# Global Warming: Why the proper spread and use of information on college campuses is necessary for combating climate change

by Katherine Stevens

An alarming statistic from a 2014 Yale poll revealed that a staggeringly low 63% of the American population believes climate change is occurring[1], while an overwhelming 97% majority of published climate scientists confirm that not only is global warming occurring but that it is attributable to man-made causes[2]. To address this disappointing dearth of information, I would like to bring attention to several issues on campus related to sustainability and environmental awareness. After spending a semester in Denmark learning about climate change and renewable energies, a year in LEAP (Lafayette Environmental Awareness and Protection), and this summer investigating sustainability at Lafayette, I see a number of barriers to Lafayette becoming more sustainable. Lafayette has already made some very significant strides towards sustainability, but my analysis will demonstrate that there is always room for improvement and development.

I spent the fall 2014 semester in Denmark learning how well sustainability, efficiency, and renewable energy use can work on a large scale. Having grown up in an environmentally aware household, I was drawn to Copenhagen to learn how they have been so successful in becoming a global sustainability powerhouse. As the 2014 European Green Capital, Copenhagen was a perfect spot to learn about the implementation of green practices. Copenhagen is on track to reach its goal of becoming the first carbon-neutral capital by 2025. Denmark as a whole is ahead of their goal of having 100% of their energy produced by renewables by 2050. The Danes are mostly in agreement that global warming is a very real problem that needs to be dealt with. They believe in using technologies that have as little impact on the environment as possible, and using more sustainable alternatives to fossil fuels whenever feasible. However, some Danes believe that since the country is small, the Danish impact is minimal. Other Danes believe Denmark is setting a good example for other countries to follow. Lafayette should adopt the belief of the latter group, and strive to set an example for other colleges and universities.

Other colleges and groups across the country are making sustainability their mission. The University of New Hampshire has been developing their 'Sustainable Learning Community' model since the establishment of their campus sustainability program in 1997. In addition, new ways to help colleges develop sustainably are arising every day. Organizations such as Second Nature just announced the Alliance for Resilient Campuses, AASHE provides the STARS reporting tool, and countless programs exist to help colleges with energy monitoring, recycling, greenhouse gas emission calculators, and more. Resources like these can allow Lafayette to easily and efficiently tackle newly focused sustainability oriented goals.

*Cur non*. Why not? As Lafayette students, we are encouraged by the Latin phrase on the family crest of the Marquis de Lafayette, a man who left home to become a "leader and a hero." At Lafayette, we are encouraged to take risks, become leaders, flourish as thinkers, and to make a difference. Why not better educate students on sustainability? Why not do everything we can to reduce our negative impact on our environment? Why not develop an aggressive system for becoming climate neutral and become a leader in sustainability to serve as a model for other colleges throughout the nation?

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[1] http://www.slate.com/blogs/the_slatest/2015/04/06/new_climate_change_poll_shows_americans_believe_in_global_warming.html

[2] http://climate.nasa.gov/scientific-consensus/

If a city and an entire country can be successful while leading the world in sustainability, a small college of highly educated and motivated individuals should be able to do the same. In the following pages, I will explain the areas that pose a hindrance, and suggest solutions for your consideration.

I see three major barriers, all interconnected. The first is a lack of transparency, communication, and available information about sustainability on campus. The second is a lack of general environmental knowledge and awareness within the campus community. Finally, I see an excessive amount of wasteful practices on campus, wasting energy and money that the College could be putting to better use, as well as wasting an opportunity to be a model for other schools across the country. I present these areas as three separate topics for clarity, but as you will see, all three are intricately linked. Likewise, the solutions presented later are interconnected and using them together enhances their power and increases their effectiveness. Anthropogenic climate change is already causing devastating problems worldwide, and Lafayette should make it a priority to take action.

**Transparency and Communication**

In 2008, President Dan Weiss signed the American College and University President's Climate Commitment, which led to the enacting of the Climate Action Plan (CAP) in 2011. The CAP had lots of promise for change, and listed over 450 proposed energy conservation measures. Now, almost 8 years after the Climate Commitment was signed, and 4 years after the CAP was completed, it is unclear as to what actually has been done. In the CAP, the College committed to investing $400,000 per year for 10 years to finance these measures. Has this been done? No updates have been posted, and no recent data is accessible. This is a clear example of the lack of transparency, availability, and communication of information related to sustainability on campus. Without a system for documenting sustainable goals and progress, there is no incentive to make improvements, and no accountability to follow through.

The Climate Action Plan mentions work with Entech Engineering, Inc. in 2011 to facilitate CAP Subcommittees for identifying sustainable projects. Found on Entech's website, although not mentioned in the Climate Action Plan or on the Lafayette website, is a Project Profile for Lafayette with an Energy Audit & Reduction Planning. It highlights $1 million in annual energy savings, 25% greenhouse gas emission reduction, and a 5.7-year average payback period. The Climate Action Plan briefly mentioned Entech's Energy Planner as a way to schedule and manage energy conservation measurers, and provide tracking of emissions with updates and modifications. Is Entech's Energy Planner in use? If not, it should be, and if so, it should be publicly accessible. Many goals set and mandates made in the Climate Action Plan have yet to come to fruition, and this is unacceptable.

Even when positive steps are made, they are not communicated effectively to the campus community. Despite being a member of LEAP and interested in the environment, there are several sustainability initiatives and programs on campus that I had not heard about. This is partly because the Sustainability web page is vague and difficult to find from the Lafayette home page. I am aware that the Sustainability website is undergoing a renovation, but currently it is very general and lists accomplishments that are several years old. Where are students expected to gain environmental awareness if the College hides its goals and actions?

Another factor in the failure to communicate is that a group comprised of Plant Operations employees, professors, and students handles sustainability. The Sustainability Committee has certainly done an admirable job and led the College to make many improvements, but all of the

members have other commitments that come before sustainability projects. The fact that we don't have any employees dedicated full time to sustainability demonstrates how much change needs to be made. Having Lafayette's sustainability information spread throughout various committee members instead of being available in one place is a barrier to effective communication and coordination.

**Awareness**

The deficiency of transparency and communication within the campus community contributes to students' lack of environmental awareness and limited knowledge of sustainable programs that exist, as shown by the surveys performed in various classes. In the Spring 2015 semester, a group in Professor Nicodemus' Sustainable Solutions class performed an assessment using STARS, or the Sustainability Tracking, Assessment & Rating System. To help gather information for the assessment, the group sent out a survey to students asking various questions about knowledge and behavior on campus[3]. When asked, "Does Lafayette have a comprehensive plan detailing steps toward reducing its impact on the environment?" 304 out of 431 students surveyed, or 71%, responded with 'no.' These results indicate a low environmental awareness, and confirm the lack of readily available information on the environment and sustainable initiatives on campus. Only 29% of students said 'yes,' and most of them knew about it from a sustainability-focused class or involvement in a campus group such as LEAP or SEES.

It seems that sustainability-related facility improvements go unnoticed by even the most involved of students. LEED certified buildings and other sustainability programs are not talked about on campus tours, and student orientation contains no environmentally focused activities, so incoming freshman are unaware of our sustainable achievements. Once on campus, student programs for sustainability that are very under-publicized and many people are unaware of those as well.

One example of an under-publicized program is Green Move Out, where students donate clothes, furniture, and other still-usable items they would otherwise throw out when moving out of a dorm. This program has successfully diverted tons of trash from the landfill and saved the college money. However, many students don't know what it is or even that it exists. If the College promoted Green Move Out more actively, many more students could participate, more items could be collected, and even more trash would be diverted from landfills.

Another low-participation activity is the reusable food container program. In this case, many students have heard about the program, but don't participate. In the survey sent out by the STARS group, 90% of students said they knew the reusable container program existed but only 6% 'always' use it and 58% 'never' do. Additionally, 58% of students indicated that they would be more willing to use it if there was some type of reward system in place, and 39% want more readily available information about the program. This clearly indicates that students would be willing to participate in sustainable activities and initiatives if they had more information about them! This program would certainly reduce waste and have a big impact if used widely, but it is not advertised or publicized well enough for this to be the case.

LEAP has many great and informative events and talks, but most of the people who attend are already moderately or highly environmentally aware so not much knowledge is being spread. Knowledge is power, and the first step to having a more sustainable campus is to have a student

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[3] https://www.dropbox.com/s/812qeh1mjq1lsob/STARS%20FINAL%20REPORT.pdf?dl=0

body, faculty, and staff that are knowledgeable about environmental issues and what they can do to be more sustainable.

Dealing with the impacts of climate change can be daunting. There is so much that needs to be done, and Lafayette and its students are only a tiny fraction of those contributing to our global problem. Fortunately, small individual behavior changes can make an enormous difference when taken collectively. One example would be to reduce the load from 'vampire' electronics. According to ENERGY STAR, 'vampire' electronics, or appliances that use power even when not turned on, account for more than 100 billion kWhs of electricity consumption and $10 billion in energy costs every year[4]. On a campus like Lafayette, most students have computers, cell phone chargers, printers, microwaves, video game consoles, and TVs. These are sucking energy and costing the school money. By simply using a power strip and switching it off, individuals could cut down on energy use, energy bills, and greenhouse gas emissions. This means that individual occupants have the power to significantly reduce energy use by unplugging unused items. Part of the problem is that most people probably assume that when an appliance is turned off, it stops using energy. This lack of awareness contributes in part to the next area of concern.

**Wasteful Practices**

Not only is there a lack of knowledge about sustainability on campus; there is an incredible amount of unsustainable behavior that wastes both energy and money. Setting the thermostat back one degree saves an average of three percent on energy bills. Lafayette could save thousands of dollars and avert thousands of pounds of $CO_2$ every month by turning the heat down or the air conditioning up two or three degrees. In many residential buildings, the rooms are kept too cold in the summer and too hot in the winter. Lafayette's Campus Energy Policy lists guidelines, but it is not clear that they are always followed.

Excess lighting is also a huge waste of energy. In many academic buildings, the lighting is too bright, and lights are often left on when there is nobody there. In places like Skillman library, Kirby gym, and Farinon, every single light does not need to be turned on, especially when there is ample natural light available. In residential buildings, many students leave lights on when they leave their room, or don't utilize natural light from their windows during the day. Adjusting the number of lights that are on at a given time in public spaces, and making students aware that they should turn lights off when leaving a room would reduce the amount of energy wasted on campus.

In addition to energy wasted from over-heating and cooling, over-lighting, and the 'vampire appliances' mentioned above, wasteful water use is rampant. Many students leave sinks running unnecessarily while brushing their teeth and doing dishes. A huge amount of water is also used in toilet flushing, excessively long showers, and less-than-full loads of laundry. And, most of these activities require the use of hot water, which utilizes even more energy to heat. A large part of this waste comes from a lack of awareness. Most students don't think about how much time and energy goes into treating water that goes down the sink while left on during teeth brushing, or the extra energy needed to heat a shower for 15 minutes rather than 10. Making this information clear to students would at least improve their knowledge base, although any change depends on what they decide to do with the newly acquired knowledge.

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[4] *Ways to Save on Electric Bill: 25 Appliances You Can Unplug to Save Electricity.* Retrived from: http://www.entrustenergy.com/25-ways-to-save-on-electric-bills-unplug-your-appliances#sthash.XjTdDhMY.dpuf

## Recommendations

*1. Establish an Office of Sustainability*

An Office of Sustainability and a Sustainability Coordinator, who would have sustainability as his or her first priority, would greatly improve the College's ability to move forward in campus awareness and overall sustainability, improve the transparency and communication issues on campus, and facilitate change in all areas. The sustainability coordinator would gather and compile information, see projects through, and engage the student body. The Office would centralize all sustainability related information, streamline avenues of communication, and improve follow through and accountability in reaching set goals. Many schools across the nation have at least one employee dedicated to working on sustainability, if not an entire office. For instance, Lehigh hired a Sustainability Officer in 2010, created a Sustainability Office, added a full-time Sustainability Program Coordinator in 2013, and now has 2 graduate students and 10-15 undergraduates per semester working part-time in the office as well. After talking to Lehigh's Sustainability Officer and various professors on the Sustainability Committee at Lafayette, it certainly seems that having a Sustainability Office streamlines communication and coordination of information and projects.

*2. Publish goals and progress online*

Making information visible to students and other members of the campus community is the first step to change. By publishing goals and achievements, the school would receive more credit for its progress and be more accountable for meeting the targets they set. Having information such as completed energy conservation measures or charts showing reduced GHG emissions over several years would increase visibility and highlight Lafayette's accomplishments. This could be achieved through Entech's Energy Planner, an energy dashboard, or more updates on Lafayette's website.

Many schools, such as Dickinson, Colgate, and Wake Forest, have energy and water dashboards online. These easily accessible websites show the amounts of energy and water used by individual buildings on campus. This makes the amount of energy and water used more tangible and comprehensible to students, and might encourage students to reduce their use when they can physically see the change that occurs when they change their behavior. An energy dashboard like this would serve to raise awareness on campus by providing numbers and graphs of comparable information for energy use in campus buildings.

*3. Publish a guide to sustainable practices*

A guide for sustainable living would increase individual actions to support sustainability and raise awareness at the same time. Holy Cross has a great example of this that covers all of the sustainable bases while keeping it short and informative with an exciting presentation. Their 'Purple Goes Green' guide[5] gives a short explanation of why sustainable behavior changes are important, then gives suggestions of what changes individuals can make. The Holy Cross guide covers everything from Green Living to Food and Transportation and how you can get involved on campus. Lafayette does have a guide of sorts, but it is very brief and outdated, demonstrated by the fact that one of the contact emails listed for further information does not exist. Updating and expanding Lafayette's Green Living Guide could be a step toward increasing environmental knowledge on campus and even toward improving campus sustainability just through individuals changing minor behaviors.

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[5] http://offices.holycross.edu/sites/all/files/sustainability/PurplegoesgreenFinal2014.pdf

*4. Encourage Competition to raise awareness*

A sustainability competition could help engage students and raise awareness of environmental issues. Many schools have competitions among their own buildings or with other schools, dealing with energy, water use, and recycling. These competitions serve to raise awareness of environmental issues and have a chance to influence or change student behaviors. Dickinson College is just one of many schools to hold some type of energy competition. From March 16-April 6, 2015, they held the 'Spark the Change' Energy Challenge. 15 dorms participated, and the energy use for each day for each building was displayed on their Building Dashboard. In total, the competition saved over 70,000 kWh, averted over 86,000 pounds of $CO_2$, and saved over $6000[6].

However, in order to hold a successful energy competition, there needs to be a baseline from which to start, a clearly defined timeline, and an up-to-date metering system that would be easily accessible to students. There would also need to be a way to look at the change or improvement of each building, which would be accomplished with an online database or dashboard, or by students reading meters and logging the results. The energy use in different buildings needs to be monitored and accessible to the students. As far as I am aware, Lafayette doesn't have the infrastructure in place that would make monitoring energy use for a competition possible. This shows just how far behind Lafayette is, if we wouldn't even be able to hold an energy competition due to a lack of proper accessible metering. So, our first step should be to develop the infrastructure necessary to hold an energy competition.

Another possible competition to raise awareness and improve campus sustainability could deal with recycling. In a recycling survey sent out by Doc Waters' Environmental Biology class in the spring, students were asked to describe their recycling awareness. 66% of students describe themselves as highly or moderately aware, while a third described themselves as only slightly aware or unaware. Further questions made it evident that there is definitely room to improve the campus awareness as a whole. Every school in the Patriot League besides Lafayette, Holy Cross, and Navy participate in the 8-week Recyclemania competition. This competition would improve recycling awareness, but reducing consumption and reusing materials should also be emphasized. Lehigh has participated in Recyclemania for two years now, and uses each week in the 8-week period to focus on a different aspect of recycling on campus to educate their students. Additionally, Lehigh performs a public waste audit every year on Earth Day, to better know what knowledge and behavior changes to address. For example, lots of plastic water bottles in the trash indicate that students may not know to recycle them, or that sufficient recycling for water bottles is not available. This allows them to target specific problems within the broad spectrum of recycling. For Lehigh and other schools that participate, Recyclemania calls attention to recycling and waste, increases awareness, and has educational as well as operational benefits.

*5. Participate in STARS*

As mentioned previously, Professor Nicodemus' class performed an informal assessment of Lafayette using STARS in the spring semester. STARS has its downsides, with some credits that are too weak or easy to obtain, but it does provide a reasonably comprehensive framework for understanding all aspects of sustainability as well as a structure for sustainable development and a consistent basis for comparison from year to year. Participating in STARS also creates incentive for sustainable improvement, as schools are ranked compared to other participants.

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[6] http://buildingdashboard.net/dickinson/#/dickinson

*6. Publish an annual inventory of GHG emissions*

Publishing the overall emissions and trends will help to raise awareness and create opportunities for classes to engage in the critical topics of global warming, GHG emissions, and the climate crises that are emerging. As made clear in President Obama's Clean Energy Plan, there are no regulations on $CO_2$ released into the environment. Carbon dioxide makes up 82% of the U.S. greenhouse gas pollution,[7] as determined by measuring the relative radiative forcing impacts of the greenhouse gas[8]. Tracking greenhouse gas emissions, like carbon dioxide, is crucial in making a change to reduce emissions. To be consistent with other colleges and the American College and University President's Climate Commitment, Lafayette should use the accepted 'Campus Carbon Calculator' which is available online and as a downloadable spreadsheet.

**Conclusion**

Knowledge is power, but it is only part of the battle. On October 30th, 2014, President Barack Obama delivered an impassioned speech at the United Nations Climate Summit in New York warning "we have to all shoulder the responsibility for keeping the planet habitable, or we're all going to suffer the consequences – together". Scientific research continues to emerge that not only confirms the harmful effects of climate change but details an ever-shrinking window of time for us to react. In addition to spreading this knowledge among the campus community, we need to cultivate an atmosphere of taking action. A community with as much talent, passion and resources as Lafayette would be doing both our neighbors and our world a great service, and strengthen our position in academia, by demonstrating what should be done. My research has clearly outlined simple and effective changes the administration and student body can enact together to move our community in a beneficial and sustainable direction. Not only will an adoption of these practices benefit our campus, it will also allow Lafayette to serve as a role model for other colleges and universities attempting to create sustainability programs of their own. Ultimately through a combination of student action and administration commitment, Lafayette can emerge as a successful ideal of environmental awareness and protection.

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7 https://www.whitehouse.gov/climate-change

8 http://www.epa.gov/climatechange/Downloads/ghgemissions/US-GHG-Inventory-2015-Chapter-1-Introduction.pdf