

Culture Clash: Art, Electrons, Teaching, Research, and Engagement Meet at the Solar Strand

University at Buffalo

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[AASHE Case Study](#): Curriculum, Public Engagement, Energy

Project Overview

The University at Buffalo's 750 kilowatt Solar Strand, brought to life by world-renowned artist Walter Hood, reflects a transformative vision that defines the future of sustainability. Its approach moves beyond obtaining carbon neutrality and reducing our footprint. It welcomes students, faculty staff and community members to UB's campus through a connected and cultural natural landscape, designed to be one of the most publicly accessible energy sites in the world. Like higher education, the strand is multidimensional; merging teaching, learning, art, research, sustainability and community engagement into a complex and powerful resource that will be a model for future development.

Background

As a public research institution, our model of sustainability focuses on finding solutions to global challenges through research, educating individuals about these challenges, setting the bar high for sustainability in our own operations, and sharing our experiences and partnering with the external community. The University at Buffalo has been an environmental leader for well over 30 years and was at the forefront of the birth of the modern environmental movement with our faculty deeply involved in Love Canal (located 10 miles from campus). UB was also one of the first universities to hire an energy conservation officer, who worked diligently for over 25 years to save millions of dollars in operations costs and greatly reduce the university's carbon emissions.

In 2007, the university created the Environmental Stewardship Committee and formed the foundation of a university-wide approach to sustainability. During the next two years the university moved aggressively with renewable energy purchases which now make up 30% of our energy portfolio (not including hydro generated energy from Niagara Falls). In 2007, UB was an early signatory of the American College and University Presidents Climate Commitment (ACUPCC) and after two years of input, collaborative planning, and engagement of the campus and community, the university created a detailed roadmap of how we would obtain climate neutrality by 2030—an aggressive date for a public research university. During the drafting of the UB Climate Action Plan the university constructed our first full scale solar project. Funded in part by the New York State Energy Research and Development Authority, the 73.5 kilowatt array can be viewed from the Undergraduate Library adjacent to it, and serves as an educational opportunity for students, faculty, and staff. The Solar Strand is yet another step in UB's evolving sustainability strategy.

It was this commitment that attracted the New York Power Authority (NYPA) to approach UB about partnering on a solar project in 2009 as part of their initiative to increase solar power across New York State.

Goals

Change the perception of renewable energy and demonstrate that solar energy can be beautiful, accessible and incorporated into everyday living.

Advance UB's goal of becoming climate neutral by 2030 by producing 750 kilowatts of renewable energy, to feed into the grid.

Serve as an educational tool for both K-12 and UB students, and the community to learn more about renewable energy and sustainability.

Provide research opportunities on renewable energy (specifically in a northern climate with significant snowfall and cold winter temperatures), engineering, art landscape, and habitat.

Collaborate with regional planning efforts to redefine our area's future.

Maximize the engagement of local contractors and partners.

Implementation

The UB Solar Strand represents a unique partnership between the New York Power Authority (NYPA) and UB. With the Solar Strand, UB and NYPA are committing to a long-range investment in creating a climate for excellence—a sustainable, innovative environment that supports our students, faculty and staff while increasing our positive impact on the communities we serve, locally and globally.

On May 7, 2009, the university and NYPA announced the awarding of 7.5 million to UB to construct a world class solar array. The award is a cornerstone of a statewide renewable energy program and UB's own efforts to achieve climate neutrality. At 140 feet wide and 1,250 feet long, the array's 3,200 American-made panels will prevent 400 tons of CO₂ from entering the atmosphere annually.

During the ensuing months intensive conversations occurred between the university and NYPA as it became clear that there were two different perspectives on the direction of the project. The power authority envisioned a large scale solar field that would produce a maximum quantity of renewable energy. The University agreed with this approach, but also wanted the Strand to be a blend of art, teaching, community access, and research, which would reflect the university's mission.

To achieve this objective, UB convened an artist selection panel that included faculty and members of the community. The panel was co-chaired by Louis Grachos, director of the Albright-Knox Art Gallery, and Ted Pietrzak, director of the Burchfield Penney Art Center. An international design competition was then conducted to solicit more than 50 world class submissions for the design of the solar array. The university celebrated Earth Day 2010 with the unveiling of the three finalists' designs which included those of: Vito Acconci, Diana Balmori and Walter Hood. The competition called for designs that would create a visually attractive gateway to the campus; integrating beauty with engineering innovation and environmental sustainability.

The panel, in partnership with NYPA, chose landscape architect and artist Walter Hood. Hood is the founding principal of Hood Design and professor and former chair of the Landscape Architecture Department at the University of California-Berkeley. His concept for the UB project demonstrates his affinity for exploring ways that landscape typologies reinforce and remake landscapes specific to places and the people who occupy them.

A pioneering urbanist, Hood heads a firm committed to issues that address the reconstruction of urban landscapes within towns and cities. Hood's body of work includes refurbishing local parks, restoring well known memorials and creating new works of public art. His projects include the Center for Civil & Human Rights in Atlanta, the De Young Museum in San Francisco, the California African American Museum in Los Angeles and the Jackson Museum of Wildlife Art in Jackson, Wyoming.

Hood's vision for the site is a response to the geography and history of the campus space. Groups of photovoltaic panels are mounted onto supports that stretch in three rows along Flint Road, creating a new gateway to the North Campus. Walkways run between the rows of panels and connect the array with local roads, the Center for Tomorrow, and naturally regenerated meadows and wetland areas that the public can enjoy. Gathering spaces embedded in the project include an open-air chamber paved with recycled, concrete sidewalk slabs. The array's tallest groupings of solar panels form a slanted roof over three outdoor "social rooms." At 140 feet wide and 1,250 feet long, the array has the capacity to produce 750,000 watts of energy—enough to power hundreds of on-campus student apartments.

After the design was shared with the community and approved by NYPA and UB, construction began. Over 40 local contractors, vendors, and businesses were employed to install the 3,200 American-made solar panels and create a space in line with Hood's vision.

UB students, faculty, staff, and community members were active participants in the construction of the Solar Strand. Hood's vision included an extension of the DNA concept on the opposite side of Flint Road using linear rows of native tree and shrub plantings. In the Fall and Spring, our campus community came together to plant the trees and shrubs. The planting events will serve as a reminder for years to come of the engagement the Solar Strand fosters.

On April 23rd, 2012 the UB Solar Strand was officially powered on. Power is flowing from the Strand and real-time output can be viewed on the Solar Strand website. As of July 1st, we have produced 260,031 kilowatt hours and prevented 186 tons of CO2 emissions.

By September 2012, the Solar Strand will be accessible to the public, and educational outreach programs will commence shortly thereafter for K-12 students. The space will serve as a classroom, laboratory, and a one-of-a-kind habitat for plant and animal species.

Timeline

2009 (spring): NYPA approaches UB to construct a solar array on campus and awards grant.

2009 (summer and fall) scoping of project, site selection and spec development occurs.

2010 (winter/spring) artistic selection committee formed.

Call for artists and artist selection.

2010 (summer/fall):Design

2011: Construction and student ecology enhancements.

2012 (spring) Strand is powered on.

Fall 2012:Project completion.

From start to finish, the project took approximately three and a half years. This includes the extensive and integrative design selection process—a unique practice amongst colleges and universities.

Financing

Costs

The project was financed by the New York Power Authority in the amount of \$7.5 million. This funded the design and construction of the Strand, although it does not include thousands of hours of UB personnel involved in the process. Annual recurring costs will be addressed by UB.

Results

The creation of a one-of-a-kind space that blends public art, technology, science, engagement, and education for the campus and community.

The generation of 750 kilowatts of electricity, enough to power hundreds of on-campus student apartments.

A methodology for project collaboration demonstrating that through innovative and integrated planning and design, a renewable energy project can be enhanced to reflect all aspects of the modern public research university.

A renewable energy project that celebrates community and public access.

Lessons Learned

We discovered that through innovative and integrated planning and design, a renewable energy project can be enhanced to reflect all aspects of the modern public research university (teaching, research, engagement and operations). By planning and designing outside of a campus vacuum, we learned firsthand how a renewable energy project can increase community and campus access. We learned that the opportunities for teaching and learning are limitless as witnessed over the last several months, as we prepare for a regular schedule of tours with community members and K-12 students through the Strand.

We also learned that while our government partner may have originally had a different scope in mind, by working with them to identify common priority areas we were able to create a dynamic project that achieved their goals (renewable energy) as well as ours (teaching, research, art and community engagement).