

# APEC Advancements in Low carbon Hydrogen

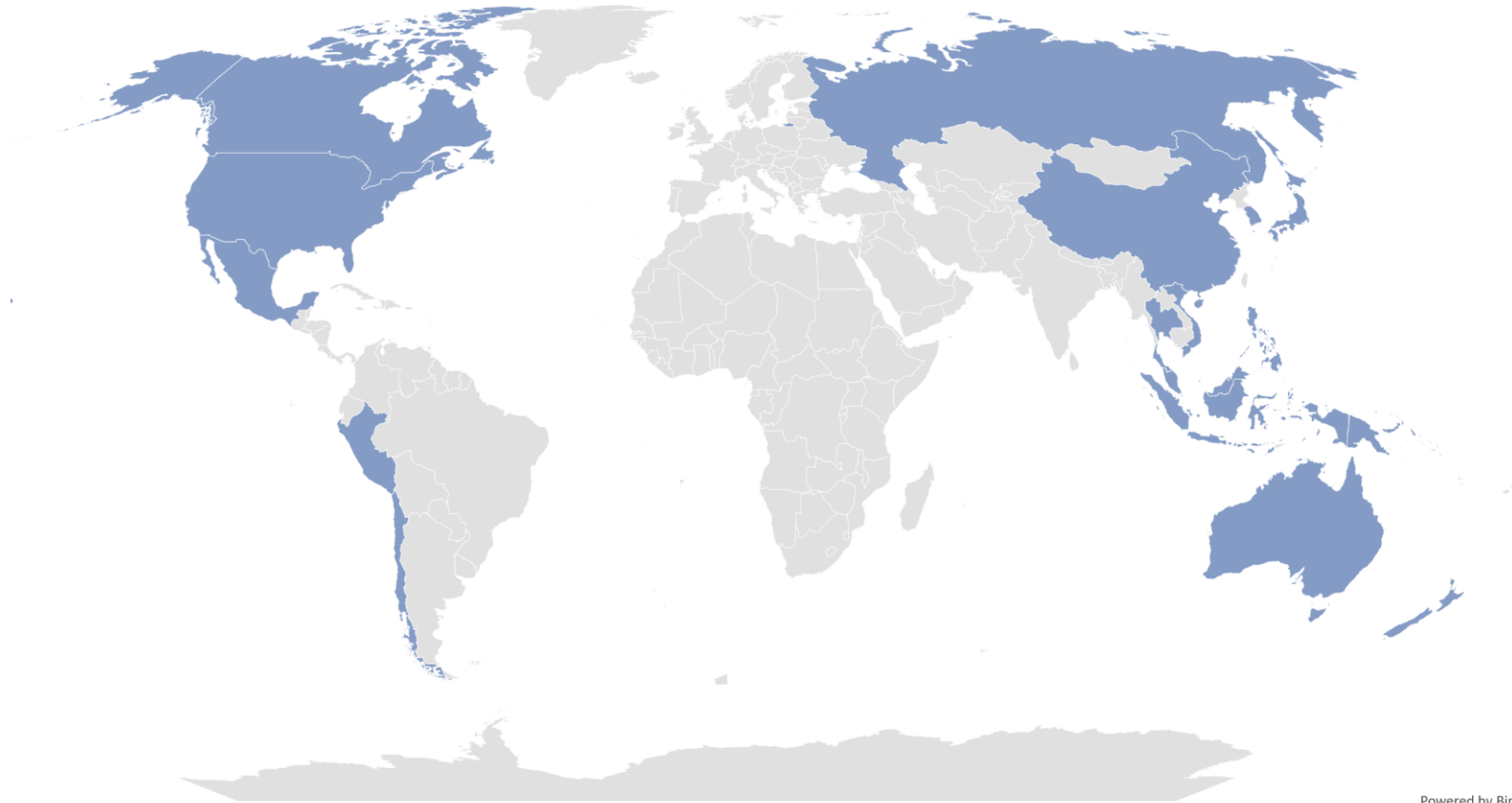
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**September 12, 2023**



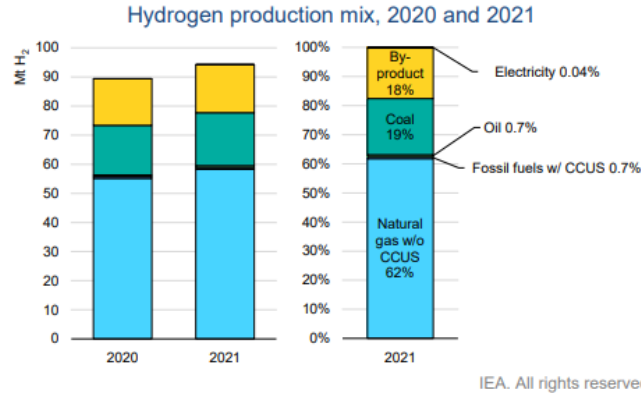
# APEC has and will have a substantial role in forthcoming H2 market

- APEC members have been leaders in the development of hydrogen policies and the implementation of initiatives to develop a hydrogen market.
- China and USA, are the two major H2 consumers and producers in the World, accounting for more than 43% of global demand.
- In 2017, Japan became the first APEC economy member to formulate and release a hydrogen strategy. This strategy was updated in June 2023.
- Several APEC economies have abundant resources to produce low carbon hydrogen.



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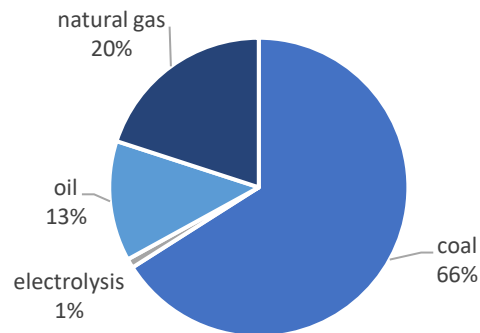
# Low-carbon H<sub>2</sub> now represents only 0.74% of total H<sub>2</sub> produced



Note: CCUS = carbon capture, utilisation and storage.

Source: *Global Hydrogen Review 2022* (IEA, 2022)

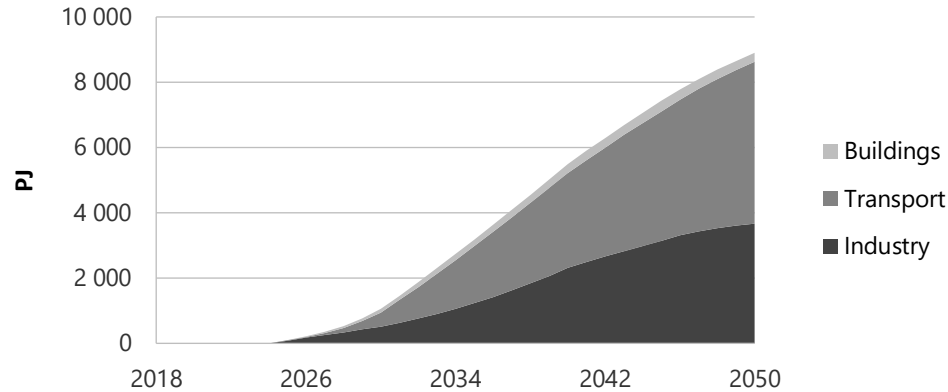
China H<sub>2</sub> production mix 2020



- Current H<sub>2</sub> production is responsible for around 2.5% of global CO<sub>2</sub> emissions.
- According to the IEA, H<sub>2</sub> production reached 94 Mt H<sub>2</sub> in 2021. H<sub>2</sub> production is dominated by natural gas, representing 62%, followed by coal with 19%. Additionally, 18% was generated as by-product from various industrial processes.
- Coal-based H<sub>2</sub> production is relevant mainly in China.
- H<sub>2</sub> production via fossil fuels W/CCUs is greater than H<sub>2</sub> production using electrolysis. According with IEA , there is operational carbon capture capacity for H<sub>2</sub> production of 0.1 MtCO<sub>2</sub> in 2022 although it is expected to reach around 60 MtCO<sub>2</sub> per year in 2030.
- **Almost all H<sub>2</sub> is used as feedstock in industry.** 0.04 Mt H<sub>2</sub> are used in new applications.

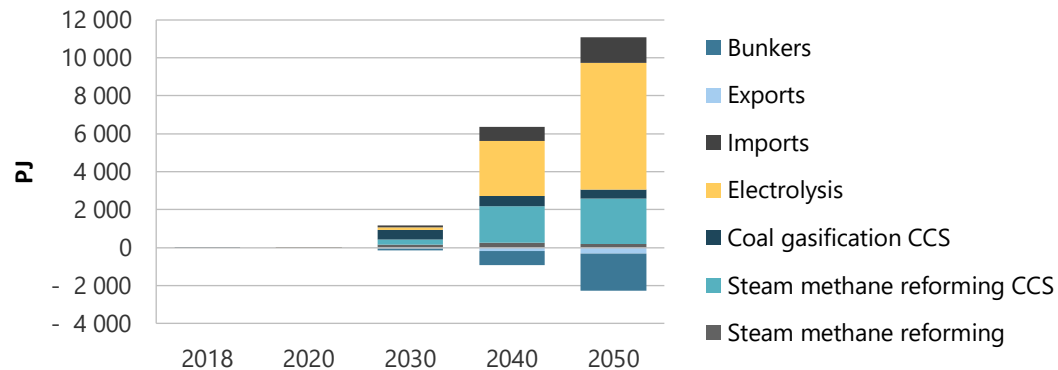
# Potential Hydrogen Demand and Supply for Future Applications within APEC

## APEC H2 demand in CN



The 8th edition of the APEC Energy Demand and Supply Outlook presents projections of hydrogen demand within the APEC region. Under the Carbon Neutrality scenario, CN, the energy outlook foresees a demand of 1064 PJ by 2030 and 8907 PJ by 2050 in APEC. These estimates translate to a demand for 9 million tonnes of H<sub>2</sub> by 2030 and 74 million tonnes by 2050.

## APEC H2 supply in CN



Electrolysis is projected to yield over 1.1 million tonnes of hydrogen by 2030, and 55.7 million tonnes by 2050. To accomplish this, a minimum of 9 GW of electrolysis capacity must be installed by 2030, which will then escalate to 403 GW by 2050.

Source: APEC Energy Demand and Supply Outlook 8<sup>th</sup> Edition (APERC, 2022)

# Several APEC economies have unveiled strategic visions and plans for H<sub>2</sub>

Potential low-carbon exports are key in their visions

- Australia - National Hydrogen Strategy
- Canada - Hydrogen Strategy for Canada
- Chile - National Green Hydrogen Strategy
- Russia - Roadmap for Hydrogen Development until 2024

Emphasis on decarbonization of the economy (e.g. transport, power sector)

- Japan-Revised Basic Hydrogen Strategy
- Republic of Korea-1st Basic Plan for the Implementation of the Hydrogen Economy
- Chinese Taipei - Hydrogen Energy Development Roadmap
- Singapore - Singapore National Hydrogen Strategy

Comprehensive strategies with emphasis on energy security

- USA - National Hydrogen Strategy and Roadmap
- Popular Republic of China - China's Hydrogen Energy and Fuel Cell Industry Development Plan (2020-2030)

Most of the rest APEC economy members are currently developing their own strategy

# Challenges persist in Advancing the Hydrogen Industry

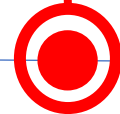
Around 10% of total announced investment have reached FID. Most of these projects are developed along midstream and/or specific end-use. In comparison, investment to promote new application demand is low, although APEC has the biggest number of H2 refueling stations



NOW

- SINOPEC's H2 projects in China.
- Hydrogen Energy Supply Chain in Australia

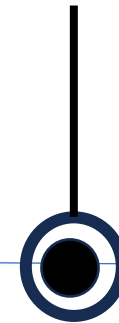
If most of the announced investment are finally built, more than 2 million tonnes of H2 would be available to supply to new applications demand, aligned to the Outlook's CN scenario. H2 tube trailers are the initial way of transporting H2.



2030

- Western Green Hydrogen Energy Hub in Australia

There is still uncertainty on new application demand. Increase manufacturing capacity of electrolyser production, H2 tanker ships. The amount of H2 carriers' ships required by 2050 in the Outlook's CN is much higher than the current number of LNG ships.



Beyond  
2030

**Thank you.**

