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ShinMaywa Industries Participates in Hydrogen Supply Chain Business

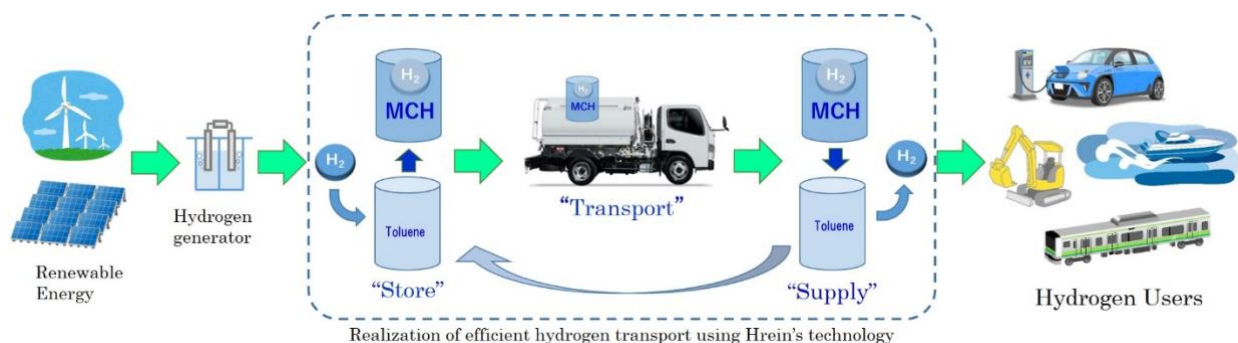
Working on hydrogen business in cooperation with Hrein Energy,
a company with hydrogen storage and supply technology using organic hydride

ShinMaywa Industries, Ltd. (Head Office: Takarazuka-shi, Hyogo, Japan, President & CEO: Tatsuyuki Isogawa) (the “Company”) and Hrein Energy Inc. (Head Office: Sapporo, Hokkaido, Japan, President: Akira Koikeda) (“Hrein”) entered into an agreement in August 2022 for the joint development of products comprised in the hydrogen supply chain, and tests using prototypes developed by Hrein have now commenced at the Company. Both companies plan to enhance the completeness of the prototypes and establish a sales and mass production system for new hydrogen supply units, taking advantage of the compactness of the units, which other companies cannot offer.

1. Background to signing of agreement with Hrein

The Company is currently promoting its Long-term management plan [SG-Vision 2030] oriented toward materialization of the Company’s Long-term vision, with the target year of 2030. The New Business Strategic Division was established in 2022 and is aimed at one of the targets of the Long-term management plan, “net sales of 400 billion yen or more.” It has been exploring new business beyond the framework of the Company’s existing business, and the present collaboration with Hrein is part of those efforts.

Hrein was established in 2001. Specializing in hydrogen energy to promote the spread of renewable energy, it has equipment using organic hydride technology that makes it easy to store and transport methylcyclohexane (MCH), which is produced by a catalytic reaction of hydrogen with toluene. Using Hrein’s technology, clean hydrogen produced from renewable energy sources (solar, wind, biomass, etc.) in Japan and overseas is temporarily converted to MCH, which is highly stable and suitable for transportation, and stored. The hydrogen can then be extracted from the MCH at the point of use, thus addressing key parts in supply chains.



Hrein has also succeeded in commercializing a small power generation unit that uses hydrogen. The product can be expected to be applied to the transport equipment field (industrial vehicles, construction machinery, ships, harbor machinery, etc.) where weight and volume have been obstacles until now.

Society is highly interested in hydrogen energy as a countermeasure against CO₂ emissions. To meet these expectations, it is essential to commercialize products that can be used safely in a variety of situations, and to develop production and service systems that can provide a stable supply of such products.

The Company has the production technology to achieve this and is also considering the development of dehydrogenation equipment for the transport equipment field as one of the future targets in the supply chain. Judging that this is a field where it can make use of expertise acquired in its current businesses, it entered into a joint development agreement last year.

At this stage, various tests using Hrein’s dehydrogenation equipment (prototype) have been commenced at the Company with a first deadline of 2024. As well as demonstrating factors such as safety, high efficiency, and productivity, both companies will work together concurrently to identify issues and demand for mass production with the aim of commercialization by 2025.

2. Outline of Hrein

Company name	Hrein Energy Inc.
Representative	Akira Koikeda, President
Head office address	Daini-Hishimoto Bldg, 16-1-1, Kita 15-jo Higashi, Higashi-ku, Sapporo, Hokkaido
Main business	Manufacture and sale of hydrogen production and storage equipment Repair and maintenance of hydrogen production and storage equipment Contract studies and contract research and development work related to hydrogen production and storage technologies and fuel cells Manufacture and sale of distributed power supply equipment Manufacture and sale of waste treatment equipment
Share capital	32.10 million yen (as of March 2023)

3. Future plans

2023	In-house demonstration testing of hydrogen supply chain* * Renewable energy – water-electrolysis – hydrogenation reaction – storage – dehydrogenation – power generation cycles
2024	Development of dehydrogenation equipment for the transport equipment field

2025	Commercialization and mass production of the above equipment
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Inquiries related to the news release

<Inquiries from the press>

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