

Demonstration equipment Major specifications

Wind turbine generator system (owned by Muroran City)	Rated output : 1,000kW
Water electrolyzer system	Hydrogen production capacity : 1Nm ³ /hour
Vehicle-mounted metal hydride tank	Rated hydrogen absorb capacity : 45Nm ³
Fixed metal hydride tank	Rated hydrogen absorb capacity : 45Nm ³
Pure hydrogen fuel cell	Rated output : 700W
Hydrogen transport vehicle	2t (container attachable/removable type)



Engineering Division, Taisei Corporation
1-25-1 Nishi Shinjuku, Shinjuku-ku, Tokyo 163-0606
TEL(+81)3-3348-1111 FAX(+81)3-3345-7859



Economic Department, City of Muroran
1-2 Saiwai-cho, Muroran, Hokkaido 051-8511
TEL(+81)143-22-1111 FAX(+81)143-25-2478



New Business Promotion Headquarters,
The Japan Steel Works, Ltd.
1-11-1 Osaki, Shinagawa-ku, Tokyo 141-0032
TEL(+81)3-5745-2046 FAX(+81)3-5745-2049



Kyushu University
744 Motooka, Nishi-ku,
Fukuoka 819-0395
TEL(+81)92-802-2130
FAX(+81)92-802-2139



Tomoe Shokai Co., Ltd.
1-2-5 Kamatahonmachi, Ota-ku, Tokyo 144-8505
TEL(+81)3-3734-0511 FAX(+81)3-3734-0553



Muroran Institute of Technology
27-1 Mizumoto-cho, Muroran,
Hokkaido 050-8585
TEL(+81)143-46-5000
FAX(+81)143-46-5644



Kita Koudensha Corporation
2-10 Nishi-23-chome, Kita-11-jo, Chuo-ku, Sapporo,
Hokkaido 060-0011
TEL(+81)11-640-2231 FAX(+81)11-640-2151

Ministry of the Environment Demonstrating a regional, low-carbon hydrogen supply chain

Project to demonstrate a low-pressure hydrogen delivery system to promote hydrogen use in buildings and city infrastructure



Low-pressure Hydrogen Delivery System Demonstration Project

This demonstration project is being promoted as part of the Low-Carbon Hydrogen Supply Chain Demonstration Project of the Ministry of the Environment.

Low-pressure handling of hydrogen throughout all phases from production through storage, transport, and use help to achieve a safe and secure hydrogen-based society,

Storing the hydrogen at low pressure also enable unmanned operation of the hydrogen production systems, which help to reduce the price of hydrogen.

Low-temperature waste heat from buildings is used as heat supply to release hydrogen from the metal hydride (MH) tank. This helps to conserve energy.

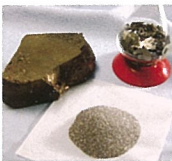
>> What is a hydrogen absorbing alloy?

A hydrogen absorbing alloy absorbs hydrogen when it is pressurized or cooled under hydrogen and releases hydrogen when pressure is reduced or a hydride is heated. A hydrogen absorbing alloy absorbs a large amount of hydrogen (1,000 time the alloy volume or more) without high pressure nor high temperature. For this demonstration project, the AB5-type alloys are used because they show small pressure difference between absorption and desorption and can be easily used for practical applications.

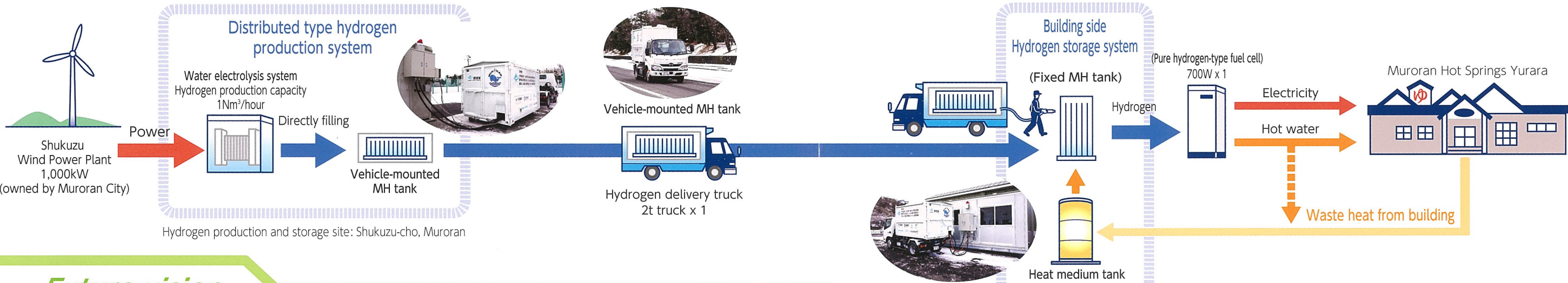
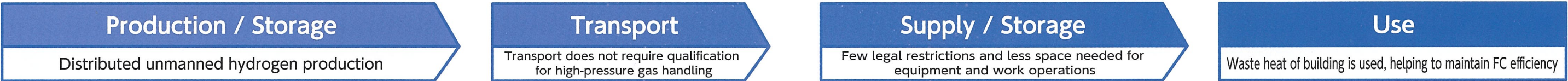
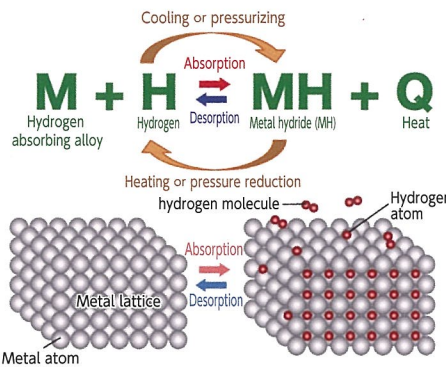
■ Comparison of various types of hydrogen absorbing alloys(MH)

Alloy type	AB5	AB2	AB	BCC
Typical alloys	LaNi5	ZrMn2	TiFe	Ti-V-Cr
Durability	○	○	△	△
Tunability of working pressure	○	○	×	△
Compactness of MH container	○	△	△	○
Confirmation of safety	○	△	△	△

■ Appearance of hydrogen absorbing alloys.

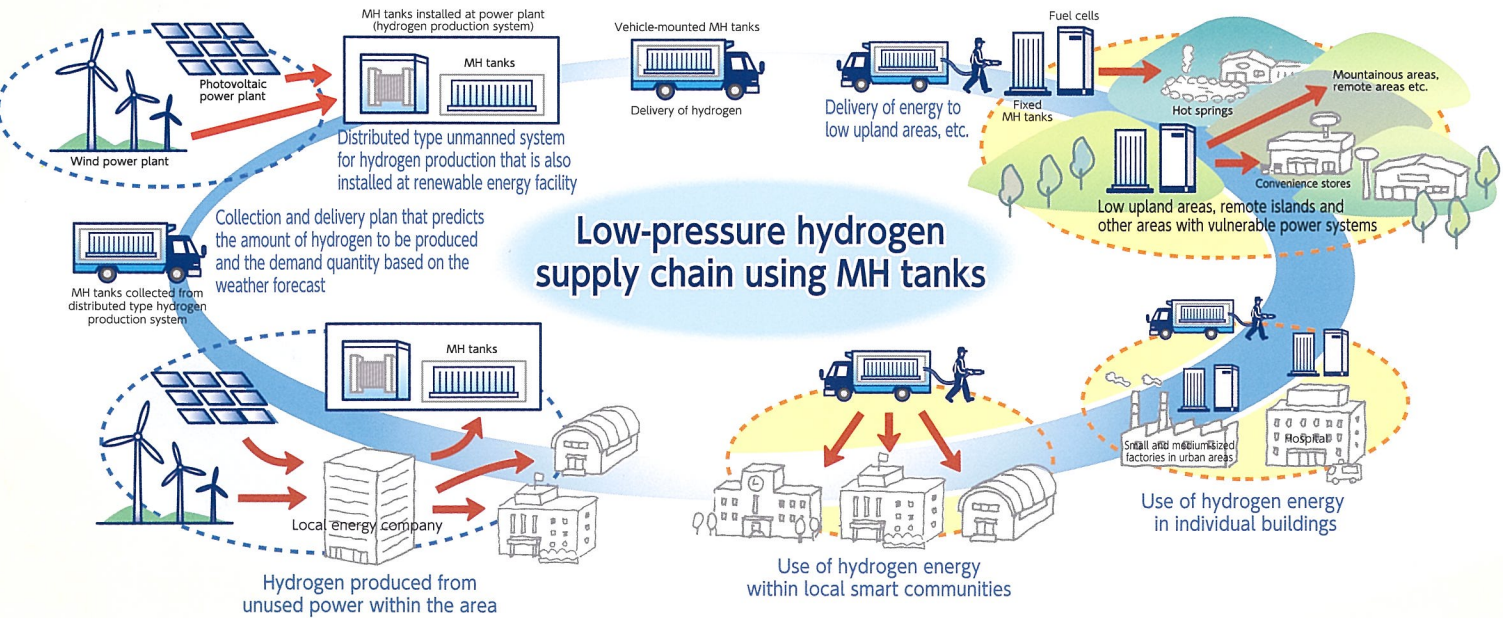


The hydrogen atom bonds with the metal atoms in the metal lattice (the metal atoms by the metal atoms), so the alloy is called a metal hydride (MH).



Future vision

In the future, a fully unmanned and distributed type system for hydrogen production will be placed in a photovoltaic power generation, wind power generation or other renewable energy facilities. At regular intervals, hydrogen delivery trucks will collect the MH tanks in which hydrogen is stored and deliver the hydrogen to the locations in the region where it is needed.



Heat cascade use

