

Activities of Hydrogen Energy Research in Yokohama National University

By Professor Ken-ichiro Ota, Yokohama National University

[Yokohama National University](#) was founded in 1948 by the merging of the engineering, economics and education colleges. It is located in Yokohama city near Tokyo. Yokohama is the second largest city in Japan. Yokohama National University has 4 schools; engineering, economics, management and education. 10,000 students are studying including the graduate students.

The hydrogen energy project in Yokohama National University was started in 1972 by Prof. Tokio Ohta, a former president of our university. That was a beginning of the hydrogen energy study in Japan. The main target of that project was the hydrogen production using solar energy in ocean. About 20 companies in Japan were jointed to this project. Since then, we are operating the solar-hydrogen laboratory in our university.

After this, Yokohama National University has been leading the development of hydrogen energy in Japan. The Hydrogen Energy Systems Society of Japan (HESS) was founded in Yokohama National University in 1974. The members of our university strongly supported the activities of HESS from the beginning and also the [15th World Hydrogen Energy Conference](#) that will be held in Yokohama in the end of June, 2004.

Currently, two university projects related to the hydrogen energy are going as 3 years project with the financial support from the president of our university, in addition to the individual efforts of each professor on the national projects. One project is a "Study on the Materials for Hydrogen Energy System" that is composed of 12 professors, mostly from the Division of Materials Science and Chemical Engineering. The major topics of this project are as follows:

- Evaluation of hydrogen energy system using water circulation
- Risk analysis and safety issues of hydrogen energy system
- Materials for the improvement of water electrolysis
- Production of hydrogen from biomass wastes
- Materials study of metal hydrides
- Materials for improvement of fuel cells

The other is a "Study of Hydrogen Energy System Using Ocean Energy" that is composed of 15 professors, mostly from the Division of Materials Science and Mechanical Engineering. The major topics of this project are as follows.

- Design of marine turbines using ocean stream
- Design of ocean float for hydrogen production
- Hydrogen production using the energy of ocean stream
- Hydrogen utilization using polymer electrolyte fuel cell

These 2 projects will join together in the next fiscal year and the plan for the research center for hydrogen energy is being considered in Yokohama National University. Yokohama National University is actively working for the establishment of hydrogen energy system – a clean energy system for the sustainable growth of human beings.