

Aggregating Higher Education Demand for Renewables: A Primer



February 2018

CONTENTS

3 [Executive Summary](#)

4 [Introduction](#)

5 [Benefits of Aggregation: Creating an Energy Cohort](#)

7 [Challenges & Solutions: Locking Arms or Holding Hands?](#)

8 [Aggregation Examples](#)

12 [Conclusions](#)

13 [How Your Campus Can Participate](#)

Executive Summary

Cohorts of colleges and universities are aggregating energy loads to achieve economies of scale when sourcing renewable energy.

This primer highlights the benefits of this aggregated approach by examining several completed group purchases as well as some in progress, such as a 100 MW effort in Buffalo, New York. It also describes best practices for pursuing group renewable energy aggregations structured as power purchase agreements (PPAs).



Introduction

Campuses are increasingly looking to renewable energy as the most financially attractive strategy for achieving dramatic reductions in greenhouse gas (GHG) emissions while reducing long-term energy costs and minimizing energy price risk.

A number of campuses have already taken steps to source renewable energy. In fact, as reported in [Assessing the Higher Education Sector's Use of Renewable Energy](#), more than 240 are already using some amount of renewable energy. However, according to the *The State of Sustainability in Higher Education 2016: The Life Cycle of Higher Education Facilities*, average annual campus greenhouse gas reductions have not been commensurate with many of the carbon-neutrality target dates compiled in the report. Unless campuses take more dramatic actions, they may be at risk of missing greenhouse gas reduction goals.

Unless campuses take more dramatic actions, they may be at risk of missing greenhouse gas reduction goals.

Since 2009, there has been steady growth in renewable energy adoption by institutions of higher education. Many schools purchase “unbundled” renewable energy certificates (RECs). As the costs of solar and wind energy have dropped, many campuses are now opting for directly sourcing renewable energy via power purchase agreements (PPAs) from both onsite solar arrays and as

well as from offsite, utility-scale solar and wind farms.

Onsite solar is an attractive strategy because it can be highly visible to campus stakeholders and because it is “behind-the-meter,” which means it can displace more of the delivered cost of electricity. However, it is constrained by the size of the sites on a campus available to host arrays, therefore typically only providing a small portion of campus electricity usage. Given the approaching carbon-neutrality target dates, onsite solar is unlikely to provide the scale needed by many campuses to reach their GHG targets on time.

Offsite wind and solar projects are much larger, and are therefore capable of providing up to 100% of a campus’ electricity usage – achieving dramatically larger greenhouse gas reductions and far more significant financial benefits.

Both options can be conducive to a consortium-style approach in which two or more entities aggregate their efforts in order to capture economies of scale. Higher education is particularly well-suited to aggregation strategies, as evidenced by the growing number of cohorts emerging to achieve scale through renewable energy buyers groups.

Benefits of Aggregation: Creating an Energy Cohort

There are several benefits to aggregating campus energy load for the renewable energy market, including:

1. Reducing soft costs through peer-learning cohorts

Most campuses have yet to adopt a comprehensive renewable energy strategy or, at least, have yet to execute a large onsite or offsite renewable energy PPA. One of the main benefits of participating in a renewable energy consortium is to climb the learning curve with a group of peers – or, perhaps, lead your peers on that journey. Soft costs can account for as much as two-thirds of the cost of an institutional renewable energy deal. Undertaking the learning process as a group can help cut those costs for developers by reducing the effort needed to acquire customers, which gets passed along to the institution in the form of lower PPA prices.

2. Gaining momentum

Renewable energy developers are attracted to colleges and universities because of their status as “forever” institutions. Stability and longevity tend to go hand-in-hand with strong credit ratings, which helps keep the cost of capital down for developers. But institutions that expect to be around forever (or close to it) also tend to take slow, methodical steps into unfamiliar territory. Thus, it can be challenging to gain traction on large-scale renewable energy efforts. The shared accountability that comes from working with peers can be a good way of keeping things moving forward.



3. Achieving scale

The average wind project size in the U.S. is now over 200 MW. Utility-scale solar projects are smaller, on average, but many are still too large for one campus. Some projects will accommodate smaller PPA contract sizes, but many will not. This means many (probably the vast majority) of campuses will be restricted in the number of projects willing to seek their business simply because there is a mismatch between the amount of electricity used by the campus and the amount produced by the project. Going to the market as a group can attract more competition and therefore more attractive bids.

Benefits of Aggregation:

Creating an Energy Cohort *(continued)*

Higher education is especially suited to aggregation, for a number of reasons;

1. Size matching

A rooftop solar array can sometimes produce all the power a single home needs in a year, and utilities can purchase all of the output from a single large wind or solar farm. But most colleges occupy a mid-size energy-usage segment in the market, falling somewhere between residential and utility-scale. This means solar arrays located on campuses are unlikely to produce as much electricity as a campus uses – often just a few percent of the total annual usage. But wind and solar projects that produce hundreds of thousands of megawatt hours of electricity per year are much too big for any one campus. Thus, combining electricity loads from two or more campuses helps achieve a scale that is more attractive to renewable energy project developers.

2. History of Collaboration

While each college and university has its own independent financial responsibilities, which require it to compete in the marketplace for students, faculty, and staff, higher education institutions also have a long history of collaborating with institutions that might otherwise be viewed as competitors.

3. Town–gown relations

Some local governments are adopting climate plans or renewable energy targets. Colleges and universities often represent a large constituency to local governments, which can provide opportunities as well as responsibilities. It is possible that an aggregated renewable energy procurement can align with, and contribute to, a local government renewable energy goal, providing a positive opportunity for town-gown relationships.



Challenges & Solutions:

Locking Arms or Holding Hands?

The benefits of a renewable energy aggregation strategy must be weighed against the challenges of such an approach. Inherently, joining a group can raise questions regarding the independence of each member. This section highlights two sources of tension that institutions may face in aggregating their demand with others and suggests an approach to manage these tensions that can be summarized as, “holding hands, not locking arms.”

1. **Tension:** Coordinating Schedules

Solution: To the extent feasible, identify key decision-making points in the process and schedule them in advance. Individual participants may be better able to keep their internal processes moving forward if there is a clear group deadline. Consider who will need to sign off on each important milestone and schedule time with them as far in advance as possible. It is easier to cancel a meeting than to get one scheduled with a senior decision-maker at the last minute.

2. **Tension:** Agreeing on Project Criteria

Solution: Discuss project criteria early in the process. Criteria can affect financial benefits, risks, and sustainability impacts. Think about criteria in terms of requirements versus “nice-to-haves.” Establish clarity about the minimum requirements for success, as compared to what might be a shoot-for-the-stars scenario. Identify any “deal-breaker” criteria that are unlikely to change regardless of other mitigating factors. Otherwise, taking a “consider-all-options” approach until a more complete picture emerges may be helpful.

Criteria for consideration:

- › **Financial Benefits** – will the project economics mitigate risk associated with energy price volatility, improve budget certainty, and reduce costs?
- › **Location** – are you looking for a solution that is on-campus, i.e., “behind the meter” or will you consider nearby, in-state, within your regional market, or beyond your regional market?
- › **Environmental attributes** – will you require renewable energy certificates (RECs) from the project or are national RECs sufficient?
- › **Academic integration** – does the solution need to include any teaching or research components?
- › **Contract term** – how long do you want to contract for renewables?

Different participants may have different requirements. For example, some projects may allow one buyer, or “offtaker” as they are called, to retain RECs from the project while another offtaker allows the project owner to retain the project RECs. The number of years in the contract term may also be flexible, with one participant contracting for 12 years and another for 15 years, for example.

Keep in mind that one of the benefits of aggregation is minimizing soft costs by working as a group. Thus, the more the group agrees on similar requirements, the more efficient the process is likely to be. But, in the end, if participants are “holding hands rather than locking arms”, each participant will have the flexibility to make independent decisions about many of the criteria.

Aggregation Examples

The track record of successful renewable energy buying consortia in higher education is growing longer, and more appear to be underway. Here are a few of the successful efforts to date:

1. University at Buffalo Consortium

Localizing Buffalo's Renewable Energy Future, 2017-2020

The largest campus renewable energy aggregation to date is being led by the University at Buffalo, and also includes Buffalo State College, Erie Community College, Erie County, and the City of Buffalo. Together, the group is seeking to catalyze 100 MW of renewable energy by 2020, building a portfolio of onsite and near-site solar, along with utility-scale projects within and beyond the state of New York. The project, called Localizing Buffalo's Renewable Energy Future, is a multi-phased, multi-year effort in partnership

"Our strategy is to think about how to enter into a PPA in a cutting-edge way, with a number of regional partners, while tying it into UB's academic core."

– Ryan McPherson, UB's chief sustainability officer and a key architect of the proposal.

with external renewable energy advisors from Edison Energy. The team plans to use renewable energy installations to achieve a wide variety of benefits, including energy budget cost-control and long-term energy price-risk mitigation, as well as a host of possible co-benefits such as urban renewal and energy affordability for low-income residents.



2. **Boston Green Ribbon Commission** Renewable Energy Leadership Prize, 2016

Boston's Green Ribbon Commission (GRC) convenes leaders from the city's key sectors, including higher education, to support the City's Climate Action Plan. In 2016, the GRC awarded a \$100,000 Renewable Energy Leadership Prize, which spawned a variety of innovative approaches to large-scale adoption of renewable energy. While the prize was awarded to enable Tufts University and Endicott College to benefit from 12 megawatts of wind energy, that aggregated deal has not been transacted. However, encouraged by the effort, additional BRC participants have pursued renewable energy contracts, including MIT and Boston University.

"[W]e are very excited that the other Prize applicants also continue to move forward with their projects and are in active negotiation."

– John Cleveland, BRC Executive Director, commenting on the successful ripple effect caused by the Prize.

3. **Council of Independent Colleges Virginia (CICV)** Solar Market Pathways, 2015

Supported by the U.S. Department of Energy's SunShot Initiative, this project brought together private colleges from across Virginia to create a Solar Master Plan to guide solar deployment on their campuses, with a goal of installing 30 megawatts (MW) of distributed solar generation by 2020 through a series of collaborative procurements. The group has completed its first solar RFP resulting in 1.9 MW of PPAs, and issued a Lessons Learned document that includes these recommendations: 1) "[O]ne representative from each organization participating in the collaborative procurement should be someone involved in procurement for her organization;" and 2) "the group should have access to an outside consultant with [solar industry] expertise." A second solar RFP was under consideration for 2018.

Aggregation Examples *(continued)*



4. University of California, 2014

Senior administrators from ten University of California campuses joined together to centrally execute power purchase agreements to construct 80MW of new solar generation in the Central Valley of California. The participating campuses and medical centers now receive approximately 50% renewable power through the Wholesale Power Program of the UC system's own power company.

"Through systemwide collaboration,
UC's campuses have been able to obtain cost-effective utility-scale renewable energy. Equally important, key leaders established a shared long-term vision for UC's energy supplies."

– Mark Byron, Executive Director - Renewable Energy Programs, University of California Office of the President



5. Capital Partners Solar Project, 2014

American University (AU), George Washington University (GWU), and the District of Columbia (DC) banded together to seek nearly 100 MW of combined load (representing roughly 50% of each campus's annual usage and 35% of the District's usage). DC diverged from the group effort and continued on its own, eventually contracting a 46 MW wind PPA through a separate process. Also, the George Washington University Hospital (a separate buying entity from the University itself) joined the effort so that, in the end, the three members (AU, GWU, and the GWU Hospital) sourced 53 MW of solar from one developer under similar terms.

"The greatest benefit I saw from teaming together
with GW was having a trusted colleague from another institution thinking through all the same questions and concerns. We served as second opinions for each other, providing reality-checks each time we encountered something that made us both wonder if we could really pull this off."

– Chris O'Brien, American University's Director of Sustainability during their participation in the Capital Partners Solar Project, and currently Director of Higher Education Programs at Edison Energy

6. Environmental Protection Agency (EPA)

Washington D.C. Metro Region Onsite Solar Collaboration, 2010

EPA launched a clean energy collaborative procurement initiative within the Washington, D.C., metro area to develop a significant

“This was an ambitious undertaking.

Looking back, I think it was a little ahead of its time.

One thing it accomplished was focusing organizations on evaluating specific solar opportunities. And many of them came away convinced that the time for solar had arrived.”

– Blaine Collison, formerly program director of the U.S. EPA’s Green Power Partnership, and currently Edison Energy’s Managing Director, Marketing & Partnerships

number of clean energy projects within the region. The target area in and around the District of Columbia and adjacent counties, cities, and suburbs was an optimal location for a collaborative clean energy procurement given the high density of federal, state, and local governments and educational institutions, as well as the existing

market dynamics. More than 170 sites at 20 organizations were evaluated, and 36 sites at four organizations were found to be viable for installing solar projects. Ultimately, several of the entities involved ended up pursuing solar projects individually rather than through a group effort. This story illustrates an important point about collaborative efforts: Even if they don’t directly result in a group purchase, they can still play a valuable role in paving the way for individual participants to move forward.

7. Emerging Efforts

As of early 2018, new efforts to aggregate campuses into large renewable energy-buying consortia were underway led by the Midwest Higher Education Consortium (MHEC), the Texas Regional Alliance for Campus Sustainability (TRACS), and the Pennsylvania Environmental Resource Consortium (PERC).

Conclusions

According to data reported in *Assessing the Higher Education Sector's Use of Renewable Energy*, the higher education sector is adopting renewable energy at a steady growth rate. Indeed, hundreds of campuses are now buying renewable energy, but most are either buying “unbundled RECs,” which incur an added cost, or they are sourcing onsite solar which is a step in the right direction but lacks the scale needed to make significant financial and environmental impacts.

In short, the renewable energy adoption rate in higher education may be too slow to meet the sector’s voluntary greenhouse gas reduction goals. **Ramping up renewable energy sourcing through large-scale, offsite PPAs may be among the most financially viable ways to meet the goals on time.** But large, offsite deals are complex and can be time-consuming. In this light, renewable energy buying consortia that aggregate campus load and create “learning and doing” cohorts may be the pivotal strategy that enables hundreds of colleges and universities to meet their climate goals under financially attractive conditions.



How Your Campus Can Participate



AASHE is providing a number of resources to support these aggregation efforts:

- › Aggregating Renewables for Higher Education: A Primer (this document)
- › In-Person Workshops – AASHE plans to host at least two workshops focused on renewable energy aggregation in 2018 in partnership with Edison Energy.
- › Webinars – Look for renewable energy webinars coming in 2018.
- › [Green Power Projects Database](#) – Visit AASHE's online database to find renewable energy projects already completed by campuses across North America

AASHE hopes the best practices and lessons outlined in this primer, along with the additional resources listed above, will accelerate large-scale renewable energy efforts among colleges and universities.

If you have questions or would like support to initiate or join a renewable energy consortium, please contact AASHE's Director of Programs, **Julian Dautremont-Smith** at julian@aaashe.org.

About the Authors



Julian Dautremont-Smith

Julian is one of AASHE's co-founders and served as Associate Director from 2004 until 2009, when he left AASHE to pursue graduate studies. He rejoined AASHE in 2015 as the Director of Programs. In his work with AASHE, Julian played leadership roles in creating the Sustainability Tracking, Assessment & Rating System (STARS) as well as the American College & University Presidents' Climate Commitment. Outside of AASHE, Julian served for two years as the Chief Sustainability Officer of Alfred State College and spent another year as Senior Program Manager with GreenerU. He has an MBA and an MS in Natural Resources and the Environment from the University of Michigan and a BA in Environmental Studies from Lewis & Clark College.



Chris O'Brien

Chris is the Director of Higher Education at Edison Energy. Previously, he was Director of Sustainability at American University, where he led the university's efforts to achieve carbon-neutrality by the year 2020, including a large-scale aggregated renewable energy project. Chris teaches energy, climate, carbon markets and sustainable purchasing in the Sustainability Management program at AU's Kogod School of Business. At Edison Energy, Chris shares what he learned at AU with other colleges and universities across North America, helping the higher education sector catalyze the transformation of America's electricity supply to clean and renewable sources. He is also a founding board director of the Sustainable Purchasing Leadership Council, and has served on AASHE's STARS Steering Committee.



AASHE is the leading association for the advancement of sustainability in higher education. We serve a full range of higher education faculty, administrators, staff and students who are change agents and drivers of sustainability innovation. Established in 2005, AASHE is comprised of over 900 members across 48 U.S. states, 1 U.S. Territory, 9 Canadian provinces and 20 countries.



Edison Energy is an independent advisory and services company with the capabilities to develop and integrate an array of energy solutions across supply and demand for the largest energy users nationwide.

Released February 2018

© 2018 Association for the Advancement of Sustainability in Higher Education (AASHE)

2401 Walnut Street Suite 102 Philadelphia, PA 19103 • (888) 347-9997 • www.aashe.org • info@aashe.org