



IIT DELHI



CENTRE OF EXCELLENCE FOR RESEARCH ON CLEAN AIR
INDIAN INSTITUTE OF TECHNOLOGY, DELHI
HAUZ KHAS, NEW DELHI-110016

Date: 24.04.2021

CALL FOR RESEARCH PROPOSALS

To

**All Faculty Members,
Indian Institute of Technology, Delhi
Hauz Delhi -110016**

Subject: Call for Research Proposals on Carbon Sequestration Technologies

Centre of Excellence for Research on Clean Air (CERCA) invites research proposals from expert faculties of IIT Delhi for developing innovative Carbon sequestration technologies. The selected proposal would be considered for financial support by CERCA, IITD.

Genesis: The Genesis of the program is global concern about GHG emissions especially CO₂ emissions which is a major contributor to GHG emissions responsible for global warming. CERCA's mandate includes research on Climate change besides Ambient and Indoor Air quality. Carbon Dioxide is the largest contributor to climate change (~63% of GHG). Other short-lived climate-forcing pollutants (SLCPs) include Nitrous Oxide (N₂O), methane, black carbon, organic carbon, ground-level ozone, sulphate aerosols, Fluorinated gases (F-gases) such as Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur hexafluoride (SF₆). All of them have significant impacts on the climate. These sources of atmospheric pollution could lead to severe and irreversible changes for people, assets, economies and ecosystems including food security, rising sea levels and stronger storms affecting coastal areas, health issues, migration, and growing economic damages which are only a few of the immediate implications of climate change. The consequences of climate change on the social systems are expected to vary in different regions of the world on account of several regional and other local factors. Therefore, different modeling studies, adaptation strategies and technology systems would be required in different geographical and social contexts. To protect the earth from the adverse effects of climate change, efforts are being made to reduce the dependence on fossil fuels through improved efficiency and introduction of non-fossil energy sources like solar and nuclear energy. However, while these strategies may slow the build-up of atmospheric CO₂, they will not reduce emissions to the level required by the United Nations Framework Convention on Climate Change (UNFCCC). In other words, the fossil fuels, which currently supply over 85% of the world's energy needs, are likely to remain our primary energy source for the foreseeable future. With the growth in India's industrial production and GDP, we are bound to see increases in GHGs especially CO₂. The current measures to adopt green technologies alone may not be sufficient to address the problems of CO₂ build up. This has led to increased interest in a new strategy termed Carbon Capture and Sequestration (CCS)/Carbon Capture Use and Storage (CCUS). Therefore, carbon dioxide removal (CDR) technologies could be the best option for long-term removal, capture or sequestration of carbon dioxide from the atmosphere to slow or reverse atmospheric CO₂ pollution and to mitigate or reverse global warming.

In view of the global developments vis-à-vis Indian R&D efforts on emerging areas of Carbon Sequestration Research, CERCA invites Research Project proposals on various possibilities of CO₂ Sequestration Research as given below.

R&D Areas:

1. Carbon capture process development
2. Catalytic conversion of CO₂
3. Materials for CO₂ capture
4. Membrane separation
5. Effective carbon-dioxide use
6. Sorbents/absorbents
7. Chemical mineralization
8. Development of Nanomaterials for CO₂ sequestration,
9. Carbon dynamics in different land use sector in the long-term context of carbon sequestration; crop land, forest land, grass land, wet land and agro-ecosystem

10. Bio-logical carbon sequestration: including terrestrial, fresh water and marine form including approach for improved Forest Cover, type of trees/ vegetation which may improve CO₂ absorption.
11. Synthetic Photosynthesis to capture CO₂ in the air
12. Modelling of carbon sequestration
13. CO₂ Transportations
14. CO₂ storage (including geological and ocean)

In addition to above, CERCA would welcome development of any novel idea/concept related to CO₂ sequestration. Joint Proposals with Public-Private-Partnership in technologies development and dissemination are also welcome.

Eligibility and Qualification

1. All IIT Delhi faculties are eligible to apply against this Invitation for Proposal.
2. Applications against this Invitation for Proposal in emerging technologies of CO₂ Sequestration may be in association with Industry / NGO.
3. The program encourages multi-disciplinary proposals envisaging network/collaboration of various departments/Centres/Schools within IIT Delhi including collaboration with reputed external institutions having diverse expertise and facilities for synergistic implementation of the Project. However, CERCA would provide financial support to IITD Faculty who would also be the Principal Investigator of the project.

To qualify for such funding, Principal investigators (PIs) are required to provide a concrete and sound research proposal that includes Introduction, Project description, objectives, experimental methods including importance and use of the specific project research outcome. It is expected that the PI will remain in service throughout the duration of the Project.

Review and selection process: A two-phase selection process would be followed. CERCA Research Project selection Committee comprising of members from the academic/scientific community (including from outside IITD), Government and Industry would shortlist a few project proposals. The shortlisted project proposals would be submitted before CERCA Advisory Committee for final selection of Research Proposal/Proposal(s) out of the shortlisted proposals for consideration of financial support by CERCA.

Financial Support by CERCA: CERCA will fund 25% of the Research project cost up to a maximum of Rs. 25 lacs whichever is lower. Research Proponents would arrange balance fund requirements either through Government grants or collaboration with Industry/NGO/Reputed Institutions both within India and Abroad.

Submission Details

Interested faculty should send an email containing:

1. A cover letter.
2. A detailed project proposal document.
3. Address for Communication

Email Address: cerca@iitd.ac.in, Alternate Email Id: cerca.iitd@gmail.com/hemantkaushal.india@gmail.com

Email subject (to be used verbatim): Call for Research Proposals on Carbon Sequestration Technologies for CERCA financial assistance.

Application Deadline: Applicants can submit their proposal by **30th June 2021**.

List of Annexures:

Proposal guidelines

CERCA Project Proposals Guidelines

Each application should provide a project title and proposed timeline, the name(s) of the Principal Investigators (PI) or Co-PI(s), an abstract of 300-500 words, and the following documents: the CV(s) of the PI and Co-PI(s)

The project proposal should have a summary statement of the objective of the proposal, describing how the project will benefit from. It should also include following necessary points mentioned below:

- What additional knowledge/ insights do we expect to generate?
- What problem can it help in solving? (in the broad context of Climate change)
- What will be the deliverables and timeline?
- Are we being asked to fund a particular component of a larger project?
- Is the project a pilot study or seed project leading to a larger one? Or is it a one-off project, complete in itself?
- Have the applicants also applied for other grants?
- What is the overall significance of the project for which funding is being sought?

Budget Guidelines

The budget proposal may include costs necessary to accomplish project objectives and to carry out the described research activities. It should also include an itemized estimate of costs and describe how estimates were calculated and how it is reasonable in relation to the anticipated outcomes.