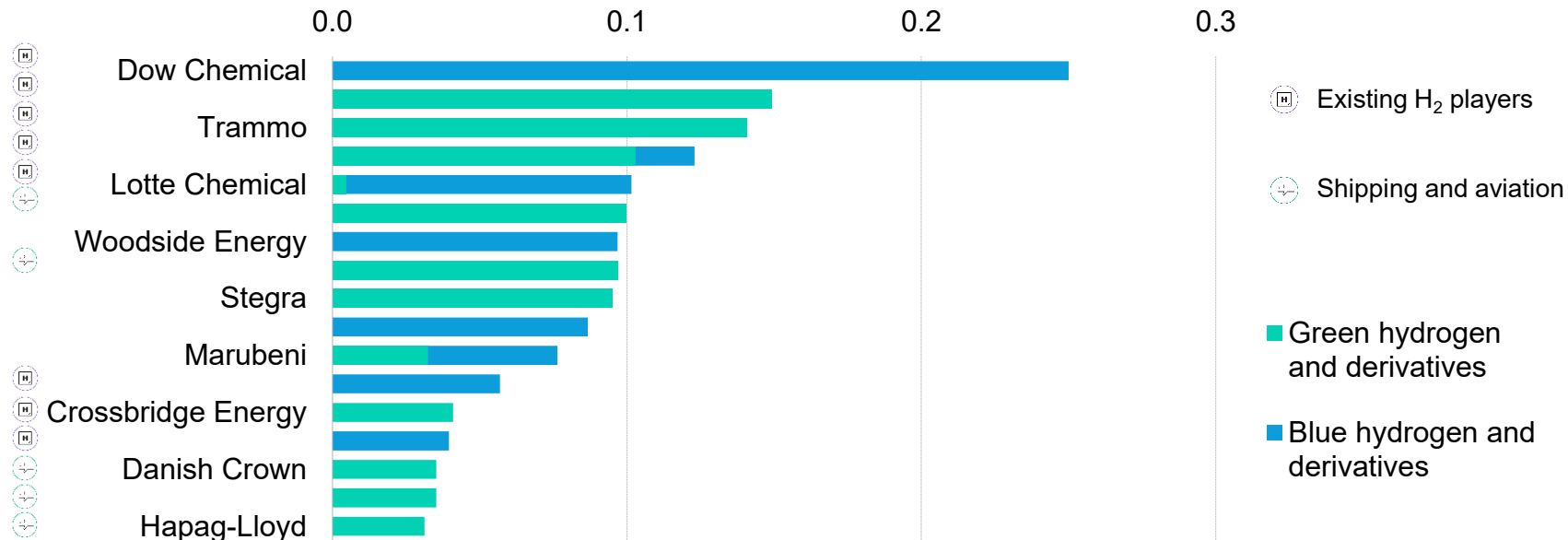


Source: BloombergNEF. Note: Data as of May 30, 2025. BNEF's Hydrogen Offtake Agreement Database only includes projects of at least 20 megawatts or 2,800 metric tons per year of capacity.

# Gray H<sub>2</sub> users, shippers and airlines have signed the largest binding offtake deals

## Top 15 binding clean hydrogen offtakers, by offtake product type

Million metric tons per year



Source: BloombergNEF. Note: Data as of May 30, 2025.

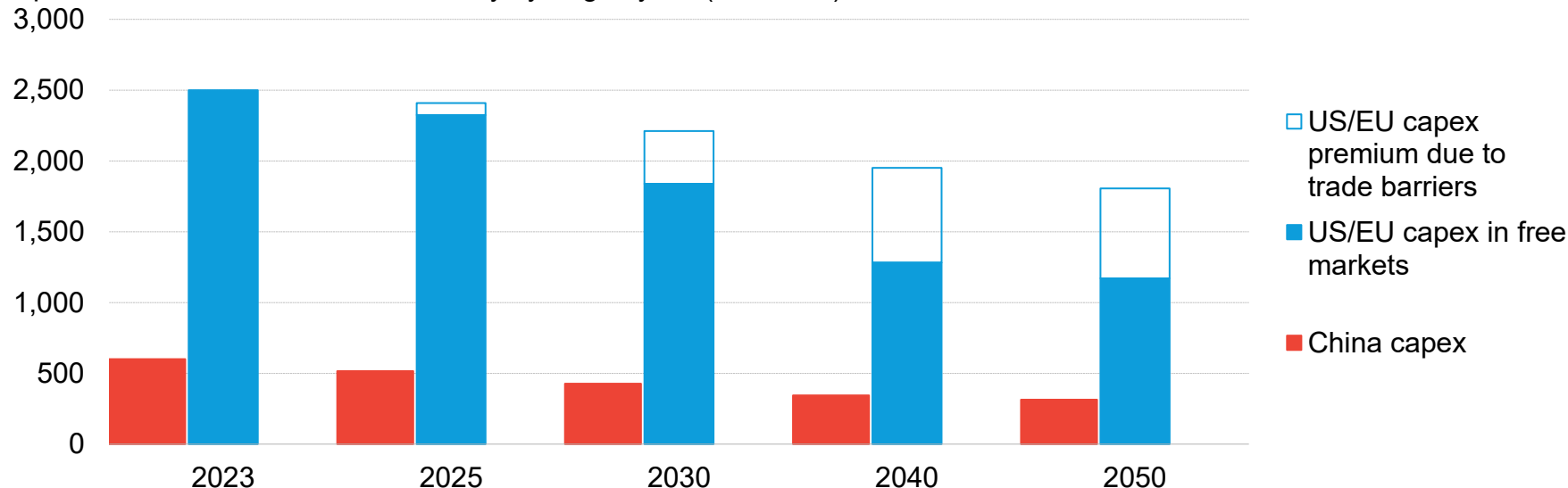
# Costs

Higher than anticipated

# Electrolysis system costs will fall, and the extent will depend on trade policy

## Forecast of benchmark capex for electrolysis projects

\$ per 0.2 normal cubic meters of hourly hydrogen yield (2023 real)

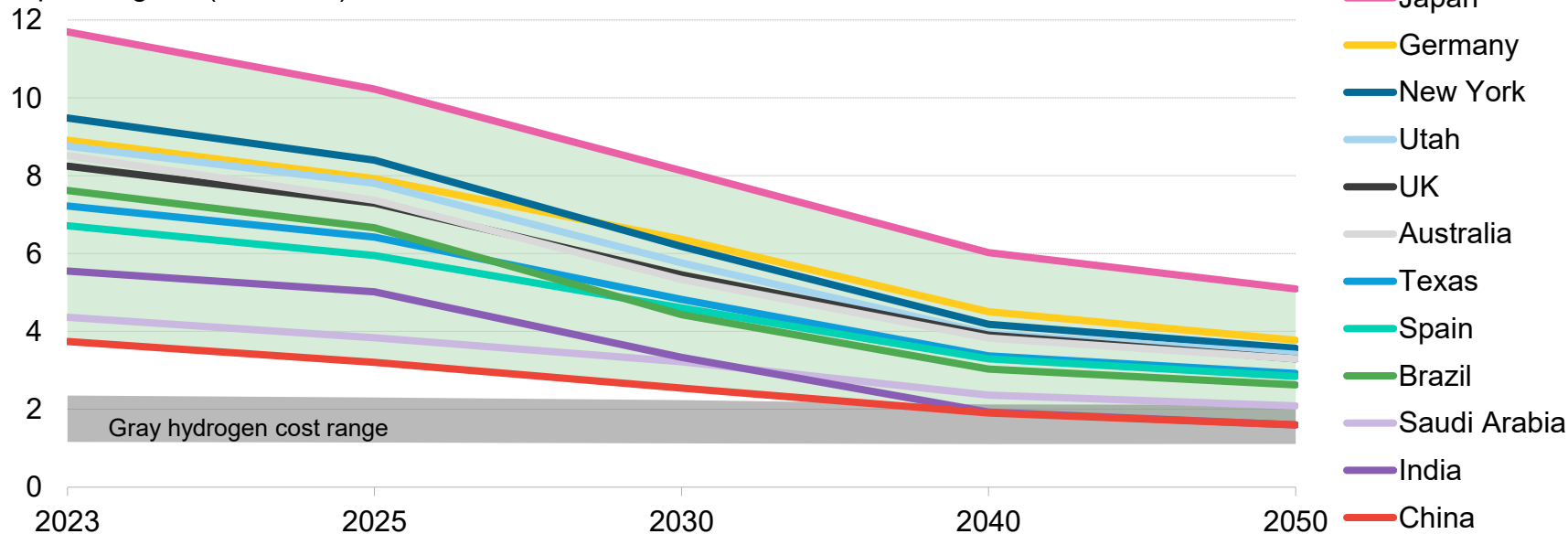


Source: BloombergNEF. Note: Year refers to time of final investment decision (FID); engineering, procurement, and construction (EPC) bidding closure or equipment purchase. There was no trade barrier in 2023, so the 'premium due to trade barriers' was not available then. The unit '0.2Nm<sup>3</sup>/h' is equivalent to 'kilowatt' under the current industry consensus.

# Renewable H<sub>2</sub> may always need supportive policy to compete with gray hydrogen

## Green LCOH<sub>2</sub> for new plants in 12 markets, by financing year

\$ per kilogram (real 2023)



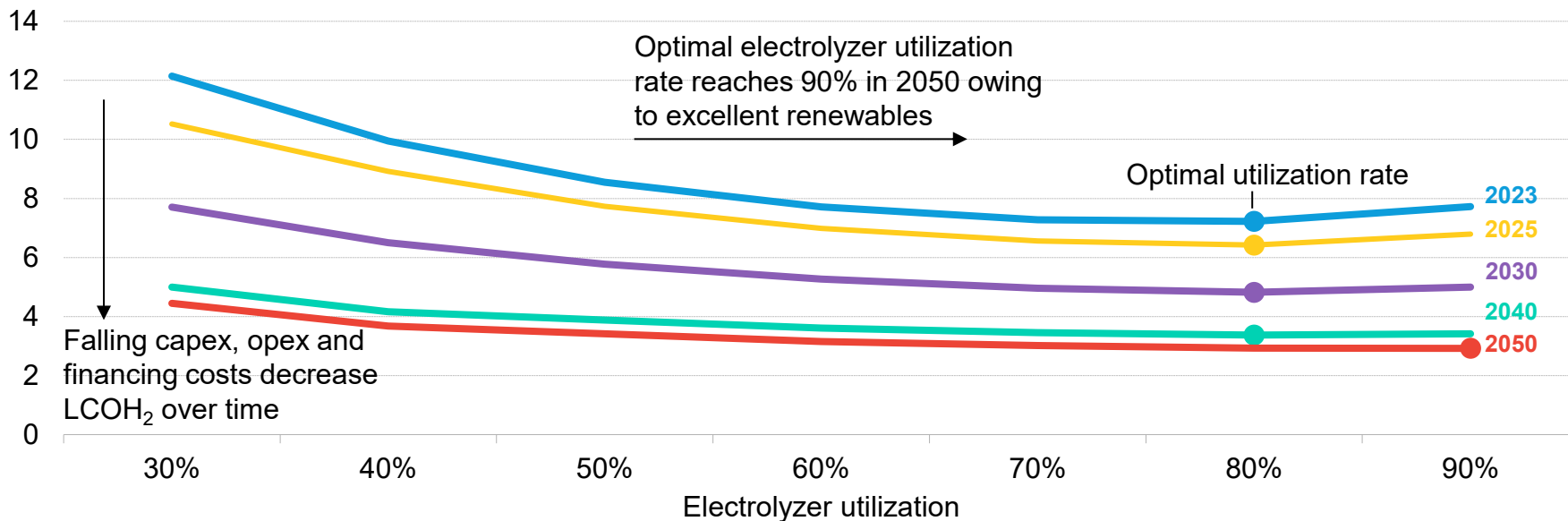
Source: BloombergNEF Hydrogen Levelized Cost Outlook 2025: Forget \$1/Kilogram ([web](#) | [terminal](#)). Note: LCOH<sub>2</sub> stands for levelized cost of hydrogen production.



# Texas's strength in renewables means cheaper green H<sub>2</sub>

## LCOH<sub>2</sub> by electrolyzer utilization and financing year, Texas

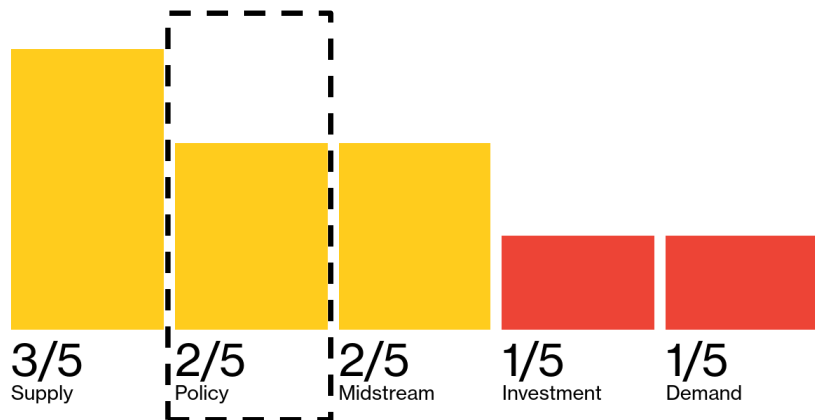
\$ per kilogram (real 2023)



Source: BloombergNEF. Note: Years represent financing years. The colored circles represent the levelized cost of hydrogen production (LCOH<sub>2</sub>) at the optimal utilization rate, which is the rate at which an electrolyzer produces the lowest LCOH<sub>2</sub>. The utilization rate may vary based on coordinates input for the renewables.

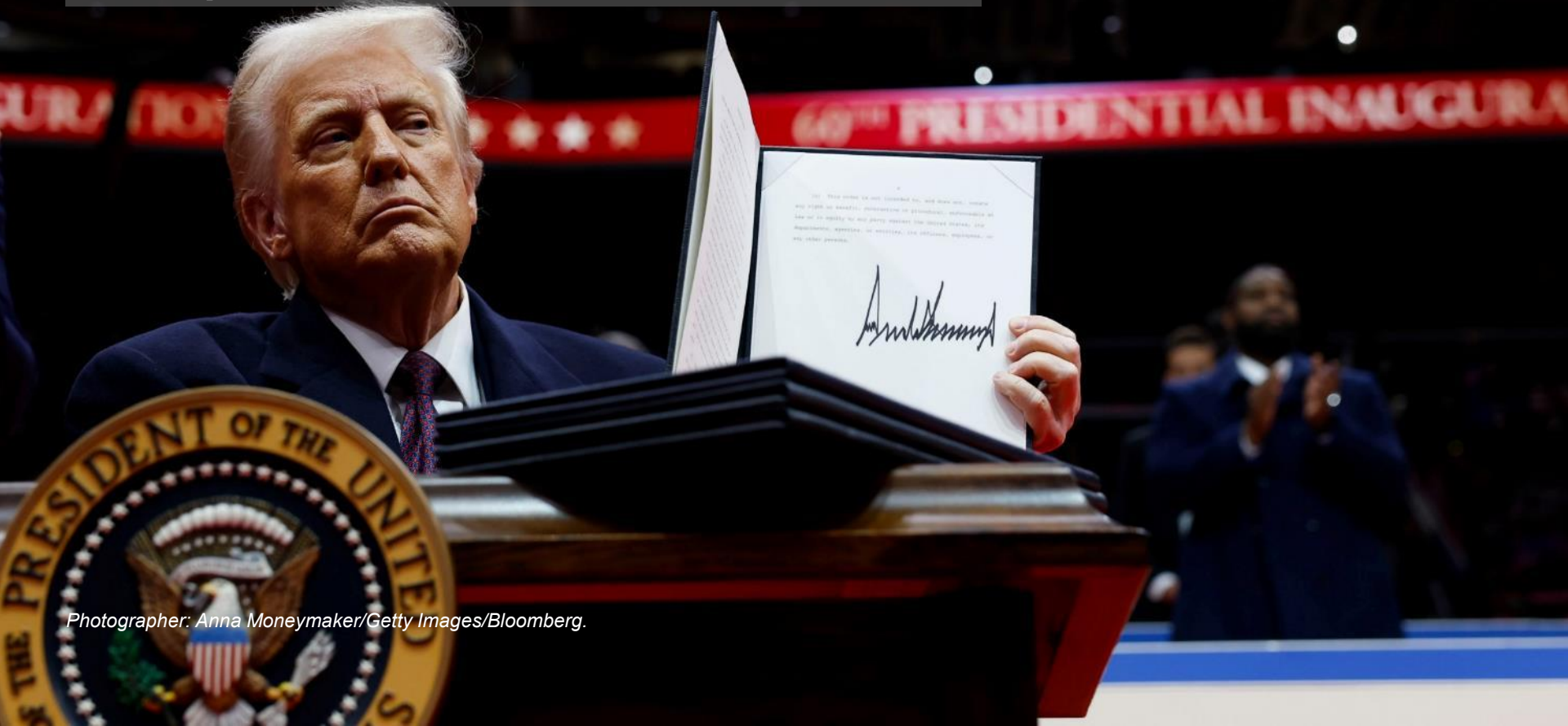
# Policy

## Uncertainty



Policy

# US policy uncertainty has kept hydrogen developers in limbo

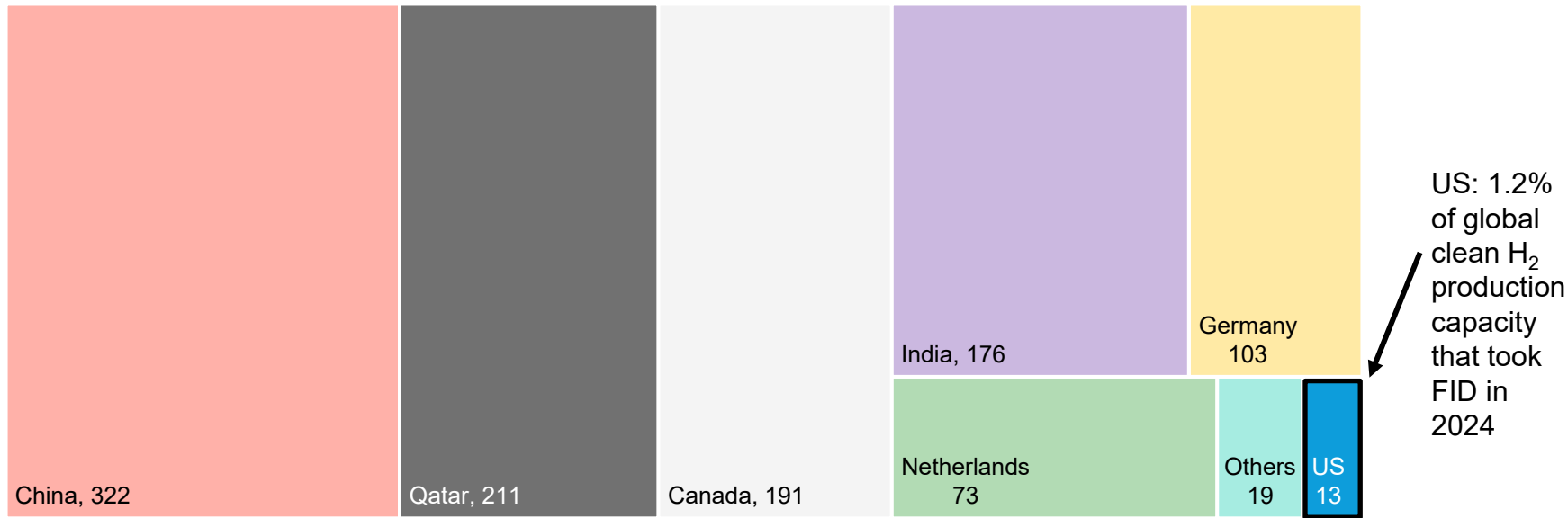


Photographer: Anna Moneymaker/Getty Images/Bloomberg.

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

## Clean H<sub>2</sub> project capacity that closed financing in 2024, by market

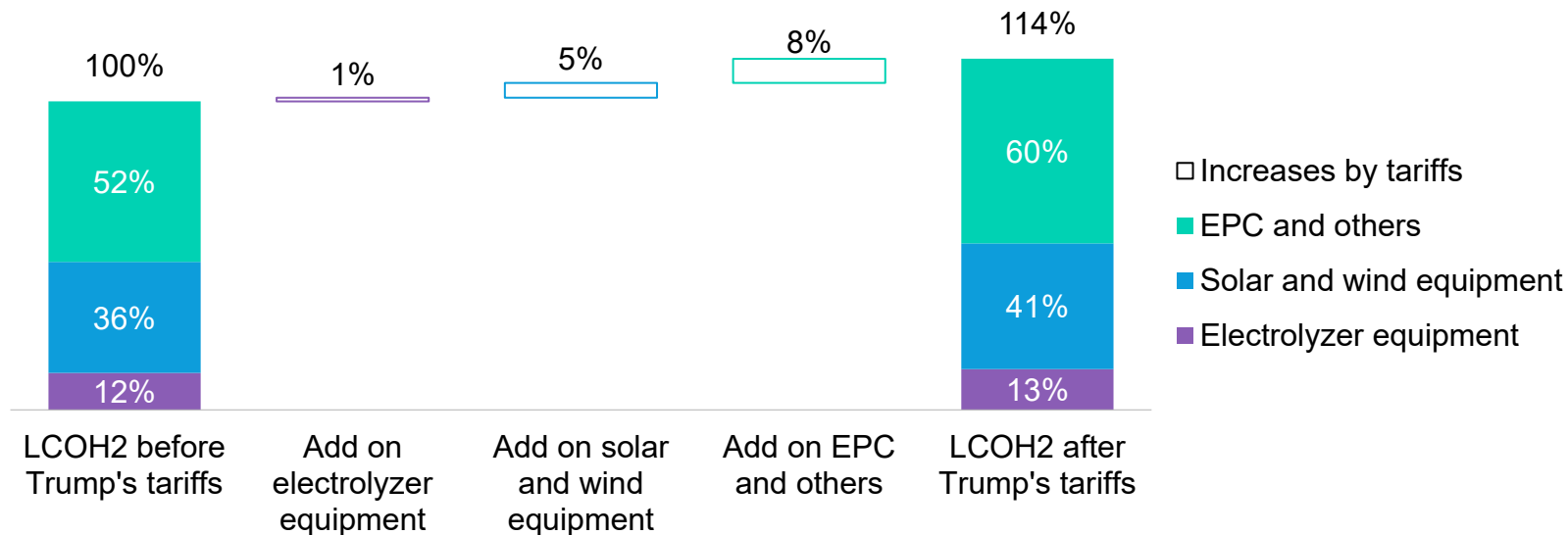
Thousand metric tons of hydrogen



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

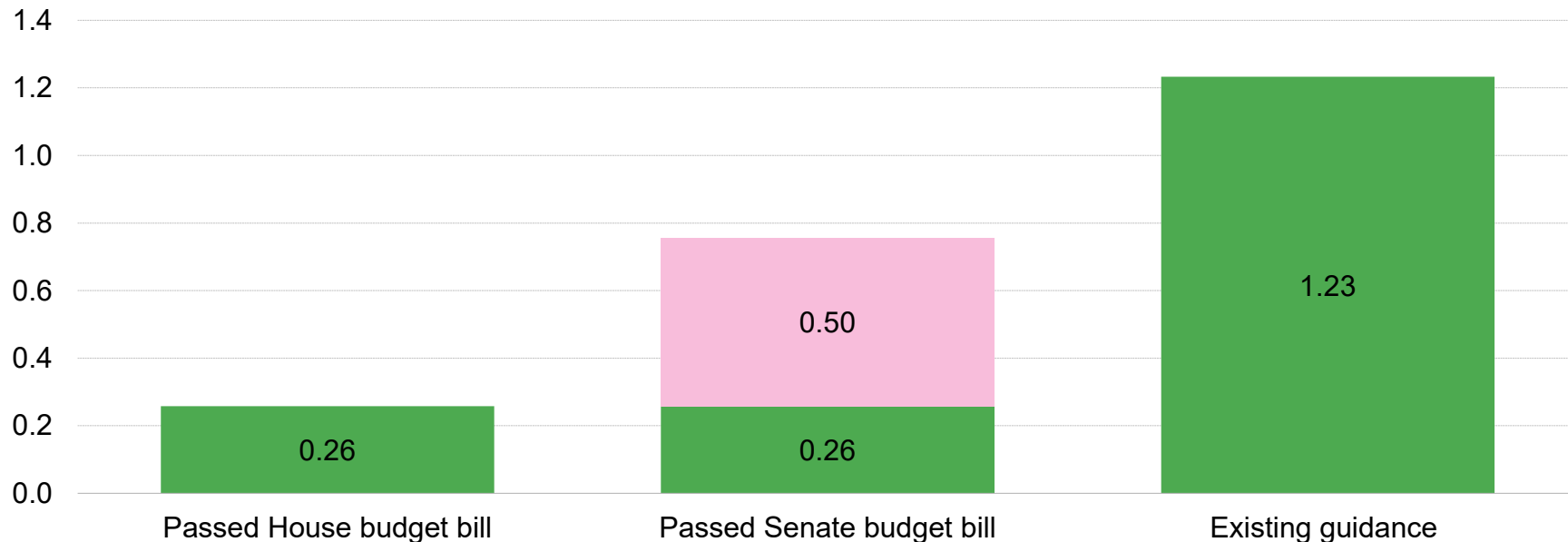


Source: BloombergNEF. Note: LCOH2 stands for levelized cost of hydrogen production. The year 2025 refers to when final investment decision (FID) is reached. Calculations of tariff impacts are based on announcements by April 8, 2025.

# The “One Big Beautiful Bill Act” boosts blue hydrogen, takes a jab at green supplies

## Green hydrogen volume eligible for 45V tax credit

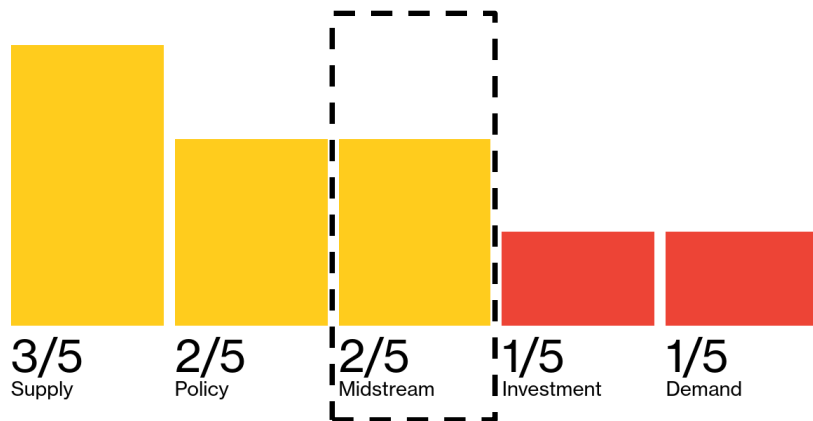
Million metric tons per year



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

# Midstream

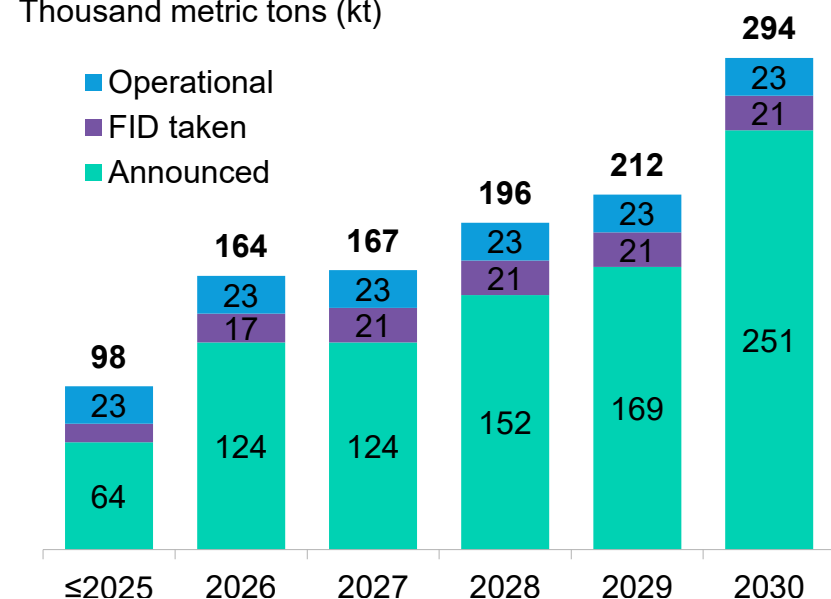
- Europe and China start building pipelines
- Storage mostly remains an afterthought



# Underground H<sub>2</sub> storage announced, but few projects are actually built

## Cumulative underground H<sub>2</sub> storage by status and planned commissioning year

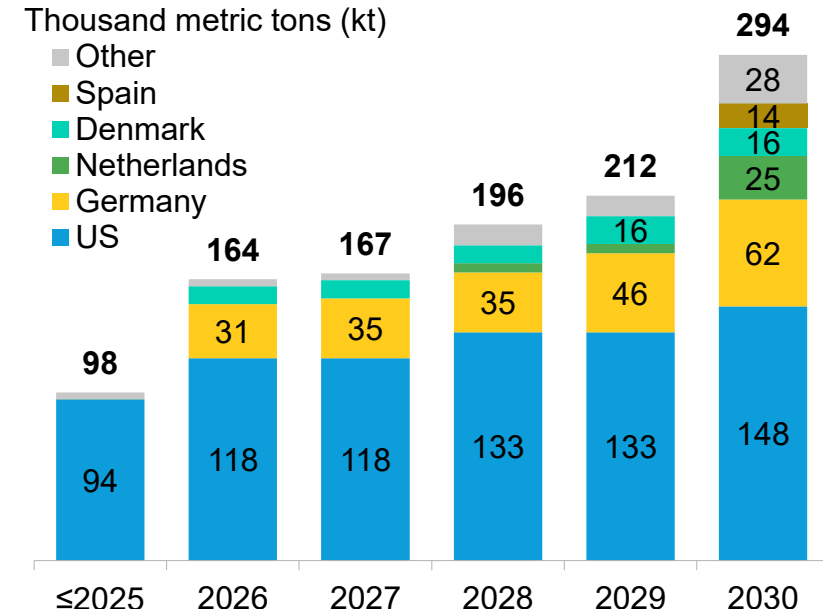
Thousand metric tons (kt)



Source: BloombergNEF, IEA, H2Tools. Note: Data as of February 10, 2025.

## Cumulative underground H<sub>2</sub> storage by market and planned commissioning year

Thousand metric tons (kt)



Source: BloombergNEF, IEA, H2Tools. Note: Data as of February 10, 2025.



Midstream

# We must not forget about safety

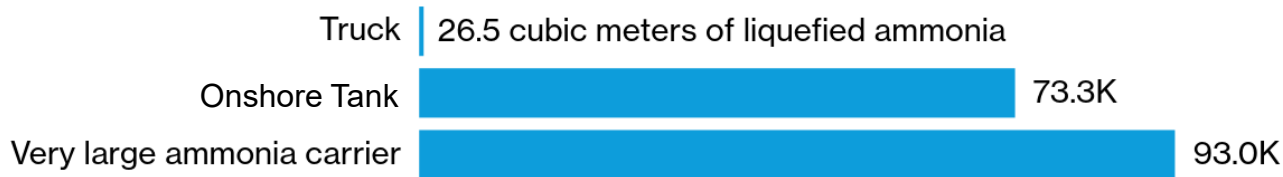


*Source: Houston Chronicle. Picture shows clouds of ammonia spreading over the West Loop 610 overpass at the Southwest Freeway about a minute after a crash on May 11, 1976, left seven dead and 200 injured.*

# Accident on a VLAC could be catastrophic and stop the industry in its tracks

## Three orders of magnitude

Volume comparison of ammonia-carrying trucks, tanks and ships



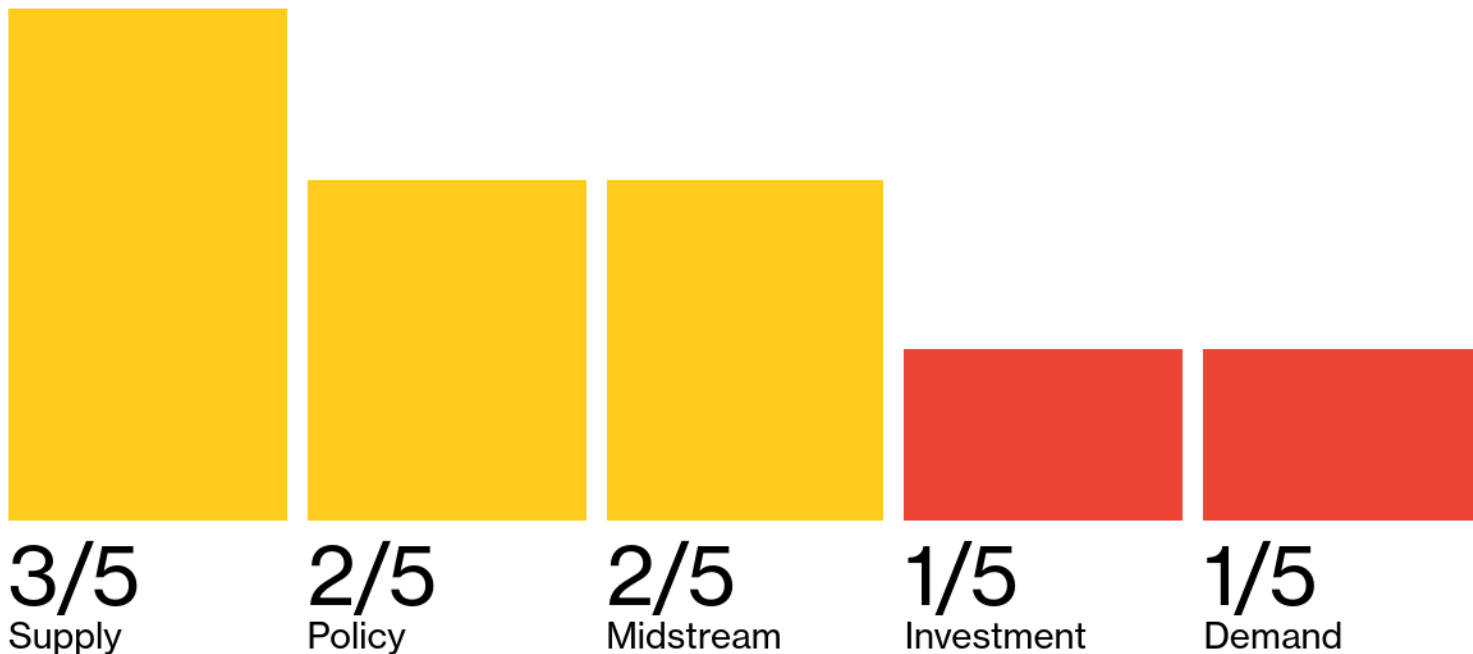
Source: BloombergNEF

Note: assumes one cubic meter of liquefied ammonia at -33.3 degrees Celsius has a mass of 681.9 kilograms

BloombergNEF

Source: Houston Chronicle. Picture shows clouds of ammonia spreading over the West Loop 610 overpass at the Southwest Freeway about a minute after the crash on May 11, 1976, left seven dead and 200 injured.

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