

Luther College: Third-Party, Supporter-Financed Campus Solar An Approach and a Partnership that Works

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.

Overview of Solar Projects at Luther College: Donor and Supporter-Financed Funding Methods

With five onsite solar PV projects, Luther currently hosts more solar PV than any other entity in Iowa. As of 2016, it ranks third nationally among private liberal arts colleges (behind Oberlin and Bowdoin). Each of the college's projects has been uniquely financed through different methods, including an innovative use of direct donor contributions and supporter investment financing.

In an effort to continue supporting sustainability initiatives, the Luther College Development Office included a renewable energy initiative within the college's Sesquicentennial Campaign. Launched in 2008, the drive identified sustainability as one of the campaign's priorities and established separate endowed funds for renewable energy and the Center for Sustainable Communities. Between all funds, the Sesquicentennial Campaign collected an impressive \$57 million in gifts, pledges, and planned gifts. Most notable, perhaps, is the magnitude of success despite the economic downturn beginning just after the Campaign launch.

With this success, the college was able to continue moving forward toward their goal of carbon neutrality by 2030. To meet this ambitious goal, the college needed to further address their energy purchases. With the 2014 Iowa Supreme Court decision to legalize third party power purchase agreements (PPAs) for solar energy, Luther College was well positioned to build off their previous experiences in renewable energy projects and explore large-scale development of solar using PPAs.

"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](#)

"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

Going Big with Solar to Reduce Costs and Carbon Emissions

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%.

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.

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 3rd 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

"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

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 neutrality and saving money on the way.

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): 6,600

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



Luther College

**Photo courtesy of Luther College*

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