Better Buildings CHALLENGE
U.S. DEPARTMENT OF ENERGY

EDUCATION PARTNER

ALLEGHENY COLLEGE

Implementation Model: Leverage Student-faculty Research

ORGANIZATION TYPE
Higher Education Institution: small liberal arts college

BARRIER
Lack of organizational buy-in for energy efficiency, insufficient access to capital

SOLUTION
Leverage student-faculty research to predict financial benefits of energy-saving options for campus construction and renovations

OUTCOME
A virtuous circle of successful green building upgrades and associated cost savings supports a culture of sustainability on campus

Overview

How does an institution of higher education with a comparatively small endowment and a limited investment in dedicated sustainability personnel develop an integrated sustainability culture on campus? A combination of bottom-up efforts and top-down leadership converged to create a climate conducive to deep infrastructure sustainability at Allegheny College. Student research and written reports, development of partnerships, dialogue, and the integration of sustainability principles into existing projects and budgets have had transformative value for Allegheny's continuing sustainability efforts.

Allegheny College's Playbook

Policies

Funding for efficiency projects is included in annual budgeting through the Physical Plant so continuous progress is supported and expected.

- The president signed the American College and University Presidents' Climate Commitment because history had taught the college administration and trustees that sound research could be used in support of morally important goals.

- Sustainability was included in job descriptions for facilities staff, a new president and vice presidents to ensure commitment was institutionalized and momentum would not be lost to changes in leadership.
- A sustainability coordinator position was added by rearranging existing jobs in anticipation of pending retirement in order to create the additional position without adding to the number of employees and therefore cost.
- Contract language for new construction and renovation projects was added to require emphasis on energy efficiency, including requiring new constructions meet at least LEED Silver standards.

Process

Hands-on campus sustainability research by student-faculty teams has evolved to emphasize the generation of reports and case studies analyzing costs savings and performance of sustainable building technologies, rather than simply a recommendation based on principle. The environmental science department, in particular, has developed a strong relationship with the Physical Plant which allows both parties to communicate about upcoming projects and propose mutually beneficial research opportunities. The student-faculty research teams regularly present their evidence-based recommendations to the administration to inform the design of new campus building projects or retrofits. The Physical Plant director became a partner in the effort when the actual performance of initial student-recommended projects confirmed the budget relief and ease of operations predicted by student research. This relationship has created a virtuous circle, with the Physical Plant director now presenting financial successes of efficiency projects to the administrative Finance & Planning team at Allegheny, who in turn seek additional building savings opportunities for future projects.

For example, while the 106-bed dormitory, called North Village I, was being designed, the ES department employed a junior seminar of 14 students to find ways to make the building greener and more energy efficient. Working with the architects and Physical Plant, the students suggested the building be LEED certified and strongly supported the installation of a geo-exchange heating and cooling system to maximize efficiency. A year-long senior thesis analyzed the payback time expected for a geo-exchange system: about ten years. The calculations and case studies of success at comparable facilities were sufficient to convince the administration and Physical Plant that the alternative technology was available, acceptable, and performed well. The geo-exchange heating and cooling system was installed resulting in economic savings which exceeded student projections, reduced campus utility costs and greenhouse gas emissions per square foot, and proved to be easy to operate and maintain. Since then, two additional geo-exchange systems have been used on campus for a 232-bed dormitory and the renovated Admissions Office.

One of the hallmarks of an Allegheny College education is student engagement and hands-on learning opportunities. The impacts of student research and suggestion manifested in sustainable buildings, solar arrays and an annual Energy Challenge provide tangible and attractive stories for Admissions staff to share with prospective students.

To ensure support for sustainability and momentum is maintained as an institutional value over the years, Allegheny incorporates language in job descriptions for positions such as Director of Physical Plant, Executive Vice President, and even the President of the College. For example, the call for applications for a new Executive Vice President in 2013 stated, “Allegheny is one of only 10 schools receiving the Climate Leadership Award from the American College and University Presidents' Climate Commitment and Second Nature. The EVP will provide critical leadership as the College maintains its commitment to environmental sustainability.”

Outreach

Allegheny's commitment to deep infrastructure sustainability is successful because sustainability is integrated into all decisions, policies, operations, and budgets rather than held up as a stand-alone achievement. The drawback to this integration is that sustainability is not as flashy and visible as it would be if treated like a showcase piece. To help illuminate sustainability initiatives and educate the campus population, a green tour consisting of eighteen signs posted around campus highlights geo-exchange heating and cooling systems, a green roof, solar arrays, wind REC's, efficiency retrofits, the College's 2020 climate neutrality goal among other initiatives.

> Allegheny is annually recognized by the Princeton Review's Guide to 322 Green Colleges and the Sierra Club as a national leader of campus sustainability. Since 2007 Allegheny College has been recognized as an EPA Green Power Partner every year and since 2009 has been the largest purchaser of renewable electricity in our athletic conference. In addition, Allegheny was awarded the Green Power Leadership Award in 2011. In 2012, Allegheny was awarded the Climate Leadership Award by Second Nature. Allegheny created a video highlighting our sustainability commitments and progress when vying for the 2012 Climate Leadership Award. Not only did it help us win the award, but has been a useful tool to communicate with our campus community, alumni, friends and prospective students. The Department of Energy featured Allegheny in its "Clean Energy in Our Community" video series also in 2012.

Tools and Resources

Senior Comprehensive Projects

- Geothermal Ground Source Heat Pumps: Allegheny College Athletic and Recreation Facility Economic Feasibility Study – full text available on request
- A Virtual Tour of Sustainability for Allegheny College – full text available on request
- Cost Benefit Analysis of Retrofitting Allegheny College Owned Houses with Insulation College – full text available on request
- Solving the Problem of Student Energy Consumption: An Energy Competition for Allegheny College – full text available on request
- Allegheny College Clean Energy Education Initiative: Design and Installation of an Educational Solar Photovoltaic Array on Carr Hall – full text available on request
- Are the Standards of Allegheny's Theater and Communication Arts (TCA) Building Compatible with LEED Certification? – full text available on request
- Incorporating "Green" Materials into Allegheny's New Admissions House
- Solar Power: Bringing Clean Energy to Allegheny

Other Resources

- Allegheny College Campus Wide Energy Challenge, a Powerpoint for AASHE
- AASHE Presidential Voices Interview Series: James H. Mullen, Allegheny College
- Richard J Cook Center for Environmental Science is Dedicated in Ceremony at Allegheny College
- Allegheny by the Numbers, an Admissions video
- ACUPCC 5 Year Report, page 23
- Constellation NewEnergy blog about 100% wind REC purchase

Measuring Success

The sustainability coordinator tracks energy consumption before and after efficiency retrofits to quantify the energy and financial savings realized. Cumulatively, the progress is also tracked in annual greenhouse gas inventories to assess institutional progress towards the goal of climate neutrality by 2020.

More difficult to measure is the qualitative impact a well-integrated culture of sustainability has on the visibility, value and acceleration of sustainability initiatives and accomplishments. As sustainability has gained institutional support, it has been incorporated into the annual comprehensive maintenance plan, the Campus Master Plan, the Strategic Plan and the priorities of groups such as the student government.

Over the past decade, Allegheny's reputation as a leader in the campus sustainability movement has continued to grow. This can be qualitatively measured by the number of honors we receive, but is perhaps more evident in the respect of our peer institutions also seeking to improve campus sustainability.

Outcomes

Solid research and analyses followed by successful implementation of energy efficiency measures on campus demonstrated the financial benefits of sustainability initiatives. This demonstration of success and savings was influential in the signing of the American College and University Presidents' Climate Commitment. The institution signed because of support for sustainability and climate progress efforts, but also felt confident that the goal of operational efficiency and ultimately climate neutrality were achievable. Allegheny adopted a Climate Action Plan with the ultimate goal of climate neutrality by the year 2020 – a bold commitment bolstered by the confidence of previous successes and the understanding that sustainability was now an important core value of the College.
To ensure consistent progress towards the goal of climate neutrality, Allegheny administrators included the commitment in the Strategic Plan and established annual funding through the Comprehensive Maintenance Plan and the campus Master Plan.

After signing the ACUPCC, a position was created for a full-time, permanent sustainability coordinator to more purposefully direct campus efforts and track and measure success. There was broad support for the addition of this position for many reasons including the belief that the position would pay for itself in energy savings. The sustainability coordinator's tracking of energy efficiency retrofits, including many suggested and initially researched by students and faculty, reflect an average reduction in consumption exceeding 20%.

Including language about institutional support for sustainability and stipulating that new employees be actively supportive of this value has ensured that progress and momentum is not solely dependent on certain individuals, but rather is part of the fabric of each position, particularly for top administration positions.

Nationally, sustainability has become an important factor when prospective students choose their college. While Allegheny has not completed a quantitative survey of how our sustainability commitment and accomplishments impact a final decision, responses to a question about sustainability on our Admissions evaluation form indicate there is much interest and enthusiasm for the work we've undertaken both because it represents our campus values and demonstrates

financial responsibility.

Allegheny College requires all new construction to meet LEED Silver certification. However, the recent construction of a 232-bed dormitory demonstrates that administrators also work closely with the architects and contractor to ensure we're emphasizing efficiency and sustainability as a principle and operations priority rather than solely as a means to accumulating points. This emphasis resulted in the North Village Phase II dormitory achieving LEED Gold certification and featuring the third geo-exchange heating and cooling system on campus.

In the late 2000's the convergence of bottom-up approaches of student-faculty research and the top-down leadership of administrators convinced of the worth of sustainability initiatives led to a fundamental transformation of the institution. Emblematic of this acceptance and integration of sustainability into operations and decision-making, was the commitment to purchase 100% of the campus's electricity with wind-generated renewable energy credits (REC's), a move that cut the institution's carbon footprint by 52%.