Eastern Mennonite University: Climate Action Plan 2015

EMU's Climate Action Plan was created by the EMU Office of Sustainability & the Creation Care Council, with the help of many faculty, staff and campus community members.

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Cover photo: Kaitlyn Troyer planting an olive tree on a farm near Bethlehem while on cross-cultural in the Middle East, photo by Trey Pitt

Executive Summary

What is Climate Change?

In the fall of 2014 the United Nations International Panel on Climate Change (IPCC) published its Fifth Assessment Report on the warming of the planet. Earlier in the same year the United States released its third National Climate Assessment as a collaboration between 13 federal agencies with help from more than 300 experts. These large and thorough documents both came to the same conclusions. Greenhouse gases such as carbon dioxide and methane are increasing in the atmosphere primarily from human activities such as burning fossil fuels and agricultural processes, and their presence is trapping heat from the sun and raising the temperature of Earth's climate. This warming is leading to more extreme weather events such as extended droughts and increased flooding, melting glaciers and rising sea levels, ocean acidification and shifts in ecosystems that are threatening the existence of large numbers of plant and animal species.

Global climate change is expected to increase as more heat-trapping gases are released into the atmosphere. Even with rapid emission reductions the planet will continue to warm due to the long life of greenhouse gases. Given the severity of changes that are occurring now with relatively small global temperature changes, humanity cannot continue with business-as-usual.

What is EMU's Role in Climate Change?

In fiscal year 2014-15 EMU emitted approximately 6263 metric tons of carbon dioxide equivalent (MTCO2e) greenhouse gases. This was a 2% increase over 2013-14 emissions (6133 MTCO2e) and a 24% increase over 2009 emissions (5044 MTCO2e), the first year EMU collected data on greenhouse gas emissions. EMU emissions come mostly from energy usage (59%) and transportation (39%), with emission levels most affected by winter temperatures for heating costs, cross cultural destination distances from the U.S., and the number of students and employees traveling to and from campus daily.

EMU has the potential to be a model and a leader in our community and in society at large for ways to address climate change. President Swartzendruber signed the American College and University President's Climate Commitment in 2013 after careful consultation with members of the EMU community including the Physical Plant and the Creation Care Council. The ACUPCC states in part, "Campuses that address the climate challenge by reducing global warming emissions and by integrating sustainability into their curriculum will better serve their students and meet their social mandate to help create a thriving, ethical and civil society."

How Will EMU Achieve Climate Neutrality by 2035?

The Climate Action Plan that follows lays out the path for EMU to achieve climate neutrality by 2035. This plan is meant to be a living document that is continually updated as knowledge improves in how best to reduce our climate warming impact. Several significant projects in the appendix have already seen implementation in the year long process of writing this document, which is a good sign moving forward. Successful implementation of the 2015 Climate Action Plan will rely on careful organizational support and follow-through, the ability of the institution to engage students around climate change, and the creativity of the institution to find funding for the projects needed to meet our commitment to be climate neutral by no later than 2035. To reach this goal, EMU will strive first to reduce our carbon emissions wherever possible, and second, to invest in local or globally-affiliated projects to offset the basic emissions we are unable to reduce and still function as a university.

Introduction

A spring 2014 report from the United Nation's International Panel on Climate Change (IPCC), *Climate Change 2013: The Physical Basis*, states that, "Warming of the climate system is unequivocal, and since the 1950s, many of the observed changes are unprecedented over decades to millennia. The atmosphere and ocean have warmed, the amounts of snow and ice have diminished, sea level has risen, and the concentrations of greenhouse gases have increased." The report further elaborates, "The atmospheric concentrations of carbon dioxide, methane, and nitrous oxide have increased to levels unprecedented in at least the last 800,000 years. Carbon dioxide concentrations have increased by 40% since pre-industrial times, primarily from fossil fuel emissions and secondarily from net land use change emissions." [1] As indicated in the last sentence of that statement, the global scientific consensus is now that human actions are primarily to blame for the warming of the planet. The three reports released in the last year building up to the Fifth Assessment Report (5AR) from the IPCC clearly communicate the overwhelming evidence of the warming of our planet's climate and the impact the warming has and will have on people around the world and our environment. The strong warnings issued in previous IPCC reports compelled EMU to seriously consider signing on to the American College and University President's Climate Commitment (ACUPCC) in 2007. At the time President Swartzendruber consulted with the facilities staff and vice president for finance who would have to implement the carbon emission reductions and later that year released a statement saying, "we could not see our way clear to promise that we would be able to meet all of the very strict standards established in the president's letter. We will continue to review our systems and I will sign the document when I have the information to support doing so."[2]

In the years that followed, EMU established the Creation Care Council (CCC), a widely represented group of faculty, staff and students, tasked with coordinating EMU's growing number of sustainability initiatives. The campus took on several large energy conservation efforts and brought site-generated solar power to campus through a power-purchasing agreement on a 104KW solar array on roof of the campus's Hartzler Library. These efforts convinced the administration that EMU would be able to meet the goals of the ACUPCC and in February of 2013 President Swartzendruber signed the ACUPCC pledge.

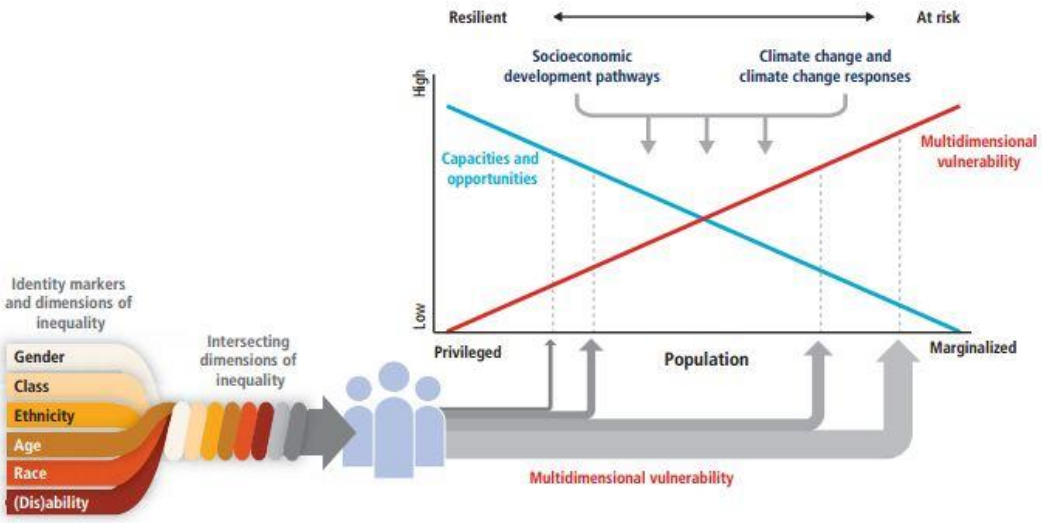
[1] IPCC, 2013: Summary for Policymakers. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

[2] EMU Press release from 2007, "Presidents Climate Commitment: Why EMU Hasn't Signed On"

Guiding Statement on EMU's Climate Commitment

Creation Care Council was given the task of crafting proposals to present to the President and the President's Cabinet for how the university would meet the climate neutrality commitment. Seven months after President Swartzentruber signed the ACUPCC, the CCC adopted the following as the guiding statement for EMU's response to the changing climate:

1. We accept the scientific consensus on the realities of climate change and the role of human behavior in contributing to the problem.
2. We acknowledge that the wealth and opportunities afforded us today, unprecedented in human history, are partly due to energy derived from fossil fuels over the past 150 years, which we now know to cause climate imbalances.
3. We agree that the effects of climate change will disproportionally impact those who have contributed to it least, and who are least-equipped to adapt to predicted environmental, social, economic, and political changes.
4. We agree that our continued emissions of greenhouse gases places further strain on the poor and disadvantaged, and impacts all of Creation.
5. We agree that the operations of EMU and each of our individual parts in it are contributing to climate change.
6. We agree that we have a responsibility and choice as an institution and as individuals to reduce our climate impact.
7. We agree that taking full institutional responsibility requires a policy-level action plan.



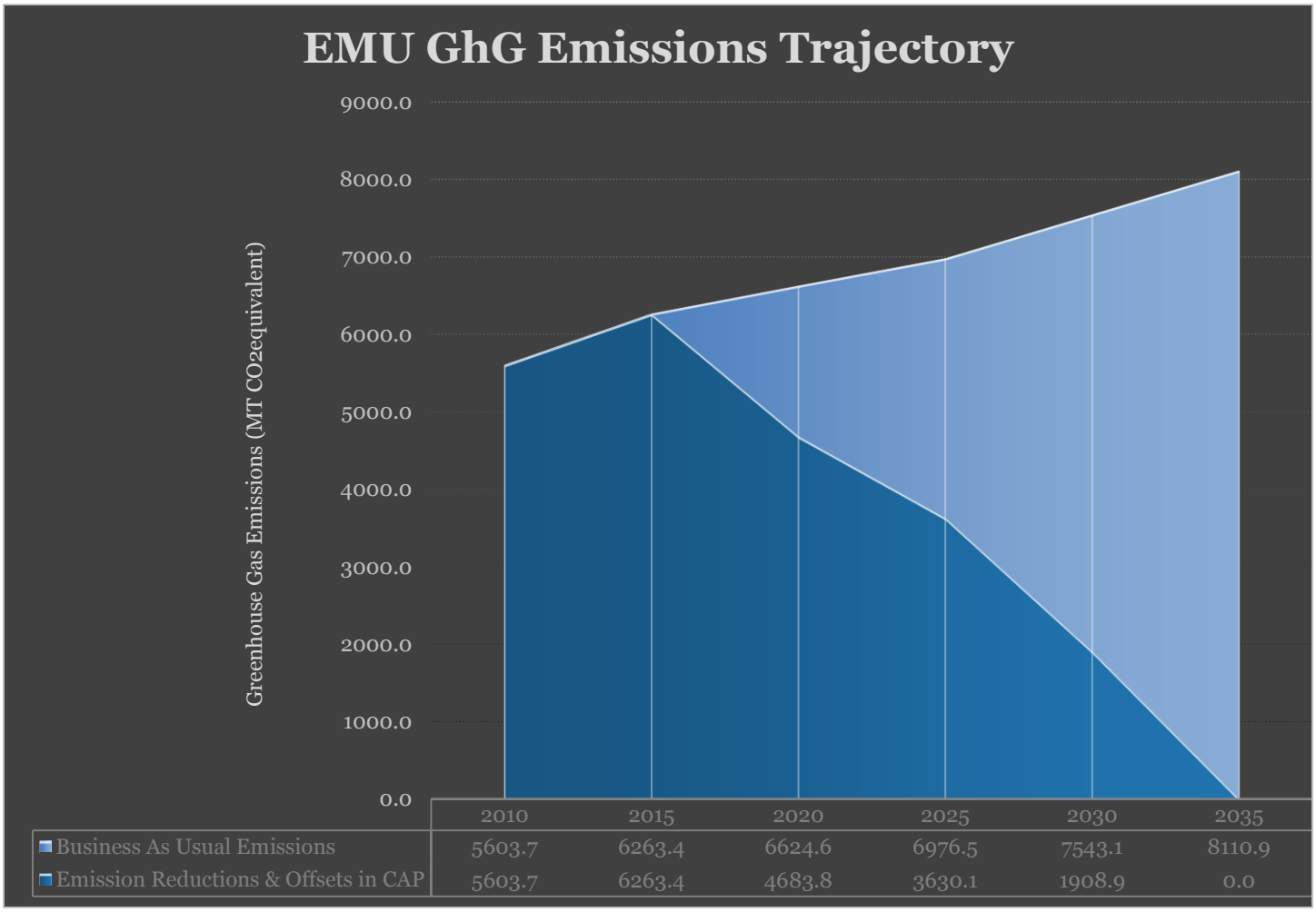
Box TS.4 Figure 1 | Multidimensional vulnerability driven by intersecting dimensions of inequality. Vulnerability increases when people's capacities and opportunities to adapt to climate change and adjust to climate change responses are diminished. [Figure 13-5]

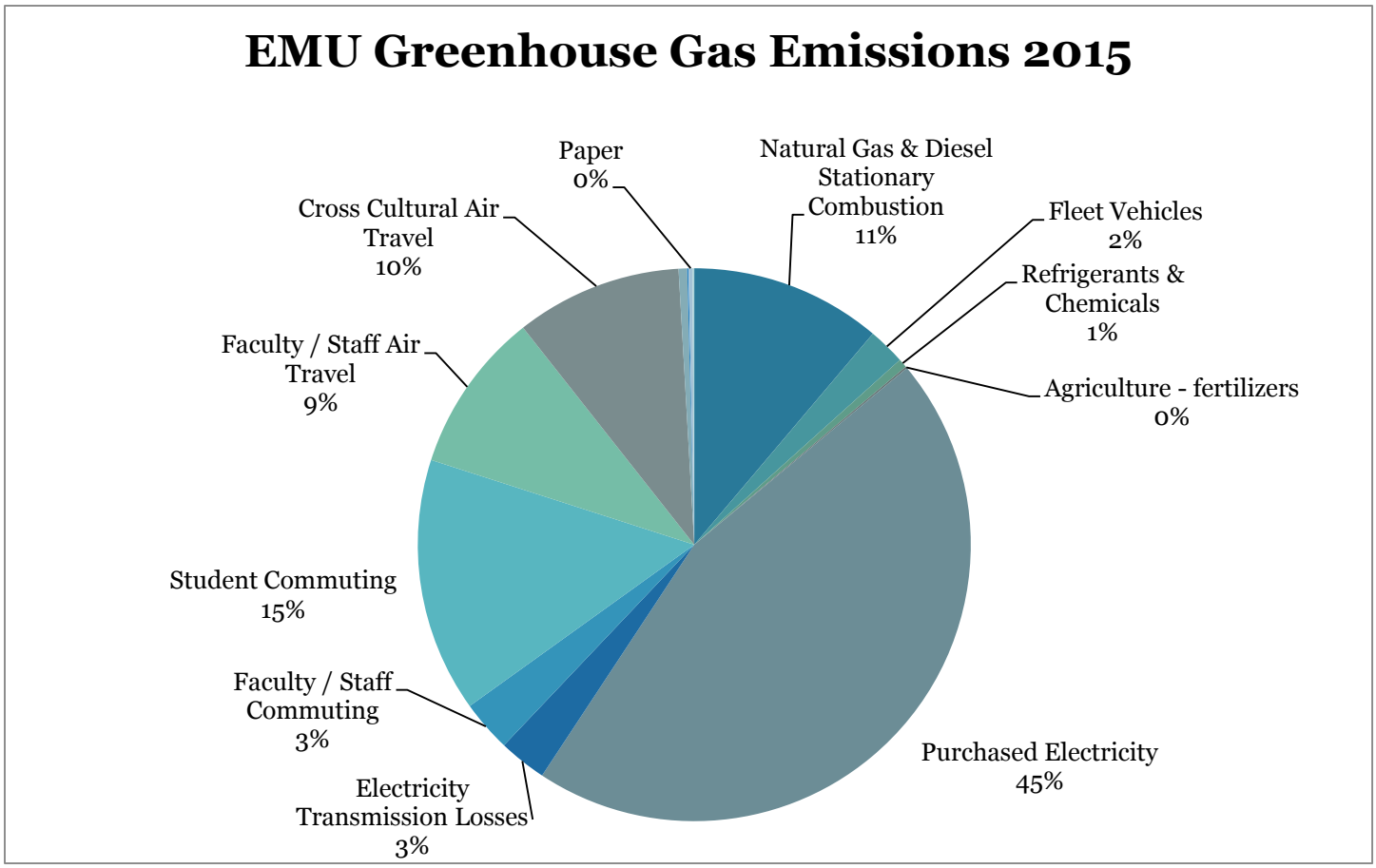
Graphic from Field, C.B., V.R. Barros, K.J. Mach, M.D. Mastrandrea, M. van Aalst,W.N. Adger, D.J. Arent, J. Barnett, R. Betts, T.E. Bilir, J. Birkmann, J. Carmin, D.D. Chadee, A.J. Challinor, M. Chatterjee,W. Cramer, D.J. Davidson, Y.O. Estrada, J.-P. Gattuso, Y. Hijioka, O. Hoegh-Guldberg, H.Q. Huang, G.E. Insarov, R.N. Jones, R.S. Kovats, P. Romero-Lankao, J.N. Larsen, I.J. Losada, J.A. Marengo, R.F. McLean, L.O. Mearns, R. Mechler, J.F. Morton, I. Niang, T. Oki, J.M. Olwoch, M. Opondo, E.S. Poloczanska, H.-O. Pörtner, M.H. Redsteer, A. Reisinger, A. Revi, D.N. Schmidt, M.R. Shaw, W. Solecki, D.A. Stone, J.M.R. Stone, K.M. Strzepek, A.G. Suarez, P. Tschakert, R. Valentini, S. Vicuña, A. Villamizar, K.E. Vincent, R.Warren, L.L.White, T.J.Wilbanks, P.P.Wong, and G.W. Yohe, 2014: Technical summary. In: Climate Change 2014: Impacts,Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Field, C.B., V.R. Barros, D.J. Dokken, K.J. Mach, M.D. Mastrandrea, T.E. Bilir, M. Chatterjee, K.L. Ebi, Y.O. Estrada, R.C. Genova, B. Girma, E.S. Kissel, A.N. Levy, S. MacCracken, P.R. Mastrandrea, and L.L.White (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 35-94.

Our Greenhouse Gas Emissions

Recognizing the devastating impacts to our planet and especially to the poor in a business as usual scenario, EMU commits to reaching climate neutrality by no later than 2035.

The baseline for Greenhouse Gas (GhG) emissions reductions is EMU's 2009-10 emissions year, the earliest year with adequate data. The data presented here is the best available at the time, and has improved year over year as sustainability data collection becomes institutionalized.





Standards and Conventions

To understand the targets set forth in this document, a general understanding of greenhouse gas accounting is helpful. The World Resources Institute, a non-profit think tank in Washington, DC, crafted the Greenhouse Gas Reporting Protocol which is the internationally recognized document governing how greenhouse gas emissions are calculated. The Protocol divides emissions into three categories:

Scope 1 emissions are those GHGs that are directly released on-site, such as combustion of fuels and the application of fertilizers on campus.
Scope 2 emissions result from energy purchased from off-site sources where fuels are burned. For EMU this is exclusively electricity we purchase from Harrisonburg Electric Commission.
Scope 3 emissions include all other GHG-producing activities associated with the activities of an institution, including: student and staff commuting; air travel for university activities; cross cultural travel; waste disposal; and embodied emissions from the extraction, production, and manufacturing of purchased goods. Food would also be included in this section, but we are unable to accurately estimate the associated emissions and so have left them out of our GhG inventory. We hope to add food-related emissions in coming years.

Goals for Greenhouse Gas Mitigation

Reaching for climate neutrality on campus will require continued reevaluation and re-invention over the decades to come as science continues to learn more about the impacts of human burning of fossil fuels and humanity improves our mitigation and adaption efforts. The following interim targets provide our best current framework for the institution's transition to climate neutrality.

In order to meet the most immediate interim targets, those listed above for 2020, the following specific goals have been set for the university, by scope.

Year	Scope 1	Scope 2	Scope 3
2020	20% reduction from baseline	20% reduction from baseline	15% reduction from baseline
2025	40% total reduction from baseline	40% total reduction from baseline	30% total reduction from baseline
2030	70% total reduction from baseline	70% total reduction from baseline	60% total reduction from baseline
2035	100% total reduction from baseline	100% total reduction from baseline	100% total reduction from baseline

Scope 3 reductions lag Scopes 1 and 2 reductions due to difficulties in managing upstream and downstream emissions produced by outside companies. The built-in assumption is that the marketplace will continue to offer more options for EMU purchasing and waste handling, but slightly behind the pace that the university keeps with our Scope 1 & 2 reduction efforts.

Strategies for Meeting Goals

The six strategies below were used to identify and prioritize the GhG mitigation projects listed in brief below. More detailed projects are listed additionally in Appendix I.

1. Individual **behavior change** – change thermostats, turning off lights, use bicycles more, vehicles less, dress for the season
2. **Conservation**/efficiency measures – LEDs, large motor efficiency (VFDs), insulation, window film, air-tight renovations, building energy audits
3. **Improve purchasing** decisions to include environmental costs of producing (upstream) and of disposing (downstream) of purchased products – eg. 100% recycled content paper, bottle water bans, off-site renewables, buy from environmentally conscious companies that are working at reducing carbon emissions (our upstream emissions)
4. **On-site renewable** generation – solar pv, solar thermal, biogas, etc.
5. **Offsets** – high quality local offsets, methane recovery
6. **Policy advocacy** outside of EMU – car and airline fuel efficiency (i.e. CAFE standards), renewable energy in state utility portfolios (mandated or "voluntary"), national carbon tax

Specific Goals for 2020

2020 Goals Scope 1:

- 15% reduction in fleet vehicle usage compared to 2008-2009
- 15% reduction in NG usage compared to 2008-2009
- 25% increase in fleet mpg compared to 2008-2009
- 15% decrease in NO2 emissions related to fertilizer application on campus grounds
- 15% decrease in grounds-related fuel usage compared to 2008-2009
- No increase in generator emissions compared to 3-year running average baseline from 2012-2013 through 2014-2015

Possible projects: Electric car for security, tow behind reel mowers, campus car share program with solar-charged EVs and/or hybrids for students and employees

2020 Goals Scope 2:

- 20% reduction in electricity usage compared to 3-year running average baseline from 2008-2009 through 2011-2012

Possible projects: Solar Phase II, LED light bulb retrofits, higher efficiency lighting in parking lots, fees on student dorm fridges that would fund local offsets or a green loan fund, fan and blower efficiency upgrades, Variable Frequency Drives (VFDs) on large pumps, purchases of high quality wind power Renewable Energy Credits (RECs), changes to student laundry to reduce dryer run times and hot water use, window film on west facing windows to reduce cooling loads, campus and inter-campus energy competitions to encourage behavior change, upgrade electric hot water heaters in Parkwoods Apartments, wastewater recovery/preheat, require new buildings and renovations to meet LEED Gold or strict in-house greenbuiding guidelines, energy audits with airsealing/insulating, installing swipe card system for laundry with quotas similar to printing that would cut abuse

2020 Goals Scope 3:

- 15% reduction in all commuter emissions with corresponding increases in carpooling, bus transport, biking and walking to work/class compared to 2014-15
- 15% reduction in financed employee air travel compared to 2014-15
- 25% reduction in emissions resulting from EMU cross cultural trips
- 75% recycling rate
- 20% overall waste stream reduction, including compost, recycling and waste compared to to 3-year running average baseline from 2008-2009 through 2011-2012
- 100% post consumer recycled content paper usage across campus
- 25% local and community-based, fair, ecologically sound and/or humane food purchases as defined by Real Food Challenge
- 35% reduction of transmission and distribution related GhG emissions through on-site generation and energy conservation projects compared to 3-year running average baseline from 2008-2009 through 2011-2012
- 20% reduction of potable water usage on campus compared to to 3-year running average baseline from 2008-2009 through 2011-2012

- Possible projects: Priority parking or incentives for fuel-efficent employee vehicles, subsidize and expand public transit, improve bike commuter facilities (covered parking, showers, bike hub with repair), green purchasing guidelines, 100% recycled content paper on campus, high-quality offsets for cross cultural travel, increase campus-grown food including dairy and meat, increased parking fees to discourage car commuting, rideshare program, meatless Mondays, green office program

Sustainability in the Curriculum

Part of the ACUPCC commitment is "to make climate neutrality and sustainability a part of the curriculum and other educational experience for all students" and "to expand research or other efforts necessary to achieve climate neutrality."[3] Educating students to serve and lead in a global context, the core of EMU's mission, requires that we incorporate into our teaching the interlocking aspects of economic, environmental, and social sustainability. *Peace with Creation: Sustainability from an Anabaptist Perspective* was an initiative that drew together EMU students, faculty and staff around the theme of sustainability and how it relates to Anabaptist beliefs concerning creation care, peace and social justice. The initiative was a five year Quality Enhancement Plan (QEP) that focused on undergraduate student learning, beginning in the fall of 2009 and ending in spring of 2015. Currently the Office of Sustainability has a Sustainability Curriculum Coordinator whose job is to ensure that the curriculum work begun under *Peace with Creation* is continued and expanded where possible.

Principles of Sustainability

We acknowledge that individual, institutional, and community actions have local and global impacts on the current and future health and prosperity of all humans and other species. These impacts include the:

- The fairness, equity, stability and security of human cultures and social systems
- Economic opportunity for all current and future humans
- Ecological diversity and integrity[4]

Therefore, we strive to transform and renew social, economic and ecological systems to create just and peaceful relationships between humanity and the rest of Creation.

Principles for Teaching Sustainability

The following principles are essential aspects of teaching sustainability:

- Emphasize the interconnectedness of all people, disciplines and actions (i.e. systems thinking)
- Engage students in actions that are experiential and include real world problem solving
- Explore economic, environmental, and social justice through connections to people both locally and globally

Student Learning Outcomes

1. Define sustainability according to the *Principles of Sustainability*
2. Justify sustainability from a theological perspective
3. Explain how individual, institutional, and community actions impact sustainability
4. Name and defend actions that promote sustainability at the individual, institutional, and community levels
5. Integrate the *Principles of Sustainability* within the student's discipline
6. Incorporate sustainability into one's values system

[3] *Text of the American College and University Presidents' Climate Commitment*. Retrieved November 24, 2014 from http://www.presidentsclimatecommitment.org/about/commitment.

[4] Cortese, A. D. (2005, April). Learning principles for sustainability: Sustainability curriculum framework for curriculum development. Retrieved January 28, 2009 from http://www.secondnature.org/efs/res_sheets/sustainabilitythemes.pdf

Implementation Structure and Tracking Progress

The Creation Care Council will provide joint oversight in the implementation of the Climate Action Plan along with the Office of Sustainability (OS). The OS will track the university's progress toward achieving climate neutrality through compilation of an annual greenhouse gas inventory, which will be shared with the Office of the President and the Creation Care Council along with updates on the interim targets listed in the CAP annually at the start of the spring semester. The Office of Sustainability will pull together working groups of faculty, staff, students and administrators in consultation with CCC in order to draft the biennial Progress Report for the ACUPCC and propose new interim targets to CCC and the Office of the President for inclusion in the Progress Report. Similar working groups would be organized to update the 5 year CAP in collaboration with the university's strategic planning process. Leadership and coordination for the listed mitigation and adaptation projects will fall to the OS at the last, but individuals and departments must continue to provide leadership for many of the CAP projects listed in this document to be completed.

Barriers

EMU is an institution of higher education; it is our mission and business to educate. At this point we are not an organization with significant annual funds earmarked in the budget for sustainability. Significant reductions to our climate impact will require detailed moral and financial justification to compete with the regular expenses of the institution including fair compensation of all employees; technologies for teaching; air and car travel for recruiting, fundraising and professional development.

Climate warming is also theoretical, complex and wide-ranging in nature which makes communicating about climate change difficult. Addressing our warming climate also necessitates re-evaluating our lifestyle choices, both institutional and personal – how we consume energy, water, transportation, food and soil. Lifestyle choices are often not discussed because our individual choices as a consumer of goods and energy at home and at work are culturally sacred and the freedom to consume without much scrutiny is at the center of the social fabric of our economy.

Finally, the warming planet is slow enough that it is not perceived as an emergency and cannot compete with other more immediate concerns. Outside of emergencies, tuition-dependent EMU is necessarily focused on next year's enrollment. Given that EMU does not have a huge endowment or well-funded, research-only centers as many larger public institutions do, there is very little institutional attention for 25-50 year planning around global-scale problems at the administrative level.

Opportunities

Being an institution of higher education is also a great strength. The changes EMU implements to our institution model sustainability to students and faculty and staff. We have woven sustainability into the curriculum so that every student leaves EMU with knowledge of the changing climate and with ideas of what needs to be done to counter that change.

Costs and Financing

The majority of the financing for the CAP projects will come from capital budgets and from operating cash in projects where payback times are two or three years. The OS is working with the university Advancement division to reach out to alumni and constituency groups that would be interested in funding on-going sustainability efforts through an EMU Sustainability Loan Fund. Beyond possible donations, the fund might also receive funding from fees assessed to students and employees to disincentivize behaviors that contribute to GhG emissions such as increased parking fees, dorm refrigerator fees or an internal carbon tax. Finally, the fund could capture all or parts of the savings from energy improvements on campus as a way of growing capacity to implement our ACUPCC commitments. Of some concern is the possibility that the easiest projects with highest payback will get implemented and leave stranded larger projects that have a larger emissions impact but with longer payback periods. Harvard University has been working at this dilemma by pairing fast and slow payback projects in one funding effort to give a medium rate of return with a far larger impact on emissions.

In the coming decades the university will continue to emit carbon through air and commuter travel; purchasing of paper, food and equipment; and burning of natural gas for water heat and back-up electricity generation. This will require the purchase of carbon offsets.

Conclusion

EMU is well positioned as an institution to address global climate disruption on our campus and around the planet. The campus community has been engaged at all levels in sustainability efforts for many decades, often with self-started projects created and run with passion and concern for people and the environment. Our cross cultural programs and Center for Justice and Peacebuilding grow relationships between our campus and communities around the planet where poverty and conflict are becoming exacerbated by climate stressors like drought, floods, loss of marine life from ocean acidification and increased heat. EMU has the opportunity over the next two decades not only to transform how we impact our climate as a living laboratory for students and staff, but to engage the world outside our small campus. We have many resources to support other communities as they work to meet basic needs while adapting to a changing climate. And all of this happens in a community of reflective and engaged learning with students who leave EMU with the knowledge and skills to work at the greatest human challenge of this century, slowing global climate change.