

ENEOS and JERA to Start R&D to construct hydrogen quality standard system under NEDO's commissioned Project

TOKYO — 9 June 2023 — ENEOS Corporation (“ENEOS”) and JERA Co., Inc. (“JERA”) have commenced “Research and Development for Hydrogen Quality related to Establishment of a large-scale CO₂-free hydrogen supply chain”, with the aim to construct hydrogen quality standard system for industrial utilization.

This research and development is commissioned by the New Energy and Industrial Technology Development Organization (“NEDO”)’s “Development of Technologies for Building a Competitive Hydrogen Supply Chain” program.

Towards the realization of a carbon-neutral society, various industrial applications hydrogen such as power generation, steel manufacturing, heat utilization, methanation, etc. is being considered, and it is desired to establish specifications and standards for hydrogen quality in each application.

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In this project, ENEOS will conduct research on hydrogen properties for a wide range of industrial fuel applications, JERA will evaluate the impact of aromatic compounds, etc., on power generation applications. *2 In power generation applications, and the two companies will work toward industry standardization of hydrogen properties for each application, with the aim of establishing a quality standard system for hydrogen that compiles these results.

Under its “ENEOS Group long-term vision” objectives, the ENEOS Group is taking on the challenge of achieving both “stable supply of energy and materials” and “realization of a carbon neutral society.” To achieve “tomorrow’s normal”, a decarbonized and recycling-oriented society, ENEOS will work to establish a CO₂-free hydrogen supply chain in Japan and all over the world, in anticipation of a mass consumption of hydrogen in a decarbonized society. In particular, regarding the storage and transportation of hydrogen, ENEOS is considering the use of methylcyclohexane (MCH), a type of organic hydrogen carrier, as one of the main options. It is expected to be cost competitive as it can leverage the existing infrastructure of the petroleum industry.

Under its “JERA Zero CO₂ Emissions 2050” objective, JERA has been working to reduce CO₂ emissions from its domestic and overseas businesses to zero by 2050, promoting the adoption of greener fuels and pursuing thermal power that does not emit CO₂ during power generation. JERA will continue to contribute to energy industry decarbonization through its own proactive efforts to develop decarbonization technologies while ensuring economic rationality.

Both two companies will promote the versatility of hydrogen in industrial applications, improve international competitiveness, and contribute to the early realization of a hydrogen society in Japan

by summarizing the results of these investigations and evaluations of hydrogen properties and studies toward quality standardization.

<Summary of R&D on hydrogen quality for industrial applications>

Title	Reserch and Development for Hydrogen Quality related to Establishment of a large-scale CO2-free hydrogen supply chain
R&D Items	<ol style="list-style-type: none"> 1. Summarize hydrogen usage examples and standard values in various applications, and study hydrogen properties required for each application 2. Implementation of impact assessment of contaminants in hydrogen on gas turbines for power generation applications 3. Comparative study of optimal hydrogen refining methods to satisfy hydrogen property requirement thresholds 4. Study toward standardization of hydrogen quality for each application, construction of hydrogen quality standard system
Role of each Company	<p>ENEOS : Examination of standards for general industrial applications</p> <p>JERA : Conducting impact assessments of contaminants in power generation applications</p>
Term	From FY 2023 to FY 2025

*1 The hydrogen for fuels FCVs (fuel cell vehicles) at hydrogen stations in Japan satisfies the ISO 14687 (2109) quality standard. In other industries, it is operated by agreement between supply and demand companies.

*2 It is an organic compound containing a benzene ring. Hydrogen (byproduct hydrogen) etc. from catalytic reformer in petroleum refining may be contained in trace amounts.