

Carbon Recycling Fund Institute (CRF)
FY2023 Application Guidelines for Research Grant Activities (General category)

Objectives of the Research Grant Program

- ✓ CRF focuses on the importance of promotion of innovation in carbon recycling and will begin a call for proposals through the CRF research grant activities.
- ✓ Individual researchers (or teams), regardless of the organization they belong to, are eligible to apply. The program expects research results that contribute to the achievement of carbon neutrality by 2050 and is open to a wide range of fields ranging from chemistry, fuels, and mineralization to negative emissions such as biomass.
- ✓ In collaboration with New Energy and Industrial Technology Development Organization (NEDO) and other organizations, the program has already produced achievements in the past that were conducive to state-sponsored projects. CRF also provides support in commercialization of research achievements.
- ✓ CRF has been putting efforts into developing human resources such as launching the Carbon Recycle University (workshop-style training program) and expects many young researchers to take this opportunity.
- ✓ Under the same objectives, CRF has decided to establish a startup category with a simplified application form as in the previous application.

1. Purpose of Research Grant Activities

The Carbon Recycling Fund Institute (hereinafter the “Institute”) establishes the research grant for research on carbon recycling and provides the grant for the achievement of the sustainable carbon society according to 1) Article 131 of the Act on General Incorporated Associations and General Incorporated Foundations; 2) Articles 29 through 32 of its Articles of Incorporation; and 3) Article 2, item (1) of its Rules on Donations.

Carbon recycling means to utilize CO₂ as a resource and convert it into chemicals, fuels, minerals, and the like. The sustainable carbon society that the Institute aims to achieve is a society that better utilizes carbon circulation on a global scale by comprehensively incorporating the utilization of not only CO₂ but also CO₂ sinks and living organisms in agriculture, forestry, and fisheries and the recycling of materials that contain carbon (Figure 1).

Under the carbon recycling policy, the Ministry of Economy, Trade and Industry of Japan established the Carbon Recycling Promotion Office in February 2019, announced the roadmap for carbon recycling technologies in June 2019, and revised the roadmap in July 2021. Further, Japan declared that it would aim to realize carbon neutrality by 2050, and the declaration states that revolutionary innovations, such as carbon recycling, are key to achievement. Based on this, Green Innovation Fund was established, and carbon recycling was identified as one of 14 priority fields in Japan’s Green Growth Strategy. And yet, the private sector’s voluntary support in carbon recycling is considered essential for introducing carbon recycling practices into society.

Under these circumstances, the research grant activities are aimed at contributing to the development of carbon recycling innovation through grants and support for research designed to reduce the cost of carbon recycling technologies or to solve issues hindering the introduction of carbon recycling practices into society.

Recognizing the importance of developing young researchers in efforts to reach the long-term goal of achieving carbon neutrality by 2050, the Institute launched the Carbon Recycle University, a workshop-style training program targeting young human resources, in FY2021. The Institute intends to **proactively help young researchers** in these research grant activities as well.

In Europe and the U.S., a number of startups holding technologies related to carbon recycling

have been founded, resulting in the development of innovation. Also in Japan, the government has declared its full support for startups and been shifting its focus to nurture startups. Under the same objectives, the Institute has established a new startup category with a simplified application form in order to help startups grow and produce innovations.

In collaboration with public projects of the New Energy and Industrial Technology Development Organization (NEDO) and other organizations, the program has already produced achievements in the past that were conducive to state-sponsored projects. CRF also provides support in commercialization of research achievements.



Figure 1. Image of the sustainable carbon society

2. Overview

To this end, the startup category has been established as part of this research grant activities. For information on the documents required and place of submission, check the website designated separately. Applicants may submit application for both the startup category and the general category.

Startup category website:
<https://growth.creww.me/53b5040d-da89-11ed-b790-f3b08b773a98.html>

General category: The activity’s public grant category.

→ **Startup category:** Application form is simplified. Applicants may submit application for both the startup category and the general category.

- * Startups companies, small and medium businesses, and corporations especially in their seed/early stage and researchers planning to start business are encouraged to apply for the startup category.
- * As for the startup category, the grant will be awarded to several individuals/teams.
- * The amount of the grant will be up to 10 million yen for each recipient, and the term of the grant is expected within two years.

3. Application Guidelines

(1) Research Grant Targets

A) Research on carbon recycling and related technologies for using CO₂ (or materials containing carbon atoms or carbon) as a resource to solve social issues; and B) research in the fields of social science and institutional design intended for achieving carbon recycling and technologies contributing to mitigation of climate change.

(2) Research Fields (Specific Examples)

- CO₂ recycling and utilization field
 - ✓ Chemicals (production of olefins, BTX, biodegradable plastics, etc.)
 - ✓ Fuels (methanation, biofuel production, use of enhanced oil recovery (EOR), etc.)
 - ✓ Mineralization (concrete products, mineral carbonation, etc.)
 - ✓ Utilization of living organisms (utilization of germs and bacteria, blue carbon, improvement of photosynthesis efficiency through genetic manipulation or breed improvement, etc.)
 - ✓ Functional materials (production of carbon nanotube, graphene, etc.)
 - ✓ Biomimicking (artificial photosynthesis, etc.)
 - Fields relating to the separation and capture of CO₂ and H₂ that are necessary for carbon recycling
 - ✓ Efficient hydrogen production (water electrolysis technology, bacteria that boost hydrogen production, etc.), efficient synthesis and decomposition of ammonia
 - ✓ Technologies for the efficient separation and capture of CO₂ associated with CCS*¹, DACCS*², BECCS*³, and other approaches (absorption solvent, solid sorbent, membranes, direct air capture, etc.)
- Notes: *1. CCS : Carbon dioxide Capture and Storage
*2. DACCS : Direct Air Capture with Carbon Storage
*3. BECCS : Bio-energy with Carbon Capture and Storage
- Direct use of CO₂
 - ✓ Medical field (utilization of carbonic acid effect, etc.)
 - ✓ Fields of agriculture, forestry, and fisheries (forcing culture using plastic greenhouses, soil fixation, forestation, fast-growing trees, etc.)
 - Social science and other fields (CO₂ reduction scenario, carbon recycling introduction promotion scenario, institutional design to promote carbon recycling, study on attachment of value to CO₂, etc.)
 - Technologies related to circulation of carbon resources (including plastics)
 - Technologies related to the enhancement of value of carbon recycling (including CO₂ visualization supported by AI and IoT technologies, conversion to high added-value materials using CO₂)
 - Other fields (technologies contributing to mitigation of climate change)

(3) Scope of Applicants

An applicant(s) must be a researcher(s) or research team affiliated with a university, company, incorporated association/foundation, etc. (hereinafter referred to as the “affiliated institution”). An application should be submitted after obtaining approval from the affiliated institution. The principal investigator may be of any nationality but must belong to Japanese affiliated institution. He/she is not required to hold the CRF membership.

In particular, young researchers who work to help achieve carbon neutrality by 2050 are

encouraged to apply.

(4) Amount of Grant

The amount of the grant will be up to 10 million yen per application and awarded to approx. 10 individuals/teams.

(The average amount of the past programs were approx. 7 million yen per recipient.)

(5) Period of Grant

The research period subject to the grant shall be not more than two years from the date when grant decision is made.

However, the grant is provided on the conditions that, after one year passes from the date when grant decision is made, the recipients is to give presentation at the progress report meeting and submit the interim report.

(6) Application Method

(i) Documents to be submitted

- Applicants must submit application documents in both hard copy and electronic data to the address and the Microsoft forms given under item (11) below.
- Hard copy: Submit documents 1) and 2) below to arrive at the Secretariat by Wednesday, June 15, 2022 (as indicated by the postmark) using postal mail or specified correspondence delivery. Please be aware that submitted documents will not be returned.

1) One set of the Grant Application Form (a set including Form 1: Research Grant Application Form Cover Sheet and Form 2: Research Grant Application Form)

2) One copy of reference material that indicates the details of the affiliated institution's activities, such as a company information booklet or brochure

- Electronic data: Submit electronic data (PDF in color) of Grant Application Form (a set including Form 1: Research Grant Application Form Cover Sheet and Form 2: Research Grant Application Form), as well as a video clip described in (ii) below to store the files on a cloud service (e.g., BOX, firestorage, and Giga File *bin*) and answer the basic information (written in Form 1) and the link of the file to the Microsoft forms by 5:00 p.m. on Thursday, June 15, 2023. If you cannot share by any cloud services, you also can send by email (grant@carbon-recycling-fund.jp).

(ii) Other items for submission (video clip: optional)

- An applicant may use a camera on a smartphone or PC to create a self-promotion video that is not longer than three minutes, covering self-introduction, the gist of the research, his/her enthusiasm, and so on. The submission is optional.

(iii) Application Period

From Wednesday, May 10, 2023, to 17:00, Thursday, June 15, 2022 (If submitting by postal mail, application must be postmarked no later than June 15.)

No public briefing for researchers will be held. If you have any questions, please contact us at the address given under item (11) below.

In the event that the affiliated institution's seal cannot be obtained on the application form by the submission deadline, the application form will be accepted without a seal. In such case, however, a sealed application form must be submitted by Friday, July 14.

(7) Selection Method

- (i) Applications will be screened by the screening committee.

- (ii) The results of the selection will be notified to applicants in about early August.
- (iii) Successful applicant(s) will receive the Grant Decision Notice and documents describing procedures for receiving the grant.
- (iv) Applicant information (name of principal investigator and affiliated organization) and the theme of research selected for the grant will be publicized on the Institute's website. In addition, the same information may be announced at seminars hosted by the Institute, as well as at seminars and academic conferences hosted by other organizations.

(8) Awarding of grant

- (i) The Institute will deposit the grant into the account designated by the affiliated institution without delay after deciding to award the grant. When necessary, at the time of the decision being made to award the grant, the Institute will consult with the applicant to determine the timing and method of the grant payment.
- (ii) When the grant is awarded, the applicant must submit an acknowledgement that he/she adheres to the conditions specified under item (9) below.
- (iii) The grant is not required to be repaid except for cases described under item (9), paragraph (i) below.

(9) Points to Note for Awarded Grant

There are the following three points to note for awarded grant. For other details, see the Guidelines for Research Grant Program posted on the website.

- (i) No particular restrictions have been set for the use of the grant, as long as the expense is truly necessary for the research. For details about item names, see the Guidelines for Research Grant Program. However, the grant may not be used for indirect expenses of the affiliated institution.
- (ii) When the research is completed, the Results Report outlining the research results shall be submitted to the Institute. The Final Progress Report shall also be submitted to the Institute within 30 days after the completion.
- (iii) The grant will be awarded in accordance with the descriptions in the Research Grant Application Form.

(10) Handling of Personal Information

Unless otherwise required by law, etc., the Institute will not provide any third party with the personal information provided in the submitted documents without prior consent of the individual.

(11) The Secretariat (Application Submission Address and Contact Information)

Address: Daiwa Nishi-Shimbashi Building 3F, 3-2-1, Nishi-shimbashi, Minato-ku, Tokyo, 〒105-0003

Innovation Department, Carbon Recycling Fund Institute (CRF)

Person in charge: Shiokata (Mr.)

Phone: 03-6432-0011

Microsoft Forms for application: <https://forms.office.com/r/sZkaWkaS1y>

Email: grant@carbon-recycling-fund.jp

(12) Others

The Institute will provide various types of support (e.g., the Institute will offer services such as matching applicants with member companies.) to rejected applicants, so feel free to contact us.