Future Cities of Japan Starting from Tomiya City

Aiming to become a future city with no CO2 emissions, Tomiya City expands the demonstration project to the Toshoku region and all over Japan.

Delivery to Family houses and Public Facilities

The hydrogen cassettes are transported by trucks that also deliver such goods as food and water to the family houses of Coop members.

Project’s System Flow Chart

Both renewable energy power generation and solar power facilities in accordance with the sun’s radiation conditions. To achieve this, the power that is generated is used for the electrolysis of water to produce hydrogen, which is stored and delivered to secure cassettes (hydrogen storage areas). The hydrogen is supplied to fuel cells in remote energy demand areas and used to generate power and heat.

Ministry of the Environment
Low Carbon Hydrogen Technology Demonstration Project in Cooperation with Local Government

Hand-in-Hand with the Community
Low Carbon Hydrogen Supply Chain Demonstration Project
Ministry of the Environment, Low Carbon Hydrogen Technology Demonstration in Cooperation with Local Government

The Low Carbon Hydrogen Technology Demonstration in Cooperation with Local Government is a public lender by the Ministry of the Environment to demonstrate low carbon hydrogen supply chain as a mid- to long-term global warming countermeasure. A collaboration between Hitachi, Maruoni, Miyagi Co-op, and Toshiya City in Miyagi Prefecture was approved for this project. Since hydrogen does not emit CO2 during use, it is an effective energy for preventing global warming.

New Energy with Great Potential for the Future

In the case of energy storage, electricity can be stored in batteries, but will self-discharge over time. With hydrogen, it rarely self-discharges since it is stored, so it is a new energy suitable for long-term storage. (Other storage/transportation methods include less-expensive hydrogen storage alloys like high-pressure compression and cryogenic liquid hydrogen.)

Production
Power generated by the heliostat field’s reflector solar system is used for the electrolyzer.

Electrolyzer
Water (H2O) is decomposed into hydrogen (H2) and oxygen (O2).

Cassette
Hydrogen storage alloy
Hydrogen is stored and transported by hydrogen storage alloys.

Easy to carry, low pressure, and a safe storage/transportation method

Miyashirai Elementary School
Miyashirai Elementary School is located at Toshiya City in Miyagi Prefecture. The students also learn about hydrogen in class.

Miyagi Co-op
Abashiri Supermarket
At the supermarket, power and heat are generated from hydrogen. This power is used for lighting and cooling, among other uses, and the heat is used to produce hot water.

In the future, we expect fuel cell vehicles (FCV) including FCVs to be an important local energy source. FCVs are fuel and water inputs (H2 and water) and emit only water outputs (CO2 and water vapor). We also expect fuel cells driven by hydrogen will be fully used to supply power and heat.

Family houses
The hydrogen is used for power supply in the family houses. Large-scale hydrogen storage cassette can accommodate approximately a day’s power demand for one household.

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