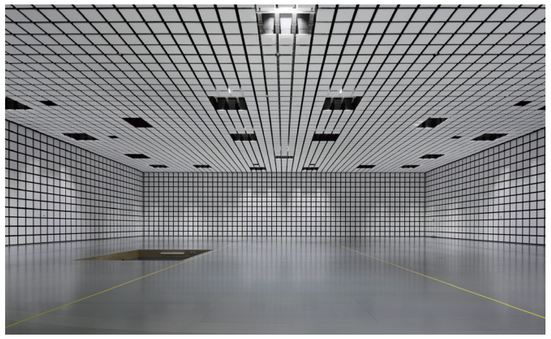
Research Facilities

On the spacious 78,000 m^2 site, various testing facilities for renewable energy for social implementation have been established.

Solar cell production line

We have established an integrated thin-film crystalline silicon solar cell production line and are developing mass production technology for solar cell modules that combine high efficiency, low cost, and high reliability. This line is capable of producing cells with conversion efficiencies equal to or greater than those of the manufacturer's mass-produced products.



Electromagnetic wave anechoic chamber in the Smart System Research Facility

This facility can test and evaluate power electronics equipment, megawatt-class large power conditioners, etc., which are indispensable for smart distributed power generation for the mass introduction of renewable energy, under various power systems and weather conditions. The anechoic chamber in the photo is one of the largest of its kind in Japan, with an area equivalent to about five tennis courts.

Reconstruction Support and Industry-Academia-Government Collaboration Activities

We provide technical assistance and human resource development related to renewable energy to companies, universities, and high schools located in the areas affected by the Great East Japan Earthquake.

Results of technical assistance to companies in the affected areas

We provide technical assistance to companies in the affected areas with the aim of creating a new renewable energy industry in the region. Many projects and products have been commercialized to date.

Outreach lectures to high schools and universities

We focus on fostering industrial human resources who will lead the renewable energy field in the future by holding lectures at high schools and universities and accepting students for study tours.

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2024-07

AIST
Create the Future, Collaborate Together

Renewable Energy Technology for the Society of Tomorrow

FREA

Fukushima Renewable Energy Institute, AIST (FREA)

About the Fukushima Renewable Energy Institute, AIST (FREA)

The world is beginning to move toward a decarbonized society.

In the midst of this trend, expectations for renewable energy continue to rise.

FREA opened in April 2014 as a new research center of the National Institute of Advanced Industrial Science and Technology (AIST),

with two major missions: open, world-leading research on renewable energy

and support for recovery from the disaster through the integration of new industries,

based on the basic policy of recovery from the Great East Japan Earthquake.

One of FREA's unique features is its vast demonstration fields located at its research sites.

Taking advantage of this field, we conduct research for commercialization and product realization in collaboration with industry and universities.

We are committed to developing innovative technologies and conducting research for social implementation

so that we can contribute to the realization of a sustainable society with FREA's technologies.

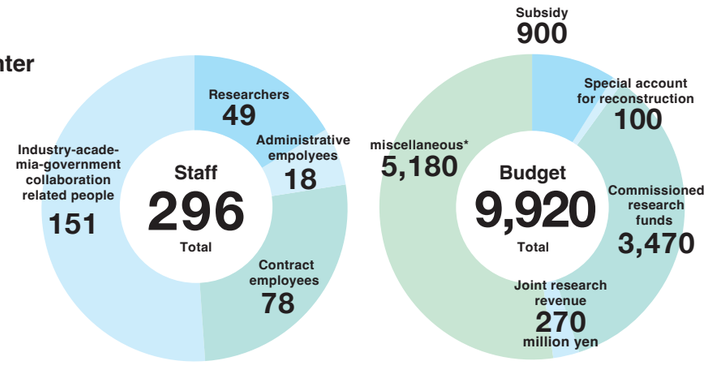
Research Promotion Organization

Renewable Energy Research Center

(●: AIST Tsukuba Center Base)

Research Team

- Energy Network Team
- Hydrogen Energy Team
- ●Hydrogen Energy Carrier Utilization Team
- Wind Power Team
- ●Photovoltaic Device Team
- Photovoltaic Module and Application Team
- Photovoltaic System and Application Team
- ●Photovoltaic Calibration, Standards and Measurement Team
- Geothermal Energy Team
- Shallow Geothermal and Hydrogeology Team



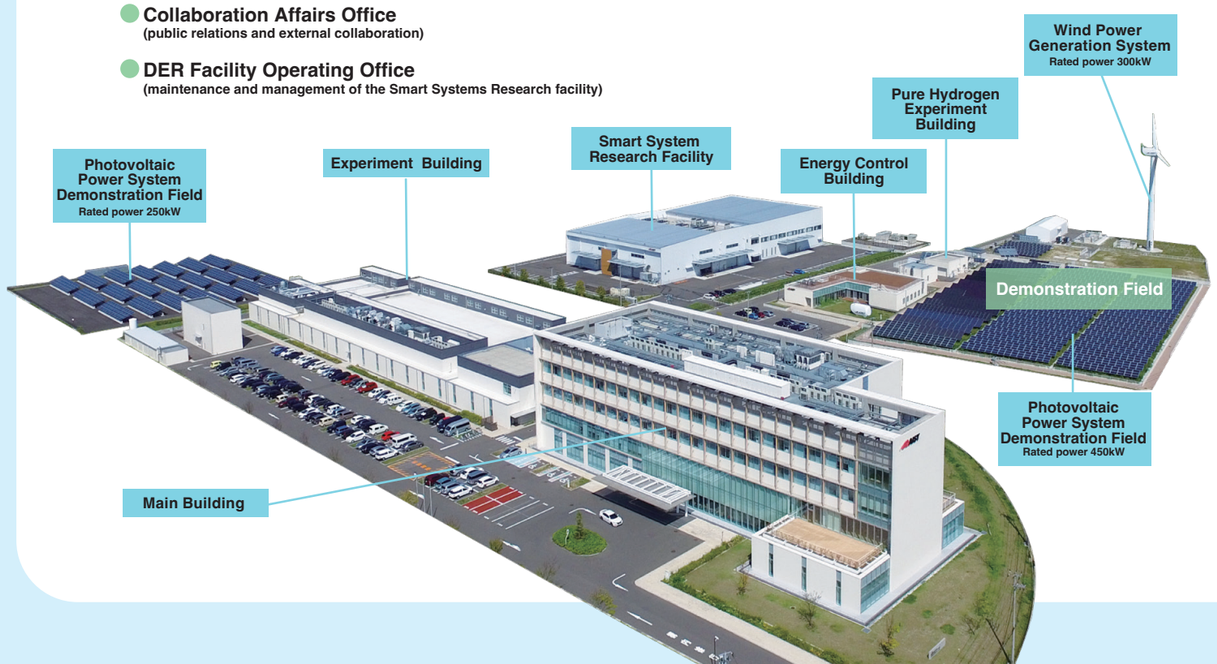
As of July 2024

FY2023 (unit: million yen)

*Includes subsidies for facility development

Organization

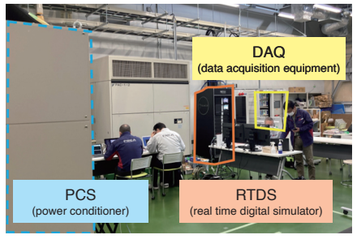
- **General Affairs Office**
  (general affairs, accounting, environmental and safety management)
- **Collaboration Affairs Office**
  (public relations and external collaboration)
- **DER Facility Operating Office**
  (maintenance and management of the Smart Systems Research facility)



Research Outline

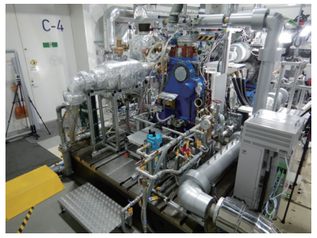
FREA is working on and demonstrating the following three categories of R&D issues through joint research and other means.

Next Generation Energy Network Technologies toward Carbon Neutralization



Development of hardware-in-the-loop (HIL) simulation environment for actual equipment

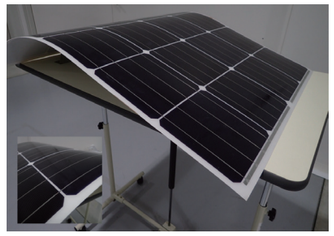
Development of building-attached hydrogen energy utilization system (Hydro Q-BiC®)



Development of a 100 % hydrogen engine for a 1 megawatt-class power generator

Expansion of Utilization of REs and Development of O&M Technologies for the Establishment of a Sure and Major Power Source

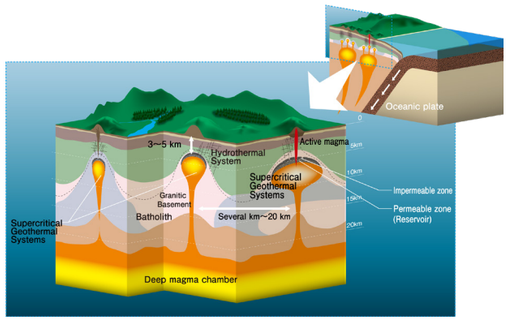
Research on photovoltaic operation and maintenance (O&M) technologies



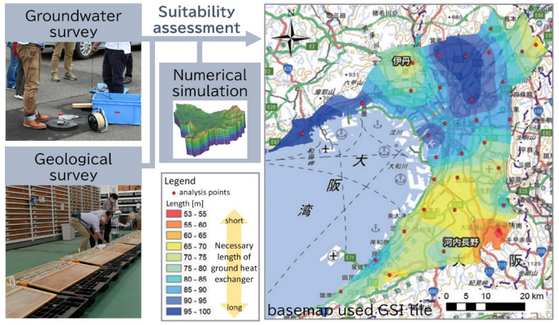
Research on glassless lightweight and flexible modules for multiple applications

Research on technology to prevent deterioration (erosion) of wind turbine blades caused by raindrops, etc.

R&D and Construction of Databases for Expansion of Proper Utilization of REs



Supercritical geothermal systems with their origins in oceanic plate subduction



Creation of a geothermal heat potential map (closed-loop system) for the Osaka Plain