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 policies. 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 “One 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.

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 10 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.

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 CO2 and hydrogen in Australia, store energy to hydrogen and transports it to Japan. Specifically, the unit plans to separate brown coal into CO2 and hydrogen in Australia, store hydrogen 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.
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**Activity policy**

Conduct the following items for building up a hydrogen supply chain in cooperation with industrial-academic-government members:

1. Collection, organization and analysis of correct information;
2. Extraction of bottlenecks and research problems; and
3. Consideration of measures aiming at social implementation.

Based on this approach, promote activities for “Establishment of hydrogen energy utilization system based on unused energy” in cooperation.

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**Hydrogen use system assessment study**

**General outline of “Total system introduction scenario survey research”**

- **System analysis for full-scale introduction**
  - National Institute of Advanced Industrial Science and Technology
  - Institute of Applied Energy

- **Future prediction and assessment of technology based on theories**
  - Tokyo Institute of Technology

**Technological scenario analysis based on macro analysis**

**Technological innovation**
- Granting of social organizational rationality

**Preparation and refinement of technological development scenario**

**Global Hydrogen Energy Consortium (GHEC)**

Global Hydrogen Energy Consortium (abbreviated as GHEC) has been established as a platform of industrial-academic-government cooperation (July 1, 2015). With an intention to share information of participating corporations and researchers aiming at establishing a hydrogen supply chain and resolving technological problems relevant thereto, activities to realize hydrogen energy society are developed. We expect that the consortium activities may contribute to achievement of a new international best-mixed energy based on diversified energy resources including renewable energy in the long run. Please contact with GHEU head office if interested. We will send you a document of description.
Activity status of the unit is updated as necessary on the website. Intention, activities and organization of the industrial-academic consortium, background of establishment of the unit and positioning of the organization in the university are described on the website in addition to records of organized symposiums and workshops.