

Climate Action Plan New College of Florida



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May 2010

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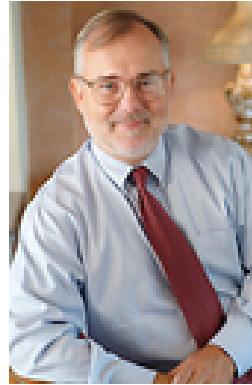
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Executive Summary

This Climate Action Plan reflects a pledge made in January of 2008, when New College President Mike Michalson signed the American College and University President's Climate Commitment (see Appendix 1). New College is one of twelve colleges in Florida to have made this commitment. The commitment mandated, among other actions:

- Creating and implementing a climate action plan (that includes a target date and interim milestones for achieving campus climate neutrality) within 2 years.
- Integrating sustainability into the curriculum and making it part of the educational experience.
- Making the action plan, inventory and periodic progress reports publicly available.



Since the initial pledge was signed, staff, students and administrators have been working not only to comply with the terms of the commitment, but also to more broadly engage the campus in its quest for sustainability. New College has inventoried its contribution of Greenhouse Gases and found that it is quite close to average for baccalaureate colleges (on a square foot basis).

Our most significant challenge and focus is purchased electricity, which accounts for 66.88% of our greenhouse gas contribution. Our purchased electricity's carbon footprint reflects the amount of electricity purchased and the fuel sources relied upon by the utility company in any given year. New College will work on reducing its use and we assume electric utilities will also be working toward reducing greenhouse gas emissions.

Most of our immediate strategies for moving towards climate neutrality focus on reduction of the demand for electricity and combine both structural and behavioral approaches. In our subtropical setting, we have about six times as many cooling days as heating days. Finding the balance between comfort and consumption will be a major challenge.

Finally, all Climate Action Plans need to be viewed as works in progress - they are dynamic documents designed to respond to new insights, changing technologies, price fluctuations, and funding opportunities. We intend to continue to monitor our progress toward achieving carbon neutrality, and to adjust our efforts and strategies as needed.

Introduction



New College's single campus in Sarasota is the only main campus in Florida's State University System located directly on a bay. That provides us with a unique perspective on issues related to climate change and it also makes our campus especially vulnerable to many of the known effects of climate change, such as rising sea level and the potential for more dangerous hurricanes. We may never understand the exact role that anthropogenic production of greenhouse gases plays in climate change. Although the debates will continue, the predicted outcomes remain the same.

Whether climate change is the result of natural fluctuations or cycles or has anthropogenic causes, our campus, state, nation, and planet are threatened. Our economy and culture are based on generally stable climate assumptions and we would be well advised to do whatever possible to moderate, or minimize changes. As the ACUPCC website states: "The scientific consensus is that we need to reduce the global emission of greenhouse gases by at least 80% by mid-century at the latest in order to avert the worst impacts of global warming and to reestablish the more stable climatic conditions that have made human progress over the last 10,000 years possible."

The Florida Oceans and Coastal Council issued a report (revised in 2009) detailing the most important effects of climate change in Florida. Of these effects, several have important implications for New College and its local setting.

Ocean acidification has the potential to harm marine life with calcium carbonate shells or skeletons. Student research projects and fieldwork often consider crabs, mollusks, and invertebrates in the shallow bay waters adjacent to our campus.

Temperature increases will likely increase the frequency of sponge and seagrass die-offs and harmful algal blooms. Mudflats and seagrass beds extend seaward from the campus shoreline. These have long served as areas of ecological study for classes and student research projects. When harmful algal blooms enter Sarasota Bay, the College shoreline is cloaked in windrows of dead fish.

Sea level rise, already measured at 8 inches in the last century, will accelerate. New College's bayfront stormwater culverts were designed for the sea level of the 1920's; their efficiency is reduced by higher sea levels, especially at high tide.

Higher sea levels will likely accelerate shoreline erosion, increase the loss of tidal and intertidal wetlands, and lead to serious coastal flooding. Soft shorelines at New College adjust land ward during strong storms. We expect the existing pockets of mangroves and tidal marsh on campus to also adjust up-slope. In addition, the New College Foundation owns 177 acres of mangrove swamp at the north end of Sarasota Bay, where additional effects of sea level rise will be felt.

Built infrastructure in coastal areas will be exposed to costly damage from storms and flooding. Our campus includes three historic homes built on the shore of Sarasota Bay between 1924 and 1932. All three are vulnerable to hurricane winds and storm surge flooding. These buildings house faculty offices, classrooms, and administrative offices. The college has already made a significant investment in wind resistant windows for these buildings. Soon, the College will begin work to design and replace our failing 1920's seawall with sea level rise and potential storm surges as a design consideration.ⁱ

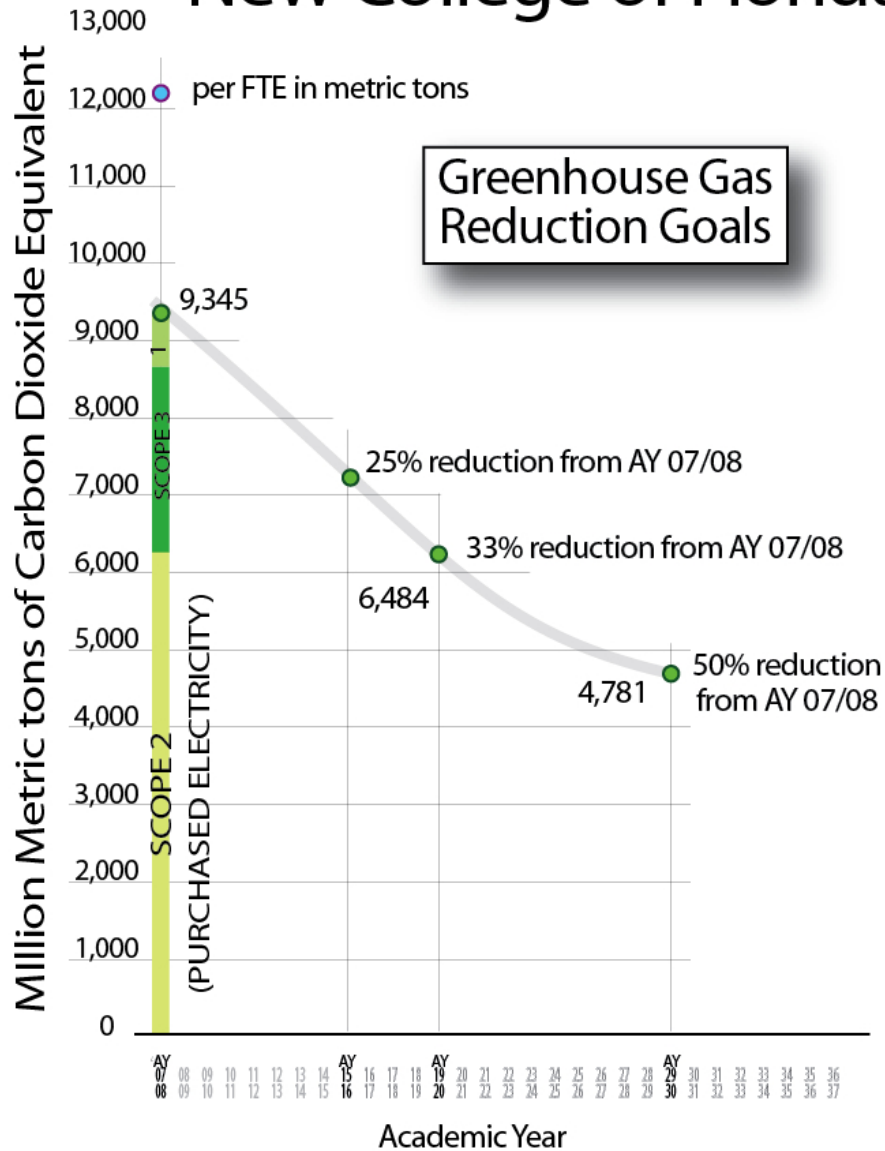
3. Our Climate Commitment

Nine principles guide our efforts to generally improve sustainability and specifically reduce greenhouse gas emissions.

- 1) All groups (students, faculty, administration, staff and Trustees) of the College need to participate in reducing greenhouse gas emissions.
- 2) Both behavioral changes and structural changes will be required.
- 3) Educating the campus community about greenhouse gas emissions is a crucial component of our efforts to reduce greenhouse gas emissions.
- 4) This is a long-term project that will depend on renewed commitments from successive generations of the campus community. The current community cannot predict future costs or technological advances.
- 5) In general, the quest for carbon neutrality must be affordable. The college will support efforts to creatively fund GHG reductions.
- 6) Not all sustainability initiatives produce significant greenhouse gas reductions or produce a reasonable financial return on investment.
- 7) The first major focus will be on reducing the demand for purchased electricity, but we will explore reductions in all sectors.
- 8) While some behavioral and structural changes will be implemented simultaneously on a campus-wide scale, a more likely scenario involves utilizing small-scale trial tests before scaling up to full implementation.
- 9) In addition to mitigating our greenhouse gas emissions, the College must take significant measures to adapt to the local effects of climate change - specifically sea level rise and tropical storm readiness.

Our goal, which can be viewed as both modest and ambitious, produces an average 3% decline in greenhouse gas emissions each year, measured on a per student basis. This can be projected to produce a 25% reduction from current emissions in nine years (AY2019/20), a 33% reduction in twelve years (AY22/23), and a 50% reduction in 20 years (AY29/30). Because we cannot control the fuels used to produce electricity, and because purchased electricity is our biggest generator of greenhouse gases, an alternative goal will be a 3% reduction in the amount of purchased electricity (per student) each year.

New College of Florida



It is not possible to project with any accuracy the date at which the campus may achieve climate neutrality. In addition to the large number of variables and the long time span involved, our inability to bind the future actions of the campus community affects the predicted timeline. As noted below, the key will be continuity of commitment.

4. Education, Research, and Public Engagement

Academic Programs for All Students:

New College was founded in 1960, and by 1970 biology classes began incorporating environmental topics into course syllabi. An Environmental Studies Program was established in 1972 and has persisted for 38 years. During these nearly four decades, teaching and scholarship related to environmental issues and sustainability have become a part of the broader academic curriculum. This integration was fueled by strong student and faculty interest.

Classes form the basic structure of academic work at New College, but the academic program also includes Independent Study Projects (each student must complete three ISP's as a graduation requirement), tutorials which allow students to investigate topics that go beyond normal classes; and a senior thesis or project which is a graduation requirement for every student.

The New College Environmental Studies Program (ESP) plans and supports academic activities reflecting general student interest and for students who pursue an area of concentration in environmental studies. Each year a class that is open to all students, Introduction to Environmental Studies, orients students to five disciplines of environmental inquiry and introduces them to five faculty members at New College who teach in these areas. Each January, the ESP offers one or two group projects featuring intense engagement with environmental topics. During the January interterms of 2009 and 2010, teams of students led the effort create the green house gas inventory that forms the basis of New College's Climate Action Plan.

In the Natural Sciences, the Pritzker Marine Biology Research Center (PMBRC) provides aquaria, labs, and academic offerings that investigate the ecology of marine and aquatic life. The theme of ecological change in coastal and marine systems characterizes these classes. Field research is an integral component of the program; for example, Pritzker students can participate in faculty-led summer study on the coast of Honduras. Students also engage in ecological studies of upland and freshwater systems through coursework in conservation biology and plant-insect interactions. Each year, biology faculty organize a January interterm visit to an international sites to engage in the study of the "Ecology of Extreme Environments", places where the effects of climate change are often vivid and measurable.

Courses in every discipline of the social sciences touch on the topics of sustainability. Psychology faculty and their students are engaged in research to understand the cognition and behavior of marine mammals, specifically manatees and bottle-nosed dolphins. Political Science faculty offer classes that explore the international relations and treaties that guide the world toward sustainable practices and investigate the role of science and media in the policy and politics of sustainability. History faculty share expertise about the history of American energy development, and anthropology courses consider the intersection of conservation and indigenous knowledge. Finally, sociology and economics

courses engage students in the challenges of sustainability in developing countries, and the sociology of urban and built environments.

Humanities disciplines engage students in the study of environmental ethics, American environmental literature and poetry, and the relationship of music to place.

See Appendix # 2

Research: Undergraduate research is a hallmark of the New College education. Each New College student completes a senior thesis or senior project prior to graduation with a Bachelor of Arts degree. A key word search of the New College thesis database identifies 128 senior theses based on words "Environment" or "Sustainability" or "Ecology". Each student must also complete three Independent Study Projects (ISP's) prior to graduation. ISP's and senior theses require each student to engage in undergraduate research.

In addition, New College faculty members are actively engaged in environmental, ecological, and sustainability scholarship. Recent publications from seven faculty members demonstrate the range of this research:

Alcock, F. (2008). Conflicts and coalitions within and across the ENGO community. *Global Environmental Politics*, 8(4), 66-91.

Bauer, G.B. (2005). Research Training for Releasable Animals. *Conservation Biology*, 19, 1779-1789.

Beulig, A., & Gange, J. (2004). Coral reef and mangrove interactions in Bocas del Toro, Panama. *Integrative and Comparative Biology*, 44(6), 677.

Brain, D. (2005). From good neighborhoods to sustainable cities: Social Science and the social agenda of the New Urbanism. *International Regional Science Review*, 28(2), 217-238.

Beno, C., & **Gilchrist, S. L.** (2004). Contributions to the carbonate budget of reef building corals: Dissolved organic matter and CO₂. *Integrative and Comparative Biology*, 44(6), 676.

Hicks, B. (2004). Setting agendas and shaping activism: EU influence on Central and Eastern European environmental movements. *Environmental Politics*, 13(1), 216-233.

Lowman, M. D., & Rinker, H. B. (2004). *Forest canopies* (2nd ed.). Boston: Elsevier Academic Press.

Wider Community: Faculty, students and staff are actively engaged in wider community discussions regarding sustainability and climate change. Prof. Lowman is the Science Advisor on Climate Change matters to Florida's CFO Alex Sink. She also serves as an officer of the Ecological Society of America with special responsibilities for outreach and education. Prof. Lowman frequently participates in international meetings addressing climate change. Prof. Alcock works with the wider community through the Mote Policy Institute and frequently comments on environmental and climate change policies for TV and other media outlets. Prof. Alcock led a community workshop about sea level change in the fall of 2009, and recently authored a report on the potential impacts of oil and gas exploration in the Gulf of Mexico for the Century Commission and the Collins Center for Public Policy. Community lectures sponsored by the New College Foundation have

featured climate change and energy topics moderated by both Prof. Alcock and Prof. Lowman. Prof. Fitzgerald serves in the Florida House of Representatives, and consistently sponsors bills to set Florida's energy policy on a sustainable path. Prof. Gilchrist organizes and leads a growing program of marine science outreach workshops for K-12 teachers and students at PMBRC. Prof. Gilchrist collaborates with other marine labs in the Southeast and Florida, and is a leader in their organization, SAML. Staff member Jono Miller serves on advisory boards to Sarasota County and Florida regarding environmental land and parkland acquisition and river management. Staff member Julie Morris is a member of the federal council that manages fish and fishing in the Gulf of Mexico.

Students regularly connect their learning with community outreach. Group tutorials each year focus on science outreach to local middle schools. During the winter interterm period in 2010, a group of students created maps of the potential inundation of local landmarks and transportation infrastructure by predicted sea level rise. These maps were presented at a community forum on climate change. Students and faculty studying sustainable cities and urban policy have helped Sarasota County to become more sustainable.

In 2009, Student government created the Council of Green Affairs and an elected position of the Vice President for Green Affairs. The Council of Green Affairs was established under a revision of the New College of Florida's Student government constitution. The committee consists of six members, the student member of the Environmental Studies Steering Committee, the student Landscape Committee representative, the student director of Composting (otherwise known as the Compost TA), two representatives of the student body at large, and the Transit Coordinator (who oversees the transit partnership). The CGA is chaired by the Executive Cabinet's Vice President of Green Affairs (VPGA). The CGA's funding capability will support student-generated sustainability initiatives. Current Projects of the CGA include: oversight and expansion of the transit partnership, establishment of the green dormitory, and facilitating a sustainable move-out: donating appliances and furniture instead of sending them to the landfill.

They are also advocating for adoption of a student Green Fee. The Green Fee will be assessed based on a certain amount per credit hour. In the case of New College, that charge will be 1\$ per credit hour. A student referendum, passed in 2008, revealed that than 80% of voters favored the implementation of a green fee. The new funds generated will be spent on renewable energy and efforts designed to decrease greenhouse gas emissions. The fee has not yet been implemented and thus assumptions cannot be made as to how this will affect our overall greenhouse gas reduction campaign. However, this will be a new funding source to help mitigate GHG emissions. The specific allocations of Green Fee funds will be guided by suggestions brought to the combined committee of the Council of Green Affairs and the New College Student Association Presidential representatives. The fee will be included in the overall budget for the 2010-11 fiscal year. The amount of annual revenue collected will be dependent upon student enrollment and class selections, but should range from \$26,000-\$30,000.

Students have also initiated a public transit partnership, a composting program, and an improved recycling program. Students are currently preparing two brochures to introduce

new students to the college's sustainability programs. One brochure will encourage new students to leave their cars at home, including a guide on how to use the unlimited access partnership with the local mass transit agency to reach shops, parks and businesses. A second brochure will introduce personal actions students can take to contribute to campus sustainability.

5. Our Campus Carbon Footprint



To indicate how much direct responsibility an institution bears for specific emissions, the ACUPCC uses the concept of three different 'scopes'. Scope 1 emissions are defined by the ACUPCC as "direct emissions produced through campus activities"; scope 2 is defined as "indirect emissions from purchased energy"; scope 3 is defined as "indirect emissions from student, faculty and staff commuting/institution-funded air travel."ⁱⁱ

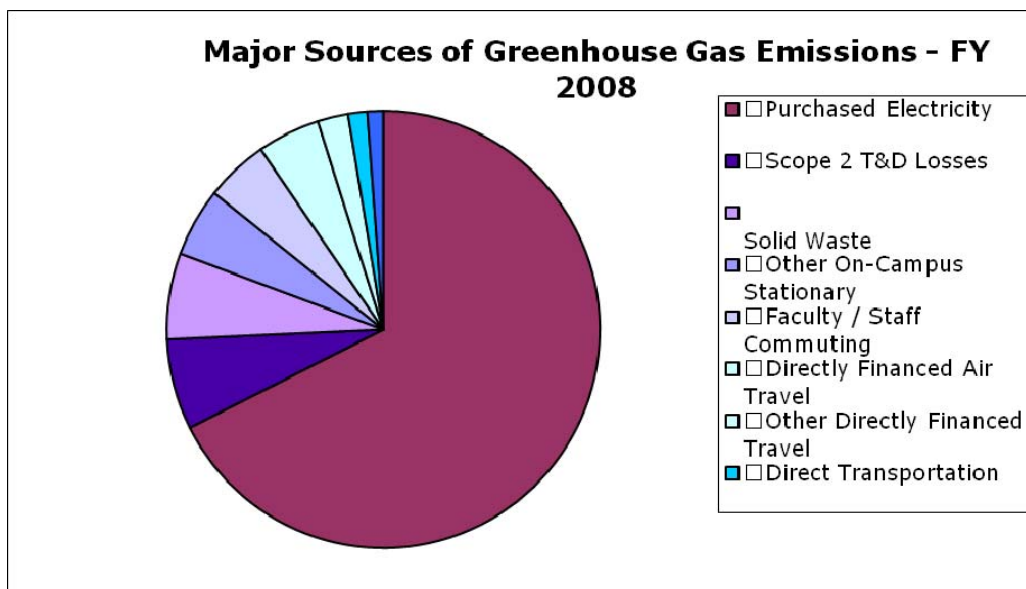
The results of New College's greenhouse gas inventory, completed using data from Fiscal Year 2008 (July 2007-June 2008), are close to expected figures for a school of its size yet divergent from the norm. Other baccalaureate colleges report approximately half of their emissions in Scope 2, with the remaining half almost evenly divided between Scopes 1 and 3. At New College, However, scope 2 emissions account for the majority of our greenhouse gas production, representing 6249.4 mtCO₂ equivalent (66.88% of the total); Scope 3 represents 2399.8 (25.68%) and Scope 1 represents 695.5 (7.44%). The major factor that contributes to the discrepancy between our numbers and the average is likely the climate of southern Florida, which requires less heating via stationary sources (Scope 1) and more cooling via electricity (Scope 3) than more temperate regions.

At 9344.7 metric tons of CO₂ overall, or 15.9 metric tons of CO₂ equivalent per 1,000 square feet, New College's overall emissions resemble the average for all baccalaureate

colleges (15.46 mtCO₂ per 1,000 sq. feet).

When normalized by number of students (767 in FY 08), New College generates 12.18 mtCO₂e per FTE, noticeably more than the average of 9 mtCO₂e for baccalaureate schools. However, a larger percentage of students at New College live on campus. At 72% residency in FY 2008, this proportion is much greater than most Florida schools.

Major Sources of Emissions: Purchased electricity accounts for the majority of the campus's carbon footprint, responsible for 6249.4 mtCO₂ (66.88% of total) during FY 2008. This large use of electricity also results in high transportation and distribution losses (618.1 mtCO₂; 6.61%). Solid waste (588.9 mtCO₂; 6.30%) and on-campus stationary sources (470.9; 5.04%) are the next largest contributors. Commuting (faculty/staff: 433.1 MTCO₂, 4.64%; students: 109.7 MTCO₂, 1.17%), direct transportation (132.1, 1.41%) and financed travel emissions (air: 432.6 MTCO₂; 4.63%; other: 210.2 MTCO₂, 2.25%) follow, with no other sources of emissions rating higher than 1% contribution to the total. For a graphic representation, see the figure below.



Trajectory of Emissions: The trajectory of the campus's emissions is impossible to estimate, since FY 2008 is the only time period for which we have a complete Greenhouse Gas Inventory. As we complete inventories in future years, we will be more equipped to analyze and discuss the trends in our carbon footprint. Nonetheless, tentative conclusions can be offered.

While some of the sources detailed above seem likely to continue increasing at their current rate, such as emissions related to Solid Waste, some of the largest contributions to the campus's carbon footprint are already trending downward. During FY 2008, the

campus used 10,404,168 kwh of electricity; during FY 2009, this number was reduced by 1,822,137 kwh (17.5%) to 9,049,071 despite sizable increases in energy use within the dormitories. This reduction was largely due to the installation of a modern HVAC system in one of the major campus buildings, resulting in a 1,559,886 kwh reduction for that building's usage alone.

Such a steep decrease is not likely to be repeated in FY 2010, but a continued decline seems feasible. Many of the mitigation strategies detailed in this document address decreasing purchased electricity use further, primarily through encouraging decreased reliance on air conditioning and increased awareness among students about personal policies of consumption. As electricity use decreases, Scope 2 transportation and distribution losses should decrease as well, resulting in a downward trajectory.

Most of the other major sources of emission are not currently decreasing, but are likely to trend downward once the projects listed in this document are fully underway. Particular declines may occur in commuting and transportation costs due to a student-initiated partnership with Sarasota County Area Transit and Manatee County Area Transit to provide free bus rides to individuals affiliated with New College.



6. GHG Emissions Mitigation

The following strategies were generated by examining our greenhouse gas inventory and by choosing to focus on the largest source of emissions: purchased electricity. Students involved in the Climate Action Plan Tutorial developed a list of over 60 potential strategies that would result in the reduction of the College's emissions. Then each proposed strategy was ranked according to cost and the potential for reducing GHGE. The top-ranked strategies were reviewed with the Vice President for Finance and Administration and Director of Physical Plant to determine the feasibility and benefits of each. The strategies below were then investigated from both a cost/benefit and a greenhouse gas reduction perspective.

N.B. New College is not committing to implementing all these strategies. They comprise a menu of leading ideas that are being seriously considered or explored. Some are currently underway; others are anticipated to begin in the next academic year or two; still others currently have an unknown timetable for implementation, as they may be waiting on improvements in technology or cost reductions to make them feasible.

Strategies highlighted in green are currently funded and underway; strategies highlighted in yellow are under serious consideration; and strategies highlighted in white are ideas that may be implemented in the future.

Mitigation Strategy	Cost/Payback	GHG reduction per year	Year
1. Adjust thermostats to 78 for AC	\$0 cost; immediate return	10% savings; 220,000 kWh, 145.2 mtCO ₂ e	2010
2. Adjust thermostats to 68 for heat	\$0 cost; immediate return	10% savings; 825.7 MMBtu, 43.7 mtCO ₂ e	2010
3. Place stickers advising setting AC and Heat to "off" when windows and doors are open in dorms	\$740-915 for 600 stickers	Estimate underway	2010
4. Four-day work week for summer employees; electricity reduction	\$0 cost; immediate return	120,000 KWH, 79.2 mtCO ₂ e	TBD
5. Four-day work week for summer employees; reduced commuting	\$0 cost; immediate return	21.6 mtCO ₂ e	TBD
6. Establish Green Dorm	\$1200-2000 for submeter; 1; 1 year payback	20% savings; 26901 kWh, 17.8 mtCO ₂ e	2010
7. Dormitory submeter for real-time monitoring and feedback	\$1200-2000 for submeter; <1 year payback	30% savings; 33345 kWh, 22 mtCO ₂ e	TBD

8. Add buildings to the Automated Logic System	\$25,000 per building	Estimate underway	TBD
Mitigation Strategy	Cost/Payback	GHG reduction per year	Year
9. Convert all classrooms to motion-sensitive lighting	\$70 each room	Estimate currently underway	TBD
10. Convert outdoor pole lights to motion-sensitive LEDs	\$250,800; 43-year payback	About 114,157 kWh, 75.4 mtCO ₂ e	TBD
11. Solar hot water in new dorms		Estimate underway	TBD
12. Replace all remaining incandescent bulbs with CFLs		Estimate underway	2010
13. Extend Chiller Water cooling to bayside/Caples Fine Arts Complex	\$800,000 per building; 450-year payback in College Hall	25% energy savings per building; in CFA, 67,450 kWh, 49.5 mtCO ₂ e	2010 for CFA
14. Carbon sequestration in Mangroves at Tidy Island Preserve	\$0 cost; immediate return	177 acres; 107 metric tons sequestered. Each hectare of sediment may contain 700 metric tons of carbon per meter depth.	2010
15. Carbon sequestration in campus tree cover	\$0 cost; immediate return	Estimate underway	2011
16. Reduced lawn mowing	\$0 cost; immediate return	3 acres less; about 0.97 mtCO ₂ e	2011
17. Purchase offsets for air travel	Average of \$5 per metric ton; \$1786 for all air travel emissions	If all emissions offset; 432.6 mtCO ₂ e	TBD
18. Golf cart fleet converted to solar electric	\$2,000-\$3,000 per cart; 20.5 year payback	If all carts converted; 21,450 kWh, 14.2 mtCO ₂ e.	TBD
19. Other transportation initiatives		Estimate underway	TBD
20. Bus passes for students/staff/faculty.	\$ 6,333.00 per academic year	20% driving replaced by bus trips: 30.4 mtCO ₂ e saved by faculty/staff, 8.6 by students, total 39 mtCO ₂ e	2010
21. Contract with Zip Cars	Unknown at this time	Unknown at this time	TBD

Sum of savings for implementation in 2010:		295.2 mtCO ₂ e (from FY 08 figure, 3.1%; however, FY 09 figure will be lower, meaning greater percentage decline)	
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Basic Assumptions: We are working with a cost of 5.72 cents per kilowatt-hour.

1. Adjust all thermostats to 78 for AC

New College's largest source of greenhouse gas emissions is our consumption of electricity. After reviewing carefully the different options, the solution that best maximizes GHG savings at minimal cost would be setting the cooling thermostats on campus to 78 degrees Fahrenheit. Seventy-eight degrees is a frequently-recommended temperature for thermostats in Florida buildings during the summer, but the recommendation is rarely observed. Thermostats should also be set to a 10-degree bandwidth; which ensures that the air conditioning temperature drop will not trigger supplemental heating keeping the system from cycling unnecessarily in order to maintain an ideal temperature.

Currently, Florida state policy mandates that our campus be cooled to 78 degrees. Exceptions are made for science labs because research animals and equipment may require cooler conditions. However, most thermostats on the New College campus are set at 76 degrees Fahrenheit or lower. This means that the air conditioning systems work harder, and in the process consume a significant amount of additional electric energy.

Adjusting thermostats by one degree yields an average of a 4% decline in energy usage. It is projected that if these recommendations were implemented for the entire campus, there would be approximately 10% electrical energy savings. Many of the campus's buildings are cooled by the chiller plant, which used 2,197,200 kwh in FY 2009. Reducing 10% of its expenditure provides a conservative estimate of the benefits gained by setting thermostats to 78; about 220,000 kwh saved, which equates to 145.2 mtCO₂.

Monitoring to ensure that thermostats remain at 78 degrees Fahrenheit complies with state policy and at the same time significantly decreases the amount of electricity consumed on campus. This solution is free of cost and will reduce our electric costs by an estimated 15%. Encouraging the community to live and work in environments that are a bit warmer represents a powerful solution that significantly minimizes costs and maximizes greenhouse emissions reduction.

2. Adjust all thermostats to 68 for heating

Similar to the adjustment above, although less important in Florida's climate, thermostats should also be set at a single standard level for heating purposes. Setting them to 68 degrees is estimated to save about 10% of energy use. The campus's total natural gas use in FY 09 was 82569 therms, or 8256.9 MMBtu; reducing this by 10% would result in a savings of 825.6 MMBtu, or 43.7 mtCO₂e. However, this number may be inaccurate due to the impossibility of determining of the proportion of the campus's natural gas used for consumer hot water as opposed to heating.

3. Place "windows open: AC off" stickers on dormitory windows

One of the ways in which energy is wasted on New College's campus is through the opening of doors and windows at the same time the air conditioning is operating. To prevent this from occurring, signs will be placed on the dormitory windows to remind students to turn off their AC when their windows are open. To implement this, we will purchase 600 stickers, three-inch square, and place them on dormitory windows. This cost will range between \$740 - \$915.ⁱⁱⁱ

4/5. Four-Day Work Week

Due to decreased demand for employee services during the summer, last year New College adopted a four-day, 10-hour a day work week system when the semester ended. This strategy has a two-fold impact on emissions; it reduces the days during which cooling the campus is necessary and cuts down on commuting trips to campus taken by staff and faculty. Examination of the four-day work week policy during summer 2009 revealed a reduction of approximately 120,000 kwh in electric use, equating to 72 MTCO_{2e}. Reducing the average employee's trips to campus from 10 times a week to 8 times a week for 10 weeks out of 40 reduces the overall average number of trips across a year from 10 to 9.5, creating a further reduction of 21.6 MTCO_{2e} in faculty and staff commuting emissions.

The four-day work-week policy will not be implemented in the summer of 2010, but remains a potential strategy that can be implemented to reduce emissions.



6. Green Dorm

Green dorms and sustainable living have become popular at colleges and universities. New College will be joining these other institutions in the 2010-11 school year by dedicating one dormitory as a green dorm, where policies to reduce GHG emissions will be selected and implemented by green dorm residents as well as the school's Council of Green Affairs. The dorm, currently known as V Dorm, consists of two levels and contains several individual rooms, suites that house 3 students and suites designed for 4 students. Altogether, V Dorm accommodates 32 students. Based on 2008-09 statistics, the dorm consumed about 111,150 kilowatt-hours of electricity during the course of the year. The goal of future V Dorm residents will be to act in a more sustainable manner by following specific guidelines that will moderate the climate impacts of their everyday lives. A sample of guidelines under consideration are described below.

A) Taking shorter showers:

The average showerhead uses about 2.5 gallons of water per minute. Each 1000 gallons of water cost approximately \$2. Assuming that students currently take eight-minute showers, 20 gallons and \$00.04 is consumed per shower. If students reduced their shower duration to five minutes, only 12.5 gallons and \$00.025 would be consumed per shower. Assuming each student showers every other day for 250 days, approximately 125 showers per student per year would be

taken. This means that the 32 students in V Dorm would take approximately 4000 showers. At \$00.04/shower, \$160 and 80,000 gallons of water would be used. In comparison, at \$00.025/shower, only \$100 and 50,000 gallons of water would be used. This reduces costs by \$60 per year and reduces water usage by 30,000 gallons per year. Altogether, this yields a 37.5% reduction in the use of both resources.

B) Keeping the thermostat at 78 at all times, completely off if windows are open:

Every degree a thermostat is raised saves 4% to 8% in cooling costs. Assuming students have their thermostats usually set at 72 degrees now and that the average savings are 6% per degree, 36% could be saved on cooling costs. Although exact figures on cooling costs for V Dorm are not currently available, it is likely that cooling accounts for a significant portion of V Dorm's current electric bill.

C) Hot water provided from solar water heaters:

Reduces electricity used to heat water. Consider installing a drain water waste heat recovery system; a recent Department Of Energy study showed energy savings of 25% to about 30% on water heating as a result of these systems.

D) Furniture made from recycled products:

As furniture items such as desks, bed frames, tables and chairs become old and unusable, they should be replaced with items made from recycled materials. These can be aesthetically pleasing, visible reminders of student's efforts to live sustainably. The materials used in this furniture may otherwise remain in a landfill, causing stress on the environment. They also do not necessarily cost more than conventionally manufactured furniture.

E Recycling:

Students should be encouraged to avoid products with excess packaging. They also should not purchase water in plastic bottles, and instead should carry a bottle that can be refilled. This promotes and emphasizes re-use. By recycling materials like plastic and glass, less energy is used in the production of products and less pollution is emitted. It is unclear how much students currently recycle, a study of household waste completed by The Open University for the Department for Environment, Food and Rural Affairs provides insight as to how much CO₂ emissions can be reduced through recycling: a household produces 1.5 tons CO₂e/ton cardboard & paper, 2 tons CO₂e/ton dense plastic packaging, 1.5 tons CO₂e/ton ferrous packaging, 10 tons CO₂e/ton aluminum packaging, and 0.5 tons CO₂e/ton glass packaging.

F) Organizing environmental awareness activities:

Efforts of students in the green dorm should be extended into the surrounding community. By communicating with citizens off campus, the students' successes will inform others' successes. Students also should be engaged in community-based discussions about sustainability to become informed about current issues. Additionally, campus events should be planned with the help of the V Dorm RA. It is important that the entire student community be aware of policies installed in the green dorm, as the policies are intended to one day become a standard for every dorm on campus.

G) Turning off computers:

It is surprising how much energy is used by small appliances like computers. Laptops use an average of .03 kWh when turned on, and if all 32 students kept their laptops running 24 hours a day for 250 days, 5760 kWh would be consumed. That translates into \$329.47! The good news is that these numbers can easily be reduced if students place their computers in sleep mode (about .003 kWh) or turn them completely off and unplug them (0 kWh). Assuming the V Dorm students keep their laptops on for 12 hours a day for 250 days (2880 kWh, \$164.74), put their laptops to sleep 12 hours a day for 125 days (144 kWh, \$8.24), and turn them completely off for the last 12 hours a day for 125 days (0 kWh, \$0), only 3024 kWh would be used, at a cost of \$172.97. That's a 47.5% reduction in electricity and cost per year. It is likely that many students are not aware of how much electricity is used by leaving appliances on while not in use. Even appliances that are off but still plugged in experience electricity flow. By unplugging them, or having their plugs connected to power strips that can easily be switched off, even more electrical savings will be realized.

H) Sheltered area for bicycles:

The campus does not currently have a safe, sheltered area for bicycles to be stored. If a shelter was constructed near the green dorm, it might encourage residents to own and use bicycles more often as an alternative to driving cars. While 1 gallon of gasoline can produce 20 pounds of CO₂ emissions, bicycles produce zero emissions.

I) Limited laundry usage:

Larger appliances like washers and dryers can consume large amounts of electricity. V Dorm does not currently have a laundry, but the dorm belongs to a grid connecting four dorms, one of which does have a laundry room. We currently have Maytag Commercial Energy Advantage™ Top Load Washers, Model: MAT14PDAWW and Maytag 27" Commercial Electric Dryers, Model: MDE17CSAZW. The washers run on 120V and 15Amps, equal to 1.8 kWh. Assuming all 32 students

use the washers once a week for 8 months, at 42 min/use (1344 min/student, 43008 min total) they will be used 716.8 hours/year. This translates into 1290.24 kWh/year, or \$73.80 yearly. The dryers run on 240V at 30Amps, equal to 7.2kWh. Assuming all 32 students use the dryers twice a week for 8 months, at 63 min/use (1008 min/student, 32356 min total) they will be used 537.6 hours/year. This yields a total of 3870.27 kWh/year, or \$221.41 yearly. The total laundry use is 5160.51 kWh/year and \$295.21, which comprises 2.66% of V Dorm's electric bill. If dryer use was reserved only for heavy items such as towels and blankets and cut back 50%, 1935.14 kWh/year, or \$110.70 yearly would be saved. The other half of the time clothes could be air-dried, which not only would save electricity but could make them last longer.

J) Replace old appliances with newer, more efficient ones:

While the washers we have are Energy Advantage rated, our dryers could probably be upgraded at some point to make them even more efficient. However the dryers are leased commercial machines not owned by the school. The only large appliances in V Dorm rooms are GE Hotpoint® ENERGY STAR® 18.2 Cu. Ft. Top-Freezer Refrigerators, Model: HTH18GBTCC. Altogether there are 11 of these refrigerators, which according to the GE website, operate on 120V at 15Amps. This is equal to approximately 1.8 kWh. Thus 10800 kWh and \$617.76 in operating costs are required per refrigerator. Applied to all refrigerators in the dorm, these numbers increase to 118,800 kWh and \$6795.36. This consumption accounts for approximately 6.11% of the current electric bill.

Savings depend on the type and model of refrigerators that replace the existing appliances. However, these refrigerators are already Energy Star products; in fact they are the least expensive, most efficient top-freezer refrigerators that GE currently offers.

Implications for Greenhouse Gas Emissions:

Other than the specific policies outline here, It is likely that students within the Green Dorm would pursue additional avenues of voluntarily reduced consumption, such as using fewer consumer electronics and perhaps turning the thermostat even higher than 78. If one assumes they would manage to remove 20% of electricity use through such care, an additional 22230 kwh would be saved over the 4671 kwh saved by reduced laundry use/computer activity, resulting in 29601 kwh/year or 17.8 mtCO₂e saved.

7. Dormitory Submeter for real-time monitoring

Education combined with a submeter and display showing real-time energy use could effectively reduce dormitory energy use. An estimate of the potential savings can be made by reviewing efforts at other institutions. For example, a report from Oberlin College (2) suggested that a 32% decline in electricity use occurred in a dorm provided with education and weekly feedback about energy and accompanied by incentives to conserve. This rate of savings for a comparable dorm at New College would yield savings of 33,345 kWh a year or 22 mtCO_{2e}.

Another potential strategy would be to offer a financial incentive to conserve. A portion of the cost savings from a reduction in purchased electricity could be refunded to student residents in a dorm that met targeted reductions in electricity use. This strategy could be tested as a pilot in one dormitory, and evaluated before expanding to additional dorms. However, additional discussion of the financial and social aspects of this idea will be required before it can be implemented.

8. Converting buildings to Automated Logic

The Automated Logic system at New College allows for the climate and electricity use of rooms to be controlled remotely. Buildings installed with this system have air conditioning, lighting and other electrical systems wired into a central system, which can be monitored digitally and used to control thermostats. This system, most recently implemented in the Cook Library, is useful for energy-saving measures such as shutting down all heating/cooling between midnight and 6 am.

The cost of each additional building added to the Automated Logic system is approximately \$25,000. Eight additional campus buildings are candidates for the Automated Logic system. Although savings are assured, it is difficult to estimate the magnitude of the impact because of the complex ways in which the Automated Logic system impacts energy use. Both air conditioning and lighting can be reduced during times of low usage.

9. Converting Indoor Lighting

Several classrooms on campus already possess a lighting system that automatically shuts off when the classrooms are not in use. This technology could be added to the remainder of the classrooms at a cost of \$70 per room. We are currently establishing a list of how many classrooms lack this technology and the kind of lighting used in those classrooms to determine possible payback periods and savings in electricity.

10. Converting Outdoor Lighting

New College is currently investigating a policy that will retrofit its 228 outdoor lights with energy-efficient LEDs that dim to 50% power during times of low usage as determined by motion sensors. These lights are expected to consume 50 watts an hour, compared to the current 175-watt bulbs. Two-hundred-twenty-eight 175-watt bulbs, running 10 hours a day, consume 399 kWh a day; used every day, they use 145,635 kWhs a year. The LEDs, in contrast, would require 85.5 kWh a day at 5 hours of full power and 5 hours at half power, reducing consumption to 31,207.7 kWh over the course of a year. This difference of 114,157 kWh would save the college 75.4 mtCO₂ and \$5707.88 every year. Financially,

considering the \$1100 cost per pole of the LEDs and the 44-year payback period, this may not be a feasible energy and cost saving strategy. However, if and when LED prices drop this changeover could have sizable positive economic and environmental impacts.

11. Convert to Solar Hot Water

Due to the abundance of solar energy available in southern Florida, solar hot water is a potentially reliable alternative to electric or gas water heating. Installing solar hot water would require extensive retrofitting in the older dorms; the new dorms (VXWY) already possess the basic infrastructure.

Plans for an estimate of cost and savings are currently underway.

12. Replace Incandescent Bulbs with Fluorescents

It is College policy to replace all incandescent bulbs with compact fluorescents to save money and energy. However, these replacements have largely been made when old bulbs reached the end of their natural lifespan. The number and wattages of remaining incandescent bulbs is being determined in order to calculate the potential greenhouse gas savings of full replacements. Exceptions will be made for certain historic ornamental lights.

13. Extending Chilled Water Loop

Buildings on campus are heated and cooled in different ways. The most modern system incorporates a chilled water loop. The water used in the system is purchased municipal water, and a certain amount of make-up water is needed to replace water lost in cooling towers. We are currently retrofitting to accept the College's own wellwater as make-up water, rather than using purchased municipal water from the county. The chiller only cools a portion of the buildings on campus. However, it is estimated that extending the loop to reach the older bayside buildings (College Hall, Cook Hall and Robertson Hall) will save approximately 25% of current cooling costs.

However, the cost for such a renovation is estimated to be approximately \$800,000 per building, and these remaining buildings are relatively low energy consumers. Connecting College Hall, the highest at 122920 kWh/year, to the chilled water loop would save 30,730 kWh/year. At 5.72 cents a kWh, that equates to about \$1750 in savings - necessitating a payback period of over 400 years.

The Caples Fine Arts building (CFA) is already being added to the chilled water loop; assuming the same 25% figure, 67,450 kWh, or 49.5 mtCO₂e will be saved per year.

14. Carbon Sequestration in Mangroves

The New College Foundation owns a 177-acre tract of intertidal mangrove forest on Tidy Island at the northern end of Sarasota Bay. The forest includes red, black, and white mangrove trees. Mangroves have the capacity to sequester 1.5 metric tons of carbon/hectare each year. This results in a Tidy Island sequestration of carbon at the rate of 107.44 metric tons each year. In addition, each hectare of mangrove forest sediment is estimated to contain 700 metric tons of carbon per meter depth. Continued conservation of the Tidy Island mangrove forest prevents the release of this sequestered sediment

carbon.

15. Carbon Sequestration in oaks, pines, and other campus tree cover

Once the Campus Landscape Master Plan is finalized we will be able to use the Plant Material Zone Map in conjunction with the Campus Master Plan to determine the acreage of the campus that will not be cleared or built upon. Then we can add sequestration acreage in subsequent updates.

16. Reduced lawn mowing through conversion of lawn areas to alternative landscape treatments.

During the coming year, New College will replace 3 acres of frequently mown lawn with native grasses and wildflowers that may only be mown twice a year. This represents a 2.6% reduction in the mown area of campus. If successful, this treatment may be extended to other areas of campus. Reductions in greenhouse gas emissions attributable to reduced mowing do not include other gasoline powered landscape equipment such as string trimmers or transportation losses getting to the site.

17. Offsets

A smaller yet still important source of greenhouse gas emissions is transportation. This category is somewhat more complicated and thus it is difficult to develop a single solution that will address all of the diverse forms of transportation utilized by faculty, students and staff. One of the strategies that has significant potential is the purchase offsets for faculty travel. For a relatively low cost, offsets of various sorts can be purchased to counter the greenhouse gases emitted by faculty and staff travel on airplanes, trains and even automobiles.

Carbon offsets are a competitive industry, and New College has the potential to receive a discount for block purchasing of these offsets. Prices of offsets range from \$2.50 up to \$99.00 per metric ton of CO₂ offset.^{iv} At a rate of \$2.50 per metric ton, it would cost the college \$893.00 to offset all staff and faculty air travel for one year (based on 420,350 miles of air travel by staff and faculty during the 2007-2008 year).

18. Solar Golf Carts

New College has been working with Cruise Car, Inc. to determine whether it would be feasible to switch some of the electric golf carts now in service to solar-electric golf carts. This would be done through the installation of a solar panel on the roof of the electric golf cart. Solar panels are projected to extend the battery power of a golf cart by five miles per day. Most of the golf carts on campus travel fewer than five miles a day so there would be little to no carbon footprint for each vehicle following solar panel installation.

According to the Cruise Car, Inc. survey, the college uses 22 electric golf carts that could be converted to solar-electric. The following table summarizes the conversion costs.

	Four Passenger	Six Passenger	10 Passenger
Two Passenger			
12 vehicles	6 vehicles	2 vehicles	2 vehicles
\$ 2,000/panel	\$2,100/panel	\$2,375/panel	\$2,975/ panel cost based 2 solar cells.
			Additional costs for a 3rd panel.
\$24,000	\$ 12,600	\$4,750	\$5,950

Total to convert all 22 vehicles: \$47,300

We also have six gas powered golf carts that could be converted to electric or solar electric vehicles. After purchasing 6 replacement electric vehicles, converting to solar-electric would cost an additional \$12,600. The solar panels last for about 20 years.

To determine the payback period, we calculated that each electric golf cart mile costs between 3 and 5 cents. The following calculations are based on \$4.29/per mile cost and show the pay back period.

Assume each golf cart travels 5 miles/day

4.29 cents per mile per cart (5 miles a day)= 21.45 cents/day/cart

22 carts (.2145 cents per day per cart)= \$4.72 dollars/day

\$41,350 (total cost of panels for 22 vehicles)/\$4.72per day= 8762 days/365= 24 years to payback

According to these calculations it would take 24 years to recoup the cost of converting 22 vehicles to solar-electric.

Electricity costs for New College are currently 5.72 cents a kilowatt-hour. Assuming then that one mile takes approximately .75 kWhs (which would cost 4.29 cents, a reasonable figure between the 3 and 5 cent figures quoted above), each golf cart is consuming 3.75 kWhs a day, or 82.5 for the entire fleet for a day. Assuming 260 days of use a year (52 weeks at 5 days a week; though holidays are not included, many golf carts are likely used on the weekends as well), this equates to 21,450 kWh a year saved, or 14.2 mtCO₂ if all 22 carts were to be converted.

Although the payback time is long, buying solar panels for our golf carts would reduce our greenhouse gas emissions. It would also serve as a visual reminder of the school's environmental efforts. To determine if this is a good plan, the benefits and drawbacks need to be weighed carefully.

20. Universal Access Transit program through unlimited bus access for students, faculty and staff:

During 2009-10, the college and the Sarasota County bus system (SCAT) arranged for students to access bus rides based on their student ID. The college pays an annual negotiated fee to SCAT for universal access. In 2010-11, this access will be extended to include college faculty and staff. This program will reduce the GHG emissions caused by commuting.

Our Greenhouse Gas Audit estimated the total annual emissions generated by faculty, staff, and students commuting to campus.

Faculty / Staff Commuting	433.mtCO ₂ e	4.64 of total emissions%
Student Commuting	109.73mtCO ₂ e	1.17 of total emissions%

Surveys conducted among New College students suggest that, of the 10% of students who regularly commute to campus in personal automobiles, 20% would be willing to rely on buses instead. This would effectively reduce the percentage of students who drive to campus from 10% to 8%, saving 8.6 mtCO₂e a year.

While 20% is not a large percentage, this number has the ability to grow in sizeable terms as the "cultural lag" of personal automobile usage transitions to transit alternatives among new students and faculty. Research from other colleges^v found that average ridership on mass transit increases between 70-200% in the years following first implementation of similar programs.

Similar surveys of faculty and staff suggest fifty percent (50%) of Faculty and staff said they "may" or "would" use the bus more often with unlimited access passes. If approximately 20% of the automobile staff/faculty commutes transitioned to mass transit, faculty and staff commuting emissions would decrease by 30.4 mtCO₂e, bringing the total savings for this program to 39 mtCO₂e a year.

The total cost for the universal bus pass program will be a central administrative cost. There is no direct institutional financial savings from reduced commuting; however, there may be a reduced need for parking in the future. Transferring individual commuting costs to the college represents a benefit to students, faculty, and staff, and an improvement to campus and community sustainability.

21. Contract with Zipcar

In the interest of encouraging students not to bring their own cars to campus and to reduce use of rental vehicles by school employees, a partnership with Zipcar is under consideration. Zipcar provides cars to an institution on the basis of a pay-as-you-go system; several vehicles would be available on campus for employees and students to rent for outings. Currently, this idea is still in the early stages of planning, as little is known about the level of demand on campus, the cost, or potential impact on greenhouse gas emissions.

Overall sum of savings for implementation in 2010:

Should we succeed in implementing all of the strategies currently slated for 2010, we will reduce our greenhouse gas emissions by 295.2 mtCO₂e, or 3.1% of the total emissions in FY 2008. This would meet our threshold of a planned 3% decrease; however, we have not yet calculated a carbon footprint for FY 2009. Due to noticeably decreased use of electricity, FY 2009 is likely to have a lower footprint than FY 2008, resulting in an actual decline that is likely to exceed 3%. Precise numbers cannot be calculated until the footprint for FY 2009 is known, but at the moment New College's mitigation strategies appear well on track to success.

7. Barriers and Solutions

Predictable barriers to the implementation of this plan exist. We all recognize that it is far simpler to sign a document supporting a long-term conceptual goal than to annually redirect scarce resources to projects that may not yield a reasonable return on investment as traditionally calculated. So our first challenge may be to translate a long-term goal into short-term actions that provide tangible rewards.

We also will need to ensure that the commitment of campus leaders translates into broad community commitment. The success of the effort will be determined by the extent to which members of the campus community endorse and incorporate the greenhouse gas reduction effort into their daily lives.

Our effort to reduce greenhouse gas emissions will need to be sustained over many years, which will require a series of successful among changing leadership and community membership. For this reason the campus should renew its ACUPCC vows periodically, perhaps every five years or alternatively whenever there is a change in top administration (President, Provost, or Vice President for Finance and Administration). In addition, the Board of Trustees should be asked to renew its commitment via periodic affirmations of our course.

It is expected that significant reductions will be relatively easy at first and require greater commitment and possibly imply greater costs as time passes. This trajectory may succeed if the perceived importance and urgency of sustainability increases, and if new technologies improve efficiencies or lower costs. But our efforts could founder if community opinion shifts or wanes.

Cost will be an obstacle. As all are aware, these are tight budget years and dollars are generally scarce. Initiatives are difficult to implement if they do not promise an immediate return on investment. Furthermore, initial cost concerns can trump life cycle costs in capital projects, reducing the likelihood of long-term savings. Finally, a zero-sum mindset often prevails that suggests reductions in greenhouse gas emissions can only come at the expense of pedagogy, faculty salaries, or staff positions.

SOLUTIONS: The foundation of all solutions lies in the continuity of commitment. That will involve continuous leadership from the highest levels of the college, significant ongoing student support for both behavioral changes and projects, and agreement from the faculty and staff that both goals and means are worthy. With broad support, significant reductions in greenhouse gases are possible. For issues related to the financial implications, see Costs and Financing below.

8. Costs and Financing

One third of our initial proposed strategies incur no cost, and three others (Caples Fine Arts - HVAC- Phases 1 & 2 and Chiller Plant/Cooling Towers Make-Up Water Well) are already included in our Capital Improvement Plan. Other strategies will be evaluated to see whether they might contain benefits not identified using traditional accounting methods. Mandated government targets for recycling and other guidelines may impose the use of specific strategies despite their direct returns on investments. In addition, the prices of many emerging technologies are decreasing and government incentives and grants may help span gaps in the costs between old and new technologies. Thus, technologies that seem out of reach in the near term may well become more feasible as they mature.

9. Implementation Structure

We envision an annual cycle of implementation that will start in January with our Greenhouse Gas Inventory and Climate Action Plan review. Results from those reports will inform both behavioral strategies and the capital improvement plan as reflected in the budget.

10. Communications Strategy

Administrative leadership and commitment will help drive employee participation. Student's have created a new Council of Green Affairs, which meets weekly and is pursuing a variety of sustainability initiatives. An organizing principle is the maintenance of a chain of communications that begins with literature about the college and is reinforced through campus visits and mailings to prospective and admitted students. Upon arrival as new students, a variety of events, handouts and web-accessible documents will focus on sustainability initiatives. Course, tutorial and Independent Study Projects will continue to illuminate sustainability issues.

11. Tracking Progress

As noted above, we envision an annual cycle of implementation that will start in January with our Greenhouse Gas Inventory and Climate Action Plan review. Results from those sources will inform both behavioral strategies and the capital improvement plan as reflected in the budget.

12. Next Steps

- Discussion of the Climate Action Plan with the New College Administrative Council
- Discussion of the Climate Action Plan with the New College Board of Trustees
- Online posting and circulation of the Climate Action Plan
- Increase student awareness/work with student leadership and the Council of Green Affairs to engage students
- Reconfigure and convene the Climate Action Implementation Committee including students from the Council of Green Affairs, faculty, and key administrative staff.
- Complete the process of approval for the student Green Fee and identify initial projects for funding to match Administrative funding commitments
- Adopt the Campus Landscape Master Plan
- Incorporate climate action strategies that involve structural or capital projects into the Capitol Improvement Plan
- Present the Climate Action Plan at a student Town Meeting
- Secure administrative support for establishment of a green dorm for AY 2010-11.

13. Conclusion

Despite budget constraints, several campus buildings over 75 years old and significant cooling demand, New College's carbon footprint is similar to other institutions our size. Our chief target for reduction is purchased electricity, which accounts for two-thirds of our greenhouse gas generation. We are addressing this target by introducing a dozen separate strategies that include some structural and behavioral changes.



14. Appendices

Appendix #1. Text of the American College & University Presidents' Climate Commitment

We, the undersigned presidents and chancellors of colleges and universities, are deeply concerned about the unprecedented scale and speed of global warming and its potential for large-scale, adverse health, social, economic and ecological effects. We recognize the scientific consensus that global warming is real and is largely being caused by humans. We further recognize the need to reduce the global emission of greenhouse gases by 80% by mid-century at the latest, in order to avert the worst impacts of global warming and to reestablish the more stable climatic conditions that have made human progress over the last 10,000 years possible.

While we understand that there might be short-term challenges associated with this effort, we believe that there will be great short-, medium-, and long-term economic, health, social and environmental benefits, including achieving energy independence for the U.S. as quickly as possible.

We believe colleges and universities must exercise leadership in their communities and throughout society by modeling ways to minimize global warming emissions, and by providing the knowledge and the educated graduates to achieve climate neutrality. Campuses that address the climate challenge by reducing global warming emissions and by integrating sustainability into their curriculum will better serve their students and meet their social mandate to help create a thriving, ethical and civil society. These colleges and universities will be providing students with the knowledge and skills needed to address the critical, systemic challenges faced by the world in this new century and enable them to benefit from the economic opportunities that will arise as a result of solutions they develop.

We further believe that colleges and universities that exert leadership in addressing climate change will stabilize and reduce their long-term energy costs, attract excellent students and faculty, attract new sources of funding, and increase the support of alumni and local communities. Accordingly, we commit our institutions to taking the following steps in pursuit of climate neutrality.

1. Initiate the development of a comprehensive plan to achieve climate neutrality as soon as possible.

a. Within two months of signing this document, create institutional structures to guide the development and implementation of the plan.

~~a.b.~~ Within one year of signing this document, complete a comprehensive inventory of all greenhouse gas emissions (including emissions from electricity, heating, commuting, and air travel) and update the inventory every other year thereafter.

~~a.c.~~ Within two years of signing this document, develop an institutional action plan for becoming climate neutral, which will include:

i. A target date for achieving climate neutrality as soon as possible.

~~i.ii.~~ Interim targets for goals and actions that will lead to climate neutrality.

~~i.iii.~~ Actions to make climate neutrality and sustainability a part of the

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curriculum and other educational experience for all students.

i.iv. Actions to expand research or other efforts necessary to achieve climate neutrality.

i.v. Mechanisms for tracking progress on goals and actions.

2. Initiate two or more of the following tangible actions to reduce greenhouse gases while the more comprehensive plan is being developed.

a. Establish a policy that all new campus construction will be built to at least the U.S. Green Building Council's LEED Silver standard or equivalent.

a.b. Adopt an energy-efficient appliance purchasing policy requiring purchase of ENERGY STAR certified products in all areas for which such ratings exist.

a.c. Establish a policy of offsetting all greenhouse gas emissions generated by air travel paid for by our institution.

a.d. Encourage use of and provide access to public transportation for all faculty, staff, students and visitors at our institution.

a.e. Within one year of signing this document, begin purchasing or producing at least 15% of our institution's electricity consumption from renewable sources.

a.f. Establish a policy or a committee that supports climate and sustainability shareholder proposals at companies where our institution's endowment is invested.

a.g. Participate in the Waste Minimization component of the national RecycleMania competition, and adopt 3 or more associated measures to reduce waste.

3. Make the action plan, inventory, and periodic progress reports publicly available by providing them to the Association for the Advancement of Sustainability in Higher Education (AASHE) for posting and dissemination.

In recognition of the need to build support for this effort among college and university administrations across America, we will encourage other presidents to join this effort and become signatories to this commitment.

Signed,

**The Signatories of the American College & University
Presidents Climate Commitment**

(685 signatories as of May 2010)

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Appendix #2. 2007-2010 New College Courses with Specific Emphasis on Climate and Sustainability

Spring 2010 Climate Change: Science, Media, Policy and Politics *Alcock*

Spring 2010 Sustainability Questions in the Real World *Helmers*

Spring 2010 Fall 2007 Conservation and Indigenous Knowledge *Dean*

Fall 2009 Animals, Oil, Atomic Power: A History of American Energy *Johnson*

Spring 2009 American Environmental History *Johnson*

Spring 2009 Sustainable Development *Alcock*

Fall 2008 Seminar on Ecological Anthropology *Dean*

Spring 2008 Sustainable Development *Alcock*

Fall 2007 Conservation Biology Climate Change *Lowman*

Winter 2010 and 2009 Greenhouse Gas Group Independent Study Project
Callahan/Miller

Winter 2010 Local Impact of Rising Sea Level GIS Group Independent Study Project
Shafer

Appendix#3 References, Citations and Links

ⁱ "Florida Oceans and Coastal Council. Revised June 2009. The effects of climate change on Florida's ocean and coastal resources. A special report to the Florida Energy and Climate Commission and the people of Florida. Tallahassee, FL. 34 pp."

ⁱⁱ <http://www.presidentsclimatecommitment.org/about/faqs#11>

ⁱⁱⁱ Window Sticker prices are from the websites www.javasigns.com and www.customonlinesigns.com

^{iv} The following companies are just a few in the offset business, and ones New College will look into when considering carbon offsets:

Versus Carbon Neutral (www.versus-co2.com): Versus offers the lowest rate for offsets, at \$2.50 per metric ton. The money paid by the college would be utilized to fund projects which are intended to counter the presence of CO₂ in the atmosphere. Versus funds the following sorts of projects: "wind farms, biomass energy, or hydroelectric dams."

E-Blue Horizons (www.e-bluehorizons.com): Horizons offers to offset CO₂ and other emissions for \$5.00 per metric ton. Projects funded by Horizons include reforestation.

Carbon Fund (www.carbonfund.org): Carbon Fund offers to offset CO₂ and other emissions for \$10.00 per metric ton. Projects funded by Horizons include reforestation, hydroelectric projects, methane destruction and waste to energy conversion.

^v Unlimited Access Programs:

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