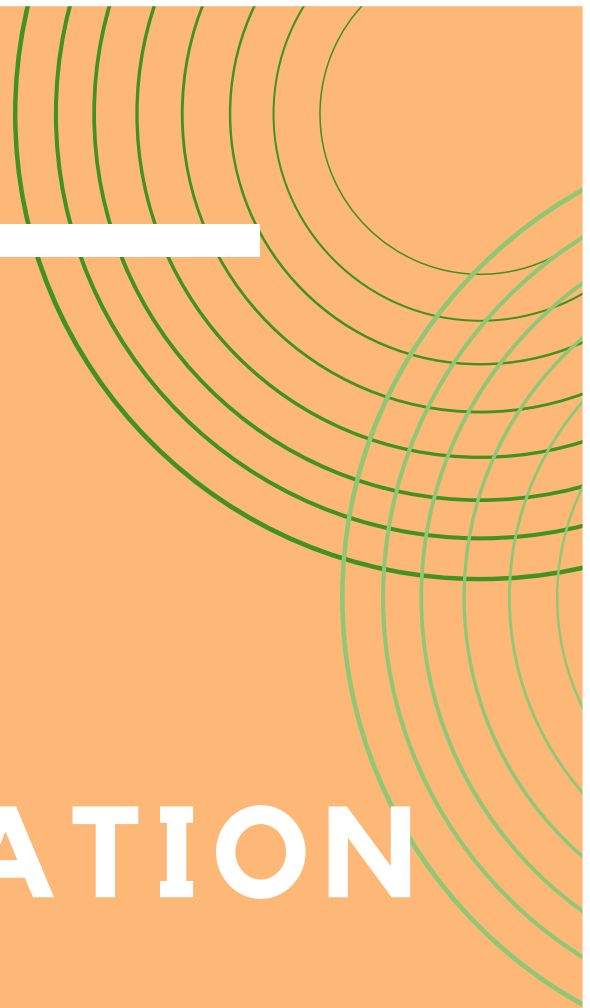


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CAMPUS CLIMATE CONVERSATION



University of Montana's
Commitment to Carbon
Neutrality

19

WELCOME

Leaders in support of sustainability across the University of Montana (UM) have recognized that academic institutions have an impact on our climate and have a responsibility to help drive change.

In 2007, President George Dennison became one of the first 100 charter signatories of the American College and University Presidents' Climate Commitment (ACUPCC, now called the Carbon Commitment), committing UM to reducing our emissions footprint and achieving carbon neutrality by 2020. In 2010, a diverse group of campus stakeholders researched and developed our Climate Action Plan (CAP) based upon the findings of our first greenhouse gas emissions inventory. The 2010 CAP includes strategies to reduce UM's emissions through campus operations, policies, teaching, research, and outreach.

Now in 2019, UM acknowledges that without the purchase of carbon offsets or renewable energy credits, we will not meet our 2020 neutrality commitment. The students and campus leadership who set the goal of 2020 carbon neutrality knew the goal was ambitious. Goals are meant to be ambitious; the point is to push ourselves to be innovative with our approaches and to acknowledge the importance and urgency of climate change.

This Resource Guide provides a brief summary of the strategies addressed in UM's CAP, our progress and action to date, and concludes by sharing possible strategies for the future that we hope to explore with you during our April 4th Campus Climate Conversation.

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BACKGROUND AND PURPOSE

Without the purchase of carbon offsets and/or renewable energy credits, we will not meet our 2020 neutrality commitment. However, this does not mean that we haven't made progress since initially setting this target. The 2010 CAP set an interim emissions reduction goal of a 10% emissions reduction below our 2007 baseline year by 2015 based upon efficiencies we felt were achievable with immediate funding. With only a small purchase of carbon offsets, we met that 2015 goal and continued to reduce our emissions with energy efficiency investments.

In 2016, however, the addition of four new buildings to our campus footprint set us back, stalling our downward trend. This situation is not specific to UM. The 2017 Sightlines State of Sustainability Report that includes energy and emissions data from hundreds of academic institutions across the country conveys the same trend: colleges and universities that have signed carbon commitments have invested substantially in energy conservation over the last decade but have simultaneously continued to build new facilities. The two strategies have opposing impacts when it comes to climate action. In essence, for every three steps we take forward, new buildings take us two steps back.

We have also spent the last ten years building a foundation of policies and tools that are critical for our continued emissions reduction work. In 2011, student leaders developed the Smart Buildings Initiative (SBI), which prioritizes energy efficiency and conservation projects. In 2012 and 2013, there were two Campus Climate Conversations held to discuss climate action progress at UM. In 2016, the Student Athlete Academic Center and the Gilkey Executive Education Building were certified LEED Gold. In 2018, the Missoula College River Campus was certified LEED Gold. Also in 2018, UM earned a Bronze STARS rating from the Association for the Advancement of Sustainability in Higher Education (AASHE), making us the first university in the northern Rockies to achieve a STARS rating.

Ten years into this important work, now is the time to revisit our goals and strategies and chart an intentional path forward. The Campus Climate Conversation on April 4th seeks to **accomplish three main goals:**

- 1) **Inform and engage our campus partners** on UM's work accomplished to date toward our emissions goals, how UM compares to peer institutions, and our options for moving forward;
- 2) **Generate recommendations for next steps** and prioritize strategies for university leadership;
- 3) **Identify areas of interest for engagement** among students, faculty, staff, and administrators

We hope to end the Conversation with:

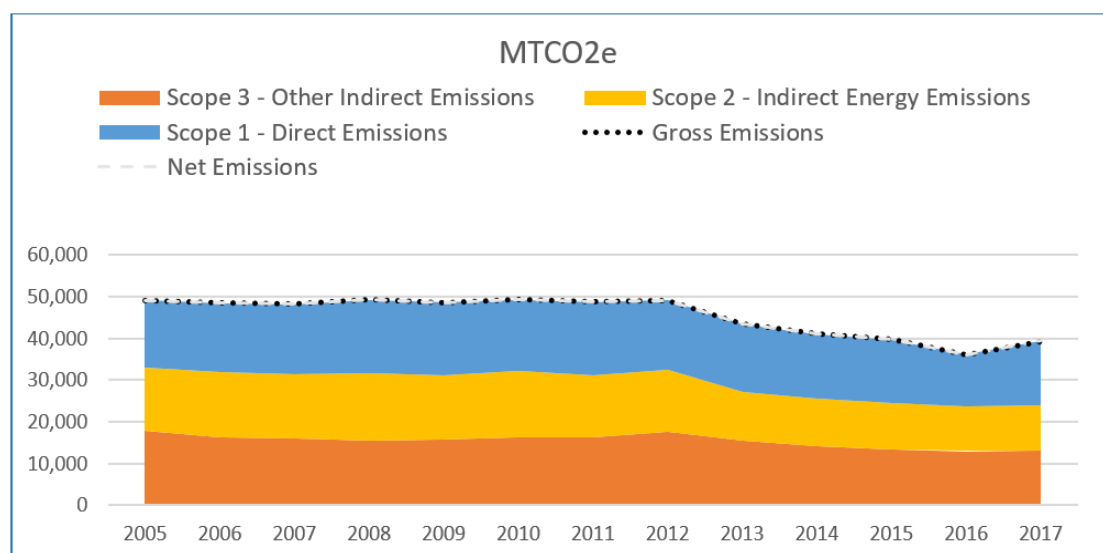
- 1) A group of campus stakeholders caught up to speed on our climate action work;
- 2) Ideas on resources, strategies, and support we need from administrators as we seek to prioritize those recommended actions and do this work;
- 3) A sense of which strategies garner the most interest, motivation, and possibility

WHERE WE ARE NOW

UM has been tracking its GHG emissions since 2009 and calculates total emissions every two years. Our GHG inventory includes:

- Scope I emissions: Direct emissions (natural gas for heating, gas-diesel from fleet vehicles, fertilizer)
- Scope II emissions: Indirect emissions (purchased electricity, kWh from NWE)
- Scope III emissions: Other emissions attributed to UM (directly financed travel, solid waste, commuting of students, faculty, and staff)

Scopes I & II make up the largest portion of our GHG footprint, which is the case for most colleges and universities. In FY 2017, UM was responsible for approximately 39,000 MTeCO₂ total across all three scopes. Scopes I & II comprised just over 26,000 MTeCO₂. This is an important factor to consider when exploring emissions reduction strategies and prioritizing those with the greatest impact per dollar spent. Strategies that greatly reduce our energy consumption in our buildings or generate non-carbon based energy for our campus to use are two of the biggest pieces of this puzzle.



University of Montana GHG emissions profile in MTeCO₂, all three scopes, 2005-2017

Taking advantage of a larger budget and federal funds for infrastructure improvements (State Long Range Building funds and American Recovery & Reinvestment Act funding, or ARRA), UM tackled energy conservation hard from 2010 through 2014. Some of the most impactful work to reduce our energy use and emissions is considered to be standard upgrades and maintenance to campus infrastructure: upgrades to lighting and HVAC systems, domestic hot water upgrades, mechanical insulation, steam trap replacement, etc. This is the “behind the scenes” work of energy efficiency and sustainability that should happen before adding solar panels to a building or purchasing carbon offsets. Since UM’s first infusion of ARRA funds, facilities services has spent nearly \$6M on mechanical and building operation improvements resulting in nearly half a million dollars in avoided costs (energy savings) each year.

In addition to prioritizing building performance and behavior change on campus, the 2010 CAP identifies many strategies that, if implemented successfully, would reduce UM’s emissions footprint by varying degrees. The following chart summarizes emissions reduction strategies from the 2010 Climate Action Plan and our efforts to implement these strategies to-date:

Where UM has struggled the most is in our quest to find large scale renewable energy options that provide a decent payback, are palatable to campus and community members, and are feasible within the confines of our contractual relationship with NorthWestern Energy. The largest impact we stand to make on our emissions footprint will come with increasing our consumption of green energy; many of the other strategies we have identified and have succeeded in implementing make a difference, but a relatively small difference compared to a biomass facility, large-scale solar, or a combined heat and power project.

RELATIVITY TO OUR PEERS

University	Location	Student Population	STARS Rating	Carbon Neutrality Date	% Emissions Reduced	Major Reduction Strategies
 UNIVERSITY OF MONTANA	Missoula, MT	10,644	Bronze	2020	20%	<ul style="list-style-type: none"> Energy efficiency upgrades Carbon offsets
 MONTANA STATE UNIVERSITY	Bozeman, MT	16,902	N/A	No Date	17%	<ul style="list-style-type: none"> Energy efficiency upgrades New energy contract Hydroelectric energy sources with Northwestern Energy
 NAU NORTHERN ARIZONA UNIVERSITY	Flagstaff, AZ	31,073	Gold	2020	15%	<ul style="list-style-type: none"> Integrate sustainability in academics and research Energy efficiency upgrades Renewable energy certificates (RECs)
 Colorado State University	Fort Collins, CO	33,413	Platinum	2050	12%	<ul style="list-style-type: none"> Renewable energy production Energy efficiency upgrades
 AMERICAN UNIVERSITY	Washington, D.C.	13,061	Gold	2020	100% in 2018	<ul style="list-style-type: none"> Renewable energy production Carbon offsets

This chart includes demographic data and sustainability metrics for several schools (including UM) that provide comparison as well as a model for how aggressive climate action can be achieved.

As noted earlier, UM is not alone in its struggle to continue reducing emissions while simultaneously living by the growth paradigm that is ubiquitous in higher education and our western culture at large. We are also not alone in our efforts to pursue climate action and renewable energy solutions while also acknowledging state culture and politics that is often less proactive and favors carbon intensive energy sources.

There are, however, a number of universities that have risen to the challenge of aggressive climate action goals and have made significant progress. American University in Washington, D.C. is one of those institutions that has made substantial progress toward their emissions reduction targets through the implementation of large-scale energy projects. Many universities pursuing this work have embraced the role Renewable Energy Certificates (RECs) and carbon offsets will play in institutional climate action.

LOOKING FORWARD

Looking to 2020 and beyond, given the research and effort already invested in many climate action strategies, where should UM go from here? The “low-hanging fruit” of campus sustainability is and will always be energy savings through recommissioning, building improvements, and behavior change. We will continue to do this work as funding allows, but there are tools at our disposal that, should we grow them and use them effectively, could expedite energy conservation efforts at UM. The following are basic overviews of strategies UM could pursue and are not listed in any particular order.

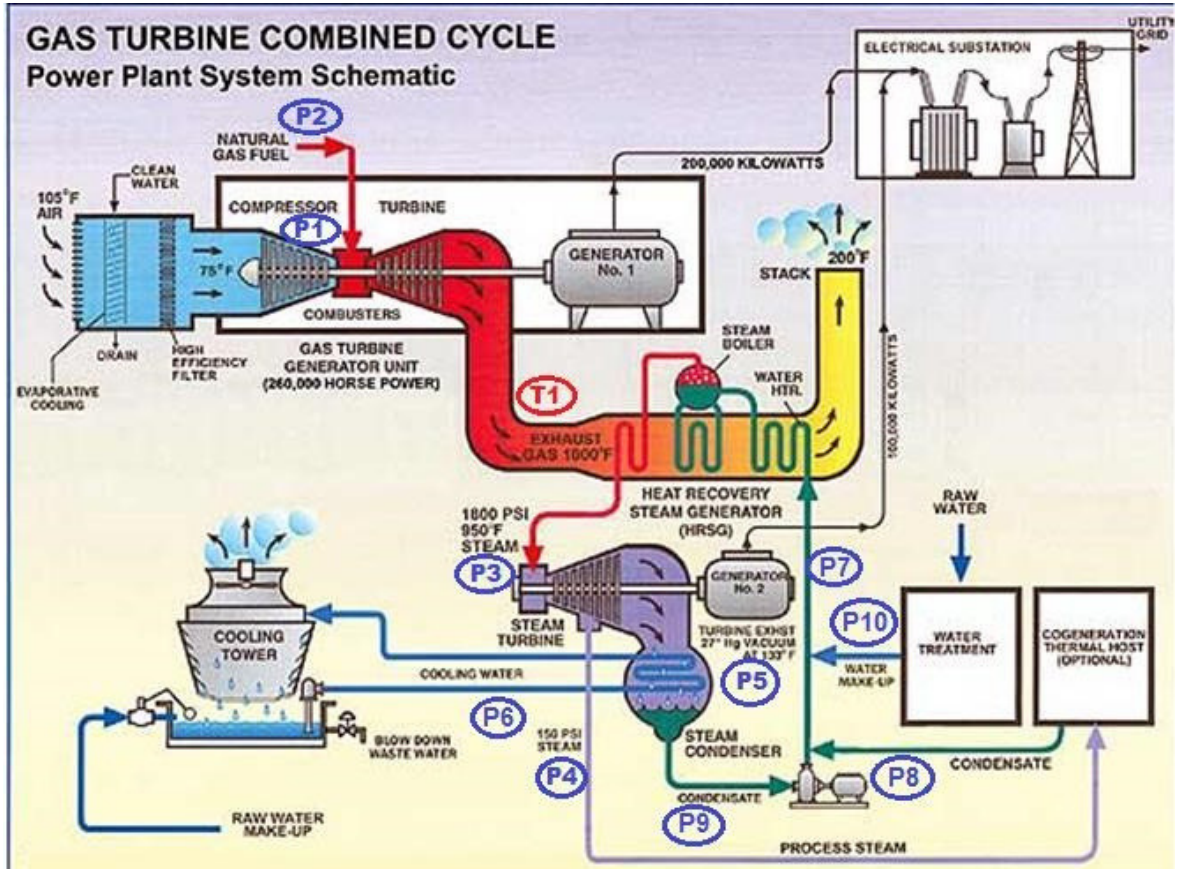
Kless Revolving Energy Loan Fund (KRELf)

One of the most unique and important tools available to the University of Montana is the Kless Revolving Energy Loan Fund (KRELf). KRELf was one of the nation’s first university funds created to support student-driven sustainability initiatives. Since 2009, students have supported KRELf through the opt-out \$6/student Sustainability Fee they pay every semester and the fund continues to be UM’s primary source of sustainability funding. Students developing projects pertaining to resource conservation, waste reduction, energy savings, or other environmental initiatives submit proposals for a KRELf loan or grant during the spring semester. Students then work with UM faculty and staff throughout the next year to complete their projects. Loan projects are paid back using funds realized through energy savings after projects are implemented, allowing the fund to be self-sustaining over time. Funded projects have saved UM approximately \$30,000 annually every year through operating expenses and energy costs, while also decreasing UM’s carbon footprint.

Beginning fall 2014, \$3.68 of the Sustainability Fee has been allocated for KRELf’s Large Project Reserve Fund. The fund is to remain untouched until reaching a \$500,000 threshold, at which point funding will be used for large-scale energy conservation and efficiency projects that meet KRELf’s guiding principles. The fund currently sits at just over \$360,000. Other universities, including Colorado State University, have used revolving energy loan funds to advance their sustainability goals. KRELf is a unique and creative strategy that can be used to support UM’s carbon neutrality commitment. With additional support from private funds (through intentional fundraising efforts), KRELf could allow UM to tackle larger, building-wide energy projects when operating budgets are tight. We have not yet tapped the full potential of KRELf and would like to make that a priority over the next few years.

Combined Heat and Power Generation (CHP)

Given the historic price trends of electricity and natural gas, using a natural gas combustion turbine to produce UM's power and steam would be economically and environmentally advantageous. UM has conducted a feasibility study with CTA engineering and a design was selected that would provide about 85% of UM's annual electrical consumption while also reducing UM's electrical carbon footprint by 1/3. ears.



Costs: \$12M of essential CHP-related capital costs with estimated *payback of 10 years*.

Solar Panels

When it comes to large-scale renewable energy projects, UM's contractual relationship with our utility, NorthWestern Energy, limits our ability to pursue Power Purchase Agreements (PPAs), one of the primary tools other institutions have used to make significant progress greening their energy supplies. For example, American University uses almost entirely non-carbon energy sources through participation in PPAs.

The installation of photovoltaic panels on suitable roofs and/or parking lots across campus would provide clean alternative sources of energy to campus. Panels provide a visible sign that UM is committed to sustainable energy production. Rooftops that are good candidates for PV arrays are the Mansfield Library, Liberal Arts, UC, PARTV, Payne Family Native American Center, Lommasson and Curry Health Center.

Costs: \$2.5M for Library, \$1.3M for UC & \$1.0M for Liberal Arts roofs, \$20M for parking lots A, F, G, H, P. *Payback estimated at 30 years.*



Solar PV Carports at University of Massachusetts

LEED-EBOM (Existing Building Operation and Maintenance)

UM's existing building stock provides a great opportunity to reduce energy consumption and increase UM's STAR rating. A typical LEED-EBOM certification process looks to improve an existing building's water and energy efficiency, provide sustainable purchasing of office/building supplies, reduce our waste stream, and improve indoor environment quality and operations for building occupants.

Cost: typically about \$100K per average sized campus building of 50,000 square feet. UM should see about 10% decrease in energy use per building after the certification process. *Payback is approximately 7-10 years.* (There is the potential of reducing costs by 20-30% if UM Facilities architects and engineers can perform the LEED certification process in-house).

Carbon Offsets

Regardless of our feelings about carbon offsets, the reality is that offsets, whether generated from UM projects or purchased through an offset vendor, will be part of UM's climate action toolkit if we remain committed to carbon neutrality. The general rule about offsets is that efficiency, conservation and renewable, non-carbon strategies should come first before purchasing offsets to address remaining emissions. Offsets do not get us 'off the hook' for changing our behavior, investing in energy conservation, or pursuing renewable energy options. They are the tool that we use when we acknowledge that, even with all the efficiencies and alternative energy, UM students and employees will continue to fly in planes for our research, teaching, studying, networking, student recruitment, and professional development. Our student athletes will continue to ride in coach buses as they travel for games and events. Even with an excellent, fare-free public bus system (two, in fact), one of the most bicycle-friendly communities in the country, and a beautiful, walkable city core, some students, faculty, and staff will continue to drive single-occupant vehicles to campus. All of those emissions are important parts of our greenhouse gas footprint. Carbon offsets are meant to address those activities we cannot "efficiency" our way out of.

In fall 2014, another Campus Climate Conversation brought UM students, faculty, and staff together to discuss the role of carbon offsets in our climate action work. On the cusp of our 2015 emissions reduction target, a major goal of the event was to identify the type of offsets we would be purchasing to supplement the energy conversation work we had already done to shrink our emissions footprint. A small group of campus partners donated to the effort and, by supporting three different projects with three different offset vendors, UM met our 2015 emissions target. Outcomes from the event included establishing campus support for offsets that come from renewable energy and energy efficiency projects, prioritizing offsets that are as local as possible and that have educational co-benefits, and demonstrating strong support for incentivizing behaviors that decrease the university's footprint.

If UM wants to begin incorporating carbon offsets consistently into our climate action strategies immediately, there are several opportunities to connect specific carbon-emitting behaviors directly to a cost:

1) Carbon Neutral Commuter Program

Pioneered by Appalachian State University in Boone, NC, parking permit holders are given the chance to voluntarily purchase a supplementary “carbon neutral commuter pass” for \$5 per vehicle. Participants receive a small decal for their car to indicate their participation in the program. Funds are collected annually in a carbon offset account that is used to purchase an annual bulk volume of offsets to address the campus commuting-related emissions.

2) Voluntary departmental purchase of offsets

Currently, several departments on campus have taken it upon themselves to address their air travel emissions or even the emissions associated with scopes one and two of their footprints.

- Campus Recreation offset their entire (Scopes 1-3) footprint for the second year in a row after significantly investing in energy efficiency projects in their buildings (and will continue to do so as funds allow).
- The Department of Philosophy chooses to use non-general fund dollars to offset emissions associated with departmental air travel.
- The Law School also just purchased renewable energy credits (RECs) and carbon offsets to reach carbon neutrality for the first time, an effort led and implemented by law school students.

Zero Net Growth

Sometimes referred to as a “zero net new” policy, the main idea behind this strategy is that no additional built space is constructed on campus without eliminating or decommissioning existing space. The 2017 Sightlines Sustainability Report cited earlier notes the trend in higher education, specifically across institutions that have committed to carbon neutrality, of large investments in energy efficiency and conservation while simultaneously adding new square footage to the campus footprint. The end result: lower energy intensity of campus built space but a growing carbon footprint despite significant investments in energy conservation. Zero Net Growth policies encourage universities to explore and identify what their “right size,” both in terms of enrollment and total built space, really is and plan accordingly. Rather than assuming more students, more research, or more staff necessarily require additional facilities, zero net growth policies require institutions to make data-driven decisions to identify space needs and modify existing spaces to meet their evolving needs. These policies also encourage campuses to undergo space utilization studies to identify spaces across campus that can be modified to support new programs or uses and to assess the use of classroom spaces for various types of classes in order to make the best use of existing space. The University of Illinois at Urbana-Champaign is one of the few universities in the U.S. that has successfully implemented one of these policies. The graphic below is a simple illustration of the concept.

NET ZERO GROWTH a policy to cap campus space & reduce ecological footprint

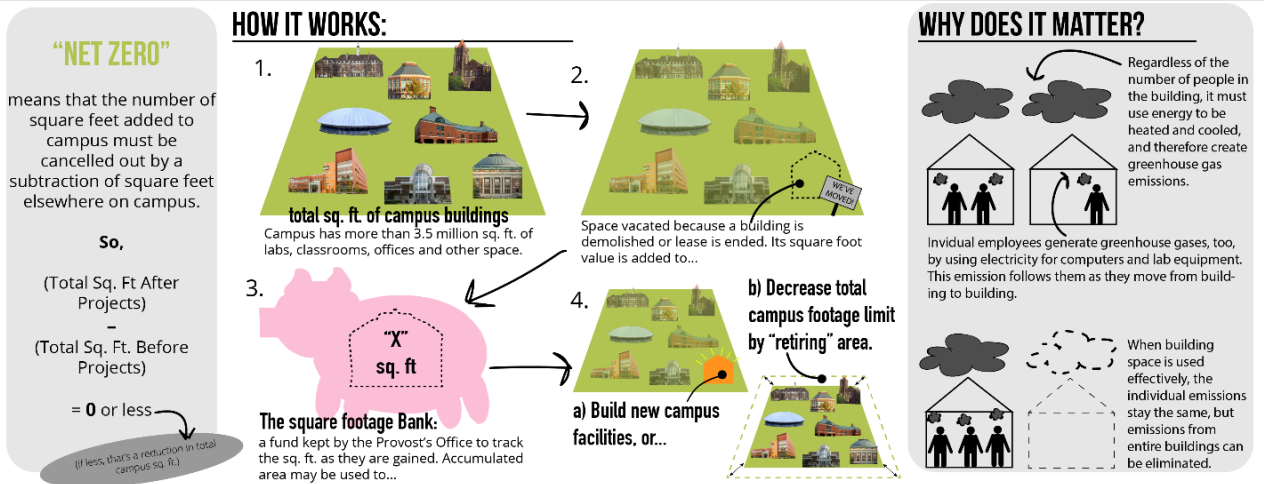


Figure 6. University of Illinois at Urbana-Champaign enacted a Net Zero Space Growth policy in 2015 as part of their campus climate action efforts. Image can be found at <https://sustainability.illinois.edu/whats-the-real-impact-of-campus-net-zero-space-growth-policy/>

CONCLUDING REMARKS

On March 15, 2019, youth around the world made their stance on climate *inaction* known to the world: It is unacceptable and irresponsible to ignore climate change. Citizens and world leaders are compelled to take exacting, immediate, and drastic action on behalf of future generations. From this recent display of advocacy, it is surprising to think that there is still any doubt at all what current college-aged students think and feel about climate change or our collective responsibility to address it. It is misguided to relegate sustainability efforts and climate action to a small group of “enviros” or to make it just the responsibility of the non-profit sector or large government entities. As an institution of higher education, the University of Montana, like all of our peer institutions, is uniquely situated to not only cultivate the next generations of sustainability-literate, engaged world citizens, but to address our immediate emissions footprint and ‘walk the walk.’

The work of climate action and improving the sustainability of UM’s operations, academics, research, and culture is slow and challenging. But, it is important and it is happening. Recognizing the value of our engagement in this work, our goals, progress, and intentional roadmap to carbon neutrality, we look forward to hearing responses from the Campus Climate Conversation on April 4, 2019. The last 10 years have been spent trying (and sometimes succeeding) to tackle our biggest emission-generating activities, but we have a long way to go. Given what we know about strategies still available to UM, we are eager to discuss what most excites you, what questions you still have about our path forward, how you intend to engage with our climate action efforts, and what resources we will need to continue to move the dial. Perhaps most important, we hope to leave the Conversation with a sense of what resources, people, and steps will be required to move each strategy forward. With these tools and resources, the next 10 years of UM’s climate action work looks a lot brighter.