





# Sustainable Dining Hall Habits

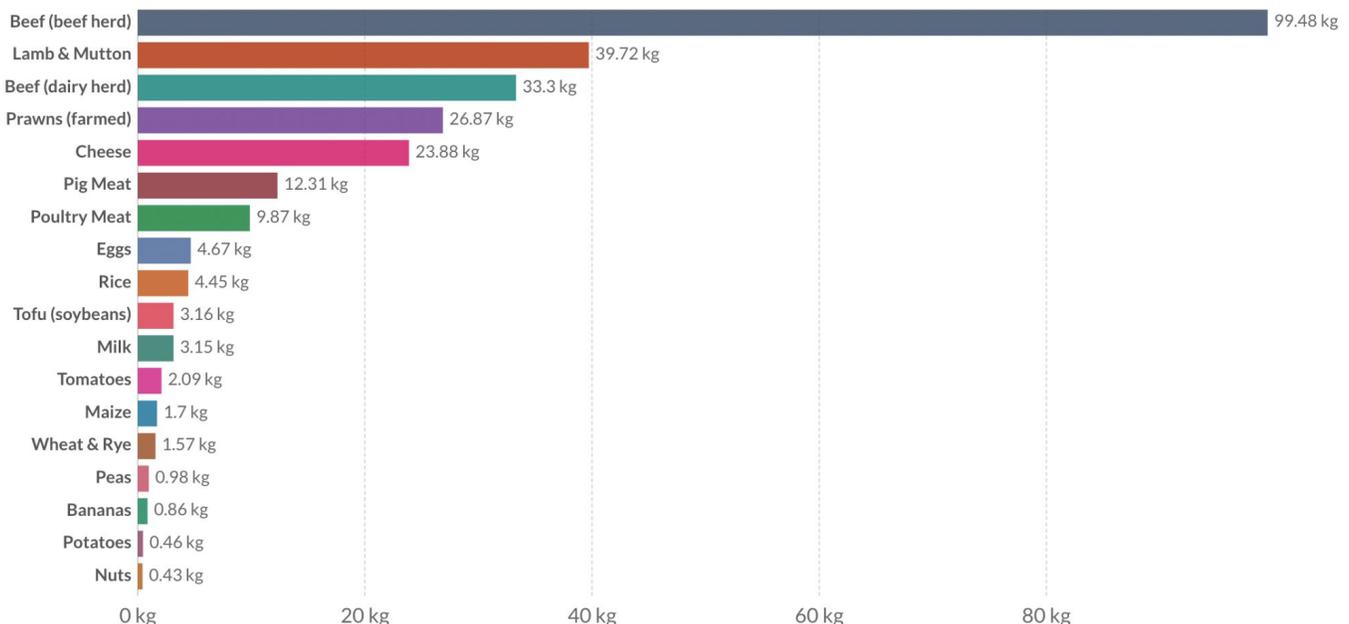
- Bring your own silverware and napkins
- Don't take more food than you will eat
- Consider opting for lower carbon footprint foods
  - Vegan and Vegetarian diets have the lowest impacts, but poultry, fish, and pork have much lower carbon footprints than beef

Green Cats Program

## Greenhouse gas emissions per kilogram of food product

Our World  
in Data

Greenhouse gas emissions are measured in kilograms of carbon dioxide equivalents (kgCO<sub>2</sub>eq) per kilogram of food product. This means non-CO<sub>2</sub> greenhouse gases are included and weighted by their relative warming impact.



Source: Poore, J., & Nemecek, T. (2018). Reducing food's environmental impacts through producers and consumers.

OurWorldInData.org/environmental-impacts-of-food • CC BY

Note: Data represents the global average greenhouse gas emissions from food products based on a large meta-analysis of food production covering 38,700 commercially viable farms in 119 countries.

Green Cats Program



# Streamline Bus Services



Economical, efficient, eco-conscious, and fare free! Routes provide service to and from Bozeman, Belgrade, Four Corners, Livingston, and seasonal routes to Bridger Bowl. Streamline also connects with the the Skyline Bus System for travel to and from Big Sky. Track buses and find information online at [streamlinebus.com](http://streamlinebus.com) or download the mobile app RouteShout 2.0, to access this information remotely.

**Green Cats Program**



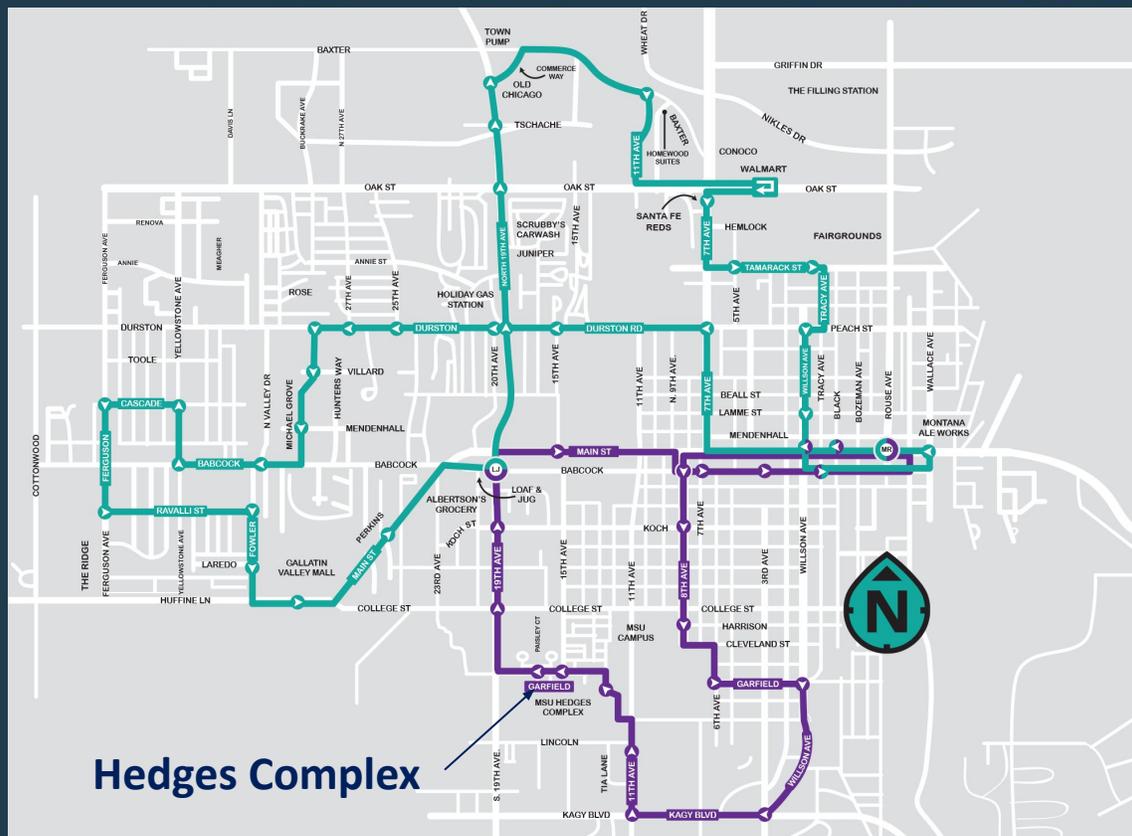
## Streamline Bus Fare-Free Routes:

- Service in Bozeman
  - Weekday, Saturday, Sunday, and Late Night
- Service to and from Belgrade
- Service to and from Livingston
- Winter Service to Bridger Bowl

**Green Cats Program**



Weekday service: Monday - Friday, 6:30am - 7:15pm **Green Cats Program**



Late Night Routes: Thurs - Sat, 8:00 pm - 2:30 am

**Green Cats Program**



## Utilize Bozeman Commuter Project to Travel More Sustainably in and Around Bozeman

- **Save Money**
  - Track gas money saved by not driving
- **Stay Healthy**
  - Log pedestrian miles
- **Save Time**
  - Explore biking, busing, and carpooling options all in one place.
- **Go Green**
  - Track your carbon emission savings



Green Cats Program



Register with Bozeman Commuter Project at [bozemancommute.org](http://bozemancommute.org) and use their trip planner to find the best walking and biking routes, view Streamline bus routes and schedules, and connect with carpool partners.



Download the mobile app “Commuter Tracker” and connect your account!

Green Cats Program



# Montana State University Office of Sustainability

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Located in SUB 284, near the Procrastinator Theater.  
Stop by and say Hello!

“The Office of Sustainability strives to be a voice for progress and stewardship—for our land grant university, for our students, and for the betterment of our community.”

Learn more at: [montana.edu/sustainability](http://montana.edu/sustainability)

Green Cats Program 



## MSU's Sustainability Goals

- **Steward** use of student and the University's resources, ensuring these funds contribute effectively to campus sustainability efforts and engage students, faculty and staff in a meaningful way.
- **Provide** employment, volunteer, and internship opportunities to students who wish to contribute to sustainability efforts at MSU.
- **Build** programs that engage the campus in dialogue and action.
- **Link** students, faculty and staff to information, campus resources, and decision-makers with regard to campus sustainability.
- **Leverage** student activism by building partnerships with MSU administration and departments to provide program continuity year to year.
- **Advocate** for increased institutional commitment to sustainable policies and practices.

Green Cats Program 



## MSU LEED Certified Buildings



**Platinum:** Norm Asbjornson Hall (NAH)

**Gold:** Rendezvous Dining Pavilion, The Cooley Laboratory, Jake Jabs Hall, Gallatin Hall, Yellowstone Hall, Hyalite Hall, American Indian Hall (AIH)

**Silver:** Gaines Hall, Miller Dining Commons

**Green Cats Program**



Leadership in Energy and Environmental Design (LEED) is a world-wide green building certification program. It is designed to encourage new developments to be energy efficient and environmentally responsible. The LEED rating model is constantly evolving to include the most environmentally friendly and forward-thinking designs. Because of this, AIH will only be LEED gold, even though it is more advanced than NAH in many ways.

**Green Cats Program**



# Romney Oval Geothermal Project

Approximately 80 boreholes, each 700 feet deep and 7 inches in diameter, will contain closed loop water pipes. These pipes will act as a giant heat battery.



Green Cats Program



- Romney Hall will consume less than half as much energy per square foot as other MSU buildings
- MSU's Carbon Emissions will be reduced by about 20,000 metric tons over the lifetime of the system
- The system will connect with Norm Asbjornson Hall, nearly doubling the size of that heat battery and creating an energy district.
- As other nearby buildings are upgraded, they too can connect to the system to reduce energy demand

Green Cats Program



# Recycling in Bozeman

Outside of MSU, The City of Bozeman Solid Waste Division offers curbside recycling services to Garbage Collection customers for \$9.93 per month. The City also has free drop-off sites at Walmart, Gallatin County Fairgrounds, Ballfields – Highland Blvd, MSU, Billion Auto, Safeway, and Bozeman Convenience Site. Get to know what you can and cannot recycle in the City of Bozeman!

## What You Can Recycle:

- Plastics
  - #1 and #2 bottles and jugs
- Cans
  - Aluminum
  - Tin
  - Steel
- Cardboard
  - Flattened corrugated cardboard
  - Cereal and other paperboard boxes
- Paper
  - Newspaper, Magazines, and Catalogs
  - Writing and office paper
- Phone books
- Paper bags

## Important! - Make Sure To...

- Rinse containers with water to eliminate food residue
- Clean, dry, and empty recyclables
- Flatten boxes to conserve space
- Keep garbage, food waste, and unclean items separate from recyclables
- Crush plastic bottles and put caps back on to conserve space (if feasible)
- (Labels do not need to be removed)

## What You Cannot Recycle:

- Non-Bottle Shaped #1 and #2 Designated Plastics
- Any #3 through #7 Designated Plastics
- Glass or glassware
- Food contaminated pizza boxes, paper plates, napkins, etc
- Aerosol cans
- Pill bottles
- Ceramics
- Foil
- Metal hangers
- Batteries
- Light bulbs
- Juice boxes and pouches
- Chip bags
- Styrofoam containers and packing peanuts
- Paper milk cartons
- Plastic bags
- Frozen food bags
- Toxic Product Containers (oil bottles, antifreeze containers, herbicide containers, pesticide containers, etc)



# Composting

## On Campus

MSU has continually expanded its composting program since its inception in 2015, partnering with the City of Bozeman in 2018. From composting 35,000 pounds of food waste in its first year, the program diverted 540,000 pounds of food waste within a year of the partnership, a number that is still growing. All food scraps are accepted, including napkins. Dining halls, University Catering, coffee shops, and other food outlets on campus contribute food scraps which are then transported to the city's industrial composting facility. There it is processed and eventually used as a soil amendment in city projects.

## In Bozeman

The city of bozeman has several resources to aid with off-campus composting efforts.

### Happy Trash Can

Happy Trash Can is a locally owned commercial and residential compost collection & processing company. Their mission is to make quality local compost to give back to local farmers, gardeners, and to their local subscribers. They provide weekly compost pickups to their subscribers.



### City Compost Collection

The City of Bozeman Solid Waste Division offers yard waste compost collection services from May through August (into September) every year to garbage collection customers. They collect grass clippings, leaves and small branches (pencil size diameter), and garden waste.



### Gallatin Solid Waste Management District

Bozeman Convenience Site accepts clean wood & brush as well as grass, leaves, straw, manure, hay, clean sawdust, woodchips, and small branches for composting purposes.



## Why Compost?

- Reduce landfill waste
- Introduce valuable organisms to soil
- Recycle food waste
- Return nutrients to soil
- Reduce need for chemical fertilizers
- Conserve resources



# Workstation Guide

Green spaces manage workstations responsibly, monitoring energy consumption and practicing green habits. One way office members can act more sustainably is by setting their default search engine to [Ecosia](#), which uses revenue from search ads to plant trees around the world. To date, the search engine has planted over 100 million trees.



## Last One Out? Make Sure You Have:

1. Turned off printers, copiers, faxes, and other electronic devices
2. Turned off/unplugged small appliances (microwaves, toasters, coffee makers, space heaters, etc.)
3. Turned off all lights
4. Closed windows, shades, and blinds
5. Reported any electric or plumbing issues to Facilities Services
6. Unplugged phone chargers, laptop chargers, etc
7. Put your computer to sleep

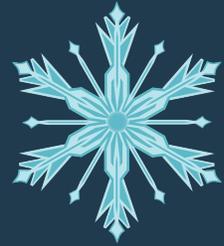
Talk to your IT department before shutting down computers completely to avoid missing nightly updates. Instead use Energy Saver and Sleep Mode!

## Saving Energy on Apple Computers:

- A.  ⇒ System Preferences
- B. Customize settings in Energy Saver
- C. Set Display Sleep to 10 minutes, after which computer screen shuts off
- D. Set Computer Sleep to 15 minutes, after which computer enters Sleep Mode
- D. OR manually go to  ⇒ Sleep
  - Turn off Screen Savers:  ⇒ System Preferences ⇒ Screen Saver ⇒ Off
  - Reduce Brightness and Increase Contrast setting on Monitors
  - Turn Monitors Off

## Saving Energy on Windows Computers:

- A. Start ⇒ Control Panel or Settings ⇒ Power Options or System
- B. Customize settings in the Power Options tab or Power & Sleep tab
- C. Set System Standby: 15 minutes
- D. System Hibernate (for laptops only): 30 minutes
  - Reduce Brightness and Increase Contrast Setting on Monitors
  - Turn Monitors Off When Not in Use



# Winter Heating

## General Winter Tips and Tricks

- 68 degrees is the recommended thermostat temperature for efficient heating.
- Utilize passive solar heating! Open up blinds and curtains when the sun is out and close them when it's overcast or dark to conserve heat.
- When leaving your space for the day, close all windows, curtains, blinds, and doors.
- Close closet, supply area, and other doors to minimize unneeded heat distribution.
- Keep all air vents open and unblocked.
- Embrace the weather – keep a spare blanket, throw, or sweater at your desk.

## Space Heaters

Space heaters are generally not recommended because they heat inefficiently, consuming excessive energy. However, on some cold mornings they may be hard to resist.

Here are some things to keep in mind:

- Most convection space heaters run on 1.5 kilowatts, which is about 1.5 times that of a household refrigerator and 25 times that of a lightbulb.
- Consider using a radiant space heater, which heats a direct target while using much less energy
- Use space heaters only when you are present, and unplug overnight.
- Turn down/off the heater once your space has warmed up.



Radiant



Convection



# Sustainability in Bozeman

The City of Bozeman works tirelessly towards its sustainability goals. Use this resource to become familiar with these efforts.

## City of Bozeman Sustainability Office

The City of Bozeman Sustainability Office collaborates with residents, businesses, and organizations to inspire action and reduce the community's carbon footprint now and for future generations. Below you will find information about the office and their projects/initiatives.

**BOZEMAN**<sup>MT</sup>  
City Sustainability

[bozeman.net/government/sustainability](http://bozeman.net/government/sustainability)

## Bozeman Climate Plan

In 2017, the City of Bozeman passed a resolution to join the Climate Mayors partnership of over 400 United States mayors committing to uphold the goals of the Paris Climate Agreement through local action.



Bozeman  
Climate  
Plan

Even with a rapidly growing population, Bozeman's greenhouse gas emissions in 2016 were nearly equal to its emissions in 2008, while community emissions per person declined by 22%.

In the summer of 2019, the City set out to reimagine its climate plan in accordance with the Paris Climate Agreement, assessing climate equity and human health & well-being in the following focus areas:

Greenspaces & Natural Systems, Community Development, Buildings, Energy & Utilities, City Assets, Consumption & Waste, and Transportation.

The plan's development timeline was set to take place from July 2019 to July 2020, though impacts from COVID-19 lengthened this timeline, setting the plan's implementation back to October 2020.

Numerous other smaller-scale climate action plans are simultaneously underway within the City, each touching on different combinations of the focus areas listed above.

**Green Cats Program**



## Residential Energy Efficiency

Residential energy use accounts for almost a quarter of the City of Bozeman's greenhouse gas emissions, so individual actions can both reduce utility bills and help the City meet its Climate Action Plan goals, reducing emissions.

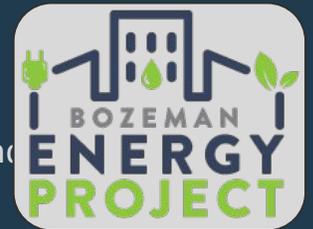
Residential energy use includes heating and cooling your home, lighting, cooking, appliances, and powering all of your electronic devices.

Bozeman's Sustainability Office website provides in-depth information on how individuals can reduce their energy and resource consumptions from home, divided into four cost-level checklists: No Cost, Low Cost, Moderate Cost, and Investment Level.

## Bozeman Energy Project

Helping local businesses save money and reduce energy use while also helping the community and the environment.

Participating businesses benefit from lower energy bills, potential rebates from Northwestern Energy, and a cash incentive of up to \$2,500 from the City of Bozeman. They also benefit from reduced environmental impacts, recognition and publicization through the program, marketing and outreach, and access to resources in energy efficiency and conservation technologies, strategies, and best practices.



## Climate Info

Information on global climate change, its local impacts, and Bozeman's climate action plans and policies can all be found on Bozeman's Sustainability Office website.

## Bozeman Climate Partners

The Bozeman Climate Partners is an energized citizen working group that meets weekly to support both conservation work underway in Bozeman and efforts to reduce the City's carbon footprint. They hope to inspire, focus, and tap the vast reservoir of talent and knowledge within the Bozeman community.



## Contact Bozeman's Sustainability Office

Reach out to sustainability staff Heather Davies (Energy Conservation Technician) and Natalie Meyer (Sustainability Program Manager), following the contact link on their website.





## More City of Bozeman Sustainability Office Initiatives:

- **Bozeman Solar Project**

The City of Bozeman partnered with NorthWestern Energy to install a 385 kW utility-scale solar array at the Wastewater Treatment Facility. The project covers 2.5 acres, incorporating 1,152 solar panels, and it will produce enough electricity to offset the annual consumption of 60 Montana homes.



- **Climate Vulnerability Assessment and Resiliency Strategy**

In the coming years, Bozeman is projected to be impacted by extreme heat, floods, drought, decreased snowpack, more extensive, frequent, and intense wildfire, and more severe winter storms. Serving as a precursor to the City's 2019 Climate Plan, this initiative assessed local climate impacts, prioritizing vulnerabilities, and developing adaptation strategies and an action plan for resiliency.

- **SolSmart**

Working with the Montana Renewable Energy Association, the City of Bozeman is reviewing local processes to identify opportunities for improving efficiencies in solar energy system installations, making solar power more accessible to Bozeman residents and businesses.



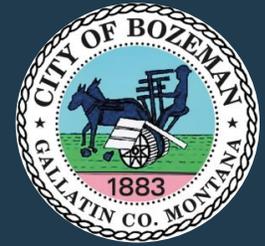
- **Energy Retrofits**

The City of Bozeman continues to prioritize the energy efficiency of their facilities and operations by implementing LED street light retrofits and completing energy efficiency upgrades in select facilities.

- **Idle Free Bozeman**

It's as simple as turning your key when you'll be stopped for 30 seconds or longer. Save gas, save money, no-brainer. Idling contributes to poor air and water quality, and generates unnecessary greenhouse gas emissions.





# More Sustainability in Bozeman

## Water Conservation

Bozeman is semi-arid and drought-prone, sourcing 80% of its water from snowmelt in the Gallatin Range. With shifting climate patterns, future water supplies are likely to become less reliable, with more rain replacing snow and warmer temperatures causing earlier peak flows and drier summers. Bozeman is also growing rapidly, further straining the water supply. The City of Bozeman has identified water conservation as the largest water source for Bozeman's future, increasing water supply by reducing water usage in and around homes and businesses. The City provides water-wise resources, cash rebates for installing water-efficient appliances, and free services for swapping shower heads, installing faucet aerators, and assessing sprinkler systems. Learn more by visiting the City of Bozeman Water Conservation website.



## Stormwater Division

Stormwater is rain or snow melt that flows over impervious surfaces (roads, rooftops, and driveways). It picks up pollutants such as trash, dog waste, lawn fertilizers, car washing soaps, bacteria, and oil. Stormwater is transported through underground pipes and dumped, without treatment, into local waterways like Bozeman Creek. Polluted stormwater can negatively impact water quality, fish populations, wildlife habitat, public infrastructure, and community health. Learn more about cleaning up stormwater from the City Stormwater Division Website.



## Streamline Bus

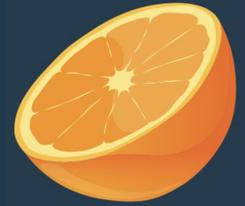
Economical, efficient, eco-conscious, and fare free! Routes provide service to and from Bozeman, Belgrade, Four Corners, Livingston, and seasonal routes to Bridger Bowl. Streamline also connects with the the Skyline Bus System for travel to and from Big Sky. Track buses and find information online at [streamlinebus.com](http://streamlinebus.com) or download RouteShout 2.0, the mobile app to access this information remotely. Learn more about sustainable transportation in and around Bozeman from our "Bozeman Commuter Project" resource.



## Recycling, Compost, and Waste Collection Services

Numerous resources are available in the City of Bozeman to help make waste collection more sustainable. See our "Recycling in Bozeman" and "Composting" resources to learn more.





# Carbon Neutrality at MSU

Greenhouse Gases, energy, and carbon neutrality are difficult concepts to grasp. We've included definitions of important concepts to provide context for our Carbon Neutrality story here at MSU. In all things, our partnerships work to make this institution a better place for this campus community and for future students, faculty, and staff.

## Definitions

### Greenhouse Gas Effect

So named because certain gases in our atmosphere act like a greenhouse; heat from the sun passes through the atmosphere to reach the earth's surface but is then unable to escape back through the gases. This concentrates heat on the earth's surface. It is a natural occurring phenomenon, essential to the earth's environmental systems, but human activities (burning fossil fuels for energy) are compounding the effect.

### CO<sub>2</sub>e (CO<sub>2</sub> Equivalency)

Not all gases affect heat the same way, but the most abundant heat-trapping gas in our atmosphere is Carbon Dioxide, or CO<sub>2</sub>, so we use that as our baseline. Methane gas, on the other hand, traps about 25 times as much heat as CO<sub>2</sub>. Therefore, a methane molecule has the equivalency of 25 CO<sub>2</sub> molecules. One pound of methane has 25 CO<sub>2</sub>e. CO<sub>2</sub>e is measured as equivalent pounds of CO<sub>2</sub>.

### Carbon Footprint

The total CO<sub>2</sub>e a person, institution, company, country, etc is responsible for emitting into the atmosphere, generally measured per year. You can [measure your carbon footprint here!](#)

### Global Warming or Climate Change

Global Warming: An oversimplifying and often misleading name for the issues posed by human activity and the Greenhouse Gas Effect, suggesting that the temperatures of all geographic regions on earth are increasing together and at a constant rate.

Climate Change: The overarching effects of the human-compounded Greenhouse Gas Effect, increasing average global temperatures, but in doing so, drastically altering global weather patterns and ecological zones.



# Carbon Neutrality at MSU

## Mitigation

Acting to reduce the severity of Climate Change and its immediate effects. Mitigation efforts often strive to reduce carbon footprints by either using less energy or by sourcing more energy from renewable sources and less from fossil fuel sources.

## Energy: Fossil Fuels and Renewables

Energy powers things to change and move. Energy from food powers our bodies and energy from fossil fuel and renewable sources powers our vehicles and homes.

Fossil fuels: Buried deposits of organic materials, formed from decayed plants and animals that have been converted to crude oil, coal, natural gas, or heavy oils through exposure to heat and pressure in the earth's crust for over hundreds of millions of years. Though they store high densities of energy, the combustion required to access that energy releases their high percentages of carbon into the atmosphere.

Renewable Energy: Collected from resources that are naturally replenished on a human timescale, such as sunlight, wind, rain, tides, waves, and geothermal heat. Though named for their ability to renew, these sources of energy are favored in climate change mitigation because of their limited carbon footprints.

## Carbon Offsets and Carbon Sequestration

Carbon Offsets: Reduction in CO<sub>2</sub>e emissions in one location in order to compensate for emissions made in another. Entities can “purchase” offsets by funding projects that reduce global greenhouse gas emissions, *offsetting* their own emissions. These projects reduce greenhouse gas emissions and increase carbon sequestration.

Carbon Sequestration: The long-term removal, capture, or sequestration of carbon dioxide from the atmosphere. Carbon dioxide is naturally captured from the atmosphere through biological, chemical, and physical processes that can be accelerated or mimicked by human efforts.

## Net Greenhouse Gas Emissions

The net greenhouse gas emissions of a person, institution, company, country, etc. is equal to the entity's total CO<sub>2</sub>e emissions minus the entity's carbon offsets.



# Carbon Neutrality at MSU

## What is Carbon Neutrality?

Carbon Neutrality refers to achieving net zero Greenhouse Gases emissions at a particular institution or organization. Per Fiscal Year, Montana State University uses energy to power and heat our buildings, grow and transport our food, handle our garbage, etc. We use a third-party calculator to determine the net amount of CO<sub>2</sub>e emissions Montana State University is responsible for, per Fiscal Year.

The overarching purpose of Carbon Neutrality is to reduce the “Net CO<sub>2</sub>e” to effectively zero pounds per Fiscal Year. As we reduce our Net CO<sub>2</sub>e, we are effectively reducing our contributions to climate change.

How do we do this? At Montana State University, the primary tools we use to power and heat our buildings are:

- 🍊 Our on-campus steam plant that burns natural gas to generate steam. Steam is delivered to our core buildings and generates approximately 4% of our electricity use
- 🍊 Purchased natural gas from our local utilities that can be burned on-campus to heat our buildings
- 🍏 Purchased electricity from our local utilities that can power electric heating or power our electrical appliances
- 🍏 On-site generated electricity from renewable sources that power electric heating or power our electrical appliances

As engineers on campus identify and implement strategies to reduce CO<sub>2</sub>e, the primary goal is to switch our sources of energy from 🍊 natural gas and electricity that was generated from fossil fuels to 🍏 electricity that was generated from renewable sources (solar, hydropower, geothermal and wind).



# Carbon Neutrality at MSU

## So What Do We Do About It?

**Past:** In years past, our primary goal has been to reduce the total amount of energy consumed on campus. Instead of switching out energy sources, we have been concentrating on “mitigating” or reducing the total amount of energy needed to actually power this campus. Examples include:

- LED bulbs we have switched out in campus buildings!
- Increasing our waste diversion rate from 2% in 2010 to 36% in 2020
- Installing 10 LEED Buildings in the past 10 years
- Installing software to instantaneously monitor energy consumption on our campus

**Current:** University Services has begun to install on-site renewable electricity sources and switch natural gas heating with alternative sourcing.

- Photovoltaic cells installed on the roof of Norm Asbjornson Hall
- Passive solar walls heat air coming into Jabs Hall and Norm to reduce natural gas
- Drilling geothermal wells around Romney Oval and annually mitigating one million pounds of CO<sub>2</sub>e

**Future:** MSU’s new Sustainability Plan, called for in the Choosing Promise Strategic Plan, will contain goals for carbon neutrality on our campus. This will involve bringing our approximately 50,000 ton CO<sub>2</sub>e footprint to zero by our goal date. A number of changes on campus must happen to achieve this, including energy reduction, campus electrification, greening the grid, behavioral transformations, and potential sequestration projects. It is an exciting time to talk about carbon neutrality here on campus, so stay tuned!