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Environment 391

University of Michigan’s Greenhouse Gas Emissions

Climate change is one of the biggest global issues we face today. We know that climate change will have serious effects on our world as we know it, and we know some of the factors causing it, but we have not been doing well in resolving the problem. One of the major contributing factors to climate change is the emissions of greenhouse gases or GHGs. Greenhouse gases trap heat in the atmosphere and to a certain degree they are helpful to keep the planet hospitable to life. However, we have come to a point where there are too many GHGs and our global temperature is increasing resulting in many other changes a long with it. (Energy Module Content, 2014)

The effects of climate change are already being felt around the world through increases in extreme weather, spread of diseases that are found in warmer climates, and loss of biodiversity. We are even seeing effects here in the Great Lakes region and even Ann Arbor (Energy Module Content, 2014). The options we have left are to either make changes or stand by and watch things fall apart. One of the best places to start changes is in our GHG emissions.

Greenhouse gas emissions come from a variety of things, from energy used in transportation, electricity and heat, industry, fuel combustion, to industrial processes, agriculture, and waste (Center for Sustainable Systems, 2013). If Ann Arbor wants to make a difference in its emissions, the bulk of the change will have to be through the University of Michigan. The university is the major contributor to emissions because of the mass amount of Ann Arbor that it occupies.

The University of Michigan does currently have a sustainability plan and they are working on many measures including reducing their GHG emissions. The university is working on improvements in sustainability in comparison to their 2006 levels. Particular goals the university holds by 2025 are reducing GHG emissions by 25% from 2006 levels and decreasing carbon intensity of passenger trips on U-M transportation by 30% from 2006 levels (University of Michigan, 2012).

When we look at the university’s progress report from 2013, we can see that we haven’t been progressing toward our first goal very well. The starting baseline for GHG emissions in 2006 was 680,000 MTCO2e, making the goal for 2025 510,000 MTCO2e. However, our current emissions of 2013 have increased to 710,000 MTCO2e (Alexander, 2014).

How could this be? The university has made so many sustainability positive changes! University of Michigan’s campus is now home to six LEED certified buildings and five that are registered. The university also has two sites with solar panels, two 2.5 MW turbines in Cadillac, and the Central Power plant that provides steam, electricity, compressed air, and hot water for Central and Medical campuses (Alexander, 2014). The central power plant produces half as much CO2 and much less nitrogen and sulfur oxide as well in comparison to coal (Energy Module Content, 2014). Another great change for the university has been through Planet Blue who saved more than $4 million in utility costs by decreasing energy consumption about 8.4% (Energy Module Content, 2014)

The answer lies in many contributing factors to this increase in emissions. The university has added about 4.8 million square feet in infrastructure to the campus since 2006 and there is probable continued campus growth (Alexander, 2014). More infrastructures to support, means more energy use, and more GHGs. Another major factor to our emission increase is that a large amount of the added energy we need is purchased energy through DTE. DTE relies heavily on coal powered energy, and we rely heavily on DTE. GHG emissions have increased 16% since 2006, mostly because of purchased energy (University of Michigan, 2013).Until we can reduce our need for coal powered electricity, we won’t be able to meet our 2025 goals (Alexander, 2014).

The University of Michigan is currently in a tough spot when it comes to reducing GHG emissions. They have been doing a lot to make sustainable changes, but are running low on options now due to much of the problem coming from outside of the university, from their purchased energy. What can the university do to still move forward even with the DTE barrier? They could offset their carbon emissions instead. There are only so many factors we can change and reduce; there will always be factors that are out of the university’s control. A carbon offset program would make the most sense as a solution to those issues.

Many other universities have carbon offset programs in place. Duke and Seattle University both have programs that involve anaerobic digesters. These digesters capture methane from hog or cow waste on farms nearby. The Seattle program burns the methane in a generator to produce electricity outside of the service area. Their digester captures more than 1.7 million pounds of methane annually which is over 37 million pounds of carbon dioxide. Natural gas customers can purchase carbon offset blocks for four dollars each, and remove 400 pounds of carbon dioxide. Seattle University has purchased enough blocks to offset its natural gas usage 100%.(Howard, 2011). The Duke program captures methane and uses it to power a micro-turbine that produces energy for a waste management system. The system treats water for ammonia and other pollutants so it can be re-used for irrigation and barn-flushing. (The Loyd Ray Farm). The University of Florida has two different styles offset programs through “Earth Givers.” Their first program takes place at Village and Forest Green Apartments where Earth Givers are trained volunteers and they retrofit each apartment with the latest water and energy efficiency products that reduce utility bills by about 20% and lower climate change contribution. They also provide energy efficiency education to residents so that they are equipped to make behavior changes for more sustainable living in the future. The second program is through the Revolving Tree Fund. Earth Givers select, purchase, plant, and care for trees to restore the local ecosystem and to sequester carbon. They then sell these trees as offsets for money to purchase more trees. They say one tree equals one ton of carbon reduction! (Our Projects, 2013).

Carbon offsetting through permaculture would be a great help to the university and to Ann Arbor in general. We’ve heard of many examples of universities or companies offsetting their emissions by planting trees, but through permaculture, we can completely build a forest. Forests and trees have an abundant amount of benefits that come with them; physical, psychological, and social health, food production, habitats for wildlife, and most importantly to our climate, carbon sequestration.

I won’t be going into detail about the benefits of permaculture or how it works, but I believe it is a perfect solution to the University of Michigan’s sticky situation. This built forest could not only help the university reach their 2025 sustainability goals, but also bring in multiple other benefits. It is also a great insurance plan for the future; if things don’t go as planned in emission reductions, we can always plant more trees and add more to the forest to sequester more carbon. In the end, if the university wants to successfully reach its goals, the answer lies in the forest.

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