

Cornell Energy Institute

Aspiration

A world in which people can satisfy their energy needs without compromising the environment or the ability of future generations to do the same.

Mission

CEI brings together people with diverse capabilities (faculty, students, alumni, external partners) in pursuit of a common purpose:

Creating the capacity to conceive, develop and deploy sustainable solutions, to meet the world's critical energy challenges.

Approach

Educate: We train the next generation of engineers and scientists in the fundamentals of sustainable energy systems.

Innovate: We conceive solutions to sustainable energy problems through novel research and development. We use a multidisciplinary approach to teaching and research, accessing the breadth of Cornell's capabilities in e.g., engineering, natural and social sciences, business, agriculture, and law.

Implement: We deploy new energy solutions rapidly via "living laboratories". This approach gives students leadership experience in multidisciplinary teamwork and achieves timely, real world impact. We apply a transformational systems approach to tackle complex problems, balancing the social, economic, environmental, political and technical aspects.

Engage: We inform the public regarding their potential energy use choices and trade-offs. We build strong, comprehensive partnerships with external parties that have common aspirations and complementary resources.

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Areas of Concentration

Subsurface Systems

Developing multiscale approaches to sustainable subsurface resource utilization at the intersection of Engineering disciplines and Earth Science.

Geothermal heating and cooling

Mineral recovery from geothermal brines

Induced seismicity

Microseismic fracture mapping

Interferometric Synthetic Aperture Radar (InSAR) methods

Carbon management

Biofuels and bioproducts

Expanding Cornell's biomass portfolio using novel feedstocks and thermochemical processing

Algae to biofuels and animal feed

Life cycle analysis (LCA)

Techno-economic assessment (TEA) evaluation

Hydrothermal conversion of agricultural residuals and food wastes

Aerodynamic and Hydrokinetic Energy

Focusing on power from wind and tidal flows, including their effect on avian and marine mammal populations.

Large scale wind power deployment

Tidal basin power

Community energy usage

Applying a unique systems approach to evaluating options for sustainable energy systems in the context of rebuilding aging infrastructure.

Model sustainable communities in upstate New York

At scale deployment of renewables and smart buildings on Cornell Campus

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Value Proposition

Features	Benefits	Evidence
Institutional commitment to sustainability at Cornell and in society	Assurance that top talent will focus on a University-wide priority.	Investment in combined cycle power/heating plant. Lake source cooling. Investment in ACSF. Climate Action Plan. Synergy with ACSF.
The only Ivy League Institution with a Land Grant mission (“Knowledge with a Public Purpose”)	Depth and breadth in all key academic disciplines on a single campus. Ability to take on big challenges. Opportunity to apply new ideas at scale. Increased return on investment (both time and \$).	Utica Sustainable Communities Project. NY Tech Campus.
Multi-disciplinary, systems approach	Opportunity to tackle complex problems, take on tough issues.	Earth-Energy IGERT program Algal biofuels/animal feed program. Effect of wind power on avian/marine populations. AVF grants from ACSF.
Access to talented, well-trained students	Graduates become immediately productive employees.	Highly sought students. Success of student competitive teams.
Collaborative research/analysis	Opportunity to interact with talented faculty and students on problems of mutual interest. Access to any IP created.	ACSF IP policy.
Sponsored research/analysis	Efficient way to extend internal capabilities.	
Energy forums/symposia	A neutral venue to explore sustainable energy issues.	