Kyushu University
Carbon Xtract Corporation
NanoMembrane Technologies, Inc.
Sojitz Corporation

PRESS RELEASE（2023/11/24）

Kyushu University to Make First Business Investment in Carbon Xtract Corporation, a Company with Revolutionary DAC Technology that Uses Nano-Separation Membranes

Kyushu University has made its first business investment in Carbon Xtract Corporation (“Carbon Xtract”), a company established mainly by Sojitz Corporation (“Sojitz”) in May 2023 to promote practical implementation of separation membrane-based Direct Air Capture technology (“m-DAC®”)*1 using nano-separation membranes being developed by Kyushu University as well as to support practical development of application technology for use of recovered CO_2.

This revolutionary m-DAC® technology is the world’s first DAC technology that can capture and condense CO_2 simply by filtering air through a membrane system. The creation of membrane filtration devices will enable CO_2 to be captured across multiple locations.

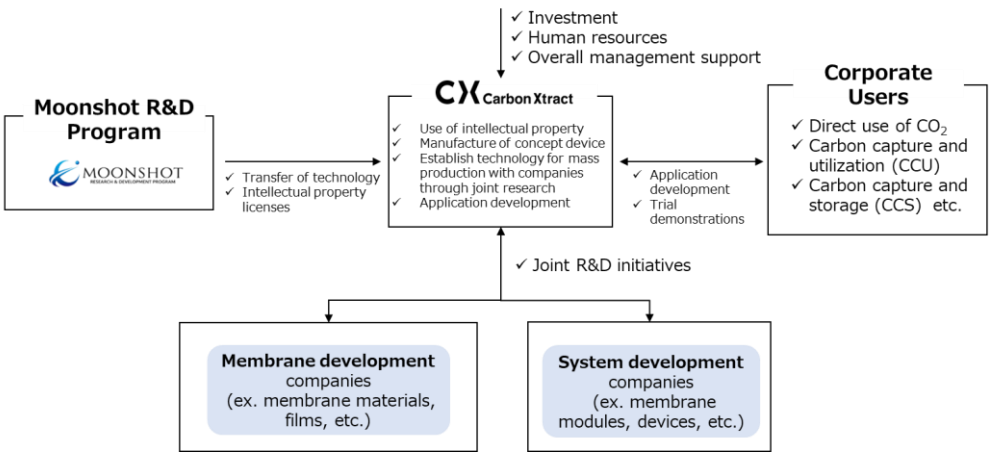
Kyushu University strives to strengthen Carbon Xtract’s R&D capabilities and accelerate social implementation of the related technology in order to contribute to the realization of a decarbonized society.

The Direct Air Capture and Utilization System (DAC-U®) has a separation membrane acts like an air filter to capture and condense CO_2 from the atmosphere and convert the CO_2 into other useful substances.

At a routine press conference on November 24, 2023.

From left to right:
President Tetsuo Moriyama of Carbon Xtract Corporation
Executive Vice President Susumu Fukuda of Kyushu University
President Tatsuro Ishibashi of Kyushu University
President Masayoshi Fujimoto of Sojitz Corporation
Executive Officer Osamu Matsuura of Sojitz Corporation
President Toyoki Kunitake of NanoMembrane Technologies, Inc.
Professor Shigenori Fujikawa of I²CNER

Carbon Xtract Corporation Business Structure



[Background of Business Investment]

Kyushu University has positioned decarbonization as a priority issue and aims to make a collective effort to provide solutions for a future society. The International Institute for Carbon-Neutral Energy Research at Kyushu University ("I²CNER") is advancing R&D of m-DAC®, the world's first direct air capture technology that can capture and condense CO_2 simply by passing air through a membrane system. The creation of membrane filtration devices will enable CO_2 to be captured across multiple locations. Kyushu University is actively promoting initiatives for practical implementation of m-DAC® and CO_2 conversion technology with support from the Moonshot Research and Development Program*² promoted by the Cabinet Office of Japan.

In order to achieve early product commercialization and social implementation of m-DAC® and CO_2 conversion technology, Kyushu University signed a memorandum of understanding with Sojitz on February 9, 2022. After careful consideration of the essential need for collaboration with latent consumers from the R&D stage, Sojitz took the lead to establish a new company, Carbon Xtract, with chemical materials venture, NanoMembrane Technologies, Inc. on May 26, 2023. Kyushu University has now made its first business investment in Carbon Xtract with the aim of extending beyond past joint research and patent licensing to further collaboration by offering stronger support through the provision of related facilities and equipment as well as through support for the development of intellectual property.

Kyushu University has provided the revolutionary research seeds for this business and will collaborate with general trading company Sojitz, a business operator possessing a range of business networks. This partnership and business model for participation is a first for Kyushu University. Carbon Xtract has set up offices at ITO Lab Plus and officially started business. ITO Lab Plus is a facility operated by Fukuoka City for R&D purposes and to promote the industry-academia partnership with Kyushu University. Carbon Xtract is in discussions regarding plans to collaborate with a wide variety of industry partners from multiple companies. Carbon Xtract is currently considering business alliances with several companies following formulation of concrete strategies. In order to realize practical implementation by the late 2020s, Carbon Xtract plans to complete development of m-DAC® device prototypes for capturing CO_2 this fiscal year. After prototype completion, Carbon Xtract will conduct trial demonstrations with multiple partner companies with the aim of providing a DAC device needed by the market. Kyushu University and Sojitz have been promoting industry-academia partnership with Sojitz previously investing in Kyushu University-based startups. Moving forward, Kyushu University and Sojitz will pursue further possibilities for collaboration in the decarbonization business field.

Kyushu University views this first investment project as a starting point to pursue business partnerships and further strategic development of intellectual property that promotes promising seeds of business for new business creation.

[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 CO_2 from the atmosphere, this new research center is engaged in everything ranging from core research related to CO_2 resource recycling to the application and implementation of CO_2 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 Corporation]

- Location : 1-1, Uchisaiwaicho 2-chome, Chiyoda-ku, Tokyo
- President : Masayoshi Fujimoto
- Website: https://www.sojitz.com/en/
- 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.

[Overview of NanoMembrane Technologies, Inc.]

- Location: Fukuoka, Fukuoka Prefecture
- President: Toyoki Kunitake
- Website: https://nanomembrane.jp/
- Capitalization: 10,000,000 yen

NanoMembrane Technologies, Inc. was established with the mission to develop large-scale nano-membranes discovered through research at the RIKEN research institute for future technological application. These large-scale nanomembranes have no defects and a nano thickness that enables a high gas permeability. The material design also works well for gas separation with a macro area and nano thickness, these membranes have the potential for practical technical application. Kyushu University's Professor Fujikawa who is working on R&D of m-DAC® is also engaged in technological development of these nano-membranes. These nano-separation membranes can efficiently separate CO_2 at different concentrations and temperatures for a wide range of concentrations and have many applications. NanoMembrane Technologies is therefore working with companies and research institutions in Japan and overseas to expand basic technological use of large-scale nano-membranes.

[Overview of Carbon Xtract Corporation]

- Location: Fukuoka, Fukuoka Prefecture
- President: Tetsuo Moriyama
- Website: https://c-xtract.com
- Established: May 26, 2023

Carbon Xtract Corporation is engaged in DAC solution proposals and the development and sale of devices and products utilizing nano-separation membrane technology that can selectively capture CO_2 from the atmosphere. Carbon Xtract aims to realize early product commercialization and utilization of m-DAC® based on collaboration with multiple companies, universities, and research institutions. Carbon Xtract strives to become a leading company in the small-scale and distributed DAC market.

[Glossary]

*1 m-DAC®: A direct air capture (DAC) technology that utilizes a nano-separation membrane to directly capture CO_2 from the atmosphere. Kyushu University is advancing development of m-DAC® technology, which allows CO_2 to be collected by simply passing air through the membrane. Unlike previous CO_2 separation membranes, the nano-separation membrane is distinguished by its high CO_2 permeability.

*2 Moonshot Research and Development Program: The program's mission is "to tackle important social issues including our shrinking and aging societies, global climate change and extreme natural disasters, the Moonshot R&D Program is pursuing disruptive innovations in Japan and promoting challenging R&D based on revolutionary concepts."
Moonshot R&D: https://www.jst.go.jp/moonshot/en/about.html

[Related News Releases]

1)"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." Sojitz Corp. Press release, 9 February 2022.
https://www.sojitz.com/en/news/2022/02/20220209.php

2)"Sojitz Establishes New Company for Realizing Practical Implementation of DAC Technology Utilizing Nano-separation Membranes by Late 2020s." Sojitz Corp. Press release, 12 June 2023.
https://www.sojitz.com/en/news/2023/06/230612.php

[For questions, contact:]

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