

# APERC HYDROGEN REPORT 2023

## Introduction

Clean hydrogen has been acknowledged as an important tool for the decarbonization of hard-to-abate sectors. However, the development of a clean hydrogen industry is covered by a veil of uncertainty. The APERC Hydrogen Report 2023 is the first in a series intended to monitor the real advancements in the development of the nascent clean hydrogen industry within the APEC region.

This report will describe the main policies that influence the hydrogen industry, the construction of major projects, and the challenges that may delay this development. The aim of this initial report is to provide a valuable source of information for discussions about hydrogen as a clean energy source during Energy Working Group meetings.

## Key Findings

The APERC Hydrogen Report 2023 is divided into three main sections: Section 1, “Advances in Hydrogen Projects”, reports the main hydrogen projects that are currently running or under development in each economies; Section 2, “Hydrogen Policies and Strategies”, presents the main initiatives and documents that APEC economy members are developing to foster the creation of hydrogen industry; and Section3, “Current Challenges”, describes important global challenges that need to be addressed to facilitate the development of hydrogen.

## Advances in Hydrogen Projects

- The estimated committed annual hydrogen production capacity by 2030 is approximately 2.5 million tonnes of hydrogen.
- China and USA are the main global hydrogen consumers and are leading on committed investments in renewable and low-carbon hydrogen.
- Committed investment in North America, mainly in 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 the recently announced hydrogen projects globally are renewable energy-based projects.

## Hydrogen Policies and Strategies

- The APEC region has been a leader in developing and implementing policies to promote the nascent hydrogen industry. Each economy's hydrogen strategy reflects the economy-specific characteristics and priorities.
- Most APEC economies are implementing policies designed to increase the production and consumption of zero- and low-carbon hydrogen. These policies emphasize their ability to produce low-carbon hydrogen and highlight the role of hydrogen in decarbonizing energy end-use and power sectors as a fuel.
- Some strategies to promote the development of hydrogen projects include the use of tax credits and subsidies.
- Recently, some economies are implementing clean hydrogen actions to decarbonize power sector.

## Main Challenges

- High cost of zero- and low-carbon hydrogen. The cost of hydrogen is vulnerable to the energy cost of the primary energy source. While increasing the scale of announced projects may decrease costs, the growing complexity of these projects also needs to be considered.
- Lack of adequate transportation and distribution systems for hydrogen.
- NOx emissions in the direct combustion of hydrogen and ammonia.
- There is a need of recognized international standards for zero and low-carbon hydrogen.