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West Japan Railway Company  
Carbon Xtract Corporation  
Spice Cube Inc.

## Demonstration of a Plant Factory Operation using m-DAC® Technology to Capture CO<sub>2</sub> from the Air.

West Japan Railway Company (Head Office: Osaka City, “JR West”), Carbon Xtract Corporation (Location: Fukuoka City, “Carbon Xtract”) and Spice Cube Inc. (Head Office: Osaka City, “Spice Cube”) are joining forces to conduct a demonstration at a plant factory using m-DAC® technology to capture CO<sub>2</sub> present from the air. This project was applied for and selected by Osaka Prefecture and will be implemented as a project of its 2024 Subsidies for Carbon Neutral Technology Development and Demonstrations program.

### 1. Details of the demonstration

- The demonstration will combine Carbon Xtract's m-DAC® technology with Spice Cube's indoor plant factory to grow vegetables by promoting photosynthesis using the CO<sub>2</sub> captured from the air.
- The demonstration will be carried out at Osaka Loop Line’s Benten-cho Station during the Osaka and Kansai Expo.
- During the demonstration, the promotional character featured in the separate attachment will be used to promote the worldview the plant factory aims to achieve through the use of m-DAC® technology.
- This project is the first in the world to utilize the CO<sub>2</sub> collected on the spot from the air by small, distributed DAC (\*1) systems.

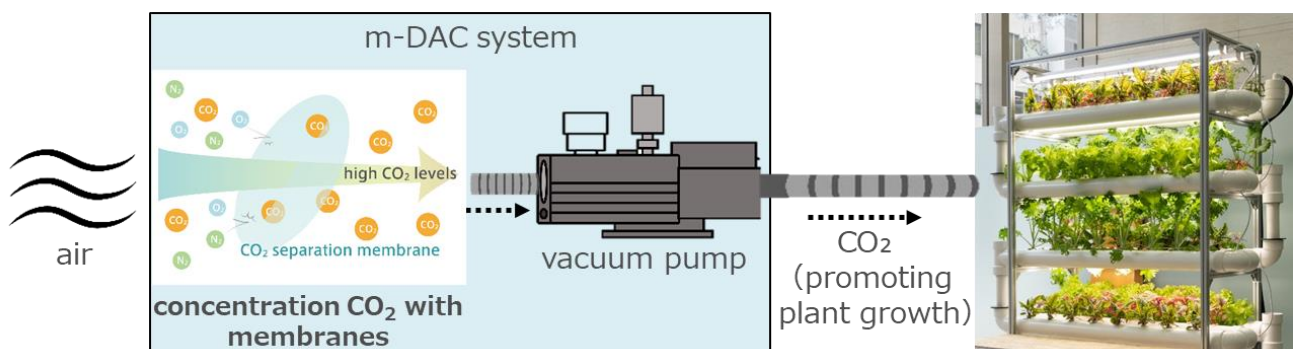


Illustration: diagram of plant factory utilizing m-DAC® technology

## 2. m-DAC® technology

- Carbon Xtract's world-first proprietary technology for recovering airborne CO<sub>2</sub> through membrane separation using innovative separation nanomembrane technology (m-DAC®) with extremely high permeability to CO<sub>2</sub>.
- While industrial-size DAC equipment is currently the norm across the world, its m-DAC® devices are small and allow the recovery of airborne CO<sub>2</sub> in any location.
- \* m-DAC is a registered trademark of Kyushu University, a national university corporation.

## 3. Our goals

- Plant factories using m-DAC® technology will be installed in stations and various cities, and fresh vegetables will be grown while capturing CO<sub>2</sub> to promote the effective use and collection of CO<sub>2</sub> in metropolitan areas.
- Vegetables will be sold to the public through neighboring stores, restaurants and stations with the aim of introducing a new model for reducing CO<sub>2</sub> that the public can immediately become familiar with.



Illustration: visualization of project's goals

(\*1) DAC is the acronym for Direct Air Capture, which refers to the direct recovery of CO<sub>2</sub> (carbon dioxide) in the air

We believe that the initiatives outlined in this booklet contribute particularly to No. 9, No. 12, and No. 13 of the 17 SDG goals.



JR西日本グループは持続可能な開発目標（SDGs）を支援しています。



Attachment

- Character used for promotional purposes

We plan to promote the initiative using McDac™, a character that users can easily identify with, during the demonstration stage at the Osaka-Kansai Expo to create familiarity with CO<sub>2</sub> capture and its efficient utilization in the metropolitan areas using m-DAC technology.

A promotional poster for the McDac character. The background is a soft, abstract gradient of light green, yellow, and blue. On the left, a large, stylized green character named McDac is shown from the waist up. It has a simple, rounded body, a small black line for a mouth, and two large, white, circular eyes with blue pupils. In the top left corner, the logos for JR West (JR西日本) and Carbon Xtract are displayed. The main text on the right side of the poster reads "McDac Creates the Future." in a large, black, sans-serif font. Below this, in smaller black Japanese text, it says "駅や電車の空気から、CO<sub>2</sub>をつかまえてつかう未来へ。" (From the air at stations and trains, capturing and using CO<sub>2</sub> for the future). At the bottom, it states "JR西日本 × Carbon Xtract Station Farming Project はじまる。" (JR West × Carbon Xtract Station Farming Project begins).

# McDac Creates the Future.

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CO<sub>2</sub>をつかまえてつかう未来へ。

JR西日本 × Carbon Xtract  
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