



**CARBON  
RECYCLING  
FUND**

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# **Carbon Recycling: From Concept to Business**

– Unlocking Carbon Utilization through  
Collaboration and Innovation –

9<sup>th</sup> CEFIA Forum

April 22, 2026

Carbon Recycling Fund

Reo Hayashi

# From Carbon Neutrality to Carbon Recycling

- Carbon recycling is essential – no longer optional
- Moving beyond reduction: turning CO<sub>2</sub> into a resource through utilization and circulation
- We are entering a new phase of carbon management

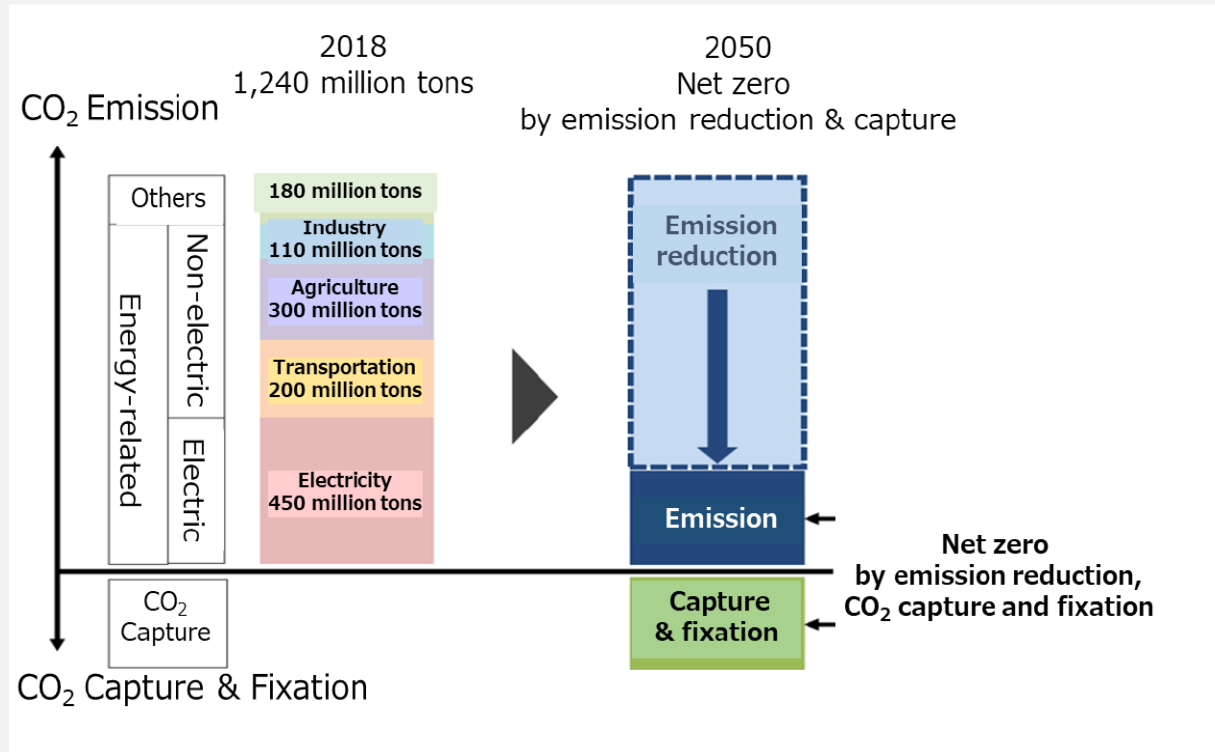
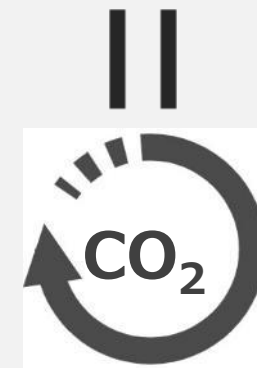


Image of Carbon Neutrality

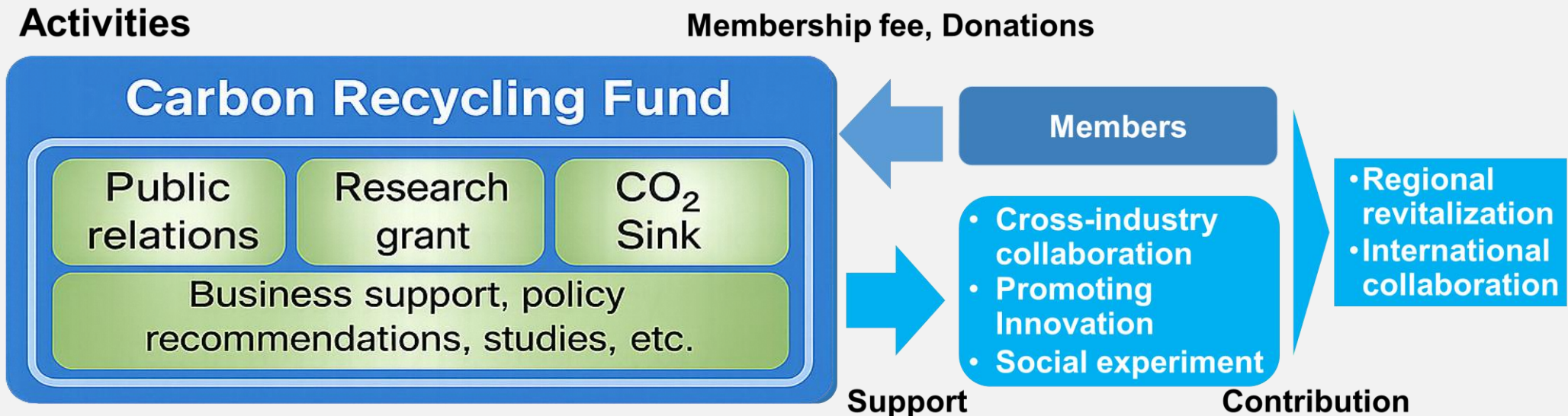
**Towards the Realization of  
Carbon Neutrality  
-The Society We Should  
Aim For**



**Circular Carbon Society**

## ■ CRF is not just a fund – it is a collaboration platform

- **Mission:** Contributing to regional revitalization and international collaboration by undertaking activities to generate innovation towards carbon neutrality by 2050, alongside public relations and human-resource-development initiatives concerning carbon recycling.  
→ **A cross-sector platform providing information on carbon recycling and opportunities for collaboration**



# List of Principal Members

## Members from industries

### <Chemicals>

Lion Corporation, Mitsubishi Chemical Corporation, Mitsui Chemicals, INC. Toray Industries, Inc.

### <Electric power>

**Electric Power Development Co., Ltd. (JPOWER)**, Tokyo Electric Power Company Holdings, Inc.

### <Precision>

SHIMADZU CORPORATION

### <Energy>

COSMO OIL CO., LTD., ENEOS Holdings, Inc., **Idemitsu Kosan Co., Ltd.**, INPEX CORPORATION, Japan Petroleum Exploration Co., Ltd. (Abbreviation: JAPEX), TOKYO GAS CO., LTD.

### <Iron, Metal, Cement, Paper>

JFE Steel Corporation, Kobe Steel, Ltd. Nippon Paper Industries Co., Ltd., NIPPON STEEL CORPORATION, Sumitomo Osaka Cement Co., Ltd., TAIHEIYO CEMENT CORPORATION

### <Trading company>

ITOCHU Corporation, Marubeni Corporation, MITSUI & CO., LTD., SUMITOMO CORPORATION

### <Heavy industries, Engineering>

IHI Corporation, Kawasaki Heavy Industries, Ltd.

### <Printing>

Dai Nippon Printing Co., Ltd., TOPPAN Holdings Inc.

### <Transportation>

Honda R&D Co., Ltd, Japan Airlines Co., Ltd., Nissan Motor Co., Ltd.

### <Construction, Real estate>

KAJIMA CORPORATION, Mitsui Fudosan Co., Ltd, Obayashi Corporation, SHIMIZU CORPORATION, TAISEI CORPORATION

### <Banks, Financing>

Mizuho Financial Group, Inc., MUFG Bank, Ltd., Nippon Life Insurance Company, Sumitomo Mitsui Trust Bank, Limited

### <Retail>

Asahi Group Holdings, Ltd., Shiseido Company, Limited (Brand Value R&D Institute)

### <IT, Analysis, Assessment>

Boston Consulting Group Japan LLC, Deloitte Tohmatsu Consulting LLC, Fujitsu Limited, KDDI CORPORATION, NTT, Inc.

### <Others>

**Low Emission Technology Australia (LETA)**, Plug and Play Japan

## Members from local government

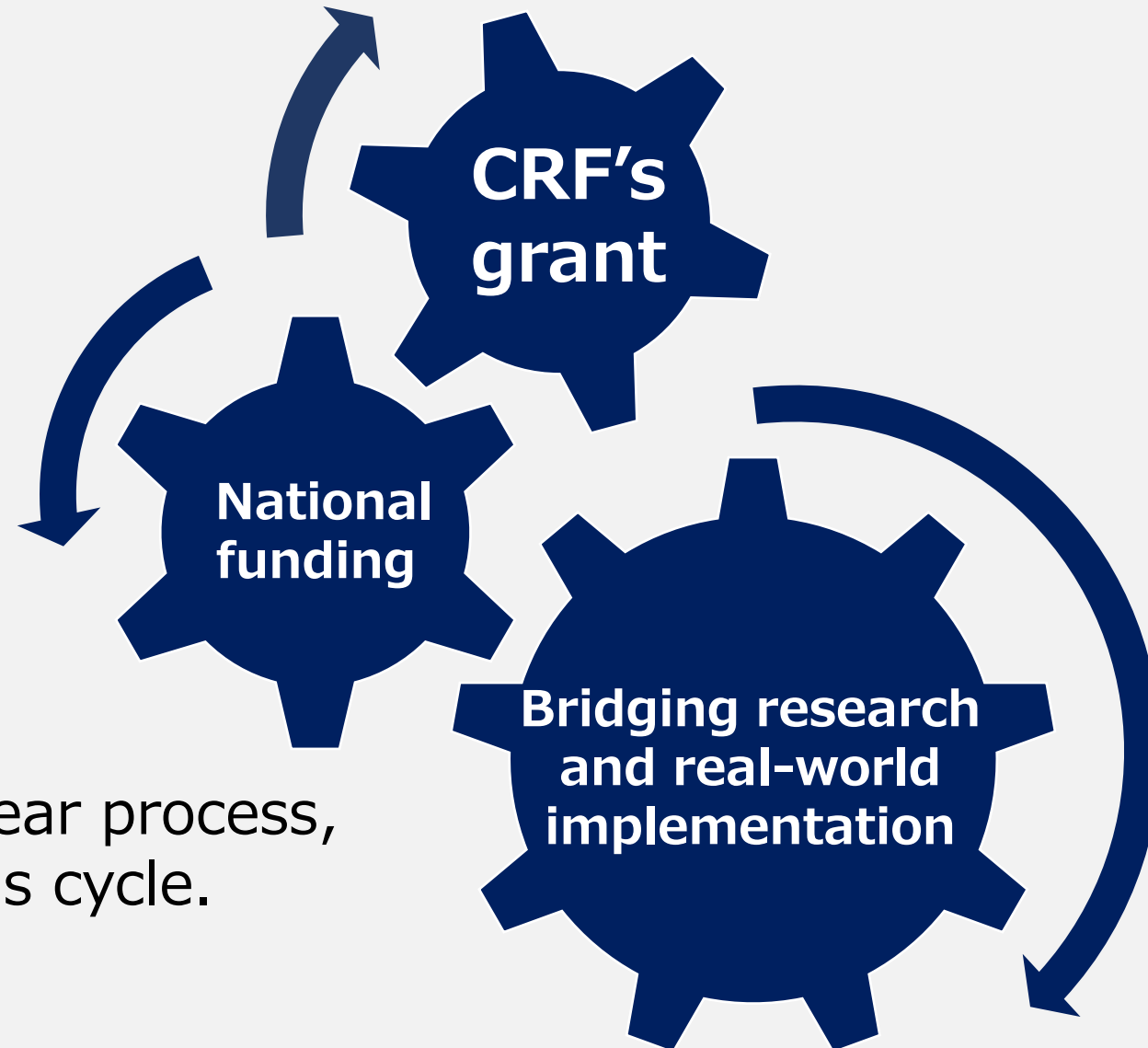
Aichi, Akita, Hiroshima, Hokkaido, Kagawa prefectures, Tokyo Metropolitan Government

## Members from academia

Ibaraki University, Kyoto University, Nagasaki University, Science Tokyo GXI, Tokyo University

**Promoting carbon recycling alongside these 260+ members**

# How CRF Creates Value



This is not a linear process,  
but a continuous cycle.

## ■ We focus on early-stage innovation

**Leveraging private funding characteristics to discover and nurture research seeds (ideas, people) related to carbon recycling.**

**Over six years, 93 projects (total funding approx. ¥540 million) were supported.**



- We have received a total of 428 applications, of which 93 have been selected and funded
- Support also provided for collaborative research with links to ASEAN countries

	Research title	Name of Research Representative (Organization)
FY2024	Cultivation of biofuel plants for revegetation of abandoned coal mine sites	Shin OKAZAKI (Tokyo University of Agriculture and Technology) with Bogor Agricultural University
FY2022	Development of Carbon Neutral Technology and Carbon Value Creation using Unutilized Biomass Materials	Koryu KAWATANI (Innovare Co., Ltd.) Participating institutions: Ritsumeikan Univ., Prince of Songkla Univ. (Thailand)

# (Appendix) FY2025 Research Grant Selected Projects (22 projects)

Field	Research Project Title	Principal Investigator (Affiliation)
CO <sub>2</sub> Separation, Recovery, and Immobilization	Development of a CO <sub>2</sub> separation system using an innovative high-purity refined "gate-adsorption zeolite"	Shunsuke Tanaka (Kansai University)
	Direct air capture combining zeolite and liquid phase desorption system	● Kenta Iyoki (Planet Savers Co., Ltd.)
	Development of a CO <sub>2</sub> fixation process using carbonate granules from coal ash recycled after rare earth recovery	Yuko Ogawa (Hiroshima University) Collaboration : University of Wyoming
	Establishment of CO <sub>2</sub> Conversion System Using Ship-in-Bottle Synthetic Hollow Silica Catalysts	● Daichi Takami (Osaka University)
	Development of a DAC system compatible with multiple capture materials to achieve cost optimization by CO <sub>2</sub> application	● Takashi Kawasaki (CarbonNest Inc.)
Conversion to Fuel and Chemicals	Development of a water-cooled electrode-type direct methanol synthesis system using CO <sub>2</sub> as feedstock with a DC pulse power supply	Shinsuke Kobayashi (Gifu University)
	Synthesis of biomass plastics utilizing carbon dioxide and non-edible sugars	Masashige Kimura (Nagasaki University)
	Production of chemicals from CO <sub>2</sub> using metal cluster catalysts and silicon reducing agents	● Shingo Hasegawa (Yokohama National University)
	Creation of resource-constraint-free, high-speed-driven CO <sub>2</sub> electrolysis catalysts utilizing coordination polymers	Kazuhiko Maeda (Tokyo University of Science)
	High-efficiency methanol conversion of CO <sub>2</sub> using tungsten trioxide catalyst	Hidetoshi Miyazaki (Shimane University)
Social Science	Designing a voluntary credit system for conserving green carbon ecosystems	Akiyoshi Washizu (Waseda University)
	Economic and institutional research toward realizing the Japan-Australia JCM: using CCS/CCUS projects in Australia as case studies	Toshihide Arimura (Waseda University) Collaboration : Australian National University
Circulation of Carbon Resources, etc.	High-value-added conversion of organic materials and high-efficiency hydrogen production using porous copper-based electrodes	Sho Hideshima (Tokyo City University)
	Establishing an innovative carbon recycling process for acrylic resins	● Keita Koshiba (Mitsubishi Chemical Corporation)
	Development of recycling technology for high-stability plastics	Masanori Shigeno (Tohoku University)
	Chemical recycling of mixed waste plastics using catalysts, simultaneously achieving carbon fixation through waste plastic carbonization	Naotsugu Kubo (AC Biode Co., Ltd.)
Biological Utilization	Carbon-negative power generation using photosynthetic microorganisms and enzyme fuel cells	Tsutomu Mikawa (National Research and Development Agency (RIKEN))
	Bio-PET cycle absorbing and utilizing CO <sub>2</sub>	Tsutomu Tanaka (Kobe University)
Value-Added Materials	Establishment of an innovative direct conversion process from carbon dioxide to acrylic resin feedstock without hydrogen consumption	Teruoki Tago (Tokyo University of Science)
CO <sub>2</sub> Absorption Source	R&D on seaweed-based colonization systems for large-scale blue-carbon generation	Nobuko Nishikawa (BLUABLE Inc.)
	Development of functional biochar as the ultimate form of lignocellulosic CCUS	● Masako Seki (National Institute of Advanced Industrial Science and Technology)
H <sub>2</sub> Carrier Usage	Development of precious-metal-sparing catalysts enabling low-temperature, high-speed ammonia decomposition and establishment of scale-up manufacturing technology	● Akira Oda (Institute for Catalysis Science, Hokkaido University)

● : Young researchers under 40 Start-up Companies International Collaborative Research

## World's First Pilot Plant for Lower Olefin Production Commences Operation

- At the petrochemical plant operated by Thailand's SCGC\*, installation of a pilot plant for producing lower olefins has been completed, and operation using actual exhaust gas from the existing naphtha cracker as feedstock has commenced.
- The pilot plant synthesizes lower olefins with CO<sub>2</sub> separated and recovered from exhaust gas supplied by SCGC's naphtha cracker along with hydrogen by-products from other processes within SCGC. IHI developed a CO<sub>2</sub> conversion catalyst to enable that reaction.
- This is the world's first pilot plant to use CO<sub>2</sub> emissions from a naphtha cracker as feedstock.



Commissioning Ceremony



Pilot Plant

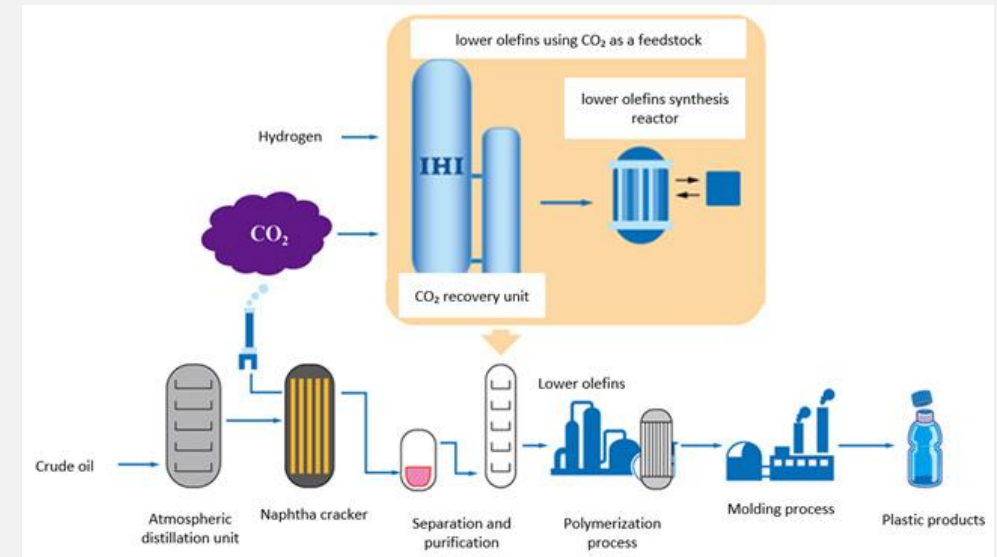


Illustration of lower olefins production process using SCGC's existing facilities

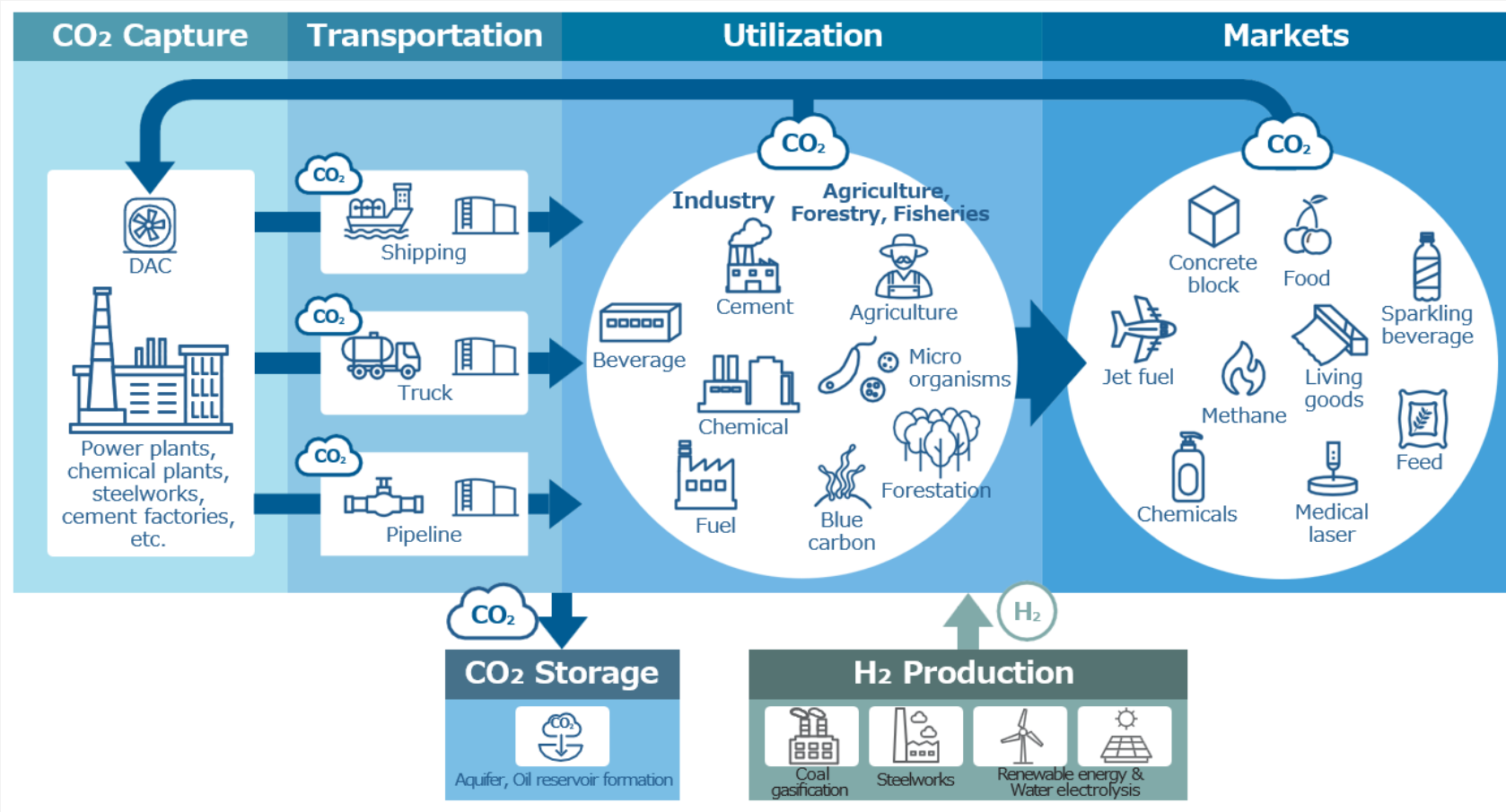
\* SCGC : SCG Chemicals Public Company Limited, a subsidiary of The Siam Cement Group Public Company Limited

\* This project(JPNP16002) is subsidized by the New Energy and Industrial Technology Development Organization (NEDO)

- **This is what has changed since last year**
  - ✓ **International collaboration expanding (ASEAN, Australia, India and so on)**
  - ✓ **Increasing joint research proposals**
  - ✓ **2026 Grant Call Now Open**

## ■ The real challenge is integration

CCUS is a key component of this value chain



Left: CRF Vice Chairperson HIRANO Atsushi  
Right: METI Director-General ITO Sadanori

This overview highlights the various challenges for Carbon Recycling.

This is why policy matters.

We have made policy recommendations to address these structural challenges.

- ✓ **Carbon recycling is essential**
  - ✓ **Collaboration is key**
  - ✓ **CRF connects stakeholders across sectors and regions**
  - ✓ **Expanding collaboration, including ASEAN**
- **Join our upcoming webinar (Late 2026)  
to explore our vision for carbon recycling and  
future collaboration opportunities**
- (we welcome your input on topics of interest via Q&A or questionnaire)**

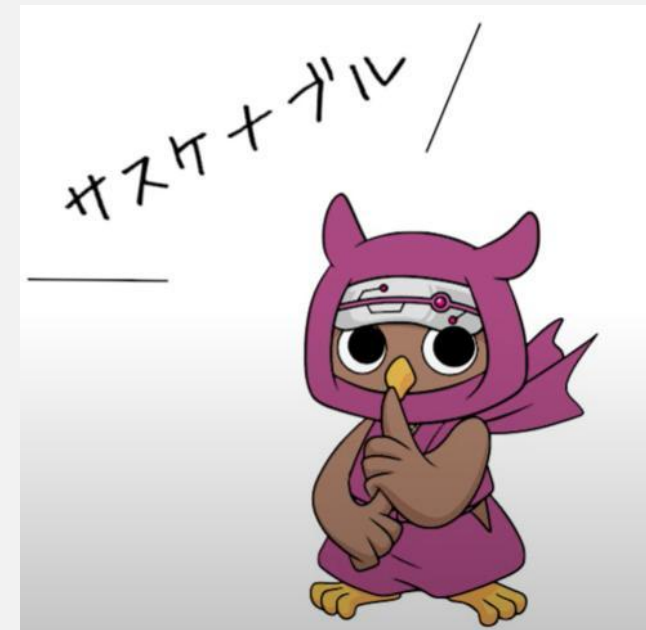


Our English Website



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# Thank you



Our mascot character: "Sasuke," the Ninja Owl  
(symbolizing sustainability)