

CLEAN ENERGY & SUSTAINABILITY INNOVATION PROGRAM

What can you expect to gain during this program?

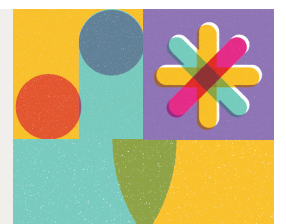
- Develop your interpersonal communication and **critical-thinking** skills
- Work with UConn faculty and industry personnel to get *your* teams idea in development
- Learn about the ins and outs of research and **problem-solution development**
- Access to **continued opportunities** in research and **internships with Eversource**
- Contribute to decarbonizing UConn and reaching long-term sustainability goals!
- Receive **\$2,500 stipend** for the summer to work on your idea with your team!

Program Description

UConn is committed to sustainability and taking the necessary steps to reduce its carbon footprint, foster environmental justice locally and globally, and prepare for climate extremes. UConn recognizes that these challenges will take innovation and buy-in from the entire university community. **To this end, UConn is partnering with Eversource Energy to support students interested in participating in the design of our energy future through a funded innovation competition that could lead to a grant-funded research program.** This is a unique opportunity for teams of undergraduate and graduate students to propose their own ideas to facilitate a clean energy transition at local, state, and regional levels (see below). Selected student teams will receive summer funding and be paired with mentors from the UConn faculty and Eversource Energy, to support the development of ideas on the real-world dimensions and details of the clean energy transition. **We welcome all students across the university to pitch their “grant ideas” to explore sustainability problems that matter to them!**



Through this summer program, students will get to workshop their ideas in both an **academic** and **industry** setting and develop the skills to apply critical thinking to their clean energy sustainability ideas.



Teams will present their projects at a University-wide Sustainable Clean Energy summit in October and be eligible to receive additional funding and support to extend their research and development throughout the 2024-2025 Academic Year.

Problem Statement

Reaching decarbonization targets is a complex process that requires interdisciplinary teams. The goal of this summer innovation program is to address the clean energy sustainability problem at **local** (UConn campuses), **State** and **regional** (New England) levels:

- **Local:** UConn currently relies on its on-site Co-Generation Facility that uses natural gas to meet the energy needs of its main campus in Storrs. However, the facility and its associated distribution infrastructure is currently at its capacity limits. This fact, combined with a desire to move to a cleaner source of energy than natural gas to reduce carbon emissions, means that a solution will need to be developed to enable the co-gen facility to retire and meet both the current and future projected energy needs of the campus. With the growing adoption of electric vehicles and electric sources of heat, combined with the general economic and population growth of the university, a load of 35 megawatts is predicted for 2025 and 70 megawatts for 2040. A comprehensive solution to this challenge would include evaluating what the possible different approaches are, including new sources of generation, transmission and distribution infrastructure upgrades, costs, impacts to campus life, etc.

Sample Local questions: *What is the optimum installation at the Supplemental Utility Plant or elsewhere for increasing the production of power to the 2025 and 2040 targets with the least carbon, NOX, and SOX emissions? Which enabling projects are required? What are the costs? How does consumption load-shaping affect the burning of fossil fuels? The use of sustainable fuels? What is the optimum load-shaping for the campus to limit GHG emissions? Is this achievable? How are ground source heat pumps used for heating and cooling? How can they be used in central campus or for peripheral campus buildings? What are the limitations to the distribution of power on the UConn campus? What is the maximum power that the current circuits can absorb? How can they be updated? How does the Eversource grid compare to the UConn microgrid for GHG emissions?*

- **State:** Connecticut has committed to getting all of its energy from zero carbon sources by 2040 and reducing statewide emissions 45% by 2030 and 80% by 2050.

Sample state questions: *What is needed to meet these goals? Areas of further research could include costs to different stakeholders, growth of renewables, impact of new transmission, new supply-side technologies, increasing load growth, other sources to reduce emissions, etc. If solar panels are used for supply of clean electricity, what is the area required for meeting the state goals? What happens on an overcast day or at night? How is battery storage accomplished and what area does it require?*

- **Region:** While the New England region has made significant progress on the path to a clean energy future, as older fossil fuel power plants have been retired new clean energy power sources like offshore wind, solar and hydro have not been developed at the same pace. This has created a lingering dependency on natural gas for power generation. In the winter when there is a shortage of pipeline-delivered natural gas (because it goes to heating homes and buildings first), power plants turn to liquified natural gas (LNG) imported from other countries or fuel oil delivered via barge, tanker trucks, or oil pipelines. Projects to bring additional pipeline capacity to the region, as well as transmission projects to deliver on-demand clean energy resources like hydro, have failed thus far. This has resulted in high energy supply costs and the possibility of power interruptions during prolonged periods of extreme cold during the winter where there is not enough fuel available to meet the demand.

Sample regional questions: *How do we ensure that electric reliability is maintained during the winter months while transitioning to a clean energy future? What changes are needed to energy supply, transmission and distribution infrastructure, policies, etc.? What would be the timeframes for implementing these changes? How will the possible solutions evolve with time? How do we also ensure that our infrastructure is resilient to the increasing effects of climate change, including more extreme heat, cold and increasing storms?*



Challenge

The goal of the challenge is for student teams to propose potential projects to address **one or more** of the above questions. Students will submit these proposals and selected teams will work over the summer on an “idea grant” that would formulate possible solutions (**both technical, social, and political**) to address a specific aspect of the grand challenge of decarbonization (campus, state, region). Your idea can be relevant at either or all levels.

Application Details & Timeline

Team Requirements

Teams must be comprised of **two or three students** (undergraduate and/or graduate) from a minimum of **two different disciplines**.

Program Timeline

- Teams will need to submit proposals by **May 5, 2023**. Proposals should entail one paragraph explaining the “grant idea” that the team wants to work on over the summer; and personal statements from each team member that includes their major, activities on campus and their motivation for applying (how this program can support their study and/or career)
- Teams will be selected by Eversource and UConn committee by **May 17, 2023**. Selected teams receive fellowship to work on the “grant idea” in the period of **June 01 – August 10, 2023**
- Teams will be supported by two mentors: a **UConn faculty and Eversource staff**
- Team members will have the opportunity to spend time at Eversource during the summer, if they so choose.
- Each team will present their work at the **Sustainable Clean Energy Fall 2023 Summit**.
- Winning team(s) will receive a **continuation grant** to further develop their work throughout the academic year in close collaboration with an Eversource department

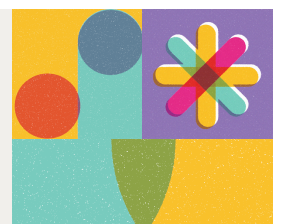
Student Stipend

Each selected student will receive a **\$2,500 fellowship** to work on their project with their team during Summer 2023 (June-August).

Submissions



Please submit all of your materials to **engr-cleanearth@uconn.edu** by **May 5, 2023**.



UConn **EVERSOURCE**

