



Duke Carbon Offsets Initiative 2016 Annual Report



**Duke Carbon
Offsets Initiative**
DUKE UNIVERSITY

Letter from the Program Manager

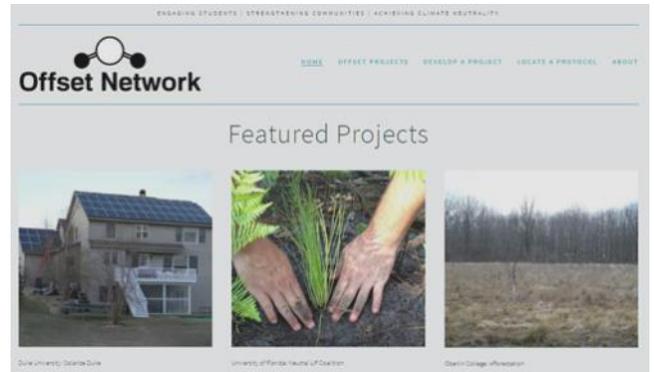
Since its inception, the DCOI has helped dozens of peer institutions better understand carbon offsets — what offsets are, how offset projects can be designed to help local communities, and how to connect projects back to academics and the campus community. With more schools reaching out to us than ever before, we saw a growing interest in offsets and a need for a central resource to help schools develop their offset strategies.

Recognizing this opportunity to further the fourth prong of the DCOI's mission—to facilitate and catalyze high-integrity, unique offset projects by serving as a resource for other institutions—we set out to do just that. In the first part of 2016, the DCOI strengthened our existing relationships with other schools and expanded our network. Then, working hand-in-hand with other schools, we updated the Second Nature Offset Guidance, a resource used by over 600 schools across the country. We ensured that schools would have the flexibility to test and create new and innovative offset projects as well as less expensive verification options. In addition, we established guidelines that encourage schools to develop offset projects that connect back to research and education within their institutions.

But institutions still needed a resource to show them *how*. So, we partnered with Oberlin College and the University of Florida to launch OffsetNetwork.org, a central web resource that shows institutions how to develop high co-benefit offset projects.

We hope that these resources will help others join us in our mission. Looking forward to 2017, our goal is to continue building our momentum to connect and collaborate with schools across the country to bring offset projects to their communities.

Sincerely,



Duke Carbon Offsets Initiative



History

In 2007, Duke University signed the American College and University Presidents' Climate Commitment (ACUPCC) and set a target of achieving climate neutrality by 2024. After being aggressive with reducing emissions on campus, Duke will have to offset an estimated 185,000 metric tons per year of carbon dioxide in 2024. The Duke Carbon Offsets Initiative was created as a branch of Sustainable Duke to help Duke University reach climate neutrality. Since its beginning in 2009, it has developed a variety of innovative carbon offset programs in swine waste-to-energy, energy efficiency, solar, and urban forestry.

Vision

To make Duke University a model climate-neutral institution and to lead peer institutions in their efforts to become climate neutral.

Mission

- To meet Duke University's climate neutrality goal by 2024 by **developing and implementing the University's strategy** for identifying, creating, and purchasing carbon offsets.
- To implement the strategy in a way that **provides educational opportunities** for students, faculty, and staff.
- To **prioritize local, state, and regional offsets that provide significant environmental, economic, and societal co-benefits** that are beyond the benefits of greenhouse gas reduction.
- To **facilitate and catalyze high-integrity, unique offset projects** by serving as a resource for other institutions.

Urban Forestry

5

Cities receiving funding to plant trees

400

Trees to be planted in 2017 in exchange for carbon offsets

40

Trees planted in Wilson, North Carolina in 2016

In 2016, the DCOI launched its urban forestry carbon offset program with a tree planting in Wilson, North Carolina. In collaboration with program partner [Urban Offsets](#), the DCOI planted a total of 40 trees, marking the first carbon offset project of its kind in the US.

Program Highlights

- Finalized and used the DCOI [Urban Forestry Protocol](#) for tree plantings
- Partnered with Urban Offsets to scale urban forestry offset program around the United States
- Completed first offsets-based urban tree planting in [Wilson, NC](#) (pictured on the right)
- Developed partnerships with other universities to plant trees in other cities across the United States



Program Partners

URBAN
OFFSETS

In 2016, the DCOI and Urban Offsets also laid the groundwork for a number of 2017 plantings in 5 cities across the United States with the goal of planting over 400 trees in total. The cities include: Charlotte, NC; Durham, NC; Burlington, NC; Fayetteville, NC; and Phoenix, AZ.

DAVIDSON

ASU
ARIZONA STATE UNIVERSITY

 **ELON**
UNIVERSITY

Ongoing Offset Projects

Energy Efficiency

In 2016, Eileen Thorsos joined as DCOI's energy efficiency education specialist (pictured on the right). The DCOI hosted its first interactive, educational workshop on energy efficiency for Duke students and employees in December. Below are some additional highlights from 2016.

- Published [Designing an Effective Employee EE Program: A Review of the DCOI-HEAL Pilot Program](#)
- Published [Energy Efficiency and the Clean Power Plan: Options and Opportunities](#)
- Collaborated with [Home Energy NC](#) to centralize energy efficiency resources for homeowners/renters



Loyd Ray Farms

The DCOI's swine waste-to-energy project located in Yadkinville, NC had a successful year in both offsets and renewable energy production. Also, the offsets generated by the project over the past two years are being verified by a third-party in compliance with the Climate Action Reserve.



1800

Carbon offsets generated

299

RECs produced

Students from the Bass Connections Program and Duke's Energy Initiative visit LRF to learn about waste-to-energy

- Published [Performance evaluation of a full-scale innovative swine waste-to-energy system](#)
- Published [Design and Assessment of an Innovative Swine Waste To Renewable Energy System](#)

Offset Guidance

17

Schools helped develop new offset guidance

600

Colleges and Universities follow the updated Second Nature offset guidance

30

Percent of emissions can now be offset with peer-reviewed and innovative offsets

Second Nature Guidance

The DCOI helped Second Nature update its guidance on carbon offset purchases and project development. The DCOI was integral to the Technical Advisory Group and authored a section on ***Peer-Reviewed and Innovative Offsets*** that encourages universities to develop local carbon offset projects with an educational focus. The DCOI co-hosted a [webinar](#) with Second Nature to announce the new guidance.



Peer Reviewed Projects

These projects leverage relationships between universities to review offset projects. Designed for small-scale projects where traditional verification would be too costly, these projects also provide opportunities for students and faculty to get involved.

Innovative Projects

Innovative projects allow universities to develop unique offset projects that align with faculty and student research. This project type encourages schools to be first actors and work to create replicable offset project protocols that can be used by other universities and organizations.

Offset Network

Sharing Best Practices

The Duke Carbon Offsets Initiative partnered with Tomorrow's Climate Solutions, Oberlin College, and the University of Florida to create a website dedicated to university-based carbon offset projects. OffsetNetwork.org is a platform that helps schools learn how to develop an offset project, share best practices, and catalyze new partnerships around the United States. The website currently hosts information on 12 projects from 8 universities.

Project Examples



Animal Waste-To-Energy in NC
Duke University



Reforestation in Patagonia Sur
Colgate University



Agro-forestry in Haiti
Sewanee University

Peer Review Committee

Building on the updated Second Nature Guidance, the DCOI is leveraging the Offset Network to establish a peer review committee. This committee will establish the requirements and processes for peer review and innovative offset projects. If your school is interested in participating, please contact us through the [Offset Network](https://OffsetNetwork.org).

Contributing Schools

OBERLIN
COLLEGE OF ARTS & SCIENCES
CONSERVATORY OF MUSIC

Duke

SEWANEE
THE UNIVERSITY OF THE SOUTH

Colgate University

UF UNIVERSITY of
FLORIDA

Yale

Clarkson
UNIVERSITY

UNIVERSITY OF GEORGIA

Visit OffsetNetwork.org to learn more about each project.

Bass Connections

Feasibility Study for a Campus Digester

The DCOI, along with Duke faculty members Marc Deshusses (Pratt), Jay Golden (Nicholas) and Brian Murray (Nicholas Institute), led a team of 6 students to research the feasibility of an anaerobic digester on Duke's campus. Findings identified that a small, educational digester would be feasible and Duke's Facilities Department approved exploring next steps for designing the system. Pictured on the right, students visited a large scale digester in Charlotte, NC to see anaerobic digestion in action.



Energy Reports and Carbon Pricing at Duke University



The DCOI, along with faculty members Billy Pizer (Sanford) and Tim Profeta (Nicholas Institute), is leading a team of 8 students to determine methods of reducing energy use on campus through energy reports and carbon pricing. Pictured on the left, students took a trip to Yale University to learn about Yale's carbon charge program. They will finalize and present their recommendations in 2017.

Animal Waste Management and Global Health

The DCOI, along with faculty members Michelle Nowlin (Law) and Kim Lyerly (Medicine), is leading a team of 13 students to research animal waste management and related policies around the world to identify best practices. The students focused on U.S. based policies in 2016 and will investigate international policies in 2017. Pictured on the right, students had the opportunity to tour local farms during the 10th Annual Eastern Triangle Farm Tour in NC.



Academic Engagement

Theory and Practice of Sustainability

The DCOI served as a client for a team of four undergraduate students as a part of faculty member Charlotte Clarks' (Nicholas) and Sustainable Duke Director Tavey Capps' sustainability course. The students surveyed over 100 students about their knowledge of offsets and the DCOI, the information they would like from the DCOI on projects, and their preferred mode of communication. The team also developed a [video](#), which will be displayed on the DCOI website to serve as a brief educational introduction to the DCOI.



Nicholas School Master's Project

The DCOI and faculty member Randy Kramer (Nicholas) led a team of graduate students (pictured on the right) in researching home energy efficiency marketing strategies. The team developed two surveys to identify perceived barriers and benefits of energy efficiency and test a variety of marketing messages. The [final report](#) provides recommendations about how to employ the results of the survey to develop a company-based employee energy efficiency program. Currently, the team is working to publish their results in a peer reviewed journal.



Presentations and Conferences

- **2016 State Energy Conference**

The DCOI presented results from the DCOI Home Energy Affordability Loan program to local energy efficiency experts.

- **Charlotte Urban Forestry Summit**

The DCOI presented on the urban forestry based carbon offsets program to encourage schools and cities to participate in the DCOI urban forestry program.

- **Association for the Advancement of Sustainability in Higher Education Annual Conference**

The DCOI unveiled the [Offset Network](#) website and tested the Offset card game with educators and students from around the United States.

- **Duke University's Health and the Environment in North Carolina Forum**

The DCOI and Marc Deshusses (Pratt School of Engineering) presented on the Loyd Ray Farms project to a full room of academics, local non-profit organizations, and interested community members.

- **Swine Waste-To-Energy Field Day**

The DCOI presented on the Loyd Ray Farms project to local farmers and engineers in Duplin County.

- **Energy Week at Duke University**

The DCOI provided carbon offsets to make [Energy Week at Duke](#) University climate neutral. This event provided students and faculty opportunities to learn about innovative energy technology and policy.



Testing the Offset card game at the AASHE conference



Duke University's Health and the Environment in NC Forum



Presentation on swine waste-to-energy in Duplin, NC

If your student organization is interested in making your event climate neutral, please fill out Sustainable Duke's [Green Event Certification](#).

Working @ the DCOI



Interning with DCOI was rewarding for so many reasons. I was able to make personal connections with Duke University faculty and staff, I gained interpersonal and technical skills, and I always felt like I was making significant contributions with my work. Learning about what Duke does behind the scenes in order to be a sustainable campus was insightful and I really had an amazing experience this summer!

Amanda Sear (Trinity 2019)
Summer Intern 2016



At the DCOI, I developed a carbon offsets protocol for future peatland restoration projects and compiled data on energy efficiency allowance-based markets in the United States. As a graduate student studying water resources management, working on DCOI initiatives to help Duke reach carbon neutrality provided me with valuable insight into the water-energy nexus that I have since applied in my studies and professional career.

Cat Bowler (MEM 2017)
Research Assistant 2015-2016



The DCOI office not only gave me the opportunity to work closely with innovative energy efficiency programs at Duke and hone my research and analytics skills, but also build meaningful relationships with the awesome staff and engage with the sustainability community across the entire campus, which will play a big role in my life, beyond graduation!

Erin Leon (MEM 2017)
Research Assistant 2015-2016



Working on the Loyd Ray Farms Swine Waste-to-Energy Project enabled me to have a thorough understanding of the carbon offset verification process and be able to do the first hand data compiling. The holistic knowledge of U.S. carbon markets I've learned through this work is helpful for my ongoing research work.

Yan Cheng (MEM 2017)
Summer Intern, 2016

**For more information on the
Duke Carbon Offsets Initiative, please visit
sustainability.duke.edu/carbon_offsets/**