



# Global Hydrogen Energy Unit

## Overview

Hydrogen is a secondary energy source with high potential to contribute to the goal of realizing a low-carbon society and bringing about a change in energy structure. In order to make hydrogen energy a practical reality, however, it is necessary to explore the development of elemental technology and systems as well as industrial and social structures to identify and address issues of importance. The Global Hydrogen Energy Unit was established to evaluate a wide range of issues from a multilateral, subjective, and scientific perspective through industry-government-academia collaboration centered around Tokyo Tech. The unit also identifies bottlenecks in problem solving and determines development goals related to the technology and systems required to realize a hydrogen energy society.

## Research goals

The goal of the Global Hydrogen Energy Unit is to establish a global-scale hydrogen supply chain which converts unused overseas energy to hydrogen and transports it to Japan. Specifically, the unit plans to separate brown coal into CO<sub>2</sub> and hydrogen in Australia, store the CO<sub>2</sub> underground, and transport liquefied hydrogen to Japan for storage and conversion to energy. The unit will also link this with the use of hydrogen energy generated from renewable energy sources in Japan. The Global Hydrogen Energy Unit conducts research on the organization of accurate and subjective information, creates new value, designs and evaluates systems, and identifies and solves technical development problems.



Research Unit Leader **Ken Okazaki**

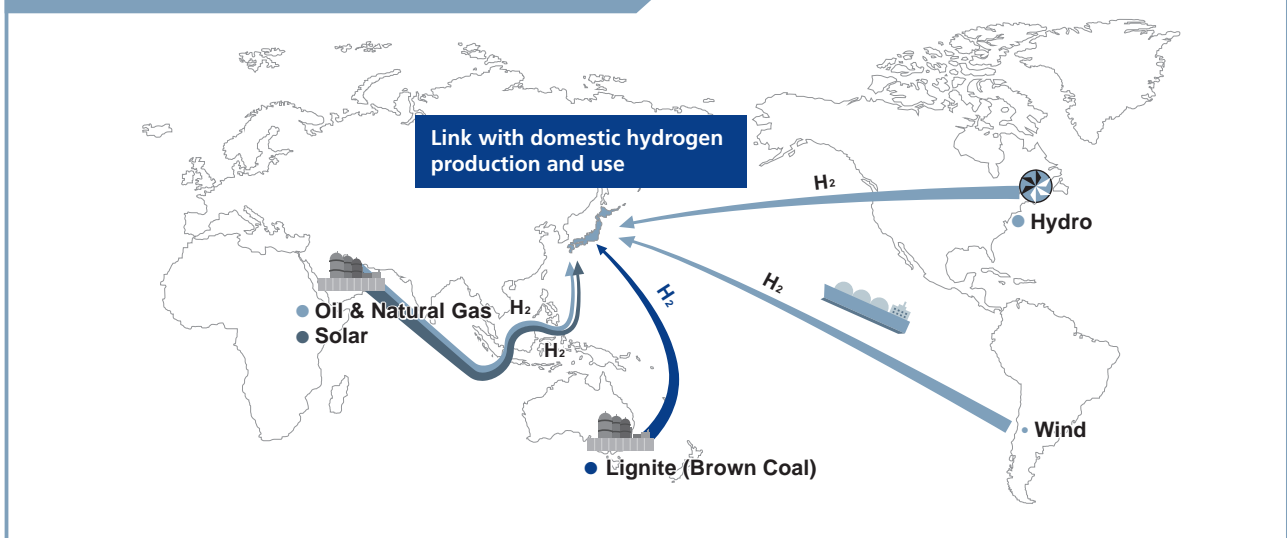
### Profile

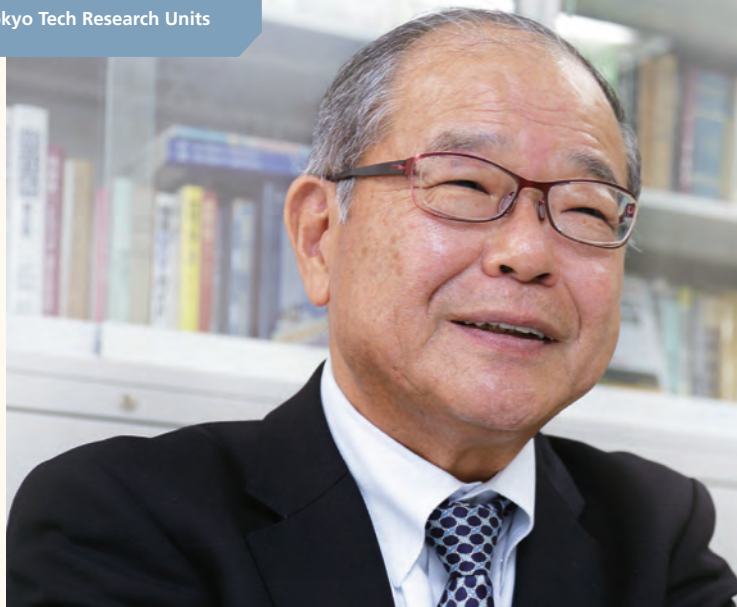
- 2015 Institute Professor (Professor Emeritus), Tokyo Institute of Technology
- 2007-2011 Dean, Graduate School of Engineering, Tokyo Institute of Technology
- 2000 Professor, Department of Mechanical and Control Engineering, Graduate School of Science and Engineering, Tokyo Institute of Technology
- 1998 Professor, Department of Mechanical Engineering and Science, School of Engineering, Tokyo Institute of Technology
- 1992 Professor, Tokyo Institute of Technology
- 1984 Associate Professor, Toyohashi University of Technology
- 1980 Lecturer, Toyohashi University of Technology
- 1978 Assistant Professor, Toyohashi University of Technology
- 1978 Doctor of Engineering, Department of Mechanical Engineering, Graduate School of Science and Engineering, Tokyo Institute of Technology
- 1973 Bachelor of Engineering, Department of Mechanical Engineering, School of Engineering, Tokyo Institute of Technology

### Unit members

- Adjunct Professor Michio Hashimoto
- Adjunct Professor Yoshihisa Sato
- Adjunct Professor Takuya Oda
- Professor Manabu Ihara
- Professor Tomohiro Nozaki
- Professor Yukiata Kato
- Professor Akira Yamada
- Professor Ichiro Yamanaka
- Associate Professor Yuya Kajikawa

## Global hydrogen supply chain





In order to realize a hydrogen energy society, universities, industries, and government agencies must be organically linked

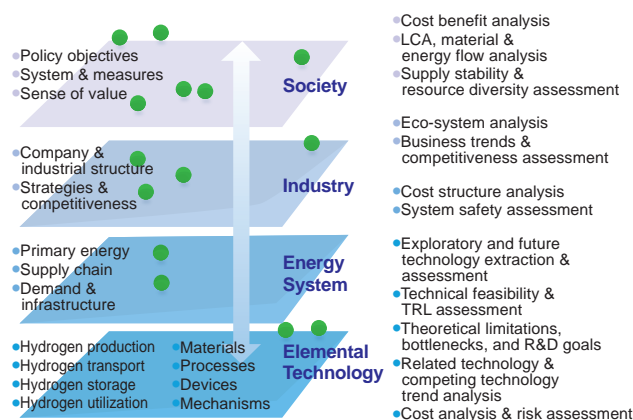
## Q Why was this research unit established?

In order to realize a hydrogen energy society, it is essential to organically link universities that provide outstanding technology and research, industries that promote the commercialization of hydrogen energy, and governmental agencies that establish and execute policy. From our subjective position as a university, we established the Global Hydrogen Energy Consortium through industry-government-academia collaboration within the Global Hydrogen Energy Unit. The unit operates the consortium and facilitates multilateral assessment, the development of technology for elements and systems, and the exchange of information among members.

## Q What are the strengths of this research unit?

Tokyo Tech has a wide range of achievements in energy-related research and education that it has accumulated over the years. In 2012, the Environmental Energy Innovation Building was completed at the Ookayama Campus and the original smart power grid management system "Ene-Swallow" was initiated. Experts in innovation and technical assessment are participating in the research along with specialists on campus to push technological and system advancements. Our strength is that this unique Research Unit can engage in global and open collaboration in a wide range of activities with other consortium members.

### The Goal of the Tokyo Tech Global Hydrogen Energy Research Unit "Neutral, subjective, diversified evaluation (Technology Assessment)"



## Q What is the path to achieving the unit's goals?

The Global Hydrogen Energy Unit's initial 5-year plan was based on the requirements for achieving the desired energy society in the next 30 years. We plan to first establish a system for the subjective and diversified assessment of introduction and use of hydrogen both in and outside of Japan. In FY 2016, the Unit scheduled to start joint assessment with industry, government, and universities with the goal of encouraging external funding. Based on this assessment, in FY 2017 and 2018, the Unit will examine the identified issues and implement specific research projects that focus on solving top priority problems. In FY 2019, we plan to establish a foundation to facilitate the application of our achievements to advance to the next stage.

Contact us

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