



# University of Colorado Anschutz Medical Campus

## INTRODUCTION

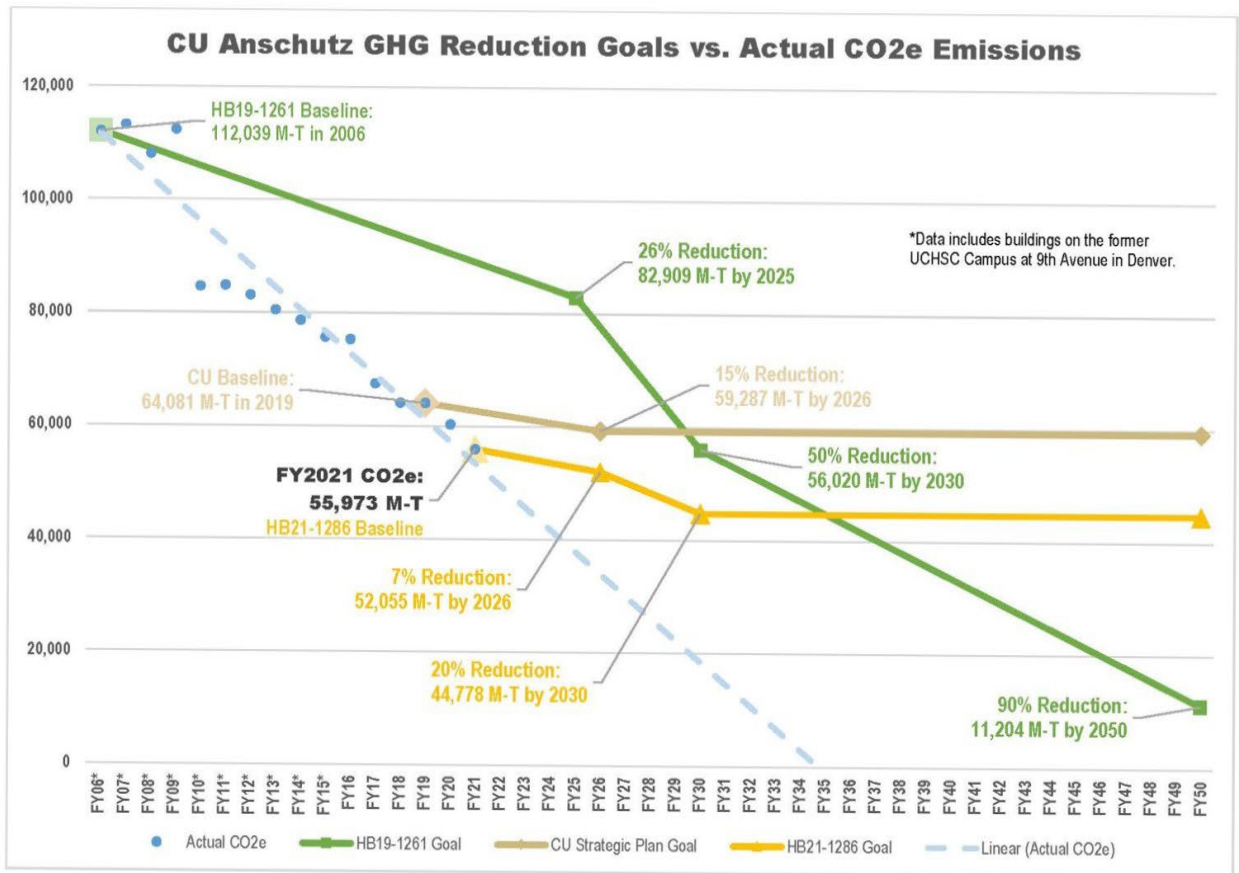
### 1. Campus goals

#### a. Planning efforts – status of condition audits, energy master plans, campus master plans, etc.

The University of Colorado Anschutz Medical Campus continues to develop and seek achievement of sustainability goals through several planning efforts. CU Anschutz is currently updating its Facilities Master Plan and it will be completed by the end of 2022. We are using the update to the Master Plan to inform other planning efforts, including Energy Master Planning and Climate Action Planning. We see these as congruous efforts that will aid the campus in developing realistic, long-term goals and specific endeavors to achieve those goals over time. Facility Condition Index Audits are ongoing and are, likewise, informing our planning processes.

The State of Colorado Climate Action Plan (developed from HB19\_1261) remains the guiding document for Greenhouse Gas Emissions reduction planning. However, new legislation has created several differing goals and baselines that we are attempting to adhere to as we move forward and we expect more are forthcoming. We attempt to showcase those data points in graphs/charts that follow with the sustainability metrics.

**Chart 1.a:**





**2. Strategic plan goals**

**a. Progress towards System strategic plan goals**

The CU Anschutz campus has incorporated the CU System Strategic Plan goals and associated metrics into the planning efforts and continues to track and document as needed. Our current understanding is a 15% reduction of GHG emissions from a 2019 baseline, Improvement in Energy Use Index (EUI), the addition of renewable energy on campus, electric vehicle replacement for fleet vehicles, and improvement in the Facilities Condition Index.

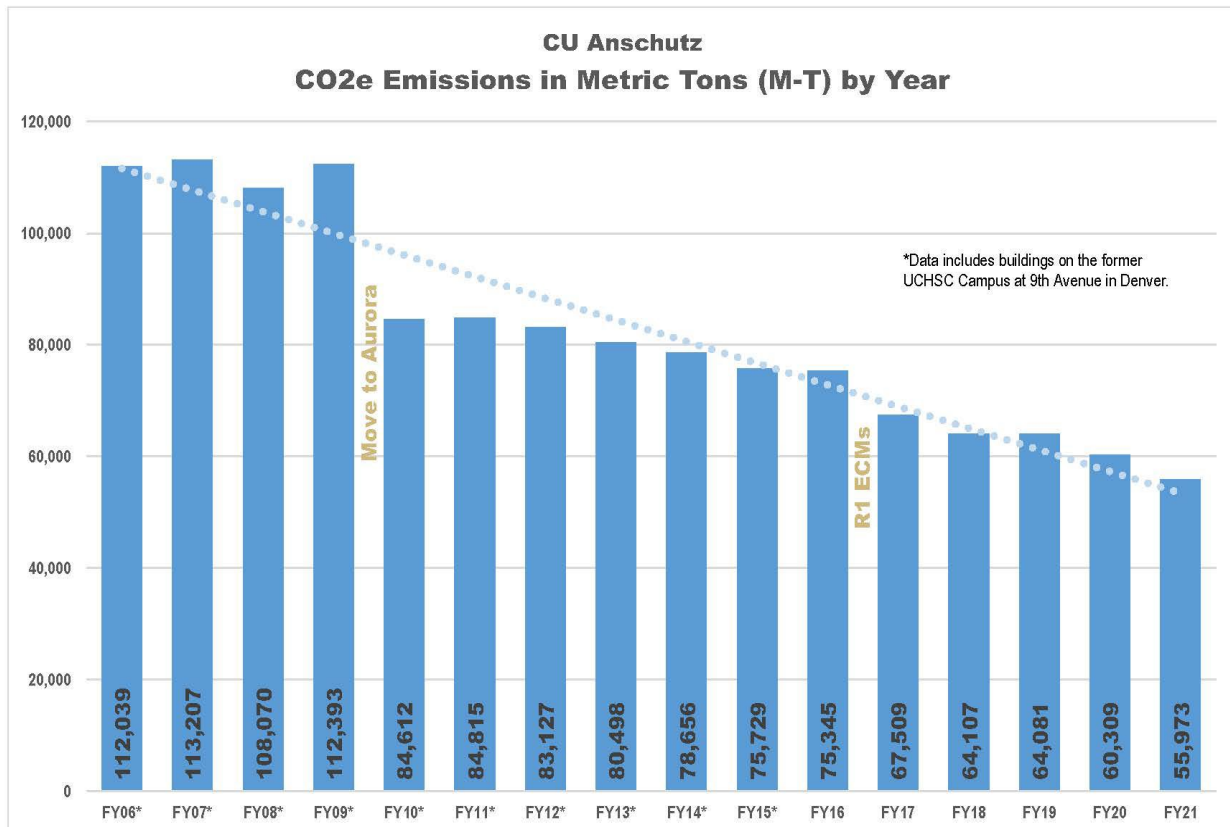
**SUSTAINABILITY METRICS**

**3. Greenhouse gas emissions**

**a. Overall emissions**

CU Anschutz Greenhouse Gas Emissions for FY 21 are 55,973 mt-Co2-e. This represents just over a 50% reduction in total emission from the baseline year of 2006. The baseline data also consists of the former CU Health Sciences Center (9<sup>th</sup> & CO) that was still under financial control until 2010. Energy Conservation Measures in all facilities, but notably the Research towers, as well as lighter carbon electrical supply from Xcel Energy have assisted in reductions.

**Chart 3.a:**





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## b. Transportation

### i. Alternative transportation

CU Anschutz provides multiple options for alternative transportation to and from campus. The campus is well-served by RTD, through buses and light rail. Light rail stops on campus are serviced by a campus shuttle that takes community members from the train to various convenient locations on campus and back again. This is further supported by a highly discounted ECO Pass offered to all campus community members.

The campus is also well-served by bike infrastructure, including bike racks, bike lockers and several bicycle repair stations on campus.

### ii. Electric vehicle charging (number and distribution of charging stations)

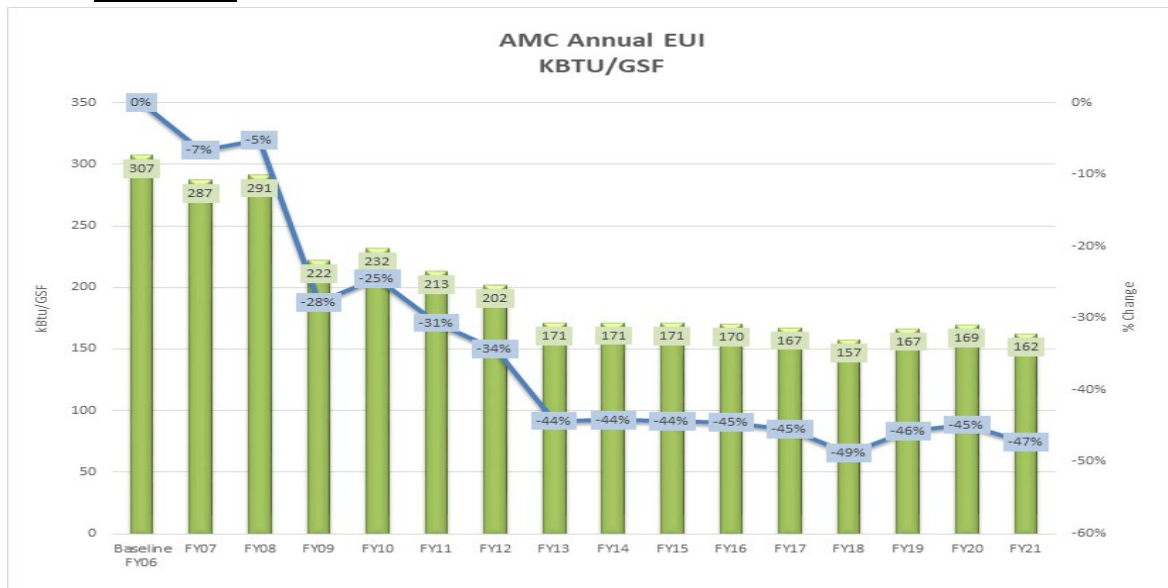
There are currently 54 Level 1 charging parking spaces on campus, all located in the Henderson Parking Garage. There are currently two (2) Level 2 (faster charging) spaces with two more currently being installed.

## 4. Energy Consumption

### a. Energy Use Intensity

Energy Use Intensity (EUI), or the amount of energy used per square foot in campus buildings, continues to decline. This is due to several Energy Conservation Measures and more efficient buildings constructed in recent years under stricter standards to meet LEED certification requirements. However, medical research facilities remain high energy users due to the temperatures and air changes desired for the types of research taking place. This is illustrated in the following charts:

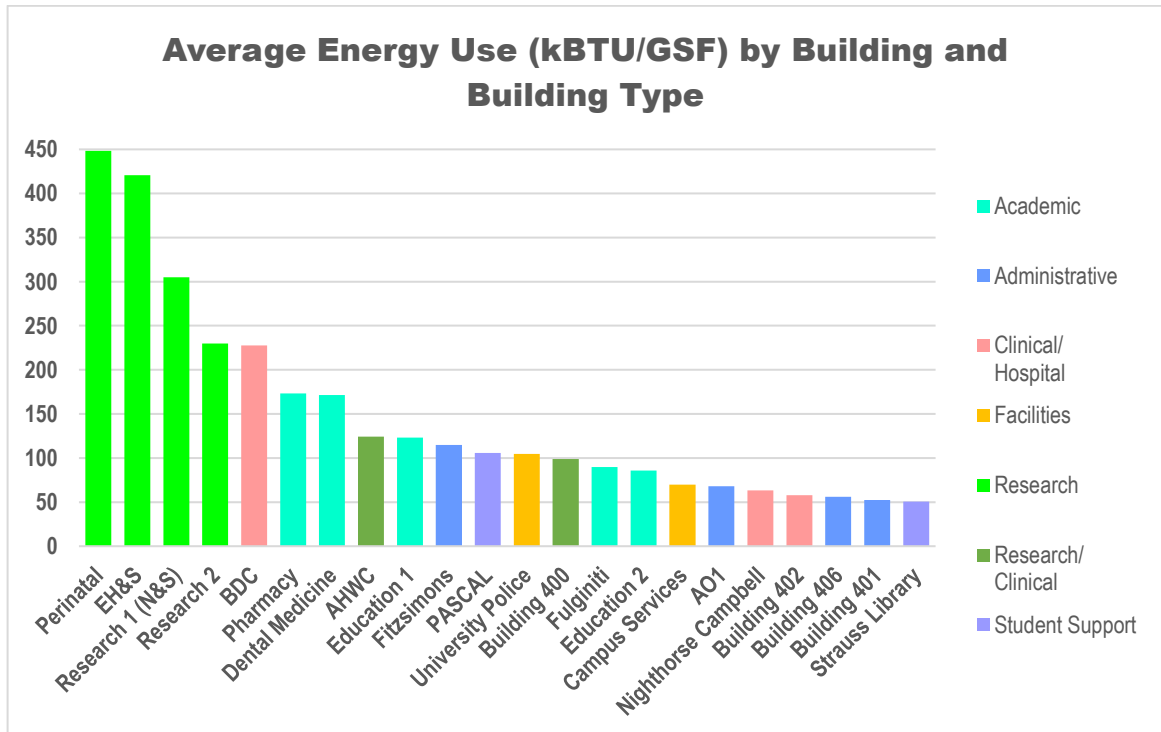
**Chart 4.a.1:**





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**Chart 4.a.2:**



**b. Renewables (quantity and production – FY 2016-17 – FY 2020-21)**

As of this writing, the campus does not have renewable energy installed on-site. This will change as the new Campus Safety and Emergency Preparedness facility is constructed. As part of that facility’s Net Zero requirements, approximately 270 kW solar system is being installed on the roof of the facility and an adjacent parking cover.

As well, the campus completed a “whole-campus” solar study in the fall of 2021 to see what is possible for installed, on-site electric generation. If all recommendations were constructed, the university could offset 11% of current electric load and reduce GHG emissions by 5,400 mt-CO<sub>2</sub>e at a cost of \$18 million.

**i. RECs**

The campus does not currently purchase any Renewable Energy Certificates (RECs). Trends in GHG emissions reductions have informed that decision as well as the need to use funds that would be spent on RECs to address Energy Conservations Measures in buildings.

**c. Energy Performance Contracting**

Energy Performance Contracting has been pursued in the past for several building efficiency and conservation projects. However, none of these have gotten past the energy audit stage as



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the projects were either not feasible or could be undertaken in-house. Studies from those efforts have been used to inform our current CU Anschutz Bundled Energy Project.

## **d. Performance Audits**

Several Performance Audits (ASHRAE, Level 2) have been performed over the years. This has informed a number of Energy Conservation Measures on campus and is currently the basis for a large ECM project that will address 49 specific projects in lighting, HVAC and controls in 7 facilities on campus. This Bundled Energy Project, when completed in Fall of 2023, will reduce campus energy spending by \$2 million and reduce GHG emissions by 10,400 mt-CO<sub>2</sub>e.

## **5. Built Environment**

### **a. Deferred Maintenance**

As the CU Anschutz campus ages, deferred maintenance concerns are growing. Immediate priority needs must be considered first in to support of the operation. However, this also presents an opportunity to consider building systems upgrades or replacements with more energy efficient solutions. The Facilities Audit (discussed below) will identify equipment, building components, and system useful life. As equipment reaches the end of its useful life, replacement must be considered. Upgrades will always consider more energy efficient equipment, and possibly entirely different technology.

#### **i. FCI**

The Facilities Audit is the process used to numerically grade the condition of building components and systems. The identification of condition and needs is used to estimate

replacement cost. Building value and the corresponding replacement/improvement need is expressed as a score. The Facilities Condition Index (FCI) that is 100% is good. Buildings with a low FCI need improvement.

#### **ii. Funding**

The Facilities Audit program informs capital renewal plans. As needs are prioritized, funding sources must be considered. This includes department funds, CU-System funding for larger capital renewal, and State funded Controlled Maintenance.

#### **iii. Prioritizing renovations and repairs**

The Facilities Audit program allows for a methodical approach to understanding capital needs. Comparing various building FCI's allows for needs-prioritization. Limited funding is then targeted to the most critical needs. As equipment is upgraded or replaced, the opportunity to replace the old with new more energy efficient equipment is always prioritized. Often times, system improvements can be accomplished with new technology that allows for better energy utilization or a completely new way of meeting the building's cooling and heating needs.

### **b. Facility Condition Audits**



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CU Anschutz has an on-going program to use Facilities Condition Audits to inform its deferred maintenance and capital planning efforts. The current program was developed in-house and is now being updated to attain industry best practice. Consulting services have been procured to produce a comprehensive campus-wide facilities audit. This process is on-going and is about

50% complete. The updated facilities audit will not only grade facilities condition and serve as a capital planning tool, but will also incorporate “energy impact” grading. As building components are inspected and evaluated for condition and longevity, the energy impact will also be graded.

## **c. LEED Buildings (and beyond)**

### **i. # of LEED buildings, by LEED rating**

CU Anschutz currently has 5 LEED Gold rated facilities: Pharmacy & Pharmaceutical Sciences, Fulginiti Pavilion, Anschutz Health & Wellness Center, Dental School, and the Anschutz Health Sciences Building (LEED v. 4)

### **ii. Associated savings (whether monetary, emissions, or EUI)**

These buildings are typically 25% or more efficient (depending on the building) than a typical facility and therefore more cost-effective to operate. They are also, typically, much more well-designed for users and provide a better environment for work and collaboration.

### **iii. Net Zero**

CU Anschutz is currently constructing the first Net-Zero facility in the CU System with the new Campus Safety and Emergency Preparedness building. This innovative facility re-uses

an older research facility for a portion of the building, has a very low Energy Use Index (42 kBtu/gsf) and will have solar panels on the roof and adjacent covered parking that will produce more electricity than the building will use. This will be a LEED Net-Zero certified facility which will involve a year of certification work after construction and occupation to ensure the facility meets all requirements.



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*Campus Safety and Emergency Preparedness Facility*

## **d. Space Utilization**

### **i. Efficiencies associated with COVID/The Future of Work**

Some efficiencies have been realized with ability of faculty/staff/students to work remotely. Some savings and reductions were realized early, but once even limited-work resumed on campus, facilities were used as if fully occupied (the exception being in areas with occupation sensors for lighting and HVAC), notably in lab and research spaces on campus where work cannot be performed remotely. However, this has informed future planning for space utilization on campus for office and some education space. Hoteling spaces and HUB office settings are being considered for future construction to maximize utilization of new and existing spaces. It is for certain that remote work has affected Scope 3 GHG Emissions contributed to the University with far less commuting to campus daily.

## **e. Green Labs**

### **i. Five years of data, conversion to green labs, reduction to energy consumption, water consumption, waste, etc.**

Sustainability of lab space is an on-going effort for the campus. Changes in recycling protocols, upgrades of autoclave equipment, lighting and HVAC in these spaces are assisting in the “greening” of labs along with efforts of individual labs to reduce waste and water use.

The School of Medicine is currently undertaking a dedicated effort to clean out lab spaces in several facilities with the goals of freeing of over 40,000 sq. feet of research space. This involves removal (and proper disposal/recycling/reuse) of old and outdated files, equipment and furniture and will allow for the space to be used for more research alternative to building new lab spaces. This project also encourages the use of more efficient equipment, notably high-energy use, ultra-low freezers. We plan to report on energy savings once the project is complete later this year.



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## 6. Waste Diversion

### a. Waste diversion rate (by volume and weight)

#### i. Recycling

Recycling is available throughout campus as a single-stream program that is sorted by our waste hauler, currently Republic Services. We have made efforts to expand recycling of certain products used in labs on campus to include items like conical tubes, Kimwipes, media bottle and pipette tip tubes. Current diversion rates are 51% by volume and 21% by weight.

#### ii. Dining/Food Waste/Composting

Currently, there is composting only at the Anschutz Health and Wellness Center facility on campus. There are initial plans to expand this to food service areas on campus in the Education and Research quads and to expand further upon success of this initial project.

#### iii. Landscaping Waste/Composting

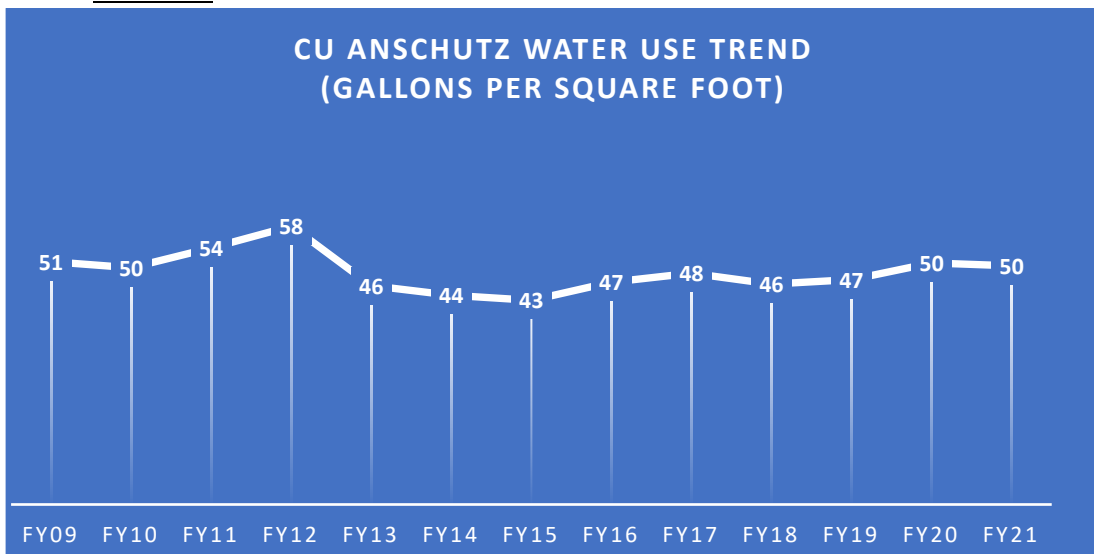
Landscaping waste is composted at an outdoor facility on campus and used seasonally for planting and mulch.

## 7. Water Consumption

### a. Potable water consumption (gallons/GSF)

Potable water consumption has remained fairly consistent over the past few years. Changes for process water use in the Central Utility Plant, replacement and updating of autoclaves and glass washers in labs, and landscape irrigation controls and sensors have aided this in recent dryer and warmer years. See chart 7.A.

**Chart 7.a:**







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## **b. Acres of Irrigated Landscape**

### **i. Xeriscape/ water management strategies**

Recently completed projects, and those under construction, have utilized xeriscaping and water efficient plantings. The projects include the Anschutz Health Sciences Building, the CUP Capacity Expansion, and the Campus Safety and Preparedness Facility.

These improvements utilize native and climate appropriate plantings in addition to dry landscape elements to reduce water use. We hope to develop a planting guide through the Facilities Master Plan update to promote those plantings and landscape techniques that have been successfully implemented on campus.

In addition, the campus has reached out to Aurora Water to learn more about the city's efforts to promote water-wise landscaping. We are working to build a working partnership and to identify other areas on campus where we could pursue other pilot projects.



*Xeriscaping Outside of Central Utility Plant*

## **COMMUNITY ENGAGEMENT**

### **8. How do you make your campus community aware of sustainability efforts? Do you engage in any public awareness/advertising campaigns? Do you promote sustainability through campus signage, communications, and policies? Do campus governance groups engage in sustainability conversations?**

Sustainability and related projects are promoted through campus communications and email as well as the Facilities Sustainability website. The Sustainability Manager also works with different governance groups on campus to inform on sustainability, resource efficiency, recycling, and climate



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action planning. Sustainability-related campus signage exists across campus but notably in the LEED-certified buildings where different sustainability features are showcased.

A recent, on-going dialogue has been established with the Campus Communications group to inform on efforts from across campus including information on how climate change is affecting communities within and outside of our campus. A few links of recent stories:

[9 Things to Know About the New AHSB](#), [Planning Strategies in the Wake of the Marshall Fire](#).

## 9. Academic Efforts

### a. Number of sustainability-related courses (within X number of departments)

CU Anschutz currently offers 9 sustainability-specific courses across several schools and departments. This does not include courses or research where sustainability may be part of the curriculum but not specifically mentioned in course description:

- [POLS 6700 Politics of the Environment and Sustainability](#)
- [CBHS 6610 Social and Behavioral Factors and Health](#)
- [CBHS 6613 Program Planning and Implementation](#)
  
- [DISP 8411 Introduction to Global Health Elective](#)
- [DSEL 9104 Introduction to Global Health](#)
- [EHOH 6614 Occupational and Environmental Health](#)
- [EPID 6645 One Health - EcoHealth - Planetary Health](#)
- [NURS 6747 Practical Applications in Palliative Care Programming](#)
- [PBHC 5500 Applied Behavior Change Theory](#)

## 10. Student Involvement

### a. Student led groups/organizations/efforts?

**Gold Humanism Honor Society (GHHS)** - Within the School of Medicine, GHHS is an honor society at medical schools throughout the country. This chapter recognizes individuals in each medical school class who exemplify "excellence in clinical care, leadership, compassion, and dedication to service". Members of GHHS are expected to conceive and lead projects that benefit the surrounding community. The CU Anschutz chapter felt that there was a need for a group on campus to promote sustainability and resource stewardship, so an action arm of GHHS emerged to assist CU Anschutz with the recycling program in lab and education buildings. This group also designs and delivers sustainability and climate change workshops to local elementary school classes. This work was highlighted in spring of 2019 when GHHS became a Distinguished Chapter - awarded to 4 of the 150 chapters across the country. University of

**Colorado Consortium for Climate Change and Health** - The Consortium is an interdisciplinary collaboration of clinicians, biomedical scientists, public health practitioners, epidemiologists, anthropologists, atmospheric scientists, climatologists, and graduate students who share an academic interest in studying the climate change and health nexus, as well as a collective desire to mitigate the effects of climate change in order to prevent disease and improve global health. The student contingent is presently expanding, and the goal is to increase student involvement



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in on-campus sustainability projects, public education on the health effects of climate change, and advocacy for responsible policies that mitigate global warming and adapt our infrastructure for the climatic changes to come.

### **b. Campus led groups/organizations/efforts?**

**CU Street Medicine** - CU Street Medicine has established an Anschutz Student Organized Street Medicine volunteer team that serves the population experiencing homelessness and provide opportunities for medical professional students to have meaningful engagements with said population. CU Street Medicine as a novel way to address the chronic sustainability issues affecting the unsheltered homeless population in Anschutz's backyard.

**CHASE** - Climate & Health Advocacy Sustainability Education is a group of diverse graduate students that share a common goal: To increase campus sustainability, advocate for climate friendly legislation, and educate partners on and off campus about the impacts of climate on health.

## **11. Partnerships with local governments, local utilities, businesses**

### **a. Rebate programs**

We participate in the Xcel Energy Design Assistance Program for new construction and major projects and received rebates totaling over \$2.25MM. Rebates are utilized to fund additional energy efficiency opportunities.

### **b. Awards**

The campus has received several awards for energy efficiency and conservation over the last decade and a half:

- Most Energy Savings at One Premise (2008)
- Energy Management Systems Award (2012 & 2016)
- Highest Savings for Multiple Programs (2016)
- Most Natural Gas Savings in Energy Design Assistance Program (2018)
- Represents over 12,000 MT-CO<sub>2</sub>e saved

## **CONCLUSION**

CU Anschutz continues to be a leader in the sustainability space for health care and medical research campuses. Challenges remain with the types of facilities that are utilized for research, but we are exploring opportunities and new ideas to address sustainability and climate action commitments. Continued growth will hamper efforts at absolute reductions of greenhouse gas emissions but new technologies, better facility design, space utilization & remote work, and partnerships with local stakeholders will help us plan for a future where we remain trustworthy stewards of the resources we must use to fulfill the campus mission.