Carbon Offsetting in Higher Education

// United States of America //

June 2021

AlliedOffsets

Executive Summary

As the effects of climate change continue to be felt globally with increasing severity, there is an increased desire among private sector actors to do something about the looming catastrophe.

One part of the solution is voluntary carbon offsetting - the mechanism of transferring money from polluters to green projects that are removing CO2 from the atmosphere, or preventing it from getting there in the first place. The market for voluntary carbon offsets has transferred over $150m to green projects to date in the US, according to our estimates.

American universities are increasingly looking at the voluntary carbon market to offset their emissions, driven by environmentally-conscious students and staff demanding more from their educational institutions. In this report, we explore what universities are doing to offset their emissions - who is leading the way in terms of offsetting the most credits, the projects they are choosing to offset with, and, in a few cases, the projects universities have set up to offset their emissions (and to allow others to offset). Our data comes from publicly-disclosed information available on carbon offsetting registry websites. It also only focuses on US universities offsetting emissions in the US. If data for your university is missing, please get in touch and we'll be able to add you to our database.

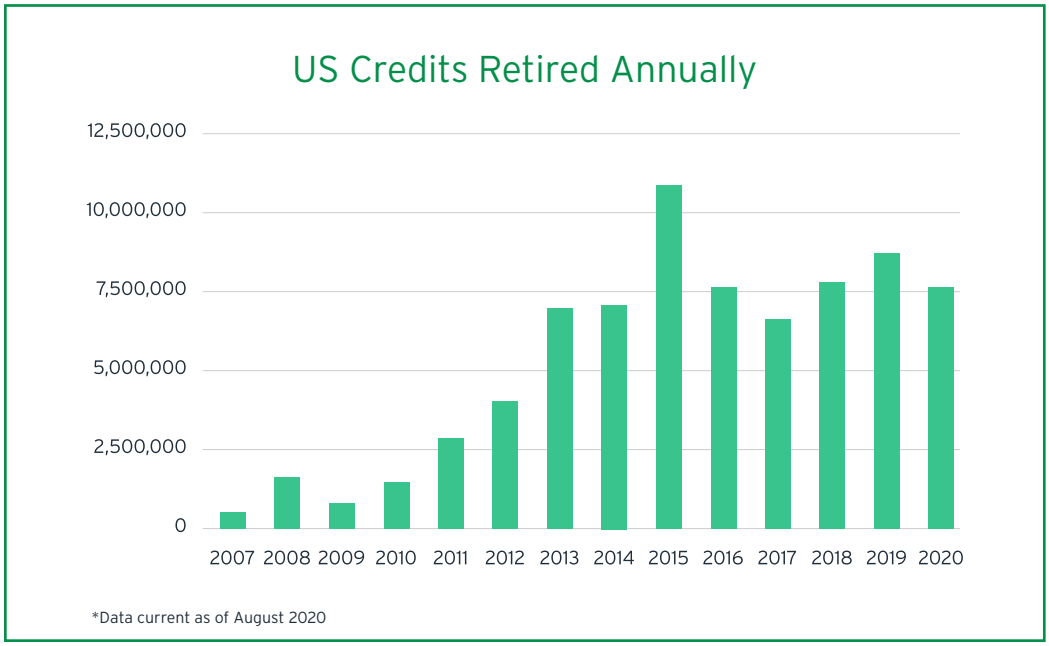
Institutions of higher education have a tremendous responsibility to educate future generations. By taking tangible steps to reach carbon neutrality, they are providing a roadmap for others to do the same. If you'd like to learn more about the data and information in our report, please reach out to carbon@alliedcrowds.com.

Anton Root
Head of Research

Introduction

With the world's third largest population, it's no surprise the U.S. is also ranked second for annual greenhouse gas (GHG) emissions. In 2020, the nation released an estimated 5.41 Gigatons of GHG.

The U.S. is also one of the largest contributors to the voluntary carbon offsetting market -- a small but growing industry that allows companies and individuals to offset their emissions by removing carbon from the atmosphere, or preventing it from getting there in the first place. Based on our database, U.S.'s cumulative carbon market size in the past decade and a half reached over $167,000,000 with a total of over 75,000,000 tons of carbon dioxide (tCO2) 'offset' on behalf of companies and individuals.

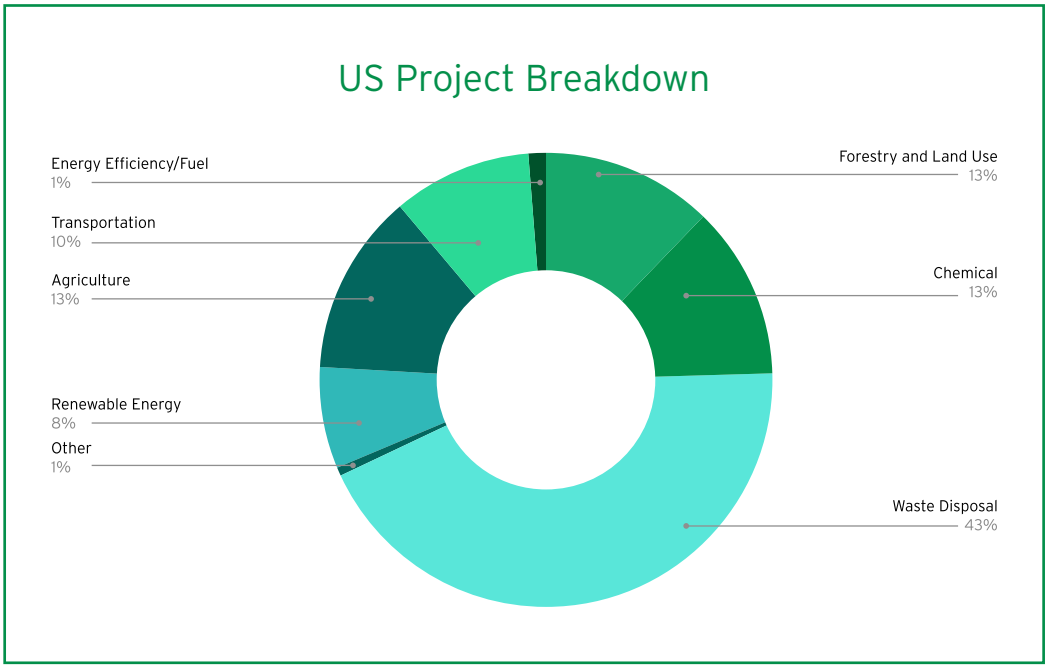


*Data current as of August 2020

Not Just Voluntary

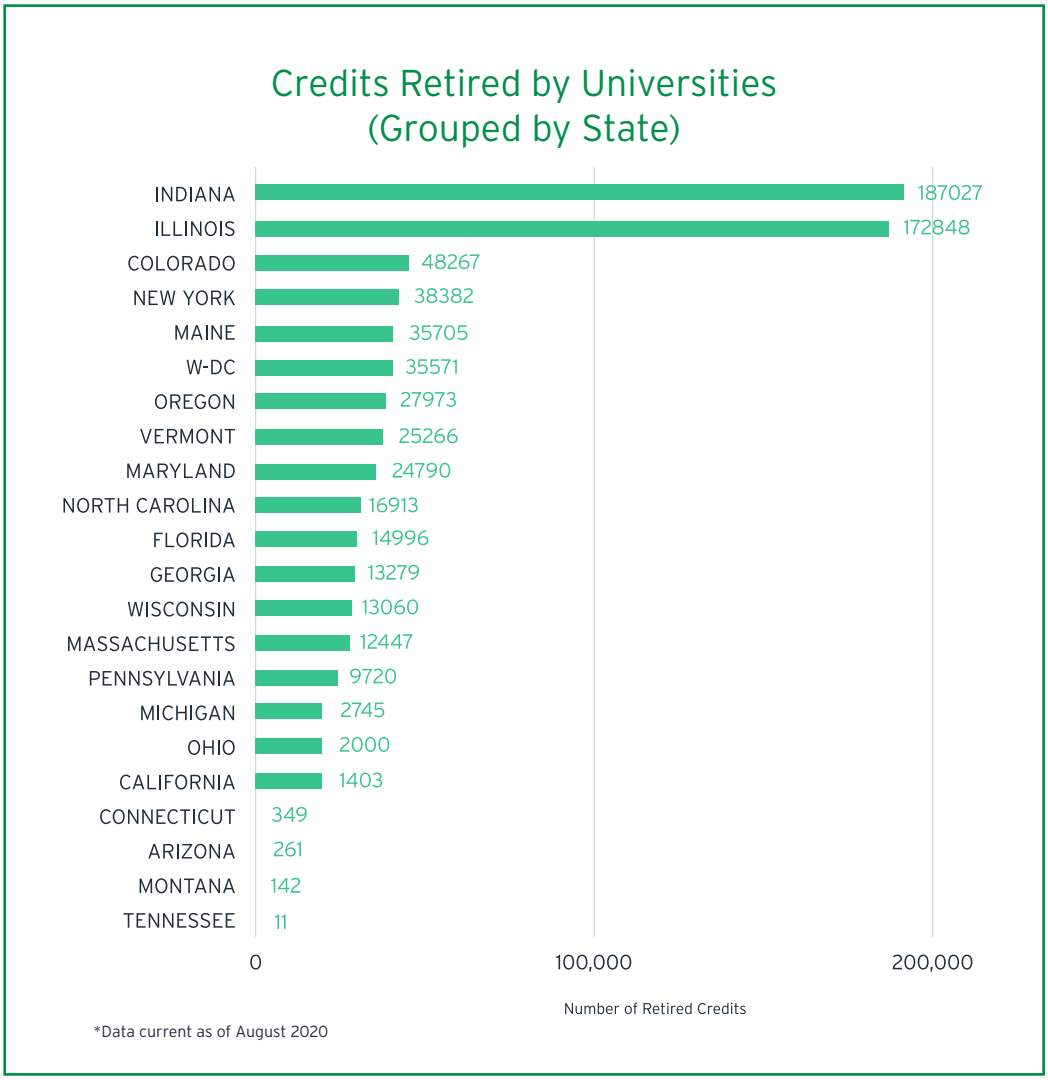
Both state and federal are taking steps to mandate green efforts. One effort to date is the Regional Greenhouse Gas Initiative (RGGI), the first mandatory market-based program in the US to reduce GHG emissions. RGGI currently consists of nine northeastern states, who sell carbon credit allowances through auctions and invest proceeds into energy efficiency, renewable energy, and other consumer benefit programs. Since its launch in 2009, RGGI has generated $1.4 billion in net economic benefits and 14,500 jobs while the power sector emissions fell by 40%. Other efforts include the California Emissions Trading Scheme implemented in 2012 and Oregon's cap and reduce program introduced in 2019.

One of the largest sectors contributing to the American economy is higher education. Up to the end of fiscal year 2017, it contributed $598 billion to the overall economy. On the basis of 2005 enrollment only, higher education institutes emitted 121 million megatons of GHG. Based on our data, an estimated 1% of the cumulative carbon market size is offset by institutions of higher education; credits retired total 925,000 credits across the 42 universities that invest in U.S. based projects in our database.



In addition to existing efforts, both students and faculty members are applying increased pressure on institutions to take further actions towards carbon neutrality. At AlliedOffsets, we believe it's important to understand the environmental impacts of a large economic sector in the country. Colleges and universities also play a leading role in educating future generations to prioritize sustainability and take real action. The aim of this report is to showcase existing domestic efforts of American universities and promote positive change. We will provide price analysis, market trends, and insight into key players, with contributions from the University of Illinois - Urbana, Duke University, and Colby College.

Why Are Schools Getting Involved?



American colleges and universities stimulate positive change in the overall economy. For example, from 1996 to 2015, technological innovations from colleges and universities totaled more than 380,000 inventions, contributing a vast $591 billion to the national GDP, and creating 4.3 million jobs. Yet these positive impacts on the economy can lead to indirect adverse effects on the environment. This is causing students and faculty members to demand more from the education institutions. "The market is very likely to grow exponentially within this sector," said Sandy Beauregard, the Director of Sustainability at Colby College, which offsets four tons of carbon per capita annually. "As the sustainability director of one of the first schools to claim carbon neutrality, I have witnessed schools all across the Northeast in the past three years setting specific plans and time frames to achieve the same goal."

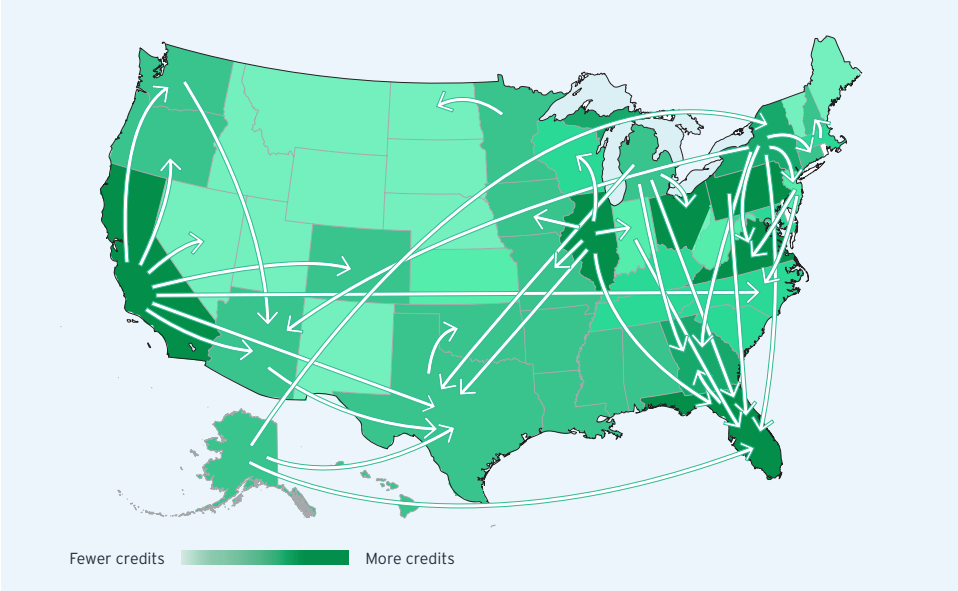
Anthropogenic activities occur in every level of an institution's operations. Half of the emissions from such activities can be calculated using programs such as the Sustainability, Tracking, Assessment, and Rating System (STARS), however the other half occur during special events. For example, Duke University created the Duke Carbon Offset Initiative (DCOI) in 2009, which develops carbon offset projects and implements the university's offset purchasing strategy. Duke has a carbon neutrality goal of 2024 and is projecting a need of ~80,000 offsets to achieve that goal. The university plans to achieve this goal first through on-campus emission reductions, then through investment in renewable energy, and finally by using offsets to address what emissions remain.

Credits Retired per Year per Student (2014-18)	
School Name	**Ton**
University of Illinois Urbana	3.7
Ball State University	6.8
University of Colorado Boulder	0.8
American University	1.2
Colby College	1.6
Union College	0.1
University of Maryland	0.6
Linfield College	10.1

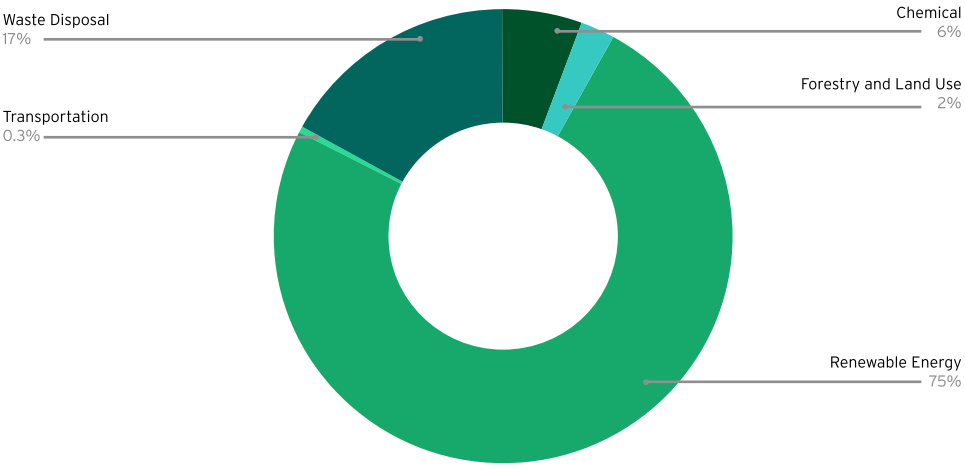
What Are Universities Doing?

Carbon markets aim to promote economic growth and investment in the clean energy economy. According to our data, there are 42 colleges and universities who are part of the voluntary carbon market, with 927,000+ tons of carbon credits retired since 2005. The majority of the projects are in the renewable energy sector. According to Duke's DCOI, it's important for universities and other institutions to seriously explore investing in renewables before relying on offsets, as a part of the reduce, renew, offset paradigm that we view offsets through."

Universities' Credit Flow Chart



Credits Retired by Universities



"The market connects us to projects that match our values, location, and development goals."

Sarah Beauregard,
Director of Sustainabiity,
Colby College

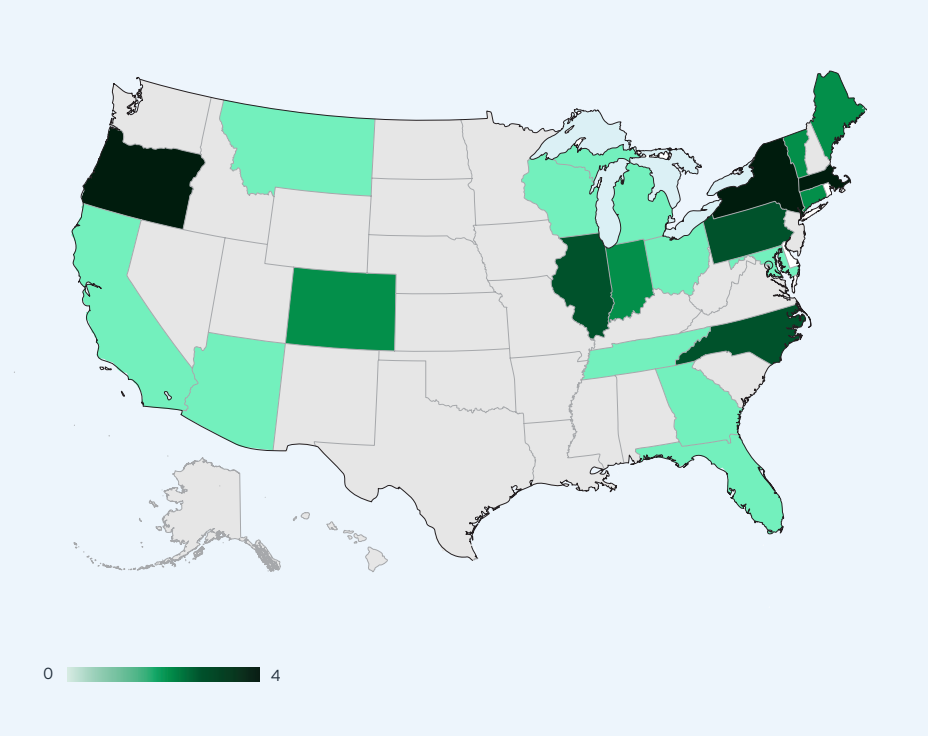
According to the institutions we interviewed for this report, despite only 42 of the estimated 5,300 schools officially taking part in the verified carbon market domestically, the trend of combining on-campus sustainability efforts and carbon crediting is increasing across the country. Schools are beginning to recognize the key benefits from joining the market.

Firstly, significant and long lasting emissions reductions are often costly to set up; the market provides a source of financing for these projects. For example, the University of Illinois Urbana - Champaign are both buyers and sellers as they have developed their own projects and buy external credits. The projects they developed have been designed and managed by their own institute of sustainability and research students, which requires significant funding. Proceeds from the sale of their own credits are invested back into their sustainability projects that help the schools further improve their green performance.

Secondly, the sharing of extensive and critical learning aids green efforts in the long term. Engaging students and faculty members in learning practical skills that will help them make green decisions for the future is a positive investment. Those students that are directly involved in setting up and managing the carbon offsetting projects receive valuable experience in a sector that's predicted to grow in the coming decades.

Third, offsetting carbon is an ethical move; Beauregard of Colby College states, "climate change affects people in developing countries most, even though developed countries are responsible for most of it. The carbon market at least funnels some money to these impacted regions. The market connects us to projects that match our values, location, and development goals."

Offsetting Universities by State



Case Study: University of Illinois-Urbana

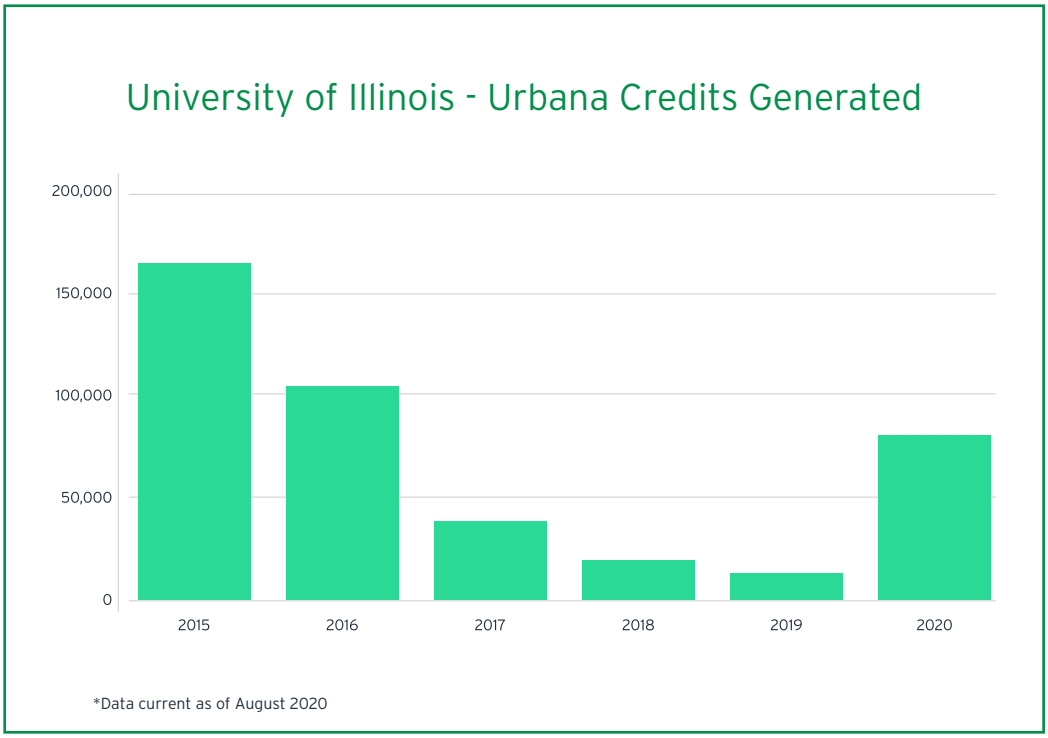
The school with the second greatest number of U.S. credits retired is the University of Illinois Urbana - Champaign (UI), a large school with over 40,000 students and staff members. UI has been cited for its commitment to sustainable building procedures, extensive campus educational programs supporting sustainable practices, and a transportation program that uses hybrid and flex-fueled vehicles. Our records show that in just a five-year span (2015-2020), they generated a total of over 400,000 credits from projects in the U.S. voluntary carbon market; our estimates suggest the cost of these offsets to be over $625, 000.

Ranking of Universities by Total Credits Retired

Ranking	School Name	Credits Retired to Date
1	Ball State University	183,622
2	University of Illinois Urbana	166,577
3	University of Colorado Boulder	36,316
4	American University	35,571
5	Colby College	30,900
6	Union College	29,224
7	University of Maryland	24,790
8	Linfield College	19,452
9	Valencia College	14,996
10	Spelman College	13,279

The official name of their project is University of Illinois Urbana - Champaign Campus Wide Clean Energy and Energy Efficiency. It was initially funded by Second Nature, a company that aims to "support colleges and universities across the U.S. to develop and market carbon offsets as a way to accelerate their progress towards campus carbon neutrality." All proceeds from credit sales are invested into campus sustainability projects that develop clean and efficient energy systems.

In 2008, UI signed the Climate Leadership Commitment, which commits them to achieve carbon neutrality by 2050 via the Illinois Climate Action Plan (ICAP), the Wind Power Purchase Agreement (WPPA), campus projects, and the purchase of renewable energy certificates. ICAP commits the school to use a certain percentage of renewable energy and WPPA commits them to receive a 8.6% of the wind-generated electricity and associated environmental attributes from the local Rail Splitter Wind Farm.



There are also an additional seven major solar installations across campus that generate electrical power throughout its major facilities:

1. **Solar Farms** - Solar Farm 1.0 stretches 20.8 acres and generates 7,200 MWh/year; Solar Farm 2.0 is 54 acres and generates 25,000 MWh/year

2. **Allerton Park** - 11,000 watt solar installation that reduces the park's use of fossil fuel by 12%

3. **Business Research Council Laboratory** - solar test bed that provides the Illinois Center for Smarter Electricity Grid a platform to collect data and research solutions for solar components, devices, and systems that support solar generation

4. **Rooftop Solar Panels at the Business Instructional Facility** - 4,000 square feet of solar photovoltaic panels that produce 8% of the building's total electricity demand

5. **Rooftop Solar Panels at the Electrical and Computer Engineering (ECE) Building** - 950 AC panels provides 20% of the building's total electricity demand; 60 of the panels are set aside for student management in order to provide active learning and assist in energy related research

6. **Rooftop Solar Panels at Wassaja Residence Hall** - solar panels that provide 33kW of power to the building

7. **Solar Thermal at Activities and Recreation Center** - 24 gravity fed solar-thermal panels that provide renewable heat energy for the building's water system

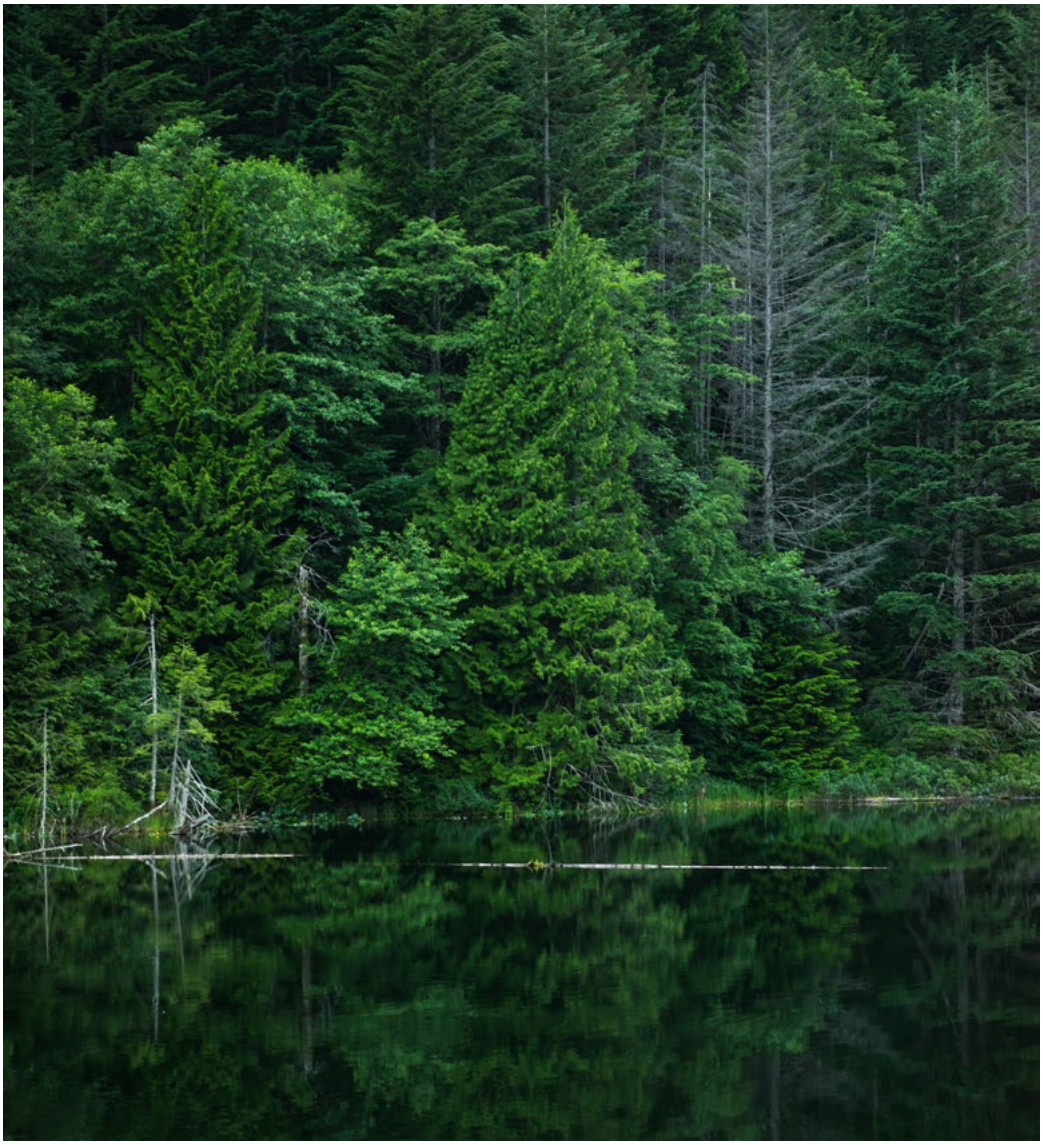
"We are using 50,000 megawatts per year from our very own solar farms and the wind PPA, and are going to plant 1,500 more trees over the next five years."

Morgan White, Associate Director of Sustainability, University of Illinois - Urbana

All these systems require funding and the market enables that. UI functions as a tier system where students track their individual footprints based on their activities, and give this data to the institute of sustainability to calculate in tons, who then hands it over to the office of sustainability to put into action using capital from the carbon market. UI owns all credits associated with energy production from their project. UI retires credits to match their ICAP goals while selling excess ones. For example, in 2020, of the estimated 74,000 credits retired, 34,000 credits were retired on behalf of Maple Leaf Food Inc., 1,400 to Greenleaf Foods, 35 to BEF Customers, 200 to the Goodlands Property Management, and the rest were retired on behalf of their campus footprint.

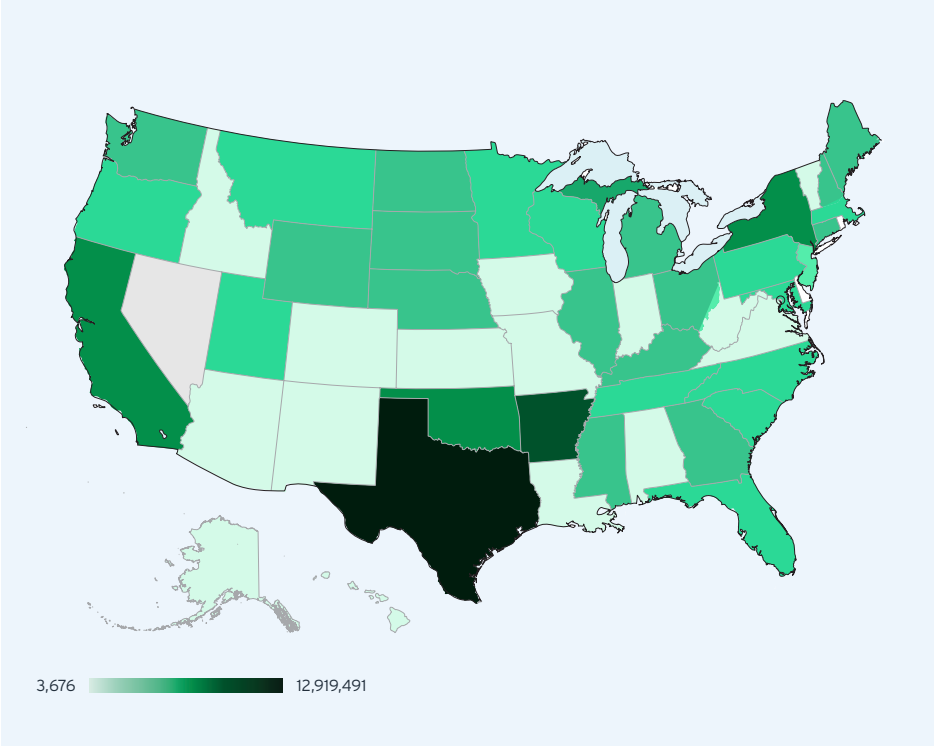
By 2015, UI reduced its existing building energy consumption by 20%, GHG emissions by 15%, and obtained 5% of all electrical energy from renewable sources. As of 2020, those numbers have increased by 4%, 5%, and 7%, respectively. According to Morgan White, the Associate Director of Sustainability, "as of February 2021, we are using 50,000 megawatts per year from our very own solar farms and the wind PPA, and are going to plant 1,500 more trees over the next five years, but we're also exploring geothermal and nuclear solutions for our steam and heat distribution."

Furthermore, UI's goal isn't to just drive down their own emissions but also to promote long term change around the world by teaching future leaders how to solve global problems. One method of achieving this is by taking part in the carbon market and using it to promote the innovations from their end while learning about external projects. As stated by White, "we like to think of ourselves as living labs, we prefer actual engagement of offsets rather than reading about it because it generates innovation and funding at the same time. Projects can't move forward without funds, which is provided to us through the market."



Conclusion

Credits Retired by State



The efforts made towards sustainability outlined throughout the report have had beneficial outcomes for the colleges and universities involved in terms of ethical fulfillment, as well as financial benefits. By taking part in the carbon market, both students and faculty members can contribute to the well-being of the planet for generations to come. The trends set by the institutions featured in this report will not only encourage their own members, but other institutions to follow suit and promote positive change amongst one the largest economic sectors in the country. Matthew Arsenault, Program Director of DCOI states, "it's part of our mission to educate not only our own, but others as well. Our responsibility is to help other institutions of higher education understand offsets and think through how to use them effectively and responsibly."

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In creating this report, we've had valuable input from the following individuals: Morgan B. White, Associate Director of F&S for Sustainability (University of Illinois - Urbana), Madhu Khanna, Professor in Environmental Economics (University of Illinois - Urbana), Sandy Beauregard, Director of Sustainability (Colby College), Matthew Arsenault, DCOI Program Manager (Duke University), Emma Fulop, DCOI Program Coordinator (Duke University), Amrita Sood, DCOI Research Assistant (Duke University).
We truly appreciate their expertise and perspectives.