

AL GORE SAID IT ELOQUENTLY: "THE DEBATE IS OVER."

We know climate change is real, it's happening quickly, its risks are great, and it is not too late to do something about it. So let's get to work!

Indicative of change is the fact that as of early 2009 over 600 colleges and universities have pledged to achieve climate neutrality through the American College & University Presidents Climate Commitment. Presidents of large and small institutions of higher education have made this commitment, recognizing that colleges and universities must be leaders in the effort to address the gravest environmental threat we have ever faced.

As the meaning of climate neutrality sinks in, i.e., the daunting task of reducing net reliance on fossil fuels to zero, many campus leaders — including facilities managers — may be shaking their heads wondering what their president has gotten them into. While students and many others on campus are applauding the move, those charged with achieving climate neutrality may be wondering how to do it. Let's walk through the process. Hopefully, this discussion will be of interest not only to campuses that have signed the Presidents Climate Commitment but also to those that have not — since we all have an interest in being good environmental stewards. We can all take steps to reduce our greenhouse gas (GHG) emissions — principally carbon dioxide caused by burning coal, oil, and natural gas. Yes we can shrink our carbon footprints.

HERE'S HOW.





CAMPUS CLIMATE NEUTRALITY

YES WE
CAN!

IT'S A BIG
CHALLENGE,
BUT HERE'S HOW
TO DO IT

BY WALTER SIMPSON

CREATING YOUR CLIMATE ACTION PLAN

The American College & University Presidents Climate Commitment requires all signatories to create a Climate Action Plan (CAP) within two years. This CAP should stipulate the date when your school expects to achieve climate neutrality, outline interim targets and set out the mitigation strategies and measures and projects your campus will use to achieve these interim targets and ultimately climate neutrality.

The plan you develop and the steps you take are informed by an initial and updated greenhouse gas inventories (see sidebar) to establish your emissions starting point and demonstrate your progress along the way. Your CAP will need to:

- Identify, evaluate, prioritize, and schedule GHG mitigation strategies
- Lay out financing options
- Be flexible enough to allow for occasional revisions
- Include plans for involving your entire campus community

Most significantly, your CAP will need to be attractive and feasible enough to be approved by your administration and garner the support of your campus community. These are tall orders.

Since much of your carbon footprint is the result of campus operations — specifically direct and indirect energy use — facilities managers and their staff will play a key role in these efforts. Note that the Presidents Climate Commitment obliges signatories to also address curricular and research opportunities for promoting solutions to the climate crisis — though these will not be addressed here. Suffice it to say we should

involve students as much as possible to enrich their learning experience and prepare them to be part of the solution after they graduate.

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GETTING STARTED

The first steps are completing an initial greenhouse gas inventory and creating appropriate institutional structures for developing and implementing the climate action plan. Typically, the latter will comprise one or more committees or working groups — hopefully operating with the blessing, full support, and involvement of campus top leadership.

If your school already has an environmental task force or sustainability committee, that's the place to start. This committee can be assigned the overall responsibility of developing your CAP or minimally should be substantially involved. All along the way appropriate stakeholders should be involved — not just campus environmental activists but also those representing key segments of the campus community — students, faculty, and staff — and the offices and departments that make the campus run. Facilities management is key among these. Since the CAP is multifaceted, there will need to be subcommittees with appropriate responsibilities.

CARBON MITIGATION STRATEGIES

Let's admit it, reducing and eventually eliminating greenhouse gas emissions from campus operations is utopian. The Presidents Climate Commitment is all about modeling a new energy future for humankind, one that is a complete break with our past and current heavy reliance on dirty fossil fuels. Nonetheless, to some extent, achieving climate neutrality involves doing what environmentally responsible schools have been doing all along — but taking those steps further. Here are the key strategies:

- Maximize energy conservation and efficiency
- Make appropriate fuel choices — stop burning coal and minimize the use of oil and natural gas
- Install renewable energy technologies on campus
- Buy green power — eventually 100 percent
- Maximize space utilization to minimize new construction
- Design and construct only the greenest, most energy efficient new buildings
- Find clean energy solutions for fleet vehicles and campus commuting

Doing a Campus GHG Inventory

A campus greenhouse gas inventory examines aspects of campus operations that contribute to global climate change. An inventory tool, such as Clean Air Cool Planet's Campus Carbon Calculator (<http://www.cleanair-coolplanet.org/toolkit>), can be used to calculate annual greenhouse gas emissions (in metric tons per year), principally carbon dioxide from burning fossil fuels.

The inventory establishes your school's carbon footprint and can help identify priority targets for action — though typically the largest sources of direct and indirect carbon emissions are easy to anticipate, namely, electricity use (purchased or self-generated), on-site fossil fuel burning for space and water heating, and commuting. To a lesser extent solid waste production, fleet vehicle use, and CFC releases from refrigeration equipment also contribute to the carbon footprint.

Perhaps the real value of a GHG inventory is educational since it allows campus climate activists to equate energy use and transportation to the problem of climate change. This can be a big wake-up call. Also, when occasionally repeated, the inventory becomes a means of tracking progress toward reducing emissions.

Also contributing to reduced emissions are campus waste reduction campaigns of all types, aggressive comprehensive recycling, purchasing programs that encourage buying less and only buying energy efficient green products such as those made with maximum recycled content (e.g., 100 percent post-consumer content recycled paper), and buying local products including locally produced food. Even though some of the GHG emissions reductions associated with these practices are unlikely to be captured or evaluated by your GHG inventory, they are still important to undertake. How far do we take it? Optimally, campus food service would offer and encourage meatless meals since nearly 20 percent of GHG emissions globally are the result of livestock production.

The GHG mitigation strategy of last resort is creating or buying carbon offsets to displace or cancel out the fossil fuel energy use and GHG emissions that your campus is still responsible for after you have done everything you can do to reduce and eliminate these emissions.

REDOUBLING CAMPUS ENERGY CONSERVATION EFFORTS

Most colleges and universities have been practicing energy conservation and efficiency for many years. The threat of climate change challenges us to do even more — much more. Admittedly there are structural inefficiencies in many of our buildings that make deep cuts in energy use difficult but we must try harder to wring savings out while still maintaining comfortable indoor environments so the educational, research, and business functions of our institutions can continue effectively.

Over the years at the University at Buffalo (UB) our energy conservation program managed to reduce energy consumption in campus buildings by over 30 percent. Could we double that? Perhaps that is a farfetched goal, but students and faculty could assist facilities management in researching that possibility.

Some conservation measures implemented by facilities management will be inexpensive and operational, e.g., tightening up on temperatures and

equipment operating hours, but these can not be maximized without the full support of campus leadership and a lot of understanding by the rest of the campus community. Thus, energy awareness efforts — with a strong climate change message — must be redoubled. To achieve deep cuts in energy consumption with capital projects that cost big bucks, it will be necessary to relax payback requirements — allowing projects to go forward with longer 10-, 15-, and 20-year paybacks instead of limiting projects to those which payback quickly.

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Performance contracting should be revisited so that large comprehensive campuswide self-financing energy conservation projects can be undertaken without delay. It may be possible to get more bang for our buck from these projects if we avoid paying for guaranteed savings and do projects on a “cost plus” basis instead of fixed cost. Of course, this will mean more facilities management involvement.

QUITTING COAL

Across the U.S. there is a huge fight against coal burning power plants. Proposed new plants are being stopped, and soon existing coal plants may be asked to shut down. And no wonder – coal is the worst fossil fuel from a greenhouse gas

If your campus burns coal in its power plant, quitting coal should be a top priority.

emissions perspective. Much more carbon dioxide is released for each BTU produced by burning coal than by burning oil or natural gas. So if your campus burns coal in its power plant, quitting coal should be a top priority. It makes sense to get started on this quickly before protestors start knocking

on your door. In 2007 Sierra Club filed a lawsuit against the University of Wisconsin at Madison because of pollution from its Charter Street coal plant.

Of course, quitting coal is more easily said than done. There are at least two big hurdles – the potentially much higher cost of alternative fuels (e.g., natural gas, biomass, etc.) and the cost to build a new campus heating/power plant or retrofit an old one.

Many colleges and universities, especially those in coal states in Appalachia and the Midwest, have traditionally used coal for what seemed to be good reasons before we became aware of the problem of climate change. Coal is, after all, plentiful and cheap – though during the first half of 2008 increasing international demand caused the price of coal to double before returning to normal once the global economic

meltdown occurred. Much higher coal prices may return once the world economy gets back on track.

Moreover, coal prices will definitely rise to much higher levels as effective cap and trade or carbon tax regimes are disproportionately applied to coal to actively discourage its use. Coal mining presents a raft of troubling environmental and health issues. And as many facilities and energy managers know, coal is dirty to handle and can have adverse health impacts on employees.

So it makes sense to look at alternatives to coal burning – perhaps making plans to convert once the economy picks up and revenues become available. There is even a silver lining to quitting coal. Switching to a higher price heating fuel will increase the incentive your campus has to implement energy conservation measures to reduce your heating load. And those measures will further reduce your carbon footprint. In any event, Climate Commitment signatories with campus coal plants can't avoid this difficult issue.

While natural gas is the most expensive fossil fuel, it is also the cleanest. A highly efficient natural gas-fired cogeneration plant can provide lower GHG emissions and reasonable cost effectiveness. The use of expensive natural gas becomes more affordable if you practice aggressive conservation on campus and reduce your heating load. Also, note that in the future all fossil fuels will be more expensive, especially coal, as carbon taxes are applied.

Of course, on-site coal burning is not the only use of coal on campus. Most schools purchase electricity from regional grids that are fed by coal burning power plants. In states like Ohio, heavy coal reliance makes purchased electricity very carbon intensive. In other areas, much less so, such as the Pacific Northwest where carbon-free hydro power predominates. Thus, depending on where your campus is located, addressing the carbon emissions embodied in your electricity will be more or less of a problem.

SHIFTING TO RENEWABLE ENERGY SOURCES

Conservation and efficiency can take us far but not all the way. Even after we have reduced our energy load to a minimum, we will still have to meet that remaining load with some form of energy. To achieve climate neutrality, our campuses must transition to carbon-free renewable energy technologies – solar, wind, biomass, geothermal, and hydro (though the latter is pretty much tapped out in most regions). We can either build renewable energy capacity on campus or buy green power.

Many campuses are installing photovoltaic solar electric arrays. These become cost-effective where conventional electric rates are high and ample incentives are offered by state government or local utilities. Obviously, the amount of available sunlight is an important factor though nonetheless PV works well in all areas.

Campus Climate Leadership is Critical

“College and universities have a critical role to play. By demonstrating their campuses can operate effectively while significantly curtailing greenhouse gas emissions, institutions of higher learning can show what is possible and point the way for others to follow. The American College & University Presidents Climate Commitment is a particularly hopeful development.”

— Jim Hansen, Director, NASA Goddard Institute for Space Studies

There are a variety of financial models for installing PV on campus. Your school need not own the system. It can be built by a third-party vendor and clean, green electrons can be yours via a power purchase agreement – though be sure to buy the renewable energy credits associated with those electrons if your campus wants to claim the PV power it receives as carbon-free.

A few schools have installed wind turbines to cleanly address their electricity needs. For example in Northfield, Minnesota, both Carleton College and St. Olaf College have installed gigantic 1.65 MW wind turbines in corn fields adjacent to their campuses to signal their environmental commitment and lighten their carbon footprints. Campus-owned wind turbines need not be on campus to meet campus carbon-free power needs. As long as they displace conventional electrical power, they can be anywhere. However, as with photovoltaics, the campus must own the renewable energy credits produced by the turbines in order to take credit for carbon-free power.

In its pursuit of climate neutrality Middlebury College is installing a biomass cogeneration plant on its campus in Middlebury, Vermont. The idea is to use locally grown wood and biomass to produce near-carbon free heat as well as electricity. While not every school can rely on sustainably produced biomass, it represents a strategy for some campuses to replace fossil fuels for heating as well as electrical generation.

BUYING GREEN POWER

Producing on-campus green power is difficult and producing enough of it to make a difference is even harder. Hence, the need to buy green power. Green power purchasing involves buying renewable energy credits or RECs, which represent the “environmental attribute” associated with renewable power. RECs typically cost 1 - 3 cents/kWh, a premium cost over and above your normal cost of power. Of course, these costs can be mitigated by careful shopping for RECs and by an aggressive campus energy conservation program that reduces the amount of electricity that must be purchased in the first place.

Not all green power is equal. For example, if you are buying or producing biomass-generated electricity, due diligence requires that you take into account the amount of fossil fuel used to produce, transport and process the biomass fuel. Wind, on the other hand

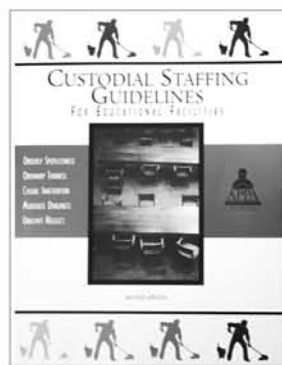
is emissions-free except for the fossil fuel used in making the wind turbines themselves, a carbon debt which is generally paid off in the first year.

There is no overall GHG emissions reduction unless each purchase of green power spurs the development of more green power capacity – so that over time, the mix of electrical generation shifts from fossil fuels to renewables. The best way to leverage new wind capacity is to build a new wind farm. The second best approach is to buy wind-generated RECs on a long term contract which makes it easier for the wind developer to finance his or her next wind farm.

AVOIDING NEW CONSTRUCTION OR GOING ALL THE WAY WITH GREEN DESIGN

While new construction is sexy and having a LEED Gold or Platinum building on campus certainly gives you bragging rights, the reality is that each new building adds to your campus carbon footprint unless it is a zero-energy building. Thus colleges and universities committed to climate neutrality need to look at new construction in a new way. We can reduce carbon emissions and save operating dollars by maximizing the utilization of existing space and thus avoiding or minimizing new construction.

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Campus Climate Action Resources

- **The Educational Facilities Professional's Practical Guide to Reducing the Campus Carbon Footprint;** Karla Hignite, principal author; APPA 2008-2009.
- **The Green Campus: Meeting the Challenge of Environmental Sustainability;** Walter Simpson, editor; APPA 2008, <http://appa.org/bookstore/index.cfm>. This book contains numerous articles on the campus climate challenge.
- **American College & University Presidents Climate Commitment (ACUPCC),** <http://www.presidentsclimatecommitment.org>. This site lists signatories and includes various resources including an implementation guide.
- **Association for the Advancement of Sustainability in Higher Education,** www.aashe.org. This site contains numerous resources on campus climate action, <http://www.aashe.org/resources/climate.php>. AASHE offers a monthly newsletter, the *ACUPCC Implementer*, for those involved on implementing the Presidents Climate Commitment of their campuses. To subscribe, reporting@aashe.org.
- **Boldly Sustainable: Hope and Opportunity for Higher Education in an Age of Climate Change;** Andrea Putman and Peter Bardaglio; 2009, NACUBO.
- **The Business Case for Renewable Energy: A Guide for Colleges and Universities;** Andrea Putman and Michael Philips; NACUBO, 2006.
- **Clean Air Cool Planet,** <http://www.cleanair-coolplanet.org/>, provides a Campus Climate Action Toolkit and the CACP Campus Carbon Calculator, http://www.cleanair-coolplanet.org/for_campuses.php.
- **Guide to Climate Action Planning: Pathways to a Low Carbon Campus;** David J. Eagan, Terry Calhoun, Justin Schott, Praween Dayananda; Campus Ecology, National Wildlife Federation, 2008, <http://www.nwf.org/campusecology/pdfs/climateactionplanning.pdf>.
- **Higher Education in a Warming World: The Business Case for Climate Leadership on Campus;** David J. Eagan, Terry Calhoun, Justin Schott, Praween Dayananda, Campus Ecology; National Wildlife Federation, 2008, <http://www.nwf.org/campusEcology/BusinessCase/index.cfm>.
- **Second Nature,** <http://www.secondnature.org>, is a primary sponsor of the ACUPCC, and its site contains numerous helpful resources.

There are a variety of ways of increasing space utilization efficiency. For example, if your school is committed to a growth scenario, it might be possible to accommodate many more students without new construction of classroom buildings if you operated academic programs at full tilt year round and thus made better use of existing buildings over the summer. Like at many other schools, at UB all campus building systems operate at 100 percent during the summer months even though the vast majority of students and faculty are elsewhere. That's pretty wasteful.

If you are contemplating new construction, just going for a LEED rating is not good enough. Your goal should be LEED Gold or Platinum with a maximum number of LEED energy points.

ADDRESSING THE TRANSPORTATION CONUNDRUM

Facilities managers can address greenhouse gas emissions associated with fleet vehicles in a variety of ways which include buying only the most fuel efficient vehicles, running vehicles on less carbon-intensive fuels like electricity, biodiesel, or compressed natural gas, and implementing policies to reduce miles driven and idling.

The larger transportation problem is commuting. At most colleges and universities, commuters dominate and typically arrive and depart from campus in single occupancy vehicles – many with poor fuel economy. Commuting by students, faculty and staff may add up to many millions of miles of driving per year at larger schools – and thus represent a substantial carbon footprint.

The Presidents Climate Commitment requires the mitigation of GHG emissions produced by campus commuting. While facilities managers may be only peripherally involved in addressing this source of emissions, campuses striving for climate neutrality will need to develop low-carbon transportation alternatives. Strategies may include increasing the use of public transit, bicycling, carpooling, and encouraging the use of more fuel efficient vehicles. In the end, the lion's share of these emissions may have to be offset.

CARBON OFFSETS TO CANCEL REMAINING EMISSIONS

Try as we might, the vast majority of us will be only partially successful in eliminating campus fossil fuel use and GHG emissions. What to do about our remaining GHG emissions? To achieve climate neutrality those remaining emissions will have to be canceled out with carbon offsets. We can offset campus carbon emissions by creating or investing in projects which reduce GHG emissions elsewhere. It's a simple concept, but the devil is in the details.

At present, the carbon offset market is in its infancy and buying offsets might seem like buying a pig in a poke. Offsets have been ridiculed by comparing them to faith-based absolution or forgiveness of sins. But with the right guarantees carbon offsets can produce real emissions reductions, and those who are responsible for creating or financing these reductions have the right to take credit for them. Schools may want to help their local regions become more sustainable by developing local community-based energy efficiency and renewable energy projects and then taking some credit for the carbon reduction these projects produce.

To define legitimate carbon offsets, the American College & University Presidents Climate Commitment program has recently issued a carbon offset protocol (<http://www.presidentsclimatecommitment.org/offsetprotocol.php>). Among other things, this protocol requires that carbon offsets produce permanent GHG emissions reductions that are in addition to any reductions that would have occurred anyway and an accounting system must be in place to ensure that they not be double counted. Participants in the Presidents Climate Commitment are strongly encouraged not to rely too heavily on offsets and thus not buy their way out of on-campus GHG emissions reductions.

CREATING A SMART PLAN

A climate action plan needs to be smart enough to chart a viable path to climate neutrality while being persuasive enough to receive wholehearted support from campus leaders and the entire campus community. A smart and persuasive CAP will evaluate and prioritize mitigation strategies on the basis of a number of criteria including the cost-effectiveness of possible measures in terms of tons of carbon dioxide mitigated per dollar invested. Out of necessity, a smart plan will also carefully consider funding and financing options, taking full advantage of grants and incentives from foundations, alumni, and local, state and federal

governments. Your plan will get a boost if it lays out a sequence of actions wherein earlier steps help pay for later ones.

Most importantly, a smart CAP will be the result of an inclusive process that involves and respects everyone and benefits by the collective wisdom and good will of the entire college or university community.

Whether your school's president made the climate neutrality commitment with full knowledge or just out of a sense of goodwill or expediency, achieving climate neutrality by any reasonable measure will be difficult and perhaps expensive. But do it we must.

We cannot stand idly by as global climate shifts, creating an untenable world for our children and for the members of other species. Colleges and universities hold a unique position in our society and have a special obligation to demonstrate intellectual and moral leadership and to inspire hope by setting an example that inspires others. The next ten years are crucial, so let's get going. ☺

Walter Simpson, an Emeritus member of APPA, is retired University at Buffalo energy officer and editor/co-author of *The Green Campus: Meeting the Challenge of Environmental Sustainability*, published by APPA in 2008. He now works as an energy consultant assisting AASHE in its support of the American College & University Presidents Climate Commitment, and can be reached at enconser@buffalo.edu.

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