News Release

November 30th, 2020
Sojitz Corporation
Hrein Energy Co., Ltd.

Sojitz Awarded Feasibility Study under NEDO to Build Hydrogen Supply Chain in Shandong Province, China
– Aiming to Establish Efficient Transport and Storage Methods for Hydrogen by Compressing Hydrogen Gas to Approximately 1/500th the Volume–

Sojitz Corporation ("Sojitz") and Hrein Energy Co., Ltd. ("Hrein") have been commissioned to perform a feasibility study ("this Study") for establishing a hydrogen supply chain using LOHC*[1] in Shandong Province, China, by the New Energy and Industrial Technology Development Organization ("NEDO") as part of the organization's "International Demonstration Project on Japan's Energy Efficiency Technologies."

Sojitz and Hrein seek to provide solutions to existing challenges in the transport and storage of hydrogen, which is expected to become the ultimate source of energy in the future. The companies will partner to begin work on this Study with results expected to be compiled within FY2020.

[Overview of this Study]

Using Hrein's LOHC technology, Sojitz and Hrein plan to convert by-product hydrogen produced at a Shandong Province factory into methylcyclohexane (MCH).*[2] The hydrogen in MCH form will be transported to a hydrogen station where it will then be converted back to hydrogen for the supply of fuel cell-powered vehicles (FCV). This Study will investigate information essential to realizing this business, such as the required permits and licenses, relevant laws, and hydrogen supply and demand potential.

[Purpose]

Hydrogen converted to MCH form is much safer to transport and store compared with high-pressure hydrogen gas and ultra-low temperature liquefied hydrogen. Additionally, as hydrogen can be compressed to approximately 1/500th the volume of hydrogen gas in MCH form, it allows for more efficient transportation and

reduced storage costs.

Having completed this Study, Sojitz and Hrein will demonstrate the efficiency of a hydrogen supply chain using these LOHC transport and storage methods with the objective of extending the spread of this technology both in Japan and abroad, as well as providing solutions to issues in society such as the need to reduce greenhouse gas emissions, realize a decarbonized society, and combat global warming.

This Study will be conducted in China, one of the world's largest producers of hydrogen, where efforts are being made to promote hydrogen's greater use and application. Out of all the provinces in China, Shandong Province has the largest supply capacity for by-product hydrogen, as well as renewable energies. Shandong Province is therefore a promising potential site for supplying CO2-free hydrogen in the future.

As part of business expansion, Sojitz and Hrein will also investigate the possibility of building a hydrogen supply chain not only inside China, but also to Japan considering Shandong's proximity to Japan.

Sojitz aims to take the first steps in advancing hydrogen-related business through this Study, pursuing further business expansion and business creation. Sojitz's Key Sustainability Issues (Materiality) state the company's goal to contribute to the global environment through our business and to pursue the development, supply, and use of sustainable resources. This Study will serve as a model for sustainable use of the region's resources to promote decarbonization in the Shandong region, and Sojitz will also promote widespread application of this model in other regions to provide hydrogen transport and storage solutions.

*1: Liquid Organic Hydrogen Carriers (LOHC): A technology that facilitates the storage and transport of methylcyclohexane (MCH), which has a volume approximately 1/500th hydrogen gas and is produced through catalysis of hydrogen gas with the organic solvent toluene.

*2: Methylcyclohexane (MCH): A stable liquid at ambient temperature and pressure. MCH is a low-risk chemical with everyday applications, such as solvents for white-out correction fluid. Use of MCH enables hydrogen to safely and easily be stored long-term and for large volumes of hydrogen to be transported.

[Related Information]

[Company Overview – Hrein Energy Co., Ltd.]

Established	April 2001 – Establishment of H2 Japan Co., Ltd. October 2004 – Renamed Hrein Energy Co., Ltd. following merger with Hydrogenetech Co., Ltd.
Location	1-24 Kotoni 2-jo, 4-chome, Nishi-ku, Sapporo, Hokkaido Yamachi Building
Representative Director	Akira Koikeda
Capitalization	JPY 32.1 million (as of March 31st, 2020)
Main Business	Technology development, manufacturing, repair service, and maintenance for Hydrogen production and storage devices

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