



QUINSIGAMOND
Community College

Climate Action Plan

2009 – 2050

Approved by President Gail Carberry
September 1, 2009

Quinsigamond Community College Climate Action Plan

Executive Summary

Quinsigamond Community College has developed a Climate Action Plan that addresses two specific targets:

- (a) achieving the carbon reduction goals identified by the Commonwealth of Massachusetts Executive Order 484, which calls for a 25% reduction below 2002 levels of greenhouse gas emissions by 2012, followed by a 40% reduction in 2020, and an 80% reduction in 2050.
- (b) achieving the goal of climate neutrality agreed to through the American College and University Presidents Climate Commitment (ACUPCC), which calls for reducing our carbon emissions as much as possible, then offsetting the remainder of the emissions through the purchase of carbon offsets to become “carbon neutral”.

In addressing these important goals, Quinsigamond Community College is doing its part to slow climate change and reduce carbon emission levels within the parameters established in 1997 by the Kyoto protocol.

EMISSIONS TARGETS

In 2008, the College conducted an emissions inventory and established fiscal year 2002 as its baseline year from which to measure all future reduction goals. In 2002, our Scope 1, 2 and 3 emissions accounted for 8,802.5 metric tonnes of eCO₂ (MTeCO₂).

In the spirit of Executive Order 484, a 25% reduction in greenhouse gas emissions would result in 2012 emissions that will not exceed 6,601.8 MTeCO₂. In 2020, our emissions should not exceed 5281.5 MTeCO₂, and in 2050 our emissions should not exceed 1760.5 MTeCO₂.

To achieve the carbon neutrality goal of the ACUPCC, we must reduce Scopes 1, 2 and 3 emissions to the point of achieving and maintaining zero net greenhouse gas emissions. This can be a particularly difficult challenge for a commuter campus such as ours. Most organizations look only at direct emissions (Scope 1 and 2). Scope 1 refers to direct emissions from the burning of heating oil, natural gas, and gasoline for college vehicles. Scope 2 refers to direct emissions from electricity use. The President’s Climate Commitment is unique in that it also requires the inclusion of indirect emissions (Scope 3). Scope 3 refers to indirect emissions from commuters and business air travelers. For colleges and universities that have residential campuses, commuting is something they have some control over, but for commuter campuses such as Quinsigamond Community College, travel to and from the campus is almost impossible to influence, particularly given the lack of transportation options available to our campus. We must be creative in the way in which we deliver instruction, in order to successfully achieve a level of carbon neutrality. Otherwise, becoming carbon neutral will come at a huge expense for our campus, as the difference between reductions and remaining emissions must be eliminated through the purchase of Renewable Energy Credits (RECs).

ACTION PLAN

Quinsigamond Community College has been engaged in a number of strategies over the past several years, which have resulted in a reduction in carbon emissions and movement towards greater sustainability. These are explained in more detail in the full action plan. In addition, we are considering several projects which should help us achieve our overall carbon reduction goals mentioned above. Figure 1 in the Climate Action Plan highlights our emissions levels if we continued “business as usual” absent any effort to reduce emissions. Figure 1 also reflects the emission reduction goals of the Commonwealth of Massachusetts and our campus climate commitment goals following ACUPCC

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guidelines. Figures 2 and 3 in the Climate Action Plan highlight the impact our emission reduction projects will have on our emissions levels over time, and when we expect to be carbon neutral. These projects are incorporated into our broader campus mitigation strategies summarized below.

1. Mitigation Strategies

A significant part of our Climate Action Plan focuses on a structured set of clearly defined mitigation strategies which fall into five general categories: (1) energy efficient operations, (2) power plant and fleet/fuel management, (3) behavioral/cultural change incentives, (4) on-campus renewable energy production, and (5) carbon off-sets.

To address energy efficient operations involving buildings, we have focused on energy conservation measures, maximization of space, and applying LEED standards to new construction and landscaping. With regards to technology, we have focused on power management tools, server virtualization, data center consolidation, monitor and computer reduction, and print management solutions. We believe our strategies in these areas will result in a reduction of, at a minimum, **1,481.23 MTeCO₂** annually.

To address power plant and fleet/fuel management, we have focused on power plant fuel conversion, electric GEM cars, and more fuel efficient campus vehicles. We believe our strategies in these areas will result in a reduction of approximately **191.97 MTeCO₂** annually.

To address behavior and cultural incentives, we have focused on energy curtailment, recycling, purchasing environmentally preferable products, alternative ways of working, commuting reductions, and e-campus and other IT initiatives. We believe our strategies in these areas will result in a reduction of approximately **367,369.7 MTeCO₂** annually. This significant reduction is tied directly to distance education, providing our campus with a way in which to reduce the number of commuters, and thereby address the most significant contributor to our campus emissions.

We have taken steps to explore wind, solar, and biofuel renewable energy options, as well as considering the purchase of renewable energy credits (RECs), as ways in which we might address additional mitigation strategies for reducing our carbon emissions.

2. Making Climate Neutrality and Sustainability a Part of the Curriculum and Educational Experience

Faculty at Quinsigamond Community College have understood for quite some time, the importance of introducing topics of sustainability across the curriculum, and have often worked collaboratively through team teaching and other methods to ensure that the information within their subject areas are also integrated into the learning taking place in other subject areas. Some science, biology, food, auto technology, and energy utility technology credit courses have been and are being developed which are specific to climate change and many general education courses such as English and sociology have integrated a sustainability theme into their coursework. In addition, a proposal for general education learning goals is under development, which will ensure that climate neutrality and sustainability issues are incorporated into the curriculum for all associate degree-seeking students. Non-credit courses, workshops and programs are also in development to address regional workforce needs regarding labor pool development and employee effectiveness in the emerging green economy.

Although Quinsigamond Community College is a commuter college with thousands of students attending classes each day and evening between job and family commitments, there are several ways in which the student learning experience involving climate neutrality and sustainability takes place: class activities and learning labs that involve demonstrations of sustainable practices, Honor's Program projects with a

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focus on local food production, Earth Day events, student club interests in environmentalism, campus newspaper articles produced by student journalists targeting sustainability and climate issues for raising awareness, and Student Life Office and Student Senate sponsored activities which model sustainable practices.

3. Community Outreach

Quinsigamond Community College has engaged in efforts to reach out to our campus community and to our larger Worcester community, to inform, inspire, and build upon broader integrated strategies which address a common goal of sustainability and carbon reduction. As a partner in the Clean Energy Technology Working Group – a collaborative effort on the part of Massachusetts Community Colleges and Technical High Schools, we are joining in efforts to build the capacity of a Massachusetts Clean Energy Education and Training Center to meet workforce development needs of the fast-emerging clean energy/energy services sector. We have also hosted a forum for Presidents and CEOs of area businesses to brainstorm around specific issues, in an effort to develop an industry-driven vision that focuses on labor pool development, employee effectiveness, aligning programs and services, developing career tracks, and documenting knowledge and skill set deficiencies, around a theme of Sustainable Energy and Green Technology. The President has been a guest on a local radio program called “Energy Freedom Fighters” to discuss the energy savings measures the college has been engaged with over the past few years. In addition, many experiential learning activities take place throughout the year where students and faculty engage the public through the hosting of dinners that use locally grown foods, to the creative expression of Earth Day events, to the informational focus on sustainability in the campus newspaper, to the campus collaboration with millions of other global participants to shut-off non-essential lighting for an hour in the event called “Earth Hour”, to extending free electronic recycling collection to the Worcester community each Spring. For the past year, a “Green Thought of the Day” has been sent out electronically once each week to provide members of the college community with personal strategies for reducing their own carbon footprint and understanding broader issues around sustainability and climate commitment. In addition, there are discussions underway to consider weekly brown bag lunches around green topics, and enhancing the information available on the campus website to promote energy conservation, recycling and other initiatives.

CONCLUSION

Quinsigamond Community College is proud of the work it has achieved so far in conserving energy and reducing carbon emissions, and is honored to be a part of a continuing global effort to make a significant difference in slowing climate change. We believe that, in fiscal year 2009, we are meeting and exceeding the goals of both the Commonwealth of Massachusetts and the American Colleges and University Presidents Climate Commitment, and will continue to strive for greater improvements in sustainability. This Climate Action Plan looks forward, beginning in fiscal year 2008 and will be reviewed annually and updated as conditions change and technology improves.

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Message from the President
Dr. Gail Carberry



As a community college, Quinsigamond views Climate Commitment as a logical extension of its role in strengthening the “community” we serve. Whether the term “community” implies our immediate neighborhood, our state, our nation or our world, we recognize that we affect a difference through the various impacts we make. QCC purposefully chooses to make positive impacts rather than negative ones.

As a College, we have the opportunity to influence the minds of a generation that is soon to occupy positions of decision making power in our community. We also influence the present thoughts and possibly the day to day actions of about 25,000 students and staff annually.

Our commitment to do the right things toward reaching climate neutrality demonstrates to our students the importance of ethical behavior. It enables us to concretely demonstrate intersecting points of science, philosophy, management, engineering, politics and economics in addressing real world challenges and opportunities.

QCC is part of a system of fifteen community colleges in Massachusetts. We are proud that each and every President at the fifteen colleges has signed the Presidents’ Climate Commitment. Jointly, we are poised to share our best practices and to learn from each other.

Like many who grew up as part of the *Baby Boomer* generation, I was raised in a “throw away” society of plenty where we rarely thought about our wasteful habits and their impact on the world. Now, as an individual blessed to be raising a young grandson, I share the lessons of our College’s climate commitment with a new generation. Together, my grandson and I make choices at home “to save the polar bears” and to protect our planet as a whole. The lessons learned from QCC’s climate commitment are also rippling through the households of our students and our employees. We are beginning to learn and teach new habits to ourselves and others.

Our facilities planning and our strategies to accommodate enrollment growth are viewed through a changing lens as we advance our climate commitment. We believe that we can reach our goals for climate neutrality.

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Introduction:

Background:

Quinsigamond Community College is an Associate Degree granting college located approximately 4.5 miles from downtown Worcester, Massachusetts. The college offers over 70 associate degree and certificate career options in the fields of Business, Technology, Liberal Arts, Health Care and Human Services, and serves over 13,000 students annually. The main campus is approximately 50.4 acres, with a topographic change between the eastern and western boundaries of 104 feet, has 380,786 square feet of assignable space and 634,591 square feet of gross building area, along with 1,558 parking spaces on campus. The main campus was formerly the home of Assumption Preparatory Academy, established in the early 1900s by the Augustinians of the Assumption as a predominantly French-Canadian Catholic institution. The campus' main Administration Building was originally constructed in 1906, with additional wings added in the 1920s and 1950s. The Commonwealth of Massachusetts acquired the property in 1964, and added 3 new buildings in 1965. It wasn't until 2004 that another new building was added to the campus. The Commonwealth of Massachusetts owns all buildings on our campus, and responds to upgrades, renovations and new construction initiatives as part of its overall green building strategy and carbon emission goals for Commonwealth buildings.

Basis for Action:

The world is very different now than it was in the early 1900s when our first buildings were constructed on campus. Not only do we have to be more energy conscious because of the rising cost of energy, but we also have to be more globally conscious because of the interconnectedness of the global community. We have to be good role models to the communities we serve, prepare our students for the world and the emerging workforce, and ensure that our business practices do no harm. Climate change, and the role we play in it, has taken on a new precedence as current scientific evidence necessitates an urgency of action on our part.

Consider the information reported by the Intergovernmental Panel on Climate Change (IPCC) in the 4th IPCC's Assessment Report (AR4), called "Climate Change 2007". The IPCC is the leading body for the assessment of climate change, established by the United Nations to provide the world with a clear, balanced view of the present state of understanding of climate change. Its report was developed by 2500+ scientific expert reviewers and 800 contributing authors from 130 countries, and it tells us that GHG emissions have grown since pre-industrial times, with an increase of 70% between 1970 and 2004, and are a direct result of human activity. In order to stabilize the concentration of GHGs in the atmosphere, emissions need to peak and then decline thereafter. The lower the stabilization level, the more quickly this peak and decline would need to occur. In order to achieve the lowest stabilization range assessed, we, as a world community, need to peak our CO₂ emissions by the year 2015! As Jim Hansen, Director of the NASA Goddard Institute for Space Studies stated in 2006:

We have to stabilize emissions of carbon dioxide within a decade, or temperatures will warm by more than one degree. *That will be warmer than it has been for half a million years*, and many things could become unstoppable. If we are to stop that, we cannot wait for new technologies like capturing emissions from burning coal. We have to act with what we have. This decade, that means focusing on energy efficiency and renewable sources of energy that do not burn carbon. We don't have much time left. (Hansen, 2006)

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The most recent research being conducted at MIT, reveals that climate change may actually be twice as severe as was previously estimated (MIT Tech Talk, May 20, 2009). This only adds to the importance of acting as rapidly as possible to reduce our own campus carbon emissions in as short a time frame as feasible, because our contributions to carbon reduction will be critically needed to curb the increased risk of rapid global warming.

In the past several years, a number of group initiatives have taken shape in our region, which have reinforced and supported a broad concern for sustainability and carbon reduction.

In August 2001, the New England Governors and Eastern Canadian Premiers issued a Climate Change Action Plan which identified the following regional goals:

- Short-term Goal: Reduce regional GHG emissions to 1990 emissions by 2010.
- Mid-term Goal: Reduce regional GHG emissions by at least 10% below 1990 emissions by 2020, and establish an iterative five-year process, commencing in 2005, to adjust the goals if necessary and set future emissions reduction goals.
- Long-term Goal: Reduce regional GHG emissions sufficiently to eliminate any dangerous threat to the climate; current science suggests this will require reductions of 75–85% below current levels. (*NEGECP Climate Action Plan 2001, pg 10*)

Then, in 2006, presidents within higher education began a movement to publicly step up to the plate and take a personal interest in addressing the issue of climate change and carbon reductions on their college campuses. These Presidents initiated a commitment, called the American College and University President's Climate Commitment (ACUPCC), in which they pledged their institutions to achieve carbon neutrality by a specific period of time to be determined by each campus. For the purposes of the ACUPCC, climate neutrality is defined "as having no net greenhouse gas (GHG) emissions, to be achieved by minimizing GHG emissions as much as possible, and using carbon off-sets or other measures to mitigate the remaining emissions." This commitment included (a) Establishing an institutional structure to oversee the development and implementation of the school's program; (b) Completing an emissions inventory; (c) Establishing a climate neutrality action plan; (d) Taking some immediate steps to reduce greenhouse gas emissions; (e) Integrating sustainability into the curriculum; and (f) Making our climate action plan, inventory and progress reports publicly available. (*ACUPCC Implementation Guide, September 2007, vl.0, pg. 3*)

Finally, in April 2007, Massachusetts Governor Deval Patrick issued Executive Order No. 484 "Leading By Example – Clean Energy and Efficient Buildings", which set aggressive targets for state agencies as a whole, to meet the following goals by 2012 (with additional larger goals set for 2020 and 2050): 25% greenhouse gas emission reductions from 2002 levels, 20% energy reduction per square foot from 2004 levels, 15% of energy consumption procured from renewable energy sources, and 10% reduction in water use from 2006 levels. All new construction and major renovation over 20,000 square feet must meet MassLEED Plus requirements. All new construction less than 20,000 square feet must meet MassLEED Plus, achieve 20% above the Mass Energy Code, or meet Advanced Buildings energy criteria. The intent of this order was to help state agencies minimize the environmental impacts of their operations and activities and to promote innovative solutions to critical environmental problems. (*Taken from the Official Website of the Executive Office for Administration and Finance*)

The state's Division of Capital Asset Management (DCAM) is responsible for the construction and maintenance of all state facilities, of which the buildings on the Quinsigamond Community College campus are included. As a result of Executive Order 484, DCAM is charged with initiating several activities that our campus would ordinarily be initiating if we were privately managed. As such, we are and have been working in collaboration with DCAM to ensure that sustainability and climate

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commitment concerns on our campus are addressed when feasible and appropriate. DCAM is charged with the following (*Taken from the Official Website of the Executive Office for Administration and Finance*):

- Initiating comprehensive large-scale energy efficiency projects at all appropriate facilities over 100,000 square feet.
- Undertaking “retro-commissioning” at all applicable buildings over 50,000 square feet.
- Considering energy performance in sighting and procuring leased space.
- Developing a facility maintenance program for lighting and HVAC systems.
- Supporting training of client agency personnel on energy, water and sustainable practices.
- Assisting in the development of an Energy Information System to track agency energy use.

Guiding Principles:

Higher education can play a critical role in addressing global warming. As articulated by the President’s Climate Commitment, the following principles apply:

- ✓ Training tomorrow’s architects, engineers, attorneys, business leaders, scientists, urban planners, policy analysts, cultural and spiritual leaders, journalists, advocates, and politicians – all will play a central role in transforming today’s GHG intensive economy into tomorrow’s low-carbon economy.
- ✓ Ideal settings to develop workable new strategies, systems, behaviors and technologies that can be scaled up to the community and state levels.
- ✓ Higher Ed is a \$317 billion industry that employs millions and spends billions on fuel, energy and infrastructure. If every US campus used 100% clean energy, it would nearly quadruple our current renewable electricity demand, create thousands of new jobs, support emerging “green” industries, and speed the availability of innovative financing options.
- ✓ Community colleges are particularly unique in that many of their students are already in the workforce and will therefore augment their experience with knowledge and skills about clean energy and technologies, to help society make the necessary transition. (*ACUPCC A Call for Climate Leadership, pgs 5-6*)

Definitions:

Before addressing action, it is important first to clarify definitions of terms used throughout this plan.

- ❖ Global warming: the name given by scientists for the gradual increase in temperature of the Earth's surface that has worsened since the industrial revolution.

Background: There is more CO₂ in the atmosphere now than at any time in the last 650,000 years. Scientists expect that, in the absence of effective policies to reduce greenhouse gas pollution, the global average temperature will increase another 2.0 degrees Fahrenheit to 11.5 degrees Fahrenheit by 2100. Even if the temperature change is at the small end of the predictions, the alterations to the climate are expected to be serious: more intense storms, more pronounced droughts, coastal areas more severely eroded by rising seas, increased distribution of infectious diseases. At the high end of the predictions, the world could face abrupt, catastrophic and irreversible consequences. *Source: <http://fightglobalwarming.com/>*

- ❖ Carbon Footprint: a measure of the impact human activities have on the environment in terms of the amount of green house gases produced, measured in units of carbon dioxide.

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A Carbon Footprint is made up of the sum of two parts, the direct / primary footprint and the indirect / secondary footprint.

- i. The primary footprint is a measure of our direct emissions of CO₂ from the burning of fossil fuels including domestic energy consumption and transportation (e.g. car and plane).
 - ii. The secondary footprint is a measure of the indirect CO₂ emissions from the whole lifecycle of products we use - those associated with their manufacture and eventual breakdown.
- ❖ **Carbon Neutral:** Having no net greenhouse gas emissions. This is usually achieved by combining the following actions:
- ✓ Limiting energy usage;
 - ✓ Obtaining electricity from a renewable energy sources; and
 - ✓ Offsetting the remaining emissions by purchasing carbon credits.

Measures Used:

For determining our campus carbon footprint and mapping our trajectories in order to assist us in developing a comprehensive plan of action, we used the Clean Air-Cool Planet Campus Carbon Calculator tool, found at <http://www.cleanair-coolplanet.org/>.

When estimating metric tonnes of eCO₂ (MTeCO₂) burned by previous and current activity for discussion and comparison purposes in the narrative, we used the U.S. Environmental Protection Agency Greenhouse Gas Equivalencies Calculator: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>, in addition to information consolidated by Carbon Fund.org, found at http://www.carbonfund.org/site/pages/carbon_calculators/category/Assumptions/.

Air miles were determined using an air miles calculator found at: http://www.airtimetable.com/air_mile_calculator.htm.

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Action Plan

The Climate Neutrality Action Committee spent the last year reviewing steps that have already been taken to reduce carbon emissions on our campus, and exploring steps that need to be taken to address our more immediate concerns for further carbon reductions and achieving climate neutrality, as well as addressing our long-term and ongoing concern for education and job training around this important issue. Their research confirms the wonderful work that has taken place in all corners of the campus for the past several years, and makes recommendations for moving forward on a path toward carbon neutrality. The Campus Action Plan becomes the foundation from which we make decisions and measure outcomes. It is intended to be an evolving plan, which will be reviewed on an annual basis, and improved upon as new technologies, opportunities and ideas make additional solutions possible for tomorrow that are not available today.

To be successful, our Campus Action Plan must become an integral part of the way in which we do business. By institutionalizing our commitment, we begin on a path of true cultural change. Climate Commitment is a shared responsibility with the strategic vision for addressing it being guided from the highest levels of campus leadership, and with each branch of the college accountable for actions specific to its area. To guide this process, we will be incorporating our commitment into key documents, such as our Strategic Plan, our Vision and Mission Statement, our Plan of Education, and Governance Initiatives addressing campus-wide policies. At appropriate All College Day events, the President will include updates on our progress towards meeting our carbon emission goals, as part of the overall “state of the college” presentation. The President and top campus leadership will continue to publicly express their support and encouragement for those engaged in addressing aspects of the Action Plan, and will guide and monitor activity within their areas of responsibility, to ensure that a high level commitment and passion for achieving carbon neutrality is evident to the entire campus community.

Quinsigamond Community College has an obligation to prepare its learners for the challenges they will face in a complex and evolving community and world. Impacting, or being impacted by climate change reflects one of those challenges. As such, we will address the curricular component of this problem by making climate change and sustainability a part of the curriculum and other educational experience for all our students, so as to address the urgent need for future professionals, leaders and citizens in all disciplines to be engaged in and part of the solution to these problems.

Engaging the public in climate concerns will be an added approach to demonstrate our commitment to our community at large. As such, we will take action to create student, staff, faculty and community partnerships, which will emphasize our connections to one another, and the need for joint approaches in addressing larger societal concerns.

Our Campus Action Plan begins first with an inventory of our current campus emissions, where we will be if we continue to conduct “business as usual”, and how taking specific actions over time to reduce our emissions, will reduce that trajectory. It then moves into a discussion involving our intended mitigation strategies. This will address our goal of carbon neutrality. We will also speak to our strategy for addressing education and community outreach efforts, as a demonstration of our understanding that we serve a unique role within higher education. Finally, we will discuss financing strategies and ways in which we will track our progress in meeting our goals.

We believe we will achieve carbon neutrality by fiscal year 2009.

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A. Campus Emissions

Quinsigamond Community College established fiscal year 2002 as its baseline year for measuring campus carbon emissions. In fiscal year 2008, the college conducted an emissions inventory, reflecting campus carbon emissions from fiscal years 2002 - 2007. This inventory accounted for Scope 1, 2 and 3 emissions, as required by the American College and University President's Climate Commitment (ACUPCC).

Our emissions inventory revealed a steady increase in emissions through fiscal year 2005, reflecting the increased student enrollments and the construction of a new library on campus. The gradual decrease in emissions from fiscal year 2005 forward reflected a commitment to energy conservation following a detailed energy audit in 2005 and the implementation of energy conservation measures in 2006 (lighting upgrades and controls, vending machine controllers, installation of low-flow devices in faucets, showers, urinals and toilets, HVAC insulation, and window film). While these measures helped us significantly, they were not enough as our enrollments continued to increase, and our campus continued to expand.

As mentioned previously, our emissions are tracked in three scopes, in accordance with the International Green House Gas (GHG) Protocol Standards:

Scope 1 is derived from direct emissions from burning fossil fuels for vehicles and oil and natural gas.

Scope 2 is derived from direct emissions from electricity usage.

Scope 3 is derived from indirect emissions from commuters and business air travel.

It should be noted that many organizations, while taking into account their Scope 3 emissions, measure progress toward carbon neutrality primarily from Scope 1 and Scope 2 emissions. These are the activities they have direct control over, and some even argue that Scope 3 emissions are in some way already being accounted for in some other organization's Scope 1 and 2 emissions. As mentioned above, the ACUPCC requires that we measure the impact of all three Scopes, and include them in our carbon neutrality goals. For residential campuses, this seems like a reasonable request, because they have options available to them for controlling student commutes. For commuter campuses, however, this is much more challenging. While there are steps that can be taken to impact some commuters, the burden of offsetting commuter emissions makes the task of achieving carbon neutrality much more difficult. While additional transportation supports from the City of Worcester and the State may have a slight impact on our commute reductions, our strategy for addressing this challenge has been to focus more on the delivery of services through distance education. This has resulted in a significant decrease in our overall emissions.

An example of how much our commuters impact our overall emissions can be seen below.

Using our baseline fiscal year of 2002, our total emissions were 8,802.5 metric tonnes of eCO₂, made up of the following:

Scope 1 emissions - 931.4 metric tonnes of eCO₂
Scope 2 emissions – 1654.1 metric tonnes of eCO₂
Scope 3 emissions – 6217.0 metric tonnes of eCO₂

Scope 3 emissions in fiscal year 2002 accounted for almost 71% of all our emissions.

In fiscal year 2007, our total emissions were 10,221.1 metric tonnes of eCO₂, made up of the following:

Scope 1 emissions - 1785.4 metric tonnes of eCO₂
Scope 2 emissions – 1971.0 metric tonnes of eCO₂
Scope 3 emissions – 6464.7 metric tonnes of eCO₂

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Scope 3 emissions in fiscal year 2007 still accounted for 63% of all our emissions.

The result of our campus emissions inventory conducted last year revealed that the greatest contributors to our carbon emissions are commuters and electricity usage.

B. Mitigation Strategies

Quinsigamond Community College has been engaged in a number of strategies over the past several years, which have resulted in a reduction in carbon emissions and movement towards greater sustainability. Burning fossil fuels is the primary cause of global warming and climate change, and of these, electricity use is the most damaging source of carbon emissions. Our strategy, therefore, has been to pay particular attention to ways in which we can conserve energy, reduce electricity usage, and move in a direction of clean renewable energy sources. The purchase of Renewable Energy Credits will be used as a last resort if we find we cannot achieve carbon neutrality through any other means. We have also paid particular attention to the way in which we might reduce the most significant source of emissions for our campus: commuters. Because we are a commuter campus, with limited public transportation access, extremely hilly terrain, and a population of students, staff and faculty on a variety of work and school schedules, reductions in drive alone trips to the campus present a unique challenge, that must be thoughtfully and creatively addressed.

Figure 1 highlights our emissions levels if we continued on a path of “Business as Usual” without taking further action to reduce our ongoing emissions. Also reflected are the emission reduction goals of the Commonwealth of Massachusetts, as well as our campus climate commitment goals following ACUPCC guidelines.

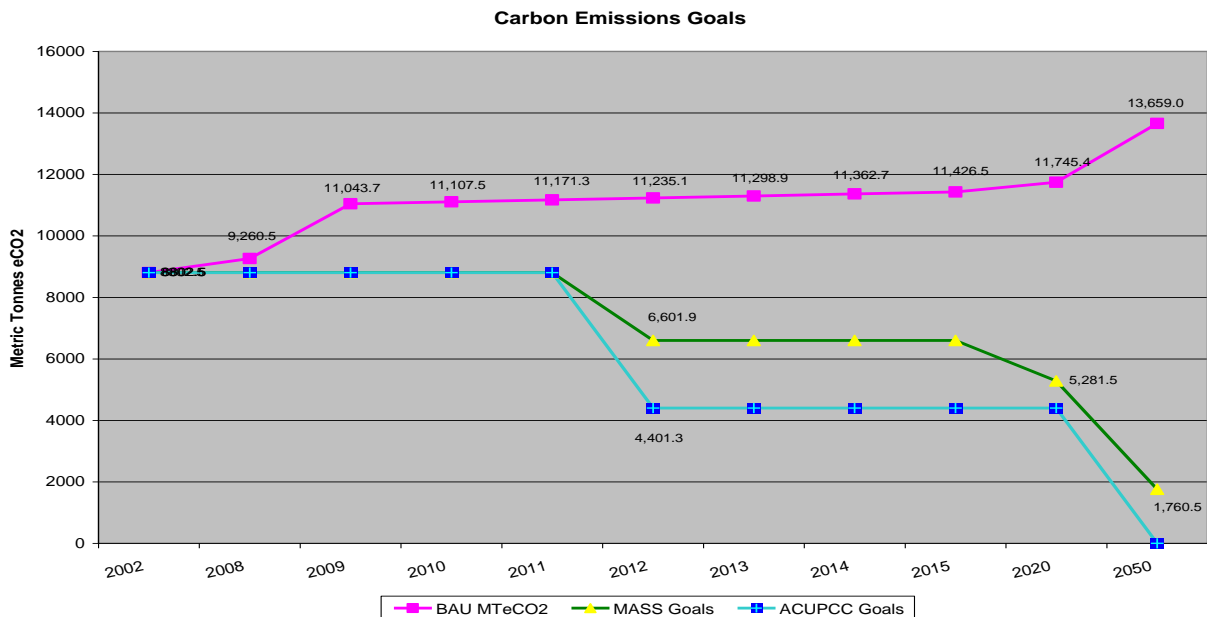


Figure 1

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We considered several carbon reducing projects to help us achieve and maintain appropriate reductions in our campus emissions over the next several years, with the ultimate goal of achieving carbon neutrality. The Clean Air-Cool Planet Campus Carbon Calculator tool was used to test project assumptions, to identify what actions our campus should take which will ensure the greatest impact.

Figure 2 below highlights the impact on our emission levels over time of 17 different emission reduction projects. Because Scope 3 emissions (primarily caused by commuters) are responsible for such a large percentage of our overall emissions, these 17 projects have very little impact on our reductions over time.

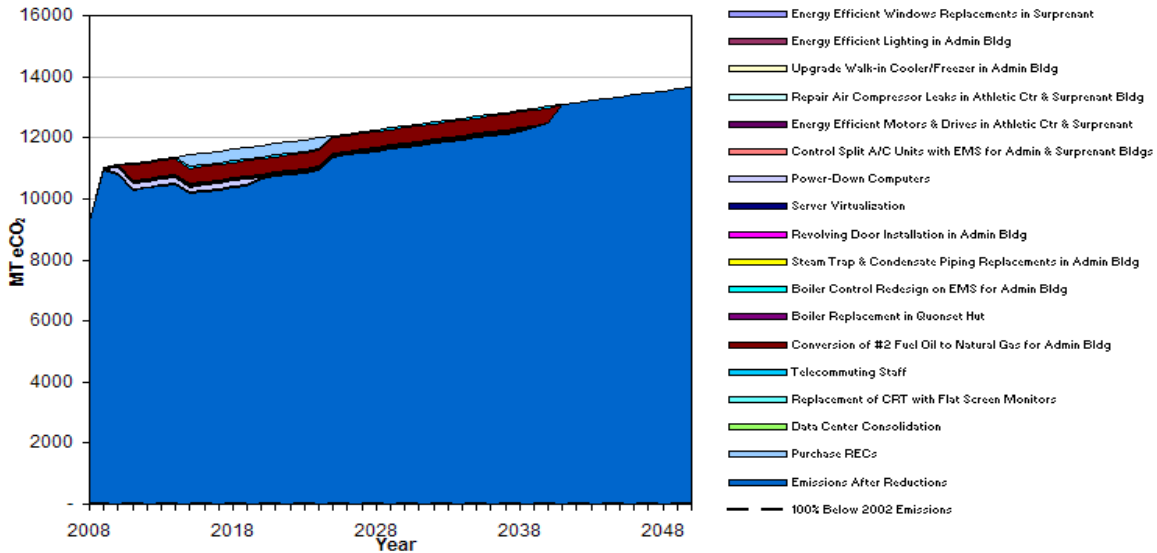


Figure 2

To more aggressively address the concern for rising Scope 3 emissions, we have given added emphasis to the need for increasing our offerings of distance learning options so that the result will produce a significant decrease in the number of commuters required to travel to campus. Figure 3 highlights this impact of adding distance learning options (online and off-site) to the projects already included above. It is this added approach which enables us to achieve a level of carbon neutrality.

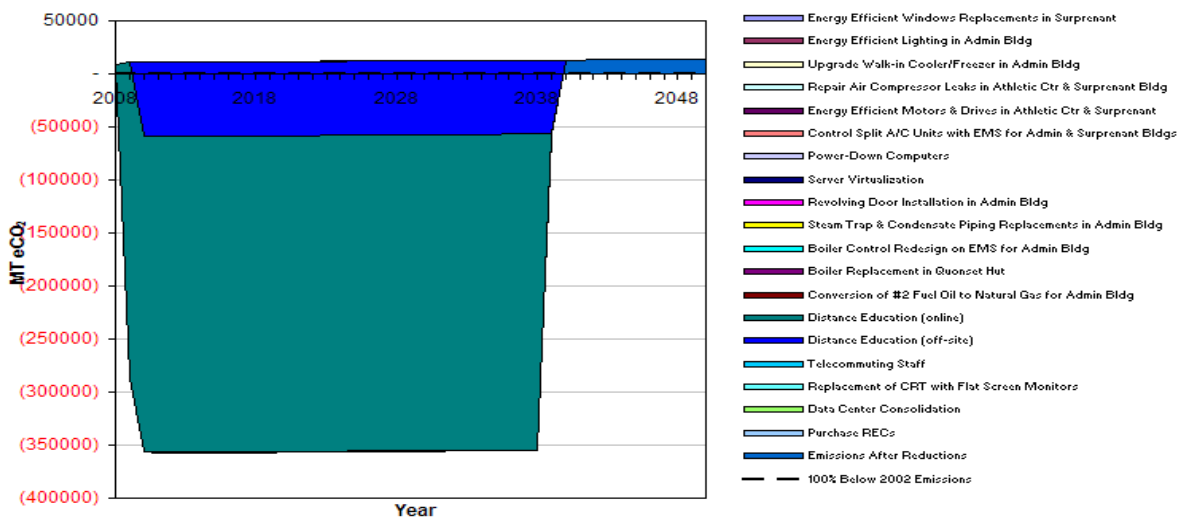


Figure 3

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To be carbon neutral, our actions must have the overall effect of having no net greenhouse gas emissions. Based upon the results of the project planning tool we have determined that we can achieve carbon neutrality in fiscal year 2009, and maintain carbon neutrality well into the next several years.

Our overall campus strategy for reducing carbon emissions is tied to 5 major categories of GHG reduction activities. These are (1) energy efficient operations, (2) power plant & fleet/fuel management, (3) behavioral/cultural change incentives, (4) on-campus renewable energy production, and (5) carbon off-sets. Each of these are explained in further detail below.

1. Energy efficient operations

a) Buildings:

I. Energy Conservation Measures:

As mentioned above, Quinsigamond Community College, as an agency of the Commonwealth of Massachusetts, does not own its buildings. They are state-owned, and managed by the state Division of Capital Asset Management (DCAM), which determines appropriate scheduling and funding of large maintenance projects, deferred maintenance, and new construction, and all with a special emphasis on achieving the Commonwealth's LEED Plus Standards.

For most organizations, 80-90% of GHG emissions result from energy use in buildings (again, it must be noted that their emphasis is primarily on Scope 1 and 2 emissions). As a result, we first focused our efforts on reducing excess energy consumption in our facilities, by ensuring that energy conservation was maximized throughout the campus.

In 2005, the college partnered with Constellation Energy and the state Division of Capital Asset Management (DCAM) to institute energy saving measures into its buildings, as part of a 10-year energy savings contract. These energy savings measures included high efficiency lighting upgrades in many areas of the college, lighting controls, an energy management system, domestic water conservation, vending machine controllers, HVAC insulation, and the addition of window film on our glass covered library building. This contract (which guaranteed annual utility cost savings to offset the periodic lease payments that resulted from financing the project), has resulted in the annual elimination of **967.1 MTeCO₂** through an annual reduction of 1,095,417 kWhs of electricity (787 MTeCO₂), 11,045 therms of natural gas (55.2 MTeCO₂), and 11,657 gallons of heating oil (124.88 MTeCO₂).

In 2009, the college once again partnered with Constellation Energy and DCAM to institute further energy savings measures into its buildings. These new energy savings measures included steam trap and condensate pipe replacements in the Administration Building, energy efficient motors and variable speed drives installation in the Athletic Center and Surprenant Building, energy efficient lighting in locations of the Administration Building not completed in the 2005 contract, energy efficient window replacements in the Surprenant Building, cafeteria walk-in cooler/freezer upgrade, air compressor leak repairs in the Athletic Center and Surprenant Building, Emergency Management System (EMS) control of split system Air Conditioners in the Administration and Surprenant Buildings, boiler control redesign on the EMS for the Administration Building, energy efficient revolving door installation in the Administration Building, and boiler replacement in the Quonset Hut. These improvements will annually eliminate an additional **140.8 MTeCO₂** through an annual reduction of 94,862 kWhs of electricity (68.1 MTeCO₂) and 6,789 gallons of #2 heating oil (72.73 MTeCO₂).

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II. Space Maximization:

As a rule, new buildings increase an organizations carbon footprint, so it is always better to ensure current space is maximized before acquiring new space. This has definitely been true for our campus.

Limited state and local resources have contributed to our campus need for maximizing space as an alternative to new construction. One clear example of our space maximization, is the fact that our facilities were initially built to accommodate 300 students, and yet we currently accommodate over 13,000 students annually. In 2005, the Commonwealth of Massachusetts initiated a Space Utilization Study to see how campus space may be better utilized before addressing campus master planning new construction needs. The results of this study completed in 2006 when our headcount was 5,970, was that we had not only maximized our space and were in serious need of additional space, but that we were exceeding average standards for utilization of classrooms and labs. With each year, we continue to determine and pursue new ways of reconfiguring space on the main campus, to accommodate even greater space needs for classrooms, labs and offices.

III. New Construction and Landscaping:

Our campus master plan calls for the construction of a new academic building within the next 10 years. This building will most likely accommodate our health and science programs, and will be LEED Plus certified, in accordance with the Commonwealth's carbon reduction standards and goals.

In fiscal year 2009, the campus initiated a landscape design study to incorporate a plan for ongoing landscaping to address replacement of trees, diversification of species, and sustainability concerns.

b) **Technology:**

I. Power Management Tools:

On average, PCs and their monitors consume about 600 kWh of electricity annually, which amounts to about 0.43 MTeCO₂. Approximately 2/3rds of this power consumption on administrative systems and 1/3 on computer classroom systems is wasted when computers remain running without use.

There are currently 800 office and 600 lab/classroom computers located throughout the campus. These must remain on for 24 hours a day, so that updates and reboots can be automatically conducted at times when the computers are not in use (between 11:00 pm and 6:00 am). 1400 computers amounts to 840,000 kWhs of energy, or 603 MTeCO₂ burned each year.

As part of the IT department's "acquire / retire" program (in which 1/3 of campus computers are replaced every 3 years), IT personnel have been purchasing green-capable systems that will have the capability to wake-up for updates and then shut down when the updates are completed. All systems are now green-capable! Power-down software has been purchased and will be installed in summer 2009. Once everything is in place, we anticipate an annual electricity savings of 440,000 kWhs, resulting in a carbon emission reduction of **316 MTeCO₂** per year.

II. Server Virtualization:

Server virtualization (the migration of physical servers into separate virtual environments) provides several opportunities for savings. First, it reduces the need for physical servers, so we save on space, construction expenses for creating new space, the cost of purchasing new servers, the need for additional

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air conditioning and management of heat, electricity, generators and maintenance. Second, numerous physical servers are an inefficient use of the server's processing power, as many applications on servers use only about 5-10% of the processor. Additional benefits of virtual servers are that they can be brought up in a fraction of the time it takes to deploy new physical servers, by standardizing steps, settings and configurations across virtual servers (saving weeks of work involved in ordering, hooking up, and then loading software). They make computing environments more portable (which is especially important for disaster recovery), and it is also easier to test new applications. And finally, most server virtualization software is free! Using Windows Server 2008 Hyper-V, we can take advantage of the benefits of virtualization, without the expense of buying third-party software.

In fiscal year 2009, we reduced our physical servers from 63 to 43, through server virtualization. On average, one physical blade server uses 3,980 kilowatts of energy per year, and emits 2.9 MTeCO₂ a year. By virtualizing 20 physical servers, we save approximately 79,600 kilowatts of energy and reduce **57.2 MteCO₂** per year.

III. Data Center consolidation:

According to the EPA, about half of the electricity consumed in a data center is from the power and cooling infrastructure that supports IT equipment. In fiscal year 2011, we intend to initiate a data center consolidation project to consolidate 3 server rooms into one energy efficient data center. Consolidating use and reducing the power needed for electricity and air conditioning through data center cooling improvements will result in significant energy savings and carbon reductions.

IV. Monitor and computer reduction:

In fiscal year 2010, we will be replacing 300 15" CRT monitors with 15" flat screen monitors. CRT monitors use roughly 75 watts when awake; whereas, flat panel monitors use roughly 26 watts when awake. Assuming each monitor is awake for 10 hours a day and for 300 days a year, replacing CRT monitors with flat panel monitors will save us $(75-26) \times 10 \times 300 = 147,000/1000$ 147 kWhs of energy per year, and result in a reduction of **0.11 MTeCO₂**. In addition, we will also begin replacing 400 computer systems with E-peat gold standard compliant systems or laptops.

V. Print Management Solutions:

We have eliminated many individual desktop printers over the past 5 years, and intend to continue eliminating individual printers by installing multifunction group printers, instead. For each group print option, we can eliminate 5-10 individual printers. These multifunction machines will also eliminate the need for individual fax machines, scanners, and copiers.

2. Power Plant and Fleet/Fuel Management:

a) **Power Plant Fuel Conversion**

In the Campus Master Plan of October 2006, it was noted that most of our campus buildings are electrically heated, and that long-term consideration to expand the natural gas distribution throughout the campus is warranted. DCAM, when determining long-term maintenance scheduling, has and will continue to incorporate issues identified by the campus master plan.

Natural gas is considered one of the cleanest fossil fuels. Until we can convert to other sources of renewable energy, natural gas is the best way in which we can reduce some of the carbon emissions generated by our power plants. In this context, the Athletic Center HVAC system was converted from

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electricity to natural gas powered in fiscal year 2008, as part of a larger facility upgrade. Other buildings for future conversion from electric to natural gas are Hebert Auditorium in fiscal year 2012, Suprenant Hall in fiscal year 2014, and Ahlfors Hall and the Child Study Center in fiscal year 2016.

The Administration Building burns #2 heating oil. We burn approximately 50,000 gallons of #2 oil each year, resulting in the emission of 507.57 MTeCO₂. In fiscal year 2010, we will work with the local gas company to install gas lines in order to convert the heating plant from three #2 oil fired boilers, to natural gas. Because natural gas emits 30% less CO₂ than the burning of #2 fuel oil, this is an important step toward reducing our carbon emissions, and will result in a reduction of approximately **152.27 MTeCO₂** per year.

b) **Global Electric Motorcars (GEM Cars)**

Since 2002, the college has maintained a fleet of six GEM cars for use by building/grounds maintenance and food services personnel for campus transport purposes. These vehicles have zero tailpipe emissions, are nearly silent in operation, can reach top speeds of 25 miles-per-hour, and can usually travel between 30 to 40 miles before needing to be recharged. The cumulative number of hours that the GEM cars have been driven since 2002 is 8,000 hours, or an average of 1,143 hours per year. Assuming we used one of our gasoline powered vehicles for 1,143 hours at 14 mpg traveling at 5 mph, we would burn 3,200 gallons of fuel per year. As a result, their use has eliminated and is eliminating the burning of 3,200 gallons of gasoline per year, preventing **28.2 MTeCO₂** from being released into the air.

c) **Campus Vehicles**

The college maintains 3 police vehicles, 1 cargo van, 2 athletic use vans, 4 maintenance trucks, and the President's car. Each vehicle averages about 14 mpg, making them very inefficient and another high contributor to our carbon emissions. At the end of their life cycles, the college will purchase or lease more fuel efficient or hybrid vehicles through state purchasing contracts, when available, that will average at least 20 mpg. Currently, the college uses approximately 4500 gallons of gasoline per year in the operation of these vehicles. We expect to save approximately 1300 gallons of gasoline per year by converting to vehicles that receive at least 20 miles to the gallon, reducing our annual carbon emissions by **11.5 MTeCO₂**.

Greater emphasis will be placed on better preventive maintenance practices on all campus managed vehicles to ensure they remain as energy efficient as possible.

The construction of a loop road on campus in fiscal year 2009/2010 is intended to have the effect of reducing vehicle idling as a result of stalled traffic backups created by the previous inefficient way of accessing and maneuvering the campus. The loop road has also been designed to accommodate bus traffic, so that greater commuting options may result in further elimination of vehicle use on campus.

3. Behavioral/Cultural Change Incentives:

In an effort to increase awareness, and thereby develop a culture of conservation, we have pursued a multi-pronged approach to changing and enhancing our business practices that involve energy curtailment, recycling, the purchase of environmentally preferable products, alternative ways of working, commuting reductions, and e-campus initiatives.

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a) Energy Curtailment:

We have an ongoing agreement with EnerNOC, as part of its Consumption Curtailment Program, to “share” our energy with the power grid by curtailing our energy use during peak demand periods, in an effort to reduce rolling brown outs or black outs in our surrounding communities. By sharing our energy during times of need, we help prevent the need for additional new energy plants having to be built, and we help reduce overall energy consumption during times that demand would ordinarily be higher.

b) Recycling:

As a campus, we began a pretty active recycling process in 2006, and it has grown each year since. From 2006 through 2008, we have reduced approximately 426,405 pounds of CO₂, as a result of preventing the following from being sent to landfills:

**Mixed paper, bottles and cans – 388,000 pounds

**Electronic waste (batteries, cell phones, computers, tvs, etc.) – 32,565 pounds

**Donated textbooks – 5,840 pounds

We also donate roughly 25 gallons of used French fry oil per year to a local farmer for reuse in his farming equipment, as well as asking the campus community to donate used hand and bath towels for Facilities cleaning use, as a way to save paper.

Several offices and labs recycle used paper for use as scrap paper or note paper. And interagency envelopes are used when paper documents need to be delivered to other offices on campus.

c) Environmentally Preferable Products:

There is a campus policy in place which requires the campus to promote the procurement and use of Environmentally Preferable Products and energy-efficient computers/appliances with Energy Star certifications. Facilities staff has been purchasing only Energy Star appliances for years, and IT staff has done the same for computer purchases. More will be done to further educate cost center heads on selecting appropriate environmentally preferable products. The Commonwealth of Massachusetts assists with this process by providing an Environmentally Preferable Products Purchasing Guide which designates products currently on state contracts.

In 2011 we plan to install 40 XLerator Hand Dryers to replace paper towel dispensers in campus restrooms. These hand dryers, which are GreenSpec Approved and help qualify for LEED credits, use 80% less energy than conventional hand dryers, and provide a 95% cost savings to the college (and an added benefit to the environment) through the elimination of paper towels purchases and waste.

d) Alternate Ways of Working:

I. Shortened work schedules / Flextime

The college closes half days on Fridays in the summer months to conserve energy needed to cool buildings and run computers, equipment and lighting. It also closes during the last week of December to reduce the need to heat buildings during the holiday period when all students and most faculty and staff are away from campus.

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II. Telecommuting

Some IT staff utilize telecommuting options at various times when commuting to the campus or other off-site locations does not make sense. Current technology enables them to perform work remotely from many alternate locations. In addition, other areas of the campus are exploring possibilities for telecommuting options where the job can easily fit that model.

III. Web-conferencing or virtual conferences, Webinars, and Phone Interviews

Wherever possible, these means are used to participate in activities, such as professional development and job interviews, that would ordinarily involve air travel. Out-of-state travel is also discouraged and limited.

e) Commuting Reductions:

As our emissions inventory revealed, this is the area creating the most challenge for the campus because it is the largest contributor to our carbon emissions. To complicate this further, our enrollments continue to increase at record numbers, and are guaranteed to do so even more as a result of our commitment to President Obama's Education Challenge to double the number of college graduates in the next 10 to 15 years. The implications of these increases in commuters on our overall emissions, as well as our ability to accommodate parking and space concerns, gives us an added urgency for addressing ways in which to significantly reduce our drive alone commuters. As a result of a number of initiatives we have focused on, with an added emphasis on distance learning, we expect to save approximately 761,110 kWhs of electricity, as well as eliminate 2,013,540 miles of travel for faculty, staff and students (or approximately 91,525 gallons of gasoline a year), thereby reducing our annual carbon emissions by at least **367,369.7 MTeCO₂**.

I. Distance Learning

Distance learning courses, online programming, virtual classrooms and other e-learning strategies are offered as alternatives to on-campus classes, and these have been increasing over time, from 1.5% of total credit courses offered in 2002 to 8.9% in 2008. We will continue to focus on additional distance learning possibilities and options over the next several years.

II. Public Transit

The campus is currently engaged in the construction of a Loop Road which will improve traffic flow around campus. Two benefits to this will be (1) a marked decrease in vehicle idling which resulted from traffic backup, and (2) the ability for buses to access the campus, which they were unable to do before due to the congestion, steepness, and lack of appropriate turning radius. The campus is working with the Worcester Regional Transit Authority to make bus access more available once the loop road is complete.

The campus use to provide discounted rates on transit passes, but discontinued this practice during tough economic times. We will be revisiting this initiative once buses have access to the campus, to encourage more ridership of city buses.

III. Bikes

Bike racks and shower facilities are available for those who ride bikes to work, and each May we promote a statewide initiative called "Bike to Work" week.

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IV. Car Pools

Preferential parking is provided to those who car pool through three designated Car Pool parking spaces on campus. In addition, monthly promotional are offered to encourage individuals to take advantage of the Commonwealth's Rideshare opportunities.

The college will also be exploring the use of online social sites to boost carpooling, as well as ways to offer financial incentives for those who choose the option of car pooling.

V. Information Sharing

The College website lists alternative forms of transportation to the campus, including bus schedules for the Worcester Regional Transit Authority. Reminders of alternative transportation options are additionally sent to the college community each semester. New staff and faculty receive information on alternative travel options at new employee orientations, and new students receive them at new student orientations.

f) E-Campus & Other IT Initiatives:

In an effort to reduce waste and save trees, we have expanded on e-campus initiatives that include the development and wide-spread use of websites, portals, electronic documents and manuals, share point, plasma screens, and online forms to reduce the use of paper. Examples are:

- ✓ The IT Department has configured systems to be able to remotely manage services offered at our satellite campus locations, thereby reducing the need for additional staffing and transportation between campuses.
- ✓ The campus portal (The Q) is used to allow for self registration, electronic communication, and to distribute grades to students. Beyond paper, self registration reduces the number of staff needed to service students, thereby saving electricity.
- ✓ Document Imaging, being implemented in 2009, will reduce the need for duplicating, archiving and storing paper files.
- ✓ Adjunct Faculty course requests and contracts are distributed via email to save paper.
- ✓ The Human Resources Office utilizes an electronic resume management system, which reduces the need for duplicating, archiving and storing paper files. This also permits search committees to access documents online, rather than checking out paper copies for review.
- ✓ The Payroll Office uses an online Attendance and Timesheet reporting system.
- ✓ The Purchasing Office uses an online Purchase Order Request System and posts forms online.
- ✓ The Campus Phone Directory is provided in an electronic format which can be accessed from on and off campus.
- ✓ Share Point websites are used for collaborative group initiatives, such as Project Management, Emergency Planning, Climate Commitment, and New Off-site Campus Planning. This reduces the amount of printed paper that passes between colleagues or gets shuffled between departments.
- ✓ Many staff and faculty have inserted a comment below their signature in emails stating "Please consider the environment before printing this email".
- ✓ Enrollment Services, Advising, Financial Aid and the Business Office utilizes a phone call-out messaging system and email to reduce the number of reminder mailings that use to go out to students throughout the year.

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Some other initiatives currently under consideration:

- ✓ Making double-sided printing the default on every printer and multi-function device.
- ✓ Begin a print-education campaign to encourage students, staff and faculty to reduce font sizes for less paper used when printing, or to print multiple PowerPoint slides on one page, instead of one per page.

4. On-campus renewable energy production

As mentioned previously, DCAM, who has responsibility for all state facilities, pursues many of these initiatives on behalf of the Commonwealth. In February 2009, the Massachusetts Executive Office of Energy and Environmental Affairs (EOEEA) completed an analysis of state-owned properties managed by DCAM, to identify existing, planned, and potential renewable energy installations. The state will use this information as a measure of where it needs to focus its ongoing efforts, based on what has already been accomplished.

Where projects cost more than 1 million dollars, DCAM must manage the activity and provide the funding. Where projects cost less than 1 million dollars, the campus can pursue activity and utilize its own funding sources. The college intends to identify strategies that make the most sense for our campus in terms of quick, short-term, low cost projects it can pursue, while considering longer-term, higher-cost initiatives the state might pursue on our behalf.

In collaboration with DCAM, action has been initiated in the following:

- a) **Wind** – Site consideration for a Met Tower and Fatal Flaws Analysis for a Wind Turbine was conducted in September 2006. The recommendation of the Renewable Energy Research Lab was that Quinsigamond Community College should not consider its campus an appropriate site for a utility-scale wind turbine because it is unlikely to generate a strong financial return for the investment. A smaller wind turbine could, however, be a possibility. To determine feasibility, the college would have to pay for a met tower to monitor wind for about a year. In April and August 2008, the Massachusetts Executive Office of Energy and Environmental Affairs expressed concern about neighborhood buy-in to the idea of a wind project, as well as the college's ability to fund both the met tower installation and a full feasibility study. Grant money that would be available for these types of projects, would be prioritized based on wind speeds, and the state had already identified several sites with higher wind speeds than ours. The idea of pursuing wind power is, for our campus, presently on hold, but will be revisited again in the near future.
- b) **Solar** – In early 2008, the campus requested a Solar PV Site Selection Survey through the Massachusetts Leading By Example Program. The survey is a screening tool for identifying suitable solar sites to support Governor Patrick's goal of installing 250MW of solar photovoltaic power by 2017. DCAM is currently in the process of compiling information about our roofs. If we are a suitable site, the state will help us develop and fund projects for solar photovoltaic installations.
- c) **Biofuel** – For FY11, we will begin purchasing our #2 heating oil with a 5% blend of biofuel, and increase to a 10% biofuel mix by 2012.

It should be noted that our regional electricity supplier already currently provides 7% of its electricity from renewable resources.

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5. Carbon offsets

In 2009, we engaged the assistance of graduate students from the Conway School of Landscape Design (a landscape design school with a focus on sustainability) to help us with a design project and planting plan that considers sustainability and climate concerns, wildlife habitats, and storm water drainage and infiltration. This assistance was sought in response to our concern for the loss of close to 100 trees on our campus due to a significant ice storm in December 2008, and an infestation of dangerous Asian Longhorn beetles in the Worcester area that caused the removal of some 6,000 trees in Worcester County (beginning with our campus). Worcester County, through an initiative called Tree Worcester, plans to plant some 30,000 new trees over the next 5 years, and Quinsigamond Community College will be a part of this effort. With the assistance of the Department of Conservation and Recreation (DCR), we have planted an initial 17 trees on campus, and will continue planting more trees over the next several years. We have also begun talks with DCR to consider participating in the Tree Campus USA initiative which promotes urban forestry. While the impact on our carbon emissions in the short-term will be small, we consider these moves to be a step in the right direction as we plan for further growth on our campus while remaining environmentally responsible.

Where conservation and energy efficiency are unable to get us fully to our goal of carbon neutrality, carbon off-sets or renewable energy credits (RECs) must be purchased. Per Executive Order 484, if we were to purchase RECs to offset our emissions, we must pursue RECs that are Mass RPS certified. These are the most expensive form of REC on the market, and the cost to our campus would be quite prohibitive (between \$24,000 and \$30,000 a year). We have been working with the Massachusetts Health and Educational Facilities Authority (HEFA) on the possibility of group purchased RECs provided to the membership at a discount rate.

C. Educational and Community Outreach Efforts:

Part of our commitment as an ACUPCC signatory is “to commit to finding creative ways to introduce all students to the concepts and practices of sustainability through traditional and non-traditional education offerings, and by creating implicit and explicit learning opportunities.” (*Education for Climate Neutrality and Sustainability: Guidance for ACUPCC Institutions, April 2009 v1.0, pg 10*). We recognize the unique role higher education plays in shaping the visions, goals and aspirations of those who pass through our doors and into our communities, and we believe that our collective decision making and critical thinking skills must be grounded in an understanding of climate and sustainability challenges that we all face as global citizens. As such, we have already taken steps to ensure that climate neutrality and sustainability are part of the curriculum and learning experience of many of our students, and we are and will be taking further steps to expand these concepts to all students.

1. Making Climate Neutrality and Sustainability Part of the Curriculum

Faculty at Quinsigamond Community College have understood for quite some time, the importance of introducing topics of sustainability across the curriculum, and have often worked collaboratively through team teaching and other methods to ensure that the information within their subject areas are also integrated into the learning taking place in other subject areas. Some courses have been and are being developed which are specific to climate change, and many general education courses have integrated a sustainability theme into their coursework. In addition, a proposal for general education learning goals is under development, which will ensure that climate neutrality and sustainability issues are incorporated into the curriculum for all associate degree-seeking students. Some examples of how the college has made climate neutrality and sustainability part of the curriculum are:

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Biology 105 – Ecology: Students are assigned semester long projects that focus on varying aspects of climate change.

Biology 101 – General Biology: Students are assigned papers and presentations relating global warming to living things.

Physical Science I: Students discuss, research and report on energy and energy sources, including the pros and cons of finite and renewable energy sources.

Physical Science II: Students discuss, research and report on heat, electricity, light and chemistry. Students participate in a semester long project to design a “green” home.

Science 105 - Integrated Science: Earth & Space: Students prepare presentations that focus on climate concerns, such as global warming and recycling.

Auto Technology Courses: Students discuss such topics as alternative fuels, hybrid vehicles, and emission controls.

Energy Utility Technology 101 – Intro to the Energy Industry: Students discuss such topics as alternative and renewable sources of energy.

Liberal Arts 101 – Intro to Liberal Arts / Sociology 111 – Social Problems, Social Change: Students in both courses work together in a collaborative manner on creating socially-conscious learning communities, of which environmental issues are integrated in.

English 100 - Intro to English Composition: Writing assignments include a paper on global warming.

Hotel Restaurant Management 112 – Basic Foods Course: Students discuss such topics as locally grown food, using left-over oil for biofuels, reducing paper product use, using eco-friendly products, etc.

In addition to the above, other new credit courses or academic programs currently in discussion or being developed are:

Science 109 - Environmental Science: Biological Topics: This course has been developed and will be offered starting in the spring semester 2010. Students learn about the interactions between humans and the environment and gain the ability to connect the issues to a framework of ideas and values that allow them to become part of the solution to environmental problems.

Science 110 - Environmental Science: Part 2 will be developed and offered in the fall semester 2010. It will include the following topics; the human impact on natural systems, air and water pollution, global warming, ozone depletion, hazardous waste, renewable energy sources, strategies for achieving climate neutrality.

2. Making Climate Neutrality and Sustainability Part of the Educational Experience

Although Quinsigamond Community College is a commuter college with thousands of students attending classes between jobs and home, there are a number of ways in which the student learning experience involving climate neutrality and sustainability has taken place.

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Some examples of class activities and learning labs include:

**Liberal Arts and Sociology Classes collaborated on an Earth Day project to build a non-recyclable sculpture from trash they collected over a week's time, to demonstrate how much non-recyclable material is thrown away by each of us.

**The Children's School children (Early Childhood Education Program Day Care Learning Lab on campus for children ages 2 to 5) collected trash for the Earth Day sculpture mentioned above, and were treated to a reading of the Dr. Seuss story "The Lorax" – to teach them about environmental issues.

**The Hotel Restaurant Management program students operate a Learning Lab Diner at the Worcester Senior Center, and have hosted events, as well as prepared and served special dinners that feature locally grown food and eco-friendly products.

**The Honor's Program students have showcased projects for the past few years that have focused on climate and the environment, sustainable food production, production and politics of food sources. One student planted a community food garden near the Child Study Center on campus as part of her research on eating locally grown foods, while another student developed a compost site utilizing food waste from the campus cafeteria.

Some examples of other student activities include:

**Clubs - There has been interest expressed by students in the past for the development of an environmentally-focused student club. The Student Senate has asked that interested students develop a formal proposal to give the club a structured mission and goal.

**Campus Newspaper - The student-run newspaper called "The Open Door" devoted an entire year to running monthly articles on Sustainability and Climate Change to raise awareness, and it continues to publish relevant informational articles when appropriate.

**Student Life & Student Senate – Throughout the year, the Office of Student Life hands out earth-friendly reusable shopping bags and models sustainable practices through recycling and carpooling. It has also sponsored films, such as "An Inconvenient Truth" to raise campus awareness around broader global issues of sustainability and climate change. In addition, The Office of Student Life and the Student Senate have taken advantage of student activities, such as "Spring Fling" to pass out thought-provoking items such as energy-efficient light bulbs and pencils made from recycled paper currency.

3. Workforce Development

Quinsigamond Community College is working in collaboration with other schools, as well as local employers, to help develop training programs that meet the needs of today and tomorrow's workforce. With the national, state and local interest in addressing an emerging green economy, this has been a natural progression for our efforts and is at the core of our mission as a community college.

One such initiative is the Clean Energy Technology Working Group – a collaborative effort on the part of Massachusetts Community Colleges and Technical High Schools to build the capacity of a Massachusetts Clean Energy Education and Training Center to meet workforce development needs of the fast-emerging clean energy/energy services sector.

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Another approach the college has taken to address emerging workforce concerns has been through hosting a series of forums beginning in February 2009, in which Presidents and CEOs of area businesses were brought together to brainstorm around specific issues, in an effort to develop an industry-driven vision that focuses on labor pool development, employee effectiveness, aligning programs and services, developing career tracks, and documenting knowledge and skill set deficiencies, around a theme of Sustainable Energy and Green Technology.

- Focusing specifically on Sustainable Energy, information was collected on energy-related challenges facing the region over the next five years, sustainable energy economic development opportunities over the next five years, challenges related to business and industry's adoption and implementation of sustainable energy practices, challenges to fostering consumer's adoption and implementation of sustainable energy practices, current occupations that will experience the greatest amount of change in job functions / activities related to enhancing sustainable energy efficiency, new occupations that will emerge, sustainable energy-related occupational areas in which the region's educational system should focus on developing or expanding programs or services, and areas in which partnering with the community college can improve the region's sustainable energy industry.
- Focusing specifically on Green Technology, information was collected on green technology economic development opportunities over the next five years, green technology-related occupational areas in which the region's educational system should focus on developing or expanding programs and services, challenges to business and industry's adoption and implementation of green practices, and areas in which partnering with the college can improve the region's green technology industry.
- Focusing specifically on Workforce Competitiveness, information was collected on the greatest non-technical or technical skill weaknesses that employers see in their current technical employees, the greatest non-technical or technical skill weaknesses that employers see in their current operational / administrative employees, and the greatest non-technical or technical skill weaknesses that employers see in their current supervisory / management-level employees.

Based on the results of the forum, the college will be developing training and education programs that more appropriately address very real concerns and expectations for our region's economic development needs. An associate degree completion program for certified HVAC/R technicians is under consideration.

4. Professional Development for Faculty and Staff

The Staff Development Office and Center for Academic Excellence have supported the desires of faculty and staff to seek professional development opportunities that enhance their ability to personally and professionally address climate concern issues in their work environments and class curriculums. Some examples of this have been staff attendance at several events and trainings focused on green communities, renewable energy, and sustainable practices. Faculty have attended faculty conferences and workshops focused on green campuses and curriculums. AFSCME union employees have been provided professional development workshops on everyday actions that can be taken to reduce their carbon footprint. The Staff Development Office and Center for Academic Excellence continue to collaborate with Academic Affairs and all other aspects of the campus to ensure relevant opportunities are made available to those seeking them, and to expand the knowledge base of our campus workforce.

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5. Community Outreach Efforts

Several key outreach efforts have already been mentioned above. The Clean Energy Technology Working Group and the forum on Sustainable Energy and Green Technology both have specific goals of working in collaboration with industry to address shared challenges and opportunities within state, regional and local economies. The Tree Worcester Initiative to plant 30,000 trees in the next 5 years, and the pursuit of Tree Campus USA status are ways in which we are engaging with state and local organizations to collaborate on the planting, care and maintenance of urban forests. In 2008, the President was a guest on a local radio program called “Energy Freedom Fighters” to discuss the energy savings measures the college has been engaged with over the past few years. In addition, many experiential learning activities take place throughout the year where students and faculty engage the public through the hosting of dinners that use locally grown foods, to the creative expression of Earth Day events, to the informational focus on sustainability in the campus newspaper, to the campus collaboration with millions of other global participants to shut-off non-essential lighting for an hour in the event called “Earth Hour”, to extending free electronic recycling collection to the Worcester community each Spring. For the past year, a “Green Thought of the Day” has been sent out electronically once each week to provide members of the college community with personal strategies for reducing their own carbon footprint and understanding broader issues around sustainability and climate commitment. In addition, there are discussions underway to consider weekly brown bag lunches around green topics, and enhancing the information available on the campus website to promote energy conservation, recycling and other initiatives.

D. Financing:

Quinsigamond Community College is a tax-exempt institution, which precludes it from taking advantage of many of the tax incentives for investing in green energy and technology. As a result, the options available to the college are grants, loans, gifts and rebates, as well as the possibility of third party purchase agreements, which would enable a contractor to use federal and/or state tax credits and other incentives to build a renewable energy system for our campus.

We financed our energy conservation building upgrades initiated in 2005 through the savings that were generated by reduced utility use, as a result of entering into a performance contract agreement with an energy service provider (ESCO). Some of the energy saving measures applied in this contract, also qualified us for electric utilities rebates. Our energy conservation building upgrades initiated in 2009 are being funded by state Deferred Maintenance dollars, as part of the state’s overall carbon reduction strategy for its buildings.

DCAM provides assistance in tying building upgrades and renewable energy installations to available grant money. Our Grant Development Office, through the Division of Community Engagement, will continue to explore funding opportunities based on identifiable campus projects.

A cost center budget has also been established within the Administrative Services Division for covering expenses associated with green initiative exploration.

E. Tracking Progress:

We will continue to utilize the Clean Air-Cool Planet Carbon Calculator as the centralized reporting tool, through which annual information will be updated, tracked, and measured against each year’s prior goals. Based on our findings each year, the college will reassess priorities, and will reallocate funding in light of new developments, new technologies, evolving energy sources, and new world realities.

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Acknowledgements

We would like to acknowledge the members of the campus community who served during FY 2008 and FY 2009 on the sub-committees of the Climate Neutrality Action Committee. Their contributions and leadership to the process made this Action Plan possible. We would also like to specifically acknowledge all those many campus members who worked quietly behind the scenes, contributing greatly to the collection of ideas, information, research, and support. The dedication of the entire campus community to sustainable practice in their professional and personal lives, and the encouragement they give to one another, has been critical to developing and maintaining a culture shift toward greater sustainability on our campus and in our communities.

Climate Neutrality Action Committee:

Co-Chairs: *Anita Bowden & Scott Gauthier*

Campus Emissions Subcommittee:

Chair: *Scott Gauthier*

Members: *Anita Bowden*

Mitigation Strategies Subcommittee:

Co-Chairs: *Ken Dwyer & Denise Cross*

Members: *Shanna Erickson, Dan McAuliffe, Kevin Ritacco, Andria Schwartz, Lisa Antonelli, Deirdre Healy, Denise Mrowka, Joanne Sharac, Amanda Holmes (student)*

Education Subcommittee:

Chair: *Nancy Schoenfeld*

Members: *John Solaperto, Donna Kilgore, Charu Travedi, Roger Meservey, Pam Fleming, Maggie Crowell, Martha Upton, Ingrid Skadberg, Colleen Doherty*

Community Outreach Subcommittee:

Chair: *Carol King*

Members: *Antoinette Raymond, Nancy Knight, Peg McGrath, Margaret Gniadek, Cheryl Finn*

Finance Strategies Subcommittee:

Chair: *Joyce Cravedi*

Members: *Robin Simonelli, Charu Travedi*