
LOYOLA UNIVERSITY NEW ORLEANS

CLIMATE ACTION PLAN

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For the

Loyola University Sustainability Committee

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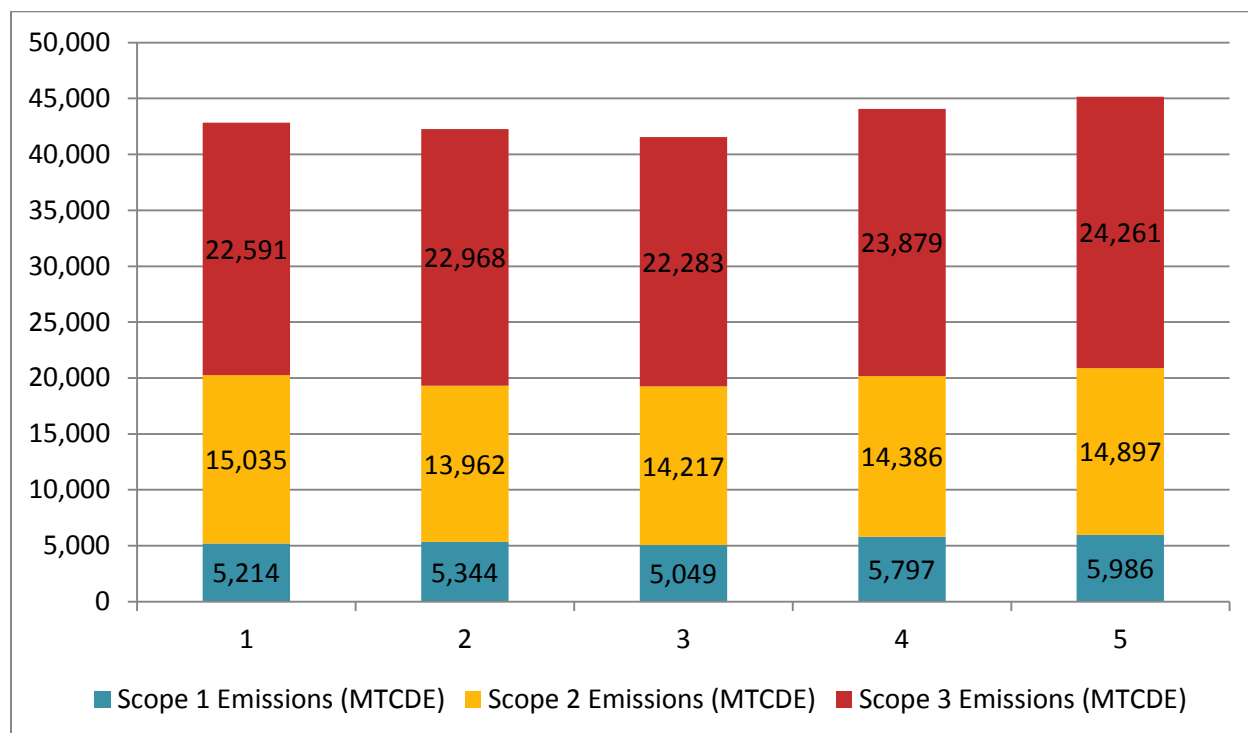
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INTRODUCTION

As a signatory of the American College and University Presidents Climate Commitment, Loyola will eventually be a climate neutral institution, meaning that no net carbon is emitted by its activities. This plan presents initial steps for Loyola University to reduce its greenhouse gas emissions. It describes policies and projects that are already in place as well as actions to be undertaken soon. It also lays out a direction for further research and analysis. In future updates to the climate action plan, Loyola will establish a concrete plan for reaching climate neutrality.

GREENHOUSE GAS EMISSIONS

Loyola University emits an average of 43,174 metric tons of carbon dioxide equivalent (MTCDE) per year, and during the first five years inventoried, emissions did not change substantially from year to year. Scope 1 emissions average 5,480 MTCDE. Scope 1 emissions are those that the institution has direct control over and that generally occur on site. Examples include burning fuel for electricity or heat, burning fuel in vehicles, and direct releases of greenhouse gases. Scope 2 emissions average 14,500 MTCDE. Scope 2 emissions are those that the institution has relatively direct control over, but generally occur off-site. Purchased electricity is Loyola's only source of Scope 2 emissions. Scope 3 emissions, average 23,200 MTCDE. Scope 3 emissions are those that the institution has relatively little control over, but are still a result of its operations. Employee and student commute, waste, business travel and study abroad air travel fall into this Scope. It is important to note that not all the data needed to calculate Scope 3 emissions were tracked, so those numbers are a conservative estimate and likely higher than in actuality. One of the first steps outlined in this Climate Action Plan is to better track Scope 3 emission sources in order to refine the inventory and set more accurate goals.



PROJECTED EMISSIONS

Over the 5 years initially inventoried, no significant growth occurred in Loyola's facilities or population. Since emissions were relatively steady over that period as well, it is reasonable to assume that future growth in emissions would be tied to growth in building area or population. Loyola has no current plans to increase enrollment significantly, but there are a few projects on the horizon that will affect overall campus square footage. When completed in 5 years, the Monroe Hall renovation will add about 5% to the campus area. Later, Loyola has plans to renovate the student center and add dormitory floors. That will add another 3% to the campus area. That renovation is not yet scheduled, but for the purpose of this plan it is assumed that it will be complete in 15 years (2027).

CLIMATE ACTION PLAN OVERVIEW

This is an initial Climate Action Plan and will be revised and updated frequently as Loyola gains experience with reducing its climate impact. This plan lays out actions for immediate implementation (0-2 years), implementation in the near term (1-5 years) and implementation in the medium term (5-10 years). Long-term planning will be reserved for later versions of the CAP because Loyola needs to make significant improvements to its tracking of greenhouse gas emission source data before climate neutrality can be achieved.

Immediate actions include existing plans and projects, and several institutional measures. In the near term, actions will include improving energy efficiency across campus, creating incentives for commuters to switch to lower carbon options, engaging students and employees in energy saving, and incorporating sustainability into the curriculum. In the medium term, actions will include installation of renewable energy systems, replacement of fleet vehicles, and tackling business travel and commuting emissions.

In this plan, each measure is described in as much detail as possible, and wherever feasible, includes an estimate of carbon and energy savings. Carbon savings will be expressed in metric tons of carbon dioxide equivalent (MTCDE) and energy savings will be expressed in the units used in the GHG inventory [e.g. kilowatt hours (kWh) for electricity or million British thermal units (MMBtu) for natural gas].

REDUCTION TARGETS

The goal of the American College and University Presidents Climate Commitment is for all signatories to eventually reach climate neutrality, meaning that they reduce their emissions as much as feasible then offset the remaining emissions by supporting projects elsewhere that reduce emissions by the same amount for net zero emissions attributable to the university. This document lays out an initial plan to reduce emissions, institutionalize sustainability, and undertake further study on renewable energy projects.

[Note: The provost's sustainability committee should decide on the interim targets that it wishes to aspire to. Initial calculations of the measures outlined here result in a reduction of approximately 12% below 2007 emissions, but the targets adopted can and should be more ambitious. Many of the measures suggested below could result in significant savings, but more study is needed to determine how much they can reduce.]

IMMEDIATE ACTIONS

EXISTING POLICIES AND PLANS

Loyola University has several policies and current projects that address sustainability and energy efficiency. The Facilities Management Department follows a “Statement on Environmental Responsibility” which states that “Loyola University New Orleans strives to maintain and operate its campus facilities in a manner which is both environmentally responsible and fiscally sound” and goes on to detail the policies and procedures in place to guide decision making on issues that affect the environment. Wherever financially feasible, the most stringent energy efficiency measures are put in place. Since 1997, all major renovations include the installation of individual building meters that are monitored by a dashboard program accessible to facilities management staff. Loyola also employs building scheduling to reduce energy use during times when buildings are unoccupied. Schedules are programmed into the system by the physical plant staff.

Recently, Loyola instituted a LEED policy for all major renovations and new construction with a goal of achieving the most energy efficiency possible. The recent renovation of Thomas Hall is the University’s first LEED project; it is striving for LEED Gold, but will definitely earn LEED Silver. A new law school building and the renovation of Monroe hall are also underway and will be LEED certified. The renovation of Monroe Hall is beginning now and will be a phased renovation over the next five years, 2012-2017. It is the largest building on campus so the energy savings will be significant once the renovation is complete.

Finally, there is a project underway now to replace the lighting in a parking garage under the City of New Orleans’ Energy Smart program. That project is eligible for incentives from the local utility, Entergy, and will save 90 MTCDE and over 195,000 kWh per year.

INSTITUTIONAL MEASURES

SUSTAINABILITY STAFFING

Loyola does not currently have a dedicated staff member to lead the implementation of the climate action plan. Hiring at least one dedicated staff member will ensure that its commitments to sustainability and reducing carbon emissions are met. The staff member should be hired within the Facilities Management department and up to half of the position should be dedicated to energy efficiency and reducing energy use on a day to day basis. The remainder of the incumbent’s time can be dedicated to overall sustainability management, including recycling coordination, waste reduction, water efficiency, education and outreach, managing participation in sustainability programs (e.g. AASHE STARS), and helping to develop a sustainability curriculum. The Association for the Advancement of Sustainability in Higher Education (AASHE)¹ has resources available to help inform the hiring of this

¹ <http://www.aashe.org/resources/resources-campus-sustainability-officers> (Members only content linked from this page.)

individual, including sample job descriptions and their periodic Higher Education Sustainability Staffing Survey.

As part of the annual evaluation process for the selected employee, actual performance in terms of energy saved and greenhouse gas emissions reduced can be a metric of success. The job description could set a goal in terms of percent savings and the candidate can be evaluated on whether he or she meets that goal each year. In the future, expansion of the sustainability staff can be considered so that one person could serve as a dedicated energy manager and another person could concentrate on other aspects of sustainability.

ESTABLISH A PERMANENT COMMITTEE TO REVIEW AND IMPLEMENT SUSTAINABILITY MEASURES

The sustainability staff member(s) described above will lead the climate action planning and project implementation for the university, however most actions are cross-cutting and require the buy-in of leaders across campus units. The establishment of a permanent committee of stakeholders to review and implement sustainability measures will ensure that all voices and concerns are considered. It will be the responsibility of the sustainability staff to analyze projects and determine their costs (or savings), carbon reduction potential and additional benefits. The committee will meet regularly (at minimum twice per year) to discuss the proposed actions and prioritize projects. The committee should be comprised of faculty and staff with sufficient decision making authority to authorize the implementation of the projects.

Projects will be prioritized based on cost, ease of implementation, potential carbon savings and the extent to which they provide additional benefits to the university. The committee will evaluate and rank projects based on these factors and the top ranked projects will be implemented first with others implemented as funds become available. The clean air-cool planet campus carbon calculator offers some utility in ranking the projects, but other factors, especially co-benefits, will have to be evaluated subjectively by the committee. During their first year of operation, the committee should establish the processes they wish to use to evaluate the projects and, with the help of the sustainability coordinator, explore different tools for ranking and evaluating measures. The committee will also be responsible for approving later updates to the university climate action plan. The sustainability coordinator will update the plan every two years and the committee will review and approve the plan before it is widely disseminated.

IMPROVE GHG INVENTORY DATA AVAILABILITY AND REPORTING

As a first step in reducing emissions, better tracking of Scope 3 emissions is necessary. Loyola's first greenhouse gas emissions inventory was subject to a large amount of uncertainty because of a lack of data on most Scope 3 emissions. For the most part, that uncertainty could be reduced by better tracking of spending in those categories. Currently, all travel and entertainment expenses are aggregated in a single accounting sub-code. To improve tracking, new accounting sub-codes can be created for tracking travel expenses by category (e.g. airfare will be tracked separately from lodging). With modes of travel tracked individually, mileage can be better estimated based on national dollars per mile figures such as

those published by Airlines for America² which is an airline industry trade group. Accounting forms could also collect data on fuel use for departmental vehicles. In most cases, individuals purchase gas and are reimbursed. Actual gallons purchased can be collected easily if those individuals are required to include that data on their reimbursement form.

In fact, because Loyola's greenhouse gas emissions aren't directly measured (e.g. though monitoring a smokestack), most of the data needed to maintain the inventory flow through the accounting office in the form of bills that are paid by the university. It may be prudent to hire a new staff member in the accounting department to be responsible for aggregating this data and assisting the sustainability staff and/or students with future greenhouse gas emissions inventory updates. He or she could keep records of fuel purchases, mileage reimbursements, electricity bills, airline ticket purchases, et cetera with the express purpose of providing these data to the sustainability staff. If accounting forms submitted to process a payment included a question or box to check for greenhouse gas related expenses, copies of those forms could be quickly routed to that staff person.

Finally, employee and student commuting emissions are also very uncertain and are based on patterns gleaned from a survey of students, faculty and staff at neighboring Tulane University. Though it is reasonable to suspect that commuting habits at Loyola are similar, campus-specific results are needed to confirm this. Loyola can begin a semi-annual or annual survey of commuters to ensure that commuting emissions are estimated as accurately as possible. The survey could be conducted by a class or student assistants to the sustainability staff. Alternately, commuting habits could be gleaned along with other student and employee data. Just as employees and students must update their mailing address and phone numbers when they change, the registrar and HR managers could ask that they be updated about changes in commuting habits.

CAMPUS ENERGY EFFICIENCY AND SUSTAINABILITY FUND

Loyola facilities managers must take the cost effectiveness of potential projects into account and cannot always complete an energy efficiency or sustainability project because of its budget constraints. Loyola can raise money for a campus sustainability fund that would be dedicated to filling the "gap" between the facilities budget and the cost of projects that will reduce greenhouse gas emissions. The fund can be repaid later from cost savings generated by the projects it facilitates. An endowment with regular returns can also help the sustainability fund replenish as funds are spent. Many other universities have reported success with similar funds, and their experience is documented on the AASHE website in the "resources" section.

NEAR TERM ACTIONS

BUILDINGS

ESTABLISH A SYSTEM FOR TRACKING BUILDINGS AND THEIR ENERGY EFFICIENCY IMPROVEMENTS.

² See for example: <http://www.airlines.org/Pages/Annual-Round-Trip-Fares-and-Fees-Domestic.aspx>

Details:

While Loyola's centralized chilled and hot water distribution system presents certain challenges to the individual building metering process, the university will continue to work with its mechanical and electrical consultants to ensure that the system currently in place continues to be developed into an effective tool for measuring each building's energy use, and that all future new construction and major renovations will be designed with individual building performance metrics in mind.

GHG Reduction:

N/A – management measure

BEGIN A PROGRAM OF RETROCOMMISSIONING WHENEVER A BUILDING'S DEFERRED MAINTENANCE ISSUES ARE ADDRESSED.

Details:

Retrocommissioning (RCx) is a process of “tuning up” existing buildings’ and their systems to improve their overall performance. “Retrocommissioning is a process that seeks to improve how building equipment and systems function together. Depending on the age of the building, retrocommissioning can often resolve problems that occurred during design or construction, or address problems that have developed throughout the building’s life. In all, retrocommissioning improves a building’s operations and maintenance (O&M) procedures to enhance overall building performance.”³ Mills (2009) analyzed a database of 643 buildings around the United States and found that the median cost of retrocommissioning is \$0.30/square foot and yields a median of 16% of whole building energy savings. The median payback time for commissioning of existing buildings is 1.1 years. The report also recommends that buildings be retrocommissioned every 5 years.

Loyola currently maintains detailed building audits which outline the age and life expectancy of all major building systems in each of the older buildings on campus, along with the estimated cost of bringing these systems up to date. The most logical and cost-effective time to implement energy-saving measures is at the time a building's deferred maintenance issues are addressed. But these projected deferred maintenance costs are currently in the tens of millions of dollars, and the university is not likely to be in a financial position to address 20% of that annually as the Mills report recommends. As building systems are scheduled for updates and deferred maintenance is addressed, energy retrocommissioning can be part of that process.

GHG Reduction:

Reduction will vary depending on budget and deferred maintenance. Using the Mills report figures and assuming every building were retrocommissioned every 5 years, GHG reduction would be 430 MTCDE per year (about 571,000 kWh of purchased electricity and about 3,275 MMBtu of natural gas per year)

³ Mills, Evan. 2009. *Building Commissioning: A Golden Opportunity for Reducing Energy Costs and Greenhouse Gas Emissions*. Lawrence Berkeley National Laboratory, Berkeley, CA. <http://cx.lbl.gov/2009-assessment.html>

INSTALL VENDING MISERS OR SIMILAR PRODUCTS ACROSS CAMPUS.

Details:

Vending machines are convenient for students and employees, but they are plugged in and running constantly. Vending misers⁴ and similar products are devices that reduce the energy use of vending machines by powering them down or inducing a low power state when nobody is around. They are controlled by an occupancy sensor and automatically power on when someone approaches. Calculations for greenhouse gas emissions savings above are based on adding vending misers to the existing 35 refrigerated and 14 non-refrigerated vending machines on campus now. Alternately, vending machines can be replaced with newer, ENERGY STAR qualified machines, which would likely yield similar savings.

GHG Reduction:

23 MTCDE per year (about 51,860 kWh of purchased electricity per year)

ESTABLISH A PURCHASING POLICY THAT MANDATES ENERGY STAR LABELED ELECTRONICS AND APPLIANCES.

Details:

ENERGY STAR is a joint Environmental Protection Agency (EPA) and Department of Energy (DOE) program that labels the most energy efficient appliances and electronics to educate consumers. The ENERGY STAR label is only awarded to those products that meet strict energy efficiency standards which are periodically re-evaluated to ensure that they reflect the state of the art. There are many categories of products that are labeled by the ENERGY STAR program, from personal computers to building components to commercial kitchen equipment.

Loyola can institute a policy that mandates the purchase of ENERGY STAR labeled products in those categories that are available. Exceptions can be made if the marginal cost is burdensome, but such exceptions should be evaluated on a case by case basis. The policy can document specific conditions that would need to be met for an exception. The policy should also outline the requirements for Loyola's vendors and contractors. A sample policy is included in this plan as Appendix A.

GHG Reduction:

74 MTCDE per year, 161,668 kWh purchased electricity per year – Calculations are for a sample of small electronics found in dorms and offices and assume that 50% of electronics are already ENERGY STAR labeled. The savings for replacing large appliances, such as laundry equipment and commercial kitchen equipment, will be significantly greater.

FLEET

DEVELOP A POLICY FOR THE LOYOLA FLEET THAT MANDATES THE PURCHASE OF VEHICLES WITH A LOWER CLIMATE IMPACT.

⁴ http://www.usatech.com/energy_management/

Details:

Develop a policy for fleet vehicles that mandates the purchase of fuel efficient, electric, or alternative fuel vehicles to replace regular gasoline vehicles with average to poor fuel economy. Cost must be a factor in the decision making process, but the lifecycle cost of the vehicle should be taken into account rather than just the purchase price of the vehicles. This means that the purchaser of the vehicle will need to estimate annual fuel use, maintenance costs, et cetera and add those to the purchase price of each vehicle being considered. The policy should specify what lifecycle costs must be estimated and provide a threshold that must be exceeded in order to justify the purchase of the less fuel efficient vehicle. Many resources are available to departments to guide them in choosing a new vehicle. The EPA⁵ and the American Council for an Energy Efficient Economy⁶ (ACEEE) both have websites where purchasers can research the best cars by class or evaluate them by model.

Alternately, a cognizant staff member (like the sustainability staff member proposed above) could evaluate vehicle options and write the policy to prescribe which vehicles, by class, Loyola departments are allowed to purchase. That would reduce the burden on individual purchasers, but would not allow as much flexibility.

Loyola has already begun to build infrastructure for electric vehicles. There is an electric vehicle recharging station located alongside their first LEED building that is visible to people driving by the campus on St. Charles Avenue. Loyola can ensure that their investment is used by purchasing electric vehicles for use by departments, campus police, and the shuttle service as new types and sizes of electric vehicles become available.

GHG Reduction:

6 to 30 MTCDE per year, 700 to 3500 gallons of gasoline - Calculations assume a 10% reduction in fuel use per year for 5 years, then a 25% reduction for the next 10 years, and then a 50% reduction for the following 10 years.

COMMUTING

DEVELOP INCENTIVES FOR FACULTY, STAFF AND STUDENTS TO CARPOOL INSTEAD OF DRIVING TO CAMPUS ALONE.

Details:

Loyola can institute a policy that encourages carpooling among students and employees by reducing parking fees, offering prime parking locations, or providing some other financial incentive. With uncertain gas prices, a small perk may be enough to convince someone to stop driving alone. Even if a

⁵ www.fueleconomy.gov

⁶ <http://www.greenercars.org/index.htm> (A subscription is required to access all content, but the lists of the “greenest” and “meanest” vehicles are available to the public.)

financial incentive is not feasible, Loyola can still encourage carpooling by reducing barriers for its students and employees.

One of the barriers to carpooling may be a lack of flexibility. For example, someone might worry that they could not reach a child who becomes ill because of their carpool obligation later in the day or because they aren't the person who drove that morning. Loyola can assuage these concerns by offering programs that guarantee a ride home. The program could offer rides through the campus shuttle, it could provide taxi fare reimbursement, or it could somehow be connected to the "WeCar" car-sharing program that is already in place on the Tulane and Loyola campuses.

The university can also research ways to help employees and students connect for carpooling, since people may live near each other but not know that they both commute to Loyola. Many software programs exist that allow members to search for colleagues who live near them and express their interest in carpooling. Some are also likely tailored to the institutional setting and would allow secure authentication, e.g. through the use of a Loyola email address and password, to ensure that one's carpool matches are indeed trustworthy. If feasible, Loyola can connect with and use the same system as Tulane University because their campuses are so close to one another. (Tulane does not currently have a carpool program, but is interested in pursuing one.) If the data gleaned from connecting carpoolers support it, Tulane and Loyola can also study the feasibility of sponsoring vanpool services for employees that live on the North shore.

GHG Reduction:

473 MTCDE, 10% reduction in annual miles commuted by faculty, staff and students

BUSINESS TRAVEL

DEVELOP POLICIES TO ENCOURAGE TRAIN AND BUS TRAVEL FOR SHORTER BUSINESS TRIPS.

Details:

Loyola can explore ways to encourage its faculty and staff to use train and bus travel instead of air travel for shorter, regional trips. One possibility would be to set limits on the amount of airfare that can be reimbursed but fully reimburse bus and train fares. For example, if a person flies less than 250 miles, she or he would only be reimbursed for 75% of the ticket price, and if she or he flies less than 400 miles, only 90% of the ticket price would be reimbursed.

GHG Reduction:

To be determined.

CREATE A CULTURE OF SUSTAINABILITY: EDUCATION AND OUTREACH

The actions in this section do not directly reduce the carbon footprint of the university, but they contribute to the mission of the ACUPCC by "providing the knowledge and the educated graduates to

achieve climate neutrality.” Loyola’s students will graduate with a working understanding of climate change and how to mitigate it through their personal and professional actions.

ESTABLISH A PEER-TO-PEER EDUCATION PROGRAM TO ENGAGE STUDENTS, FACULTY AND STAFF IN MAKING LOYOLA’S CAMPUS MORE SUSTAINABLE.

Details:

Many colleges and universities have found that peer pressure can be a good thing when it comes to sustainability. They have established peer-to-peer educational programs, many times called “eco-reps” (for representatives), to allow students and/or faculty and staff to educate each other about sustainability and encourage energy efficient habits. The program can be designed to meet Loyola’s needs, but many examples exist at other universities. As with many other actions in this plan, there are many resources on the AASHE website to assist with planning and implementing a peer-to-peer education program.

Another option for offices (where there is less regular turnover than with students) is a “certification” program. The coordinator of such a program would develop a set of actions that offices can take to reduce their environmental impact, then certify offices who demonstrate that they have met the requirements. The offices would gain recognition through the display of a logo on their website and office door. If funds were available, the people in the offices who spearhead the effort to go green could be recognized through some type of reception or small gift.

CHALLENGE STUDENTS, FACULTY AND STAFF TO CHANGE THEIR HABITS THAT WASTE ENERGY BY HOLDING COMPETITIONS AMONG DORMITORIES AND OFFICE BUILDINGS.

Details:

People can have bad habits that increase the energy use of Loyola’s buildings. They leave the lights on when they leave a room; they leave their computers at full power 24/7; they take 30 minute showers. These and many other seemingly innocuous actions add up when thousands of people engage in them daily. Loyola can encourage energy smart habits by having an annual energy reduction competition. The competition would likely be done on a building by building basis because often many departments and purposes share one building. Energy use would be tracked for 1-2 months before the start of the competition and throughout the competition. The building occupants who reduced their energy use by the largest percentage would win some type of prize. The student and staff “eco-reps” could organize such a competition and serve as the motivator for their building co-occupants. It is generally a good idea to hold such a competition in the middle of the fall semester so that a baseline can be established early in the semester and then the good habits it engenders can benefit the university, in reduced energy demand, for the months ahead.

ASSIST PROFESSORS WHO WANT TO DESIGN NEW COURSES RELATED TO CLIMATE CHANGE AND SUSTAINABILITY.

Details:

Faculty members may have an interest in educating their students about climate change, but don’t have the resources to incorporate it into their existing courses or develop new courses centered on such

themes. The provost could encourage faculty to incorporate sustainability into their courses by providing small grants, funds for sustainability education themed conferences and workshops, and other supplemental support.

ESTABLISH A COURSE OR INTERNSHIP FOR STUDENTS TO BECOME INVOLVED IN THE CLIMATE ACTION PLANNING AND GREENHOUSE GAS EMISSIONS INVENTORY PROCESSES.

Details:

Hands-on experience with climate action planning and greenhouse gas emissions inventories can give Loyola graduates an edge in the job market in the coming years. Loyola can provide that experience through developing actions for the campus plans. The sustainability managers can keep a list of the topics that need to be researched for future climate plans, and students in a small class or internship could take on one or a group of topics to research. For example, a student interested in engineering could do the work to research a ground source heat pump system for the campus. As long as the work is documented well by the student(s), the results can be verified by a campus official and considered for future planning efforts.

OFFSET EMISSIONS

PURCHASE A TRACT OF LAND OFF CAMPUS FOR CARBON SEQUESTRATION AND COMPOSTING

Details:

Trees and soil can store carbon thereby offsetting emissions from campus activities. The existing campus locations are in an urban setting and offer little to no opportunities for on-campus carbon offsets. The purchase of a tract of land nearby in a more rural setting could have multiple benefits for the university. Carbon offsets could be created by planting trees, maintaining healthy soil, and composting the university's food waste. Food waste that goes to a landfill decomposes anaerobically and generates methane, which is a greenhouse gas 25 times more potent than carbon dioxide. (I.e. every metric ton of methane emitted counts as 25 MTCDE.) Food waste that is composted decomposes aerobically and generates carbon dioxide. That carbon is offset by the carbon that the plant used when it was growing, so composting is considered climate neutral. In addition to reducing methane emissions from food waste and offsetting emissions by planting trees and maintaining soil, the tract of land could be used by faculty and students for field trips and research.

GHG Reduction:

Composting: 1,518 MTCDE, 2,200 short tons (40% of existing dining services waste)⁷

Carbon sequestration: To be determined

⁷ Note: Loyola began composting some of its food waste with a commercial composting service during FY12, which will be included in the GHG inventory update.

MEDIUM TERM ACTIONS AND LONG TERM PLANNING

BUILDINGS

EMPLOY BEST PRACTICES FOR LABORATORY ENERGY EFFICIENCY, ESPECIALLY DURING CONSTRUCTION AND RENOVATION OF LABORATORY FACILITIES.

Details:

Laboratory facilities are some of the most energy intensive on a typical college campus, and Loyola has recently made a commitment to increase its portfolio of sponsored research. As funding increases, so will the use of laboratory facilities. The US Environmental Protection Agency and Department of Energy have partnered to promote best practices for laboratory energy efficiency through their “labs for the 21st century”⁸ (Labs21) program. The program offers guidance including case studies, brief topical guides on best practices, an equipment efficiency wiki, and other tools. Many of the practices outlined are only applicable to the design phase of new lab facilities, but a few steps can be taken in existing facilities.

The Energy-Efficient Laboratory Equipment Wiki can help investigators choose the models of equipment, such as sample freezers or centrifuges, that use the least amount of energy and still provide the needed performance. Since it is a wiki, users contribute information and the content changes regularly. Loyola can encourage its faculty and staff to consult the Labs21 website for guidance any time that they will purchase a new piece of equipment.

Another action that can be taken in existing laboratories is fume hood management. Fume hoods are an important safety feature in most labs, but they also use a large amount of energy in their operations. The simple act of training lab personnel to properly use the fume hoods can reduce energy use. At minimum, they can be trained to keep the sash closed completely when the hood is not in use, and they should ensure that air flow is not blocked by items placed in the hood. Students and new employees are likely trained to use the fume hood safely when they begin working, so adding information about using the hood as efficiently as possible could easily be added to the existing training protocols. Creation of a standardized training program for all labs will ensure consistent practices.

GHG Reduction:

To be determined

INSTALL A SOLAR SYSTEM ON CAMPUS TO OFFSET ENERGY USE AND PROVIDE A DEMONSTRATION TO STUDENTS AND VISITORS.

Details:

Though New Orleans does not have the solar resources of other parts of the country, like the southwest, solar hot water and solar photovoltaics are still viable sources of emission free energy. A local vendor

⁸ <http://www.labs21century.gov/index.htm>

recently provided Loyola facilities managers with an estimate for a 100 kilowatt (kW) system to be installed on the roof of the Communications/Music Complex building. They estimate that a 100 kW system could reduce Loyola's purchased electricity by approximately 135,000 to 139,000 kWh per year. On its own, at the price quoted, facilities managers found that this is not a cost effective project. However, solar prices have been dropping steadily, so this may become more feasible in 3 to 5 years. This project may also benefit from the instatement of the sustainability fund discussed above. If successful, study the feasibility of installing solar panels on all suitable roof surfaces.

GHG Reduction:

60-63 MTCDE per year (for a 100 kW system that saves 135,000 to 139,000 kWh of purchased electricity per year⁹), scalable

STUDY THE FEASIBILITY OF INSTALLING A GROUND SOURCE HEAT PUMP FOR CAMPUS HEATING AND COOLING.

Details:

Ground source heat pumps are devices that use the constant temperature of the earth to heat buildings in the winter and cool them in the summer. Loyola will consider the installation of a ground source heat pump to offset steam and chilled water generation from natural gas. A system would be designed to offset the winter heating needs of the university and a portion of the summer cooling needs. (A system cannot be designed to offset all of the summer cooling needs because the number of cooling days is much greater than the number of heating days. If a system were designed to meet all cooling needs, there would be a risk of heating the ground over time.) Many factors must be considered, so Loyola will explore this possibility for the long term. If feasible, it will be described in more details in future climate action plans.

GHG Reduction:

To be determined

COMMUTING

PROVIDE INCENTIVES FOR COMMUTERS TO BIKE AND WALK INSTEAD OF DRIVING TO CAMPUS ALONE.

Details:

Biking and walking are the only truly carbon-free methods of commuting, so they should be encouraged as much as possible. Loyola already offers a safe ride shuttle so that bikers and walkers can get a ride home if they find themselves on campus later than usual or with a flat tire. Other measures to encourage biking and walking could entice more students and staff to forgo automobiles. For bikers, it would be useful to offer a repair station where minor repairs can get people back on the road quickly. The station could have basic tools that people can use, a stand, air for tires, and a way to access basic instructions (e.g. a touchscreen computer or signage). It would also be useful to bikers to have a vending

⁹ Amount of electricity produced by the system decreases over time.

machine for inner tubes since other venues, like the bookstore, likely aren't open 24 hours per day. One example of a bicycle repair station can be found here: <http://bostonbiker.org/2011/03/22/cambridge-installs-self-help-tool-stations/>.

For both bikers and walkers, one of the barriers may be arriving at work or school perspiring, especially given New Orleans climate. Changing and/or showering stations around campus would allow those people to feel more comfortable and confident. When buildings are renovated, one or more bathrooms could be converted to basic unisex shower facilities. (This could result in LEED points if it serves the requisite number of building occupants.) The school could also publicize the changing areas in the recreation center since those are already in service and free to faculty, staff and students.

GHG Reduction:

473 MTCDE, 10% reduction in annual miles commuted by faculty, staff and students

DEVELOP A CARBON MARKET FOR LOYOLA COMMUTERS.

Details:

Carbon markets are emerging as a solution to climate change and there are many examples¹⁰ of both voluntary and mandatory carbon markets around the world. Carbon markets are based on “cap-and-trade” which entails setting a limit on the amount of a pollutant that can be released by all polluters, issuing permits to release a certain amount of the pollutant to each polluter, and then allowing the polluters to trade the permits. Some polluters may be able to cost effectively reduce their pollution by more than their limit, and others may find it difficult to reach their target. A market for pollution permits allows the company who can't reach their target to purchase additional credits from the company that exceeded their target. The European Union instituted their Emissions Trading System (ETS) in 2005, and it is binding on the 27 EU member nations. Though there have been problems with the implementation of the program, it has resulted in a reduction in carbon emissions. In the United States, there has been little success with carbon markets, all of which are voluntary. Cap-and-trade has been successful in the US in regulating other types of pollutants, though.

Loyola can attempt to create a micro carbon market for its commuting students, faculty and staff. Once commuting emissions are more accurately measured, Loyola can institute a cap-and-trade system in an attempt to reduce emissions through an open “market.” While the comparison to other markets is not perfect, using commuting emissions to engage the campus community in carbon “trading” would at minimum be an interesting educational tool.

The “cap” would be based on the emissions if every student and employee drove a vehicle to campus with a certain fuel economy. If a person chooses to use a mode of transportation with fewer emissions (e.g. bike, carpool, or take the streetcar) she or he would have carbon “credits” to *sell*. If a person chooses to use a mode of transportation with more emissions (e.g. driving an SUV), she or he would

¹⁰ Karbon, Gary. 2012. *Cap and Trade and Carbon Credits: An Introduction*. TCC Publications, Special Report 5.

need to *purchase* carbon “credits.” The University would have to create a marketplace for these “credits.” It is possible that a simple cash market would work where buyers and sellers trade permits, and this would be most comparable to an actual cap-and-trade system. However, it is likely that a modified system would be needed in the campus setting. For example, the cost to drive a less fuel efficient vehicle could be paid with the price of a parking permit and the benefit of driving a more fuel efficient vehicle or carpooling is in the form of a discount on a parking permit. If using the parking permit were employed, those who do not drive or carpool would have to be able to register for some other type of benefit. They could be paid a small amount of cash or be given some other incentive, like discounts for other campus services. Over time, the “cap” on emissions would become tighter, meaning that there is more costly to drive a less efficient vehicle and more beneficial to move to less carbon intensive forms of transportation.

The complexity of such an undertaking would necessitate pilot programs for each group of stakeholders (students and faculty/staff). A class project would be an ideal setting to engage students in a pilot program. Faculty and staff participating in a pilot program could be from a particular department or office. If successful, the program would be ramped up to include participation by all campus community members.

GHG Reduction:

To be determined

BUSINESS TRAVEL

EXPLORE THE PURCHASE OF CARBON OFFSETS FOR ALL BUSINESS TRAVEL.

Details:

Travel is often necessary for Loyola to conduct its business. Faculty attend conferences to disseminate their knowledge and connect with colleagues in their fields. Recruiters often travel to distant cities to attend college fairs and meet with potential students. Reducing travel is one option, but eliminating business travel entirely would not be possible. Loyola can explore carbon offsets to neutralize its climate footprint from the travel that is necessary. Many carbon offset options are available. Short of choosing alternates to flying, which would still entail some carbon footprint, carbon offsets may be the only viable way to eliminate the carbon footprint of Loyola’s business travel. This option will be explored further and future climate action plan updates will include a discussion of the findings and financial feasibility.

GHG Reduction:

To be determined

BUILD OR EXPAND TELECONFERENCE FACILITIES ON CAMPUS.

Details:

Participation in conferences, meetings, and professional societies is an important aspect of scholarship and research. Loyola can explore ways for its faculty and staff to engage in such activities through

teleconferencing. This is more of a long-term option because right now there are likely few conferences or meetings that are set up to teleconference their participants. However, increasing awareness of climate change has already prompted some forward-thinking organizations to host “virtual” conferences and consider webinars over in-person meetings.

Recruiting students is another travel-intensive activity that is critical to the mission of the university. Loyola can engage alumni as “ambassadors” to help recruit students in their home towns. Admissions office staff could connect to a group of potential students in a remote location via teleconferencing. She or he could make their presentation and answer questions over the video conference, but the alumni who live in town could be on hand to provide the “human touch” to the recruiting process. For less than the cost of a plane ticket, the alumni could even be paid a small stipend to thank them for their time and compensate them for such tasks as setting up the event. By demonstrating commitment to sustainability in this way, Loyola will attract bright young people who are interested in bringing their talents to bear on the monumental task of mitigating climate change.

GHG Reduction:

To be determined

INCLUDE THE COST OF CARBON OFFSETS IN STUDY ABROAD TUITION AND FEES.

Details:

Studying abroad is a valuable experience and one that Loyola encourages for its students. Since alternative modes of transportation are generally out of the question, Loyola can begin including carbon offsets for air travel in all of its study abroad program fees. The study abroad program manager(s) and the sustainability manager(s) can explore carbon offset programs and choose a suitable vendor for voluntary carbon offsets. They must ensure that the offsets purchased meet all of the requirements set forth by the ACUPCC guidelines. Once a vendor is chosen, fees can be established and assessed along with the tuition and other fees to the student. The carbon offset calculator at climatefriendly.com/flight was used to estimate greenhouse gas emission for study abroad in the inventory, and a very brief exploration of roundtrip offset prices yielded a range of \$17.59 (for a flight from New Orleans to Mexico City, Mexico) to \$146.99 (for a flight from New Orleans to Sydney, Australia). Even if Loyola uses a “bulk” method of purchasing offsets, fees assessed to students should be based on the distance they are travelling so that they understand the environmental impacts of their decision to travel abroad.

GHG Reduction:

4,000 – 5,000 MTCDE per year (100% of travel offset, completely financed by the students who are travelling)

CREATE A CULTURE OF SUSTAINABILITY: EDUCATION AND OUTREACH

ESTABLISH A COMMON CURRICULUM REQUIREMENT TO PROMOTE ENVIRONMENTAL LITERACY.

Details:

The students who are in college now and in the future are facing a drastically different world than their parents and grandparents, largely thanks to climate change. If public opinion polls are any indication, the general public has been vastly undereducated about climate change. Loyola can ensure that its students have a basic understanding of climate change science and solutions by incorporating basic knowledge about climate change and sustainability into the existing common curriculum that all undergraduate students must follow. The common curriculum was recently revised, therefore further revisions to include environmental literacy would have to be considered at the time of the next scheduled revision.

OFFSET EMISSIONS

PURCHASE RENEWABLE ENERGY CERTIFICATES (RECs) AND/OR CARBON OFFSETS.

Details:

The best way to reduce the climate footprint of Loyola's buildings is by reducing energy use through efficiency and switching to carbon free energy sources. However, there comes a point where the costs of such projects outweigh the benefits and less expensive solutions must be sought, at least temporarily. Renewable energy certificates (RECs) and Carbon Offsets are a cost effective solution that can be employed to meet carbon reduction targets. RECs are a product that represents the environmental benefits of renewable energy that can be sold to customers who are too far away to buy the actual "clean" electricity. They are sold in units of kilowatt hours (kWh) or megawatt hours (MWh). For example, a wind farm in Texas that generates 1 MWh of carbon-free electricity can sell the electricity to the grid and sell RECs to a customer in New Orleans. When they do so, the electricity that goes to the grid "counts" as regular "dirty" energy with the same carbon footprint as any other MWh produced in the region. The RECs that are sold to the customer in New Orleans represent the carbon free "clean" energy and the customer then subtracts the carbon emissions that resulted from that amount of electricity use from their inventory of GHGs. Similarly, carbon offsets represent the carbon savings of projects outside the boundaries of an institution that are then credited to that institution. The main difference is that carbon offsets are sold in tons or metric tons of carbon dioxide equivalent instead of in units of energy. Another difference is that RECs are only applicable to electricity, but carbon offsets can count against any source of GHG emissions. Also, carbon offsets can be created by projects that do not involve electricity production. For example, carbon offsets can be created by planting new trees. For more information about carbon offsets, see the ACUPCC Voluntary Carbon Offset Protocol¹¹, which prescribes the guidelines for purchasing offsets to meet the ACUPCC.

Every effort can be made to purchase carbon offsets and renewable energy certificates that benefit projects close to home. There are many efforts underway in the region to generate carbon offsets from coastal restoration projects. Local scientists are studying if and how wetlands sequester atmospheric carbon. The results of their work will pave the way for state and private interests to sell carbon offsets for projects that restore existing wetlands and create new wetlands. Coastal restoration is critical for the

¹¹ <http://www.presidentsclimatecommitment.org/resources/guidance-documents/offset-protocol>

survival of Southeast Louisiana, so the purchase of offsets from those projects will be especially beneficial to Loyola's sustainability goals.

GHG Reduction:

To be determined

CONCLUSION

The actions laid out in this plan are only a start for Loyola to reduce its direct and indirect emissions of greenhouse gases. Further study is needed, starting with the improvement of Loyola's inventory of Scope 3 emissions. Loyola can undertake as many of these projects as possible in the near term while studying projects that could have a larger impact for future editions of the climate action plan. The most important step that Loyola can take immediately to reduce its facilities related emissions is to institutionalize sustainability by creating the staff position in the Office of Facilities Systems. The chosen candidate can then guide the process of implementing these and other projects. The goal is to first make Loyola's facilities as energy efficient as possible then begin to meet the remaining energy needs through the least carbon intensive methods that are fiscally feasible. The most important step that Loyola can take immediately to reduce its non-facilities related emissions is to begin the process of engaging the entire campus community and helping them to understand how they contribute to Loyola's climate footprint through their actions. Once they understand, they will be more engaged in reducing their impact. With these strategies, Loyola can become a climate neutral campus over the coming decades.

APPENDIX A: SAMPLE ENERGY STAR PURCHASING POLICY

Note: The structure and elements of the policy below are based on the guidance provided by the LEED for Existing Buildings: Operations and Maintenance rating system.

PURPOSE

This policy establishes guidelines for the purchase of electronic items for the express purpose of reducing the climate impact of Loyola University's facilities.

SCOPE

This policy applies to the purchase of electronics and appliances for which there is an ENERGY STAR qualification available. Examples include computers, peripherals, light bulbs, commercial kitchen equipment, and clothes washers. A complete listing of qualifying products is available at www.energystar.gov.

PERFORMANCE METRIC

Performance will be evaluated by the purchasing department, which will perform an annual audit of purchasing records. They will choose [#] departments each year and evaluate their records for compliance with the policy. They will look at receipts, reimbursement requests, and any other necessary records to ensure that the models of electronics and appliances purchased are ENERGY STAR qualified.

GOALS

The goal of this policy is to reach a level of 95% ENERGY STAR among all potentially qualifying purchases.

PROCEDURES AND STRATEGIES

The purchasing department will assist departments in identifying ENERGY STAR qualified electronics and appliances. They will also develop and regularly update a list of cost effective ENERGY STAR qualified products and vendors that sell them at the best prices. This will allow departments to quickly and easily make choices when they are ready to purchase. Loyola may be able to negotiate preferred pricing for a limited list of products, which would further encourage departments to choose those models.

If a department or division has researched a product and found that none of the ENERGY STAR qualified models will meet their needs, they must document their research and their justification for purchasing the non ES qualified product. Similarly, if there are budget constraints that prohibit the purchase of ES qualified products, they must be documented. Documentation should include price and specification quotes from the vendor and/or manufacturer.

RESPONSIBLE PARTY

The purchasing department will be responsible for conducting annual audits of purchasing records and for developing lists of preferred models in each applicable category of electronics and appliances commonly purchased on campus. Individual departments and divisions will be responsible for the actual

purchase of ES qualified products. They must keep a record of each purchase and any documentation justifying the purchase of non-ES qualified products for a minimum of 3 years.

TIME PERIOD

This policy will be in effect from August 1, 2013 on.