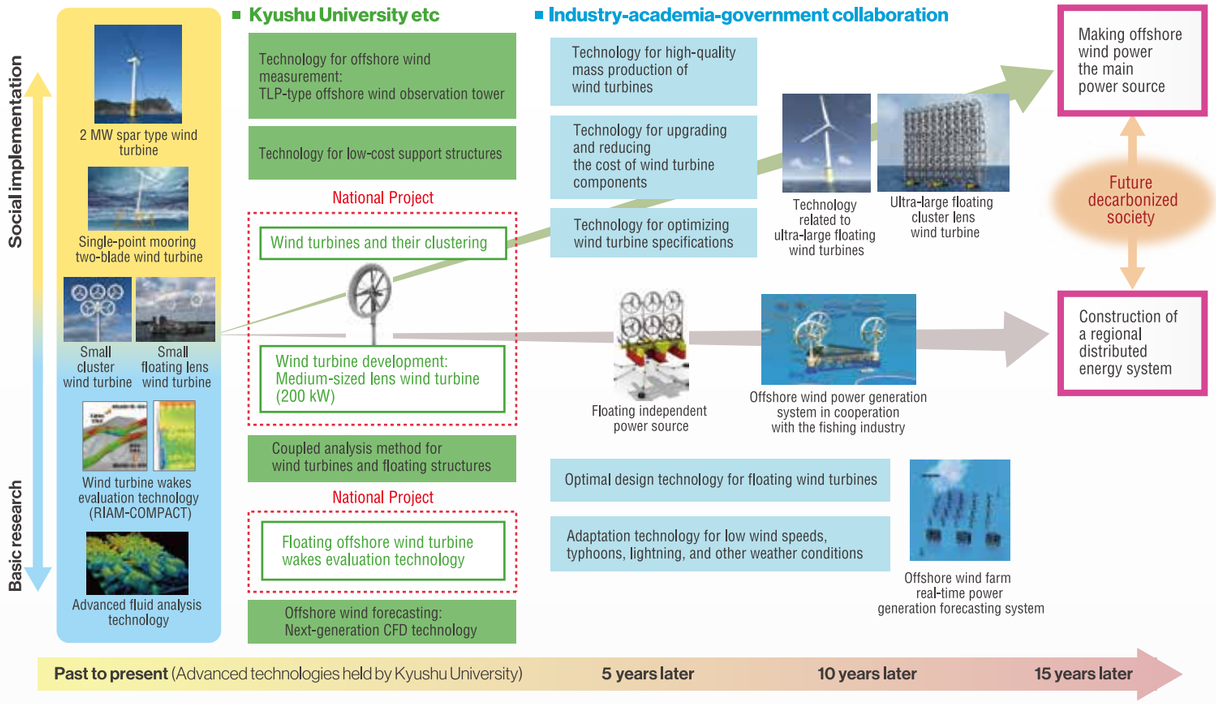
RECOW Research and Development Roadmap



Main Members

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https://recow.kyushu-u.ac.jp/

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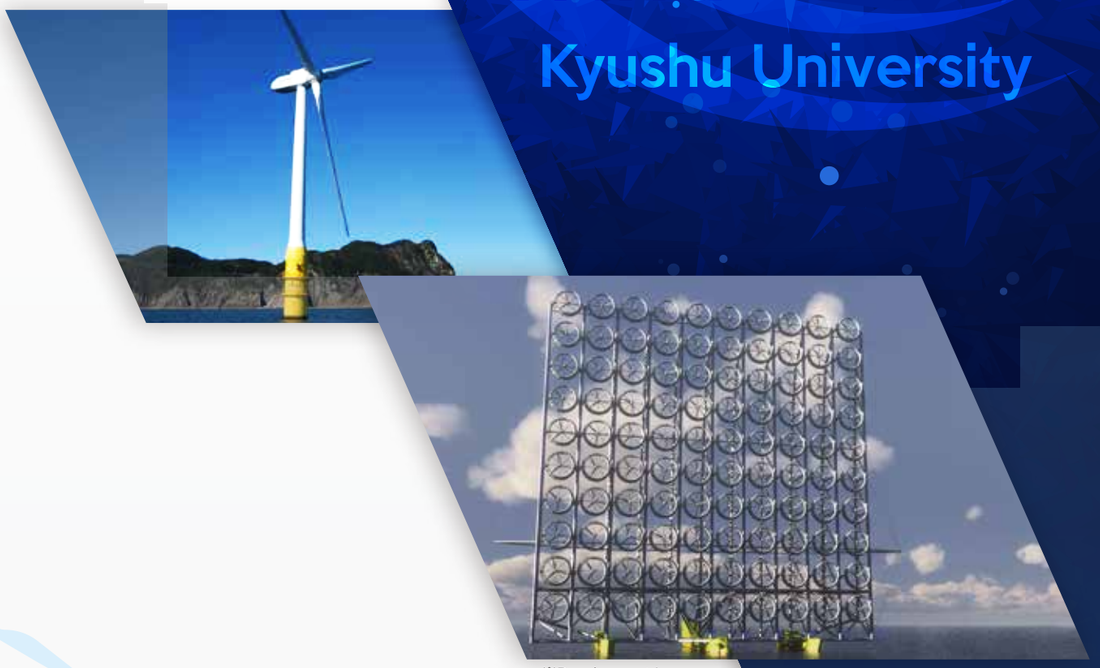
Access Guide
Located beside Onojo Station, JR Kagoshima Line
Approximately 15 min. walk from Shirakibaru Station, Nishitetsu Tenjin Omuta Line
Approximately 10 min. by car on open road from the Dazaifu Interchange on the Kyushu Expressway
* Vehicles can enter only at the Kasuga-Gate (Kasuga Park side).

KYUSHU UNIVERSITY

Research & Education Center for Offshore Wind

Kyushu University



※Development image

Greetings from the Director of the Research and Education Center for Offshore Wind (RECOW), Kyushu University

My name is Tanimoto, Executive Vice President and Senior Vice President of Kyushu University (responsible for industry-academia-government-society collaboration). I was appointed as the Director of the Research and Education Center for Offshore Wind in October 2024. I am determined to devote myself to the development of the center. I thank you in advance for your support.

Kyushu University is the only university in Japan capable of developing wind turbines, combining its unique wind turbine & floating structure technology (hardware) and wind analysis & fluid structure analysis technology (software). In addition, under the Designated National University Corporation Concept, Kyushu University aims to become Japan's Green Innovation Hub, contributing to creating innovative technologies, making policy recommendations and developing human resources, and presenting innovations in wind energy technologies, including offshore wind power generation. By consolidating related research resources based on the abovementioned offshore wind research achievements, we established the Research and Education Center for Offshore Wind (RECOW) on April 1, 2022, under a university-wide structure centered on the Research Institute for Applied Mechanics, which is Japan's top institute in the field of offshore wind power. In conjunction with the establishment of RECOW, in August 2022, we launched the Consortium for Offshore Wind Industry-Academia-Government Collaboration, aiming to bring together the experience, know-how, and capabilities of industry, academia, and government, with the RECOW at its core. This has enabled us to establish a system to promote research and education, in an integrated manner, on wind conditions, wind turbines, and floating bodies, which are essential for offshore wind research and education, and, through the acquisition and promotion of large-scale projects, we have accumulated and built a foundation for basic research related to offshore wind power generation. These efforts have been recognized by the government, and in April 2024, we established new divisions to promote industry-academia-government collaboration and international cooperation and promote social implementation, in order to make RECOW a core research and education center for offshore wind energy in Asia. The introduction of wind energy in Japan is currently lagging behind advanced wind power generation countries in Europe and the US. However, RECOW, to which the new divisions have been added, and the Consortium for Offshore Wind Industry-Academia-Government Collaboration will work on issues related to offshore wind power generation in an all-Japan framework that transcends organizational boundaries, and will actively contribute to making offshore wind power a main source and to realizing a decentralized energy society in Japan.
We very much appreciate your cooperation and encouragement in the operation of RECOW. Thank you in advance for your support.

October 2024

Jun Tanimoto
Executive Vice President and Senior Vice President of Kyushu University
Director of the Research and Education Center for Offshore Wind,
Kyushu University

Outline of RECOW

It was established on April 1, 2022 as a world-class center for offshore wind-related research and education.
It will actively contribute to making offshore wind power the main source of power and to realizing a decentralized energy society.

Organization of RECOW

- Department of Multiscale Offshore Wind Environment Research
- Department of Next-Generation Offshore Wind Turbine Research
- Department of Support Structures and Offshore Power Transmission Research
- Department of Carbon-Free Energy Management Research
- Department of Industry-Academia-Government Collaboration and International Cooperation Promotion
- Department of Social Implementation

Direction of Activities of RECOW

Challenges toward expanding offshore wind power in Japan

- Domestic supply chain formation
- Human resources development for the offshore wind industry
- Energy security
- Suitability for Japan's wind conditions and social environment

Direction of Activities

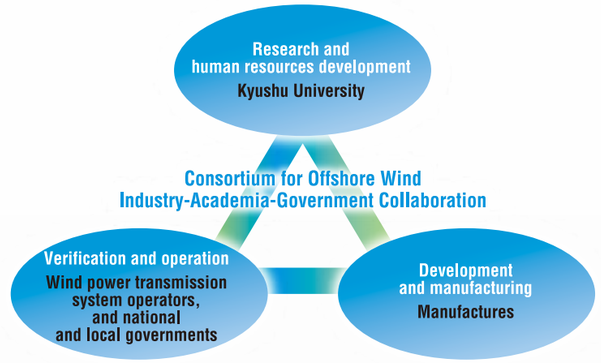
- Activity (1) Close industry-academia-government collaboration with the offshore wind power industry
- Activity (2) Development of human resources who will lead the offshore wind power industry
- Activity (3) Effective policy recommendations for the expansion and promotion of offshore wind power
- Activity (4) Research and development of offshore wind technologies optimized for the Japanese environment

Consortium for Offshore Wind Industry-Academia-Government Collaboration

With RECOW at its core, the Consortium for Offshore Wind Industry-Academia-Government Collaboration was established to bring together the experiences, know-hows and capabilities of industries, academia and governments to contribute to realize the carbon-neutral society.

Main functions of the consortium

- Holding seminars and symposiums (sharing information on activities)
- Responding to issues by industries, and wind power transmission system operators, and national and local governments (coordinating collaboration on individual issues)
- Planning and consideration of industry-academia-government collaboration projects (collaborative planning on common themes)
- Accumulation, analysis, and utilization of big data (data integration)



Offshore Wind Power Generation Human Resources Development Courses

The RECOW has established the Offshore Wind Power Generation Human Resources Development Courses designed for students to cultivate the engineering expertise and capabilities required for the planning, installation, operation, maintenance, and removal phases of offshore wind turbine projects. Based on the lectures on offshore wind power generation provided by Kyushu University, Saga University, and the University of Kitakyushu for graduate and undergraduate students, these courses are developed in cooperation with the Consortium for Offshore Wind Industry-Academia-Government Collaboration and others.

2023	Offshore Wind Turbine Engineering	This course is designed for students to acquire the basic principles of energy conversion, analysis methods, equipment design, and evaluation methods regarding offshore wind energy and its utilization technologies
2023	Floating Body Design	This course is designed for students to understand the basic theory of response analysis of floating structures affected by waves and to acquire analytical skills for real-world problems. The Floating Body Design course in the first semester mainly covers the scope up to the calculation of the floating structure response function using potential theory. The Support Structure course in the second semester will cover response analysis methods in the frequency domain and time domain, as well as time history response analysis of a rotor-floater-mooring coupled system as a wind turbine support structure. (The Floating Body Design course and the Support Structure course are scheduled to be held in the first semester and the second semester, respectively.)
2023	Supporting Structure	
2024	Introduction to Offshore Wind	This is an introductory course on site condition assessment, wind turbine engineering, support structure/floating structure design, and environmental and economic evaluation.
2024	Site Condition Assessment	This course is designed for students to acquire the methodology to assess the power generation potential of a target area by learning about observation and simulation methods and wind turbine layout optimization methods that correspond to the weather and oceanic conditions in Japan.
2024	Environmental and Economic Evaluation	Offshore wind power projects must take into account economic, social (regional), and environmental considerations. Acquire the necessary environmental and economic evaluation methods for this purpose.

Medium wind lens turbines (100 kW)
Next-generation energy demonstration facility project

Single-point mooring two-blade downwind floating offshore wind turbine

2-MW spar-type floating wind turbine