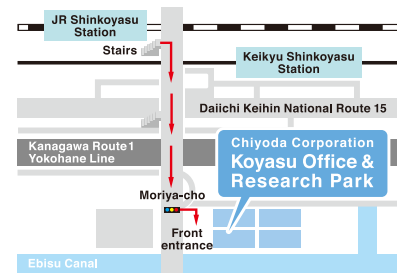
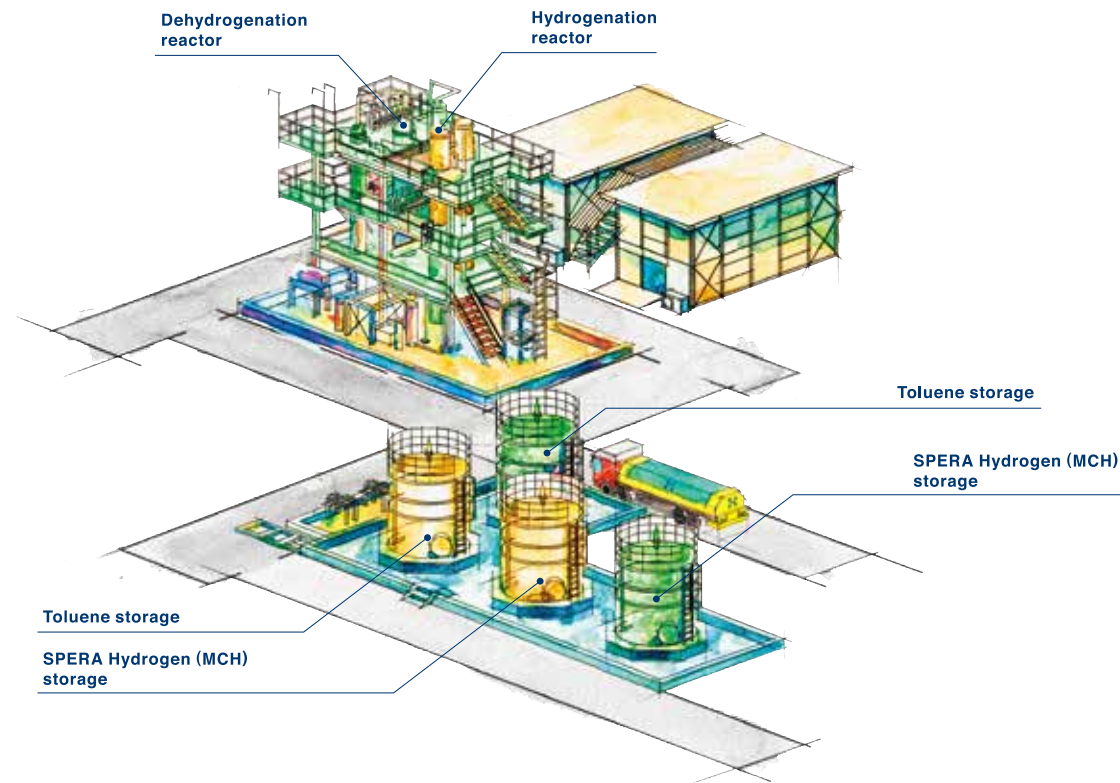


Visit our demo plant!



Koyasu Office & Research Park

[Address]
13, Moriya-cho 3-chome, Kanagawa-ku,
Yokohama 221-0022, Japan

[Adjacent Stations]
Ten-minute walk from:
Shinkoyasu / JR Keihin Tohoku Line
Keikyu Shinkoyasu / Keihin Kyuko Line

[Nearest Highway]
Moriya Ramp / Yokohama-Haneda Route

Chiyoda Corporation
Minatomirai Grand Central Tower 4-6-2, Minatomirai, Nishi-ku, Yokohama 220-8765, Japan
URL : <https://www.chiyodacorp.com/en/service/spera-hydrogen/>
Email : HSCD_ADM@chiyodacorp.com



What comes next? Hydrogen.

Hydrogen is no longer an impossible dream. Hydrogen is no longer difficult to handle as an energy. Transportable, storable, safe, and CO₂-emission free, hydrogen deserves to be the global energy of today.

SPERA HYDROGEN

SPERA Hydrogen is easy to use.

Hydrogen, once considered a distant dream of an energy, has become a reality, and Chiyoda Corporation has made it remarkably easy to use. Our innovative technologies enable hydrogen to be liquefied and consequently transported at ambient temperature and pressure. We named this liquid “SPERA Hydrogen.” Able to survive transportation over long distances and storage over long periods of time (almost unthinkable before), this “hydrogen of hope” is highly safe and stable. It will overturn the conventional wisdom regarding hydrogen.

SPERA Hydrogen

SPERA derives from the Latin word for “hope.” We at Chiyoda Corporation chose the name to represent our desire that hydrogen technology will give people around the world the hope they need to build a better future.



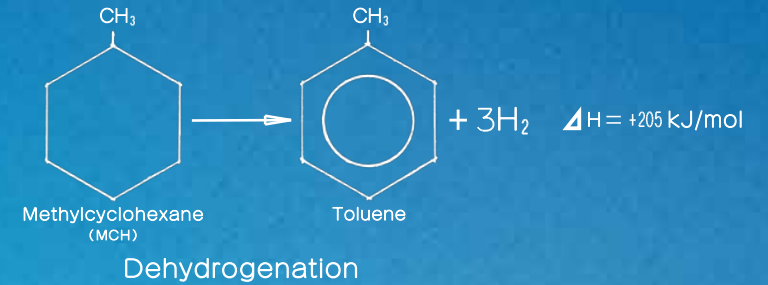
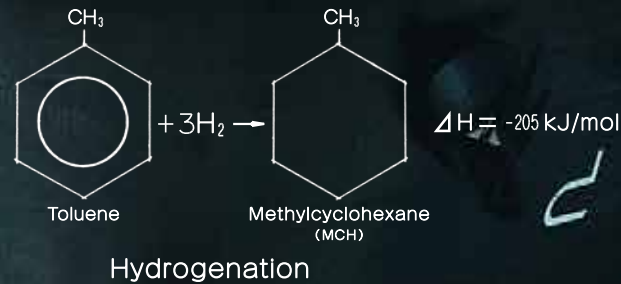
Two technologies defied conventional wisdom and made SPERA Hydrogen possible.

1

~Organic Chemical Hydride (OCH) Technology~

Enables the transport of hydrogen at ambient temperature and pressure.

Fixing hydrogen to toluene, a major component of gasoline, produces a liquid called methylcyclohexane (MCH), which is easy to handle at ambient temperature and pressure. This is SPERA Hydrogen. Our technology facilitates storage of hydrogen in large quantities and long-distance transportation at a low cost because it eliminates the need for hydrogen (the lightest gas, difficult to store or transport under normal conditions) to be liquefied at cryogenic temperatures or pressurized in cylinders.



~Dehydrogenation Catalyst~

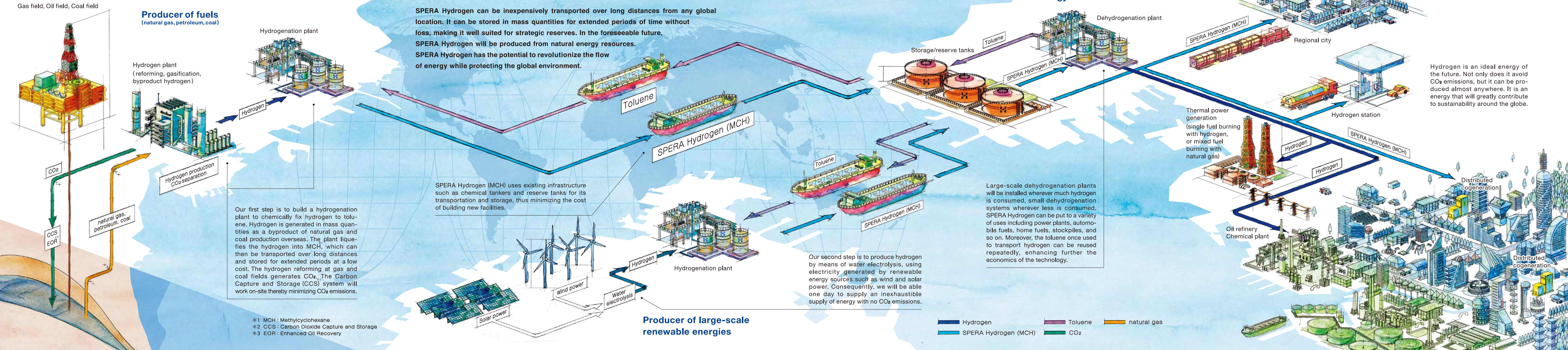
Extracts hydrogen from MCH.

For some time, the extraction of hydrogen from methylcyclohexane (MCH) had been considered impossible. However Chiyoda Corporation developed a catalyst to achieve exactly that, by means of our proprietary nanotechnology. The catalyst makes it possible to supply just the right amount of hydrogen on demand at any time and any place.

2

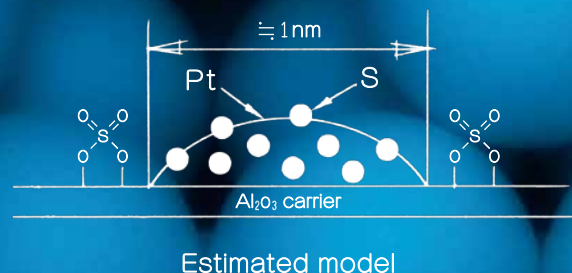
SPERA HYDROGEN

Changing the world's energy landscape.



SPERA Hydrogen is the result of Chiyoda's nanotechnology. Our R&D team and years of hard work led to the breakthrough: SPERA Catalyst.

In 2004, Chiyoda Corporation succeeded in developing the world's first dehydrogenation catalyst through the use of platinum nanoparticles. SPERA Catalyst not only makes it possible to easily extract hydrogen from SPERA Hydrogen (MCH), but it has a long lifespan and can be mass-produced.



Chiyoda Corporation was established in 1948. We grew alongside Japan's petroleum industry, and maintain our position as a global leader providing energy and environmental solutions. Among other records, we completed the world's largest LNG plant in Qatar, while completing a number of flue gas desulfurization plants (CT-121) worldwide. For many years, we have strived to develop SPERA Hydrogen to pave the way for a new, low-carbon society. Our dream has finally become a reality, and we are moving it forward.

Burning hydrogen generates zero CO₂ emissions and therefore helps to prevent global warming. It can be used in a variety of applications, from power plants to transportation infrastructure (including automobiles) to home fuel cell systems.

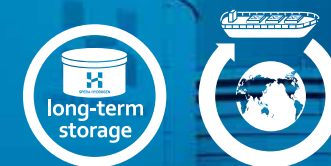
CO₂=ZERO

SPERA Hydrogen provides advantages.

The toluene that hydrogen is fixed to is later removed and can be repeatedly reused.



Hydrogen can be stored in mass quantities for extended periods of time and transported over long distances at ambient temperature and pressure.



SPERA Hydrogen (MCH) is classified in the same hazardous material category as gasoline. Therefore, MCH can be transported and stored using the same tank trucks, gas station, and other elements of the existing infrastructure. This minimizes the cost of introducing and distributing the technology.

