

The World's First Transocean Shipment of Hydrogen Begins to Fuel Gas Turbines for Power Generation

Advanced Hydrogen Energy Chain Association for Technology Development (AHEAD)*1

AHEAD is pleased to announce that it has reached an important milestone towards realizing a hydrogen-fueled society by commencing the supply of hydrogen separated from methylcyclohexane (MCH) *2 at the dehydrogenation plant in the Keihin Refinery of Toa Oil Co., Ltd. in the coastal area of Kawasaki City to fuel gas turbines of Mizue Power Station under the “Demonstration Project for a Hydrogen Energy Supply Chain Utilizing the Organic Chemical Hydride Method*3,” which is undertaken by AHEAD with a subsidy from the New Energy and Industrial Technology Development Organization (NEDO).

This represents another step towards commercialization of the international hydrogen supply chain that consists of a series of processes from the production of MCH in Brunei to ocean transport to the separation of hydrogen from MCH in Japan, as the use of hydrogen shipped from abroad as fuel for power generation will create a substantial addition to hydrogen demand, which is expected to rise in the future.

The Strategic Roadmap for Hydrogen and Fuel Cells established by the Ministry of Economy, Trade and Industry in March 2019 states the importance of hydrogen-fueled power generation, along with the transition to renewable energy, towards a low carbon society, setting the commercialization of hydrogen-based electricity as a goal to be achieved in 2030 in its Basic Hydrogen Strategy and Fifth Basic Energy Plan that lay out specific actions to be taken up to 2030.

The supply of hydrogen to gas turbines marks the first consumption of foreign-produced hydrogen for power generation in Japan, leaving a significant footprint towards mass consumption of hydrogen in the electricity sector.

AHEAD will continue to demonstrate the feasibility of international hydrogen transport through the pilot operation of the hydrogen supply chain in collaboration with its member companies, namely, Chiyoda Corporation, Mitsubishi Corporation, Mitsui & Co., Ltd., and Nippon Yusen Kabushiki Kaisha, as well as a growing circle of stakeholders.

We appreciate and welcome your continued support and cooperation.

Hydrogen supply for power generation (schematic illustration)



Dehydrogenation Plant



Gas turbine (thermal power plant)

*1: Overview of AHEAD

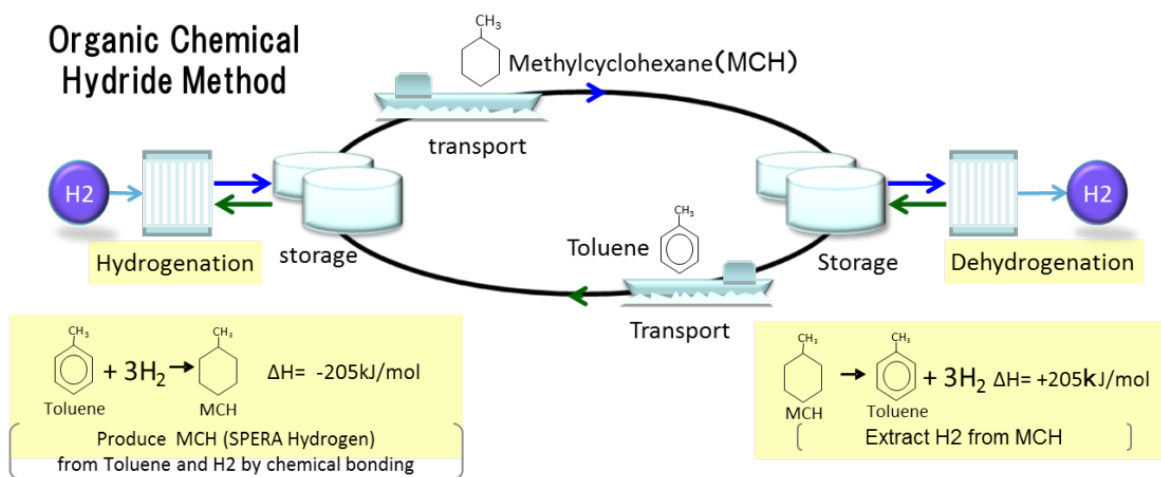
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 Established : July 3, 2017
 Research partners : Mitsubishi Hitachi Power Systems, Ltd., Development Bank of Japan Inc.

*2: Methylcyclohexane (MCH)

An organic compound generated through the hydrogenation of toluene. It remains in a liquid state at an ambient temperature and pressure, and is used widely as solvent in liquid paper (correction fluid), etc.

*3: Organic Chemical Hydride Method

A technology developed for international shipment of hydrogen. Hydrogen and toluene procured from resource-rich countries are converted through a chemical reaction (hydrogenation) into methylcyclohexane (MCH), which remains in a liquid state at an ambient temperature and pressure. The MCH is stored and transported to a hydrogen consumer country, where it is separated (dehydrogenated) into toluene and hydrogen. The hydrogen is then supplied as gas to customers, and the toluene is shipped back to the origin countries, where it is re-hydrogenated into MCH and reused for transporting hydrogen.



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