Global Zero Emission Research Center (GZR) Overview

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Global Zero Emission Research Center Overview

Purpose

- To conduct foundation research pertinent to environmental innovation in order to create innovation vital to strengthening measures to reduce CO_2, in accordance with the Japanese government ‘s Progressive Environment Innovation Strategy.

Philosophy

- To tackle the global challenge that is climate change by gathering the world’s expertise, developing basic sciences and industrial technologies, and making an Environment and Energy Technology (ET) revolution a reality.

Background

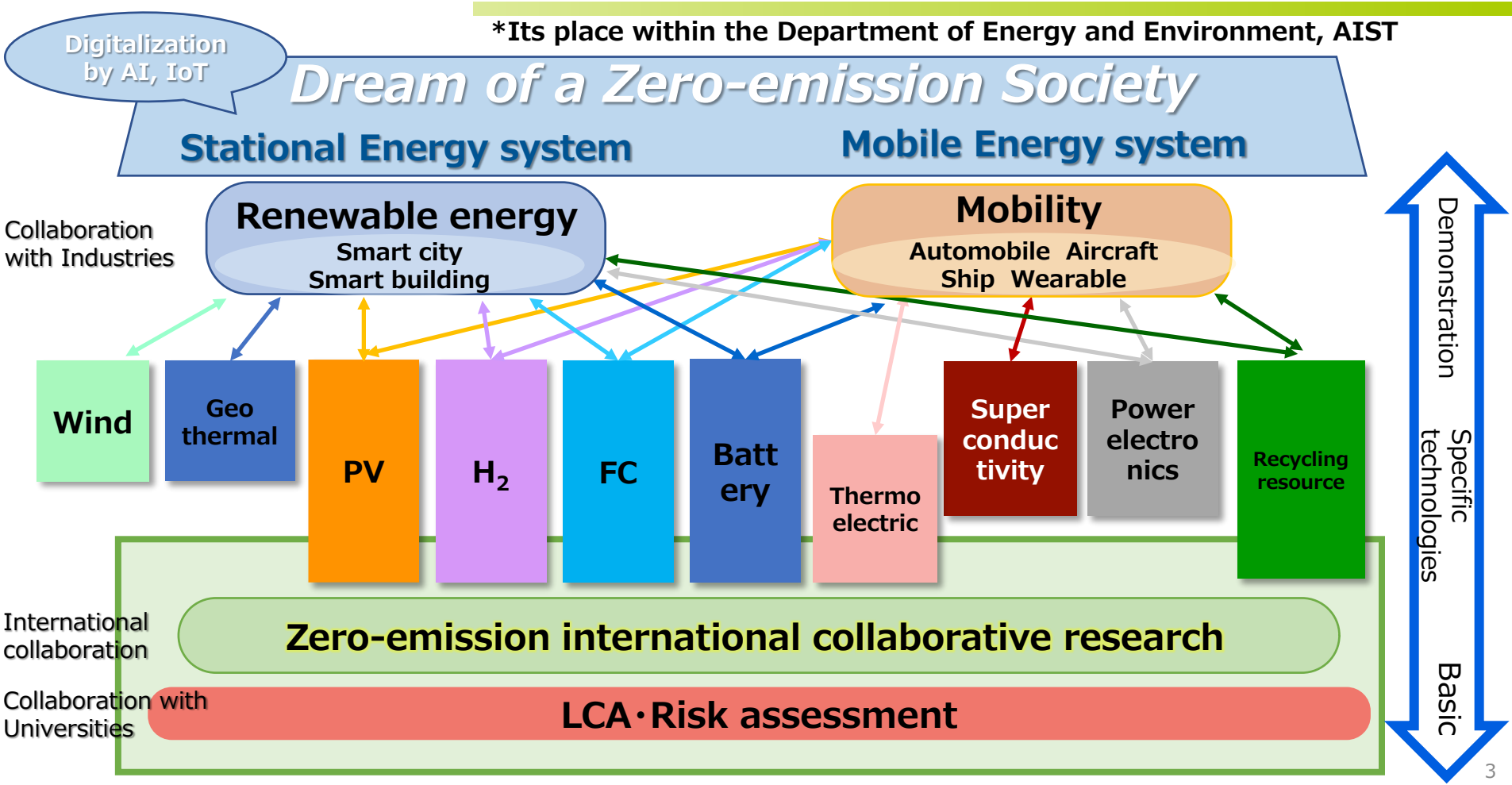
- Oct 2019: “Research and Development 20 for clean energy technologies (RD20)” hosted by AIST
- Oct 2019: Prime Minister Abe unveils plans to establish a “Global Zero Emissions Research Center” at the Green Innovation Summit
- Jan 2020: Dr. YOSHINO Akira appointed General-Director of center.

Established

- January 29, 2020

Global Zero emission Research Center (GZR)

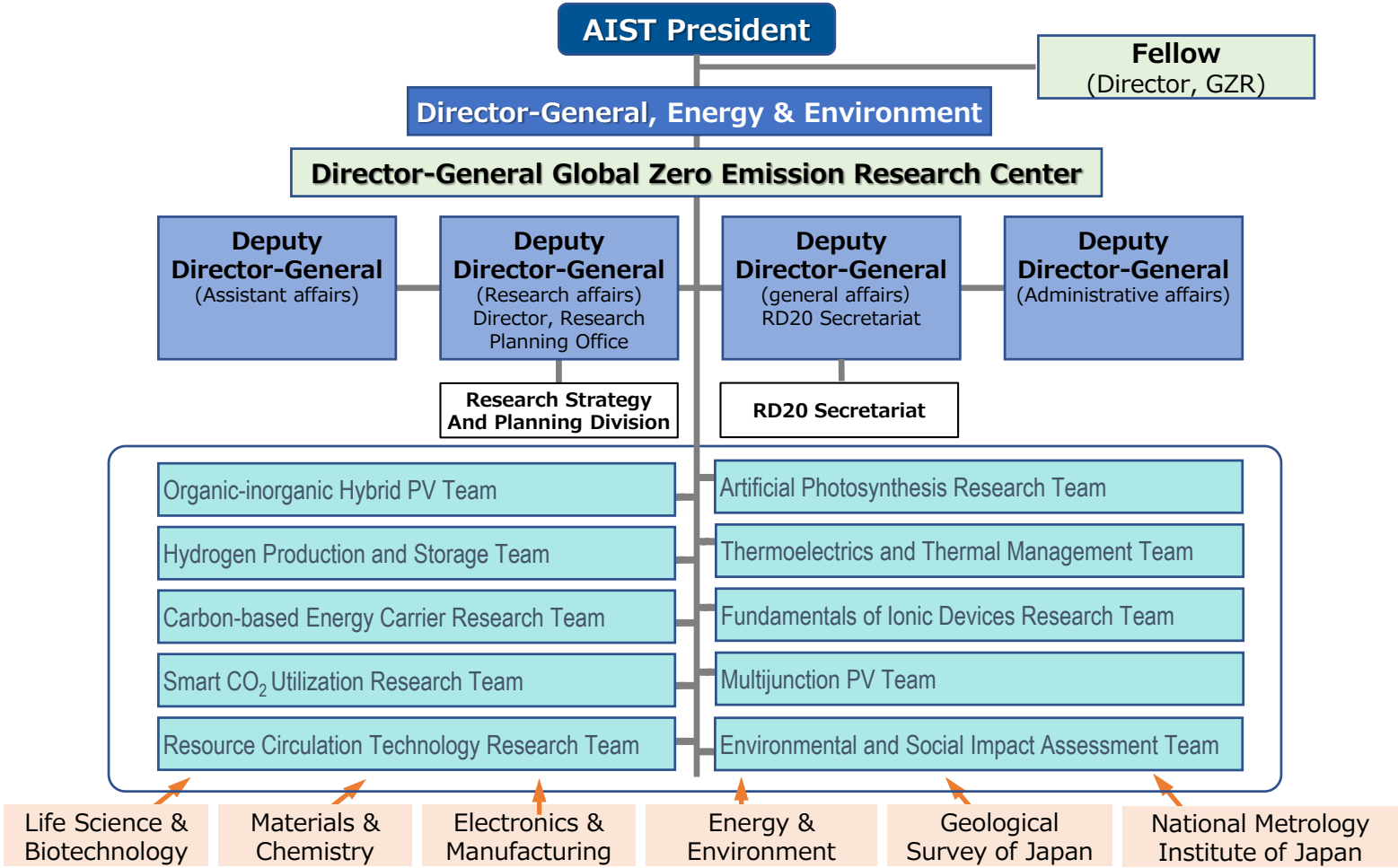
*Its place within the Department of Energy and Environment, AIST



Global Zero Emission Research Center Locations

- AIST Tokyo Waterfront (Headquarters), AIST Tsukuba (Basic Research)
- Fukushima Renewable Energy Research Institute (FREA), AIST Kansai (Experimental Research)

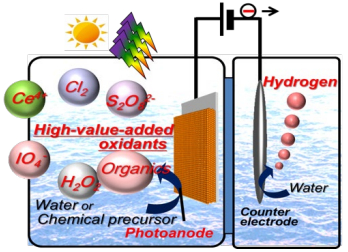
GZR Organizational Chart



Main Research Topics

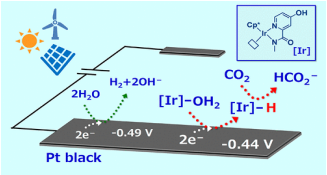
■ **Artificial photosynthesis**

Developing a high-quality photoelectrode catalyst that enables production of hydrogen as well as useful chemicals, (hydrogen peroxide, etc.)



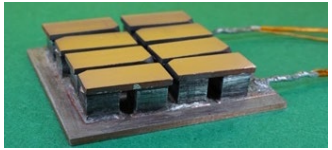
■ **Energy Carrier**

Developing a catalyst that enables synthesis of hydrogen carriers such as formic acid and ammonia under conditions milder than the conventional ones.



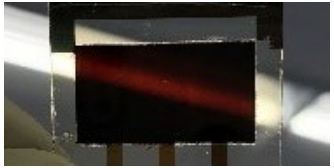
■ **Thermoelectric**

Developing a high-reliability thermoelectric device with the world's highest conversion efficiency, enabling direct conversion of waste heat into electricity.



■ **Organic PV devices**

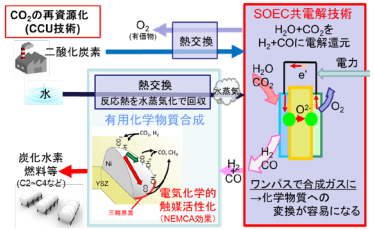
Developing high-quality materials/devices with flexibility and permeability for use in mobility/architectural materials/wearable devices.



Main Research Topics

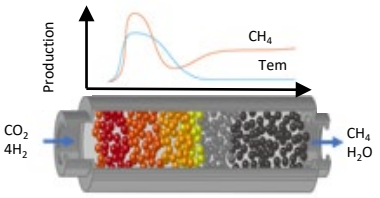
■ Electrochemical Reaction Control

Basic research aimed at producing hydrocarbon (methane, etc.) using water electrolysis technology. Establishing a cutting-edge method for evaluating materials needed to develop safe/secure high-performance batteries.



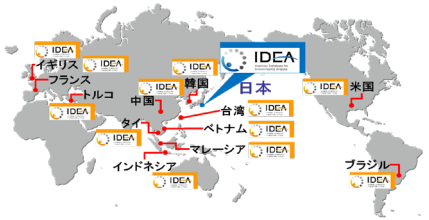
■ CO_2 separation and utilization

Developing a catalyst that enables efficient synthesis of methanol (a raw material in the chemical industry) from CO_2 at low temperature. Sophistication of methanation process control method for producing methane by the reaction of CO_2 and hydrogen.



■ Energy evaluation

Developing a technique for the quantitative evaluation of global-scale risk/sustainability from an LCA standpoint by combining energy systems/resource risk analyses.



Expected international collaborations