TAIHEIYO CEMENT
NEWS LETTER

February 4, 2022

A NEDO-funded project for the Development of Carbon Circulation Technology for the Cement Industry

Taiheiyo Cement has completed installations to demonstrate CO_2 capture from kiln exhaust gas and the utilization of the captured CO_2, boosting the development of innovative technologies for carbon neutrality

Taiheiyo Cement Corporation (Headquarters: Bunkyo-ku, Tokyo; President: Masafumi Fushihara) has completed installation of demonstration facilities for its project "Development of Carbon Circulation Technology for the Cement Industry" which is funded by the New Energy and Industrial Technology Development Organization (NEDO) of Japan. Demonstration tests for CO_2 capture from kiln exhaust gas and utilization of captured CO_2 will shortly commence.

The demonstration plant to capture CO_2 by the chemical absorption method using amine-based sorbents at our Kumagaya Plant is the largest installation of its kind in Japan's cement industry. Furthermore, demonstration facilities for utilization of the captured CO_2 have been installed at our Kumagaya Plant and neighboring subsidiary companies. Through these demonstration facilities we aim to verify the carbon capture and utilization technologies we have developed so far, and to identify the specific issues to be addressed for establishing full-scale, implementable technologies.

Our technologies in the demonstration tests

1. CO_2 capture from cement kiln exhaust gas (①)
   A preceding demonstration test at a scale of 20 kg-CO_2/day has been carried out at our Fujiwara Plant since 2019. Based on the findings from the Fujiwara Plant, our new demonstration plant is 500 times larger, with a capacity of 10 ton-CO_2/day, targeting future implementation in the actual production process.

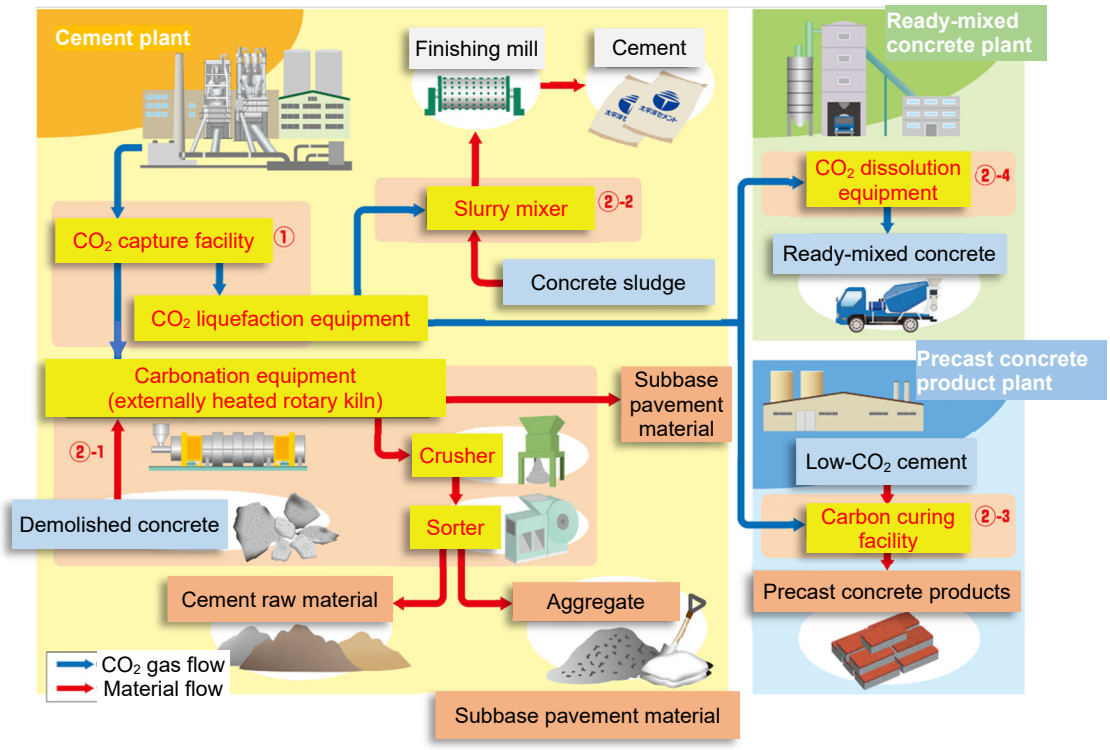
2. CO_2 utilization
   (1) CO_2 sequestration in demolished concrete (②-1)
   The captured CO_2 is sent to an externally heated rotary kiln to be sequestrated in demolished concrete. Carbonated concrete is divided into aggregate, subbase pavement materials and cement raw material, following the separation of cement paste from carbonated waste concrete.

   (2) CO_2 sequestration in concrete sludge (②-2)
   Concrete sludge is a solid material recovered in the wastewater treatment process at ready-mixed concrete plants. CO_2 is sequestrated in the sludge in a slurry mixer to be added to a finishing mill in the final process of cement production.

   (3) CO_2 sequestration in precast concrete products (②-3)
   Carbon curing equipment is used to sequestrate CO_2 in precast concrete products made of low-CO_2 cement developed by Taiheiyo Cement.

   (4) CO_2 sequestration in ready-mixed concrete (②-4)
   CO_2 will be sequestrated in ready-mixed concrete with CO_2 dissolution equipment.

We have identified the creation of CO_2 capture and recycling technologies applicable to the cement production process as the most important challenge for the future of the cement industry and positioned it at the core of our growth strategy. With our efforts focused on the development of innovative technologies, including CO_2 capture at the calciner, and subsequent methanation, we will further accelerate activities toward the realization of carbon neutrality in the entire supply chain by 2050.



Schematic diagram of the demonstration tests

Photos of the demonstration plants; CO_2 capture facility (left) and carbonation equipment (externally heated rotary kiln, right).

Related press releases:

Adoption of “Development of Carbon Circulation Technology for the Cement Industry” as a NEDO Project
https://www.taiheiyo-cement.co.jp/english/summary/pdf/200618_2.pdf
(Japanese: https://www.taiheiyo-cement.co.jp/news/news/pdf/200618.pdf)

Installation of a Demonstration Facility for CO_2 Capture from Cement Kiln Flue Gas
https://www.taiheiyo-cement.co.jp/english/summary/pdf/210421.pdf
(Japanese: https://www.taiheiyo-cement.co.jp/news/news/pdf/210421.pdf)

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