

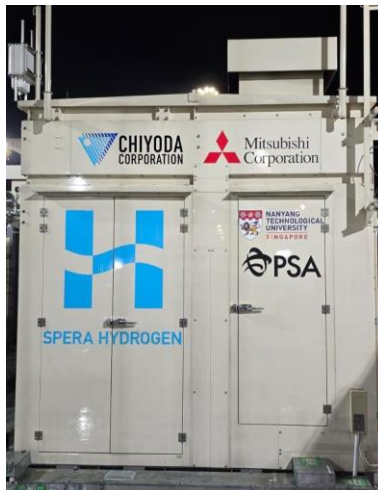
July 12, 2024

## **Using SPERA Hydrogen™ Technology with Imported Hydrogen in a Dehydrogenation Demonstration Project in Singapore**

Chiyoda Corporation (Chiyoda) is pleased to announce the commencement of a dehydrogenation demonstration project at Pasir Panjang Terminal Port in Singapore, one of the world's largest container terminals, operated by PSA Singapore (PSA).

Using methylcyclohexane (MCH)<sup>\*1</sup> as the Liquid Organic Hydrogen Carrier (LOHC), the hydrogen is imported to PSA's terminal using ISO tank containers and stored in above-ground tanks. Chiyoda's compacted dehydrogenation skids<sup>\*2</sup> extract the hydrogen for purification and utilization as a clean energy source for heavy-duty fuel cell container transportation vehicles.

Chiyoda has been collaborating with Nanyang Technological University, Singapore (NTU Singapore) since 2022 on the research & development of the next-generation dehydrogenation catalyst, based on Chiyoda's proprietary dehydrogenation catalyst technology. Having progressed from laboratory tests to full-scale plant demonstration, NTU and Chiyoda intend to verify the performance of the improved catalyst through this project, funded by the LCER FI<sup>\*3</sup>.



**Compacted Dehydrogenation Skids Provided by Chiyoda**

### **Project Participant Roles**

**NTU:** Research and development of the next-generation dehydrogenation catalyst, procurement of MCH and quality control, including sampling and analysis for verification during operation.

**PSA:** Provision of the demonstration project's location, utilities, storage facilities, hydrogen refueling station and heavy-duty fuel cell vehicles. Project construction, commissioning, operation and maintenance.

**Chiyoda:** Research and development of the next-generation dehydrogenation catalyst, provision of compacted dehydrogenation skids and support as the technology provider.

The Singaporean Government values the unique features of MCH, leading to this first demonstration project in Singapore using imported hydrogen. Of particular significance is the fact that we obtained permission under Singapore's existing laws and regulations, enabling the operation of the demonstration project without the need for new or additional framework. This advanced project will be operational until 2025 and is a major step towards a low carbon society.

The project participants have worked together to develop the commercialization of a hydrogen supply chain following the signing of a Memorandum of Understanding by a consortium of companies from Singapore and Japan in March 2020. This important initiative contributes to commercializing a sustainable hydrogen supply chain, accelerating the use of hydrogen in Singapore and expanding the use of hydrogen worldwide towards the realization of a low carbon society.

\*1: Produced from toluene and hydrogen, MCH is a chemically stable liquid under ambient conditions and easily managed using existing petrochemical infrastructure under current international standards and regulations. It is widely used as pharmaceutical agent, as a solvent for agrichemical production, as an admixture for jet-fuel and as a solvent for correction liquid.

\*2: Chiyoda's compacted dehydrogenation skids, manufactured in Japan for transportation using conventional container vessels, are easily prepared for operation by connecting piping and cables on site.

\*3: Low-Carbon Energy Research Funding Initiative

A Singapore Government program, supporting low carbon energy technology research, development and demonstration projects.

## **Reference Information**

[Please click here for the joint press release](#)

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