



# **Energy and Hydrogen in the APEC region**

**Green and Low-Carbon Hydrogen as an Enabler of the Energy Transition Policy Dialogue** The 67th Meeting of APEC Energy Working Group (EWG67) 24 February 2024 – Lima, Peru

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# Today, low-carbon hydrogen represents less than 1% of total production

- Hydrogen production reached 95 million tonnes in 2022. Nearly all the hydrogen was produced from unabated fossil fuels. The energy content in this hydrogen is approximately equivalent to 2% of global energy consumption and is responsible for around 2.5% of global CO<sub>2</sub> emissions.
- Most low-carbon hydrogen production is fossil fuel-based with CCS.
- Almost all hydrogen is currently used as feedstock in industry.



#### **Global H2 production in 2022**



## APEC will have a significant influence in the future hydrogen industry

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





# The APEC Energy Demand and Supply Outlook

- The APEC Energy Outlook is published every three years
- 8<sup>th</sup> edition: official launch end of September 2022
- Provides coverage on projected energy demand and supply trends
  - APEC-wide trends (Volume 1)
  - Economy-specific trends (Volume 2)
- For the 8th edition:
  - Projections: 2018-2050
  - Emissions focus (Kaya Identity)
  - Two scenarios: Reference and Carbon Neutrality





### **Scenarios in the APEC Energy Outlook 8th edition**

	<b>Reference (REF)</b>	<b>Carbon Neutrality (CN)</b>
Definition	Recent trends and current policies.	Hypothetical decarbonisation pathways for each APEC economy.
Purpose	Provides a baseline for comparison with the Carbon Neutrality scenario.	Additional energy sector transformations that support decarbonisation objectives.
Key assumptions	Current polices and trends continue.	Increased levels of energy efficiency, electrification, behavioral changes, fuel switching, and CCS deployment.
Limitations	Assumes that recent trends, including relevant decarbonisation measures continue.	Does not consider non-energy impacts on CO <sub>2</sub> or removal.

Note: does not represent APERC's recommendation or advocacy for a pathway or set of policies.

The analysis was performed prior to March 2022 and does not include current disruptions to international energy markets.



# Hydrogen can play a critical role in APEC energy demand by 2050



 Fossil fuel demand in APEC is expected to remain in the future energy mix, making up 45% to 62% of final energy demand by 2050.

 To ensure reliability, APEC needs energy efficiency, electrification, and clean energy technologies like hydrogen.

Source: EGEDA<sup>1</sup> and APEC Energy Demand and Supply Outlook 8<sup>th</sup> Edition<sup>2</sup>

Note: 1) Others includes biomass, renewables energy that does not produce electricity, and others.

2) APEC Energy Demand and Supply Outlook 8<sup>th</sup> Edition presents two scenarios: Reference (REF) and Carbon Neutrality (CN)



# **Status of low-carbon hydrogen industry in APEC**

Estimates of 2030 capacities for projects that have obtained financial commitments (Million tonnes of  $H_2$ )



Source: Estimation based on the Hydrogen Insights 2023 update report (Hydrogen Council & McKinsey & Company, 2023) and the draft of APERC  $H_2$  report

- Only 7% of globally announced low-carbon hydrogen projects have reached final investment decision. Most of this committed capacity is in APEC.
- China and USA are the main global hydrogen consumers and are leading on committed investments in zero and low-carbon hydrogen.
- Committed investment in North America, mainly Canada and USA, is primarily in natural gas-based hydrogen with CCS, while committed investment in China is in renewable energy-based hydrogen projects.
- Most of recently announced hydrogen projects globally are renewable energy-based projects.



# **Concluding remarks**

- APEC economies will be key players in the future zero- and low-carbon hydrogen industry, as consumers and as producers.
- APEC economies have shown some progress in the development of policies and in the construction of hydrogen projects. However, there is still gap that need to be close to meet zero- and low-carbon hydrogen demand that can help to achieve existing environmental goals.
- Collaboration among APEC member economies could help overcome some of the challenges that may delay the development of clean hydrogen industry.







# Thank you.

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