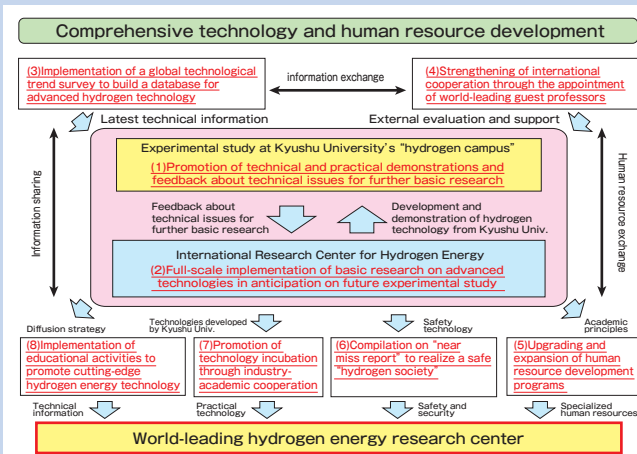


Demonstration Research on a Hydrogen-based Society through Collaboration among Industry, University, Government, and Local Community

In fiscal 2010, a project designated as "Demonstration Research on a Hydrogen-based Society through Collaboration among Industry, University, Government, and Local Community" was commenced. To realize a low-carbon society by taking advantage of hydrogen technology, this demonstration research, linked to both basic and industry-academia collaborative research, has been conducted at the "hydrogen campus" - Kyushu University's Ito Campus - in conjunction with Fukuoka Prefectural government and the Fukuoka Strategy Conference for Hydrogen Energy. These research activities aim to create a unique international center for hydrogen energy research and education in which industry, government, academia and the community collaborate.

As a result of applications that were open to all faculties of the university, fifty-two projects have been implemented, with researchers from a variety of departments and divisions involved. These projects also serve to support the activities of Kyushu University's International Institute for Carbon-Neutral Energy Research, which opened in December 2010 as part of MEXT's World Premier International Research Center Initiative (WPI).



○ Demonstration research projects for fiscal 2013

(A) Research on fuel cells

Project #	Principal researcher	Affiliation	Project title
A01	Akari Hayashi	Associate Professor, International Research Center for Hydrogen Energy	Development of PEFCs with high durability by controlling carbon nanostructures
A02	Kazunari Sasaki	Director/ Professor, International Research Center for Hydrogen Energy	Study on a carbon-free electrode catalyst for polymer electrolyte fuel cells
A03	Stephen LYTH	Associate Professor, International Institute for Carbon-Neutral Energy Research	Graphene in Fuel Cells: Exploring graphene as a unique material for polymer electrolyte membrane fuel cell catalysts and catalyst supports
A04	Tsuyohiko Fujigaya	Associate Professor, Dept. of Applied Chemistry	Improvement of a durability of carbon supporting materials by polymer wrapping
A05	Masamichi Nishihara	Assistant Professor, International Institute for Carbon-Neutral Energy Research	Direction dependency of proton conductivity of charge-transfer complex hybrid films and application for PEFC
A06	Tatsumi Kitahara	Associate Professor, Dept. of Mechanical Engineering	Hydrophilic and hydrophobic double MPL coated GDL to enhance PEFC performance under low and high humidity conditions
A07	Hiroshige Matsumoto	Professor, International Institute for Carbon-Neutral Energy Research	Development of fine-porous electrode starting from nanoparticle
A08	Yuji Okuyama	Assistant Professor, Inamori Frontier Research Center	Design of the proton conducting oxide for fuel cell
A09	Nicola Perry	Research Associate, International Institute for Carbon-Neutral Energy Research	Development of new high-durability solid oxide fuel cell cathode compositions by Sr replacement
A10	Shunsuke Taniguchi	Professor, International Research Center for Hydrogen Energy	Development of a highly durable metal supported SOFC technology using a stainless steel
A11	Sean Bishop	Associate Professor, International Institute for Carbon-Neutral Energy Research	Study of oxygen exchange rate of novel transition and precious metal CeO2 solid solutions for SOFC electrodes
A12	Kohel Ito	Professor, Dept. of Mechanical Engineering	Development of 3D Temperature Measurement Techniques in PEFC with Ultrafine Thermocouple
A13	Yuya Tachikawa	Assistant Professor, International Research center for Hydrogen Energy Research	Development of SOFC planar cell anode visualization holder
A14	Hironori Nakajima	Assistant Professor, Dept. of Mechanical Engineering	Demonstration Research on the Power Generation by an Anode-Supported Honeycomb SOFC Stack.
A15	Toshiko Osada	Assistant Professor, Dept. of Mechanical Engineering	Development of micro separator for fuel cell by metal injection molding
A16	Tsutomu Kawabata	Technical staff, International Research Center for Hydrogen Energy	Research into diversified cell production technology of SOFC
A17	XU Yang	Research Associate, Dept. of Mechanical Engineering	Developed fabricating process for SOFC unit with improved-performance by imprinting technique
A18	Yusuke Shiratori	Associate Professor, Dept. of Mechanical Engineering	Thermomechanical reliability and catalytic activity of Ni-ScSZ anode supports in internal reforming SOFC running on biogas
A19	Takeshi Daio	Research Associate, International Research Center for Hydrogen Energy	4D nano-scale visualization by EDS-TEM tomography

(B) Research on hydrogen technology

Project #	Principal researcher	Affiliation	Project title
B01	Takuya Kitaoka	Professor, Faculty of Agriculture Associate	Development of Novel Paper-Structured Catalysts for Hydrogen Production
B02	Teppeji Ogura	Associate Professor, International Research Center for Hydrogen Energy	Kinetic Simulations for Hydrogen Production from Biogas on Realistic Catalyst Surface
B03	Shinji Kudo	Assistant Professor, Institute for Material Chemistry and Engineering	Dissolution and hydrothermal reforming of lignocellulosic biomass in alkaline aqueous solution for the production of hydrogen
B04	Takaaki Sakai	Assistant Professor, Center for Molecular Systems	Fabrication of thin-film electrolyte hydrogen separation cell using La series perovskite type proton conductor
B05	Etsuo Akiba	Professor, Dept. of Mechanical Engineering	Development of high performance and energy-efficient carbon based hydrogen adsorbers
B06	Li Haiwen	Associate Professor, International Research Center for Hydrogen Energy	Development of chemical hydrides for onboard hydrogen storage materials
B07	Huaiyu Shao	Assistant Professor, International Institute for Carbon-Neutral Energy Research	Innovative development of Mg-based hydrogen storage materials for stationary energy storage
B08	Masanobu Kubota	Professor, Dept. of Mechanical Engineering	Prevention of Instantaneous Failure of Materials for High-Pressure Hydrogen Vessel
B09	Shigeru Hamada	Associate Professor, Dept. of Mechanical Engineering	Experimental Study of Block-HELP Mechanism Applied Low Carbon Steel Piping
B10	Hisao Matsunaga	Associate Professor, Dept. of Mechanical Engineering	Searching of Low Alloy Steel Having Higher Resistance against Hydrogen Embrittlement
B11	Tatsuya Kawae	Associate Professor, Applied Quantum Physics, Faculty of Engineering	Study on low temperature embrittlement by quantum tunneling of hydrogen in metals
B12	Junichiro Yamabe	Associate Professor, International Research Center for Hydrogen Energy	Study on hydrogen entry behavior of oxide-coated steels
B13	Aleksandar Staykov	Assistant Professor, International Institute for Carbon-Neutral Energy Research	Theoretical study of H2 adsorption and dissociation on metal oxide surfaces. Effect of the oxide structure and H2 gas pressure on the hydrogen entry in the material
B14	Takayoshi Ishimoto	Assistant Professor, Inamori Frontier Research Center	Development of quantum chemistry computation simulator for hydrogen science - in pursuit of an understanding of fundamental hydrogen properties
B15	Yoshiko Miura	Professor, Dept. of Chemical Engineering	Development of High-performance Solid-state Electrochemical Gas Sensors with Multiple Applications in the Proposed Hydrogen Economy
B16	Hiroshi Takamatsu	Professor, Dept. of Mechanical Engineering	Development of a Room-Temperature-Driven Micro-beam Hydrogen Detector
B17	Zhiyun Noda	Technical staff, International Research Center for Hydrogen Energy	Hydrogen Purity Sensors : Principles and Response
B18	Masahiro Inoue	Associate Professor, Dept. of Earth Resource Engineering	Experimental Research on the Optimal Placement of Hydrogen Sensors for Real World Hydrogen Dispersion Scenarios
B19	Chuanjun Liu	Research fellow, Dept. of Electronics, Graduate School of Information Science and Electrical Engineering	Porphyrin Metal Complex based Optical Sensor for the Detection of Poisonous Gases in Hydrogen Fuel
B20	Yoshinori Sawae	Professor, Dept. of Mechanical Engineering	Development of high performance valve for high pressure hydrogen gas infrastructure
B21	Naoya Sakoda	Assistant Professor, Dept. of Mechanical Engineering	Study on Thermal-Flow Characteristics of High-Pressure Hydrogen in Discharge Processes
B22	Yukihide Nagano	Assistant Professor, Dept. of Mechanical Engineering	Study on extinction phenomenon of hydrogen flame for prevention of hydrogen explosion
B23	Shin Nishimura	Professor, Dept. of Mechanical Engineering	Lifetime Assessment of Diaphragm Pump for Fuel Hydrogen Gas Circulation on Fuel Cell System
B24	Masahiro Kasai	Associate Professor, International Research Center for Hydrogen Energy	Study on Lithium Ion Diffusion in Solid State Cathode Materials for an Energy Storage Device Generated with Hydrogen
B25	Hisatake Itoga	Associate Professor, Research Center for Hydrogen Industrial Use and Storage	Study of test method of elastic-plastic fracture toughness in high pressure hydrogen gas
B26	Hirota Fujiwara	Associate Professor, Research Center for Hydrogen Industrial Use and Storage	Study of polymer materials and fillers for the use under hydrogen environment

(C) Systems research

Project #	Principal researcher	Affiliation	Project title
C01	Megumi Takata	Associate Professor, Kyushu University Business School / Robert T. Huang Entrepreneurship Center of Kyushu University	Research on Commercialization Process of Hydrogen Related Technology
C02	Kenshi Itaoka	Professor, International Institute for Carbon-Neutral Energy Research	Public acceptance study on hydrogen technology in the area of hydrogen energy demonstration projects
C03	Michihisa Koyama	Professor, Inamori Frontier Research Center	Development of Evaluation Framework for Grand-design of Low-Carbon Society and Evaluation of Hydrogen/Fuel Cell Technologies in Low-Carbon Society
C04	Seiichiro Kimura	Research Associate, International Institute for Carbon-Neutral Energy Research	Improvement of simulation model for hydrogen station deployment.
C05	Yasuyuki Takata	Professor, Dept. of Mechanical Engineering	Study on Operation Efficiency of Hydrogen Refueling Station
C06	Munehiro Miwa	Professor, Manuscript Library	Developments of Aviation Gasoline Manufacture and Hydrogen Production in the U.S.A: how to fuel the Allied Powers during the World War II
C07	Masato Furukawa	Professor, Dept. of Mechanical Engineering	Research on High Performance Wind Lens Turbine for Hydrogen House