



Climate Action Plan

Catawba College

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Introduction

Catawba College has had a long-standing interest in a large range of environmental issues. Two individuals with long-term and deep interest in environmental issues are Mr. Fred Stanback, member of the Catawba College Board of Trustees, and Dr. Michael Baranski, Professor of Biology. Both have been advocating for environmental causes for at least a quarter century. Catawba became more formally involved with environmental activity with the hiring of Dr. John Wear in 1993 to develop an environmental science program.

In 1996, the college established its Center for the Environment and named Dr. Wear its director. The Center's mission is "to educate the students and the general public about environmental stewardship and sustainability and to involve our faculty, staff, students and the Center's community partners in programs and activities that promote sustainable solutions to the environmental problems we face." It has acted as a catalyst for action at the local level by facilitating such things as the creation of the Salisbury Greenway System and by gathering various individuals and organizations together to address a special need. A good example is the Center's effort to foster a satellite image study of the Piedmont region of North Carolina, which allows communities to determine the contribution of forested areas in sequestering carbon.

In 2001 the Center for the Environment building was completed, and with its construction Catawba College moved into an even deeper involvement with environmental issues. This new building, which was one of the Southeast's first green academic buildings, was planned and construction was initiated prior to the LEED's program. Bill Holman, then secretary of the N.C. Department of Environment and Natural Resources, called it "the wave of the future in resource and energy efficiency."

Catawba's academic program has played a seminal role in engaging students in environmental issues. The first course that brought students into a campus decision-making role on sustainability issues was the Sustainable Design seminar, offered in the late 1990s. These seminars allowed students to research and make recommendations to professionals charged with planning the construction of the building that houses the Center for the Environment. That seminar spawned an even greater desire on the part of the students to become involved in sustainability efforts. The college then offered Campus Greening seminars, which ultimately resulted in the students' presenting their sustainability recommendations, first to the administration, then to the college community and finally to the trustees.

The recommendations set the stage for the formation of the Office of Waste Reduction and Recycling, which was established in 2007 to collect and track data used that reveals the college's carbon footprint and to institute and maintain energy-saving practices.

With this background, the college was well positioned to become a charter member of the American College & University Presidents' Climate Commitment (ACUPCC). Therefore, in May 2007 the Board of Trustees of Catawba College, with the strong support of President Robert Knott, agreed that Catawba College should become a signatory to the ACUPCC.

Since the signing of the ACUPCC, there has been a change in presidents at Catawba College, but no decrease in the commitment to the program. Dr. W. Craig Turner, the new president, has been very supportive of the commitment and has helped initiate new environmental programs, which will be described later. He has been quite clear about his environmental vision for the college: The goal is to erase the college's carbon footprint and become carbon neutral. "We're going to do our best here at Catawba to make it a better world for the grandchildren that are coming along now," he says. "We owe it to them."

In order to move the commitment forward at Catawba College, the Presidential Climate Commitment (PCC) committee was formed. In addition, the Office of Waste Reduction and Recycling was established in the summer of 2007, with Mr. David Najarian as the coordinator. In January of 2008, this newly formed office at Catawba College hosted a Collegiate Recycling Meeting which marked a gathering of like-minded peer institutions.

To move forward, this Climate Action Plan is being prepared to point the way toward a sustainable future at Catawba. This effort is campus-wide as indicated by the members of the PCC committee who are involved in presenting this report:

Mr. David Najarian, Office of Waste Reduction and Recycling Coordinator and Chair of the PCC Committee

Mr. Greg Alcorn, member of the Catawba College Board of Trustees

Dr. Jim Beard, Professor of Chemistry

Ms. Tonia Black-Gold, Chief Communications Officer

Dr. Sue Calcagni, Associate Professor of Biology and Environmental Science

Ms. Lisa Howard-Cardwell, Office Manager and Assistant Coordinator for the Office of Waste Reduction and Recycling

Ms. Rebecca Chinnis, student

Mr. Henry Haywood, Director of Facilities (no longer with the institution)

Mr. Richard Pickel, Network/PC Engineer

Dr. Joe Poston, Associate Professor and Chair of Biology

Mr. Dan Robertson, Outreach Specialist, Center for the Environment

Mr. Devin Rodgers, student

Dr. John Wear, Associate Professor of Biology and Environmental Science and Director of the Center for the Environment

Mr. Chuck Williams, Vice President of Business and Finance

It is the recommendation of the members of the Presidential Climate Commitment committee that the college set the date of 2030 as its goal year for achieving climate neutrality. With that in mind, we will utilize the strategies outlined in this plan and new ones that our successors will develop and implement to achieve this goal. On an annual basis, we will strive to achieve a five percent reduction in greenhouse gas emissions which will help us reach our overall goal in a manageable and affordable fashion.

Campus Emissions

The college has instituted a method for measuring its greenhouse gas emissions: the *Clean Air-Cool Planet Campus Carbon Calculator*, version 6. Although the calculator tracks several compounds independently (CO₂, CH₄, NO₂, etc.), the standard is to convert all compounds into CO₂ equivalents (eCO₂). The report on the combined eCO₂ produced through the activities and operations of Catawba College does not include custom fuel data on purchased electricity. We will make every effort to include those data in a future cycle.

Institutional Data

The data available for our calculations is nearly complete for the past few years. Prior to that, we have institutional data spanning several years for some items (operating budget, size of student body) but not for other items (particularly transportation habits of the campus community). For this reason, we must limit our conclusions and planning to data from the most recent complete year for which data are available, 2007-2008. College officials are now gathering more complete data regularly, so they will be in a position to more accurately calculate our trends in emissions and make mitigation plans accordingly.

Table 1 provides information on the ranges of data available for making calculations. To summarize, data is available on Scope 1 and Scope 2 emissions from 1999-2008 (with the exception of direct transportation – 2007 to 2008 only). For Scope 3 emissions data is available for 2007-2008. The calculator uses institutional data up to 2007, and uses projection data for 2008 and beyond. Consequently, we will limit our analyses of emissions to the time span 1999-2007 for Scope 1-2, and 2007 for Scope 3.

Table 1. Summary of data available for calculations of greenhouse gas emissions for Catawba College.

Datum	Span of years
<i>Institutional data</i>	
Operational budget	1991-2007
Energy budget	1999-2007
Physical size	1990-2007
<i>Population data</i>	
Students	1990-2009
Faculty	1990-2008
Staff	2002-2007
<i>Emissions data</i>	
On-campus Cogeneration (closed in 1998)	1990-1998
Natural Gas usage	2003-2007
Gasoline & Diesel fuel usage	2006-2007
Electricity purchased	1998-2008
Percentage of students commuting	2002-2009
Driving habits of campus community	2007-2008

Results

With the exception of 2004, every year from 1999 to 2007 demonstrated an increase in the total amount of electricity purchased (Fig. 1). The primary means of producing electricity in our region is through coal-fired power plants. Consequently, the electricity we use on campus is responsible for significant emissions of greenhouse gasses.

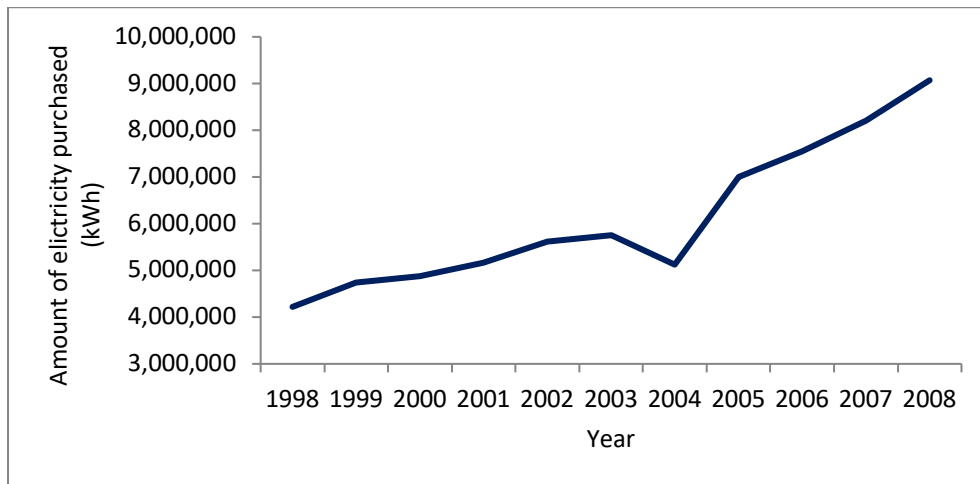


Figure 1. Total amount of electricity purchased has more than doubled between 1998 and 2008.

As expected, the usage of electricity increases with the size of the campus community (Fig. 2). The graph shows that the college made gains in energy efficiency early on; however, the college has not been able to maintain that downward trend. (Fig. 3).

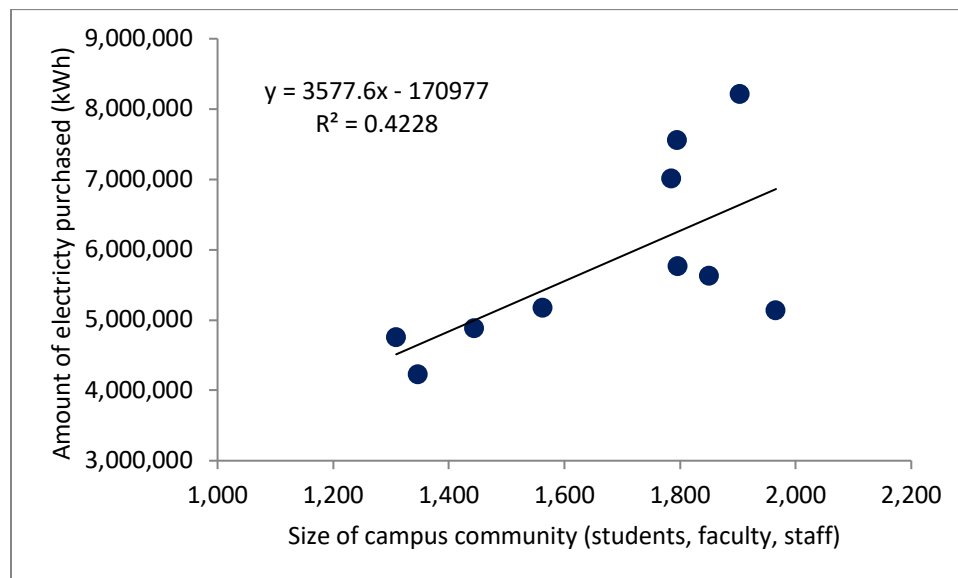


Figure 2. Relationship between size of campus community and the amount of electricity purchased, between 1999 and 2007.

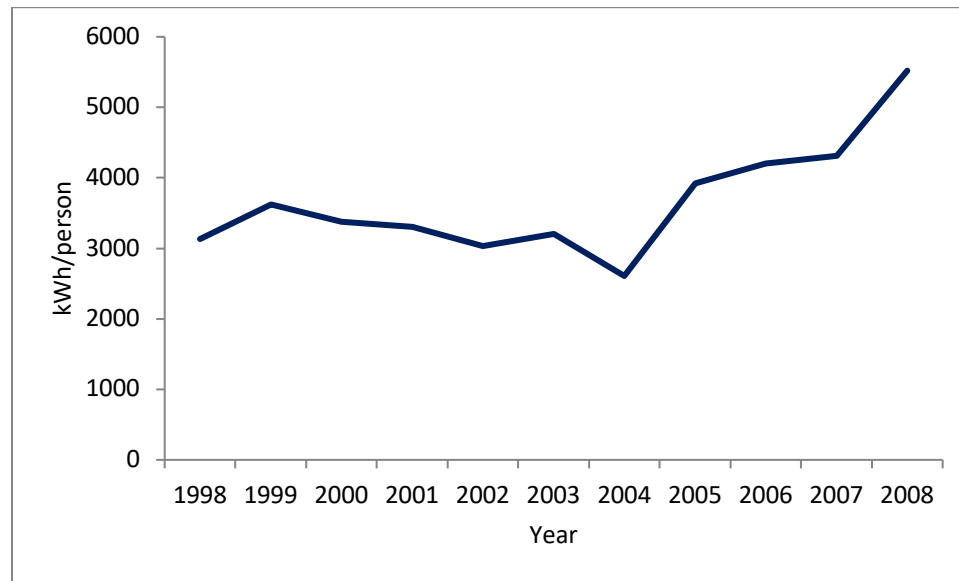


Figure 3. Efficiency of electricity usage improved slightly between 1999 and 2004, but then deteriorated from 2004 to 2008.

Table 2 provides a summary of net greenhouse gas emissions attributed to the operations of Catawba College. These values are similar to those for other colleges in North Carolina.

Table 2. Net emissions of CO₂ equivalents by the Catawba College community for the fiscal year 2007-2008.

Source	Net eCO ₂ (MT)	eCO ₂ /student (MT)	eCO ₂ /ft ² (kg)
Scope 1 & 2	7794		
Scope 1 & 2 & 3	9893	7.8	4.2

Discussion

As with many organizations, Catawba College has seen an increase in the release of greenhouse gasses as a result of campus operations. This increase represents growth in the campus community as well as additional energy use. For example, in the past few years, the college has added lighting for the football stadium and has added air conditioning to Omwake-Dearborn Chapel. We have also shifted from natural gas-powered appliances in the cafeteria to appliances that utilize electricity. So, some of the increase represents a shift from one energy source to another, while some of the increase represents true growth in emissions of greenhouse gasses. These data will serve as a baseline against which to compare future years' data. They also provide an opportunity to begin plans to reduce our greenhouse gas emissions in future years.

Mitigation Strategies

In support of the climate commitment, a number of changes and initiatives have been undertaken.

- Efforts to change behavior: In 2009, Catawba College launched an environmental stewardship campaign called the Green Pig. President Dr. Craig Turner officially introduced the Green Pig to the campus community at the college's Opening Convocation on August 27th, calling it "a new symbol of our commitment to the environment at Catawba College."
- Waste reduction: With the formation of the Office of Waste Reduction and Recycling in 2007, many specific actions were taken, including the installation of a pressure gauge on the compactor, installation of 20,000 gallon tank on the soccer fields to catch water run-off for reuse, installation of waterless urinals at the Robertson College Community Center, use of recycled bricks in college construction, conversion to green cleaning and the establishment of three municipal bus stops on campus.
- Recycling: The Office of Waste Reduction and Recycling maintains a robust recycling program. It has the ability to recycle glass, aluminum cans, steel cans, mixed paper, cardboard, cell phones, computer equipment, Styrofoam peanuts, materials made out of metal and wooden pallets. It also tracks the amount of waste that the college places in the landfill in order to compare the data in the future and try to find other means of recycling and reducing what is accumulated.
- Energy conservation: The college began energy conservation measures in 2000 when it began installing a geothermal heating and cooling system, one of the most energy-efficient space conditioning systems, for a number of its buildings. Officials continue to employ innovative energy-conservation methods. For example, last year they used water that is re-circulated in the geothermal well system to refill the pool. It not only saved on water; it also saved electricity because water from the geothermal system arrived at 82 degrees.
- Forest canopy and carbon sequestration: Catawba has strategically worked to increase its forested canopy, thereby raising its capacity for carbon sequestration, by placing its 189-acre ecological preserve under a conservation easement. In addition, the Center for the Environment, in conjunction with the Biology Department, has been working with the LandTrust for Central North Carolina on the creation of a wildlife refuge, also under a permanent conservation easement.
- Transportation: 1) Catawba's Center for the Environment initiated a partnership with the City of Salisbury in the mid-1990s to develop a system of cycling and walking trails around the perimeter of the campus that ultimately will connect the college to all surrounding neighborhoods. Phase 1 of what is called the Salisbury Greenway has been completed, and Phase 2 is underway. Part 3 will complete the system and is projected to be finished in the next five years. 2) A number of campus departments have shifted to using electric vehicles. A good example is the Center for the Environment, which uses an electric utility vehicle to manage the ecological preserve. It runs off electricity supplied by the building's photovoltaic panels. 3) The college has worked with the City of Salisbury to initiate bus service from the campus to the downtown area.

- **Local food:** Catawba has initiated a pilot program to promote the use of local foods in its cafeteria and at catered events. The Center for the Environment is working closely with Chartwells, the campus catering company, in order to provide food from local growers at its events. This initiative, it is hoped, will foster a greater emphasis on serving local food in the campus cafeteria.
- **Sustainably designed facilities:** Five newly constructed buildings on campus meet LEED certification standards. The Center for the Environment facility, planned and initiated prior to the advent of the LEED program, is currently undergoing a year-long study that will ultimately result in its certification. The college has made a commitment to construct LEED-certified buildings in the future.

Educational, Research, Community Outreach Efforts

Catawba College addresses the goals of climate neutrality and sustainability through many educational and community outreach initiatives. We offer courses and degree programs that address both climate and sustainability. In addition, the Center for the Environment, which functions in a similar manner to a non-profit organization but is part of the college, focuses on educating both the campus and larger community on environmental issues like climate change and sustainability. Details on these initiatives are provided below.

Education

Student Education

- Students receive education on climate and sustainability issues in a number of ways. An introductory General Education course on Environmental Concepts and Issues reaches a wide student population.
- The first of four environmental degrees – Environmental Science -- was approved in 1993. Subsequently, the college added Environmental Studies, Environmental Education and, most recently, Sustainable Business and Community Development, significantly broadening the diversity of environmental interest among students.
- Catawba was also one of the first colleges in North Carolina to create a set of courses that provided partial fulfillment of the requirements for state certification in Environmental Education through the N.C. Department of Environment and Natural Resources.

Student Participation

- The traditional coursework is amplified by opportunities for students to impact environmental stewardship on campus through organizations. The first environmental club, NatureSafe, focused on recycling and other environmentally friendly practices. The current club ECO (Environment Catawba Outreach) draws students from many different academic areas and encourages all students, faculty and staff to be more aware of their resource use and how that

use contributes to problems like climate change. A newly formed GEO team involves students directly in Center for the Environment initiatives which address environmental challenges. These select students will develop a series of educational programs for campus and will examine ways to engage students as participants in the educational programs of the Center.

Community Outreach

- One of the Center for the Environment's primary goals is to educate the public about sustainability issues and catalyze action to address the environmental challenges the region faces. It offers workshops and lectures – many by nationally recognized thought leaders – that are open to both the college community and the general public. The reach of these events is amplified by videos, media coverage, multiple websites and other means of disseminating information.
- Since 2003, the Center for the Environment has led a regional effort to reduce the use of fossil fuels. The effort focuses on both the impact of burning fossil fuels on human health and the reduction of carbon emissions. The program works to educate the region while providing educational opportunities for faculty, staff and students at the college. This effort focuses on educating a wide range of public sectors, including business and industry, municipal government, education and agriculture, as well as its own college campus. The program highlights various means by which fossil-fuel use can be lowered, including alternative fuels, renewable energy, conservation and sustainable community design. As part of this initiative, the Center will host multiple speakers and workshops for both the college community and the region. The reach of the Center is expanded by various media sources, including a website dedicated to the effort; a partnership with the local newspaper, the Salisbury Post, which features a microsite associated with its website; videos of various speakers and workshops; news coverage, e-mails and other avenues.
- The Center facilitates numerous experiences for special groups, for example, an annual Envirothon, Girl Scout Environmental Science Day, regional Environmental Days and the Catawba Conservation Camp. These programs focus, in part, on lowering our carbon footprint.
- The Center also offers Sustainable Communities Leadership Workshops for churches and other institutions, like Hood Seminary and the Southern Province of the Moravian Church. The goal of these workshops, and others designed for particular interest groups, is to empower the participants to become change agents in their organizations.
- A large number of groups visit the Center for the Environment facility for programs and tours, giving the Center staff and student interns the opportunity to educate the visitors about environmental issues and creative solutions.
- The Center's ability to convene people around a specific cause to educate constituents and brainstorm solutions has produced valued outcomes. During the 1990s, the Center held the nation's second largest statewide conference devoted to watersheds and rivers; more recently, it hosted one of the Southeast's earliest conferences on the topic of Faith, Spirituality and Environmental Stewardship and examined the role of faith-based groups in mitigating carbon.

Financing

Although there are many strategies in place and underway on Catawba's campus to help the institution achieve its goal of climate neutrality – which was the purpose of Catawba's signing the ACUPCC agreement – achieving total neutrality will come only with additional expenditures.

A few of the current strategies include the creation and the ongoing work of the Office of Waste Reduction and Recycling, the education and outreach of the Center for the Environment, and the Green Pig initiative, an on-campus effort to promote environmental stewardship among students, faculty and staff.

In the near term, the campus will need outside assistance to achieve climate neutrality. The College's Climate Commitment Committee recommends signing a two-year commitment with 3Degrees of San Francisco, Calif., to purchase Renewable Energy Certificates and Verified Emission Reductions. This two-year commitment comes at a cost of \$27,250.56 for Renewable Energy Certificates and \$495 for Verified Emission Reductions for a total of \$27,745.56. If the college were to commit to only a one-year agreement with 3Degrees, it would cost \$10,999 for Renewable Energy Certificates and \$247.50 for Verified Emission Reductions, for a total of only \$11,246.50.

Replacing outdated equipment and/or installing new energy-savings equipment would allow the College to achieve energy savings that would also create costs savings. In particular, replacing the outdated hot water and heating system in the Abernethy Physical Education Center with a system that combines solar energy and natural gas would reduce by more than half (53%) the current cost of energy to provide both functions. The college has a \$124,356.26 quote for this project from Tablerock Technologies of Pickens, S.C. This project would pay for itself in three-to-four years through the savings realized, and the system would be more energy-efficient and move us closer to our institutional goal of climate neutrality. Purchasing this system would create a domino-effect and allow us to reduce the Renewable Energy Certificates we propose purchasing from 3Degrees.

Catawba College, in recent (January 2010) meeting with representatives from Duke Energy, has begun discussions about collaborating with this utility in several ways. One way would be to use assistance from Duke to meter and monitor on campus buildings in order to gauge and ultimately control energy usage. Another, would be for Catawba to take advantage of Duke's Smart Saver Custom incentives which are available for both school new construction and existing building expansion, as well as other college and university projects. During initial meeting, Duke Energy representatives also put college officials in contact with a company that does lighting assessments and which may provide a free lighting assessment for a building on Catawba's campus. The aforementioned ideas were among many discussed and suggested at this very recent collaborative meeting.

The Climate Commitment Committee has several suggestions for helping underwrite the costs of the aforementioned new initiatives. These include contacting our alumni/donor base to support this undertaking. We propose working through the Development Office to create an ongoing Sustainable Climate Neutrality Campaign where donors would target their contributions to the campus' efforts to achieve climate neutrality. Those dollars would go into a restricted account that could offset some of the costs of these and future projects. We recommend that employees have the option to contribute to this fund through payroll deduction, as they have the option currently to contribute to the Chiefs Club or the Blue Masque.

Another idea would be to allow students the option of making small voluntary contributions to a campus Climate Neutrality Fund each semester when they pay their tuition fees. We recommend working through student groups such as ECO or SGA to champion this student initiative rather than issuing an administrative mandate.

Additionally, we recommend that any income received through recycling in the Office of Waste Reduction and Recycling be deposited into a restricted account that would go only to fund projects that would help the college lower its carbon footprint.

This committee, again working in conjunction with the College Development Office, will also begin pursuing available grant opportunities that may assist with funding the aforementioned and similar projects.

Tracking Progress

The college's greenhouse gas tracking and calculations were first placed on the Version 5 GHG report for the first issuance for the year 2008 of the ACUPPC; we are now going to use the newest Version 6. The calculations are typically the same, but the system allows for estimations in several categories.

- Vehicle tracking, which includes the college's travel for business operations in every type of travel, was and continues to be tracked by using the zip codes of employees and commuter students, using a rational calculation of 15 miles per individual for travel. In addition, the system tracks mileage from each college-owned vehicle with the total amount of fuel usage to include regular, diesel and electricity. Air travel is calculated by using the website for Charlotte Douglas airport, which gives distant air miles. Information for local bus travel is calculated by the number of tickets the business office sells to students and the information given by the City of Salisbury Transit System.
- The college added a pressure gauge to its compactor, allowing the college to retrieve information that has led to a reduction in the amount of waste pulls per year, which also lowers the college's emissions. We are able to calculate the amount of waste removed from our campus and placed in the landfill from the compactor, as well as any waste materials removed via temporary containers and/or dump trucks.
- We have been and currently are able to procure the data for electricity (kilowatt usage) from Duke Energy by printed documentation. The usage for 2008 was calculated by steam (MWh) 53%, Nuclear (MWh) 46.6%, Hydro (MWh) 0.1%, other total generation (MWh) 0.3%.

The total amount of water usage data is calculated by documentation from City of Salisbury. In addition, the data for natural gas are collected from Piedmont Natural Gas Company.

- In the future, we hope to have buildings on individual meters so we will be able to track by specific targets. This will allow us to host competitions among the key buildings for lowering energy usage and our carbon footprint.