Despite the many benefits of renewable energy systems, securing funding for smaller on-site and student-managed projects can be a challenge. At many campuses across the U.S., students have successfully created “green fees” to fund a wide range of sustainability-focused projects from community gardens to bike sharing programs. Typically ranging in the cost of $5-50, green fees are added to the fees students pay with tuition. In some cases, the university may also provide matching funds or alumni donors may contribute more to the amount generated by students. On some campuses, student leaders have designed the funds to focus on supporting renewable energy projects. Motivated by climate change goals, students at these campuses use their financial investments to pursue measurable carbon reduction projects. Carbon reduction impact per dollar invested in renewable energy projects (connected to the grid or building meters) can be simply and accurately measured. Through these innovative and self-financed renewable energy-focused funds, students have found success in overcoming financial barriers to support solar energy and education on campus.

Appalachian State University: Supporting Solar Energy through a Student-Financed Renewable Energy Initiative

Solar on Campus

On-site solar projects help colleges and universities reduce energy costs and lower carbon emissions. These projects have much more potential when the institution’s students are involved in the full financing and development process. From feasibility assessment and system design to financing and project management skills, the possible educational experiences are extensive. As these projects are typically built in visible locations, the learning potential applies not only for students but for the campus community as a whole.

About Green Fees and Renewable Energy Funds

“ASUREI’s mission is to reduce Appalachian’s carbon footprint by replacing the university’s existing energy sources with cleaner forms of renewable energy”

- Caitlin Stepp, ASU Graduate ’12, Former vice chair of the Appalachian State University Renewable Energy Initiative (ASUREI)
Appalachian State University’s Climate Commitment

Located in Boone, North Carolina, Appalachian State University (ASU) had been a signatory of the Carbon Commitment since April 2008 and became a signatory of the Climate Commitment in January 2016 by incorporating resilience actions into their carbon neutrality goals. ASU’s Climate Action Plan has set 2050 as its carbon neutrality target date and also stresses the importance of sustainability education for all students. ASU has invested in multiple renewable energy technologies, obtaining energy production from wind, solar thermal, and solar photovoltaic (PV) technologies. The solar PV systems on the campus contribute 7% of ASU’s renewable energy generation.

About the Appalachian State University Renewable Energy Initiative

The Appalachian State University Renewable Energy Initiative (ASUREI) is an early example of innovative renewable energy-focused green fees. As of the 2015-2016 academic year, ASUREI had funded 15 projects with six additional projects currently in the production pipeline. Eight of the installed projects are solar PV while the rest are solar thermal, biodiesel production, and wind energy projects.

The ASUREI was created in 2004 when Ernie Hodgson, a student in the ASU Sustainable Energy Society, proposed a referendum to the student body for a green fee of $5 per semester. The proposal passed with over 83% approval from voting students. After approval from the ASU Chancellor and Board of Trustees, funds began accruing in 2005. In 2007, students chose to continue supporting the Renewable Energy Initiative past its initial three-year period with 92% approval. With over 18,000 students, the estimated amount accrued each year is $180,000. The total amount spent on projects to date is $670,000.

Members of the campus community have the opportunity to submit green fee project proposals through an online form. A committee comprised of students, faculty, and staff review the projects and vote on their approval. When selecting energy projects, the ASUREI committee considers the project’s suitability, estimated system production or offset, and cost-savings analysis. Energy efficiency projects are limited to 20% of the distributed funds and must show aggressive returns on investment. For solar projects, students are required to produce a modeled forecast of system production over its lifespan using industry standard tools including the Solar Pathfinder and Solmetric SunEye.

“Appalachian’s longstanding sustainability leadership and practices are the foundation of who we are as an institution. The work of our faculty, staff, students and alumni ensure a bright and sustainable future for our community, state and beyond. Our commitment, combined with a dedication to deep engagement with communities, leads to positive and powerful learning and service.”

- Sheri N Everts, President, ASU
Biofuels Facility PV System

**Completed:** 2007  
**Capacity (KWh):** 2  
**Annual Production (KWh):** 2,457  
**Cost:** $17,500  
**Funding Method:** ASUREI/EPA grant  
**Student Engagement:** Designed to supply electricity to offset energy needed for the production of biodiesel fuel, the Biofuels Facility started as a student-led project and was funded in part by the EPA P3 Award.

E3 House System

**Completed:** August 2010  
**Capacity (KWh):** 3  
**Annual Production (KWh):** 3,745  
**Cost:** $30,000  
**Funding Method:** ASUREI  
**Student Engagement:** The E3 House has a roof mounted PV system with a battery back up, and is designed for disaster relief situations when there may be no access to electricity. Students of the Building Science and Appropriate Technology programs built this project as a culturally and environmentally adaptable alternative to FEMA Trailers after witnessing the response to Hurricane Katrina.

State Farm Solar Research Facility System

**Completed:** 2011  
**Capacity (KWh):** 8  
**Annual Production (KWh):** 8,967  
**Cost:** $33,453.44  
**Funding Method:** 75% ASUREI, 25% Appropriate Technology Department  
**Student Engagement:** This unit allows for research opportunities, focus on studying PV and solar thermal technologies.

Blackburn Vonnoy Farm House PV System (Garage)

**Completed:** 2012  
**Capacity (KWh):** 7  
**Annual Production (KWh):** 11,020  
**Funding Method:** ASUREI  
**Student Engagement:** Installed by graduate students, the Blackburn Vonnoy Farm House PV project provides energy for a faculty and student house.
Graduate students studying in the Appropriate Technology concentration in the Department of Sustainable Technology had long been encouraged to explore implementing on-campus solar projects at ASU. This allowed students to apply specific technological knowledge acquired through program courses such as “Building Mechanical Systems” and “Photovoltaic System Design & Construction”. Prior to funding availability through ASUREI, proposed PV projects were meant to simply promote renewable energy with less emphasis on projecting financial returns. Financial modeling and budgets have since been given greater emphasis in educational programs, and students give greater priority to return on investment.

A key challenge of the ASUREI program is maintaining student involvement throughout the duration of the project, from proposal to completion. A variety of factors can create barriers to student involvement including that students may not get involved right away. The length of time required for administrative project approval can take some time, impacting the proposed financing and contracts and making it difficult to formally include class involvement during a one-semester period. To address these challenges, ASU has developed a workshop that walks participants through the solar PV design and construction process before they apply to ASUREI. The objective for participants is to learn how to assess the solar resources available at a particular site and to estimate the energy production and economics of a PV system. Participants learn how to design and construct safe and reliable code-compliant photovoltaic systems on Appalachian State’s campus. ASUREI has proved to be an excellent way to involve students and reap the educational benefits of solar projects, while also ensuring that proposals make it to the implementation phase. Part of the success of the program is due to faculty and staff involvement. Through involvement with project selection, faculty and staff become responsible for the maintenance and education surrounding the project in the long-term.

For more information on going solar at your campus visit: solarendowment.org

For more information on Second Nature and the Climate Leadership Network visit: secondnature.org

Or contact: commitments@secondnature.org
Colby College: 
Developing a Diverse Solar & Carbon Neutrality Strategy

Solar on Campus
At higher education institutions, the consumption of purchased electricity represents an indirect source of greenhouse gas emissions and is a central component to lowering campus carbon footprints and meeting climate commitments. Strategies for lowering emissions from electricity include energy conservation, energy efficiency, and purchasing renewable energy through on- or off-site projects. Solar photovoltaic (PV) systems have been popular and practical for on-site campus installations as campuses typically have large and consistent daytime electrical loads, access to potential roof sites, and may have large undeveloped areas of land. According to the US Department of Energy, installed project costs have fallen by more than 50% since 2009 and can provide institutions with strong financial returns.

On-site solar projects can also provide benefits to an institution beyond potential cost savings and greenhouse gas reductions. Benefits of on-site solar include applied learning opportunities, research, resiliency if incorporating battery storage, demand response cost reductions, community support through local jobs, and investment diversification. On-site solar projects are a highly visible demonstration of sustainability commitments and can attract new student audience and engage alumni and donors.

In some cases, institutions may not be able to retain ownership of carbon reduction claims through Renewable Energy Credits (RECS). Even in these cases, the value of the project outweighs the carbon reduction potential. The reasons an institution may develop PV on-site may include fulfillment of their educational mission, strategic priorities, and climate action plans. Often starting off by developing a small to mid-sized on-site project has encouraged institutions to update their Climate Action Plan to include larger on-site projects or off-site renewable energy purchases. Even the installation of small to mid-size projects on-site can encourage an institution to update its Climate Action Plan and invest in larger on-site projects or off-site renewable energy purchases.

“IT will diversify the College’s energy supply, it adds 2.5 million kilowatt hours of renewable electricity to Maine annually, it creates another campus ‘living laboratory’ offering research opportunities to students and faculty, and it serves as another visible sign of Colby’s commitment to sustainability.”

- Doug Terp ’84, Vice President for Administration and Chief Financial Officer

Colby College: 
Developing a Diverse Solar & Carbon Neutrality Strategy

Benefits of Solar Energy on Campus
► GHG Reduction
► Cost Savings
► Research Opportunities
► Educational Experiences
► Resilience with Battery Back Up
► Donor & Community Engagement

Solar on Campus
"It will diversify the College’s energy supply, it adds 2.5 million kilowatt hours of renewable electricity to Maine annually, it creates another campus ‘living laboratory’ offering research opportunities to students and faculty, and it serves as another visible sign of Colby’s commitment to sustainability.”

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Financial Decisions: Direct Purchase or a Power Purchase Agreement

When choosing to install solar on campus, one of the key decisions is the financing method. A college can choose to self-finance using cash or grants. In some cases, a donor may choose to sponsor a solar project outright or as part of a new building expense. A smaller solar array may have a payback period of over 5-20 years, which may be longer than some internal policies for energy investments using operating funds. Larger solar arrays require more significant upfront cost but may have a better payback. When significant operating or donor funds are not available, an institution can look for outside financing, including loans from commercial banks, credit unions, and community development financial institutions. An institution can also include program-related investments from their own endowment funds.

Current federal tax incentives can provide a significant advantage to tax-paying entities owning solar, amounting to about 30% of solar project costs. Given this opportunity, many tax-exempt institutions look for a third party owner of the system. This results in an arrangement called a Power Purchase Agreement (PPAs).

In a PPA, an institution buys power at a negotiated rate ($/kWh) for a specified term without taking ownership of the system. Typically, the price per kWh is below the current electrical price, or may have a fixed escalator at a rate lower than fossil fuel energy prices are expected to rise. This fixed price allows better budget planning and hedges against unforeseen expenses. In a PPA, the project developer or owner is responsible for all permitting, installation, maintenance, and decommissioning. Many schools create a Request For Proposal (RFP) to solicit competitive PPA bids according to their various needs and goals. According to the National Renewable Energy Lab (NREL), solar power purchase agreements have facilitated over 100 megawatts (MW) of solar deployment on campuses around the country as of 2016. However, since not every state allows tax-exempt entities to indirectly benefit from tax credits through a lower PPA price than their utility may offer, it is best to check the Database of State Incentives for Renewables & Efficiency for updated information on PPA policies.

Carbon Reduction Claims

When renewable energy projects generate power, each MWh is assigned a Renewable Energy Certificate (REC) which represents the environmental attributes of the project. RECs have helped drive development of renewable energy through their use in various state renewable energy portfolio standards and through the voluntary purchase market. In order to claim to be using solar power and count the renewable attributes towards an annual greenhouse gas reporting, the institution must receive and retain the associated RECs from the project. If a signatory wants to use their purchase towards their Climate Leadership Commitment goals, they will need to retain ownership of the RECs. However, a developer may request ownership of RECs because they improve the project’s economics, depending on the market. In this instance, a university can negotiate for REC ownership in the future (typically after 5 years) or find less expensive RECs to match their production. Even in the case of direct purchase, the RECs may hold more value being sold in a local market versus retaining them in the short term. In these cases the institution will forgo any carbon claim on the project in the short term, viewing the educational experience and expected energy savings dollars as adequately valuable. Institutions may then look for alternative methods of short-term carbon reduction. In some cases, the electrical price savings from the project could be used to invest in additional renewable or efficiency projects on campus through revolving or capital funds.

![Carbon Reduction Claims](image)

Average offtaker rates for systems between 100kW and 5 MW, by state and region in 2015. Regional figures based on non-weighted state averages. Data are representative sample. Source: Mercatus
Colby College: Achieving Carbon Neutrality and Supporting Clean Energy

Colby College is a private liberal arts college in Waterville, Maine, with 2,039 students. A Carbon Commitment signatory since May 2008, the school achieved carbon neutrality in April 2013 – two years ahead of their 2015 goal. A longtime leader in the environmental field, the College has generated about 10% of its electricity through cogeneration at its steam plant since the 1990’s. Colby also committed to sourcing all of its electricity from certified renewable sources in 2003. Colby is the conference champion in the EPA’s College and University Green Power Challenge for its role in creating a market for purchasing green power in the state.

Colby achieved carbon neutrality in 2013 by implementing a diverse strategy of efforts including over 12 LEED-certified buildings on campus, two of which use geothermal systems. The college uses sustainably harvested wood biomass instead of oil as its primary fuel for heat and hot water. Colby spends about $50,000 annually on carbon offsets, partially funded by the savings accrued from converting to biomass. The offsets cover the difficult-to-avoid emissions such as travel and commuting. While the purchase of offsets will pay for carbon reduction projects elsewhere, Colby’s goal is that future reductions in emissions on campus should decrease the school’s reliance on offsets over time.

Pursuing Solar Investments on Campus

In April 2015, Colby installed a small PV array on the Schair-Swenson-Watson Alumni Center (SSWAC) with an annual production of around 32,000 kWh per year. The Alumni Center is LEED certified and is electronically heated and cooled through the use of geothermal heat pumps. This electric output will provide 10-15% of the alumni center’s annual energy consumption. A real time monitor shows the production of the system.

The SSWAC site’s potential was first identified and evaluated by Dan Chiniara ’13 as part of an environmental studies senior research project in 2012. The student focused on identifying roofs on campus that would be appropriate for solar installations and worked with a local solar developer to both learn the process and vet previous work. The student’s findings were confirmed through a competitive bid process with local solar developers for this project.

Too small to be of interest to PPA developers, the project was funded by Colby through general facilities funds. The Facilities Department has an energy management reduction project focused on maintaining energy consumption on campus over the next seven years inclusive of growth; this project was part of the first year. The project budget combines quick and longer-term payback projects to ensure a diversity of projects and not just low- or no-cost payback projects. The simple payback period payback for all projects combined averages to be about 5-7 years.

This project has provided opportunities for the college maintenance staff to understand the same technology and to investigate and successfully build support for larger projects. The success of this small-scale project illustrated the potential for Colby to create a competitive RFP for a larger project.

**Schair-Swenson-Watson Alumni Center Solar Project**

- **Completed:** 2015
- **Capacity (KWh):** 26
- **Annual Production (KWh):** 32,000
- **Cost:** $0.26/watt
- **Expected Return on Investment:** Approximately $15,000-$20,000 over 13-15 years
- **Funding Method:** Capital Funding
- **Owner:** Colby College
- **Retaining Project RECs:** Yes

**Colby College Large Scale Solar Project**

- **Completed:** In Planning Stages
- **Capacity (KWh):** 1,900
- **Annual Production (KWh):** 2,500,000
- **Cost:** Owned by NRG
- **Expected Return on Investment:** NA
- **Funding Method:** NRG Energy
- **Owner:** NRG Energy
- **Retaining Project RECs:** Yes
Colby is currently in the final implementation stages of a project consisting of 5,505 solar panels on nine acres of land, which would increase solar capacity on campus greatly. Sized at 1.9 MW, it is expected to produce 2.5 million kWh of electricity each year. This is expected to fulfill approximately 16% of the College’s electricity needs. NRG Energy will build and own the project on land leased from Colby. Colby has then entered into a 27-year power PPA to purchase the electricity at a fixed rate. This arrangement provides modest cost savings compared to the school’s current energy prices and also acts as a hedge against future energy price increases. Colby is building an underground electric line to feed electricity produced by the panels into the campus’s electrical grid.

Colby is retaining the RECs as part of the PPA for its duration - 27 years with a 3-year extension. This will support Colby’s current REC / offset strategy and carbon neutrality achievement moving forward. As part of the RFP process and PPA agreement, Colby requested a robust, web-based, real-time monitoring system be installed for academic use. The intention is for this data to be used for student research projects moving forward. Colby’s yearly CO2 reduction will be close to 87 tons of MTCDE for scope 2 reductions, taking into account transmission and distribution losses and RECs purchased before the project.

“Our first project, Schair-Swenson-Watson Alumni Center, confirmed that, once they’re installed, these things just sit up there and work for us. The only real difference in that installation and the one we’re doing now is the scale.”

-Kevin Bright,
Colby’s Sustainability Coordinator

For more information on going solar at your campus visit: 
solarendowment.org

For more information on Second Nature and the Climate Leadership Network visit: 
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Universities face a few significant challenges when it comes to developing solar photovoltaic (PV) systems on their campuses and associated properties. One of the foremost challenges is leveraging the tax incentives available to tax paying entities, including the Investment Tax Credit (ITC) and the accelerated depreciation of PV assets. These incentives alone can represent more than a 30% reduction in total project cost under optimal circumstances. Yet developing the private partnership necessary to take advantage of these incentives is complicated and can represent significant legal and contractual costs, which reduce the financial benefits. Additionally, understanding the financial performance and risks associated with third party financing can require considerable analysis and stakeholder engagement.

With that said, the details of these arrangements will be familiar to university administrators that manage energy and real estate transactions on behalf of the university. With some initial guidance and experience, university staff can be fully equipped to develop PV projects that provide the greatest financial and programmatic benefits.

Luther College, by beginning with small, low-risk PV projects, developed the internal capacity needed to effectively scale their solar efforts. The measured approach to project development, dedication to campus stakeholder engagement, and partnership with a trusted supporter of the college has resulted in a successful, replicable pathway to advance solar energy projects that meet the college’s financial and sustainability goals. They now boast more than 1.1 Megawatts (MW) of solar energy, beginning with a 3.78 Kilowatt (kW) system in 2011 and continuing with their most recent installation, an 821 kW system representing a $1.6 million dollar investment in on-campus solar.

Luther College: Climate Change Leadership in Action
Located in Decorah, Iowa, Luther College has 2,400 students and is situated on a 175-acre campus. The Center for Sustainable Communities coordinates all sustainability initiatives at Luther College and has a broader mission to be a catalyst for change on campus and in their region. Luther has been a signatory of the Carbon Commitment since June 2007. In 2012, Luther’s Climate Action Plan was approved by the Board of Regents and featured a carbon neutrality goal by 2030 as well as a mid-term goal for 70% by 2020 from its peak in 2003-2004. Their greenhouse gas mitigation strategies included a mixture of efficiency upgrades, local carbon offsets, and renewable energy generation. Electricity purchases from a coal-intensive section of the U.S. electrical grid account for 51% of their greenhouse gas emissions.

Luther has long been a leader starting with sustainability investments including a geothermal energy system at their Baker Village residence hall in 1999, a 1.6 MW wind turbine on the bluff west of campus in 2011, and five solar PV systems starting in 2011. Luther also purchases Community Wind Renewable Energy Certificates from a turbine 65 miles away in St. Ansgar, Iowa. The RECs reduce about 5% of their carbon footprint to meet both Carbon Commitment goals and LEED standards associated with the construction of the LEED Gold-certified Sampson-Hoffland Laboratories. In 2012, Luther was awarded the Second Nature Climate Leadership Award for their achievements.

As of May 31, 2015, Luther College has reduced their campus carbon footprint 44.2% from the FY 2003-2004 peak. The effort began with more than $2 million in energy efficiency improvements representing a 29.1% reduction. The college then focused their efforts on local renewable energy and further reduced their footprint by 15.1%. With these investments, electricity purchases fell to a record low, dropping from 17,888,446 kWh in FY 2002-2003 to 14,303,052 kWh in FY 2014-2015.
Making the most out of solar investments starts with understanding limits. The limits can be regulatory, procedural, social, technological, and financial. With big projects come the potential for big mistakes and appropriate design is critical to ensure a good investment. By starting with small projects, emphasizing teamwork and campus stakeholder engagement, and working with a local, trusted investor, Luther College developed a project that worked for all parties.

At the time of the project development, Iowa had a 500 kW net metering cap, limiting the system size the college was able to pursue. However, the college realized they could directly offset their electricity demand and avoid exporting energy to the utility by siting systems in conjunction with significant electrical load. Using this approach, the college identified three sites: a 96 kW system on the library and 725.7 kW in two ground-mount arrays near a large athletics facility. These projects were projected to produce 1.1 million kWh/year, result in more than $1 million dollars in energy savings over 25 years, and reduce campus carbon emissions by 5-6%.

Going Big with Solar to Reduce Costs and Carbon Emissions

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With a system this large, the college did not see direct purchase as feasible. The potential to partner with a tax-paying entity through a third party PPA could, in theory, provide greater financial benefit. The college could ensure that their needs were met and the project was delivering the greatest benefit by working with a trusted third party.

“We need renewable energy – wind, solar, and geothermal – and some of us have just got to take the initiative so others will come along. I spent my career as a community banker so it’s a natural thing to figure out ways to help build good things for the community. The more of that you do, the more you want to do it.”

- Larry Grimstad
Solar Investor & Supporter

Reference

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“We want to show our students it is possible to be carbon neutral, and that sustainable practices are incredibly important to Luther College,”

- Jim Martin-Schramm,
Professor of Religion and Energy and Climate Program Coordinator

Reference

Going Big with Solar to Reduce Costs and Carbon Emissions

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Supporter-Financed PPA Basics

In a 3rd-Party PPA, a separate entity arranges for the design, permitting, financing, and installation of a solar energy system on a customer's property. The third party sells the power generated by the system to the host customer at a fixed or variable rate for 10-25 years. The third party receives the income from these sales of electricity as well as any tax credits and other incentives associated with the system. Ideally, this situation results in no or low upfront capital costs for the customer and reduces energy costs over the long-term. Good project design ensures that the long-term energy savings exceed the payments to the third party over the contract term.

As opposed to a 3rd party lease, A PPA arrangement limits risk to the customer because the maintenance of the PV system is the responsibility of the third party, which does not receive payments if the system is not working. Meanwhile, the customer maintains continued service by its electric utility. At the end of the PPA contract term, the customer may extend the PPA, have the third party remove the system, or choose to buy the system from the third party at fair market value.

Working with a college supporter to develop a PPA can result in greater transparency and greater benefit. In the case of Luther College, this meant working directly with the investor to review the following key variables in the financial modeling of the project:

- System size and power production estimates
- Energy load reduction estimates and related energy demand charge savings
- Value of the Investment Tax Credit (ITC)
- Value of depreciation (MACRS)
- USDA Rural Energy for America Program (REAP) grant funding
- Iowa’s 476C Renewable Energy Production Tax Credit
- Site land lease rate
- Presumed utility rate escalator
- PPA price and escalator
- Estimated fair market value system purchase price at end of PPA term

Each of these variables has an impact on the project's financial performance and these assumptions can impact the returns for both the college and the investor. An open review of the variables, the assumptions being made, and the expectations of parties can build trust in the project and ensure financial performance. The project design team also needs to consider the incentive and regulatory environment that exists in their region and how it might change over time.

At Luther College, the 280 kW installation at Baker Village was on a utility rate plan that enabled the college to net meter surplus production under Iowa’s net metering rules that limit system size to 500 kW. This was critical in the financial modeling. For the larger 820 kW project, the system had to directly offset electrical use and minimize export of electricity as net metering was not allowed. The financial modeling also had to address how the demand charge in their rate would be influenced by the PV production. The studies related to the project took several months and increased both time and expenses. Future projects on the campus will need to be designed to address the new net metering rules issued by the Iowa Utility Board in summer of 2016. The rules raise the net metering cap to 1,000 kW but will not allow large general service customers to recover demand charge costs. This may constrain the installation of additional renewable energy systems unless they are conjoined with energy storage.

Navigating the changing regulatory and incentive landscape is often the most difficult aspect of PV project development. Working with a trusted PV developer that has a demonstrated history of successful projects in your region can help ensure an informed and profitable project design. Developing a team of informed campus stakeholders that follows these issues can help ensure that your institution is prepared to take advantage of opportunities as they arise. With their focus on ensuring each of these critical elements were addressed, Luther College is making significant progress towards carbon neutrally and saving money on the way.

“Luther is a perfect example of how colleges and universities can help drive America’s clean energy economy and win the jobs of the future. I congratulate Luther and its students on completing Iowa’s largest photovoltaic solar array – powering your campus with clean, renewable energy for years to come.”

- Steven Chu,
  U.S. Secretary of Energy
**Sustainability House**  
**Completed:** August 2011  
**Capacity (KW):** 3.78  
**Average Annual Production (KWh):** 5,000  
**Owner:** Luther College  
**Cost:** $22,750  
**Funding Method:** Single Anonymous Donor  
**Savings/Return:** $700 a year

**President’s House**  
**Completed:** August 2013  
**Capacity (KW):** 5.3  
**Average Annual Production (KWh):** 6, 60  
**Owner:** Luther College  
**Cost:** $16,140  
**Funding Method:** Renewable Energy Fund (multiple donors) and Utility Rebate  
**Savings:** $840 annually

**Baker Village Residence**  
**Completed:** August 2012  
**Capacity (KW):** 280  
**Average Annual Production (KWh):** 355,000  
**Owner:** Decorah Solar Field, LLC (owned by supporter Larry Grimstad)  
**Cost:** $1.2 Million  
**Funding Method:** Leased for seven years from Decorah Solar Field, LLC. Lease payments funded through avoided energy costs and a donor supported Renewable Energy Fund.  
**Savings/Return:** An average of $40,000 annually with current electrical prices, though the annual lease payments over the first 7 years are higher than Luther’s avoided energy costs. The savings are projected in years 8-25 when either the lease payments decrease or the system is sold to Luther. The benefit to Luther in years 1-7 is about $50,000 per year, including REC sales. The projected benefit after year 7 is about $42,000, with Luther keeping the RECs. That annual benefit is expected to increase every year as utility costs increase.

**Shirley Baker Commons**  
**Completed:** August 2013  
**Capacity (KW):** 20  
**Average Annual Production (KWh):** 26,500  
**Owner:** Luther College  
**Cost:** $86,000  
**Funding Method:** Renewable Energy Fund (multiple donors), Department of Energy grant, and Utility Rebate  
**Savings:** $2,676 annually

**Preus Library & Regents Center**  
**Completed:** Fall 2015  
**Capacity (KW):** 821.76 (divided in 3 arrays)  
**Average Annual Production (KWh):** 1,118,000  
**Owner:** Oneota Solar, LLC (owned by supporter Larry Grimstad)  
**Cost:** $1.6 Million  
**Funding Method:** Third party power purchase agreement (PPA) at a fixed price for ten years  
**Savings:** Estimated $999,229 over 25 years
For more information on going solar at your campus visit: 
[solarendowment.org](http://solarendowment.org)

For more information on Second Nature and the Climate Leadership Network visit:
[secondnature.org](http://secondnature.org)

Or contact: [commitments@secondnature.org](mailto:commitments@secondnature.org)
Public colleges and universities often create foundations to develop for-profit entities, contributing to the institution’s mission and resources while minimizing the risks for new investments. Foundations have more flexibility in how they can fundraise as they are outside of the public accounting process. Donors contributing to foundations may do so to feel confident that their gifts will be responsibly invested and applied to innovative services and may not take as long to support the institution as state controlled funds. Local business leaders, alumni, and other successful individuals are often willing to donate their time to fund management as a means to fulfill personal goals of community support, exercise their entrepreneurial creativity, and take action on solving today’s critical problems.

Wake Technical Community College: Public College Foundation Investment in Solar

Private Foundations at Public Institutions

Wake Technical Community College is an Associate’s College, located in Raleigh, NC with 16,766 students located on a suburban campus. The school has been a signatory of the Carbon Commitment since April 2010 and has set a goal to achieve climate neutrality by 2050. Their Climate Action Plan includes a strategy to increase use of renewable energy sources, such as solar photovoltaic (PV), on campus.

Wake Technical also offers educational programs that provide hands-on training for the green workforce. Courses such as “Introduction To Solar Photovoltaic Basics”, teach overall PV system design, systems installation, and maintenance. The Energy Training House was built in 2012 to provide practical training for jobs in sustainable energy. In this innovative model home, students learn to conduct energy audits and monitor the efficiency of energy improvements.

“This is a truly innovative initiative... [Wake Tech has] made a serious commitment to leading the way in sustainability initiatives and environmentally responsible growth”

- President Dr. Stephen C. Scott, Wake Technical Community College

About Wake Technical’s Community and Sustainability Initiatives

Solar University Network: Innovation in Solar Energy Finance & Development
In March 2013, the Wake Tech Foundation, the separate fundraising and support arm of Wake Technical Community College, spearheaded a project to install a Solar PV array hosted on the institution’s Public Safety Education Campus. The solar array is owned and operated by Wake Tech Innovations, a subsidiary of the Wake Tech Foundation that frequently partners with innovative private sector projects to provide support for the college. Financing for purchasing the panels was secured by Wake Tech Innovations through Wells Fargo.

With an annual production of 500,000 kWh per year, the system is estimated to produce about half of the public safety building’s power consumption. The local utility, Progress Energy (which has since been acquired by Duke Energy), agreed to purchase electricity output of the project for a fixed price over the next 20 years as part of the SunSense program. The SunSense program provides incentives for North Carolina residents and businesses to install solar, including monthly bill credits per watt and upfront rebates. At the time of construction, the program offered $0.18/kWh for the power.

As part of the program, the utility retains the Renewable Energy Credits (RECs and the associated carbon reduction claim) for five years. The utility uses the RECs to comply with the North Carolina Renewable Portfolio Standard law that currently requires that six percent of electricity sales in the state come from renewable energy – or be replaced by energy conservation. While the associated carbon reduction claim on the solar energy is not helping the institution reach its carbon neutrality goals, the investment is adding important local renewable energy resources. After the first five years, there may be an opportunity for the customer to renew their REC contract with Duke Energy and receive carbon reduction credits or continue receiving a financial contribution.

For the PV system, 1,368 Yingli YL 285 Modules were used on a Daetwyler Eco Top racking. The Daetwyler racking system allowed the array to follow the roof’s contours, which is important for existing buildings. The project included Draker monitoring and Advanced Energy PV Powered Inverters.

Wake Technical College Public Safety Education Campus Solar Project

**Owner:** Wake Tech Innovations, a subsidiary of the Wake Tech Foundation.

**Completed:** 2013

**Capacity (KWh):** 389

**Annual Production (KWh):** 500,000+

**Expected Return on Investment:** $300,000 over 20 years, via energy purchase payments and incentives.

**Cost:** N/A

**Funding and Revenue Methods:** Foundation funded the purchase of the panels from Wells Fargo, Rebate incentives from State, and ongoing Energy Purchase from Utility.

**Developer:** ENlight Solar, LLC and Power Secure.
Wake Technical College’s installation illustrates the investment potential for institutional foundations looking to further educational (e.g. student scholarships) and financial (e.g. solar energy opportunities) goals. Mort Congleton, Executive Director of the Wake Tech Foundation, describes the arrangement as a true win-win for the institution and the foundation. He said, “This is a solid revenue source for the Foundation, allowing us to build the scholarship funds that help so many students realize the dream of a college education.” Creating unique ownerships structures that leverage local partners and industry can be a pathway for institutions that may not be able to purchase or finance a system themselves. The installation of the solar array also provides visible educational opportunities for students at an institution that values sustainability and provides renewable energy education. The investment revenue from the project will enable even more students to have access to these important solar training opportunities.

For more information on going solar at your campus visit: solarendowment.org

For more information on Second Nature and the Climate Leadership Network visit: secondnature.org

Or contact: commitments@secondnature.org