



Alfred P. Sloan
FOUNDATION

CALL FOR LETTERS OF INQUIRY:

NET-ZERO AND NEGATIVE EMISSIONS TECHNOLOGIES

Grants between \$1-1.5 million for collaborative science and engineering research projects led by early- and mid-career scholars to better understand net-zero interventions and negative emissions technologies in the United States

Submission Deadline: April 1, 2019

I. Overview

The Alfred P. Sloan Foundation has established a new, dedicated component within its Energy and Environment program focused on supporting energy and environmental science. *The Foundation is currently soliciting Letters of Inquiry for innovative, collaborative academic research projects led by early- and mid-career scholars that examine net-zero interventions and negative emissions technologies in the United States.* This is one of two open Calls for Letters of Inquiry announced by the Foundation’s Energy and Environment program, with the other Call focused on utilizing new sensor technologies to monitor energy or environmental systems, available at sloan.org/SENSOR-LOI.

A small number of full proposals will be invited from submissions responding to this Call. Resulting grant awards are expected to range from \$1-1.5 million over a 3-year period.

Given the need to substantially decarbonize multiple sectors throughout the economy and reduce the stock of carbon dioxide and other greenhouse gases in the atmosphere, scholars are increasingly interested in a host of new science and engineering questions associated with net-zero interventions and negative emissions technologies. While there is much debate over how to define these kinds of approaches, “net-zero energy systems” are generally considered to be those that do not add carbon dioxide or other greenhouse gases to the atmosphere. “Negative emission technologies” are generally categorized as attempts to mitigate or adapt to climate change by reducing or removing greenhouse gases that already exist in the atmosphere. The intention of this Call is to be broad in scope, encompassing natural, ecological, biological, technological, or engineered approaches for the utilization, storage, or sequestration of carbon dioxide or other greenhouse gases.

The Sloan Foundation’s Energy and Environment program is interested in motivating new research in these topic areas and encouraging a new generation of scholars to make progress on these questions. Proposed research projects should demonstrate the following characteristics:

- Cutting-edge, multidisciplinary science and engineering research with potential for significant advancements in knowledge on net-zero and negative emissions technologies.
- Leadership by early- and mid-career faculty at the Assistant or Associate Professor levels.

- Collaboration between scholars from multiple fields of science and engineering, either within or across universities. Relevant disciplines include but are not limited to: chemistry, biology, physics, environmental science, ecology, atmospheric science, civil and environmental engineering, and energy systems modeling, among others.
- Training of students (graduate students, postdoctoral researchers, or undergraduates) in science and engineering disciplines related to net-zero and negative emissions interventions.
- Engagement with a range of stakeholders to help inform decision-making, including those in government, industry, and non-governmental organizations.
- Ability to leverage financial support or in-kind contributions from other sources.

II. Research Questions

Example research questions for examination include but are not limited to:

- What ecological, chemical, biological, or engineering factors affect the performance of net-zero interventions or negative emissions technologies?
- How do different net-zero or negative emission approaches compare in terms of their ability for greenhouse gas uptake, storage, or sequestration? How do natural and technological greenhouse gas removal approaches relate to and compare with one another?
- What scale of impact might different net-zero or negative emissions approaches have on either avoiding further accumulation of greenhouse gases in the atmosphere or the permanent net removal of emissions from the atmosphere?
- What advancements in environmental science, materials science, chemistry, biology, or engineering are needed to develop new net-zero or negative emissions interventions?
- What biological or material characteristics are critical for capturing, removing, storing, or sequestering carbon dioxide or other greenhouse gases from the atmosphere?
- How can carbon sequestration in soil, biological, or agricultural systems be accelerated?
- What science and engineering advancements are needed to improve the scale of utilization of carbon dioxide or other greenhouse gases for productive purposes?
- How can different net-zero or negative emissions interventions be combined with other mitigation and adaptation approaches to reduce greenhouse gas emissions?

III. Eligibility and Submission Deadline

Lead investigators of proposed projects must be Assistant or Associate Professors at U.S. universities or colleges. The Foundation strongly encourages submissions from diverse teams led by women or underrepresented minorities. Researchers may participate on more than one proposed project. Senior faculty and non-U.S.-based researchers may participate in proposed projects and are eligible to receive funding as research team members, advisors, or collaborators.

Submissions are due no later than Monday, April 1, 2019 at 5:00pm EDT. Submission materials must be integrated in a single PDF document and sent by email to energy@sloan.org, with subject heading and document title: NET LOI – <Lead Researcher Name>.

IV. Submission Components

Submissions must include the following 3 components:

(1) A completed 1-page Sloan Foundation Proposal Cover Sheet, summarizing key research project details. Projects should have a proposed start date of January 1, 2020. The Proposal Cover Sheet is available at: <https://sloan.org/grants/apply#tab-grant-forms>

(2) A Letter of Inquiry 4-5 pages in length (excluding budget table and other material), written in 12-point font. Submissions should answer the following questions, with each question serving as a section heading:

1. What is the core research question and why is it important?
2. What are the current knowledge gaps on this question?
3. What is the proposed research methodology?
4. What will be the outputs from the research project and how will they be disseminated?
5. What are the proposer and team qualifications?
6. What other sources of support can the project leverage?

(3) Supplemental material following the Letter of Inquiry, including:

1. A draft budget table for the proposed project. Funding requests are expected to range from between \$1-1.5 million over a 3-year period, with sub-awards to collaborating partners indicated where appropriate. Allowable expenses will generally include:
 - i. For faculty: up to one-month summer salary per investigator per year, plus benefits, capped at \$25,000 per investigator per year, based on project time commitment
 - ii. For graduate students, postdoctoral fellows, or undergraduate researchers: stipend and tuition reimbursement, plus benefits, based on project time commitment
 - iii. Support for project-related administrative and research staff
 - iv. Instrumentation, hardware, data acquisition, computational, and laboratory expenses
 - v. Travel and research dissemination expenses
 - vi. Indirect overhead expenses capped at 15% of direct costs
2. References or bibliography
3. Brief CV of key project leads and personnel (no more than 2 pages per person)
4. Letters of support from research partners, collaborators, or data providers, if available

V. Review Process

An expert review committee will assess submitted Letters of Inquiry. A small number of selected project submissions will be invited to prepare a full research proposal for consideration, likely to be submitted by early August 2019. Invited full proposals will be further reviewed. Proposers will receive feedback and asked to prepare a response to reviews, likely to be submitted by late September 2019. Final award decisions are expected will be made before the end of 2019. Some proposers may be invited to present proposed projects to the Foundation as one component of the review process.