The Illinois Sustainable Technology Center contributes solutions for a sustainable future through basic and applied research, extensive expertise, and a wealth of objective data to benefit the people, economy, and environment of Illinois. ISTC is a division of the Prairie Research Institute at the University of Illinois.
On Dec. 9, U.S. Secretary of Energy Jennifer M. Granholm toured several U of I sustainable energy projects, including PRI’s carbon capture efforts at Abbott Power Plant. During the visit she also heard about PRI's extensive work in carbon sequestration.

Read more about PRI's carbon management and sustainable energy research.
Climeworks’ Orca plant, the world’s largest direct air capture and CO2 storage plant, in Hellisheiði, Iceland. ©Climeworks

**ISTC-led team to design large-scale system for direct air capture and storage of carbon dioxide in the U.S.**

The [U.S. Department of Energy National Energy Technology Laboratory (DOE-NETL)](https://www.energy.gov/DOE-NETL) has partnered with ISTC in a nearly $2.5 million project to develop preliminary designs and determine feasibility for the first commercial-scale direct air capture and storage system (DAC+S) for CO2 removal in the United States.

The 18-month project will explore the possibility of pulling 100,000 tonnes of CO2 from the air annually. Project principal investigator OBrien believes this amount will help offset steep upfront costs and make the service profitable, at least at a commercial scale.

The project will use DAC technology provided by the Swiss company [Climeworks](https://www.climeworks.com). Climeworks has built and operated several DAC plants in various climates across Europe, among them...
the world’s first industrial-scale DAC plant in Hinwil, Switzerland, and the world's largest DAC+S plant, Orca, in Hellisheidi, Iceland.

U.S. Department of Energy announces investment to further develop carbon capture technology via FEED study

The United States Department of Energy’s National Energy Technology Laboratory (DOE-NETL) recently selected the University of Illinois for $4 million in federal funding for a front-end engineering design (FEED) study to develop a commercial-scale carbon capture project that separates 95% of total CO2 emissions at an industrial facility.

The scope of work also includes a business case outlining a potential model for commercial scalability, as well as analyses of environmental justice, economic revitalization, and jobs creation impacts.

The project, based in Ste. Genevieve, Missouri, is a partnership of the University of Illinois' Prairie Research Institute, LafargeHolcim in the US, and Air Liquide Engineering & Construction.
New project uses flue gas and wastewater to make algae

A three-year, $2.5 million ISTC engineering-scale project will be one of the first and largest to combine carbon dioxide (CO2) from a coal-fired power plant with nutrients from wastewater treatment plants to cultivate algae for animal feeds. The project, which will integrate an algae cultivation system at the City Water, Light and Power plant in Springfield, Illinois, will demonstrate that producing algae for commodity animal products can be cost-effective and has added environmental benefits.

Principal investigator Lance Schideman is collaborating with University of Illinois researchers Joshua McCann and Carl Parsons, who will conduct the animal feed studies. Global Algae Innovations will provide the algae biomass production system to be demonstrated at field scale for this project. The project is co-funded by the U.S. Department of Energy National Energy Technology Laboratory.
ISTC program looks ahead to renewable energy waste issues

As renewable energy is poised to replace fossil fuels long term in Illinois, ISTC is delving into a looming issue: what to do with solar modules, wind turbines, and electric vehicle batteries that are no longer used.

ISTC’s Renewable Energy Equipment Recover-Reuse Program has expanded from focusing specifically on solar module reuse and recycling to creating additional partnerships with organizations involved in wind energy and electric storage technologies and systems.

DOE publishes survey of U.S. federal and state-level solar system decommissioning policies
DOE’s National Renewable Energy Laboratory (NREL) recently published *A Survey of Federal and State-Level Solar System Decommissioning Policies in the United States*. ISTC’s Jennifer Martin was one of the report’s peer reviewers.

![Photo credit: Zach Samaras](image)

**Illinois Farm to Food Bank Project connects specialty growers with food banks**

The Illinois Farm to Food Bank program recently wrapped up its pilot project with Rendleman and Flamm Orchards in Union County. Nearly 375,000 pounds of peaches and nectarines were distributed to food banks throughout Illinois.

The program also connected Roth Countryside Produce, located in Tazewell County, with a Peoria Area Food Bank agency to purchase $1750 worth of sweet corn, green cabbage, red cabbage, green beans, cantaloupe, bell peppers, green zucchini, golden zucchini, and seedless cucumbers.
Keep up to date with the program through the Farm to Food Bank Feasibility Study newsletter. If you’re a grower who wants to participate in the project, contact TAP.

Example of micro bubble aeration floats (photo credit: John Jacobs, WTR Solutions. Used with permission.)

Tiny bubbles mean big energy savings for Henry POTW

With assistance provided through TAP's Public Water Infrastructure Plant Efficiency Program, the City of Henry Publicly Owned Treatment Works (POTW) replaced their existing lagoon aeration system with Micro Bubble Diffusion (MBD) technology, resulting in significant energy cost savings and a reduction in the dissolved solids present in their treatment lagoons.

Other stories

- U.S.-China Joint Glasgow Declaration on Enhancing Climate Action in the 2020s
ISTC in the news

- Could Prairie State cut enough carbon to avoid closure? University of Illinois has a plan (Belleville News Democrat, 1/7/22)
- Energy secretary promotes infrastructure law at University of Illinois biofuel lab (Illinois Newsroom, 12/10/21)
- Missouri cement plants scramble to cut greenhouse gases. ‘These are the steps that we need to take now.’ (St. Louis Post-Dispatch, 12/7/21)
- Research program will grow algae to feed livestock using captured carbon dioxide at CWLP (Newschannel 20, 12/14/21)
- U.S. Energy Secretary tours UI facilities focused on producing, providing sustainable power (Champaign-Urbana News-Gazette, 12/10/21)

Notable reports & publications

- Compressed Natural Gas Energy Storage (ISTC Fact Sheet TN21-145)
- Renewable Energy Equipment Recover-Reuse Program: Energy Storage and Electric-Drive Vehicle Battery Management (ISTC Fact Sheet TN21-146)

ISTC events

- Mar 10, 2022, noon-1 pm -- Breaking the Plastic Wave: Solving the Plastic Pollution Problem
- Apr 14, 2022, noon-1 pm -- Trichloroethylene (TCE) Alternatives Project

ISTC employment opportunities

Visit the PRI website to see current job opportunities at ISTC.