



Research Center for
Advanced Science and Technology
The University of Tokyo



Sept.9,2020

Press Release

Research Center for Advanced Science and Technology, the University of Tokyo
Ube Industries, Ltd.
SHIMIZU CORPORATION
Chiyoda Corporation
Furukawa Electric Co., Ltd.

Development and Application of the CO₂ Recovery and Recycling Technology Covering Dilute CO₂ Accelerates through Cooperation between Industry, Academia, and Government.

"Integrated Electrochemical Systems for Scalable CO₂ Conversion to Chemical Feedstocks" Selected for Moonshot Research and Development Program by NEDO.

The University of Tokyo, Osaka University, RIKEN, Ube Industries, Ltd., Shimizu Corporation, Chiyoda Corporation, and Furukawa Electric Co., Ltd. have jointly applied to the New Energy and Industrial Technology Development Organization (NEDO) for their project entitled "Moonshot Research and Development Program / Realization of sustainable resource circulation to recover the global environment by 2050".

As a result, we are pleased to announce that our project, "Integrated Electrochemical Systems for Scalable CO₂ Conversion to Chemical Feedstocks" has been accepted.

1. Overview

CO₂ accounts for an extremely large proportion of the greenhouse gases generated by human activities, and further reductions in greenhouse gases are necessary to protect the global environment.

In its Long-Term Strategy under the Paris Agreement (approved by the Cabinet on June 11, 2019), Japan has declared its commitment to reduce greenhouse gas emissions by 80% by 2050, and reducing greenhouse gas emissions is a major global issue that requires urgent action.

In addition, Roadmap for Carbon Recycling Technology (published by the Ministry of Economy, Trade and Industry in June 2019), indicates a policy of curbing emissions through "carbon recycling technology" that considers CO₂ as a resource and encourages the effective use of it, which calls for the development of innovative technologies.

Under such circumstances, NEDO will implement challenging R&D to accomplish Moonshot Goal 4, "Realization of sustainable resource circulation to recover the global environment by 2050", and the joint researchers have been selected^{*)} as contractors for this R&D project.



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This project is scheduled to last for up to 10 years, from FY 2020 to FY 2029, and aims to develop a process that can capture CO₂ in a wide range of concentrations from 400 ppm to 15% and convert it to useful chemical raw materials. Taking advantage of electrochemical technologies, the process will be scalable and distributable.

Specifically, we will develop an integrated system to capture dilute CO₂ before being released into the atmosphere and convert it electrochemically into useful chemical raw materials using renewable energy as a driving force, thereby establish a foundation for carbon recycling.

Following the adoption of this project, the joint researchers will develop innovative technologies for CO₂ capture and utilization in collaboration between industry, academia, and government, and will accelerate efforts to commercialize and disseminate the integrated system.

2. Project Description

Project Name

“Integrated Electrochemical Systems for Scalable CO₂ Conversion to Chemical Feedstocks”

Project Manager

Professor. Masakazu Sugiyama

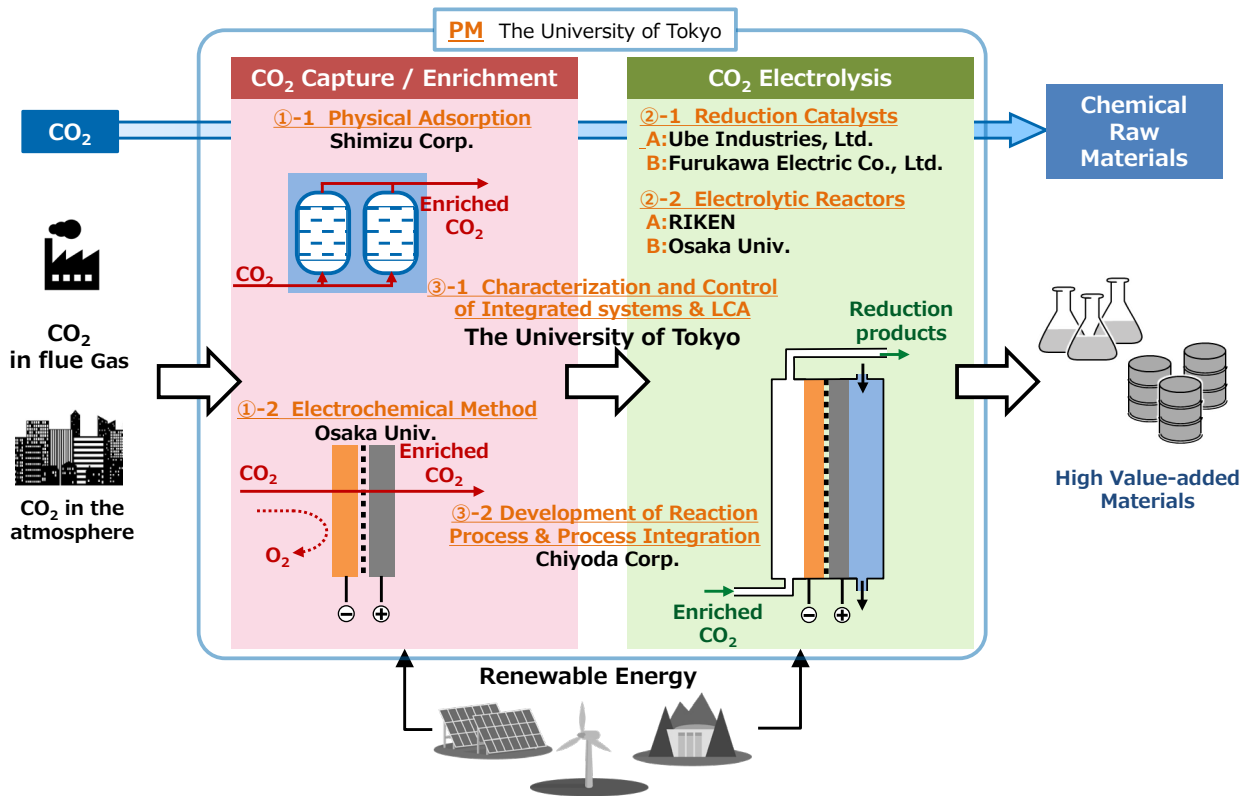
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Research and development items (Plan)

- ①-1 CO₂ Capture and Enrichment / Physical Adsorption
- ①-2 CO₂ Capture and Enrichment / Electrochemical Method
- ②-1 CO₂ Electrolysis / Reduction Catalysts
- ②-2 CO₂ Electrolysis / Electrolytic Reactors
- ③-1 Characterization and Control of Integrated systems & LCA
- ③-2 Development of Reaction Process & Process Integration

Outsourcer name (in no particular order)		Development items
The University of Tokyo	President : Makoto Gonokami	③-1
Osaka University	President : Shojiro Nishio	①-2、②-2
RIKEN	Head of External Funds Office : Hiroshi Takayama	②-2
Ube Industries, Ltd.	President : Masato Izumihara	②-1
SHIMIZU CORPORATION	President : Kazuyuki Inoue	①-1
Chiyoda Corporation	President & COO : Masaji Santo	③-2
Furukawa Electric Co., Ltd.	President : Keiichi Kobayashi	②-1

Conceptual diagram of the system to be developed



Project period: Maximum of 10 years from FY 2020

[*] "NEDO Selects 13 R&D Projects Under Moonshot Goal Targeting Recovery of Global Environment" released on August 26, 2020.

<Link URL> https://www.nedo.go.jp/english/news/AA5en_100428.html



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