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**A Comprehensive Climate Change Engagement and Education Campaign at Cornell University**

**Executive Summary**

Cornell University has the opportunity to bring about a change in culture across the entire campus by insuring that every student, faculty, and staff member understands the challenges posed by climate change and actively engages in solutions. We are proposing to build on Cornell's successes to date in reducing greenhouse gas emissions by launching a climate change literacy campaign that will include enhancements of the curriculum, student orientation programs, and professional development and leadership programs for staff and faculty. With an inspired, motivated and empowered community, we propose to implement Think BIG, Live Green in every college, school and department resulting in reductions in energy use that in aggregate will save at least \$650,000/yr. in electricity costs alone. The rate of return on investment is exceptionally high and self-sustaining. What is particularly unique about this engagement and education campaign is the involvement of Cornell's faculty who are eager to contribute their expertise to improve climate change literacy and change human behaviors around energy use, the core components of this campaign. The challenge we face with a rapidly warming climate is great but so is Cornell's capacity to meet it.

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*Building on progress to date:* Cornell University is already seen as a leader in reducing its greenhouse gas emissions through efforts such as Lake Source Cooling, the Combined Heat and Power plant, solar PV installations, and the continuing efforts to drastically improve energy efficiency through facility upgrades and retrofits. Since 2000 the Cornell building footprint has grown by 20%, yet campus-wide energy use has not increased. In addition, pilot programs such as CALS Green have demonstrated what is possible through relatively simple changes in behavior in the buildings we occupy. CALS Green resulted in an estimated savings of \$230,000 in six buildings and GHG reductions > 2 million lbs. over 12 months (Frongillo et al. 2012). However, what was unique about CALS Green was the partnership with faculty and their graduate students who through their research added greatly to the value of the CALS Green pilot project. Instead of a simple demonstration project it was also a study of human behavior (Dixon et al. 2015, 2015a). One important aspect of CALS Green was a 2009 benchmark survey of the CALS community indicating that 84% of the 2,296 respondents thought it was their *personal* responsibility to help Cornell save energy (McComas et al. 2012). A subsequent survey in 2012 (n=2,919 respondents in CALS, Johnson, CoE) showed respondents were generally concerned about climate change and reported believing both they and Cornell could do something about it (McComas et al. 2012).

The university-wide successor to CALS Green—**the Think BIG, Live Green campaign**—employs multiple complementary initiatives to educate users with real-time energy use and cost data (e.g., building dashboards), as well as best practices customized to the work

## DRAFT

place, whether it be a classroom, office, lab, residence hall, kitchen, etc. “Green Ambassadors” provide education, leadership development, social marketing, resources, and oversight of these initiatives. One Energy Smack-Down demonstration of Think BIG, Live Green Campaign encompassing six Cornell buildings demonstrated a savings of approximately \$9,000 over 6 weeks. When fully implemented, the Think BIG, Live Green campaign aims to reduce the electricity consumption use by at least 1% each year, equivalent to 7.2MWh and saving at least \$650,000 per year. Although Think BIG, Live Green focuses on reducing usage of electricity, there are also opportunities to reduce heat and cooling costs through behavioral change (e.g., keeping building doors and windows closed).

The CALS Green initiative and the Think BIG, Live Green campaign resulted in considerable savings but there are also other ways to reduce energy use and costs such as through [Lean process improvement](#) projects. One [particular Lean](#) project resulted in a reduction of greenhouse footprint by 25,000 sq. ft. and an annual savings of \$160,000-\$212,000 in heating and \$40,000-\$70,000 in electricity costs and \$120,000 in annual preventive maintenance costs. The return on investment in these various initiatives is exceptionally high. These efforts also demonstrate the positive improvements resulting from changes in human behavior and the importance of engaging and empowering the Cornell community. In total, Cornell has conducted 84 Lean projects as of June 2016, yielding millions in both one-time and on-going cost savings for the university.

## Approach

*Increasing climate change literacy:* To bring about the necessary sea-change in attitude and behavior the Cornell community must truly appreciate the gravity of the challenge we face with our rapidly warming climate. Our own researchers (Allred, et. al. unpublished) have shown that once people accept that climate change is human-caused they are more likely to act to address it. We also believe there is an inherent moral responsibility to share the climate change facts with all members of the Cornell community, particularly to our students who will feel the brunt of the changes in coming years. They need to be educated in this area so that they can make informed career choices and become effective global citizens in their ensuing professional and personal lives. They would also carry with them a deeper respect and appreciation for what the Cornell experience has meant to their lives since “we told them” while they were here at Cornell. The climate literacy campaign would need to encompass every level of leadership at Cornell including the Trustees, as well as staff, faculty and alumni. A proposed definition of climate literacy and learning outcomes (based on [NOAA](#)) follows:

- Climate Change Literacy is an understanding of your influence on climate and climate’s influence on you and society. A climate-literate person
  - understands the essential principles of Earth’s climate system,
  - understands the anthropogenic nature of climate change,
  - understands the likely impacts of climate change on humans and ecosystems,
  - knows how to assess scientifically credible information about climate,

## DRAFT

- understands how to communicate about climate and climate change in a meaningful way, and
- is able to make informed and responsible decisions with regard to actions that may affect climate.

What follows are some of the more important actions that will help us achieve a climate literate community at Cornell.

### *Students:*

An ACSF Future topical lunch - *Achieving climate change and sustainability literacy at Cornell* - was convened in April, which brought together >20 faculty and staff to assess the current status of climate change literacy for our students. Subsequently, a group of faculty convened and is now in the process of systematically assessing what is available to students and plan to have that information summarized by August 2016. Examples include:

- The climate change minor encompasses many of the climate change courses currently available but the number of students enrolled in the minor is small >25. The minor should be better marketed to all students.
- There are additional courses, which contain some climate change components but there should be a more coordinated approach to how all climate change curricular activities are offered.
- Adopting the new University of California workshop approach in which faculty consider ways in which climate change can be inserted into their courses.
- There are additional educational opportunities for students such as during freshman orientation and writing seminars,
- The new campus-wide climate change seminar series offered each spring is popular (120 registered students in 2016) but should be marketed widely.
- Students should also be encouraged to engage in the many sustainability clubs that provide opportunities for applied learning, now coordinated by ECO.
- There are innumerable ways to inculcate climate change education (classroom and experiential) into an undergraduate and graduate student's life at Cornell, but this requires a more coordinated approach.

### *Staff and faculty:*

Cornell's *Staff Skills for Success* overriding principle, which is used for annual performance dialogues, sets the stage very well for staff and faculty to gain knowledge about climate change and how they can be part of the solution. The principle reads:

*Success is neither fleeting nor accidental. Choices we make today impact our future and all who succeed us. Sustainability is meeting the needs of the present without compromising the ability of future generations to meet their own needs. A culture of sustainability sees opportunities in every Skill for Success to be more sustainable. Individually, we make a difference; collectively, we change our communities, Cornell and the world.*

Examples of specific actions to improve climate literacy for staff and faculty include:

- Encouraging staff and faculty to attend the new climate change seminar series

## DRAFT

- Adding a staff climate change/sustainability program to the professional development programming including orientation of new employees.
- Encouraging more managers to attend the sustainability program offered through Cornell's Management Academy, and continue to build upon the sustainability references integrated into Cornell's leadership curriculum,
- Continuing promotion of the Green Office Certification, Green Labs certificate program and educate and engage offices in identifying ways to behave more sustainably as a workgroup,
- Including metrics for addressing climate change in the workplace in performance dialogues and individual development plans – making it part of the culture.
- Creating/sharing educational video's, podcasts, TEDx talks, sustainability gamification, etc., in some cases already developed by faculty, and
- Innumerable other opportunities to share the climate change story and solutions at regular or annual gatherings of staff and faculty such as the Faculty Senate and Employee Assembly as well as at unit gatherings.

*Implementing Think BIG, Live Green in all departments, schools and colleges:* We fully realize that behavioral changes will be incremental and relatively small on an individual basis compared to major changes such as improvements in infrastructure but by changing the mindset – an adoption of a culture of sustainability - at an organization the size of Cornell with its nearly 22,000 students, 1,600 faculty, 1,100 academic professionals, and 7,000 staff we believe the aggregate benefit will be significant. We also see an opportunity for our community to carry this message to their homes, places of faith, civic groups, and other organizations in which they are involved to bring about change well beyond the boundaries of Cornell.

Cornell's greenhouse gas reduction targets will not be achieved without promoting both immediate and sustained changes in behaviors related to energy conservation. Indeed, other than changes in the physical plant and energy sources for the university, all other options involve behavior change at the individual level, from turning off lights to changing commuting patterns. Given the urgency of climate change challenge, key behaviors must change in a short time; equally important, they must *stay* changed to have maximum impact.

Cornell is fortunate in having extensive resources in those areas needed to maximize the benefits of behavior change initiatives. A number of faculty are devoting their scientific careers to issues of decision-making, behavior change, behavioral economics, and the implementation and evaluation of evidence-based programs. We propose that Cornell tap these research resources to set the agenda for its environmental behavior change initiatives and to monitor their effectiveness. Indeed, this is another example of Cornell being a true "living laboratory" for the development and dissemination of effective behavior change initiatives that promote a multitude of ways to reduce energy use.

The systematic application of **behavior change science** is the best option to promote energy conservation. This application can in turn lead to translational research initiatives

## DRAFT

that develop and test programs and practices designed to help students, faculty, and staff initiate and maintain behavior change. Some of these initiatives can employ Cornell research on the use of emerging technologies that involve interpersonal communication and real time social information analysis.

A reservoir of relevant research on the science of behavior change is available for translation to interventions promoting environmental sustainability. The following are four examples:

- Cornell faculty study how people psychologically represent time and make decisions over time. A major difficulty with environmental behavior change is the human tendency to devalue distant gains and losses relative to more immediate ones. Evidence-based avenues for interventions exist in this area that can be used to promote environmental behavior.
- Social scientists at Cornell are developing methods to optimize the way information is conveyed to help change behavior. Studies suggest that people are very sensitive to the specific wording that is used to present a given piece of information. Therefore, interventions using individualized message framing to promote behavior change can be applied to help attain Cornell's sustainability goals.
- Cornell can be a leader in leveraging technology to effect behavior change around sustainability. Faculty is working on issues of behavior change in the contexts of the use of online information and of technology such as smartphones or potentially a carbon footprint Fitbit.
- Cornell has leading scientists in the area of risk and rational decision-making, ranging from economists to neuroscientists. Many of their models and methods can be applied to achieve sustainability goals.

In sum, we believe that tapping the extensive scholarly resources available at Cornell constitute a critical path to promoting environmental behavior change at the university. We propose to build on existing programming and successes to (1) determine the best methods of promoting sustainable behavior; (2) systematically implement programs most likely to work; and (3) use faculty expertise to evaluate and refine these programs as needed.

*Organizational structure/leadership:* To maximize the benefits of Cornell research and educational resources related to climate change and achieving climate neutrality, we propose the establishment of two working groups.

1. Climate Change Literacy Working Group. The group would provide the intellectual underpinning for the campus-wide climate literacy initiative and would report to the PSCC Executive Committee. Members would include:

Jeff Tester (CoE), Natalie Mahowald, Bruce Monger (CALs), Joe Burke, Mike Hoffmann (CALs), Sarah Brylinsky (Office of Sustainability), Mark Milstein (Johnson), Student representative.

## DRAFT

2. Behavior Change Working Group who would also report to the PSCC Executive Committee. This group would build on successes to date such as CALS Green and Think BIG, Live Green and enhance as needed. They would be charged to identify evidence-based programs that have the greatest degree of success. Equally important, they would help prevent the use of programs that do not work, or may even have unintended negative effects. A subset of the following individuals would form the working group.

- Jon Schuldt,\* Communication, climate change messaging and public opinion
- Adam Levine, Government, citizen participation in climate change action
- Rich Stedman,\* Natural Resources, human dimensions
- David Filiberto,\* Industrial Labor Relations
- Karl Pillemer,\* College of Human Ecology, Bronfenbrenner Center for Translation Research
- Brian Wansink, Dyson School
- Linda Croll Howell,\* Human Resource Analytics
- Kathy Burkgren, Organization and Workforce Development
- Mike Hoffmann,\* Cornell Institute for Climate Change and Agriculture
- Sustainability Engagement Manager from the Campus Sustainability Office
- Resource contacts:
  - Sue Fussell, Communication (instrumental in CALS Green interactive website)
  - Marianne Krasny, short educational videos, civic engagement
  - PSCC Focus Teams
  - Katherine McComas, Dept. of Communications, risk communication
  - Drew Margolin,\* Communication, social media, Fitbit development, a test bed for social media to change a culture of an organization.
  - Cornell Team and Leadership Center, Cornell Management Academy
  - Cornell office for Research on Evaluation (CORE)

\*Contacted and interested in participating

- *Funding – grants program:* Although we believe there would be considerable interest in this overall initiative, funding for a small grants program for applied research and educational programming by faculty on environmental behavior change would be important. Cornell must provide incentives for faculty to become involved in finding solutions, as the experimental data obtained from these funded projects will also relate to their research interests. Faculty from a wide range of disciplines can develop and test interventions that can then be expanded to benefit the entire university. Team members would seek additional funding from federal, state and foundation grant sources to add value to the base resource provided by Cornell. Such a proposed initiative would also lend itself to crowdfunding and support from alumni.
  - Budget: \$50,000/yr.
- *Funding – staff and technical support:*
  - Create a full-time staff position focused on ensuring a climate literate community at Cornell. This would include coordination of the overall effort, administration of the grants program, and supporting the working groups. The position would

## DRAFT

be housed in the Sustainability Office but work closely with climate literacy working group.

- Budget: \$75,000/yr.
- Sustain the Think BIG, Live Green campaign staffing in the Office of Sustainability. Would work closely with behavior working group.
- Support will be required to enhance the current Think BIG, Live green website including an on-line interactive system that will insure engagement of participants and foster a competitive spirit that was key to the success of CALS Green.
  - Budget: \$20,000/yr.
- The overall initiative must document the return on investment from these positions in the long term. We are confident that the return in energy savings alone will be multifold their combined salaries and self-sustaining in the long-term.

### References:

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