Application Details

Manage Application: Innovation in Co-Curricular Education Award – 2018

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Application Title:	Cobb
Application ID:	002194
Nominator's First Name:	Greg
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Nominator's Primary Organization:	Georgia Institute of Technology
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Nominator's Phone Number:	404-894-5541
Nominee's First Name:	Kim
Nominee's Last Name:	Cobb
Nominee's Title:	Georgia Power Chair and ADVANCE Professor
Primary Organization(s):	Earth and Atmospheric Sciences
Nominee's Email Address:	kcobb@gatech.edu
Submission Date:	Wednesday, January 31, 2018

CETL Innovation in Co-curricular Teaching Award Nomination

Internship and Co-op Carbon Reduction Challenge

Professor Kim Cobb, Georgia Power Chair and ADVANCE Professor
Director, Global Change Program
ADVANCE Professor, College of Science
Earth and Atmospheric Sciences
Georgia Institute of Technology

Professor Beril Toktay, Brady Family Chair and ADVANCE Professor
Director, Ray C. Anderson Center for Sustainable Business
Scheller College Business
Georgia Institute of Technology

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Summary

The Internship and Co-op Carbon Reduction Challenge (CRC) invites Georgia Tech undergraduates who hold traditional internships and co-ops to identify, quantify, and obtain approval for a project at their place of employment that reduces both greenhouse emissions and operating costs. This co-curricular innovation, first implemented in Summer 2017, is an expansion of a successful Carbon Reduction Challenge class taught by Dr. Cobb since 2007, most recently as *EAS 3110: Energy, the Environment, and Society* in Spring 2017. The Internship and Co-op Challenge attracted 25 students at 10 participating organizations including many important GT industry partners (Delta, BP, VW, SunTrust, etc.). Students received hands-on learning about the relationship between energy and carbon footprints, and the design and implementation of carbon mitigation strategies within large organizational structures. Some students went on to pitch their projects to C-suite executives, obtaining immediate approval for implementation. Four of the industry projects were approved within two months, exceeding expectations. These projects are estimated to collectively result in over 12,000,000 pounds of CO2 emissions reductions and tens of thousands of dollars of savings.

Fit with Georgia Tech's Strategic Mission

Georgia Tech is poised to be a national leader at the intersection of climate change, and energy, as recognized by a year-long task force of faculty leaders working under the direction of President Emeritus Wayne Clough. Their report noted that Georgia Tech has extensive research expertise in energy policy, climate science, renewable energy, and sustainable business, and can become a "clearing-house" for economically-viable, integrated solutions to the most pressing global-scale challenges, with an eye towards regional applications. At the same time, we recognize an urgent need to train a new generation of leaders who not only understand the multi-disciplinary nature of these challenges, but is equipped to identify, design, and implement solutions wherever their professional paths may take them. Inevitably, delivering on these aspirations involves building new partnerships across key units within Georgia Tech, as well as between the Georgia Tech community and outside partners, both private and public. The CRCis an interdisciplinary education program that advances these goals, in close alignment with the Institute's Strategic Plan.

Pedagogical Objectives

In the Georgia Tech Baccalaureate Alumni Survey that asks our alumni how well they believe Georgia Tech prepared them for employment, only 45% of them gave a high rating to "understanding the environmental impact of my professional practice" and 68% to "effective work in a team" (68%). In contrast, a full 85% of students gave high scores for "solving problems in my discipline". The CRC addresses the former knowledge and skill gaps while promoting energy, carbon, and organizational literacy. Our focus on "carbon literacy" reflects the urgent need to prepare the next generation of leaders to implement aggressive greenhouse gas emissions reductions.

By challenging students to i) identify a carbon reduction project at their employer, ii) quantify the associated emissions reductions and cost saving potentials, and iii) obtain managerial approval for implementation, we aim to:

(1) Create an experiential learning opportunity specifically grounded in carbon reduction;
(2) Give students the climate literacy skills they need to estimate carbon reduction levels and calculate ROI;
(3) Teach students how to be 'sustainability ambassadors' in any job function;
(4) Foster effective teamwork; and
(5) Hone their professional communication and pitch skills.

Approach

The CRC is a co-curricular based activity that challenges student teams to design, and where possible, implement, strategies to reduce greenhouse gas emissions while delivering cost savings to their employers. Multi-disciplinary student teams compete to achieve the largest emissions reductions, while working full-time as interns and co-op student for a diverse set of employers, who serve as partners for the CRC leadership team . Partners include large multi-national corporations, governmental, and non-governmental organizations. By combining in-person meetings for the student cohort with weekly check-ins via e-mail and/or phone conferencing, the CRC team guides the students through a four part process:

(1) development of a preliminary plan with up to three potential emissions- and cost-saving strategies;
(2) refinement of the plan into a Final Plan;
(3) a peer-review session focused on providing feedback on each team's progress; and
(4) presentation of the team accomplishments in a Final Poster Expo.

The Challenge heavily relies on real-world problem-solving, creativity, networking, and strategic thinking by student teams who must combine quantitative analyses (carbon footprinting and financial analysis) with organizational learning. It borrows tools and approaches from project-based, inquiry-based learning, and experiential learning pedagogies, while encouraging the students to think entrepreneurially about engaging an organization's decision-making process in order to advance their project. The close collaboration between a College of Sciences and a College of Business faculty in leading the Challenge gives the students a holistic experience that translates science, technology and business concepts into practice. Starting this semester, the collective learning that takes place in the peer-review session towards the end of the Challenge will take place throughout the Challenge as we implement an online forum for team-to-team sharing of ideas and progress as well as instructor feedback using Monday.com as a platform.

Educational Contribution

The learning that takes place over the course of the CRC improves on existing pedagogical research in that it borrows from problem-based, inquiry-based, and experiential learning, but takes place in real-world business settings wherein students must identify challenges, opportunities, and allies in their working environments to be successful. They leverage skillsets and concepts from one climate and energy expert and one corporate sustainability expert in optimizing their projects for gains along two real-world axes - emissions reductions and financial gain - as they move their project from an abstract concept into real-world implementation. The fact that student teams compete for the largest and most cost-effective emissions reductions also greatly enhances the success rate of the student projects, many of which reach

full implementation at the close of the 12-week Challenge. An extensive review of the literature (pp. 14-20 in Georgia Tech's 10-year Quality Enhancement Plan Serve-Learn-Sustain themed "Creating Sustainable Communities" co-created by Dr. Toktay - http://serve-learn-sustain.gatech.edu/sites/default/files/documents/final-qep-document.pdf) revealed that very few of the existing pedagogies take place within large, complex organizations representing those many students join upon graduation; our innovation fills this need and fulfills the QEP's mission of creating "deep student learning experiences."

Impact

The Co-op and Internship Challenge is based on the demonstrated success of a CRC project class that Prof. Cobb has taught at Georgia Tech for several years (~240 students). Twenty-five students signed up for the Summer 2017 pilot, and carried out projects at seven corporations in different sectors (SunTrust, BP, Volkswagen, Alcon Laboratories, Home Depot, Delta Airlines, Bostik) as well as two NGOs and Georgia Tech. Despite the two-month time frame, which is short in the decision making processes of large organizations, four projects were approved by the end of summer: an employee travel reduction program at SunTrust, a shop floor LED bulb replacement project at Volkswagen, programmable light project at Alcon Labs, and a reusable container project at BP. An engine wash schedule change program and Delta Airlines made good progress as well, and is being moved forward internally. Collectively, these projects are estimated to have over 12,000,000 pounds of lifetime CO2 emissions reduction potential.

We have anecdotal evidence that improved learning and employability outcomes are occurring as a result of the Challenge: We heard from a recruiter at the M.S. in Analytics degree program that upon being asked what his most impactful experience at Georgia Tech was, an applicant said "the sustainability analytics work I did in the Carbon Challenge." The initiative the student showed in voluntarily joining the CRC, the interdisciplinary teamwork he undertook and the student's demonstrated ability to take an analytic approach to business problems in areas unfamiliar to him (sustainability, in this case) were important factors in his acceptance to the program.

Several students we talked to during the poster session reported that an important learning for them was the importance of talking to the right person in the organization, and of persevering to find that person. The CRC is uniquely positioned to hone this skill since it requires an intern in -say- a marketing or sales analyst position to talk to people in different functions - facilities, sustainability, logistics, store operations, human resources, etc. This is a skill that will transfer to future job settings.

Companies reported internal organizational value as well. The project sponsor at the winning company (who put out an internal newsletter article touting the success of the project) said that the most important learning for her colleagues across the company was that they could be sustainability champions from their desks.

Program Evaluation

We conducted feedback surveys with student participants and corporate sponsors. Students rated the structure of the program favorably, with 78% finding the weekly emails and the resources (i.e. poster

requirements, carbon calculations) helpful or very helpful, and 67% being similarly satisfied with the technical assistance. 75% felt they had enough time during their internship to complete their duties and this project. 100% of respondents said they felt well-prepared for their final poster presentations. One of the students in the winning team (who presented their proposal to a large senior leadership team including the Chief Financial Officer and got their project approved on the same day) said this Challenge was "the defining experience of my time at Georgia Tech."

Participating companies also rated the program very favorably, with supervisors answering the question "How interested are in continuing to support future interns in the Carbon Reduction Challenge?" with the highest possible score.

Future Growth

The Carbon Reduction Challenge will comprise a core activity of the Georgia Tech Global Change Program that will officially launch in March 2017 under Dr. Cobb's leadership, as it evolves from a co-curricular activity to an initiative that reaches beyond the student body at Georgia Tech. Specifically, we will work aggressively to develop, pilot, and refine a comprehensive set of on-line tools for the following specific audiences (designed to be stand-alone resources):

i) future cohorts of Georgia Tech students
ii) other interested university faculty & administrators
iii) K-12 schoolteachers & administrators
iv) the general public

In Fall 2017, to disseminate the knowledge about the Challenge, we presented it at two education sessions in Fall 2017: One at "Climate Literacy in Higher Education: Challenges and Opportunities" at the Fall Meeting of the American Geophysical Union attended by over 30,000 international geoscientists; and another at "Teaching Innovations in Sustainable Operations" at the Fall Meeting of the INFORMS Society attended by over 5,000 international operations management scholars from business schools and industrial engineering departments. We also participated at a by invitation event, The Reimagine Education conference, at the Wharton Business School. Reimagine Education aims to acknowledge those most successful in creating transformational educational initiatives, enhancing student learning outcomes and/or employability. We had expressions of interest from several programs to adopt our innovation and are in communication in particular with Green Consultants, a training program at the University of Exeter where students take on work as junior consultants dealing with environmental and sustainability issues. This early collaboration speaks to the potential of the Challenge to have transformative educational impact beyond Georgia Tech.

Appendix A: Supervisor Letter

Dear <SUPERVISOR NAME>,

Georgia Tech student <NAME> who is participating in your Spring 2018 co-op program has expressed interest in participating in the Carbon Reduction Challenge by undertaking a self-directed carbon reduction project at <COMPANY>.

With this letter, we would like to invite <COMPANY> to participate in the Internship and Co-op Carbon Reduction Challenge. This is a Georgia Tech program directed by Dr. Kim Cobb, Professor in the School of Earth and Atmospheric Sciences and Faculty Director of the Global Change Program, and Dr. Beril Toktay, Professor in the Scheller College of Business and Faculty Director of the Ray C. Anderson Center for Sustainable Business.

The program's purpose is for co-op students, in parallel with their assigned co-op duties, to take the initiative to identify and execute a plan that reduces their employer's carbon emissions, most often saving their employer money, over the course of their internship. Project examples from previous implementations range from creating employee challenges to reduce their personal carbon emissions, to changes in building lighting schedules or in default rental car options, to more capital-intensive projects such as HVAC modifications. Deliverables include a final report and poster outlining the project scope, the associated carbon reduction calculation, and the ROI calculation.

The program aims for win-win outcomes:

- Students are provided opportunities to make the business case for a sustainability project, and to engage internal stakeholders in defining, gaining approval for, and implementing the project.
- Your company is provided additional talent and resources to accomplish carbon reduction initiatives that can save money, create sustainability champions in business units and help you make progress towards sustainability targets.

What this requires from <COMPANY> is:

- Obtaining supervisor approval for the student to work up to 2-4 hours/week on this project;
- Allowing the students to participate in a final project poster exhibition held on April 12 or 13th. We encourage you, as the students' supervisor and/or their primary company contact for their Carbon Reduction Challenge project, to attend the expo.
- Working with the organization's public relations and communications team to obtain approval for press releases sharing information related to projects that proved exemplary; we commit to not sharing information about your project with the public without prior approval from COMPANY.

If you would like to learn more about the Carbon Reduction Challenge, we would be happy to meet with you in person or by phone.

Regards,

Dr. Kim Cobb, Georgia Power Chair L. Beril Toktay, Brady Family Chair of Operations Management

Appendix B: Project Plan Requirements

Your draft and final plans must contain explicit statements and plans about the following requirements:

1. Targeted reduction: Describe the nature of the project and how the reduction will be achieved. Explain clearly how the project will translate into cost and carbon reductions.
2. Steps Required for Achieving Carbon Reduction: How will you go about achieving your reduction goal? Who will you need to work with towards your goal? Please provide the names and contact information for your primary contacts at your host company/organization.
3. Carbon Quantification: Provide an initial "back-of-the-envelope" estimate of CO2 reductions your initiative will achieve, citing peer-reviewed journal articles and government reports and web-sites only. Several examples of such sources should be provided. Discuss what other information will be needed to refine the calculation and how this information will be obtained.
4. Financial analysis: Provide an initial "back-of-the-envelope" estimate of the ROI and payback period for the project. Discuss what other information will be needed to refine the calculation and how this information will be obtained.
5. Co-Benefits: Please list and describe those aspects of your project that deliver other types of benefits (social, personal, health and well-being).
6. Strategic alignment: Provide evidence that this project is aligned with the priorities of your organization.
7. Additionality: Provide evidence that the carbon reductions you will take credit for would not happen without your actions.
8. Stakeholder mapping: Who will be affected by the change? How do you anticipate they will react? What is your "pitch" to each of the stakeholders that must be convinced if this project should be approved? What is your plan to get approval for this project within your organization?
9. Documentation and Deliverables for your host: For fully implemented projects, what kinds of data/documents will you collect over the course of the semester to support your plan? And what kind of information would your host like at the end of the semester? In what form (a written report? oral presentation?)
10. Division of labor: Please indicate what activities the various members of your team will focus on over the course of the semester's challenge.
11. Team name: Please devise a team name!

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January 28, 2018

Re: Nomination of Professors Kim Cobb and Beril Toktay for the CETL Innovation in Co-Curricular Education Award

Dear Awards Committee,

It is with great pleasure that we nominate Prof. Kim Cobb and Prof. Beril Toktay for the CETL Innovation in Co-Curricular Education Award for their ground-breaking accomplishments with the "Internship and Co-op Carbon Reduction Challenge".

In 2007, Professor Cobb developed the original version of the "Carbon Reduction Challenge" for a special topics course for the Honors Program, now taught as *EAS 3110: Energy, the Environment, and Society*. After breaking the class into teams, she charged the students to reduce carbon dioxide emissions equivalent to those the average American emits over several years, but to do so in three short months. Conducting the project in the form of a student team challenge has proven to be exceedingly effective in motivating the students to scale up their activities in order to win. The student projects were shared with the Georgia Tech and broader Atlanta communities in the form of a poster session. As a prize, Professor Cobb took the winning student team up to Washington DC year after year to learn about the legislative process first-hand, and think more deeply about how policy may impact their future careers.

In 2016, the continued success of the Carbon Reduction Challenge attracted the attention of Prof. Beril Toktay, who recognized the potential of translating the Challenge into a co-curricular offering for Georgia Tech students participating in co-ops and internships. Teaming up with Prof. Cobb, they applied for and won a Scheller College of Business Dean's Innovation Fund award matching a seed grant award from the Ray C. Anderson Foundation to port the Challenge to co-op and interns during Summer, 2017.

Working with 25 students from across Georgia Tech in their initial roll-out of the co-curricular Carbon Reduction Challenge, Professors Cobb and Toktay worked closely with student teams based at Suntrust,

Home Depot, Delta, VW, BP, among others. The co-op and internship version of the Carbon Reduction Challenge proved to be the most successful cohort in the history of the Challenge, accruing over 12 million pounds of carbon reductions over 3 short months – offsetting the carbon footprints of over 300 Americans for an entire year. There projects correspond to projected cost reductions at partnering organizations amounting to tens of thousands of dollars. The students presented their projects in a poster session attended by over 100 community stakeholders, including employees from each of the companies that hosted the participating students.

The main strength of the Carbon Reduction Challenge is that students engage in solving real-world problems, from start to finish, with a strong focus on robust quantification of the carbon reductions as well as the economic value associated with their projects. Of equal value, students must build a partnership with an external entity, and over the years, students have worked with an incredible diversity of partners, including campus facilities, local churches, City Hall, as well as major corporations such as SunTrust, BP, Delta, VW, 3M, Home Depot, Chipotle, and many more.

Aside from the real-world carbon and cost savings that this activity has generated – accomplishments that help to establish Georgia Tech as a regional leader in sustainability – the students involved in the Challenge accrue valuable, hands-on experience. For one, they learn to harness their creativity in working through project ideation, refinement, stakeholder engagement, and execution in interdisciplinary teams. They learn to navigate complex organizational hierarchies while balancing their primary work duties as a co-op or intern with advancing their goals for the Carbon Reduction Challenge. They learn to improve their project through peer review as well as external review, and how to present a compelling, polished, substantive poster at the end of the Challenge.

The interdisciplinary nature of the partnership between Professors Cobb and Toktay reflects the immense potential of working across disciplinary boundaries to deliver novel learning opportunities to our students. The fact that financial lessons come packaged with climate lessons reflects the nature of the largest, most pressing societal challenges today, which often require interdisciplinary solutions. Most importantly, the Challenge inspires our students to engage directly in solving climate change, no matter where their careers take them.

In summary, Professors Cobb and Toktay have translated their passion for their respective fields, and for our undergraduate students, into a successful, scalable model for deep learning in a co-curricular setting. As such, they are wonderful examples for our entire faculty, demonstrating that you can be world-class researchers while inspiring and equipping the next generation of sustainability champions to solve society's most pressing challenges.

Sincerely,

L. Gregory Huey

Peter Thompson

Georgia Tech Strategic Energy Institute

January 29, 2018

RE: Nomination for the Innovation in Co-curricular Education Award

Colleagues:

I am writing to nominate Prof. Kim Cobb from Earth and Atmospheric Sciences (EAS) and Prof. Beril Toktay from the Scheller College of Business for the Innovation in Co-curricular Education Award at Georgia Tech. Profs. Cobb and Toktay sit on the Faculty Advisory Board for the Strategic Energy Institute (SEI), which I direct. In addition, we regularly meet and coordinate activities at the intersection of energy, sustainability, and climate change. It is through these connections that I have witnessed their significant accomplishments with the Carbon Reduction Challenge.

I have attended many of the student poster presentations associated with the Carbon Reduction Challenge when it was part of Prof. Cobb's energy class in EAS. I was impressed with the quantitative rigor of each project, as well as the passion the students demonstrated in discussing their projects. The students' collective accomplishments were anything but token – they were applying creative solutions to real-world problems, often navigating the complexities of working with a real-world partner. They were charged with quantifying carbon reductions and cost savings for their partners, and while everyone gains financial literacy as a young adult, the carbon literacy that our students gain during the challenge will serve them well as we enter a carbon-constrained economy in the next decades.

During the summer of 2017, Beril and Kim chose to roll out the Carbon Reduction Challenge in a co-curricular format targeted at Georgia Tech students engaged in co-ops and internships. In doing so, they bet that students who were embedded within their partner organizations would have easy access to key decision-makers and data that would enable them to accomplish even bigger carbon reductions than previous student cohorts. They were right – the poster presentations I saw last August represented large-scale projects that were largely implemented. The students were well versed in the minutiae of their project and had become passionate champions for energy efficiency as a way to address climate change while growing our economy. Working through a real-world problem that resulted in real-world change, the students gained the confidence and skills to translate their disciplinary knowledge into action.

I know that Beril and Kim hope to recruit several large energy companies as hosts for co-op students participating in the Carbon Reduction Challenge and have already made contacts at BP and Georgia Power.

Clearly, this is a successful, scalable program with immense potential to further establish Georgia Tech's reputation as a leader in graduating global citizens who meaningfully contribute to society. I have greatly benefited from my interactions with Beril and Kim – this program is one concrete example of the outstanding work that they are doing to educate students who are versed in sustainability and climate change issues.

Regards,

Tim Lieuwen, Professor and
Executive Director, Strategic Energy Institute

Dear Awards Committee:

A number of recent experiences have deepened my appreciation for the environment and have made me more aware of the importance of being a steward for the environment. For instance, I had the opportunity to study abroad at Georgia Tech's Lorraine campus for my Spring 2016 semester. As I travelled on my own, I quickly discovered that I preferred exploring mountains to the city. Climbing high and seeing a new location from above, I gained a greater appreciation of a place. Whenever I went on a hike, I felt the responsibility to do my part in preserving the environment so that in the future I could return to these same places to rediscover their natural beauty. On another trip overseas—this time to Asia—I once again felt the duty to live in a more environmentally-friendly way. I had to wear a facemask to protect my lungs because the air was so thick with smog. Even after I went home and was able to live mask-free, I felt sad for the people who lived there since they weren't able to breathe fresh air. I also hoped that America would never become so polluted that its citizens would need to wear masks. A final recent inspiration for my commitment to the environment has come from my sister who has decided to live a zero-waste life. I have been learning a great deal from her about how much trash one person generates in his or her lifetime, and how even a small act (such as not using straws) can impact the environment for the better.

As I was in the process of making small changes in my day-to-day life in order to be more environmentally friendly (and trying to inspire others to do the same), an opportunity arose that challenged me to do even more. This summer, as an intern in the Cargo department of Delta Air Lines, I was responsible for creating and maintaining Tableau dashboards to support the automation of reports for senior leadership. One day, I received an invitation from Georgia Tech to join the Co-op and Internship Carbon Reduction Challenge while on the job this summer. This seemed like the perfect chance for me to make an even bigger impact!

When I signed on for the Challenge, I was assigned to a Delta team that had already formed. We discovered a problem that our team could address, which is that 98.8% of Delta's greenhouse gas emissions come from mainline and regional jet fuel burn. We wanted to find a project that addressed this emission, to provide a quick ROI, and to start saving the company money right away. The team already consisted of two interns in the sustainability department, one of whom had heard how Hawaiian Airlines reduced their carbon emissions by using the Pratt & Whitney EcoPower engine washing system.

The EcoPower system works by spraying pressurized water through the engine to remove dirt and debris from blades, which allows engines to run more coolly and efficiently. The attractive business and sustainability results? Fuel savings and a reduction in CO_2 emissions. We then researched whether Delta washed its planes' engines. We discovered that of the more than 800 aircraft in Delta's fleet, about 75% of planes are indeed being washed, and that Delta has the equipment to perform this maintenance. For our project, we decided to focus on the remaining 188 planes that are not currently on a washing maintenance schedule due to the fact that they have leased engines.

Our team worked cohesively from the beginning to the end of the Challenge. As a first step, we gathered information from the Propulsion Engineering team. We then identified assumptions and ran calculations. Finally, we reported findings to the Fuel Council and Propulsion Engineering leadership to encourage the implementation of this project. Once we got in contact with the Propulsion Engineering department, we discovered that the senior leaders had already considered an expansion of their engine-washing program even before we brought our plan to the table. We then felt like we already had one foot in the door and knew we had a good chance of getting the jet engine washing plan implemented!

Although getting face-to-face time with senior leadership is difficult in a large organization such as Delta, having a point person who delivered our proposal on our behalf helped our team immensely. One of the engineers in the Propulsion Operations department, delivered our proposal and worked with us to understand better the costs associated with washing jet engines. (He has continued to keep us informed with implementation updates even after our internships ended.)

Overall, I discovered that tackling the Carbon Reduction Challenge in addition to fulfilling my day-to-day responsibilities gave me an additional sense of purpose at my internship. I felt proud of the fact that my teammates and I were able to deliver a proposal that would save considerable CO_2 emissions from the environment and also create substantial savings for Delta. It's amazing that a short-term internship can potentially make such a huge impact!

I now know that no matter what industry I work in after graduation, I will always strive for sustainability measures both big and small. Participating in this Challenge has shown me that that pitching an idea to senior leadership is not impossible! And once the project is approved, the rewards are immeasurable.

A huge thanks to the entire Carbon Reduction Challenge instructor and staff team for giving me this opportunity! I really believe they deserve to win the CETL Co-curricular Education Award.

Thanks for your consideration,

Elizabeth Jang (Industrial and Systems Engineering major)

Dear Awards Committee,

I participated in the Summer 2017 Co-op and Internship Carbon Reduction Challenge and would call it the defining experience of my time at Georgia Tech.

For the Challenge, I worked at SunTrust with five other interns (four industrial engineering students and one business student working in wholesale banking and enterprise information systems). Our goal was to complete a sustainability project in addition to our individual internship projects and duties. For the sustainability project, we were prompted to research, propose, and implement a plan that would reduce SunTrust's carbon emissions.

Our sponsor at SunTrust presented our team with several interconnected projects, such as starting a "Walk-Bike-Train Challenge" campaign, increasing recycling, increasing the use of LED lighting, and reducing employee travel. To narrow down our project, our team considered how we could make a narrow but impactful and strategic project in the realm of travel reduction (i.e. try to change one percent of Walmart). In a brainstorming meeting, we asked the following questions: What happens if we reduce one to two percent of SunTrust's domestic staff travel? What happens if we change SunTrust's default rental car reservation option from intermediate to economy class? Is there such a thing as a more fuel-efficient airline, and if so, what happens if we move a small percentage of flights to a more fuel-efficient airline?

The above issues were our company's metaphorical "ripe, low-hanging fruit" when it came to carbon emissions. We conducted research and confirmed that the proposals would have impact. We then worked to execute our project. Ultimately, by changing a small part of SunTrust, we could reduce 1.85 million pounds of CO_2 and create $1.2 million in net savings. Our rental car modification (changing the default car class from intermediate to economy class) option was implemented day one, following a meeting with C-Suite executives. SunTrust acted on our air travel reduction recommendations earlier this month.

Such rapid adoption and significant impact may seem difficult to believe. One may wonder if the CFO, CIO, and CHRO simply appreciated their summer interns' efforts and didn't want to hurt their feelings. Perhaps. However, I have a more believable, two-part theory to explain why our solutions were adopted (or will be soon).

First, our recommendations were palatable. We proposed to modify only a small percentage of employee travel (2%). We could achieve significant reduction in carbon emissions without upsetting SunTrust's current travel system. In all of my professional experiences enabled by Georgia Tech, I have dealt either with implementing or improving a new system or with changing people's mentalities, either directly or indirectly. People usually don't want to uproot their current practices completely for reasons they may not understand or view as important.

Second, the solutions were easy to implement and understand, meaning that people could take ownership of the carbon reduction efforts. An employee might see the value in using a Skype video headset in order to reduce travel to one or two meetings per year. An employee traveling alone to a meeting might see how booking an economy class car can reduce impact on the environment and help the company's bottom line as well. It's not difficult to be part of solutions like these. I believe that effective corporate sustainability involves educating employees and giving them a sense of independence and ownership in being a part of the solution for reducing the company's carbon footprint.

Environmental sustainability is difficult. It is difficult to perpetuate in business, and it is difficult to perpetuate elsewhere. Climate change and redesigning our supply chains are incredibly difficult issues—complicated, stressful issues; they may be extremely time-sensitive to boot! And please allow me one personal complaint as a student: The math is difficult!

However, sustainability is viewed according to how you paint the picture. For SunTrust, we provided padding on top of their current sustainability platform that allows the company to compete better with peer institutions, be more operationally efficient, and increase their technological prowess. As a Floridian, if someone tells me, "Half of your state will be underwater in two hundred years (or whatever the estimation is)," I cannot even begin to visualize that possibility let alone comprehend it. We provided SunTrust with a concrete way to understand carbon savings from our project: It would equate to 500+ years of continuously watching the Ed Sheeran cameo on HBO's *Game of Thrones!* That's easier to relate to.

Sustainability is hard, no doubt about it. However, if we keep tackling those "What if we changed one percent?" questions, we can begin to make progress.

The Carbon Reduction Challenge was an amazing opportunity to engage us in being part of the climate solution space. Drs. Cobb and Toktay have my strongest support for the GT Innovation in Co-curricular Education Award.

Sincerely,

Will Courrèges- Clerq

Business Administration `18

Dear Award Committee:

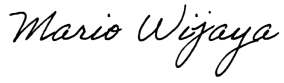
I got my BS in Industrial and Systems Engineering last summer and am now an MS student in the Analytics program. I'm writing to support the nomination of the Carbon Reduction Challenge for the Innovation in Co-curricular Education Award.

Before taking Dr. Beril Toktay's Fall 2016 Serve-Learn-Sustain class, Introduction to Sustainable Systems, I had little knowledge on sustainability practice. I was aware of global warming but didn't care to learn more about it. Prior to the class, I knew how carbon emissions impacted the earth but not so much about what companies were doing to reduce their carbon emissions through sustainable business practices. After taking this class, my perspective on sustainability practice changed from recognizing the impact/harm of carbon emissions on the environment to wanting to do something about sustainability whether through company action or a campaign initiative.

This past summer, I accepted a position at SunTrust as Business Analyst Intern. Several weeks before my internship started, I received an email regarding the Co-op and Internship Carbon Reduction Challenge (CRC) and decided to give it a shot to further my understanding on sustainability practice. I was paired with five other SunTrust interns from Georgia Tech in order to work on CRC's project with the company.

The project itself proved to be quite challenging. As a team, we had to come up with a sustainability topic to tackle for SunTrust. After we settled on a topic (travel reduction and travel efficiency), the team worked hard to find good solutions that could be easily implemented. As the team's data analyst, I faced many challenges throughout a course of about eight weeks. First, the data that was provided to me came from multiple sources and included a lot of information (both useful and not). It was impossible to pre-process or clean the data by using Excel, given that there was so much data. Luckily, an undergraduate course that I had taken at Georgia Tech (CS 2316: Data Manipulation) taught Python (high-level programming language used for data cleaning, analytics, etc), which proved to be quite useful. I never imagined that Analytics could be applied in a sustainability project! Second, after the data was cleaned and the analysis was done, we looked at the assumptions with which our team had come up, and then we modeled the data to provide a solid solution and proposal. Third, the team had the opportunity to present our findings to C-Suite executives. They responded positively to our presentation and agreed to the findings. Implementation kicked off soon after.

As someone who recently knew little about sustainability, I truly value having been given the opportunity to work on the Carbon Reduction Challenge. I sincerely would like to thank Professor Kim Cobb and Beril Toktay at Georgia Tech, SunTrust, our project sponsor at SunTrust, and my five teammates (Alex Ketchum, Anjani Agrawal, Nick Rogstad, Sam Rubin, and Will Courrèges-Clercq). Though the experience had its fair share of challenges and nerve-wracking moments, my team and I are really proud of our achievements. Though our summer internships have ended, the sustainability initiatives we put into motion will continue to make a real impact on carbon reduction.



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