



# Introduction to the **Regional Zero Carbon Working Group** and the Activities of **Kumamoto University**

12 Nov 2025 at COP30 Side-event at Japan Pavilion

**UEDA Chikako**, Chief Research Administrator,

Headquarters for Research and Development Strategy, Kumamoto University



Promoting social transformation and regional revitalization through local decarbonization

## Three Main Pillars

### 1. Expert Meetings on Developing Environmental Human Resources for Regional Decarbonization

*(May–Nov 2025, six sessions)*

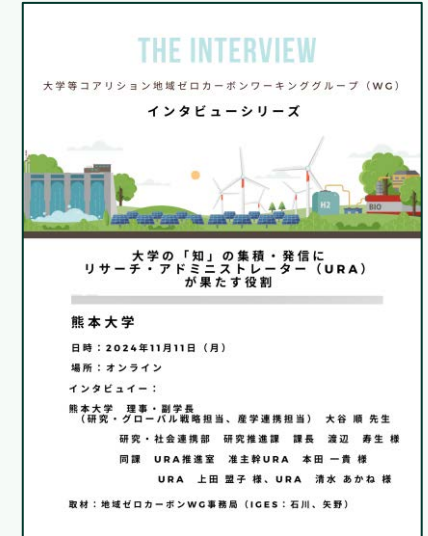
Discussing how to foster human resources capable of leading and coordinating regional decarbonization and revitalization, and how to create platforms for their active engagement.

### 2. University Interviews (30 conducted so far)

Sharing not only each university's initiatives but also the background, process, and challenges faced during implementation.

### 3. On-site Visits to Leading Universities (4 conducted so far)

Confirming that universities are functioning as **“hub of knowledge”** and **“hub of community”**, connecting diverse regional stakeholders through our **neutral and interdisciplinary roles**.



## Kumamoto University's Net-Zero Target and Plan

2021 *Kumamoto University SDGs Pledge*

Revised “Environmental Philosophy” and “Environmental Policy” after 15 years

2023 *Kumamoto University Greenhouse Gas Emission Reduction Plan* \*

\* Aiming to reduce energy-oriented CO2 emissions by 51% by fiscal year 2030  
(Base year: FY2013)

## Goals and Plans for Net-Zero Research

Kumamoto University has declared “*Always Communicating*,” “*Always Transparent*,” and “*Always Improving*” as the fundamental principles for university management, education, and research under the *Kumamoto University Initiative 2030*.

It also identifies “*Addressing the Challenges of Carbon Neutrality*” as one of its key research priorities.

## Kumamoto University's Leading Net-Zero Research

- **Electric Vehicles**

Electric School Bus Demonstration Project \*

Received the “**2024 Climate Change Action Environment Minister's Award (Grand Prize)**”

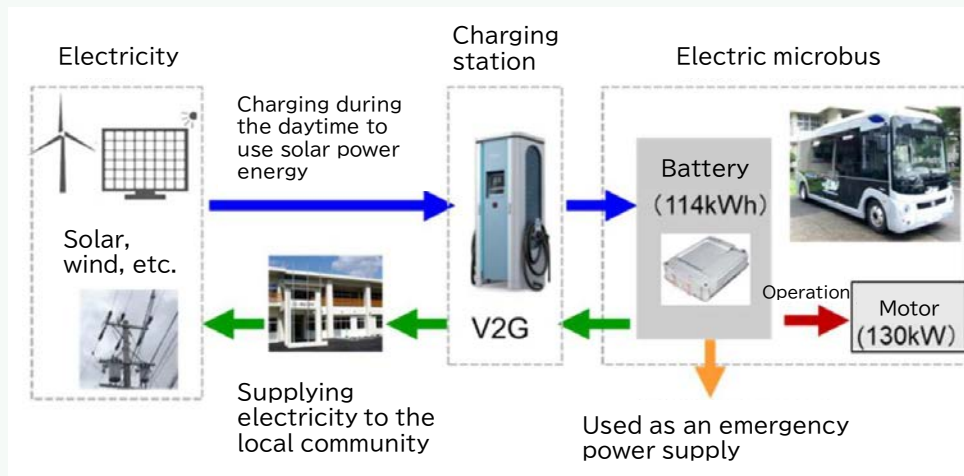


Photo at the award ceremony  
(Right: Associate Professor Toshiro Matsuda)  
Provided by the Award Secretariat

\* Kumamoto University, in collaboration with Kumamoto Prefecture and Kuma Village, implemented Japan's first *Electric School Bus Demonstration Project* under a program commissioned by the Japanese Ministry of the Environment.

The project, conducted in Kuma Village—a designated *Leading Decarbonization Area* recovering from the 2020 flood disaster—aims to promote local decarbonization, energy self-sufficiency, regional resilience, and improved mobility in rural areas through the introduction of electric microbuses.

- **Fuel Cells, Hydrogen Production**

Development of proton exchange membrane and electrode catalysts using nanosheet

- **Light Metal Materials**

Development of lightweight materials for transportation equipment  
(CO2 emission reduction through fuel efficiency improvement)

# Kumamoto University's Challenges



## Appointing *University Research Administrator (URA)* to promote collaboration with internal and external stakeholders

- Launch a special carbon neutrality website to connect researchers



Kumamoto university carbon neutrality website  
<https://kucn.kumamoto-u.ac.jp/en>



01	02	03	04	05	06	07	08	09	10	11	12	13	14		
Offshore wind pwr. Solar, heat energy	Hydrogen, Fuel Ammonia	Next generation heat energy	Nuclear power	Automobile, Storage batteries	Semiconductors Info/Com.	Shipping	Logistics, people flow, Civil eng.	Food, Agri, fishery, forestry	Aircraft	Carbon Recycling, Materials	Housing/Building Near gen. electric power management	Resource circulation	Lifestyle related	Fundamental fields related to all areas	Others
Science Hiroshi Isobe Hydrothermal alteration	Engineering Kelsuke Awaya 2D nanomaterials	INA Kazuto Hatakeyama Proton exchange membrane	HRDS Jitsuya Uemura Radiation	MRC Yoshihito Kawamura High strength	Engineering Motoki Amagasaki Bigdata	Law Tadahisa Ohno Environmental corporate social responsibility	Engineering Naoto Inagaki Coastal Environmental Hydraulics	Science Takashi Ishida Organismal size	MRC Shinji Ando Dislocation slip	Engineering Koza Onoue Alkali-activated materials	Engineering Ryo Inoue Wooden structure	Engineering Hiroaki Ito Carbonate	Engineering Kohichi Ogata Object detection	INA Ichiro Akai Bases inference	INA Yuji Akaiishi Colloidal Quantum Dots
CWMD Sooyoung Kim Wave energy	INA Shintaro Iida Proton Conducting Materials		Engineering Akimaro Kawahara Multiphase Flow	Engineering Toshiro Matsuda Electric vehicle	REISI Masahiro Iida FPGA		Engineering Jun Otani Geometaterials	INA Sunao Katsuki Non thermal Sterilization	MRC Shinichi Inoue Magnesium alloy	Letters Qutain Armando Tibigin Hydrothermal	Engineering Keiji Kawai Architectural acoustics	INA Douyan Wang Pulsed power	HRDS Shogo Kanaoka Population decline, corporate behavior value	Engineering Akira Sato Management of limestone mines and efficient use of cell	INA Ruda Lee Multi-drug resistant cancer cell
INA Daisuke Kosumi Photosynthesis	Engineering Junya Ohyama Fuel cell		Engineering Masatoshi Kuroda Material Strength Reliability		REISI Takeshi Ohkawa Parallel processing		CWMD Ryuji Kakimoto Smart City	Science Takeshi Kitano Sexual control	MRC Takanori Kiguchi Titanium alloys	INA Tetsuya Kida Hydrogen production and separation	Engineering Yuki Kuroiwa Timber structure	Engineering Masashi Kunitake CO <sub>2</sub> capture	Science Hisato Saitoh Cell Culture	CWMD Motohiro Shimanaga Ecology	Science Kimppei Ichyanagi Water
Engineering Daiki Takano Soil mechanics	Science Kohsei Shimamura Ammonia		Engineering Yoshitaka Matsukawa Nuclear Reactors		Science Shin-ichi Ohira Ionic solutes		Engineering Mitsushiro Shigetshi Sustainable materials	MRC Shinichiro Sawa Crop breeding	MRC Hiromoto Kitahara Lightweight Materials	Engineering Yutaka Kuwahara Carbon dioxide reduction	Engineering Ayumi Satoh Long life building	Engineering Atsushi Sainoki CO <sub>2</sub> mineralization	Engineering Naoya Maruyama Ease of conversation	Science Kiyonori Takahashi Development of Molecular-Based	Engineering Toshihiro Ihara Nuclear Acid Chemistry
Science Kei Toda Environmental impact assessment	Science Fuyuki Shimojo Metal nanoparticles		Science Takashi Yaguchi Crystalline rock (granitic rock)		REISI Yasunori Osana Reconfigurable computing		Engineering Naoto Tanaka Cultural Landscape	REISI Masashi Toda Pattern Recognition	MRC Takahisa Shirahishi Microstructure control	INA Michio Koizuma Graphene Oxide	Engineering Masahito Takata Bioclimatic design	INA Mitsuru Sasaki Subcritical water	Engineering Makoto Takafuji Polymer Particles	Engineering Yoshifumi Ohbuchi Elderly Support	
Engineering Tsuyoshi Fukaminato Solar Energy Conversion	Engineering Katsuhiko Nishiyama Fuel cell				Letters Hiroshi Kashima Regional economy		Engineering Hiroshi Cho Nature based solutions	Science Miyuki T Nakata Plant Movement	Engineering Tsuyoshi Mayama Crystal plasticity finite element	HRDS Akihide Koura Biodegradable plastic	Engineering Kensuke Toki Architectural design for sustainability	Science Haruhiko Nakata Microplastics	CWMD Gengo Tanaka Solar	Engineering Yousuke Katsuda INA	

- Introduced approximately 130 researchers in each key area of the “Green Growth Strategy for Carbon Neutrality by 2050”.
- The URA connects researchers to form research groups and support to get competitive research fundings.

# Kumamoto University's Challenges



## Launching New Net-Zero Research to Address Global and Regional Challenges

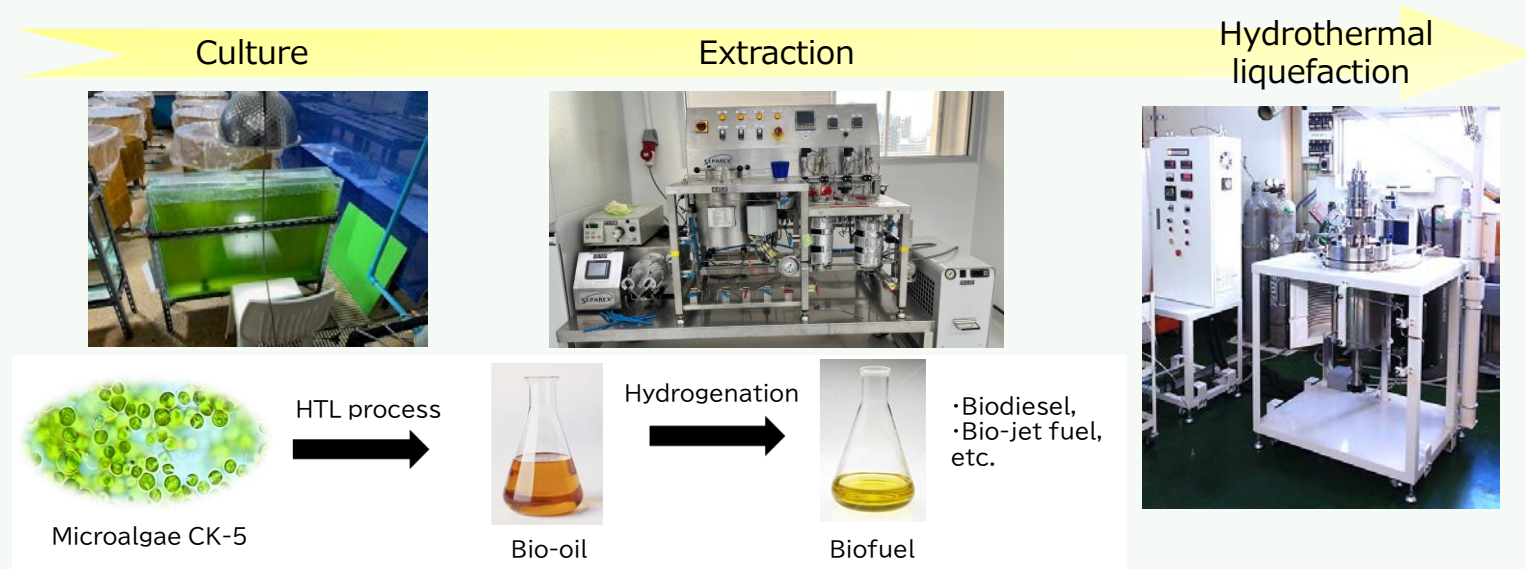
- <International> Initiating **SATREPS** project "*Regional BCG Economy and Carbon Neutrality with Hydrothermal-Based Biorefinery for Coastal Ecosystem*"



Japan Side  
Kumamoto  
University



Thailand Side  
Chulalongkorn  
University



- <Regional> At "*Environmental Impact and Infrastructure Measures Unit*" under **J-PEAKS**, research on water, transportation, and environment (incl. carbon neutrality) has started to tackle environmental and social issues from the semiconductor industry in Kumamoto.

# Way Forward and Future Outlook



- Fully utilize the University Coalition network to collect and share the latest information on carbon neutrality
- Introduce and support competitive research fundings that matches Kumamoto University's researchers, expanding and advancing carbon-neutral research
- Collaborate with industries and governments to promote large-scale projects that address regional challenges and create new strengths originating from the university
- Ultimately aim to become ***a hub for education and research that contributes both locally and globally through “co-creation” with society***