APERC Hydrogen Report 2024

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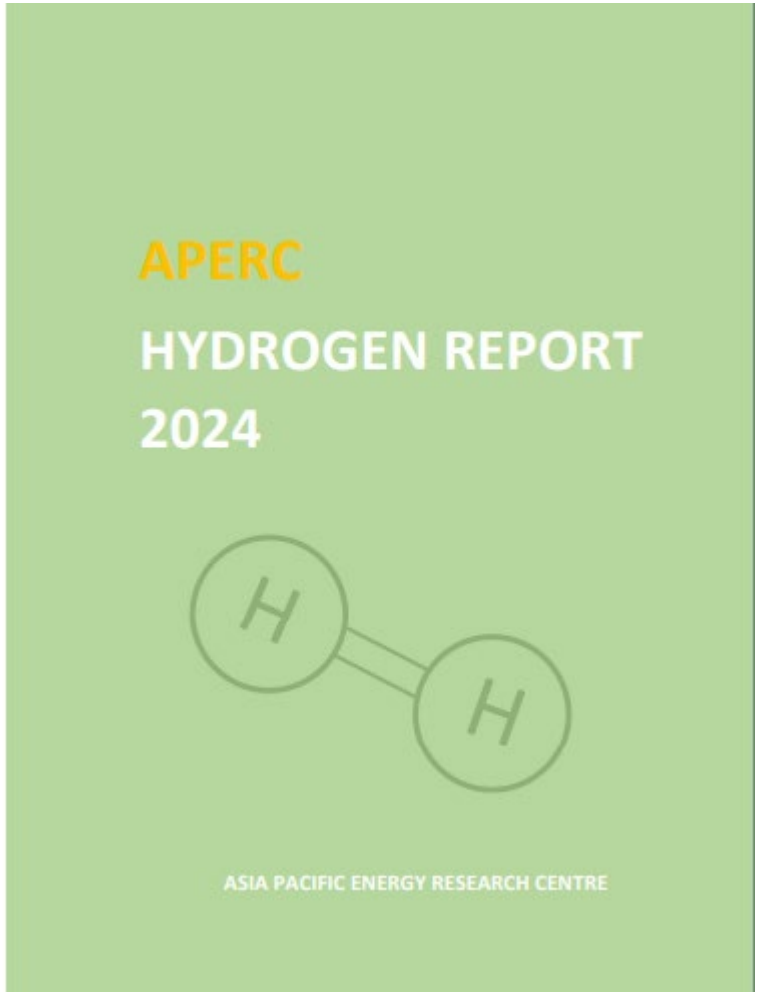
Outline

- Overview of hydrogen industry in APEC
- Major hydrogen-related policies
- Mechanisms for promoting hydrogen projects
- Certification and guarantee of origin
- Hydrogen hubs as a development strategy
- Challenges and opportunities

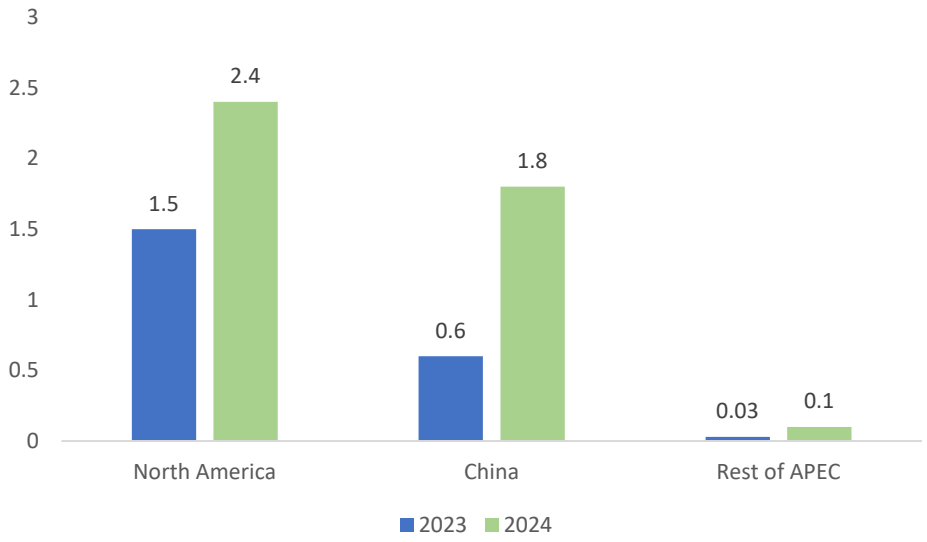
APERC Hydrogen Report 2024



The hydrogen report was published in March 2025 and is available at https://aperc.or.jp/

Hydrogen production projects showed progress in 2024

Comparison of committed clean and low-carbon hydrogen production capacity (million tonnes of H2 per annum)



Source: APERC Hydrogen Report (APERC, 2025)

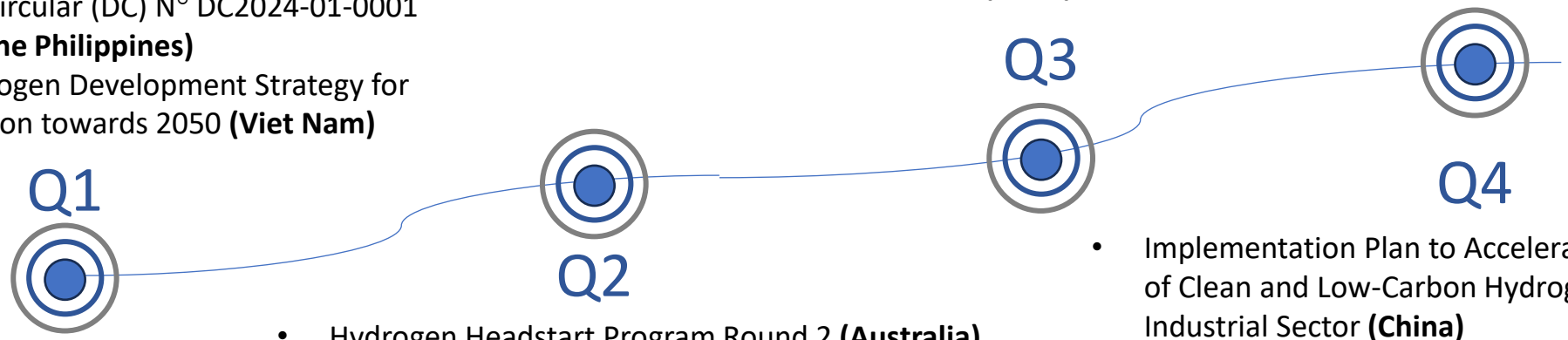
- In 2024, global hydrogen production capacity reached almost 100 million tonnes per annum (mtpa), of which less than 1% is considered clean or low-carbon hydrogen.
- In APEC, clean and low-carbon hydrogen production projects reaching the final investment decision (FID) reached 4.3 mtpa, reflecting 68% growth in one year—primarily driven by developments in North America and China.
- APEC leads in clean and low-carbon hydrogen production projects that have reached FID stage, accounting for over 85% of global, clean and low-carbon hydrogen production capacity that is committed to operation by 2030.
- Despite these significant advances, the medium and long-term demand for clean and low-carbon hydrogen remains uncertain.

Major hydrogen related policies and documents released in 2024

18 of the 21 APEC economies published important policies and/or plans in 2024

- Green Hydrogen Accelerator Version 3 **(Chile)**
- Catalogue for the Guidance of Green and Low-carbon Transition Industries **(China)**
- Clean Hydrogen Certification System **(Korea)**
- Green Hydrogen Promotion Law **(Peru)**
- Department Circular (DC) N° DC2024-01-0001 **(Republic of the Philippines)**
- National Hydrogen Development Strategy for 2030 with Vision towards 2050 **(Viet Nam)**

- 2024 National Hydrogen Strategy **(Australia)**
- Adoption hydrogen safety standards **(New Zealand)**
- APEC Policy Guidance to Develop and Implement Clean and Low-Carbon Hydrogen Policy Frameworks in the Asia-Pacific **(APEC)**

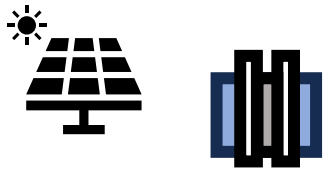


- Hydrogen Headstart Program Round 2 **(Australia)**
- Clean Investment Tax credits **(Canada)**
- Hydrogen Strategy Progress Report **(Canada)**
- Green Hydrogen Action Plan 2023-2030 **(Chile)**
- Hydrogen Development **Strategy (Hong Kong, China)**
- Phase 1 Hydrogen Supply Infrastructure Development Project **(Japan)**
- Green Technology Tax Incentive **(Malaysia)**

- Implementation Plan to Accelerate the Application of Clean and Low-Carbon Hydrogen in the Industrial Sector **(China)**
- Contracts for Difference Program **(Japan)**
- Hydrogen Action Plan **(New Zealand)**
- final rules for the Section 48 Energy Credit **(U.S)**

Hydrogen promotion mechanisms implemented in APEC

APEC economies are advancing clean and low-carbon hydrogen production and consumption projects through subsidies, support for technological innovation, and risk mitigation for investors. These temporary measures aim to make clean and low-carbon hydrogen a competitive alternative to conventional hydrogen in the medium term, and eventually to other fossil fuels in the long term.



Capital Investment support

Economies: Canada, US, China

Type of support: Fixed % tax credit to eligible investments or direct subsidies.

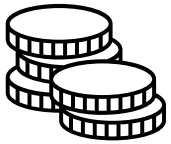
Reduce the cost of investment.

Hydrogen Production support

Economies: US, AUS

Type of support: tax credit per unit of qualified hydrogen produced

Reduce the cost of hydrogen production.

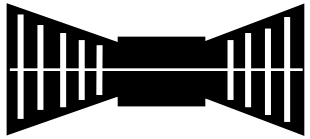


Contract for Difference

Economies: Japan

Type of support: Subsidize the gap between the price of conventional hydrogen and a reference clean hydrogen.

Price stability and risk is shared with the government.



Hydrogen energy auctions for power

Economies: Korea, Singapore

Type of support: Request bid proposals to supply a determined amount of hydrogen-fuelled electricity.

Create demand for clean and low-carbon hydrogen.

Certifications and Guarantee of Origins

A certification system is necessary to implement hydrogen support mechanisms.

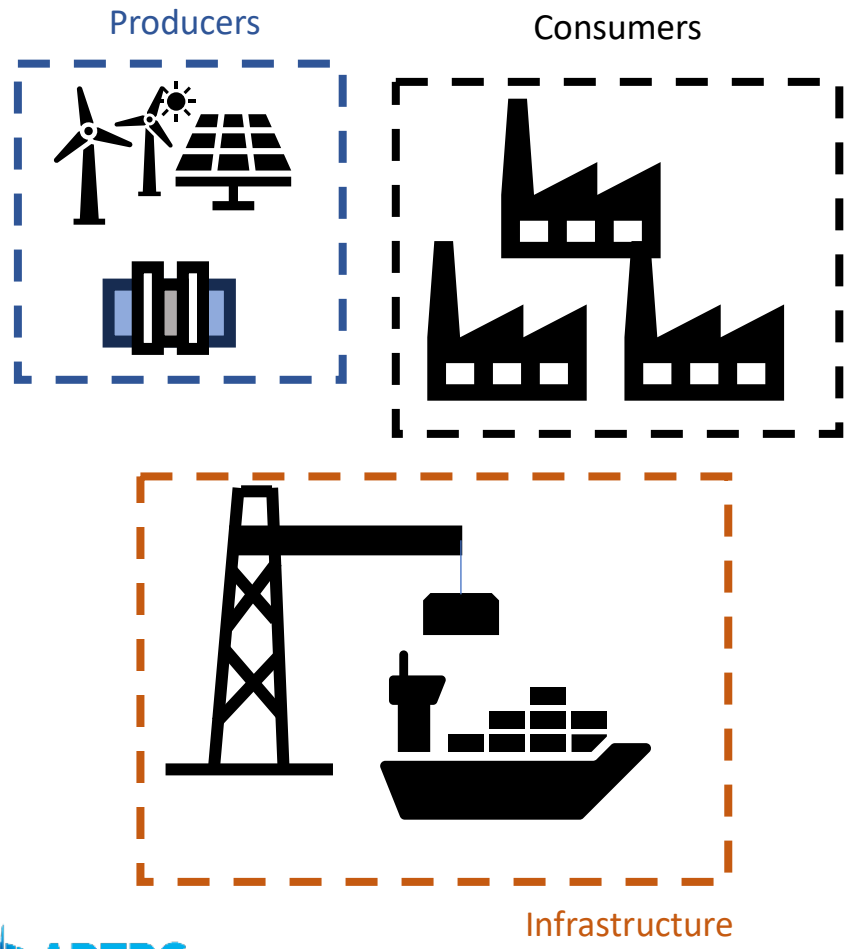
In March 2024, Korea's Ministry of Trade, Industry, and Energy (MOTIE) announced a Clean Hydrogen Certification System, defining the procedures for obtaining clean hydrogen certification. The hydrogen grade criteria was used to evaluate the bids for the hydrogen power auction.

Grade	Emission intensity ($kgCO_{2\text{-}eq}/kgH_2$)
1	0.00-0.10
2	0.11-1.00
3	1.01-2.00
4	2.01-4.00

In 2024, the Australian Government introduced the *Future Made in Australia (Guarantee of Origin) Bill 2024* and its supportive *Future Made in Australia (Guarantee of Origin Charges) Bill 2024* and *Future Made in Australia (Guarantee of Origin Consequential Amendments and Transitional Provisions) Bill 2024* to the Parliament. The Guarantee of Origin establishes a scheme to certify renewable electricity and products such as clean and low-carbon hydrogen.

Hydrogen Hubs in APEC

The promotion of hydrogen hubs —special regional network of clean hydrogen producers, consumers, and the infrastructure to facilitate integration of hydrogen into different sectors — is a strategy to develop centers of expertise and reduce commercial risk.



- Selected U.S. Hydrogen hubs by the Department of Energy: California Hydrogen Hub, Pacific Northwest Hydrogen Hub (PNWH2), Appalachian Hydrogen Hub (ARCH2), Gulf Coast Hydrogen Hub (HyVelocity) and Midwest Hydrogen Hub (MachH2)
- Donghae and Samcheok in Gangwon Province, and Pohang in Gyeongsang Province—were designated as Korea's first hydrogen-specialized hubs
- Six hydrogen hubs in Canada also moved forward. The Edmonton Region Hydrogen Hub inaugurated the thirst commercial hydrogen fuelling station in Alberta and the city of Prince George received support from PacifiCan to develop a regional hydrogen hub.

Challenges

- The high cost of clean and low-carbon hydrogen remains a major challenge, making it less competitive than conventional hydrogen and fossil fuels.
- The high production cost and uncertainty about future policies, regulations, and support schemes make it difficult to secure long-term demand for clean and low-carbon hydrogen demand.
- The absence of a globally harmonized standard for defining clean and low-carbon hydrogen is an additional challenge to the industry, especially the international trading of clean and low-carbon hydrogen.
- Infrastructure gaps in current hydrogen transport and distribution networks will constrain growth in the clean and low-carbon hydrogen economy. Substantial investment will be required to fill these gaps.

Summary

- The APEC region is leading global efforts in clean and low-carbon hydrogen, with over 4.3 mtpa of production capacity having reached FID.
- Most APEC economies have introduced policies to support clean and low-carbon hydrogen production and demand.
- These policies provide financial support for clean and low-carbon hydrogen through hydrogen supply auctions, subsidies, and tax credits, especially for renewable-based hydrogen.
- The promotion of hydrogen hubs, a strategy to develop centers of expertise, reduce commercial risk, and address infrastructure gaps, is being implemented in several APEC economies.
- Despite significant progress, the industry faces challenges such as high production costs, policy uncertainty, the lack of international clean and low-carbon hydrogen standards, and infrastructure gaps, particularly in transportation and distribution.

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Thank you.

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