



Technology Assessment Grant 2023

Evaluating the Economic and Environmental Efficacy of a New Agricultural Waste Treatment Technology

Request for Proposals

Application deadline: 5:00 pm, September 18, 2023

The North Carolina Collaboratory, headquartered at the University of North Carolina at Chapel Hill (UNC-Chapel Hill), is requesting proposals to assess the environmental and economic efficacy of a new technology that treats agricultural waste.

Key Information

- **Eligible applicants:** Any institution of higher education in North Carolina.
- **Subaward requirements:** Prime award recipient(s) will be required to enter into a subcontract agreement with academic researchers at City College of New York.
- **Total funding available for program:** \$100,000 in unrestricted funds.
- **Award budgets:** Applicants may request up to \$100,000 in direct costs, including costs for a subaward to City College of New York.
- **Award performance period:** Projects may last for up to 12 months.
- **Funding requirements:** All funds distributed via this funding opportunity are unrestricted funds and must be used in accordance with applicable university research policies.
- **Spending restrictions:** No indirect (F&A) costs are permitted, as per Article 31A of North Carolina General Statute (NCGS) Chapter 116-255 Subsection (c)(2).
- **Matching funds requirement:** None.

This RFP is solely a request for expressions of interest and statements of qualification. It is not an offer to contract or an invitation capable of acceptance to create a contract. The Collaboratory may cancel or modify this RFP at any time without liability for any loss, cost, or expense as a result of that cancellation or modification. For more information about the Collaboratory and previously funded projects, please see <https://collaboratory.unc.edu/>.

All applicants should read these instructions thoroughly before preparing an application. Questions regarding this Request for Proposals (RFP) are welcome and may be sent to collaboratory@unc.edu

Important Dates

- **Pre-proposal application deadline:** 5:00pm on September 18, 2023
- **Estimated award announcements:** November, 2023
- **Earliest project start date:** December 1, 2023

Purpose of Funding Opportunity

Established in the summer of 2016 by the North Carolina General Assembly, the Collaboratory facilitates the dissemination of expertise within institutions of higher education for the benefit of communities, economies and the environment in North Carolina. This includes fostering partnerships between academia and industry to advance the development of new technologies that could benefit the State.

The purpose of this funding opportunity is to support a research and development partnership with Upcycle Solutions, LLC, which has recently patented a new hydrothermal technology to treat wet organic waste from agricultural and other sources, such as chicken manure, hog manure and food waste. Details about the technology can be found in the following publication:

Vakalis S, et al. Operation and Thermodynamic Modeling of a Novel Advanced Hydrothermal Reactor: Introduction of the Novel 3-Step Evolution Model. Energies 2023, 16(4), 2032.
<https://doi.org/10.3390/en16042032>

Preliminary prototype results indicate that this technology can transform wet organic waste into economic products (such as hydrochar, syngas, usable water and minerals) within hours and in an environmentally friendly manner, and may have the potential to reduce the need for large waste storage facilities. A small-scale prototype has recently been rebuilt in partnership with City College of New York that is ready for in-depth testing, analysis and further development in partnership with academic researchers in North Carolina.

Priority Areas

The goal of this funding opportunity is to generate information that can be used by Upcycle Solutions to improve, scale and implement this hydrothermal technology in North Carolina. Applicants should describe how they can address one or more of the following *Priority Areas*:

- 1. The performance, scalability, and economic and environmental efficacy of the technology relative to the transformation of wet organic waste into minerals, usable water, hydrochar, syngas and other potential economic products.**
- 2. Optimal conditions and/or feedstocks for use with this technology.**
- 3. Comparative economic and/or environmental efficacy of the technology in relation to other, existing methodologies at commercial scale.**

Funding Guidelines

All funds distributed via this program constitute unrestricted funds. Applicants may request *a maximum of \$100,000 in direct costs only*, including a subaward to City College of New York. Budgets should reflect the actual needs of the proposed project and the scope of work for both institutions.

Allowable budget requests:

- Salary and fringe/benefit costs for university personnel who are directly contributing to project activities (e.g. principal investigators, project managers, research staff, and students)
- Consultants (e.g. community/government partners)
- Travel expenses (e.g. mileage, airfare, accommodation, per diem)
- Equipment
- Materials and supplies
- Contracted services
- Publication fees
- Student tuition and fees
- IRB/IACUC costs

Budget restrictions:

- Institutional overhead/indirect costs (F&A) are not permitted, as set forth in North Carolina General Statute (NCGS) 116-255(c)(2).

Eligibility

Applications will only be accepted from institutions of higher education in North Carolina. Any individual with the resources, skills, and knowledge required to carry out the proposed activities may serve as Principal Investigator in accordance with their institutional policies and procedures. Individuals from underrepresented racial and ethnic groups and individuals with disabilities are encouraged to apply for this opportunity.

Subaward Requirements

All applications must describe a subaward research partnership with [Dr. Marco Castaldi](#) at City College of New York, professor of chemical engineering and director of the CCNY Earth Engineering Center. Dr. Castaldi has worked with Upcycle Solutions for nearly 10 years to develop and test the technology. During the performance period, Dr. Castaldi will serve as the Principal Investigator of the subaward and provide the prime award recipient(s) with access to the technology, as well as technical support and performance data during the award period.

To plan and prepare an application, applicants should contact Dr. Marco Castaldi via email at mcastaldi@ccny.cuny.edu.

Project Requirements

Project Timeline

Projects may last for up to 12 months.

Confidentiality and Data Sharing Agreements

Applications will only be considered from institutions of higher education in North Carolina that have the capacity to negotiate and execute confidentiality and data sharing agreements with both university and industry partners.

Travel

The small-scale prototype is based at City College of New York, Manhattan. Based on the proposed approach and scope of work, applicants should consider anticipated travel time and costs, if any, when preparing their applications.

Deliverables and Reporting Requirements

Applicants that are selected for funding will receive reporting schedules and instructions from the Collaboratory. In total, three types of reporting will be required for this project:

1. Quarterly progress meetings with the Collaboratory and Upcycle Solutions.
2. One final performance report to summarize all project activities, findings and conclusions.
3. One final financial report to summarize all project expenditures.

Additional deliverables may include:

- Presentation slide decks for quarterly progress meetings.
- Datasets and other supporting documentation generated during the performance period.
- Peer-reviewed publications.

Public Dissemination

The purpose of this funding opportunity is to assess and advance technologies that have the potential to benefit communities, economies and the environment in North Carolina. All projects and findings may be shared with public audiences to maximize potential benefits for the State.

Application Instructions

The application process comprises two stages:

Stage 1: Pre-Proposal

All applicants are required to work with [Dr. Marco Castaldi](#) at City College of New York to submit a pre-proposal using the template available for download via the Collaboratory's webpage for this funding opportunity. **To plan and prepare a pre-proposal, applicants should contact Dr. Marco Castaldi via email at mcastaldi@ccny.cuny.edu.**

Stage 2: Full Proposal

Following reviews of all pre-proposals, select applicants will be invited to submit a full proposal in partnership with Dr. Castaldi (template to be provided by the Collaboratory).

All project activities must be conducted in accordance with established federal guidelines and policies for research involving animal and human subjects, as applicable for the proposed scope of work. IRB and/or IACUC approval are not required at the time of submission, but the application should provide relevant IRB and/or IACUC details as requested in the proposal templates.

Submission Instructions

The deadline for Stage 1 pre-proposal submissions is 5:00pm on September 18, 2023. Pre-proposals received after this deadline will not be reviewed or considered for funding. If applicants do not receive a

submission confirmation email from the Collaboratory within one week, please contact collaboratory@unc.edu.

Completed pre-proposals should be submitted as a single PDF via the Collaboratory's secure application portal: <https://projects.collaboratory.unc.edu/applications/>

Important notice for UNC-Chapel Hill applicants: An IPF submission in RAMSeS is *not* required for this RFP because the Collaboratory is headquartered at UNC-Chapel Hill, and these funds therefore constitute an internal award. Any UNC-Chapel Hill applicants that are selected for funding will receive guidance on RAMSeS procedures from the Collaboratory during the post-award phase.

Submission of an application to this RFP indicates an acceptance of all the requirements for this funding opportunity. Applicant institutions are responsible for a) ensuring all proposals submitted to the Collaboratory have been reviewed and approved by appropriate institutional personnel and b) overseeing compliance for all awarded projects.

Review Criteria

The Collaboratory seeks to ensure the highest principles of academic research rigor and scientific inquiry are followed in all projects. Accordingly, reviewers will assess proposals for compliance with the following principles:

1. The development of significant questions that can be investigated empirically.
2. Linkage of research to relevant theory.
3. The use of methods that directly address the question(s) of interest.
4. A coherent and explicit chain of logic and reasoning.
5. A standard of generalizability with existing research and research contexts.
6. Publication of research to encourage professional critique.

Specific to this funding opportunity, reviewers will also evaluate all proposals according to the following criteria:

7. Does the proposal address one or more of the *Priority Areas*?
8. Does the project have the potential to generate deliverables that can be utilized by Upcycle Solutions to improve, scale and implement this technology in North Carolina?
9. Does the proposal describe an effective partnership with City College of New York?
10. Is the project team qualified to conduct the proposed activities?
11. Is the applicant institution capable of negotiating and executing confidentiality and data sharing agreements associated with this project?
12. Are the total direct costs requested reasonable for the proposed activities and timeline?
13. Is the plan for performing the proposed activities well-reasoned, well-organized, and based on sound rationale?

Contact

Questions regarding this funding opportunity and the application process are welcome and should be sent to the Collaboratory team via email to collaboratory@unc.edu.