Development of Technology for Producing Concrete and Cement Using CO_2 (Concrete Field)

(Amount covered by the government: Up to 35.94 billion yen)

- There are high expectations that **using CO_2 in concrete** by means of Carbon Recycling technology will be implemented in society, as it will make it possible to **fixate CO_2 by means of large-scale and long-term use**.
- With a view toward social implementation, it will be important to solve challenges such as **maximizing volumes of CO_2 emission reduction and CO_2 fixation (*)**, **expanding applications and reducing costs** (material development, manufacturability and workability), and **reducing CO_2 emissions in the manufacturing process**, all while ensuring safety.
- For this purpose, efforts are to be made toward establishing and standardizing the following: **development and combined use of materials for fixating CO_2** (special admixtures, aggregates, etc.), **manufacturing and construction techniques to minimize costs**, and **quality control methods, including evaluation of CO_2 fixation volumes**.

<Example of concrete produced with reduced CO_2 emissions and maximized fixation volumes>

[Road blocks]

[Mold frame]

[Pavement blocks]

【Target】 CO_2 reduction of 310-350 kg/m^3 (of which the CO_2 fixation volume is 120-200 kg/m^3)
Costs that are less than or equal to those of existing products (Reference figures: Precast concrete = around 30 yen/kg; ready mixed concrete = around 8 yen/kg)

Development of Technology for Producing Concrete and Cement Using CO_2 (Cement Field)

(Amount covered by the government: Up to 20.84 billion yen)

- Cement is made from limestone, clay, and other raw materials. The main raw material, **$CaCO_3$, inevitably produces CO_2 through a decarbonation reaction**.
- **Develop a CO_2-recovering cement production process (*)** that will recover nearly all the CO_2 from limestone, and also **develop technology for using the recovered CO_2 as carbonate**. [* The goal is to recover more than 80% of the CO_2 generated in the preheater]

<CO_2-recovering cement production process>