



UNC
INSTITUTE FOR
THE ENVIRONMENT

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Spring 2012

**Green Business Challenge Capstone Team:
Final Report
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**Triangle J Council
of Governments**

This paper represents work done by a UNC-Chapel Hill undergraduate student team. It is not a formal report of the Institute for the Environment, nor is it the work of UNC-Chapel Hill faculty.

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Introduction

The following is a summary of the Triangle Green Business Challenge Capstone team's process and accomplishments for the 2012 spring semester. Information is broken up by relevant categories, with referenced documents linked in the Appendix.

This capstone project was created in conjunction with the Institute for the Environment at the University of North Carolina at Chapel Hill and the Triangle Green Business Challenge Steering Committee, a smaller entity under the Triangle J Council of Governments (TJCOG) that draws in members from a variety of organizations in the Triangle. The capstone projects are semester-long partnerships between students and clients to accomplish agreed upon goal(s). The capstone team comprised 14 students with a variety of backgrounds and study areas interested in helping TJCOG launch the 1st annual Triangle Green Business Challenge.

While the Triangle Green Business Challenge is the first of its nature in the area, the ICLEI association has supported several Green Business Challenges throughout the United States. The Triangle area was selected in 2011 as one of the four expansion challenges, but the competition is still modeled after the success of the previous challenges. The goal of the challenge is to promote, educate, and provide resources for businesses to achieve energy, water and waste reductions, as well as make smarter choices in purchasing and work-related travel. While the challenge provides media coverage and marketing incentives, the businesses realize economic savings from environmentally friendly business practices.

Triangle Green Business Challenge (TGBC) staff and the capstone leadership decided to narrow the focus of the team to revising and obtaining feedback on the challenge's scorecard, which is the tool used to evaluate businesses and their green practices at the beginning of the competition and at the conclusion. The capstone team then outlined a series of goals to accomplish for the client over the course of the semester-long project:

- Review, evaluate and provide feedback on the scorecard to help steer design and content
- Recruit pilot businesses to test and evaluate the scorecard
- Schedule and attend business meetings to record pilot business' feedback
- Provide analysis, recommendations, and improvements for the client
- Learn more about energy, water and waste audits

These main goals together would deliver the guidance and feedback on the scorecard necessary for the TGBC to successfully launch the Triangle Green Business Challenge on April 23, 2012.

Workplan

The Capstone team developed a work-plan to guide the following months of work to accomplish their set of goals. The work-plan organized large project objectives in Excel format for ease of use. The larger objectives were broken down into smaller sub-tasks with a timeline,

completion date and status. The team revised the work-plan (See Appendix A) as needed and tried to organize tasks to work around the timeline. The work plan proved vital to plan the semester's work and helped progress from a set of goals into a compilation of action items and deliverables detailed in this report.

Planning Committee Meeting

On January 24, the Green Business Challenge Capstone team had a formal meeting with Triangle J Council of Government's Triangle Green Business Challenge Steering Committee in the FedEx Global Education Center at UNC-Chapel Hill. This committee comprised individuals representing local governments and municipalities, TJCOG members, and sponsors of the challenge. The event served as an opportunity for the team to get better acquainted with TJCOG's vision for the Challenge by hearing about the various steps involved and concerns with the process to date. Although team members had a general idea of what was required of them, the chance to talk to the Planning Committee and to ask questions helped clarify the project. The team's goal was "to engage businesses with the scorecard" in a way that allowed team members to assess the scorecard's usefulness and appropriateness, as well as ease of use for participating businesses, so that the team could then prepare a report that included suggested modifications to the scorecard before the Earth Day launch event.

Prior to the meeting, the team had a brief opportunity to review the original scorecard. Although the scorecard would later undergo structural changes, this opportunity to review it with the Planning Committee was beneficial because it allowed team members to understand the kind of commitment participating businesses would be asked to make. In addition to the scorecard, team members discussed the types of businesses that the TGBC hoped to attract for the Challenge. The TGBC hoped to recruit 12-15 "champion participants" (pilot businesses) that could offer diverse feedback. Team members were asked to recruit businesses from different industries and locations across the Triangle. The Steering Committee suggested that pilot participants not include local governments, in order to reduce redundancy and overlap with TJCOG's existing contacts.

Despite the TGBC staff's earlier offer to recruit pilots, team members expressed willingness to aid in the recruitment process in an effort to accelerate the project. After being promised a scripted "elevator speech" to capture the attention of potential pilot participants, the team agreed to make the initial contact. From this point, the team began researching potential pilot businesses, assessing the scorecard, and discussing effective ways to deliver feedback.

Meeting with TJCOG Representative

Brennan Bouma from TJCOG joined the team on February 15 for one of their regular meetings and clarified remaining questions and concerns about the pilot program. The discussion centered on the point system and what value that added to each task. Collectively, the group agreed that it would be beneficial to move from a point to a less rigidly quantitative check system. Checks would start accumulating only after participants complete an energy, waste, and water audit. The team also addressed faulty links in the scorecard, for which revisions were promised before the team was to meet with businesses.

Ground rules for the pilot phase included the condition that, in order for a business to be considered a “champion” pilot participant, the business must be willing to sit down with a team member for 90 minutes to go through the scorecard. Businesses were welcome to give their feedback, even if they did not have an hour and a half to sit down with the team. In this case, however, they would not be recognized as a pilot participant.

A new development in the competition that Mr. Bouma shared with the team was that the competition will be free for businesses. The Challenge staff decided to abandon the Long Jump web program—the software and web interface originally under consideration for the Challenge, thus removing the registration fee.

Initial Scorecard Review

After getting more familiar with the goals discussed with the TGBC representative, the Capstone team divided into two groups, one to review the scorecard and the other to discuss potential businesses.

The scorecard group read through and commented on each question in the draft scorecard (example screen shown in Appendix B), noting issues with structure, format, clarity and point values. The group also reviewed the “help links” and determined that many were broken or ineffective. After this discussion, the team concluded that all questions on the scorecard should include applicable explanations to clarify potentially confusing terms. The team developed an “ideal” format, and recommended that TGBC staff revise all questions for clarity and consistency (See Appendix C). Later, the team compiled their suggestions, along with comments from the pilot participants, on the feedback form template. These revisions were sent to the client and the appropriate changes were made to the design and content.

NOTE: The comments from pilot participants relate to a draft scorecard used in March—*not the scorecard in use for the April launch*. The meetings with pilot participants took place before a web site and supporting materials were available, and reflect this early stage in the development of the program.

Business Recruitment

In the initial meeting with TGBC representatives and the TGBC Steering Committee, the team established the types of pilot businesses they wanted to participate in the pilot. The partners expressed an interest in gathering a diverse group of businesses varying in size, location and sector. Most importantly, the Council wanted businesses that had not previously pursued, and are in the process of completing, a “green” certification program.

After the meeting, half of the Capstone team compiled a list of potential businesses to contact for the Challenge. The team began their selection with businesses listed on the Chapel Hill Chamber of Commerce business web page. From their list, the team selected 30 companies of various size (small/medium/large), sector (restaurant/retail/service/health etc.) and location (Chapel Hill/Durham/Raleigh). The team created a spreadsheet that contained the name, address, phone number, size and sector of each business. Two additional columns denoted the Capstone student caller and notes from the response of each company.

Once TGBC supplied a phone script and “Participant Recruitment Guide,” student callers began reaching out to potential businesses. Then team compiled a master list of each company’s response. Confirmed businesses include: Chapel Hill Printing and Graphics, Durham Tire & Auto Center, Open Eye Cafe, Top of the Hill Restaurant, Piedmont Biofuels, Great Outdoor Provision, Performance Automall and Mediterranean Deli.

Two-person “student liaison” teams met with businesses during the week of March 12-16. During these meetings, the teams reviewed the scorecard questions and audit section. In addition, teams asked the “Questions for Pilot” as supplied by TGBC. Teams then transferred business comments onto the feedback form. These meetings supplied great feedback that helped TGBC staff make revisions to the scorecard before its launch day on April 23.

Business Meetings

The eight participating pilot businesses are briefly described below. A complete report on the comments and suggestions of each business about the draft Triangle Green Business Challenge scorecard was forwarded on to the Steering Committee and staff of the TGBC. The comments were generally supportive of the goals of the initiative, while providing constructive comments and probing questions about how the scorecard actually performs when being used by businesses of different types, sizes, and level of familiarity with environmentally preferred practices. Some of the pilot participations were interested in improving their environmental performance but relatively new to the process, while others have substantial knowledge and significant achievements already to their credit. For example, Piedmont Biofuels is a regional and national leader on environmentally preferable practices, and provided as an expert practitioner and served a useful check on the framing of the Challenge. The highlights of the feedback provided by these businesses are reported in the pages below, as well as in a Powerpoint presentation available at: http://www.ie.unc.edu/for_students/courses/capstone.cfm.

Chapel Hill Printing and Graphics March 13, 2012



Chapel Hill Printing & Graphics

Student Liaisons: Hayden Agnew-Wieland and Ashley Wilkes

Contact: Caze Wright, Chapel Hill Printing and Graphics Marketing Director

Open Eye Café March 16, 2012



The Open Eye Café

Student Liaisons: Hayden Agnew-Wieland and Harry Masters

Contact: Scott Conary, manager of Open Eye Café

Great Outdoor Provision Company March 15, 2012



Students Liaisons: Lucas Fries and John Hamilton

Contact: Chad Pickens, manager for the Great Outdoor Provision Company, Chapel Hill NC

Durham Tire & Auto Center March 14, 2012



Student Liaison: Ashley Wilkes

Contact: Ed Summey, sales manager at Durham Tire & Auto Center

Top of the Hill Restaurant and Brewery March 20, 2012



Student Liaison: Kate Murphy

Contact: Top of the Hill Restaurant and Brewery General Manager Guy Murphy

Piedmont Biofuels March 19, 2012



Student Liaison: Ernest Sumner

Contact: Rachel Burton, the Management Director of Piedmont Biofuels

Performance Auto Mall April 3, 2012



Student Liaison: Will Roberts

Contact: Jill McCollough, head of marketing at Performance Auto Mall

Mediterranean Deli April 15, 2012



Student Liaisons: John Hamilton and Ashley Wilkes

Contact: Mediterranean Deli General Manager Jamil Kadoura

Collectively, the comments of these pilot businesses provided detailed and useful feedback, which the capstone team recorded and analyzed, and sent on to the TGBC Steering Committee and staff.

The major themes to emerge from these eight sit-down interviews and walk-through discussions of the scorecard are summarized below:

Theme: More accessible format

- Favored website format over spreadsheet
- Allow businesses to write-in and share their ideas

Take-away message: *Format should be drastically simplified*

Theme: User-friendly scorecard for the layperson

- Provide definitions for key terms
- Split compound questions
- Make resource links more visible

Take-away message: *When targeting businesses who have not previously pursued green practices, clarity is essential*

Theme: Tangible benefits for businesses

- Recognition via official website
- Provide access to free energy audits
- Provide discounts for energy-saving appliances etc.
- Articulate savings

Take-away message: *Companies need motivation to invest the required time*

Theme: Think like a business

- Energy and waste logs should reflect business practices
- Consider safety etc. when assessing energy use
- “The bottom line”
- Some businesses will spend money to save money

Take-away message: *Articulating ROI will encourage change*

Theme: Customize scorecard by industry

- Current questions seemed more oriented towards offices
- Categories should be customized to different industries

- Restaurants and retail
- Could shape future competition

Take-away message: *Industry specific categories would encourage participation*

Theme: Pilot businesses are enthusiastic about the Challenge

- Audit categories were specific and could help them visualize savings throughout the year
- Resource links provided pertinent instruction
- Challenge makes sustainability accessible to businesses

Feedback Form

The feedback template document was created to organize and compile feedback. Given the nature of this consulting project, several groups, including the Steering Committee, Capstone team and pilot participants, were preparing—at the time of this project—to review the scorecard. The template was designed to record questions or comments about any part of the scorecard in an organized fashion. Each row has a question code designating the section and number of the scorecard along with space to define what the comment is regarding (action item, resources or other). Each suggestion has room to record the consultant’s and business’ names. The goal of this template and its design is to record all data in a universal format in order to effectively organize data and to make insightful analysis. The team compiled both student and pilot participant comments on this feedback form. The combined feedback influenced the final scorecard product for the Green Business Challenge launch in April.

Visiting the eight champion pilot participants allowed the team to gather feedback from a variety of business perspectives. Some businesses believed that questions were too vague or needed additional explanation, while others needed help defining terms and expanding on certain questions. Some questions were listed as “not applicable” for some businesses. For example, green transportation was not an issue for Great Outdoor Provisions, but the scorecard was made in such a way that the store would be unable to get credit for their current green practices. Restaurants and retail suggested the creation of separate and more customized scorecards for their business models because the questions tended to apply more to office buildings. This suggestion was a theme in the feedback, perhaps leading TGBC staff toward a more customized scorecard for business areas in the coming years, in order to judge progress on an even field. Another theme in the feedback was the difficulty of accurately measuring the trash and recycling stream for the waste log. Because of such feedback, The TGBC opted to alter the way the waste stream was recorded on the scorecard. Businesses also enjoyed seeing the projected savings from adopting a green business practice to justify the change. This feedback from each business was compiled and sent to TBGC staff to update the scorecard accordingly.

TGBC Steering Committee Meeting: Student Team Presentation

On March 19, the team presented their progress and findings to TGBC. The TGBC Steering Committee members were very interested in the pilot participant feedback the team had gathered thus far and asked several questions concerning the pilot participants' suggestions. After the team presented, Mr. Bouma outlined future plans and the group discussed potential changes to the Challenge.

The group found that many of the student team's findings were similar to those discussed in TJCOG's sub-committee meetings. Thus, progress was made in way of finalizing the scorecard. Firstly, the group decided to switch the scorecard format from an Excel document to an active PDF form. The group also discussed the merits of a point verses check system, but no concrete decision was made. At the time of this project, the scorecard was taking shape in PDF formatting under a check system, with very accessible resources and text entry boxes. The capstone team was found the scorecard to be developing nicely, and believe they contributed to generating a useful and usable final form. The final scorecard, presented at the launch held on April 23, 2012 at RTP Headquarters, is visually appealing and easy for participating businesses to use. Appendix D shows an excerpt from the scorecard, which retained the originally planned sections on waste, water, energy, transportation, healthy work environment, and company engagement, plus an "other" category.

In addition, TGBC decided to put less emphasis on the water and energy logs, but still wanted to require the waste log. Energy logs would serve as a learning exercise for participants, but no points would be awarded. Buying local and including a composting option were other suggested edits to the scorecard.

On the champion pilot participant end, TGBC encouraged the team to seek out several larger businesses in Raleigh, and promised to put the team in contact with a few companies. TGBC provided contact with several Raleigh businesses. The team followed up with each, but the short timeline and communication delays prevented these businesses from participating in the pilot phase. However, the team hopes they will join the actual Challenge.

The TGBC staff explained their plan to break awards into several categories according to industry sector: hospitality, professional, light industry and labs, retail and office. They believed this would create more equitable comparisons among participants, by acknowledging the different conditions within which various sectors operate (e.g., high water use and organic waste generation in restaurants; technical limitations on laboratory operations). Additionally, TGBC staff presented their plan for different award levels. A group member proposed an "Innovation Award" that could be awarded to participants who adopt sustainable practices or programs not explicitly mentioned in the scorecard.

With the launch day only one month away, there was general consensus at this meeting that an official website was needed soon. In addition, the TGBC marketing department was creating promotional materials to support sponsorship and recruitment efforts. The student team offered to help with social media efforts as well.

Social Media

In the weeks leading up to the Earth Day launch event, the team volunteered to help the Green Business Challenge Media Coordinator, Anna Johnson, promote the Challenge through social media. The TGBC staff launched a website for the Challenge (<http://trianglegreenbusiness.com/>) and created Facebook and Twitter pages. The team recommended a social media management tool, HootSuite, to help TGBC staff organize these various outlets. HootSuite allows users to schedule updates in advance, making it easier for organizations to keep their social media active.

Social media can be an effective tool for organizations to communicate with their target markets in an easy and informal manner. It is also an effective way to spread the word about events and community activities. The TGBC staff hoped to use social media to garner interest in the Challenge, recruit more businesses, and promote their Earth Day launch event. To this effect, the team drafted a set of sample, template tweets. The TGBC staff can continue to use social media throughout the Green Business Challenge to communicate with participants, advertise about “lunch-and-learns” and Challenge-related events, and connect with communities in the Triangle.

Audit Training with Waste Reduction Partners

On February 24, members of the Green Business Challenge Capstone Team had the opportunity to learn about energy audits and energy saving techniques from Conrad Meyer, a technical manager from Waste Reduction Partners. During the presentation, Mr. Meyer provided the team with an in-depth look at energy reduction techniques and identified the top areas to save energy: utility accounting, heating/cooling and controls, building envelope improvements, lighting, hot water and water conservation and equipment machines and processes. The training session was intended to provide background information so that team members felt more comfortable and knowledgeable when approaching businesses.

Utility Accounting

The first step in reducing energy use is to find out how much energy a company/client is using. Thanks to new automated services offered by utilities, tracking energy consumption has become quick and easy. Despite these services, many companies still do not pay attention to their energy use—the bigger the client, the harder the tracking. By tracking energy use, companies can discover the easiest areas in which to cut back. Furthermore, examining a company's electric rate schedule is a great way to increase savings and does not require capital investment. By contacting the local utility, a company may determine their rate schedule and make operational changes to provide quick savings. By reducing the amount of electricity used during peak hours, companies can save thousands of dollars a year (i.e., heat water, run heavy machinery or run tests incrementally at night because evening rates are cheaper). Clients should also check to make sure that their meters match the charge on the bill and that the demand charges match the actual demand, to ensure the utility company did not make mistakes.

The team planned to perform audits with one or more champions. Ultimately, logistics prevented this, so the team conducted a mock audit at the Institute for the Environment's office on the sixth floor of the Bank of America building. Had the team done the live audits, they would have obtained an annual energy benchmark from the client to identify potential areas of savings.

Before the Capstone team members perform on-site consulting with a client, they should obtain an annual energy benchmark from the client. If this is not available, they should explain how to create such a document. This is important so that team members may identify potential areas of savings beforehand.

Heating, Cooling and Controls

An HVAC system is often the largest user of electricity for a company. Improving the efficiency of an HVAC system and/or altering the way a client uses that system can provide enormous savings. One of the best investments a client can make is installing an Energy Management System or a Building Automation System that will automatically control temperature setbacks during unoccupied times. Clients can manually adjust their thermostats, but if a preset system is desired, the aforementioned ones are fairly cheap and have quick payback

times. By raising the temperature in summer and lowering it in winter, companies can obtain huge savings—a one-degree change can save 3% of energy costs in small buildings. Clients should check the location of their thermostats and make sure these locations are not being artificially impacted. For example, a thermostat by a coffee maker or toaster is going to provide higher than normal temperature readings due to the nature of nearby appliances.

It is important to remind clients that maintenance saves money. Air filters should be replaced quarterly, heat transfer coils should be inspected and cleaned regularly, ducts should be inspected for leaks or missing insulation once a year (use foil duct tape to prevent damage to ducts), and boilers should be inspected annually. Air filters and boilers can each raise energy costs by 4% if they are not kept in optimal condition. Furthermore, clients should adjust furniture so that it does not obstruct the flow of radiators, air diffusers or intakes.

Building Envelope Improvements

Building envelopes are one of the biggest culprits for wasted energy. Leaks, open windows/doors and poor insulation allow HVAC controlled air to leak out into the surrounding environment and uncontrolled air to leak into the building. Insulation is measured in R-values: the higher the R-value, the better but more expensive the insulation. Nevertheless, improving insulation always results in savings. A company that goes from no insulation to R19 has a 1.5-year return on investment, and a company that goes from no insulation to R38 has a 1.9-year return on investment. Weather stripping is a cheap and easy way to improve one's building envelope that can provide 1-2 cents/sq ft in savings.

Lighting

After an HVAC system, lighting often is the next biggest user of electricity for the average company. There are many ways to make lighting more efficient. The cheapest way to do so is to adjust personal habits—get in the habit of turning off the lights when you leave a room. Putting up signs around the office to remind people to turn off the lights is cheap, easy and effective. If a client wants to take the responsibility out of their employees' hands, they can install occupancy sensors that automatically turn off lights when nobody is in a room. "Delamping" (removing some bulbs) is another way to reduce energy savings. The general rule of thumb for a healthy environment is to have 2 4-ft lamps per 64 square feet. Generally, offices exceed this threshold significantly, so by removing some fluorescent lamps from a fixture, a company can save money and still provide a healthy environment for their employees. Clients can disconnect the ballast in the fixture for additional savings.

Clients also can replace existing lamps and ballasts with more efficient models. Older facilities are likely to have 1.5-inch fluorescent lamps (T12) with magnetic ballasts. Replacing these lamps with 1-inch, high-performance lamps (T8) and electronic ballasts can improve efficiency by 15-35%. Upgrading incandescent light bulbs to compact fluorescent (CFL) bulbs or LED bulbs can drastically improve savings. The life-cycle cost of burning incandescent bulbs for 25,000 hours is \$95.00, while for CFLs it drops to \$26.87, and LEDs are slightly lower at

\$25.98. LEDs are very expensive initially (\$10/bulb), so Mr. Meyer recommended that clients purchase CFLs (\$2.50/bulb). Replacing incandescent Exit signs with new LED exits signs might seem trivial, but they are easy to install and provide \$18-19 each in savings per year.

Clients should evaluate their outdoor lighting and determine whether it is actually necessary. If outdoor lighting improves the safety of a location, then it should be kept, but if its sole purpose is to provide aesthetic pleasure, clients should consider removing it or reducing its operation hours. Timers and photocells are good ways to automatically adjust the burn time of outdoor lights. It will also reduce maintenance time drastically as LED bulbs last over a year.

Hot Water and Water Conservation

Changes in hot water settings and controls and upgrading fixtures to low-flow faucets are two easy ways to reduce energy use. Clients should reduce hot water temperatures to 110 degrees F, if allowable (restaurants must have higher temperatures by order of the FDA). Clients should also put a timer on recirculating pumps and turn off the heat at hand-washing stations (not allowable at restaurants). In practice, most people do not wait for the water to warm to wash their hands anyways, so it is a luxury that will likely go unnoticed and unmissed. Installing low-flow showerheads, faucets and sprayers can save between \$500-1800/year, depending on the amount of use.

Clients should closely examine their water discharge. Water/sewer bills are typically based on water use, with sewer charges indexed to water, charging three times as much for water going down the drain into the sewer system. By determining where water is discharged (which often requires a sub-meter), companies can avoid paying unnecessary sewer charges on water they don't discharge (i.e., water used in cooling towers, irrigation systems, or production of products).

Equipment, Machines and Processes

Clients should look to install Energy Star office equipment whenever possible. Furthermore, clients should use the sleep mode on office equipment and turn it off overnight.

Restaurants can realize extensive savings in the kitchen by using low-flow pre-rinse sprayers, keeping stoves and griddles underneath the ventilation, avoiding unnecessary pre-heating and regularly cleaning and inspecting equipment. Refrigerators are massive users of electricity and should be used as efficiently as possible to avoid high costs. Temperature settings should be set at proper zones, refrigerators should be loaded properly to avoid wasting space, the cooling coils should be cleaned regularly and the door seals should be checked and replaced frequently.

Vending machines should be de-lamped and air compressors should be turned off when not in use and regularly checked for leaks. Companies that use motors should have a Motor Management Program and should consider buying a premium energy-efficient electric motor.

Basics of Conducting and Energy Audit

The following list may be a useful reference for conducting an energy audit:

- Scope
- Energy/utility bill review—before site visit
- Have right people on team
- Data collection
- Get questions answered
- Recommendations
- Financial analysis

The energy audit training was very helpful. Members of the Capstone team were exposed to a variety of new techniques/practices that benefited them in their interaction with participating businesses.

Mock Energy Audit—Institute for the Environment

On April 17, the team visited the UNC Institute for the Environment offices on Franklin Street to simulate an energy audit. Though not directly related to a final product for TGBC, it was an opportunity for team members to become more accustomed with one of the processes that businesses participating in the Green Business Challenge would conduct. Many team members will undoubtedly use this skill in a future job. Thus, the training was a useful, relevant exercise.

Capstone graduate assistant Maura Farver, who conducted the training, shared much of her experience from the past summer, which she spent conducting energy audits as a GreenPlus Fellow. The team examined various ways in which the Institute for the Environment space, which occupies most of the 6th floor of the Bank of America Building in downtown Chapel Hill, consumes electricity. First, the team dispersed throughout the building to count the number of light bulbs, computers, and various other appliances that consume electricity. From these observations, the team estimated the building's current energy consumption. One interesting find: after talking with an Institute employee, the team learned that some lights are kept on 24 hours a day. Using the number of bulbs and their corresponding wattage, the team calculated that annually just these lights use an amount of energy comparable to what the average American house consumes in its entirety.

At the next meeting, the team used the collected data to calculate the total energy consumption resulting from the light fixtures alone. Then, the team computed the savings, both monetarily and in energy terms, that would occur if the building switched from 34W T8 bulbs to 28W T8 bulbs. The building would reduce its energy consumption from 45,385.92 kWh to 37,376.64 kWh, equating to an 8,009.28 kWh reduction. Since energy for these lights costs about \$0.12 per kWh, changing the bulbs would result in a \$961.11 savings annually. It would cost \$1,110 to replace all the 34W T8 bulbs with 28W T8 bulbs. Considering the initial cost and the resulting savings, the investment would pay for itself in 1.15 years. With so short a pay-back period, a management decision to change out the bulbs seems straightforward.

Process

Capstone Team

The Green Business Challenge Capstone team was very large. Several challenges accompanied such a large team size. For example, coordinating tasks proved difficult as did finding meeting times that accommodated every member's schedule. In order to keep everyone involved and updated on the project, the team created several Google Docs that contained pertinent business information, feedback and reports. This strategy proved very successful and allowed simultaneous contributions and updates from team members. However, delegation of responsibilities still was an issue at times.

Beyond these challenges, the team's many members brought a myriad of skills and useful perspectives to their tasks. Because the team consisted of people with diverse backgrounds, the team was able to create varied and comprehensive deliverables that the team hopes will prove useful to the client.

TGBC staff and Steering Committee

The capstone team recognizes that the Triangle Green Business Challenge is in its first year, and has been a learning experience for all parties involved. It is particularly challenging to transition from the planning stages to actual implementation of any project. The Challenge ran into some difficulties involving revisions, communication and ultimate goals. Nevertheless, any problems experienced in the first trial provided opportunities for future improvement. The TGBC Steering Committee was very receptive to the team's ideas and feedback and seemed pleased with their findings and presentation.

Working with the pilot businesses, the team was able to generate helpful feedback that guided the scorecard revision process. The TGBC team adopted many of the pilot businesses' recommendations and addressed their concerns when feasible. The diverse group of businesses involved provided comprehensive, relevant feedback. All of the pilot businesses were enthusiastic and eager to sit down with the Capstone team. It was refreshing to see that such a variety of businesses were interested in at least hearing about the Challenge. At last contact with TGBC, at least one pilot business, Chapel Hill Printing & Graphics, had signed up for the full Challenge. Their participation is encouraging and shows the progress made since the Challenge's initial inception.

In summary, despite initial difficulties, it must be noted that the Challenge was the first attempt in the Triangle area to hold a green business challenge. The Triangle is a broad region consisting of several local governments. Thus, communication and interaction between all parties involved is more difficult than in individual municipalities that have held green business challenges in the past. All parties worked in good faith to address problems and propose solutions. Ultimately, this year's Challenge was a learning experience both for the Capstone team and TGBC, and those experiences will undoubtedly help refine the Triangle Green Business Challenge in coming years.

Appendices

A: Workplan

B: Initial scorecard format

C: General comments on first draft scorecard

D: Excerpt from final scorecard

In addition to Appendices A-D, the following items were submitted by the capstone team, as Excel worksheets or workbooks, to the capstone coordinator: Elizabeth Shay, Institute for the Environment, UNC-Chapel Hill, 919-966-0581, eshay@unc.edu

- Scorecard with Capstone Feedback—detailed comments and suggestions from the capstone team on the first draft scorecard
- List of Potential Businesses—contacted by the capstone team members to recruit pilot participants

Appendix A: Workplan

Recruit Champion Businesses	<i>List of Potential Businesses for Pilot Program</i>	Contact Previous Employers/ Other Contacts	2 days	<i>January 31</i>	<i>February 1</i>	Complete
		List Potential Interested Local Businesses	3 days	<i>January 31</i>	<i>February 1</i>	Complete
		Cold Call and Recruit	14 days	<i>February 1</i>	<i>February 15</i>	Complete
		Submit to Client*			<i>March 1</i>	
Develop Universal Feedback Template	<i>Finalized Feedback Template for Champion Businesses to Fill-out</i>	Create Draft Template for Questions & Comments	10 days	<i>January 31</i>	<i>February 8</i>	Complete
		Capstone Consultants Use Template to Evaluate Scorecard	5 days	<i>February 8</i>	<i>February 13</i>	Complete
		Revise Feedback Template	5 days	<i>February 14</i>	<i>February 1</i>	Complete
		Create Final Feedback Template Product *			<i>February 20</i>	Complete
Gather Champion Businesses' Feedback	<i>Gather Feedback from Businesses</i>	Schedule 90-Minute Visits	7 days	<i>February 27</i>	<i>March 2</i>	In progress
		Visit Businesses	Ongoing	<i>February 20</i>	<i>March 30</i>	
		Assist in Filling-out of Feedback Template	Ongoing			
	<i>Compilation of Feedback from Champion Businesses</i>	Gather Templates and Organize Results	5 days		<i>March 6</i>	
		Initial Findings Presentation to TJ COGs*			<i>March 19</i>	
Present Key Findings to Client	<i>Results Presentation to Triangle J Council of Governments</i>	Final Data Results Summary*	7 days	<i>March 7</i>	<i>March 11</i>	
		Create Power-point Presentation of Key Findings*	7 days	<i>March 12</i>	<i>March 18</i>	
		Present Findings*			<i>TBD</i>	

Appendix B: Initial scorecard format, on which capstone team provided feedback

GREEN BUSINESS CHALLENGE RESULTS SUMMARY					100	0	How did you achieve this? Please provide a screenshot of the action taken in response to the feedback.
<i>Part II. Scorecard</i>							
Categories	Action Items		Resources	Response Click in each cell below for a response menu.	Total Points Available	Points Achieved	
Company Engagement					13	0	
	O1	Does your company have a representative, committee, or "green team" that coordinates environmental and sustainability initiatives, engages staff and raises awareness and enthusiasm for the 'greening' of your business?	Resources	Click for drop-down menu.	2		
	O2	Have you hosted a meeting or educational activity to inform staff and company leadership about the Green Business Challenge program, and do you conduct regular meetings or updates to inform staff and leadership about green business practices, company goals and successes?	Resources	Click for drop-down menu.	2		
	O3	Is it a part of your mission or company guidelines to incorporate environmental and social sustainability indicators along with economic indicators to measure your success? Do you market your business as a green or sustainable company or product/service provider?	Resources	Click for drop-down menu.	3		
	O4	Do you donate money or make your facilities available (either permanently or on occasion) for community activities, services or events that promote sustainable community development?	Resources	Click for drop-down menu.	1		
	O5	Does your company encourage community service or volunteerism for sustainability and community stewardship? (This could be through internal company activities, participation in external community events or an employee incentivization program.)	Resources	Click for drop-down menu.	2		
	O6	Have you referred another business to participate in the 2012 Green Business Challenge? Referred companies must register and submit a baseline scorecard by the end of the Challenge in order for you to receive referral points. (1pt for each referral, up to 3pts possible)	Resources	Click for drop-down menu.	3		
	O7	Do you provide employee training on green business practices? Training categories: Energy, Waste, Transportation, Water, Healthy Work Environment (1pt. Each) Two categories (2 pts) Three or more categories (3 pts).	Resources	Click for drop-down menu.	3		

Appendix C: General comments on first draft scorecard—*before use with pilot participants*

- The questions on the help section and scorecard section should be the same; sometimes they vary
- Questions should all be similarly formatted
- Ideal question would be clearly written and include clarifying explanations and point breakdowns where applicable. Give as much information in each question as possible. User should not have to click on the help link for *every* question
- Ensure all help links are working and appropriate; eliminate extraneous links.
- When help link is necessary, mention in question to make sure it gets used
- Concerns about appropriateness of point values assigned to each question
- Arrange questions by point values so businesses have opportunity to try and get as many points as possible. “Top ten things you can do to get the most points”

Appendix D: Excerpt from final scorecard, showing formatting and design used with participating businesses

WASTE

W-4  Do you purchase and regularly use at least 30% post-consumer recycled copier/printer paper ?
 

W-5  Do you purchase and regularly use at least 30% post-consumer recycled paper products besides printer paper?
 