

Foreword

Leading economies around the world, including the United States, China, Japan, as well as the European countries, have announced or upgraded their plans for hydrogen in recent years, targeting several thousands of hydrogen refueling stations and millions of fuel cell vehicles. China is also emerging as one of the leading markets for hydrogen energy and fuel cell technologies.

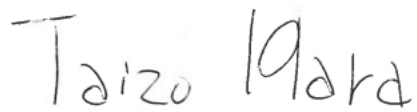
However, it is surprising to find that most of the demonstration projects of hydrogen and fuel cell applications currently source hydrogen from conventional natural gas reforming and petroleum refineries' by-products in China. Most of the demonstration projects of fuel cell electric vehicles in the country are actually running on the supply of hydrogen from fossil fuel sources. There are at least two main barriers to the development of green or clean hydrogen energy.

First, there is a lack of comprehensive and valid feasibility studies on the potential renewable or clean energy for hydrogen projects, as well as their associated energy infrastructure networks for transportation and distribution. Second, there is a lack of consensus amongst stakeholders as to who should do what to resolve the current institutional and regulatory barriers.

Hence, feasibility studies and implementation plan studies are needed to help accelerate the development of large-scale green or clean hydrogen energy demonstration. This project, titled 'Hydrogen Sourced from Renewables and Clean Energy: A Feasibility Study of Achieving Large-scale Demonstration', supported by Economic Research Institute for ASEAN and East Asia (ERIA), is timely therefore and will deliver substantial outcomes to support relevant policymaking, considering the strategic importance of developing hydrogen, especially green hydrogen in China under the country's carbon neutrality target and the 14th Five-Year Plan.

The study consisted of sub-projects covering technical, economic, financial, institutional, regulatory, and policy issues related to enabling large-scale hydrogen energy demonstration projects in China. Feasibility studies of the selected demonstration projects were conducted in collaboration with several industrial and academic entities. In the implementation plan of the feasibility studies, findings from the sub-projects provided a basis for discussion in interviews and workshops held amongst industry players, government bodies, and academic researchers. The goal of the interviews and workshops was to identify key barriers as well as proper solutions, together with an agenda for actions necessary to realise the selected demonstration projects.

The sub-projects were conducted by a working group made up of experts from both academia and industry, such as the Institute of Energy Economics, Japan (IEEJ); China Hydrogen Alliance (CHA); University of Technology Sydney; Huazhong University of Science and Technology; Foshan University of Science and Technology; Dalian University of Technology; Grantham Institute of Imperial College London; Tokai University, Japan; Singapore University of Social Sciences; Green World Low-carbon Economy & Technology Center, China; China Energy Engineering Group Co. Ltd (CEEC); and Foshan Institute of Environment and Energy, China.

A handwritten signature in black ink that reads "Taizo Hara". The signature is written in a cursive, slightly slanted style.

Taizo Hara

Director General for Research and Policy Design Administration

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