

FUTURE ENERGY THAT DELIVERS RESULTS TODAY

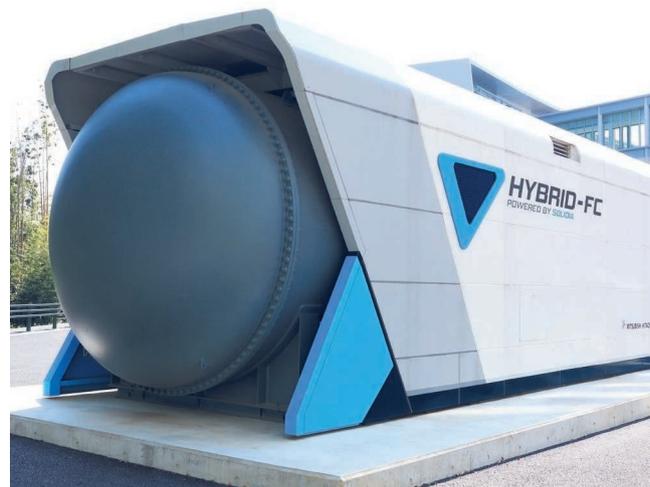
By a new initiative that pairs social scientists with engineers to design sustainable, low-carbon technology, **KYUSHU UNIVERSITY** is leading efforts to solve global energy challenges

Located on the southern Japanese island of Kyushu, Kyushu University has a remarkable research output, being ranked 86th among world universities in terms of Nature Index's WFC metric. It is now looking to expand its reputation as one of the world's premier research universities with a paradigm-shifting approach to addressing energy challenges.

"The exciting things happening here in the future will be related to fusion — a fusion of disciplines," explains Petros Sofronis, director of the International Institute for Carbon-Neutral Energy Research (I²CNER) at the university. "We are fusing engineering with applied maths, economics and

big data to open new paths for renewable energy and the integration of renewables with the power grid. It's like nowhere else in the world."

The university has attracted global attention since establishing the largest, best-funded hydrogen-related research facility in the world. Building on that lab's success, the I²CNER institute was initiated to advance low-carbon technology, improve energy efficiency and develop CO₂ mitigation schemes in collaboration with the University of Illinois and other partner universities in the US and Europe. In addition to its cutting-edge resources, I²CNER was given free rein to reform traditional aspects of Japanese



universities — introducing, for instance, performance-based compensation to attract science's best and brightest.

University president Chiharu Kubo realized that other areas of expertise may be needed to expand I²CNER's global leadership. To achieve this, the Kyushu University Platform of Inter/Transdisciplinary Energy Research, or Q-PIT, was founded in October 2016. Acting as an umbrella organization, it brings together green-energy engineers with abstract mathematicians, political scientists and economists — to better assess the social impact of new technology breakthroughs.

"If you come up with a technology that doesn't take care

of the environment or isn't cost effective, it really has no impact," says Sofronis. "The social sciences can help us develop indicators to measure sustainable initiatives for energy projects. Mobilizing these alliances is part of Q-PIT's vision."

Initial projects under the Q-PIT strategy include capturing CO₂ emissions from coal gasification, studying water-splitting catalysts atom by atom to learn their secrets, and validating the techno-economic impacts of switchgrass biofuels. Technology transfer to companies in the Fukuoka area is also helping to kick-start a new energy technology hub — a key step in returning research results back to society.

"With Q-PIT, we have projects where dissimilar researchers are starting to communicate in a common language," says Sofronis. "It's a difficult challenge, but I think we'll impact Kyushu University in a big way. ■"

COLLABORATIVE RESEARCH

KYUSHU UNIVERSITY is collaborating to solve global challenges

ACADEMIC INSTITUTIONS GLOBALLY
(2016; WFC)

TOP 100

Source: Nature Index

TOP 10 INTERNATIONAL COLLABORATORS
(2016; FC)

1. University of Illinois at Urbana-Champaign **5.17** (UIUC)
2. French National Centre for Scientific Research **3.63** (CNRS)
3. National Institute for Nuclear Physics (INFN) **3.60**
4. European Organization for Nuclear Research **2.99** (CERN)
5. Cornell University **2.65**
6. Chinese Academy of Sciences (CAS) **2.42**
7. Harvard University **2.31**
8. University of Toronto (U of T) **2.29**
9. Changzhou University (CZU) **2.00**
10. University of Freiburg (Uni Freiburg) **1.97**



- Chemistry
- Earth and environmental sciences
- Life sciences
- Physical sciences



KYUSHU UNIVERSITY

744 Motoooka, Nishi-ku, Fukuoka,
819-0395 Japan
www.kyushu-u.ac.jp/en