



**CARBON
RECYCLING
FUND INSTITUTE**

Towards a Carbon-Neutral Society, the Significance of Carbon Recycling

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- **The Significance of Carbon Recycling**
- **Overview of CRF**
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**8th CEFIA Public-Private
Forum
Kuala Lumpur
Malaysia
17 October 2025**

**Carbon Recycling Fund (CRF)
Senior Executive Director
Masamichi Hashiguchi**

【Education】

March 1985: Completed the Postgraduate Course in Geophysics
(Ocean Research Institute), Graduate School of Science,
University of Tokyo

【Principal Employment History】

April 1985 : Joined the Ministry of International Trade and Industry
(now the Ministry of Economy, Trade and Industry),
assigned to the Coal Division, Location Pollution Bureau

June 1998 : Commercial Policy Division, Industrial Policy Bureau, Ministry of
International Trade and Industry (now Ministry of Economy, Trade and Industry)

June 2002 : Director, European Office, Japan Office of Machinery and Equipment
Manufacturers, JETRO (Düsseldorf Centre, Germany)

July 2005 : Director, Research and Development Promotion, NEDO

April 2012 : Vice Governor of Akita Prefecture

June 2015 : Managing Director, Japan Carbon Frontier Organization (JCOAL)

August 2019: Senior Executive Director, Carbon Recycling Fund



- Achieving carbon neutrality requires carbon recycling
- Not only emissions reduction, but CCUS/carbon recycling, and absorption by forests, oceans, and soils are key
 - **Balancing emissions with absorption/removal (utilisation, sequestration) by circulating CO₂ as resource**

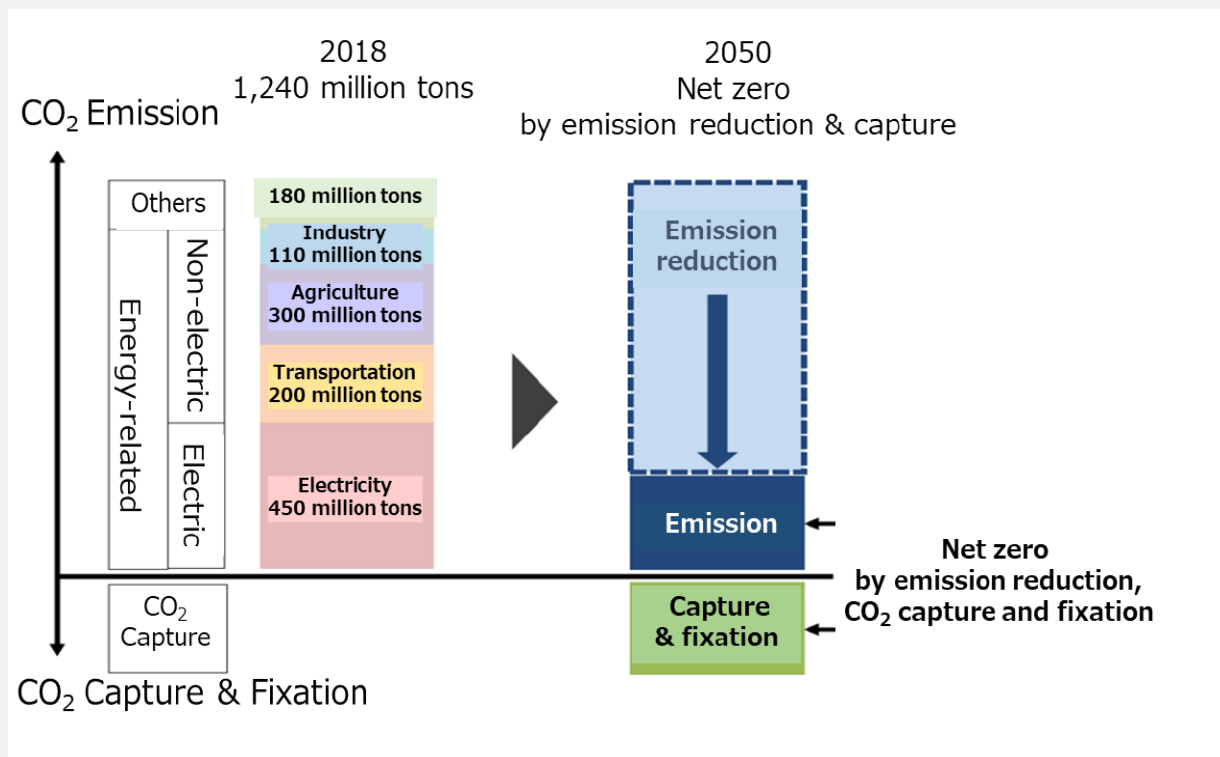
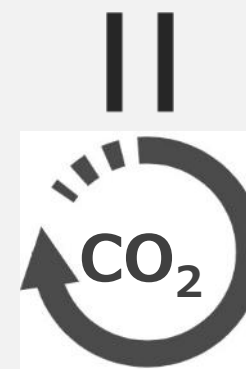


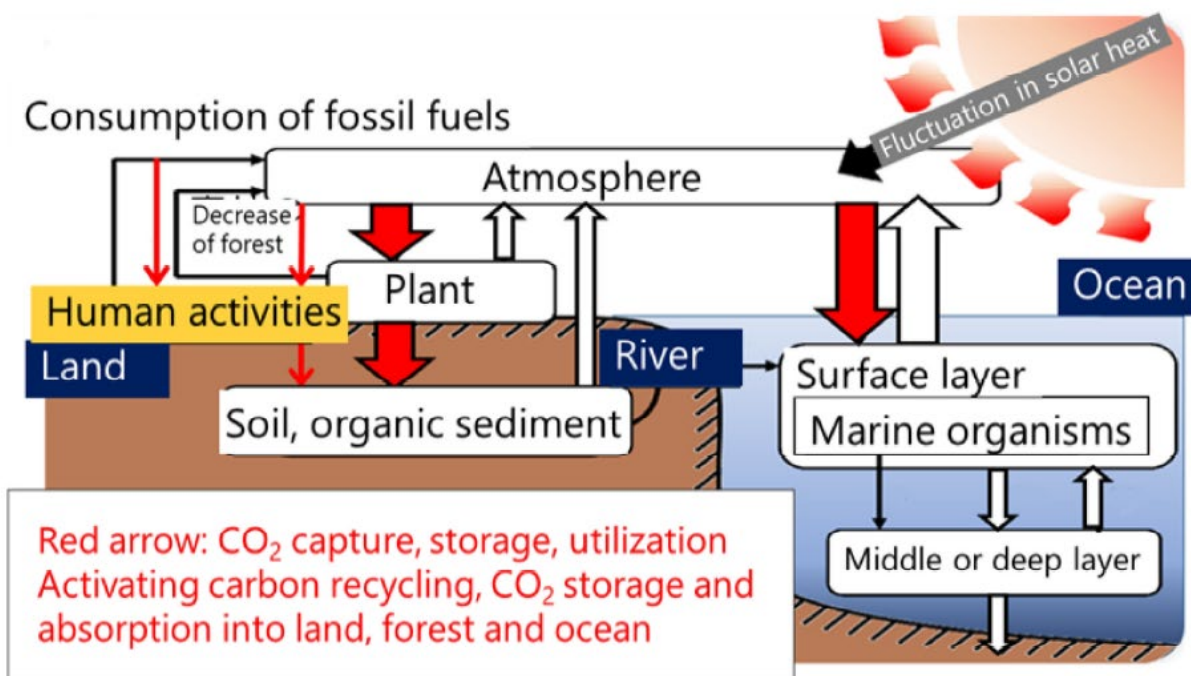
Image of Carbon Neutrality

Carbon Neutrality Towards Realisation
The society we should aim for



Circular Carbon Society

- Innovation is essential within the global carbon cycle
- CO₂ sinks (forests, oceans, soil) are also important
- for carbon neutrality



- Green carbon
(Planting fast -growing trees)
- Blue carbon
(seaweed cultivation, seagrass bed formation, etc.)
- Fixation in soil
(rock weathering, biochar, etc.)

■ **Mission:** Contributing to regional revitalisation 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 the latest information on CR and opportunities for collaboration**

■ Executives

Chairperson: Tsugio MITSUOKA (Chairman of the Board, IHI Corporation)

Vice Chairperson: Toshifumi WATANABE (Representative Director Chairman, Electric Power Development Co., Ltd..)

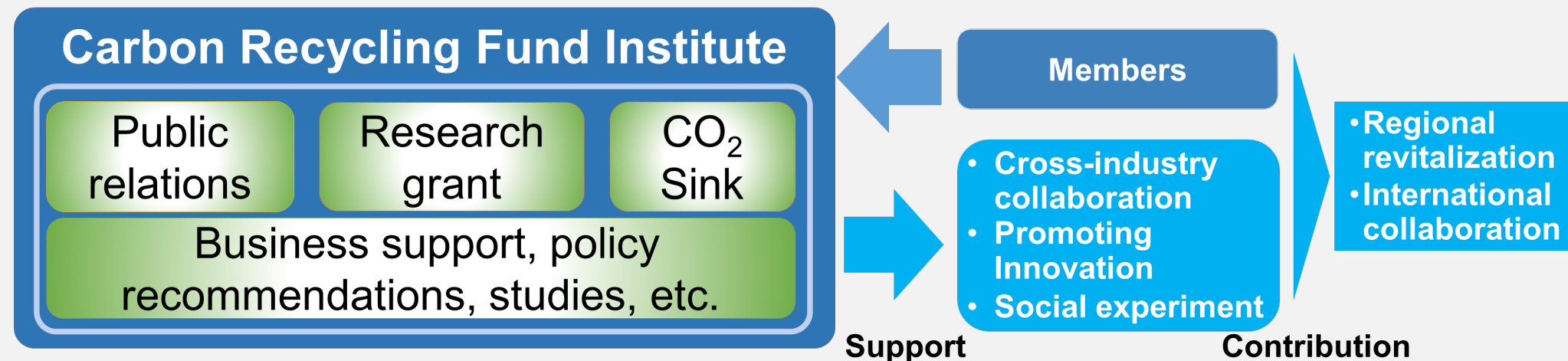
Vice Chairperson: Noriyuki MITA (Executive Officer, Chief Sustainability Officer, Mitsubishi Chemical Corporation)

Senior Executive Director: Masamichi HASHIGUCHI

Director: Atsushi HIRANO (Representative Director and Vice President, Idemitsu Kosan Co.,Ltd.)

Activities

Membership fee, Donations



List of Principal Members

Members

<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.

<Bio>

CHITOSE BIO EVOLUTION PTE. 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>

Chiyoda Corporation, IHI Corporation, JGC HOLDINGS CORPORATION,
Kawasaki Heavy Industries, Ltd., Kubota Corporation, Toyo
Engineering Corporation

<Printing>

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

<Transportation>

Honda R&D Co., Ltd, Japan Airlines Co., Ltd., Mitsui O.S.K Lines, 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,

Local government members

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

Academic members, Academic members

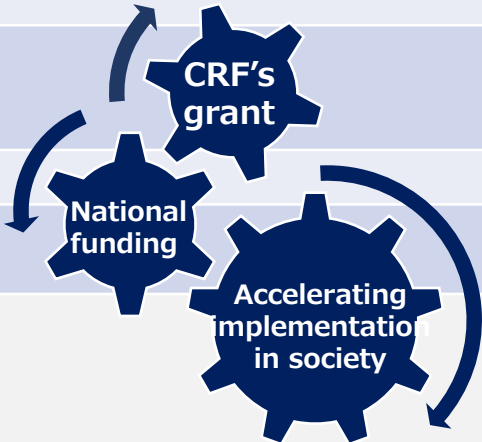
Ibaraki University, Kyoto University, Nagasaki University, Science
Tokyo GXI, Tokyo University

Promoting carbon recycling alongside these 250 members

Research Grant Activities Overview

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.

	Features
Eligibility	Researchers or teams affiliated with companies, universities, etc.
Research targets	Research on carbon recycling that uses CO ₂ (or carbon atoms) as a resource, related technologies, and social science to solve social issues
Evaluation points	Creativity, innovativeness, superiority over conventional technologies, method to determine issues, and social realization potential through collaboration with companies
Grant scale	Approx. max. 70,000 US\$ per case (average: approx. 47,000 US\$ per case)
Attribution of research results	Research results basically belong to researchers



- 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)

- **IHI Corporation**
- **Idemitsu Kosan Co.,Ltd.**
- **CHITOSE BIO EVOLUTION PTE.LTD.**

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 CO₂ 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 CO₂ conversion catalyst to enable that reaction.
- This is the world's first pilot plant to use CO₂ emissions from a naphtha cracker as feedstock.



Commissioning Ceremony



Pilot Plant

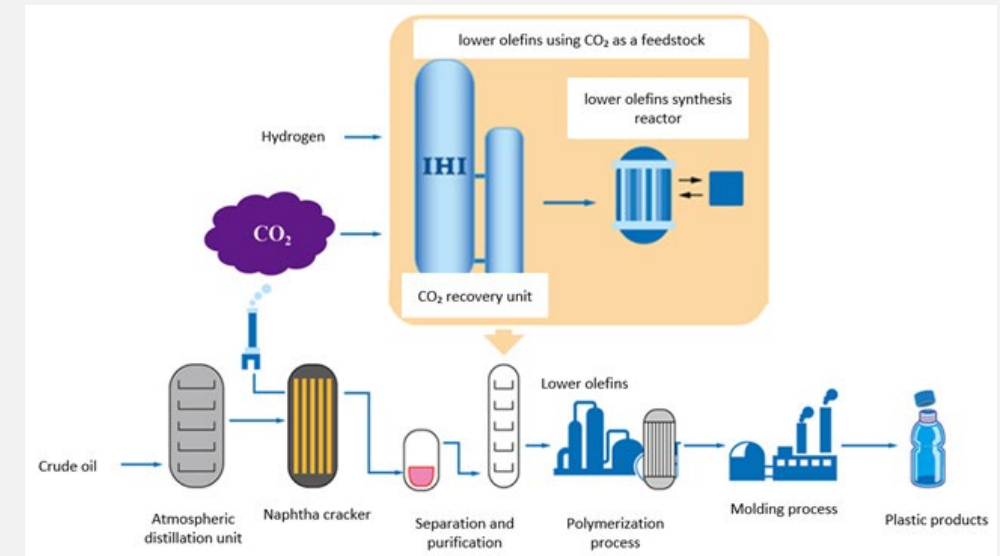


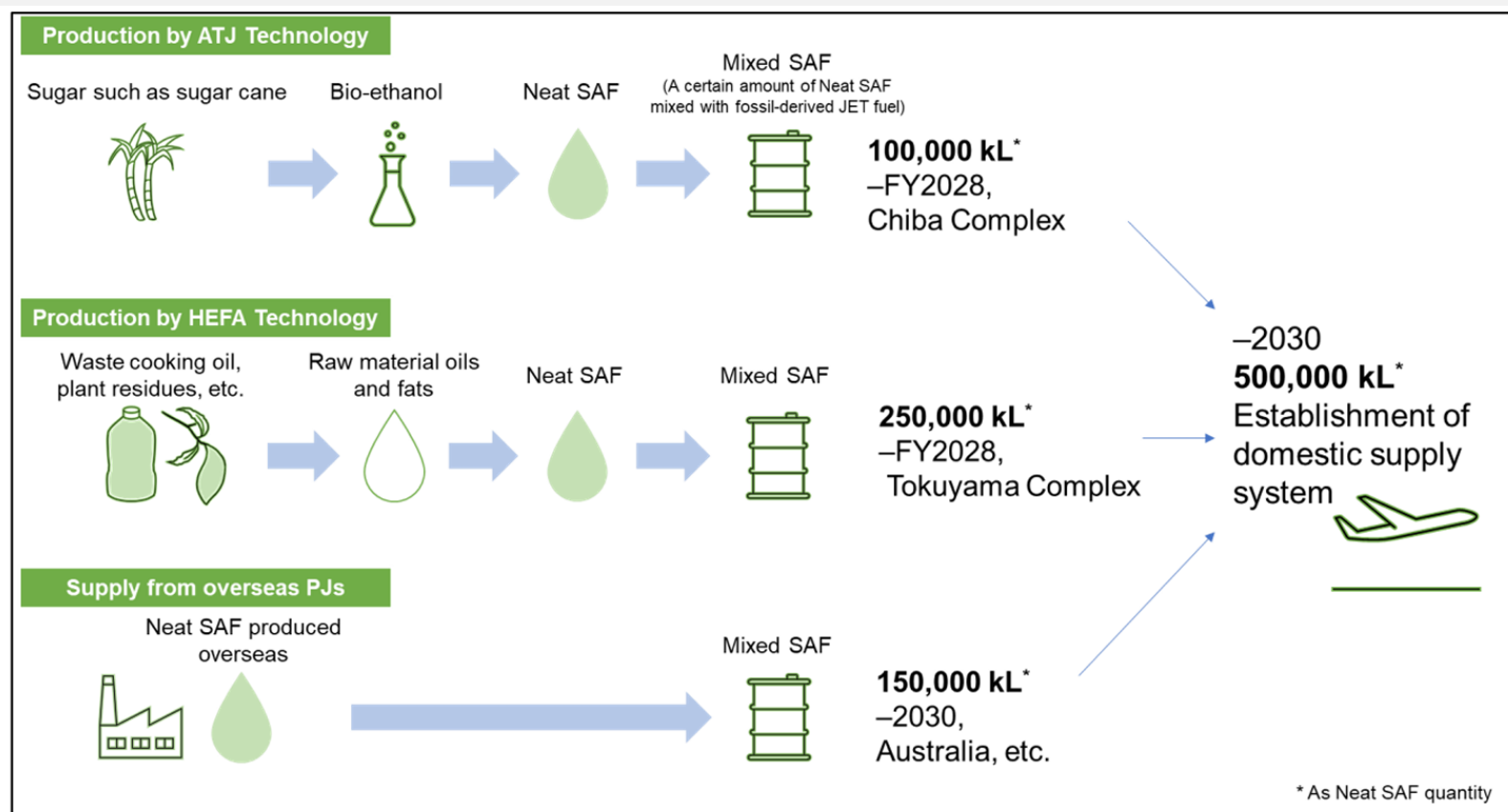
Illustration of lower olefins production process using SCGC's existing facilities

* 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)

2030: Establishing a Supply System for 500,000 kL/Year (SAF)

- Aiming to establish a supply system of 500,000 kL of SAF per year by 2030 through combine production using ATJ (Alcohol To Jet) and HEFA (Hydroprocessed Esters and Fatty Acids), and supply from overseas projects



Non-edible plants
expected as new
SAF feedstocks
"Pongamia"

The World's Largest-scale Microalgae Production Facility

- Operating “**CHITOSE Carbon Capture Central (C4)**”, a 5 ha microalgae production facility for the world's largest scale* in Sarawak, Malaysia
- Utilizing CO₂ directly from the exhaust gas of a coal-fired power plant
- Moving forward to a 100 ha facility opening in Malaysia

*As a flat-panel type algae production facility

Roadmap for Microalgal Production Scale



2023
5 ha

2027
100 ha
14,000 tons/year of CO₂ absorption

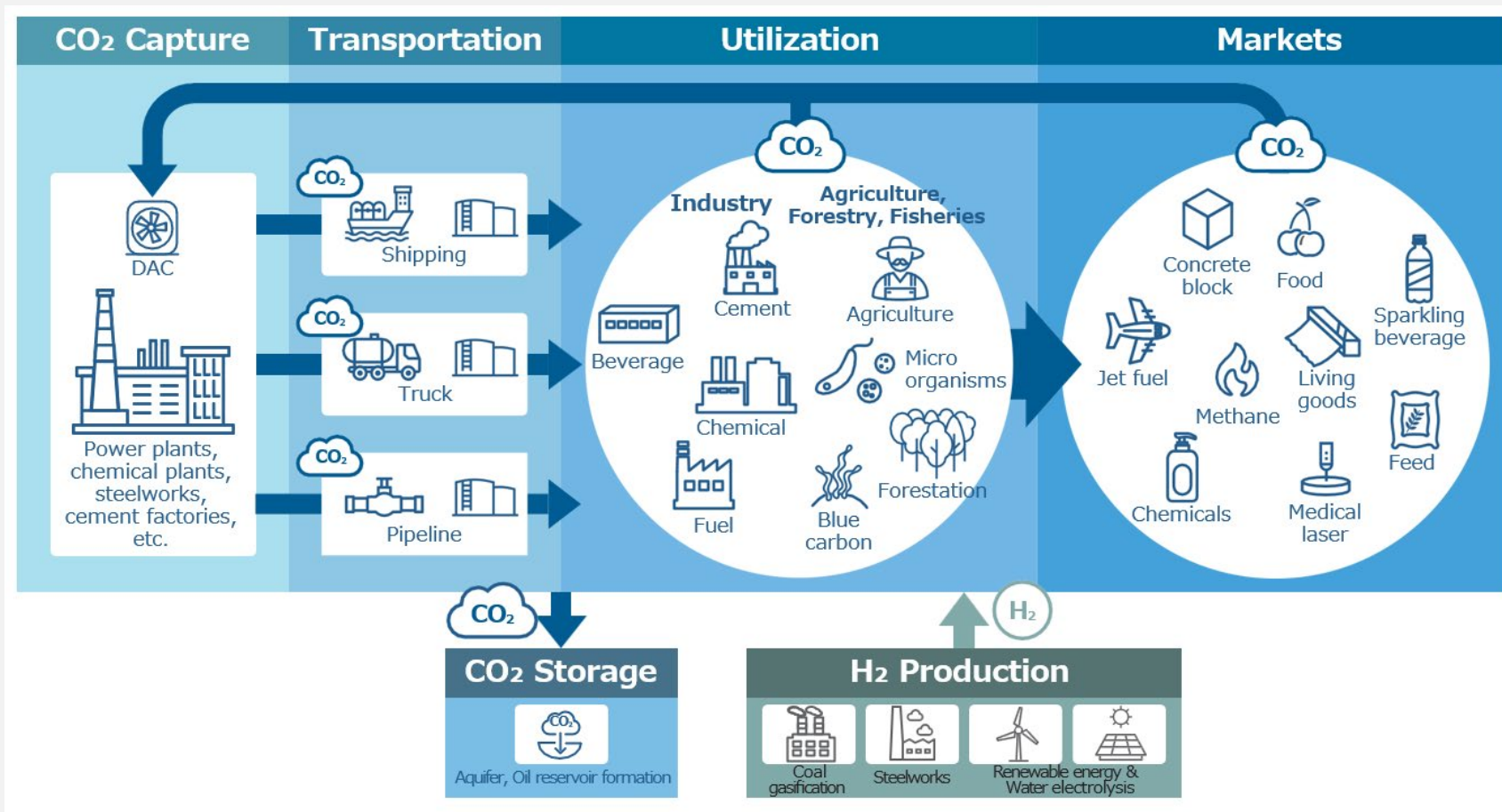
2030
2,000 ha
• 280,000 tons/year of CO₂ absorption
• Commercialization of various microalgae-derived products
• Compliance with SAF mandates

2050
10M ha
• 1.4 billion tons of CO₂ absorption per year
• 600 trillion-yen economic scale

Implementation of a Carbon Recycling

■ Building the CO₂ Value Chain

With a view to the entire CO₂ value chain—from capture at the source to transport, utilization, and storage—we will establish a social implementation model for locally produced and consumed CR technology, horizontally deploy it, and accumulate demonstration cases.



Collaboration within ASEAN for carbon recycling

★ **2050 Carbon Neutrality $\Rightarrow$ Towards Global Realisation**

★ **Institutional Design to Expand Demand for Carbon-Recycled Products**

- **Establishment and expansion of systems such as CO₂**
- **Formulation of international rules including sinks (e.g., blue carbon)**
- **Infrastructure development (including CO₂ transport: pipelines, vessels)**
- **Active regional utilisation of CR products**

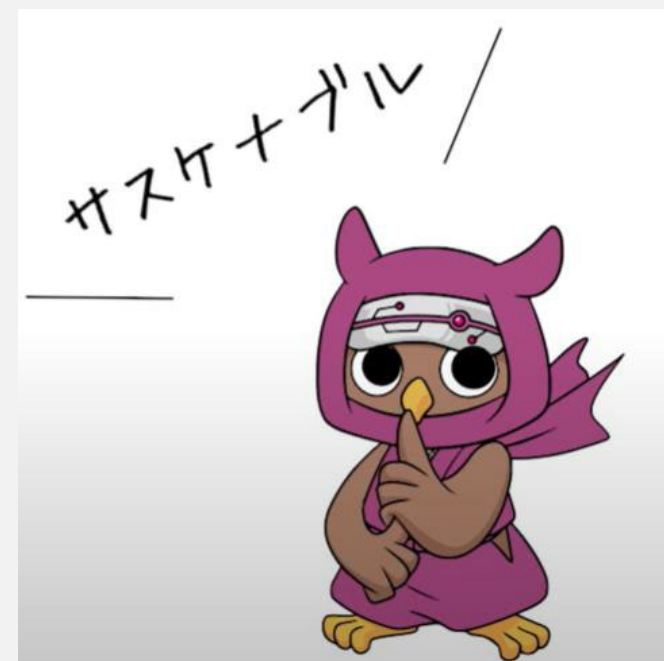
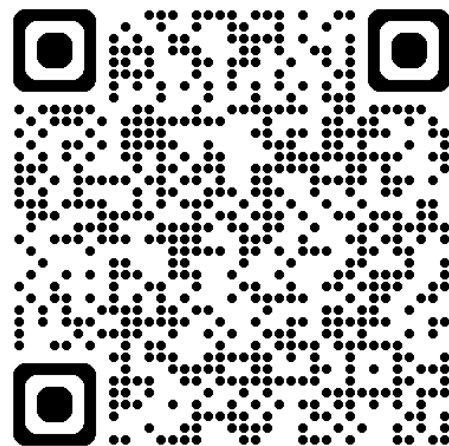
Towards realising a 'Circular Carbon Society', the Carbon Recycling Fund will strive alongside you to create and implement innovations related to carbon recycling.

Thank you for your kind attention

YouTube
Carbon Recycling Fund PR Channel



#22 Turning Factory Emissions into Building Materials!
2030 Net-Zero CO₂ Emissions Declaration [Konoshima Chemical Co., Ltd.]



Sasuke