

Clark University

Updating Clark University's Climate Action Plan

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Global Environmental Studies Capstone and Directed Study

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Table of Contents

Executive Summary	3
• Student Statement	
• Why a Climate Action Plan Update is Important Now	
• What is a Climate Action Plan?	
Strategies Needing More Data	4
• Behavior Change	
• Heating Policy and Cooling Policy	
• Purchase Green Electricity	
• Office Plug Load Management	
• Increased Video Conferencing	
• Mass Rides- Rideshare Program	
Completed Strategies	6
• Fuel Switch (#6 to NG)	
• Replace CRTs with LCDs	
Strategies to Eliminate	6
• Use B100 on campus boilers	
• Use B20 in diesel fleet	
• Eco Reps	
Strategies to Add	7
Review of Mitigation Strategies	7
• Building and Energy Systems	
• Footprint Management	
• Information Technology and Equipment Purchasing	
• Air Travel & Commuting	
• Other Policy and Behavioral Initiatives	
Evaluation of Strategies	11
Conclusion and Recommendation.....	12
Acknowledgments and Resources	13

Executive Summary

Student Statement

As a Global Environmental Studies student I have been actively committed to sustainability causes on campus through various internships, initiatives, and clubs and organizations. The culmination of my work is illustrated here as an update to the Climate Action Plan written in 2007-2008 and published in 2009. While my research produced some important findings about the state of the plan at Clark, it must be noted that a one semester directed study is insufficient. My intention is for this document to be utilized by future students, Sustainable Clark, and the Clark University Environmental Sustainability (CUES) Task Force to ensure we stay true to our commitments towards zero emissions by 2030 and specify goals to ensure that we remain a sustainable and progressive university.

Why a Climate Action Plan Update is Important Now

Since the Climate Action Plan was written, much has changed on Clark's campus and in our world. New technologies have emerged and others have been replaced. Furthermore, awareness around climate change and our energy use is still being spread through communication networks, but Clark seems to have lost its sense of urgency. The low hanging fruit from the Climate Action Plan have largely been accomplished and other categories have been attempted (although sometimes half-heartedly). Five years have passed since the Plan's approval and the need to reinvigorate and inspire a new generation of students, faculty, and staff in research and campus initiatives is long overdue. Additionally, updating the Climate Action Plan is recommended by the American College & University Presidents' Climate Commitment (ACUPCC) and being discussed by other colleges and universities. Despite the fact that long-term planning is speculative and detailed planning for 2030 is not particularly helpful, the addition of goals for the near future (2015-2030) would be tremendously valuable. Clark University needs to be strategic as it moves into a new phase of resilience and adopts the practices and values of a sustainable institution enabling us to do better future planning.

On page 31 of the Climate Action Plan, it states:

Progress toward carbon neutrality will be assessed and reported annually to the campus sustainability task force and the campus community. The capital cost and operating budget impacts of the Climate Action Plan will be included and presented as part of the annual budget submission of the university, and incorporated into the academic and financial plan of the university. *We recommend a formal review of the Climate Action Plan take place every three years, involving faculty governance and the environment committee of the board of trustees.* [Emphasis added]

A formal review has yet to be completed. This document can be a catalyst for such an evaluation on the part of the CUES Task Force as it is their responsibility to ensure the success of the Climate Action Plan at Clark University.

What is a Climate Action Plan?

Clark's Climate Action Plan represents a roadmap of mitigation strategies as described here in the original plan:

"In June 2007 President John Bassett signed the American College and University Presidents Climate Commitment. Through this action Clark University became a charter signatory to a national initiative aimed at mobilizing the resources of colleges and universities in efforts to reduce greenhouse gas emissions. Clark University's Climate Action Plan sets two goals with respect to climate neutrality. First, we adopt an interim goal of reducing emissions by 20% below 2005 levels by 2015. Second, we set a target date of 2030 for achieving climate neutrality (net zero greenhouse gas emissions)." – Climate Action Plan, 2007

Strategies Needing More Data

** A case could be made for eliminating these categories due to their lack of measurability. N.B. President Angel asserts that they should remain in the plan for their future potential and possible overall impact on energy and emissions reductions.*

Behavior Change

Behavior change is an area that has been targeted by several different departments such as ITS's campaign "think before you ink" or the Eco-Reps efforts in the residence halls. The plan also vaguely sets the expectation that faculty and staff will focus on energy and resource conservation. The results of technology and efficiency improvements leading to energy savings are often easily confused with behavior change. The bottom line is that this is qualitative data, and thus quite challenging to measure. The Climate Action Plan necessitates clear-cut numbers to track our emissions and this is not an area that can produce those results. Making significant changes in this area also requires a large-scale cultural shift on campus and top down prioritization.

Heating Policy and Cooling Policy

Currently, heating and cooling are managed on a case-by-case basis accommodating the personal comfort of faculty, staff, and students that request temperatures be changed. There is an institutional policy recommending that temperatures be changed campus wide, but without a true commitment to that policy, the goals have not and probably can not be achieved. While there are efforts to lower temperatures in unoccupied buildings, they are often not followed up on since a few people may still be in the building.

Purchase Green Electricity

The purchasing of \$150,000 worth of kilowatts annually from a solar farm will replace the use of any carbon fuels on our electricity supply that are not powered by the cogeneration plant. There is also the possibility of purchasing additional power from another solar farm.

Office Plug Load Management

This mitigation strategy was meant to make Clark employees more aware of their electronics usage and the number of items they were using by bringing watt meters to offices and suggesting more shared electronic devices. On a more basic level, it was meant to ensure that surge protectors and power strips were utilized and turned off more frequently-- especially during breaks. Attempts were made, but personal preferences and comforts in offices have trumped the effort to reduce energy. Thus, the practicality of this strategy to reduce usage is questionable unless a campus-wide policy is written and enforced.

Increased Video Conferencing

Increased video conferencing was expected to reduce travel emissions of professors going to meetings and conferences. There are several barriers to the success of this strategy. It is widely acknowledged that the value of in-person presence at conferences, events, and meetings is critical to advancing Clark's mission, so video conferencing is not expected to completely eliminate travel. While costs have decreased for video conferencing, many faculty members are not willing to make the effort to follow through with this new infrastructure. On the other hand, developments have been made to encourage video conferencing use largely driven by video conferencing technology's growing convenience. Cameras have been installed in most classrooms as well as Skype, which enables individuals to set up a free account and do one-on-one video calls for no charge. Media services has also subscribed to Fuze Meeting which allows faculty members to set up multi-person calls with the ability to show presentations alongside the video. There are equipment charges ranging from \$35-\$100 for set-up and equipment loaning. Faculty have been utilizing these new technologies and features, but there has been no system to track how much they are being utilized or if they are replacing or simply adding to trips taken by faculty. Again, without a strategic effort by the university, it is unlikely that video-conferencing can replace travel by faculty to an extent that would decrease our emissions. The lack of measurability also makes this a challenging category to quantify.

Mass Rides- Rideshare Program

Carpooling through Mass Rides was anticipated to increase shared driving and less energy intensive transportation methods such as bicycling and public transit. Mass Rides gives incentives such as discounts to local businesses for using more sustainable transit methods. While the organization publicizes their services on campus, the number of users is quite insignificant and has not widely caught on.

While the Climate Action Plan only includes faculty, staff, and university transportation, progress to educate and change students' transportation habits have been made. For example, Clark has increased carpooling through a campus Facebook group. A better consortium shuttle, better transport to the train station, and having escort vans travel farther are

all possibilities for advancement of more sustainable transportation. Top-down prioritization and enforceable policies that make carpooling more attractive to faculty are a first step, but would still need a reporting system to track and account for these strides.

Strategies Completed

Fuel Switch (oil to NG)

In 2010-2011, Clark transitioned from oil to natural gas in our co-generation plant.

Replace CRTs with LCDs

All Cathode Ray Tubes or CRTs have now been replaced by Liquid Crystal Displays in monitors.

Strategies to Eliminate

Through my research I determined that these strategies have not and will not help Clark reach its goal of zero emissions by 2030. These strategies have been trialed and evolved over time also making them unfeasible.

Use B100 on campus boilers

Using B100 (biodiesel) in our campus boilers was projected to reduce emissions by replacing the fossil fuels it currently uses; however, when this was trialed, the biodiesel reacted poorly with the pipes and machinery. Thus, this is no longer a feasible option.

Use B20 in diesel fleet

The Climate Action Plan refers to Clark's fleet, however this only includes 2 trucks, 2 tractors, and a skid steer that all use diesel fuel. We also have several snow blowers, foil gators, a plough truck, a mower, weed wackers, and leaf blowers that use gasoline and 2 propane mowers. There is the potential to use biodiesel in the newer vehicles, but there would be a significant cost increase and no reliable supply without a nearby digester.

In order for this category to be a measurable and effective reduction strategy, a full inventory of all campus fleet vehicles is necessary. The use of gas cards versus explicit expense reports and the leasing of vehicles are needed for this inventory. For example, vehicles rented by departments or cars used for administrative purposes should be recorded and evaluated.

Eco Reps

The creation of an Eco-Reps program was expected to reduce emissions in the residence halls by 24 MTCO_{2e} yearly. However, it was also planned that the program would entail paid positions. Whether or not the commitment by Eco-Reps to the residence halls has decreased because there is no paid component is unclear. The organization of Eco-Reps has shifted since 2007 and now focuses on other campus sustainability issues. While

actions have been taken in an effort to reduce energy usage in the halls, it is unclear if the reductions made can be attributed to Eco-Rep actions, overall behavior changes in society, or technology improvements.

Categories to Add

The campus carbon calculator tool that Clark utilizes and on which the Climate Action Plan was based includes these categories to give credit for areas in which positive change is made. Other calculators may have additional measures. If added to the Climate Action Plan they would act as offsets. As technology advances and the Clark environment changes new opportunities for these strategies will emerge.

- Solid waste and compost
- Carbon sequestration
- Transportation credits
- Supporting land conservation
- Selling back to the grid

Review of Ongoing Mitigation Strategies

These strategies are currently in the process or scheduled to be researched, funded, and implemented before 2030.

Building and Energy Systems

Central Plant Renovation

The central plant renovation was mostly completed upon installing the new cogeneration plant, however, the Climate Action Plan intended for new boilers to be installed (last replaced in 1967). The cost of updating the boilers does not produce significant enough energy reductions (about a 3% increase in efficiency). The boiler controls have been updated slightly improving efficiency since they can now be controlled independently. Thus, this category would need to be decreased since the boilers cannot reduce our emissions as much as anticipated.

Distribution System Replacement

Currently about 30% have been replaced and it will be about 80% with the Alden Quad renovations. Replacing the distribution systems for Goddard Library, Bullock Hall, and the Kneller will bring this category to completion.

Lighting and VFD retrofits

Lighting updates and retrofits have been about 80% completed, but are also an ongoing process as new technology developments are frequently coming out. LED lights have been installed in the outdoor floodlights, desk strips in the residence halls, and the library. GreenerU also led this initiative by targeting certain areas to make the switch. LEDs are still being improved upon in terms of quality of lighting and reduced costs. This category has

much room for improvement because motion sensors in hallways, Jefferson, Traina, faculty and staff offices, and various other locations have yet to be installed.

Central Chiller Plant

About 80% of the rooftop chillers have been removed and connected to the central one.

Building Systems and IT (*The CAP says IT, but it should be HVAC*)

This has nearly (about 80%) been completed with the installation of all large Variable Frequency Drives (VFDs) in buildings, enabling a more efficient management of energy systems with set schedules. Smaller VFDs have not been replaced, but will be in the future.

This category also includes any building technology that will improve efficiency such as air handling in science labs. Thus, there is still a great deal for improvement before 2030.

Footprint Management

Footprint Management (thru 2015)

The Registrar's Office has been diligently keeping track of classroom usage and sends that information to the HVAC supervisor to adjust energy outputs allowing for denser usage. Through this tracking we are avoiding the construction of new spaces that Clark does not need. While this is an area that has often been considered in campus planning for the future, it lacks concrete performance indicators for all of the initiatives. An annual recalculation of the campus's carbon footprint would make tracking footprint management more organized, allow for goal setting, and lead to reevaluating the size of offices and how much Clark will actually grow.

Footprint Management (thru 2025)

This strategy will be an area that needs to evolve and develop as new technologies and norms are introduced and as the University considers the best ways to grow within our means and do so sustainably. Again, specific goals based around our annual carbon footprint would make management of our footprint more effective and strategic.

Information Technology and Equipment Purchasing

Technology Improvements

Technology improvements were based on purchasing all Energy Star products, but there was no baseline established to measure our improvements. Energy Star products are purchased if that option is available and the University is committed to spending more for those products. If a computer is not funded centrally, ITS will provide recommendations taking energy efficiency into account; the final decision lies with the purchaser.

ITS staff are trained on green computing strategies which includes energy saving techniques on computers, Clark recommended power saving settings, and the minimization of devices. Many of which are optional on primary, secondary, and research-designated computer and difficult to track. Video bulletin board systems have been put up in the Academic Commons and the Kneller, but have not been utilized in other locations such as the residence halls due to high costs.

The Google/Intel Climate Savers Initiative was mentioned in the Climate Action Plan as a strategy, but no further actions were taken.

Physical Server Upgrade (Blades)

75% of the server upgrade has been completed and replaced servers with blades, which are more energy efficient.

Virtualization has decreased efficiencies that Clark can gain from blade infrastructure.

Increase Virtualization of Servers

The majority of the servers that can be virtualized have been.

Computer Power Management

Clark is currently using Microsoft System Center to manage power settings on all centrally managed Windows computers. On systems where users can manage their own power settings, only 30% have chosen the recommended power settings.

ITS utilizes email, social networking, campus portal, and campus news services to educate to the Clark community. Energy savings options are also covered with every system where users can manage their own power settings. Still many users choose not to participate.

Air Travel & Commuting

Fuel Efficiency Increases

Fuel Efficiency is a category that can be increased since standards are higher than anticipated. The Climate Action Plan projected that the average miles per gallon of cars would be 31.6 by 2015. They have actually been increased to 35.5 miles per gallon by 2016 for the combined average of passenger cars and trucks and eventually 54.5 miles per gallon by 2025.

Commuting

This is an area that has made minor strides in terms of carpooling, however, our dependency on an improved public transportation system makes this challenging. There has been unanticipated improvements in the commuter rail to Boston, but without reliable public transportation in and around Worcester (for example, to and from the train station to Clark), this goal can not be achieved.

Air Travel

Although, air travel for meetings and hiring may have been reduced due to video conferencing, travel for conferences and certain meetings remains a necessary part of many student, faculty, and staff's jobs. Nevertheless, we have no way of effectively tracking or measuring achievements or setbacks in this area.

Other Policy and Behavioral Initiatives

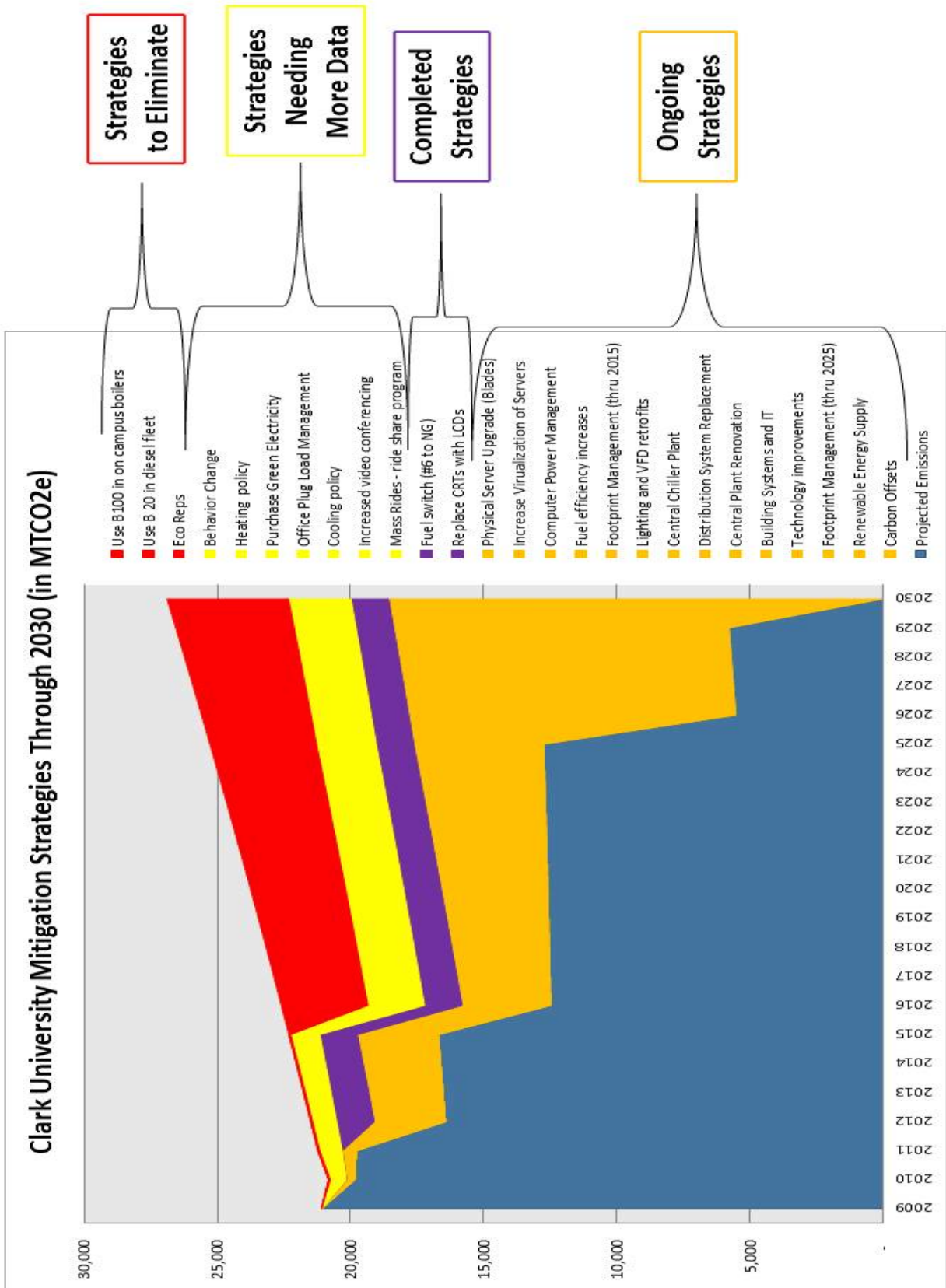
Renewable Energy Supply

Renewable energy supply specifically refers to renewable energy used on-site. This category has yet to be addressed since current forms of renewable energy supplies have been deemed unfeasible for campus. However, with the construction of the new Alumni Engagement and LEEP building on Main Street, solar panels will be included. As technology advances, new opportunities may arise for renewable energy supply on campus.

Carbon Offsets

The purchase of offsets will not take effect until closer to 2030 when Clark will be more aware of the emissions we have not decreased or completed.

Evaluation of Strategies



Conclusion and Recommendation

In my research into the actions of other colleges and universities I found not only a trend of updating climate action plans, but also broadening their scope to include overall sustainability. This allows for greater campus wide diversity, well-being, and participation towards a common goal. Furthermore, having a sustainability plan introduces the idea of sustainability as a way of life and response to the urgency of climate change. As an academic institution, I believe it is our responsibility to instill this in the student body, faculty, and staff, regardless of discipline. Michael Thomashow has introduced this idea at Unity College in Maine by integrating these 9 elements into the fabric of the university: energy, materials, food, governance, investment, wellness, curriculum, interpretation, and aesthetics. Other universities such as Wesleyan, Portland Community College, and several others are taking those values to the heart of their institutions as well. As a progressive university impacting its students, the surrounding Worcester community, and the world, we already act sustainably in all aspects; however I strongly recommend that the CUES Taskforce consider broadening the scope of its formal review to an inclusive sustainability plan as they work towards the success of the Climate Action Plan.

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- Jennie Stephens, Professor of Environmental Science & Policy
- William O'Brien, Professor of Management & Executive in Residence
- Chip Pybas, Grounds Supervisor
- Pennie Turgeon, Vice President for Information Technology

Resources

- AASHE (Association for the Advancement of Sustainability in Higher Education)
- AASHE Conference & Expo 2013 in Nashville, TN
- Clark Eco Reps
- Dave Schmidt's (former Clark Sustainability Coordinator) Background Disks
- GreenerU
- The Green Listserv
- The New England Campus Sustainability Forum 2013 in Boston, MA
- "The Nine Elements of a Sustainable Campus" (2009) by Michael Thomashow
- Second Nature
- Smart and Sustainable Campuses Conference 2014 in Baltimore, MD
- Climate Action Plans and Sustainability Plans from: Portland Community College, Wesleyan University, Cornell University, Duke University, University of Washington, Ursinus College, College of Charleston, University of Colorado, University of Connecticut, and Oberlin College