

February 9, 2022

**Kyushu University
Sojitz Corporation**

Kyushu University and Sojitz Conclude Memorandum for Implementation of Membrane-based Direct Air Capture Technology and Related Technology Solutions to Capture Carbon Dioxide from the Atmosphere

Kyushu University and Sojitz Corporation (“Sojitz”) have signed a memorandum for the practical implementation and commercialization of direct air capture (“DAC”) and related cutting-edge technologies for directly capturing carbon dioxide emissions from the atmosphere. Kyushu University and Sojitz seek to promote carbon neutral initiatives and provide solutions to social issues through the practical application of cutting-edge technologies towards the realization of a sustainable society.

- DAC is a technology that captures CO₂ directly from the atmosphere. Conventional DAC technology uses absorbent or adsorbent-based methods for capturing CO₂. However, this method consumes relatively high energy to release CO₂ from the absorbents and adsorbents by using heat or by being placed in a vacuum. This high amount of energy used in the process has been considered problematic. Additionally, installation sites for conventional DAC technology are limited due to numerous restrictions of DAC operation requirements.
- The International Institute for Carbon-Neutral Energy Research at Kyushu University (“I²CNER”) has engaged in R&D of the world’s first membrane-based DAC technology, which makes it possible to capture CO₂ through a membrane separation system. This new technology will greatly increase the number of possible locations for CO₂ capture equipment. In addition, since there is no need to release CO₂ from an adsorbent as in the conventional CO₂ absorption process, the energy required for the process can be significantly reduced.

- The recovered CO₂ can be used as a raw material for fuels and chemicals, as well as for cultivating vegetables and other crops and for beverages and dry ice. This membrane-based DAC technology will expand the range of applications for CO₂.
- Kyushu University aims to realize widespread global use of its membrane-based DAC technology and CO₂ conversion technology by 2050, and the university is currently involved in the development of a range of technologies for practical implementation.
- Kyushu University proposed to integrate its research plans for membrane-based DAC technology along with its CO₂ conversion research, and Kyushu University was selected for the Moonshot Research and Development Program promoted by the Cabinet Office of Japan, which advances ambitious R&D projects based on bold ideas anticipated to have a major impact if realized in a future society. Kyushu University has set its research goal to fully complete development of necessary devices for these technologies by 2030, with hopes to then complete mass production and move forward with implementation.
- Kyushu University and Sojitz were able to conclude this memorandum as part of the university's current efforts to establish industry-academia collaborations with multiple companies in preparation for implementation.
- This memorandum is based on I²CNER's world-leading knowledge of CO₂ capture, storage, and conversion for achieving carbon neutrality and carbon negativity, as well as Sojitz's experience from its decarbonization initiatives. Sojitz and Kyushu University concluded this memorandum to pursue possible collaboration and joint cooperation for core technology to be implemented for realizing carbon neutrality and carbon negativity.
- After concluding this memorandum, Kyushu University and Sojitz will promote the R&D of DAC technology utilizing membrane separation based on this industry-academia partnership, hold discussions, and carry out activities with the aim of realizing commercialization.

[Outline of Memorandum]

1. Date signed: February 1, 2022
2. Theme: Business tie-up for implementation of DAC technology
3. Content:
 - (1) Purpose:
 - 1) Exchange information on DAC technology and other cutting-edge technologies for capturing CO₂
 - 2) Laying the groundwork for practical implementation and commercialization for these technologies
 - (2) Period: February 1, 2022 – January 31, 2023
 - (3) Applicable research areas:
 1. CO₂ separation and capture
 2. CO₂ conversion and fixation
 3. Social engineering

[Overview of Kyushu University]

Location: Fukuoka, Fukuoka Prefecture

President: Tatsuro Ishibashi

Founded in 1911, Kyushu University specializes in higher education as a research institute with a rich history and tradition. Kyushu University develops talented students who go on to work in Japan and overseas, and the university makes broad contributions to society through its cutting-edge research, medicine, and highly specialized research findings. In 2010, I²CNER was selected by the Ministry of Education, Culture, Sports, Science and Technology (MEXT) under the government's "World Premier International Research Center Initiative (WPI)"* and nominated as a WPI Academy Center in 2020. I²CNER is the world's first to include "carbon neutral" within the name of its research institution. (<https://i2cner.kyushu-u.ac.jp/en/>)

Based on these successes, Kyushu University launched the Research Center for Negative Emissions Technologies in 2021. Starting with studies on capturing CO₂ from the atmosphere, this new research center is engaged in everything ranging from core research related to CO₂ resource recycling to the application and implementation of CO₂ technologies. (<https://k-nets.kyushu-u.ac.jp/en/>)

* World Premier International Research Center Initiative:

The WPI program aims to enhance Japan's research functions and strengthen the country's competitiveness internationally by providing intensive support for Japanese research institutions that aim to gather a core of top-level researchers to become a world-class research institution.

[Overview of Sojitz]

Location: 1-1, Uchisaiwaicho 2-chome, Chiyoda-ku, Tokyo

President: Masayoshi Fujimoto

Capitalization: 160,339,000,000 yen

Sojitz Group established the “Sustainability Challenge” as the company’s long-term sustainability vision for 2050, which includes policies for realizing a decarbonized society. Sojitz is currently working to build businesses that anticipate a decarbonized society and recycling-based society of the future. Through this partnership with Kyushu University, Sojitz will advance R&D of DAC technology and will strive to realize implementation, making use of the functions of its fully owned subsidiary Sojitz Institute of Innovative Technologies, Ltd. (Head Office: Uchisaiwaicho, Chiyoda-ku, Tokyo; President: Masashi Oki; Website: <https://www.sojitz-iit.com/en/index.html>), which was established with the goal of discovering and expanding promising new technologies based on expert scientific and technological guidance.

[For questions regarding this press release, contact:]

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