

CLIMATE ACTION PLAN 2022-25

1. INTRODUCTION

Eastern Washington University is committed to becoming a carbon neutral institution and a leader in sustainable practices. Climate change has become an existential global threat with impacts being observed at local, regional, national, and international scales. As a university composed of students, faculty, and staff from around the world, it is paramount that we address our carbon footprint and do our part to reduce our Greenhouse Gas (GHG) emissions to zero to support the communities that support EWU. The pathway to decarbonization will be informed by sound scientific practices based on industry leading methods and technology. This process is guided and documented through the EWU Climate Action Plan (CAP). Reducing net campus GHG emissions will be a challenging, decades long process, that will require the support and collaboration from all members of the EWU community. Many approaches and tools will be utilized on the pathway to lowering our carbon footprint. The CAP is a living document that will be updated regularly to reflect completed projects, next steps, changes in best practices/technologies, and evolving input from our EWU community.

1.1 GREENHOUSE GAS REDUCTION TARGETS

Within the United States, Washington State has become a leader in developing legislation and policies that seek to substantially reduce GHG emissions statewide. As a public institution, EWU falls under the jurisdiction of some of the guiding pieces of legislation that seek to address climate change (Table 1). To ensure compliance with state regulation and to join the commitment of carbon neutrality across all state agencies by 2050, EWU has aligned our carbon reduction targets with those set by the Washington State Legislature. On the pathway to carbon neutrality, EWU will reduce emissions below the following targets:

- 2030: 45 % reduction of scope 1 & 2 GHG emissions below 2005 levels
- 2040: 70 % reduction of scope 1 & 2 GHG emissions below 2005 levels
- 2050: 95 % reduction of scope 1 & 2 GHG emissions below 2005 levels and support collective goal of net zero emissions across all state agencies

Title	Code	EWU Required	Targeted Score	Implementation Agency	Summary
Clean Building Performance Standard	WAC 194-50-150	Yes	1 & 2	Dept. of Commerce	Increase building energy efficiency in all buildings greater than 20,000 square feet. Compliance dates depend on building size
Limiting Greenhouse Gases	RCW 70.235	Yes	1 & 2	Dept. of Commerce & Ecology	Reduce WA state agencies' greenhouse gas emissions to zero by 2050
Greenhouse gas reductions in design of public facilities	RCW 39.55.010	Yes	1 & 2	Dept. of Enterprise Services	New construction of public facilities must consider use of all-electric energy systems, alternative energy, and/or combined heat and power systems in building design

Table 1 – Washington State legislation directly applicable to Eastern Washington University that are intended to reduce agency greenhouse gas emissions and mitigate the effects of climate change.

Washington State agencies use the Greenhouse Gas Reporting Protocols for defining and documenting categories of GHG emissions. Using this standard, GHG emissions are categorized based on emission source. Scope 1 GHG emissions are direct emissions from sources controlled or owned by an organization. Scope 2 emissions are indirect GHG emissions associated with the purchase of electricity, steam, heat, or cooling. Scope 3 emissions are the result of activities from assets not owned or controlled by the reporting organization, but that the organization indirectly impacts in its value chain. By definition scope 3 emissions are another person/organizations scope 1 or 2 emissions. Based on the definition of scope 3 emissions, and the challenges associated with measuring them, WA State agencies are currently only required to reduce scope 1 & 2 emissions. However, EWU seeks to reduce scope 3 emissions to zero by 2050 and will target the reduction of these emissions through education, outreach, and other case specific options.

1.2 EWU GREENHOUSE GAS EMISSIONS

At EWU the largest category of GHG emissions are scope 1 (Figure 1). The main source of scope 1 emissions come from the burning of fossil fuels to provide heating for campus buildings. The EWU Cheney campus is heated through a centralized steam distribution system. Natural gas is combusted in large boilers, creating steam that is transported through a network of tunnels that connect most buildings on campus to the central steam system. Boilers are in operation year-round, providing building heating as needed as well as heating the water that comes out of water taps across campus. These heating needs make up approximately 95 % of all scope 1 greenhouse gas emissions on an annual basis. The remaining 5 % percent of scope 1 emissions results from the consumption of gasoline and diesel in vehicles and landscape equipment used to maintain campus.

Scope 2 emissions (Figure 1) at EWU result from the use of electricity to provide campus cooling, Heating Ventilation and Air Conditioning (HVAC), lighting, and plug load. Like the campus steam distribution system, building spaces are cooled during the warmer months through a centralized chilling system. HVAC systems distribute heating, cooling, and circulate air throughout campus buildings. Lighting, both interior and exterior, is extensive throughout campus. Plug load is comprised of any electrical power consuming equipment used on campus and ranges from small items like cell phone chargers to large laboratory analytical tools. The campus chillers are only operated during warmer months when building cooling is needed, whereas HVAC, lighting, and plug loads are responsible for year-round electricity use.

Scope 3 emissions, those being the most difficult to quantify, can vary widely depending on the choices of individuals and the following assessment is based on estimations. Primary sources for scope 3 emissions include commuting, university related travel, purchasing, and waste generation. Commuting by students and employees to and from campus is the largest source of scope 3 emissions. It is estimated to be about 70 % of all scope 3 emissions. The choice an individual makes to travel to and from campus can vary widely on annual, monthly, or even daily, basis. Commuting can include options such as walking, biking, riding the bus, carpooling, or single occupancy vehicles. University related travel, such as attending a workshop or conference, also contributes to scope 3 emissions. Similar to commuting, individual choices regarding method of travel (i.e. airplane, train, car, etc.), and location of travel (i.e. local vs further afar) result in variation of greenhouse gas emissions. Purchasing of goods and materials can be central to university operations and these items contain their own embodied carbon footprints, contributing to scope 3 emissions. The decision-making processes during the production of these items is beyond the control of the university, however decisions on which items to purchase can play an important role reducing in EWU's carbon footprint. Finally, a substantial amount of waste is generated at EWU on an annual basis, and how this waste is disposed of will have greenhouse gas emissions that fall into the scope 3 category. The type/amount of waste, and how it is disposed of (incinerated, recycled, composted, etc.) will have different associated carbon footprints.

Scope 1 and 2 GHG emissions for EWU are available back to 2005, the baseline year set by RCW 70.235 (Table 1). These combined emissions continued to rise, hitting a peak in 2012 at 21 % above 2005 emissions. Since 2012 these emissions have followed a gradual decline and in 2021 were 3 % above 2005 levels. This decrease is largely driven by the reduction of scope 2 emissions from campus operations (i.e. the reduction of electricity use). In 2021 Scope 1 emissions were 21 % above 2005 emissions, while scope 2 emissions were 18 % lower than 2005 emissions. This significant reduction in electricity use highlights the development and implementation of new energy efficient technologies, such as LED lighting and variable feed drive chillers, as well as other strategies that seek to reduce GHG emissions.

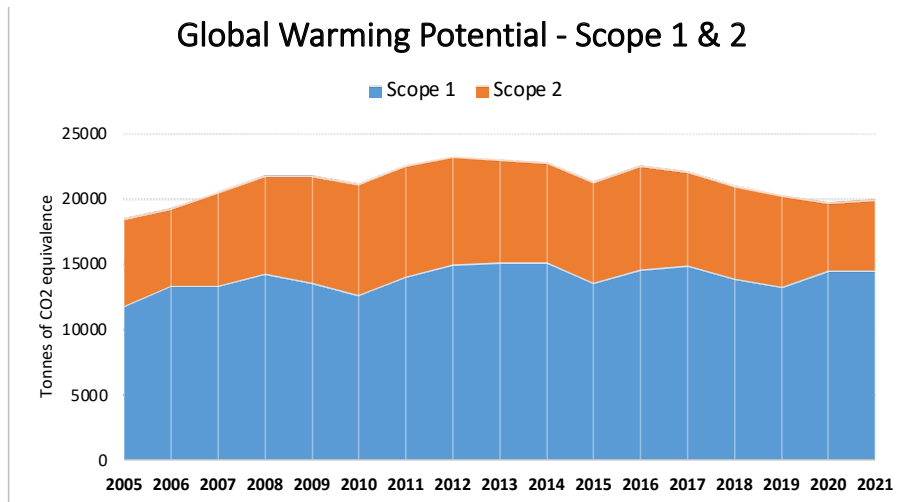


Table 2 - EWU Scope 1 & 2 Greenhouse Emissions

2. REDUCTION STRATEGIES

We are currently evaluating and developing strategies to move towards carbon neutrality for the nearer term (2030) and longer-term (2040 and 2050) targets set by RCW 70.235. To achieve the GHG targets we must accelerate increases in energy efficiency and reductions in GHG emissions. The nearer term 2030 reduction target is likely achievable through available technologies and practices. Strategies for the 2030 target include:

- Invest in infrastructure improvements to reduce energy use and GHG emissions
- Support facilities personnel in the sustainable management and maintenance of campus
- Use existing space efficiently
- Avoid increasing total campus square footage
- Carbon sequestration through the Prairie Restoration Project and management of the campus landscape
- Install electric vehicle infrastructure for both university operations and public use
- Electrify vehicle fleet as well as maintenance equipment
- Establish a University Sustainability Committee to build stakeholder engagement and help guide EWU towards sustainable practices

As we look to 2040 and 2050, the reduction targets become more challenging to plan for strategically. To achieve a 70 % reduction in GHG, and ultimately carbon neutrality, we may need to utilize technologies that are not yet available at appropriate scales. These technologies may be those that are currently cost prohibitive, unproven at scale, or still in the early stages of development. We can begin to anticipate potential solutions and review opportunities, but we have not set a specific pathway. Therefore, current planning for 2040 and 2050 is to assess and evaluate all carbon reduction options and find sustainable solutions. Strategies for these longer-range targets include:

- Work with EWU staff, faculty, and students to propose, research, and evaluate GHG reduction strategies
- Collaborate with industry experts to identify opportunities to transition EWU off natural gas
- Investigate the role of carbon capture/sequestration from point source GHG emissions
- Electrify where possible
- Track and review emerging technologies/practices to reduce GHG emissions.
- Remain open to the dynamic and evolving changes in sustainable practices and technologies to achieve the long-term carbon reduction goals

3. 2022-2025 GREENHOUSE GAS REDUCTION PLANNING

EWU intends to complete the following projects by 2025. Projects are listed by sector.

3.1 BUILDINGS

At EWU, buildings are the largest users of energy. The heating, cooling, lighting, and plug load needs require a significant amount of energy input. Actions taken to improve the efficiency of maintaining a comfortable building temperature, providing adequate lighting, and powering equipment within buildings directly reduces energy use, and thereby EWU's carbon footprint. Direct equipment improvements, such as upgrades to the HVAC systems and light fixtures reduce energy use. In most buildings on campus, HVAC systems require the most amount of energy, followed by lighting. Improvements in the forms of better HVAC designs, technologies, and controls can substantially reduce energy consumption. Switching to LED lighting will reduce lighting energy use by up to 75 %, depending on the type of lighting system that is upgraded. In addition to direct improvements to energy consuming equipment, it is also just as important that the building infrastructure remains intact and sound. The building envelope (i.e. walls, windows, roof, and foundation) serve as the barrier between the building interior and the outside environment. If there are cracks, leaks, or other forms of degradation in the building envelope that allow air and water to seep in or out, it then requires more energy to maintain the interior temperature and conditioned environment.

Between 2023 - 2025, EWU will be investing in campus infrastructure to substantially improve energy efficiency and reduce GHG emissions. These projects include:

PHASE Building Complex Energy Improvements

- The PHASE complex is the largest group of buildings at EWU, totaling 286,000 gross square feet. Much of the building HVAC equipment, energy management systems, and lighting are 40+ years old and beyond their respective operating life spans. Investing in a major overall of this equipment is required for the compliance with the Clean Building Performance Standard and necessary to meet greenhouse gas reduction targets.
- An energy audit of the complex identified a 37.5 % reduction in building energy use and greenhouse gas emissions once the work is completed. This will reduce campus total campus greenhouse gas emissions by 4 %.
- Scope 1 and 2 emissions
- \$8,389,566

Science remodel

- A major remodel of the EWU Science Building (SCI) began in 2022. This is a multi-phased, multi-year project that is estimated to be completed in 2026. Phase one is expected to be completed in 2023, with Phase 2 beginning immediately after.
- Prior to remodeling, the SCI building was responsible for almost 14 % of all energy use on campus, despite only accounting for 5 % of all campus square footage. Once completed, SCI's energy use and GHG emissions will be reduced by more than 40 % and will decrease the total energy use on the Cheney campus by 6%.

- Scope 1 and 2 emissions
- \$111,200,274

Martinson and Williamson Predesign

- Martin (MAR) and Williamson (WLM), two interconnected academic buildings on campus, are slated for major remodel. Remodeling of these facilities will result in significant energy and greenhouse gas reductions. Estimations for reductions in energy use and greenhouse gas emissions will be determined during the building predesign phase. Predesign is proposed to begin in 2023.
- Scope 1 and 2 emissions
- \$350,000

Minor works

The following minor works projects are expected to improve energy efficiency and thereby decrease GHG emissions. Total energy savings and greenhouse gas reductions will be calculated during implementation of the respective projects.

- Building Automation and Energy Management Improvements
 - Update energy management within buildings to better track, manage, and conserve energy. Conduct energy audits of buildings to collect baseline data and identify areas for improvements.
 - \$1,250,000
 - Scope 1 and 2 emissions
- Lighting retrofits
 - Update light fixtures to LED lights, which are significantly more energy efficient than the lights they replace.
 - \$800,000
 - Scope 2 emissions
- Preventative Maintenance
 - Lengthen equipment/building life cycles, reduce maintenance and operation costs, implement energy saving upgrades and replacements improve the campus sustainability and reduce carbon emissions.
 - \$2,217,000
 - Scope 1 and 2 emissions
- Roof replacements
 - Major roofing repairs are needed on campus buildings to prevent the loss of interior heating/cooling to the exterior environment and prevent water/outside air from entering buildings. Roofing repairs create more energy efficient buildings and thereby decrease greenhouse gas emissions.
 - \$2,000,000
 - Scope 1 and 2 emissions
- Heating Ventilation, and Air Conditioning (HVAC) Improvements
 - Upgrade, repair, and replace HVAC systems to reduce energy use and greenhouse gas emissions
 - \$2,000,000
 - Scope 1 and 2 emissions
- Repair exterior building envelopes
 - Upgrade and repairs to exterior building envelopes help to prevent loss of heating/cooling to the outside environment, as well as the seepage of air and water into the conditioned building space. Creates a more energy efficient building space that reduces greenhouse gas emissions
 - \$2,000,000
 - Scope 1 and 2 emissions

3.2. CENTRAL PLANT

The heating and cooling of campus buildings is delivered through a district energy system. The central plant, located in Rozell, generates steam for heating and chilled water for cooling. The steam is generated through burning natural gas in boilers and the steam is piped to campus buildings through a network of tunnels. Chilled water is generated through the use of electrified chillers and delivered through the same tunnel system. Efficiency projects to the central plant and piping delivery system provide direct reductions in energy use and greenhouse gas emissions.

Boiler upgrades

- Boilers, used to heat campus, are beyond their expected lifespans and operate using outdated technology. Boilers are to be replaced in a staged process over the next few years. New boilers will have significantly improved operating systems that are expected to conserve energy and reduce greenhouse gas emissions
- Scope 1 emissions
- Part of a \$15,000,000 investment to the central plant

Chiller upgrades

- Like the boilers, four of the six the chillers used to cool campus during the warmer months have outlived their expected lifespans and need replacing. Upgrading to new technologies will increase energy efficiency.
- Scope 2 emissions
- Part of a \$15,000,000 investment to the central plant

Medium voltage upgrade

- EWU's electrical grid is largely hidden out of site in the network of tunnels beneath campus. The grid is reliant on outdated technology that needs to be updated to meet new safety codes. As the university looks to electrify as much equipment as possible, such as the vehicle fleet and providing electric vehicle charging stations, the campus electrical grid must be updated to meet this increased use demand. Upgrading the medium voltage distribution system lays the groundwork for EWU's pathway to electrification.
- Scope 2 emissions
- Part of a \$15,000,000 investment to the central plant

Building metering

- All buildings are individually metered for the use of electricity, steam, chilled water, domestic water, and generation of wastewater. This data is monitored by the energy management team, located in Rozell. Monitoring of building inputs and output allows staff to track building energy use statistics, identify opportunities for improvement, and to detect/resolve issues.
- Scope 1 and 2 emissions
- No upfront costs associated with building metering

Building Temperature Setpoint

- In 2022 building heating temperature setpoint was reduced from 71°F to 68°F. During the 2022 - 2023 school year we will assess building occupancy comfort and energy management at this temperature to see if this is a manageable/sustainable solution for the long term.
- Scope 1 and 2 emissions
- No costs associated with reducing temperature set point

Green Revolving Fund

- A green revolving fund tied to utility budget savings will be established in 2023. The utility fund will be supported through energy cost savings. Utility costs will be reviewed annually, and when energy savings through projects are observed through decreased costs, the net savings will be directed to a separate facilities account. This account is available to fund projects/ programs that will achieve further reductions in energy use, and thereby create additional financial savings to be used for the next iteration of projects.
- Scope 1, 2, and 3 emissions

Transition to carbon neutral energy sources

- Shifting boiler use away from natural gas to a carbon neutral source poses one of the biggest challenges in EWU's pathway to achieving the 2040 and 2050 carbon reduction targets. Current infrastructure is built around the use of steam generated from natural gas, and the transition away from this system faces many technological and financial barriers. We are reviewing options and will be working with industry leaders to identify all potential pathways to eliminating carbon emission from building heating including heat recovery systems, carbon capture, boiler electrification, and renewable natural gas.
- Scope 1 and 2 emissions

3.3 CAMPUS LANDSCAPES

In addressing climate change, we need to do more than identify pathways to decarbonization. We also need to plan for some of the already-inevitable impacts of climate change we are sure to face. Regional changes already being experienced include changes in precipitation patterns, heat waves, wildfires, and drought conditions. To be resilient to this change we must plan and prepare for these impacts to campus. We need to shift management practices of campus landscapes to those that drastically reduce water use, decrease chemical inputs, account for urban heat island effect, and switch to fossil fuel free maintenance equipment. This can be achieved by transferring much of EWU's landscapes to native plants that are regionally adapted for drought tolerance. Native plants bring the additional benefits of boosting biodiversity, providing habitat for local pollinators, and sequestering carbon in the soil. Through these efforts we build resiliency, reduce emissions, and demonstrate EWU's commitment to a sustainable future.

Prairie Restoration Project

- The EWU Restoration project seeks to restore more than one third of campus land back to native habitat, and through this process, support research, educational, and recreational opportunities. More information regarding the Prairie Restoration Project can be found at (<https://www.ewu.edu/give/funds/prairie-restoration>).
- Restoration of the land has the potential to sequester carbon, helping to offset GHG emissions elsewhere. In addition to natural carbon sequestration through plant photosynthesis, we are conducting research on the use of biochar as soil amendment to boost plant growth and carbon storage. As this project develops, it has the potential to sequester carbon on an annual basis and plays an important role in EWU's greenhouse gas reduction pathway.
- Scope 1, 2, and 3 emissions
- \$400,000

Landscape Climate Resiliency Masterplan

- A landscape masterplan is currently being developed that will inform numerous projects and programs that to help reduce carbon emissions from landscape maintenance, as well as make the campus more resilient to a changing climate through the implementation of drought tolerant, native plants and other sustainable management practices.
- The plan is expected to be completed in spring 2023, with projects beginning summer 2023. Implementation of the Landscape Climate Resiliency Masterplan will be a multi-year project and is expected to be completed by 2030.
- Scope 1, 2, and 3 emissions
- Implementation costs will be identified during development of masterplan

3.4 TRANSPORTATION

EWU can create opportunities for significant reductions in greenhouse gas emissions within the transportation sector. Every day during the school year thousands of students and employees commute to the Cheney campus. Commuting to campus accounts for approximately 70 % of all Scope 3 emissions. Developing a robust public electric vehicle charging infrastructure across all lots on campus will

encourage and support the expanded use of electric vehicles. Promoting alternatives to commuting such as increased bus use, carpooling, and bicycles will help to reduce emissions and traffic. Additionally, it is also important that EWU's fleet of vehicles, including landscape maintenance equipment, be electrified.

Electric Vehicle Infrastructure

- EWU is currently in the first phase of developing an electric vehicle infrastructure system, focusing on feasibility and costs. We are working with electrical engineering consultants to evaluate EWU's electrical grid and assess the installation of electric vehicle charging stations across campus for both public and facilities use. Once completed, the results of phase 1 will be updated in the CAP and steps for phase 2 will be identified.
- Scope 2 and 3 emissions

Fleet Management

- EWU's facilities fleet management is primarily focused on vehicles used to manage and operate campus. The required travel distances are short, and vehicles are returned to central locations nightly, making EWU an excellent candidate for fleet electrification
 - As vehicles are phased out of use, our intent is to replace these with electric vehicles. However, purchasing electric vehicles is currently cost prohibitive for EWU. As barriers to purchasing are overcome, EWU will transition to an all-electric fleet.
 - Landscape equipment is a significant consumer of gasoline and diesel for the Grounds and Landscape Maintenance Department. Where feasible, we intend to transition equipment to electric power, reducing the use of fossil fuels.
- Scope 1, 2, and 3 emissions

Commute Trip Alternatives

- Develop programming to encourage the increased use of the Spokane Transit Authority bus system and carpooling
- Promote alternative commuting practices, such as riding bicycles and walking, as fun and healthy ways to get to campus
- Scope 3 emissions

3.5 ENGAGEMENT AND PLAN DEVELOPMENT

Becoming a carbon neutral institution is a long and challenging process that can only be accomplished through collective community actions. Building a community awareness and support for sustainability-based initiatives can help overcome barriers and identify numerous pathways to a sustainable future. Through inclusive and transparent planning, we can create new research and learning opportunities, and through these actions, build a resilient and sustainable university.

University Sustainability Committee

- EWU is launching a new University Sustainability Committee that is advisory to the University President. This committee will propose, evaluate, and recommend projects/initiatives to reduce our carbon footprint.
- The committee will be key to helping develop additional sustainability goals and pathways towards achievement.

Campus as a living laboratory

- Integrate student learning opportunities into CAP projects and programs

Community Engagement

- Connect with community members and invite them to campus for events, demonstrations, and collaborative discussions
- Education and outreach efforts will aid not only EWU, but our region, in reducing greenhouse gas emissions (Scope 1, 2, & 3)