

WORKBOOK

for a

Clean Energy Campus



University of Colorado Energy Summit
January 24-26, 2002
Boulder, Colorado

Written by
Land and Water Fund of the Rockies
The University of Colorado-Boulder Environmental Center

Workbook for a Clean Energy Campus

INTRODUCTION

Generating electricity from fossil fuels, like coal, is one of the most environmentally damaging things we do. The impacts on our environment are significant, including climate change, air pollution and water pollution. According to the Union of Concerned Scientists, electricity generation in the US causes:

- 40% of the carbon dioxide emissions – a major global warming gas
- 67% of the sulfur dioxide – primary cause of acid rain
- 33% of mercury – leads to water and soil pollution
- 25% of nitrogen oxides – which cause smog

In addition to environmental impacts, air pollution from power plants can cause public health problems. An October 2000 study by the Clean Air Task Force found that fine particle pollution from power plants cuts short the lives of over 30,000 people each year.

Across the country electricity providers are offering consumers the choice of cleaner options by generating electricity from non-polluting renewable energy resources like wind and solar power. Buying clean energy, also called green power, helps keep pollutants out of the environment and demonstrates your support for a sustainable energy future.

How Do College Campuses Fit In?

College campuses are frequently recognized for their leadership on social and environmental issues. In recent years many colleges have developed progressive policies in response to student concerns on a range of topics - from recycling to sweatshops. More recently several universities have made commitments to reduce waste and pollution. Several colleges around the country have committed to energy conservation and efficiency programs, not only to save money, but also to reduce the environmental impact associated with producing and using electricity. Using clean energy on campus is a great way for college students to show leadership on an important environmental issue.

Students interested in persuading their university to purchase renewable energy to reduce the environmental impact of their campus' energy use will be able to use this basic workbook to get started. It is based on the experience of the first few colleges in the country to purchase renewable energy and is not intended to answer all questions. In addition to general suggestions given in the workbook, the Case Studies section provides further details on a variety of programs that have been implemented on campuses around the country. Also provided is a list of resources with information on the environmental impacts of energy use, climate change, and details on green power.

Workbook for a Clean Energy Campus

Several colleges have developed energy plans where purchasing renewable energy is but one component of a comprehensive strategy also including energy use audits, energy efficiency and conservation. Other colleges, like the University of Oregon, are generating their own renewable energy. Purchasing clean, renewable energy can be one component of a comprehensive energy plan, or it can be a stand-alone action. Either way, there are significant environmental benefits.

How Does Our Campus Buy Green Power?

There are a variety of ways to get your university to buy renewable energy. This section will outline a few steps and strategies available to you.

STEP 1: GATHERING BACKGROUND INFORMATION

This section provides suggestions for background information you should try to find before proceeding with any of the different strategies.

Green Power

Is green power available to my college? Which companies offer it? How much does it cost? What is the process to purchase renewable energy?

A list of utilities that offer renewable energy are listed on the US Department of Energy's Green Power website: www.eren.doe.gov/greenpower/home.shtml

Check to see if your local utility or a competitive power supplier offers renewable energy. You can contact them directly to learn more about the cost and how to purchase green power from them.

Campus Energy Use

How much energy does my campus use? Who pays our electricity bills?

The best source of information about your campus's energy use is the Facilities Management department. Once you know the amount of energy your campus uses (in kilowatt-hours per month or year) you can figure out the environmental impact by using an online emissions calculator (see www.safeclimate.net or www.greentagsusa.org).

Environmental Benefits

What kind of renewable resources are used? Is it really "green"? What are the environmental benefits? Will this purchase really reduce our emissions?

In some states, utilities are required to disclose information on the types of fuel used to generate electricity and the environmental impacts. Your local utility or renewable energy supplier may have this information. If they can provide you this

Workbook for a Clean Energy Campus

information, you can compare the environmental impacts of regular versus green electricity.

You should also ask the energy supplier whether their renewable energy programs are certified "green" by any state agencies, environmental groups or other auditors.

Building Support for the Idea

Who on campus do we need to work with? How do we get support? What will it take to run a campaign?

It will be important for you to get support from a broad coalition of people on campus - including students, student government, professors, and the administration. You can review the Case Studies section to learn the details of how other students have built campus-wide support for a green power purchase.

A good place to start is with the student government or a student group that already works on environmental issues - they may be interested in working on clean energy and would be a good ally. You might consider forming a group that works specifically on energy issues - ask the student government what it takes to get funding or office space for a new group. You can host a guest speaker to talk about energy use, or have a kick-off meeting and invite interested students. Also find out if there are any professors who would be able to help you. Once you have a working group formed, you can start developing a detailed strategy on how to get your campus to use clean energy.

STEP 2: DEVELOP A STRATEGY

The universities that are already purchasing green power generally followed one of two paths: a student-led campaign to raise fees to pay a premium for renewable energy or a university administration decision to purchase green power. A third strategy gives details on what you can do if your college's electricity provider doesn't offer the option to buy renewable energy.

Student-led Purchase of Renewable Energy

The first two colleges in the country to purchase renewable energy (University of Colorado-Boulder and Connecticut College) did so by raising student fees to cover the additional cost. Details on these student-led initiatives are described in the Case Studies section. The information in this section will help students interested in pursuing a similar path on their own campus.

In addition to the basic information mentioned above, you'll need to figure out a few more things:

Workbook for a Clean Energy Campus

1. *If renewable energy has an extra cost, how do we pay for it?*

The student government (or facilities manager) can tell you if the student government is responsible for paying electricity bills in any of the buildings on campus. They will also be able to help you determine how the school could use student fees to pay for clean energy. It would be a good idea to set up a meeting with student body representatives to talk through your ideas and get their support for clean energy. They may also be able to help you figure out what other sources of revenue are available to buy renewable energy or help you get support from the administration. Using money saved from energy efficiency projects is a great way to increase the environmental benefits of your renewable energy purchase.

2. *If student fees are to be used to pay for renewable energy: How do student fee increases work? What is your school's election code? How do you get an issue on a ballot? How successful have previous ballot initiatives been?*

The student government will be able to answer these questions.

3. *Aside from student fees, what other sources of funding are available? Are there grants for environmental projects available from the university? From state or federal agencies?*

Campus environmental groups, professors, the administration or local environmental groups might have information on other sources of funding. For more ideas, read the case studies on the University of Oregon and University of Vermont.

Administration Purchase of Renewable Energy

Administrators at some universities have decided to support the use of renewable energy on campus. If you are interested in approaching the administration, read the case study on Carnegie Mellon University. Also, you might consider:

1. Educating the campus about the importance of using clean energy. You could write an editorial for the campus paper, hold a conference on energy issues, bring a series of speakers to campus, etc.
2. Demonstrate student interest in renewable energy. You could: circulate a petition encouraging the administration to use clean energy for a portion of the campus's energy needs; ask students to contact key administrators and ask that they support renewable energy, etc.
3. Talk to the student government representative to the administration for

Workbook for a Clean Energy Campus

ideas on how to approach the appropriate decision makers.

If Your Local Electricity Supplier Doesn't Offer Renewable Energy

Unfortunately, renewable energy isn't always available from your local electricity supplier. If this is the case, you could:

1. Start a letter-writing campaign or a petition to encourage your local electricity supplier to offer renewable energy. Many suppliers around the country have started renewable energy programs in response to requests from their customers.
2. Support the development of renewable energy by purchasing "renewable energy certificates" (also called "green tags"). More information and a list of suppliers (Green Certificate Marketers) is available from the US Department of Energy's Green Power site: <http://www.eren.doe.gov/greenpower/marketing.shtml>
3. Consider ways to generate renewable energy on campus - purchase solar photovoltaic panels or small wind turbines. Look in the phonebook for local equipment providers or contact the American Wind Energy Association or your local chapter of the American Solar Energy Society for more information.
4. Contact your elected officials. All levels of government, from city council representatives to state legislators and your state's senators and representatives can help support renewable energy. Let them know that you support the development of renewable energy resources in your state and ask what they're doing to help.
4. Contact local clean energy advocates or environmental organizations and learn what else you can do to promote the development and use of renewable energy.

STEP 3: IMPLEMENTING YOUR STRATEGY

The following case studies describe ideas and strategies that have been successful on other campuses. Since each university has a different situation, you can draw on ideas used in these examples and develop a unique strategy to pursue on your campus.

Workbook for a Clean Energy Campus

Case Studies

- ❖ Carnegie Mellon University - largest wind power purchase in the country
- ❖ Connecticut College - purchases renewable energy
- ❖ Penn State University - wind power purchase
- ❖ University of California at San Diego - Renewable Energy Fair
- ❖ University of Colorado - first wind power purchase; blueprint for green campus
- ❖ University of Oregon - photovoltaic system on student union building
- ❖ University of Pennsylvania - wind power purchase
- ❖ University of Vermont - solar panels
- ❖ Wesleyan University - purchases wind power

There are a number of universities that have developed detailed energy management plans or climate change action plans. For more information, visit these web sites:

New Jersey Higher Education Partnership for Sustainability
<http://www.njheps.org>

Oberlin College 2020 Project
<http://www.oberlin.edu/~envs/2020proj/home.htm>

SUNY-Buffalo
<http://wings.buffalo.edu/ubgreen/>

Tufts University Climate Initiative
<http://www.tufts.edu/tie/tci/>

University of Colorado Blueprint for a Green Campus
<http://www.colorado.edu/ecenter>

Workbook for a Clean Energy Campus

Carnegie Mellon University

May 2001 - Carnegie Mellon University aims to provide leadership in demonstrating the need and importance of environmentally sustainable practices in our places of work, our homes and our communities. The commitment to wind power for five percent of the university's total electricity needs is part of its overall energy management and conservation effort.

Carnegie Mellon has evaluated the emissions of prospective electric generation suppliers from the start of deregulation in Pennsylvania. The Environmental Practices Committee, a university group of faculty and staff with expertise in environmental issues, recommended the purchase of renewable energy if possible. No bids for renewable energy supply for a portion of our electricity needs were received the first three years.

When Carnegie Mellon was preparing to re-bid its electricity supply contract this year, Environmental Defense recommended two renewable energy suppliers capable of providing Carnegie Mellon 5 percent of its power usage for fiscal year 2002. Some faculty associated with the Green Design Initiative (www.ce.cmu.edu/GreenDesign/) reviewed the bids for emissions and recommended 100 percent wind power as the best buy environmentally.

While the cost of wind power is somewhat higher (approximately two cents per kilowatt hour) than conventional sources, Carnegie Mellon has made this investment (1) to demonstrate the university's recognition of the importance of development of renewable, less environmentally damaging sources of energy, (2) to provide educational opportunities for our students, faculty and staff, and (3) to help support the development of wind power generation in Western Pennsylvania.

The Environmental Practices Committee is planning a "university challenge" for conservation efforts to cover the extra cost of the wind power. This will have the added benefit of reducing the university's overall energy consumption.

The Environmental Practices Committee (EPC) was established in 1998. Mission Statement: The Environmental Practices Committee will strive to develop university practices that improve environmental quality, decrease waste and conserve natural resources and energy, thereby establishing Carnegie Mellon as a practical model for other universities and www.cmu.edu/epc. The EPC has developed a campus-wide Green Practices Program that encompasses review and revision of practices in energy management, waste reduction and recycling, dining services, procurement, building renovation and construction, landscaping and transportation.

Contact: Chriss Swaney, EPC
<http://www.cmu.edu/epc/back.htm>

Workbook for a Clean Energy Campus

Connecticut College

Connecticut College is 1st college to buy Green Power from The Co-op
NEW LONDON, CT — May 11, 2001 — In a move that will support cleaner sources of electricity and significantly reduce its emission of air pollutants, Connecticut College has joined the Connecticut Energy Cooperative as an organizing partner. It is the first college in the United States to commit to support 100 percent, Green-e certified, renewable electricity, according to the co-op.

The co-op, based in Hartford, is a state-approved, licensed electricity supplier that provides its members with commercial natural gas, fuel oil, propane, energy efficiency services, low-cost long-distance telecommunication and electricity. It was the first supplier in New England to offer 100 percent renewable electricity and operates on a not-for-profit patronage basis.

Students at Connecticut College spearheaded the move, raising the funds to join the co-op through student-sponsored bake sales and agreeing to support a \$25 increase in their student activity fees to pay the costs associated with purchasing renewable energy from the co-op.

"Our environment is suffering severely," said Sara Zisa, a sophomore and co-president of the Connecticut College Renewable Energy Club. "The students needed to do something." With the support of the student body, Zisa and club co-president Kassie Rohrbach raised the \$1,500 needed to join the co-op as an organizing partner and circulated a petition seeking support for the \$25 fee. The Student Government Association overwhelmingly supported the initiative and the college's Board of Trustees unanimously approved the measure on May 5.

"Connecticut College students have challenged every other student body in America to accept responsibility for the energy they consume and the pollution their campuses generate," said Bob Maddox, co-op marketing director.

Green-e certification is issued by the Center for Resource Solutions based in San Francisco. That organization administers national and international programs that preserve and protect the environment through the design of sustainable energy strategies and technologies. Companies that use the Green-e logo are monitored and audited by independent companies.

In addition to supporting green power purchases, Connecticut College's students have pledged to work to dramatically reduce the environmental impact of the college through reduced energy use. The co-op will assist students, staff and faculty in developing a strategic energy management plan, audit building energy use, suggest ways to use energy more efficiently and conduct educational seminars.

The students' goal is the purchase of 20 percent of the college's electricity through renewable resources. According to the co-op, the full purchase would reduce the

Workbook for a Clean Energy Campus

emission of sulfur oxide (which causes acid rain) by 17,254 pounds per year, the emission of nitrogen oxide (which causes smog) by 3,612 pounds per year, and the emission of carbon dioxide (which is considered the cause of global warming) by 2.3 million pounds per year.

As an organizing partner, the entire Connecticut College community will have access to all co-op products and services, including reduced lifetime memberships for their private use. The staff and faculty have the opportunity to purchase conventional electricity at 5.25 cents per kilowatt hour (kwh) compared to Connecticut Light & Power Co.'s 5.5 cents/kwh cost.

Ulysses Hammond, Connecticut College Vice President for Administration, commended the students for spearheading the effort on campus. "They have been working on this since September," he said, adding that all facets of the campus community were given an opportunity to weigh in on the decision.

"This program is very important to Connecticut College's on-going commitment to be environmentally responsible." Hammond, whose office oversees most of the college's administrative staff, said the benefits provided to the staff (a lower individual membership, free home energy analysis and low long-distance telephone rates in addition to the electricity options) were crucial in gaining support for the co-op program.

Earlier this academic year, Connecticut College received a GreenCircle award from the state Department of Environmental Protection for "promoting pollution prevention, waste reduction, natural resources conservation and/or environmental awareness." The college was cited specifically for separating organic materials for composting or animal feed, successfully implementing an innovative and unique recycling program, exceeding mandatory recycling requirements and for donating time and resources to assist with environmental projects sponsored by youth groups and community and conservation organizations.

Ranked among the most selective private liberal arts colleges in the nation, Connecticut College has an enrollment of 1,670 men and women from 43 states and 59 countries. The college is particularly known for interdisciplinary studies, innovative international programs, paid internships, and a wide range of student-faculty research opportunities. Founded in 1911, the college operates under a 79-year-old honor code and has no Greek system. The scenic 750-acre campus is managed as an arboretum and overlooks Long Island Sound.

For more information, see <http://www.conncoll.edu/>.

Workbook for a Clean Energy Campus

Penn State

Penn State Plugs into Wind Power

UNIVERSITY PARK- Wednesday, October 24, 2001- Demonstrating their commitment to renewable energy resources and the environment, the Pennsylvania State University will sign a contract with Community Energy Inc. (CEI), a renewable energy marketing firm, to purchase 5 percent of University Park's electrical needs from wind energy over the next five years. On "Wind Energy Week" as proclaimed by Pennsylvania Governor Schweiker's, this landmark pledge establishes Penn State as a national leader in wind energy, joining The University of Pennsylvania and Carnegie Mellon University. By purchasing 13.2 million kilowatt hours (kWh) annually or the energy output of over three giant 215-foot tall windmills, Penn State will become the second largest user of retail wind energy in the United States.

Three turbines will be dedicated to Penn State today at Community Energy's 'Catch The Wind' Media Event to be held at the Exelon-Community Energy Somerset Wind Farm, visible from the PA turnpike southeast of Pittsburgh. Ford Stryker, manager of the University's Finance and Business Environmental Strategy will speak at the dedication ceremony of Pennsylvania's two new wind farms. The ceremony is scheduled to begin at 11 a.m. on October 24, 2001, and will be a major event supporting Governor Schweiker's proclamation of "Wind Energy Week" in Pennsylvania.

The two new state-of-the-art wind farms are stretched on ridges in Somerset and Mill Run, rural towns in Pennsylvania's Allegheny Mountains. The three 'Penn State University turbines' will supply 13.2 million kWh of the annual electrical needs of Penn State's University Park campus. The wind farm's sixteen, 215-foot-tall turbines cover only 5 percent of the two agricultural farms. The 112-foot blades span almost halfway down the height of the towers and will operate whenever the wind exceeds 6.7 miles per hour. Six windmills stand at Somerset and ten at Mill Run.

This purchase of New Wind Energy has zero emissions associated with it. Compared to the average electric generation in the Mid-Atlantic Region, an estimated 4,644 tons of coal and about 7,914 tons of carbon dioxide emissions will be saved annually, which has the equivalent CO₂ benefits of taking over 1,000 cars off the road or planting over 2,000 acres of trees each year.

A consortium of companies including wind farm developers Atlantic Renewable Energy Co. and Zilkha Renewable Energy, wholesale buyer Exelon Power Team, and wind energy marketing firm Community Energy developed both farms. Just as developing these projects required the collaboration from several players, expanding our state's renewable energy resources will necessitate partnerships with large institutions like Penn State. By taking part in this pioneering effort, Penn State helps to build the demand for wind energy while raising the standard for environmental stewardship in Pennsylvania. The price of wind energy has dropped 80% since 1980 and today is increasingly affordable, this step makes not only environmental sense, but supports the emerging PA wind energy industry that has many rural economic development benefits

Workbook for a Clean Energy Campus

as well. These wind farms are provide steady, sustainable income for farmers, add to the tax base, and provide short-term construction jobs followed by permanent operations and maintenance positions. Penn State is proud to be a part of this important wind energy initiative.

Doug Donovan, Penn State Energy Program Engineer, said, “Penn State is proud to support the emerging wind energy market in Pennsylvania. The potential for wind energy is enormous, as it has the potential to provide the electricity needs the entire nation.”

Brent Alderfer, president of Community Energy, Inc., said, “By making one of the largest retail wind energy purchases ever, Penn State University is leading the way for all of us. Penn State’s decision to buy locally generated, emission-free wind energy makes a contribution locally and globally. I can think of no better environmental commitment than for the university to power its laboratories and classrooms with pollution-free electricity.”

Wind energy is the world's fastest growing form of electricity generation, meeting the growing demand for clean, renewable energy. Wind turbines generate electricity with no emissions and no fuel at prices 2 to 3 cents per kWh above current generation costs. In addition to the environmental benefits, wind generation can offer stable 20-year prices because it is not subject to fuel price risks. Many analysts have pinpointed short-term contracts and skyrocketing fuel prices as key components to the dramatic collapse of electricity deregulation in California.

Founded in 1855, The Pennsylvania State University provides excellence in teaching, research, and public service. Penn State enrolls more than 81,000 students at 24 locations throughout the state. The University Park campus uses 266 million kWh of electricity per year or about 55% of the entire Penn State system.

Community Energy, Inc. (CEI) was founded in fall 1999 to develop and market clean, renewable electricity. The company adds fuel-free, emission free, new renewable electricity to the electric grid. CEI partners with existing electric suppliers to make new renewable electricity available to as many commercial and residential customers as possible. CEI is working with Exelon Power Team and wind developers to bring 70 megawatts of new wind power on-line, which will almost triple the amount of wind energy in the eastern U.S.

Contacts: Paul Ruskin, Penn State, 814-863-9620
John Halley, Community Energy, 610-254-9782

Workbook for a Clean Energy Campus

University of California: San Diego (status of project, Spring 1999)

Campus Profile

Green UCSD is a small student group that promotes environmental stewardship and a more sustainable campus at UCSD. Each quarter Green UCSD chooses one area to focus on. For 1998-1999, Recycling, Organic Foods, and Renewable Energy were the focuses. In addition to focusing on one issue each quarter Green UCSD holds a roundtable meeting where Faculty, Staff, and Students gather to discuss current environmental issues on campus and the issue Green UCSD has chosen for the quarter. This is a great networking opportunity for everyone involved and helps facilitate fast progress towards goals in a bureaucracy.

Project Summary

Green UCSD chose to adopt Energy as its issue for the spring quarter 1999. After many great ideas we decided to focus our efforts into three projects:

- Hold a Green Energy Fair- Goal is to educate the UCSD community about issues relevant to renewable energy and the importance of energy conservation. The energy fair will involve renewable energy utility companies, businesses and nonprofit organizations involved in renewable energy and sustainable living, and student environmental organizations. Some of the highlights of the fair will be: a speaker on sustainable living, a band performing powered by solar panels, solar and electric vehicle displays, solar ovens and cookie baking, Ben and Jerry's ice cream served out of a truck with solar panels that run the ice cream freezers, and the opportunity for students to switch their electric company to one that supplies green power.
- Write and collect 2000+ signatures for a petition to get the university to build all new buildings using the most advanced energy efficient technologies, and incorporation of solar power.
- Implement a campus wide ban on halogen lighting in all on-campus housing units.

Accomplishments

Green UCSD anticipates a successful Green Energy Fair, and hopes to accomplish the halogen ban. We are hopeful that the petition will be successful in challenging the university to look at all possible ecological options in the decision making process of the new campus buildings.

Challenges/Funding/Publicity

There are always challenges in a bureaucracy. One challenge has been finding the right people to discuss the issues with. Green UCSD is consulting staff in charge of the new buildings to discuss our concerns before starting the petition. We are trying to work with the staff to get what we want. Funding is a problem for Green UCSD because we did not plan the energy fair far enough in advance. We will have to do fundraising to cover our costs for parking, promotion, and rental of a sound system and a stage. One of

Workbook for a Clean Energy Campus

our fundraisers is selling fluorescent torchiere lamps. They make a great replacement to halogens and use 1/6th the electricity. Promotion for the Green Energy Fair is being done through email, electronic message boards, and posting flyers (printed on the back of old flyers) around campus. The fair will help promote the petition.

Key Groups and Allies

Being a small group we understand the importance of allies. While we are planning the fair and writing the petition, we have invited other student environmental organizations to the fair. In addition, two organizations have agreed to help in getting signatures for the petition. Also, we are seeking endorsement of the petition through a resolution to be passed by the Associated Students. The student groups we are working with include: Student Pugwash, Muir Environmental Corps, Environmental Coalition, and CalPIRG.

Quote or Helpful Hint

Network with the staff. At first it is awkward but in many cases the staff is very willing to work with students, and are eager to accomplish the same things. Give yourself a timeline and set high goals.

Contacts

Student: Rachel Kalmar, rkalmar@ucsd.edu

Permanent: Recycling Coordinator: Krista Henkels , khenkel@ucsd.edu

Source: National Wildlife Federation, Campus Ecology Program
<http://www.nwf.org/campusecology/index.cfm>

Workbook for a Clean Energy Campus

University of Colorado Students Vote "YES!" for Wind Power

BOULDER, April 17, 2000 (CU Environmental Center)

In the largest student voter turnout in University of Colorado history, students voted by a 5 to 1 margin to increase student fees by \$1 per semester for 4 years to purchase wind power from Public Service Company of Colorado's Ponnequin wind farm. This clean, renewable source of energy will lower campus emissions of CO by 2.8 million pounds every year.

The increase in fees will raise \$50,000 per year, enough to purchase the output of an entire wind turbine (2 million kWh per year), making CU-Boulder the largest university purchaser of wind power in the nation! The issue was placed on the ballot after 1,300 students signed a petition in favor of purchasing wind for 3 buildings on campus (the Student Union, the Health Center, and the Recreation Center). Students votes showed an overwhelming amount of support of wind energy, with 5,178 in favor and 1,096 opposed, the largest margin of any referendum on this spring's ballot.

Many volunteers from the student group Clean Energy Now! along with the Land and Water Fund of the Rockies ran a week long campaign including handing out colorful pinwheels and information about wind power and its benefits. A "CU wind farm" comprised of hundreds of pinwheels covered a lawn in the center of campus.

"You couldn't walk around campus without seeing students carrying pinwheels," said Ghita Levenstein, the Energy Program Coordinator of the Environmental Center, "we hope this is just the beginning of the use of clean energy here at CU, as well as a model for other Universities and organizations to follow." CU students have a history of environmental leadership. The campus recycling program was started in response to student activism as was the student bus pass program.

" We salute the initiative of CU students to address the global issue of reducing the use of fossil fuels. This action will allow the University to take an important first step in responding to what may be the biggest environmental and economic issue of this century," stated Rudd Mayer, Green Marketing Program Director at the Boulder-based Land and Water Fund of the Rockies, a regional group that works on clean energy policies in the west.

Will Toor, director of the CU Environmental Center and Mayor of Boulder, said, "It's inspiring to see such support for environmental protection from CU's students. They are showing that they are willing to back up their values with their money."

For more information see the University of Colorado Wind Power Campaign Summary, available at www.colorado.edu/ecenter.

Workbook for a Clean Energy Campus

University of Pennsylvania

October 24, 2001, PHILADELPHIA, PA – The University of Pennsylvania announced today that it will make the largest retail purchase of wind energy in the U.S. through an agreement with Community Energy, Inc. (CEI). Penn's leadership was announced today along with other wind energy leaders at the dedication of Pennsylvania's newest wind farms, the Exelon-Community Energy Wind Farms at Somerset and Mill Run. The event is being held at the Somerset Wind Farm, located a couple hundreds yards from the Pennsylvania Turnpike. Penn's announcement coincides with Pennsylvania Governor Schweiker's proclamation of "Wind Energy Week" for the week of October 22nd throughout the Commonwealth in honor of the progress of this latest fast-growing energy technology.

University of Pennsylvania, together with Penn State University, Philadelphia Suburban Water, Carnegie Mellon University and Giant Eagle, Inc., have signed on to purchase 75% of what the combined 24-megawatt wind farms will produce annually. Penn alone will purchase the output of five of the 215-foot-tall 1.5-megawatt wind turbines, equivalent to more than 30 percent of the total energy generated from the two new wind farms. This purchase represents the largest retail wind energy purchase in the nation to date and will satisfy 5 percent of the University's annual energy needs. Barry Hilts, Penn's associate vice president of facilities; Mike Cole, director of facility services; and students from the Undergraduate Assembly and the Penn Environmental Group are representing the University at today's ceremonies.

Barry Hilts, said, "We're very excited to be part of a clean energy future for Pennsylvania and the nation. This is the kind of innovative business and technical leadership that Penn and its student's strongly support."

"With the leading purchase of New Wind Energy, Penn has raised the bar while leading the way to a cleaner and more sustainable energy future," said Brent Alderfer, president of CEI. "Penn students, faculty, staff, and alumni can take pride knowing five large wind turbines are producing new clean home-grown energy on their behalf. This is the kind of environmental leadership that makes a real difference."

Contact: Julie McWilliams at 215-898-1422 or juliemcw@pobox.upenn.edu

Workbook for a Clean Energy Campus

University of Vermont (status of project, Spring 2001)

Campus Profile

The University of Vermont has eight colleges and schools; a graduate college; a medical college; and a continuing education division. Its population includes 7,500 undergraduate students, 1,050 graduate students, and 380 medical students; 1,000 faculty and 1,800 staff. Located overlooking Lake Champlain in Burlington, Vermont's largest city, (population 40,000), UVM has nearly 300 buildings on its 425-acre main campus. A land grant institution with a College of Agriculture and a strong Extension Program, UVM owns 3,000 acres encompassing four research farms and nine natural areas, including the summit of Mount Mansfield, Vermont's highest peak; the Rubenstein Ecosystem Science Center on Burlington's waterfront; and several regional education centers. Environment is a major focus of the university, along with liberal arts and health. About nine percent of undergraduates major in environmentally related areas, including natural resources, sustainable agriculture, environmental engineering, environmental science, and environmental studies. More than 250 environmentally related courses are offered across campus. UVM's Environmental Council has a full-time coordinator responsible for tracking environmental performance, recommending environmentally responsible practices, working with students, faculty, and staff on environmental projects, and connecting with the Burlington and Vermont community.

Group/Class Profile

This project was a joint project of an ad hoc group, spurred by the UVM Environmental Council (<http://esf.uvm.edu/envcncl>). Student, faculty, staff and outside support combined to make this possible.

Project Goals and Summary

This project shows the casual passerby and the serious student of renewable technology the potential for solar photovoltaics to generate electricity in Vermont. A nine by 58 foot array of solar panels capable of generating five kilowatts of electricity, the largest solar installation in Vermont to date, was installed in June, 2000 in a well-traveled area near the library on the University of Vermont campus. With technical support from a local business, SolarWorks, Inc., Nik Ponzio, a student in Electrical Engineering, created a website (www.uvm.edu/~solar) showing real-time and past information about the amount of electricity generated by the array. An interpretive display will show real-time data and will compare the amount generated with the electricity use of an average Vermont home, or two efficient homes. Detailed web-based data is available for students of renewable technology, both on campus and worldwide.

Accomplishments

We have achieved most of our goals: the solar panels were installed in June, 2000; the website has been available since May, 2001. Completion of the display is planned for August, 2001. The solar panels are anticipated to function beyond their warranty of 20 years. While the University of Vermont assumed primary responsibility for the project, it would not have been possible without generous support from collaborating

Workbook for a Clean Energy Campus

organizations and individuals. The University would like to thank the Burlington Electric Department, the Department of Energy, and Solar Works, Inc., for funding and technical assistance, and students Nik Ponzio and Holly Taylor for their work on the website and display.

Strategies and Steps Taken

This project was initiated by Rich Wolbach, the energy management engineer in Physical Plant. Rich, who had taken an engineering course about solar energy with Leigh Seddon, adjunct professor in Engineering and principal of Solar Works, Inc. When it came time to replace the roof on the central heating plant, Rich thought it should include solar panels, since it had an almost ideal orientation and provided a large surface visible to many passersby. He presented the idea to the UVM Environmental Council, which recommended in a formal report to the administration that the University invest in solar roofing. The Environmental Council's strategy was to emphasize both the environmental benefits and the educational value of the project. The report detailed the avoided costs of electricity over the 20-year warranted life of the project and proposed using energy conservation funds for this portion of the costs. The remaining cost was justified as an appropriate investment in education for the campus and community at about \$750 per year. Compelling as these arguments may have been, it is likely that vocal support for the project, coming from a variety of groups, was the major impetus for funding. In addition to the Environmental Council, a student environmental group, the Consortium for Ecological Living, also advocated for taking advantage of the opportunity to install solar roofing, since the roofing was being replaced anyway. Community leaders in Burlington talked to upper-level administrators. The Burlington Electric Department provided technical support and helped find some Department of Energy funding. The administration decided in favor of the project, and funded it from special funds in the provost's office and the university's energy conservation budget. After the roofing company raised concerns about the warranty on the roof, the proposal was modified from solar roofing to solar panels attached to the roof, with roughly the same budget. The original goal was to have a real-time display on site within a few months of installation. The first proposal included a donated educational kiosk that did not pass the campus sign guidelines, and therefore additional funds and efforts were needed to create a new display. Those involved decided that developing the website was the first priority, as the data for the display would come from the website. The display is expected to be completed by August, 2001.

Challenges and Responses

In addition to finding funding, the major difficulty since the installation of the panels was that there were many far-flung players with busy schedules working on this project, with no single person primarily responsible for making sure things happened. The Environmental Council has assumed responsibility for coordination of the project, but found that its staff lacked the necessary time and expertise to complete the work in an efficient manner, and thus the project is taking more time than anticipated. When this project was funded, there was no letter charging an individual to do the work; next time, an explicit charge might be useful, with a report to the Board of Trustees a year later, accompanied by funding for staff time as necessary to complete the work.

Workbook for a Clean Energy Campus

Campus Ecology

The Environmental Council did not think to look for internship funds, which would have been very helpful but will in the future!

Funding Sources

The panels cost \$43,000, plus \$4,000 for website and display development, and donated staff time totaling about \$3,000. A solar energy grant from the Department of Energy funded \$5,000 of the project, with the remainder split about evenly between energy conservation funds and university special project funds. Funding was disbursed through the Physical Plant department.

Publicity and Media

UVM President Judith Ramaley held a press conference after the installation that was well attended by local dignitaries and media. The display will further publicize the project.

Documentation

See www.uvm.edu/~solar

Key Groups/Allies Involved

Richard Wolbach, Energy Management Engineer helped initiate and fund the project. Gioia Thompson, UVM Environmental Council coordinator, advocated for the project and helped coordinate the educational aspects of it. The Vice President for Administration's office helped find funding. Nik Ponzio, a senior in engineering, developed the website. Holly Taylor, graduate student and staff assistant for the Council, is developing the display. Help from the Burlington Electric Department and Leigh Seddon of Solar Works, Inc. were also instrumental. Funding from the Department of Energy also helped make the project possible.

Next Year's Plans

The next steps are to install a display and to fund an internship in electrical engineering about solar energy.

Quote or Helpful Hint

The UVM Environmental Council had very little time to argue for this project, but miraculously, the request was granted, despite tight budget times. Our report suggested that if funds were scarce, a smaller project could be funded for the same site. We were very surprised that the university funded the full-scale project. We conclude that if the idea is a good one at the right time, and if there is vocal support, unexpected sources of money can open up and make the project happen. Think big and bold!

Contacts

Gioia Thompson, Coordinator, UVM Environmental Council <http://esf.uvm.edu/envcnci>

SOURCE: National Wildlife Federation, Campus Ecology Program
<http://www.nwf.org/campusecology/index.cfm>

Workbook for a Clean Energy Campus

Wesleyan University

Wesleyan To Purchase Green Electricity

November 13, 2001 — Citing concern over the environment and our nation's dependence on foreign energy sources, students, staff and faculty from Wesleyan University announced today that they have joined the Connecticut Energy Cooperative (Co-op) and agreed to purchase 100% Green-e certified renewable electricity for the Freeman Athletic Center. The Center uses approximately 2.1 million kWh or 10% of the campus's annual load.

"Purchasing renewable energy helps the environment. Buying from the Co-op supports the local economy and helps lessen our nation's dependence on foreign fossil fuel," Kate Carone, a student at Wesleyan said.

The decision to join the Co-op was in response to a student lead campus-wide campaign initiated by ten Wesleyan students. The students worked with staff, faculty, and fellow students to raise awareness about renewable energy. Through a series of bake sales the students raised the Co-op's one time membership fee of \$1,500 in just three weeks.

"This is a historic stride in Wesleyan's push to become a more environmentally sustainable institution. It makes an important statement about the values that are important to this university and the students," said Janet Yun, professor of Earth and Environmental Science.

Harry Kinne, director of Physical Plant said, "The concept of green energy is something that everyone can support. Wesleyan understands that our current energy supply is limited and we think it is important to support alternative types of energy that are domestic, uninterrupted and sustainable."

Wesleyan becomes the second college in Connecticut to sign up to support renewable electricity. Last spring, Connecticut College became the first when a student lead effort convinced the college to join.

CT Energy Co-op: Bob Maddox (860) 586-2380

Wesleyan University Administration: Harry Kinne (860) 685-2787

Wesleyan Students: Kelly Paul (860) 922-7600

Workbook for a Clean Energy Campus

Resources for More Information

Environmental Information Sites/Calculators

AirHead.org

The Power Scorecard www.powerscorecard.org

U.S. EPA's E-GRID www.epa.gov/airmarkets/egrid/index.html

Clean Air Task Force report on air pollution health effects

<http://www.clnatf.org/resources/reports/index.html>

Government Sites

National Renewable Energy Laboratory www.nrel.gov

U.S. DOE Green Power Network www.eren.doe.gov/greenpower

U.S. EPA Energy Star www.energystar.gov

U.S. EPA Global Warming www.epa.gov/globalwarming

Non-profit Green Power Advocates/Environmental Organizations

Center for Energy Efficiency & Renewable Technologies www.cleanpower.org

Center for Resource Solutions www.resource-solutions.org

Citizens for Pennsylvania's Future (PennFuture) www.pennfuture.org

Climate Solutions (Northwest Clean Energy Challenge) climatesolutions.org

Environmental Defense www.environmentaldefense.org

Global Green USA www.globalgreen.org

Land and Water Fund of the Rockies www.lawfund.org

National Wildlife Federation Campus Ecology Program www.nwf.org/campusecology

Renewable Northwest Project www.rnp.org

Southern Alliance for Clean Energy www.cleanenergy.org

Union of Concerned Scientists www.ucsusa.org

Certification Programs

Green-e Certification www.green-e.org

Renew 2000 www.cleanenergyguide.org

Trade Organizations

American Solar Energy Society www.ases.org

American Wind Energy Association www.awea.org

Other

Database of State Incentives for Renewable Energy www.dsireusa.org

Renewable Electric Plant Information System www.eren.doe.gov/repis