

Auraria Sustainable Campus Program

Climate Action Plan *"To 2030 and Beyond!"*

June 2021

Foreword from ASCP Advisory Committee Chair (on behalf of the student body)



Driven by a sense of inspiration and innovation, as well as a desire to improve the relationship between humankind and the environment, students across the globe have been instrumental in leading sustainability initiatives in institutions of higher education. Students on Auraria Campus are no exception to this effort, and have demonstrated their commitment to bettering the planet by consistently voting to implement green initiatives using their student fees. We, as students, have witnessed monumental changes to our planet directly resulting from climate pollution, environmental degradation, and lack of action by the powers that be.

In 2011, the Auraria student body proved their investment in sustainability by voting to assess a student fee to establish the Auraria Sustainable Campus Program (ASCP). This year, 2021, marks the 10-year anniversary of the establishment of this program, and in those years the ASCP has enacted a multitude of efforts to make Auraria Campus more sustainable. However, more emphasis and resources are necessary to effectively address critical climate and environmental issues that are having an unprecedented impact on our planet.

The students of Auraria Campus have expressed the need for climate action, not only by voting to approve student fee increases, but also by attending protests on the steps of the state capital, and speaking to local and state representatives. However, it must be recognized that students should not, and cannot, bear the sole responsibility and cost of advocating for greener practices on our campus. We, the Auraria Campus student body, feel it is imperative for the implementation of a more systemic and campus-wide effort to contribute resources towards greater sustainability efforts.

Auraria Campus and its three educational institutions lie at the epicenter of higher learning in downtown Denver. It is our responsibility to be innovators in urban sustainability as the 40,000+ students on our campus are prepared to make positive changes in their communities. Therefore, today we are turning our attention and efforts to addressing the existential threat of climate change that will impact our campus, world, and our future. The Auraria Climate Action Plan created by the ASCP recognizes the aggressive and decisive action that is necessary to achieve our climate goals, and serves as a testament to the commitment of students to sustainability.

Auraria Campus is positioned to combat the global climate crisis and lead with innovation and dedication. By making a concerted and collaborative effort to decrease our greenhouse gas emissions and improve energy efficiency on our campus, we can ensure the safe futures of our students and communities.

Respectfully,

Marlena Fay Harwood

Chairperson, ASCP Advisory Committee

Acknowledgements

This plan would not be made possible without the contributions of numerous stakeholders across the Auraria campus and beyond:

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Finally, a very special thanks to the broader ASCP Faculty/Staff Coalition and their efforts to increase participation in our one month [Consider.it public forum!](#)

How to Use This Plan

What is this plan?



This Climate Action Plan offers **a set of recommended goals, benchmarks and strategies to aggressively reduce Auraria’s greenhouse gas (GHG) emissions**; it aims to serve as **a roadmap** for Auraria’s Climate Action. Note that this report focuses on three of the largest quantified emissions sources: energy (50%), commuting (32%) and waste (5%). This inventory does not include strategies to reduce air travel emissions or emissions not quantified in the 2019 GHG inventory.

How was this plan created?

In May 2020, the ASCP completed the first comprehensive greenhouse gas inventory for the Auraria campus since 2014. The inventory depicts where and how Auraria’s GHG emissions are generated and provides a basis for crafting strategies to reduce our campus GHG footprint. From August 2020 through March 2021, the ASCP convened stakeholder subcommittees (see Appendix 5) related to each emissions source to generate and discuss ideas to reduce emissions across the three largest categories. The ASCP then boiled these ideas down into overarching goals and benchmarks and hosted a one-month virtual public forum to gather public comment (from our campus constituents and greater community) on the proposed strategies. These recommended climate actions reflect the opinion of the ASCP and in many (but not all) cases the opinion of the subcommittee stakeholders.

How can I most easily read this plan?

This plan is intended to be concise and graphic heavy and relies on the appendices to provide a more robust and text-heavy explanation of benchmarks, strategies and resources. Here’s a breakdown of the following 15 pages for easy reference:

Auraria Greenhouse Gas Emissions & Climate Action Context

A brief 4-page review of the 2019 GHG inventory and the context for climate action

1

2030 Climate Action Benchmarks

High level benchmarks (by emissions source) to measure success of implementation

5

15 by '30 High Impact Action Steps

Highest impact action steps from strategies matrix (Appendix 1)

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Community Forum Results

Key takeaways from our 30-day virtual public forum

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Funding Opportunities

Potential funding sources for implementation

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Appendices

A place to dive deeper into the details and explanation behind the identified strategies. A more detailed internal roadmap for implementation

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Auraria Greenhouse Gas Emissions & Climate Action Context

Note: You can access the complete FY2019 Auraria GHG Inventory on the [ASCP website](#). This is an abridged version, as this plan focuses more on actions to reduce GHG emissions.

In fiscal year 2019, activity related to Auraria campus operations generated an estimated 67,407 metric tons of carbon dioxide equivalents (MT CO₂e). This includes emissions related to campus energy consumption, commuting, directly-financed air travel, landfilled waste and a handful of small indirect emissions sources; it does not represent an exhaustive inventory of Auraria's indirect emissions sources, such as embodied energy or supply chain emissions. The portion of emissions generated by building energy use totaled 32,571 MT CO₂e in fiscal year (FY) 2019.

KEY STATS		64,740 MT CO₂e generated in FY 2019 (Scopes I, II, III)
		32,571 MT CO₂e 22 lb. CO₂e/ft² built space (Scope I and II)
		3,718 lb CO₂e/headcount (faculty, staff and students)
		16.4% decrease from 2008 ACUPCC baseline (Scope I & II)
		18.5% projected decrease (Scope I & II) by 2020 <i>without any changes</i> (just additional library solar production)

These emissions were broken out by academic institution based on the percent each school comprises based on 1) headcount and 2) occupancy of building square footage.

School	% Total	Emissions (MT CO ₂ e)	Scope I & II Emissions (ACUPCC)
MSU Denver	53%	34,961	17,366
CU Denver	32%	20,973	10,418
CCD	15%	9,638	4,787
Total	100%	65,573	32,571







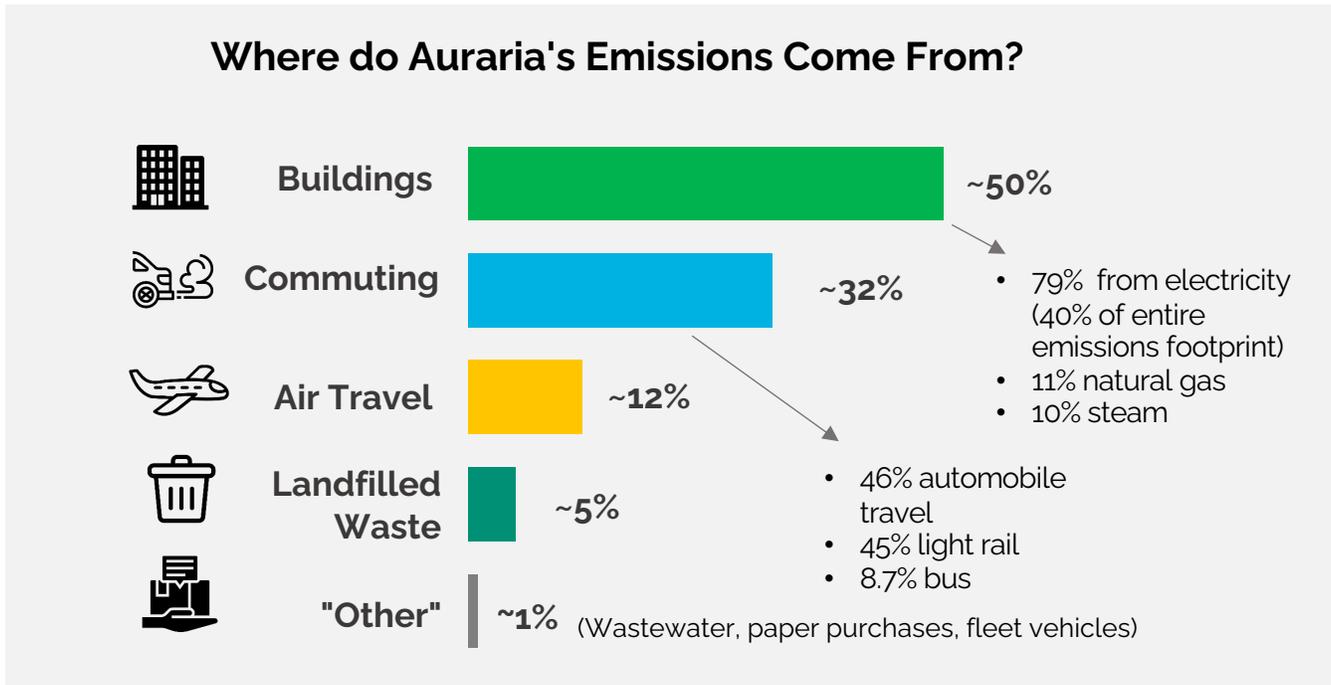






Auraria Greenhouse Gas Emissions & Climate Action Context

When broken out by emissions source (by category), Auraria’s emissions break down as depicted in the graphic directly below. Note that several emissions sources (ie: supply chain emissions, construction emissions, embodied energy) were not quantified due to lack of time and data and could be investigated in the future.



While Auraria’s building-related emissions are slightly lower than the national average and other front range schools, it is worth noting that Auraria, unlike these peer institutions, did not yet (at the time of the inventory) provide 24-hour housing and dining services that require additional electricity, air conditioning and heating—suggesting that energy efficiency is an area of improvement for this campus. Energy use intensity (EUI) metrics—which define how intensely buildings consume energy—suggest that Auraria lags considerably behind the national average for

...energy consumption could be decreased by 11% over a two year period...

This could save Auraria... \$650,000 a year

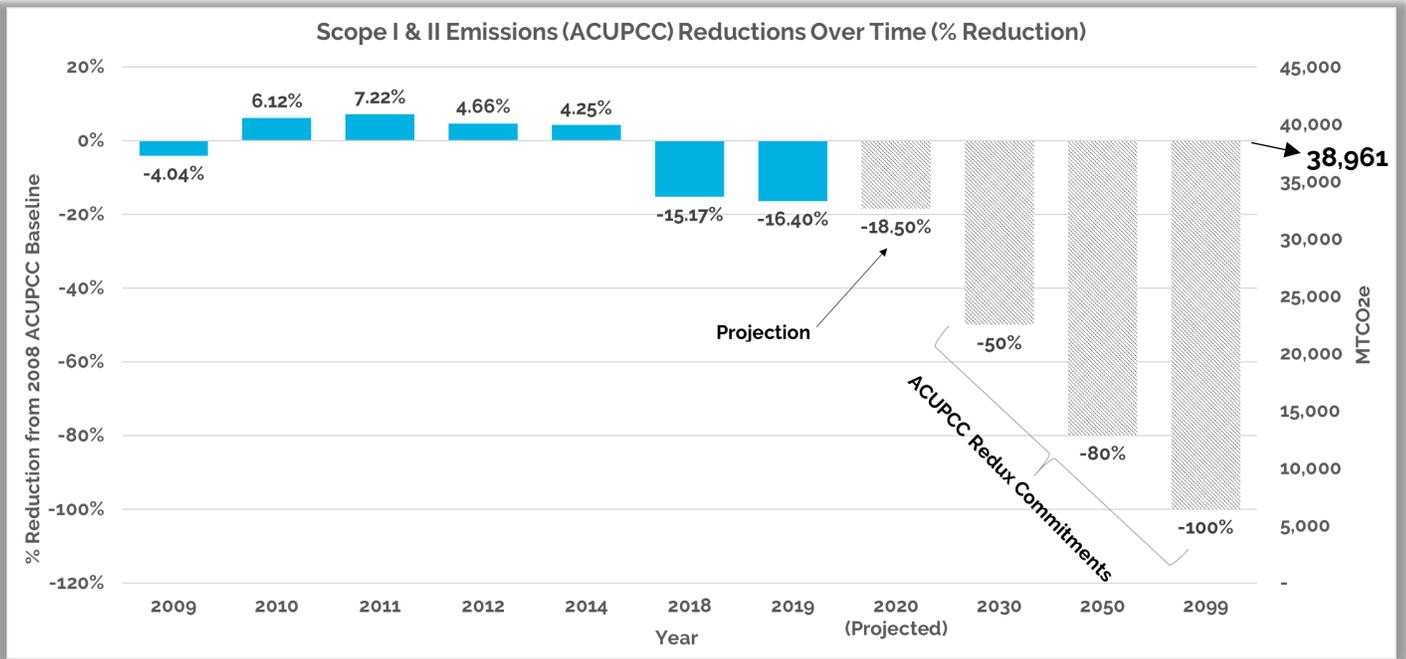
similar building use types (for more detailed information, see the full GHG Inventory). Based on Auraria’s annual energy consumption and expenses, the Department of Energy’s ROI calculator suggests that if Auraria operationalizes their energy management information system (EnergyCap) and actively monitors and analyzes energy use (through an Energy Manager), energy consumption could be

decreased by 11% (32,863,885 MMBtu) over a two year period, and continue to decrease in the succeeding years. This could save Auraria somewhere in the ballpark of \$650,000 a year—over 10% of AHEC’s projected FY20 shortfall from lost revenue due to the COVID-19 pandemic.

In 2007, the three institutions comprising the One Auraria campus signed the American Colleges

Auraria Greenhouse Gas Emissions & Climate Action Context

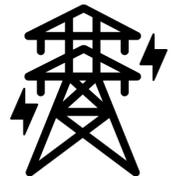
and Universities President’s Climate Commitment (ACUPCC), committing to reduce scope I and II greenhouse gas (GHG) emissions 20% below 2008 levels by the year 2020, 50% by 2030 and 80% by 2050. On the Auraria campus, scope I and II emissions are effectively emissions related to energy consumed in buildings. As of July 2019, Auraria had reduced emissions 16.4% relative to the 2008 baseline; this was almost entirely due to Xcel adding more renewable sources to the local electricity grid that powers the Auraria campus.



The Covid-19 pandemic has altered campus operations such that FY2020 and FY2021 do not accurately depict campus emissions. The ASCP will conduct a GHG inventory for FY2022 (ending July 2022) to determine performance in relation to the 2020 benchmark. However, if energy consumption, commuting behavior and waste generation had remained the same in FY2020 as FY2019, the Auraria campus was estimated to achieve an 18.5% reduction from the 2008 baseline, due to the additional ownership of Renewable Energy Credits (RECs) associated with the brand new library solar array.

The Role of Xcel’s Carbon Neutrality Commitments for the Electrical Grid:

Xcel Energy has committed to achieving 85% carbon neutral electricity grid by 2030 (recall that electricity-related emissions account for roughly 40% of Auraria’s entire emissions portfolio). While there are no published emissions factors for that 2030 electricity grid, some “back of the envelope” calculations suggest that Auraria *might* observe upwards of a 42% reduction in overall emissions (down to 42,501 MT CO₂e in 2030) and a 77% reduction in our Scope I and II emissions (down to 8,841 MT CO₂e). This calculation is absolutely not scientific and the methodology is not approved but rather based on general logic and assumptions. These calculations should not be relied upon for planning purposes, but are meant to acknowledge that Xcel’s contributions to our campus GHG reductions are significant and will make the aforementioned targets is achievable. With that said, relying on Xcel’s increase of renewable energy and failing to



Auraria Greenhouse Gas Emissions & Climate Action Context

reduce Auraria's own energy consumption does nothing to reduce demand on the electric grid, which is vital to the future of our rapidly expanding region and our globally shared greenhouse gas emissions. Climate change and climate action are heating up on the global stage and calls to action are particularly energized by advocacy amongst our global youth—many of whom attend the Auraria campus or will in the near future. The Intergovernmental Panel on Climate Change (IPCC) reports that emissions must be cut by 45% by 2030 and 100% by 2050 to limit global warming to under 1.5° Celsius and therefore avoid catastrophic climate change.

To limit catastrophic climate change, warming must be limited to 1.5° C (2.7° F).

This means reducing GHG emissions 45% from 2010 levels by 2030, and 100 percent by 2050 (IPCC).

[House Bill 19-1261](#): Climate Action Plan to Reduce Pollution

Established statewide GHG reduction goals (relative to 2005 baseline):

- 26% reduction by 2025
- 50% by 2030
- 90% by 2050

In May 2019, Colorado legislators passed [House Bill 1261](#), requiring adherence to state GHG reduction targets as follows: a 50% reduction from 2005 emissions by 2030 and a 90% reduction by 2080. With the end of FY2020 around the corner, it is time for campus leaders to revisit Auraria's climate commitments and re-commit to even bolder action that is necessary to reduce campus

GHG emissions. The next five to ten years will be defining for the issue of climate change. The manner in which this *One Auraria* campus conducts itself over that time frame—as a higher education institution embracing and symbolizing a spirit of ingenuity—will have a lasting impact on the global *One Planet* we share.

93% of surveyed students agree:

"It is important to me that the Auraria Campus prioritize climate action and the reduction of our campus' greenhouse gas emissions,"

The ASCP hopes that the following plan provides a roadmap for Auraria's climate action over the next decade (and beyond). We hope that Auraria's executive leadership team makes a bold commitment to reduce campus emissions, both over the next 10 years and beyond. It's time to get to work.

Proposed GHG Reduction Benchmarks

(from our 2007/2008 baseline):

- **50% by 2030**
- **90% by 2040**
- **Reach goal: 100% by 2050**

Some cities and universities are actively discussing 2040 carbon neutrality goals.

2030 Benchmarks

To view a more detailed explanation of benchmarks and why they were chosen, see Appendix 2.



Reduce GHG emissions 50% below 2007 baseline by 2030

(Current: 18.5% below baseline)

- ✓ All buildings in compliance with campus Building Performance Standard (TBD)
(Proposed: achieve EnergyStar score of 75 or satisfy EUI standards in ASHRAE 90.1)
- ✓ All new buildings will be Net Zero Energy (NZE)
(Highly energy efficient and energy supplied entirely by renewable energy)
- ✓ 10% of electricity is powered "directly" by renewable energy (on or off site)



- ✓ Reduce SOV (Single Occupant Vehicle) rate of faculty and staff travel to <30%
- ✓ Increase the % of commuters using light rail/bus at least 1x/week by 10%
- ✓ Increase biking/micromobility as a primary mode of transportation from 4.2% up to 7% for those able and willing
- ✓ 75% of campus has received some form of transportation education
- ✓ 50% of campus fleet converted to EV by 2025; 100% by 2030



- ✓ Increase waste diversion rate to 50% by 2030 (35% by 2024; 100% by 2040)
- ✓ Identify reuse or recycle alternatives for currently-wasted materials by 2025
- ✓ Replace 50% of unsustainable consumer products with sustainable options (i.e. replace single use plastics with compostable)
- ✓ Complete campus-wide procurement inventory by 2025 and ethical and identify sustainable alternatives by 2030
- ✓ 65% of campus constituents are receiving formal sustainable waste and procurement training (50% of campus constituent base by 2025)



15 x '30 High Impact Action Steps

→ To view a full list of proposed actions, see Appendices 1 and 3. ←

- 1** Adopt a campus-wide **Building Performance Standard and develop an Energy Master Plan**
- 2** **Retrofit and Re/Retro-Commission existing buildings** as aggressively as financially possible 
- 3** Pursue an **additional 1 MW of on-site solar** in the near term and pursue battery storage (mini-microgrid) 
- 4** Design new buildings to be **Net Zero Energy/pursue electrification**
- 5** Continue/**Improve discounted RTD pass programs** for campus and encourage adoption and utilization of pass (advocacy, subsidy, etc.)
- 6** Develop an **equitable telework policy** and investigate value of vanpool program for essential employees
- 7** **Convert campus fleet to electric vehicles (EV)** and install more EV charging stations on campus
- 8** Establish greater **anti-bike-theft program** by expanding distribution of subsidized u-locks and increasing anti-theft signage/education 
- 9** Build out bike corridors/connex (5280 trail, 7th street, Larimer bridge connection)
- 10** **Increase resource conservation outreach & ed** to all campus community members via Green Offices Program, new student/hire orientations, signage, staff training
- 11** Conduct a more exhaustive **Scope 3 emissions inventory** and identify new GHG reduction opportunities accordingly 
- 12** **Create a baseline tracking and reporting method** for all current waste diversion activity occurring on campus
- 13** Create ongoing **sustainable waste training program** and implement within interdepartmental onboarding processes 
- 14** Adopt sustainable procurement/waste **policies for goods, services, operations and endowments** (i.e. Food Vendor RFPs, Lease Agreements, etc. and procurement rules)
- 15** **Expand environmental justice and social justice work** through partnership with existing on/off campus organizations

Wait,
there's
more!



Public Comment

During the month of April, the ASCP feedback on our draft CAP goals and strategies from the community via an open, virtual public forum. This page outlines the feedback we collected. All told, the forum gathered:



1,541 opinions (opinions of a particular strategy/benchmark)

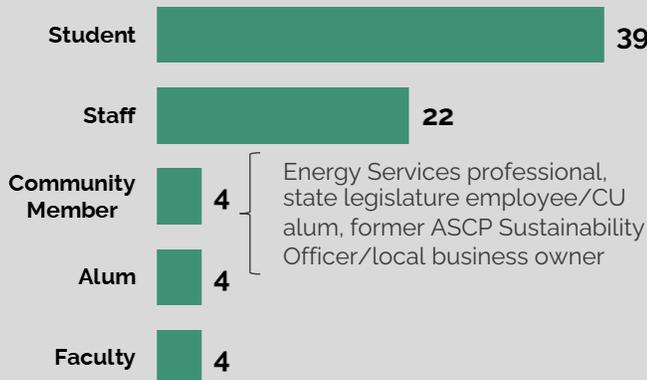


236 comments

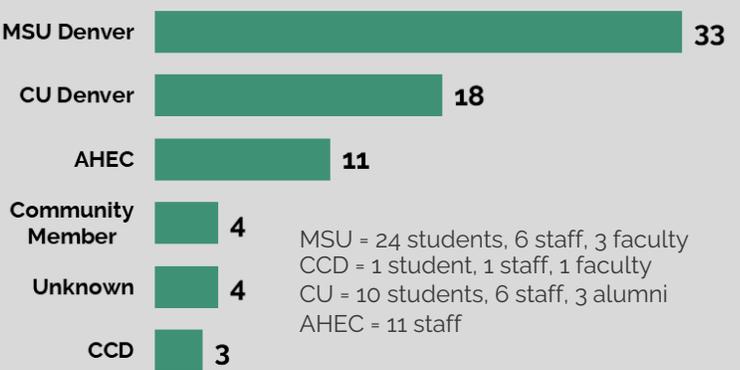


76 participants

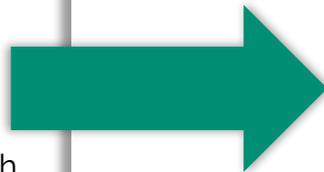
Participants by User Type



Participants by Institution



Forum participants had the opportunity to slide a ledger along a scale to denote their support/opposition of a benchmark or strategy. Participants could also leave "considerations" for others to see and comment/interact with comments from other forum users.



You can view the archive of the interactive forum at: <https://aurariaclimateaction.consider.it/>



Public Comment (Key Takeaways)

- Quad-institutional buy-in is necessary
- Flashy terms resonate with people ("net zero," "100% renewable," etc.)
- Cost is a concern for many

93% of surveyed students agree:

"It is important to me that the Auraria Campus prioritize climate action and the reduction of our campus' greenhouse gas emissions"

The table below depicts the average score for each category of benchmark and strategies. Within these categories, **the following strategies and benchmarks scored above 80% in support:**



- Reduce emissions 50% by 2030, 80% by 2040 and 100% by 2050 (83%)
- Net Zero Energy Buildings by 2030 (81%)
- Build new buildings in accordance with more stringent "stretch" code (84%)
- Pursue more on-site solar (83%)
- Hire an Energy Manager and pursue behavior-based energy conservation (80%)



- Ensure future of affordable RTD Pass (94%)
- Alternative transportation outreach to new student/employee orientations (83%)
- Increase RTD Pass utilization (80%)
- Campus Fleet Conversion to EV (93%)



- Pursue zero waste campus; reduce single-use products via procurement policy and contract agreements with vendors/outside contractors (85-93%)
- Expand compost/recycling options across campus (91%)
- Mandate compost services in all events that include food (87%)
- Reduce food waste and address food insecurity by capturing food waste (83%)
- Standardize reusable/compostable to-go wear for all food vendors/on-campus events (91%)

"Since 50% off campus GHG emissions comes from our buildings, it makes sense to target those aggressively in the upcoming decade" - CU student

"Public transportation is among the very top services that a city that is seriously concerned with equity and the environment must have." ~ MSU Staff

"...Robust change management, training and retraining, and waste auditing and reporting matter." - Alumni

Benchmark/Strategy Category	# of Opinions Recorded	Average of Score
+ Energy Benchmark	162	74%
+ Energy Strategies	219	71%
+ GHG Benchmark	41	83%
+ Sustainability Statement	43	88%
+ Transportation Benchmark	233	62%
+ Transportation Strategies	383	70%
+ Waste Benchmark	150	79%
+ Waste Strategies	298	79%
+ Your Ideas	12	66%
Grand Total	1,541	73%



Funding Sources

Funding is, of course, a lynchpin for many (but not all) of the identified strategies. However, an amplified focus on climate action at the federal, state and local level has recently increased the availability of funding opportunities. Here are some key funding opportunities identified to date that we believe could be pursued to help finance this plan:

- **Initiate a Green Revolving Fund**
 - The financial savings generated by tri-institutional investment in energy efficiency or renewable energy projects can be captured and recycled to fund future energy efficiency projects. This is common practice among many universities and could be headed up by a campus Energy Manager.
- **Auraria Sustainable Campus Program**
 - Tri-institutionally student-fee funded (\$8.31/semester/student) sustainability program charged with reducing our campus environmental footprint
- **Denver Climate Protection Fund**
 - ~\$40 million fund offering community grants to decrease GHG emissions within city limits
- **BBC Financing Navigator**
 - For energy efficiency projects, specifically, this navigator helps identify financing mechanisms for building energy efficiency investments
- **Xcel Energy Rebates**
 - Xcel offers numerous rebates for equipment updates, as well as a free Strategic Energy Management Program and partial reimbursement for Recommissioning studies
- **Power Purchase Agreements of Sustainable Energy As a Service (SEaaS)**
 - An alternative mechanism for funding renewable energy and energy efficiency improvements when lacking capital up front
- **Charge Ahead Electric Vehicle Grants** (more EV grant \$s expected in coming years)
 - Covers % of cost of installing EV chargers or replacing fleet vehicles with EVs
- **CDPHE Recycling Resources Opportunities Grants Front Range Waste Diversion Grants**
 - Two grant programs allocated by the state for projects that increase waste diversion or reduce waste generation

There are numerous other funding opportunities. Some examples include the EPA's Diesel Emissions Reduction Act (DERA), EPA Environmental Justice Grants, U.S. DOT Infrastructure for Rebuilding America Grants, and EPA Sustainable Materials Management Region 8 Grants. In addition, Biden's multi-trillion dollar Jobs/Infrastructure Plan may include local dispersal of funding to address alternative transportation, renewable energy, energy efficiency and climate justice initiatives.

Appendices

The following appendices offer more detail on the ASCP's proposed climate actions and an opportunity to engage with the material at a level of higher specificity.

Appendix 1: Strategies Matrix

Appendix 2: Explanation of Goals and Benchmarks

Appendix 3: Building/Energy Project Brainstorm List

Appendix 4: 2020 Climate Emergency Declaration Resolution (tri-institutional student government)

The following appendices are forthcoming and will be added in Fall of 2021:

Appendix 5: Funding and Grant Opportunities List

Appendix 6: Subcommittee Members

Appendix 7: "P2s": Actionable Projects and Policies

Appendix 1: Strategies Matrix

Auraria Climate Action Strategy Matrix (Goals, Benchmarks & Strategies)

Overall GHG Reduction Goal:



Reduce emissions 50% below 2007 baseline by 2030, 80% by 2040 and achieve climate neutrality by 2050



Buildings/Energy



Goal 1: Improve the energy efficiency of our existing buildings

Benchmark: Be in compliance with campus Building Performance Standard (TBD) by 2030 (see first "how" below for proposed performance standards)

Secondary Benchmark: Reduce energy consumption (across building portfolio) by 25% before 2030 (from 2019 baseline)

	<p>Building Performance Standard (BPS): Adopt a campus-wide BPS by July 2021 and be compliant with this standard by 2030 deadline (and 2026 interim benchmark). Current proposed benchmark under consideration includes the following compliance pathways: 1) Achieve EnergyStar score of 75 or higher, 2) Reduce weather-normalized Energy Use Intensity (EUI = energy use/square foot) by 15% compared to baseline, 3) EUI meets or surpasses sector and climate-zone specific targets determined by ANSI 100-2018 EUI standards.</p>
HOW:	<p>Retrofit and Recommission/Retrocommission existing buildings as aggressively as financially possible to improve energy efficiency (ie: HVAC replacement and scheduling optimization, occupancy controls, LED retrofits, low-e window glazing, building envelope improvements, participating in Xcel's RCx and rebate programs, equipment replacement, etc.; for full list of brainstormed ideas, see Buildings Strategy Matrix tab)</p>
	<p>Energy Management: Hire an Energy Manager to optimize scheduling, oversee data collection and analysis, identify opportunities for energy and power savings; develop an Energy Master Plan for campus by 2023; Consider participation in Xcel's Strategic Energy Management Program</p>
	<p>Energy Performance Benchmarking: Track annual energy consumption at the building level in EnergyStar Portfolio Manager and participate in Denver's Benchmarking Ordinance (and any pending state ordinance) starting in 2022</p>

Goal 2: Ensure that any new buildings are net zero emissions (do not increase campus emissions) and perform as intended/designed beyond initial LEED BD&C certification

Benchmark: All new buildings will be Net Zero Energy (NZE) by 2030 (building energy consumption completely supplied by carbon-free sources).

Build to more stringent "stretch" codes: Design new buildings to satisfy the most aggressive IECC and IBC energy codes and/or pursue building code enhancements and technical training similar to those being pursued by the [City/County of Denver](#) (see pg 4 for code enhancements); utilize the [thorough research](#) being done by City/County of Denver to inform action; Strive to satisfy LEED Platinum BD&C criteria, even though only LEED Gold is mandated by the state.

HOW:	Electrification: Avoid the purchase of any new natural-gas consuming equipment for space and water conditioning; When natural gas powered equipment is up for replacement, prioritize replacement with electrical based system (for example: ground source heat pump, solar thermal systems, PV-driven heat pump systems, or off-set.); Consider a complete building electrification plan (otherwise we will have to purchase carbon offsets for natural gas consumption)
	Monitor performance of LEED buildings/Ensure Energy Performance Outcomes: Adopt a campus policy for building performance verification (ie: adhere to performance-based code by 2030; perform LEED EB checklist exercise (not payment for certification) internally (or with the help/verification of a third-party consultant) every 3-5 years; etc.

Goal 3: Procure more of our campus energy from renewable sources and support regional grid optimization

Benchmark: 10% of electricity is powered "directly" by renewable energy (on or off site) by 2030; Battery storage and demand-side management (DSM) programs have been thoroughly considered by 2024

HOW:	Pursue more on-site solar: Pursue an additional 750 kW or on-site solar in the near term (currently allowed under Xcel ATO policy); have an answer from Xcel on build out limitation beyond current ATO policy prior to Dec 2021; have a revised/updated plan for campus PV expansion by December 2021 (pending info from Xcel).
	Off-site Renewable Energy: Investigate feasibility of opportunities for off-site renewable procurement (third-party community solar garden subscription, Xcel's Renewable Connect program for commercial, building off-site solar, etc.)
	Improve campus energy resiliency/Consider microgrid technology: investigate the feasibility of installing a microgrid/battery storage for on-site solar generation; enhance clean backup power generation options (ie: battery storage during blackouts); develop and hone real-time visibility and management of campus energy consumption via improved energy management systems and Energy Manager
	Support Regional Grid Optimization: Consider/pursue participation in one of Xcel's Demand Response (DR) programs to reduce demand on our local electrical grid when demand on the grid is peaking; add on-site battery storage; Support regional grid optimization and hardening

Goal 4: Behavior-Based Energy Conservation; Staff Capacity, Engagement and Training

Benchmark: Interdepartmental Energy Conservation Team established by 2025; Energy Conservation signage is present and visible in 100% of campus buildings

HOW:	Behavior-Based Energy Conservation: Encourage behavior-based energy (and water) conservation in campus offices and classrooms via Green Offices program, signage, collaboration with Energy Manager, institution-wide communication (AHEC, MSU, CCD and CU newsletters and campus listservs), etc.
	Consider Xcel's DR or SEM programs: Investigate impact of collective behavior changes for increased participation in Xcel's Demand Response (DR) programs; consider/pursue participation in Strategic Energy Management (SEM) Program with Xcel to form a team of dedicated campus energy conservationists
	Empower building-related staff to identify/propose energy savings measures: Ensure that Facilities staff have the training, resources and staff capacity needed to help implement the goals above; Institute on-going energy management training of building technicians; incentivize building staff to proactively identify of energy savings opportunities by acknowledging and rewarding "innovators"



Transportation

Goal 1: Reduce single occupancy vehicle (SOV) travel as much as possible

Benchmark: Reduce SOV rate of faculty and staff to <30% by 2030; Strive: Reduce the rate of SOV travel across all user groups (student, faculty, staff) from 30% to 25% by 2030	
HOW:	Support the adoption of alternative forms of transportation: via Goals 2-6 (below)
	Equitable Telework Policy: Support the evolution of equitable telecommuting policy across the four Auraria institutions (ie: 1-2 days a week where appropriate; flex schedules or compensatory benefits--such as subsidized childcare or transit passes--for essential staff that cannot partake in telework)
	Vanpools/Carpools: Work with DDP's Transportation and Mobility team to craft Auraria-specific solutions to reduce SOV amongst faculty and staff (ie: vanpool, carpool, EV Carshare, etc.)
	Collaborate closely with our TMA/Employee Trip Reduction Program: Collaborate with our local Transportation Management Association (the Denver Downtown Partnership); participate in DDP's Mobility Council to inform and comply with a future ETRP policy established by the Regional Air Quality Council and to collaborate with our fellow downtown employers in order to improve micromobility solutions and SOV trip reduction in our downtown area
Goal 2: Support the adoption of transit (bus and light rail) and reduce barriers to adopting transit-based modes of travel -- particularly where zero emissions modes of travel are not feasible	
Benchmark: Increase the % of commuters using bus and rail as their primary mode of transit from 63% to 66% by 2030; Increase the % of commuters using light rail/bus at least 1x/week by 10% by 2030 (establish baseline during 2022 transit survey)	
HOW:	RTD Contract: Ensure that Auraria's Student RTD pass and staff EcoPass programs remain affordable (discounted) and accessible; pursue the evolution of the current opt-in (or opt-out?) discounted pass program with RTD (being piloted now)
	RTD Route/Service Accommodations: Work to ensure that the evolving service and route needs of our campus constituents are accommodated; provide feedback to RTD and/or participate in RTD advisory boards and conversations with the City's CASR team or working groups, as necessary
	RTD Pass Utilization: Encourage registration for RTD passes and make it easy and accessible to register for a pass (or transition to an opt-out program that defaults students into the pass); encourage higher utilization of RTD pass via marketing and education campaigns (see Goal 4); address barriers to adoption as identified in annual transportation survey
Goal 3: Encourage and support the adoption of bike and micromobility travel (eScooters, walking, bike share, etc.) and reduce barriers to accessing and adopting micromobility--particularly for first/last mile connections or shorter distance commutes	
Benchmark: Increase biking/micromobility as a primary mode of transportation (from 4.2% up to 7%) for those able and willing	
HOW:	Anti Bike Theft: reduce bike theft on campus by increasing affordability and access to U-locks and helmets, encouraging bike registration with ACPD and increasing access to covered and secure bike pavilions. Specifically, this strategy includes: 1) Subsidized u-lock campaign, 2) bike registration blitz at beginning of semester, 3) see education campaign below (goal 4).
	Bike Accessibility: increase accessibility to bikes for lower income or first time riders by decreasing financial barriers; partnering with local bike co-ops/advocacy orgs that offer lower-cost bikes, education and mentorship
	Bike infrastructure: Improve bike corridors that connect to and through campus and improve connectivity with key access points and destinations; redistribute bike racks to accommodate high use areas; increase access to bike fix-it tools and maintenance; increase access to changing rooms and shower.
	eScooter and eBike Accessibility: Increase access to public eScooters and eBikes via improved contracts with micromobility service providers (pursue a discounted rate?); increase comfortability with these modes via a micromobility "practice course"
Goal 4: Increase awareness, education and outreach around all alternative transportation options and the impact of those choices on the environment, health, cost, etc.	
Benchmark: 50% of survey respondent confirm that they have received transportation education and/ or participated in an alternative transportation event by 2025 (75% by 2030)	

HOW:	New Student/Employee Orientations: Integrate educational material about alternative transportation PSAs and resources into new/transfer student and new hire orientations (ie: info about transit pass, u-locks, campus maps, etc.)
	Data Collection/Annual Survey: Understand and address barriers to adoption fo alternative transportation methods via annual campus survey
	Behavior Change Campaign/Alt Transport Day: Host an Alternative Transportation behavior change event each semester aimed at celebrating alternative modes of transportation and connecting community members with resources
	Partnerships: Strengthen strategic partnerships with on and off campus resources to enhance the delivery of alternative transportation initiatives (ie: ACPD for bike registrations/bike locks, Parking office for multi-modal and carpool programs, Denver Streets Partnership and Bicycle Colorado)

**Goal 5: Support electric vehicle adoption by increasing EV charging infrastructure on-campus;
Convert campus fleet vehicles to electric**

Benchmark: 50% fleet conversion by 2025; 100% conversion of fleet to EV by 2030.

HOW:	EV Charging Stations: Increase the # of/ access to EV charging stations available on campus in order to support EV adoption among campus community, as well as the state's commitment to vehicle electrification
	Fleet Conversion: Convert campus fleet vehicles to EV whenever appropriate/when vehicles are up for replacement; consider EV-assist bicycles for fleet when and where appropriate

Goal 6: Support a campus culture and campus plans/policies that embrace, celebrate and enhance the experience of alternative forms of transportation

Benchmark: 20% of respondents will agree with the statement that "Auraria incentivizes, encourages and plans for my adoption of alternative modes of transportation to campus" (as assessed via biannual campus survey or transportation survey) by 2026; 50% by 2030

HOW:	Campus Planning: Encourage campus master plans and development guidelines that support optimal user experience and safety for those using alternative forms of transportation (ie: planning for bike lanes and connectivity, distribution of bike/skateboard racks, pedestrian only areas, reducing golf carts on busy pedestrian thoroughfares, etc.)
	Campus Mobility Policy: Investigate and pursue campus policies that make it fun and easy to utilize scooters, prioritize pedestrians over vehicles and offer "wilderness" areas of respite from noise and direct air pollution
	Micromobility for Errands: Support the use of micromobility and Car Share program for errands to/from campus; leverage Green Offices Program to encourage this
	Safety: Identify and address areas of campus that create discomfort of lack of perceived safety (ie: lighting, Light rail/bus stations, ACPD relations etc.)

 **Waste** 

Goal 1: Improve diversion rate of municipal solid waste generated on campus through the expansion of bin infrastructure and diversion programming

* MSW – waste type consisting of everyday items that are discarded by the public household, restaurant, and building waste. Not included in construction waste, businesses, or hazardous waste*

Benchmark: Increase diversion rate of municipal solid waste (across all campus institutions) to 35% by 2024; 50% by 2030; 100% by 2040 (Denver Goal)
 *Waste Diversion - the percentage of material diverted from the landfill to either recycling or compost

HOW:

Expand compost and recycling services across campus: Support the expansion of existing waste diversion programs (Green Offices, Event Compost, AHEC custodial trainings). Install compost and recycling bins with accompanying dumpsters in all locations that are missing proper waste infrastructure (all new buildings, student residential housing, all food vendor spaces, student and staff lounges, event spaces, etc.)

Mandate compost services in all events that include food and other organic items: Include compost service as an option in all event booking platforms like EMS, ACES, or equivalent program used by student organizations, faculty, staff, and off-campus clients. Require all event planners, booking agents, and clients to go through training to become enforcers of compost service standards at events. Include service charge in booking contract that will deploy either campus custodial or ASCP Event Compost staff for compost bin/bag servicing.

Standardize bin design and function by choosing a suitable waste bin manufacturer for all campus buildings and grounds. Create consistent messaging for all waste infrastructure through strategic and consistent bin signage, design, and placement. Collaborate with all planning, facilities, architectural, and sustainability teams to agree on bin standards. Standards will be written into policy for all new purchases, building designs, and replacement bins. Bin vendor will be vetted to prioritize finding a manufacturer with high GHG emissions standards and socially/environmentally just materials and production.

Create campus operations and management standard for waste bin placement, hauling procedures, and constituent training (to include or not???)

Goal 2: Track high waste producing activities and identify solutions for how to divert materials equitably and resourcefully

Benchmark: Perform campus-wide consumption based inventory by 2023 that establishes a baseline of wasted products. Identify ways said products can be reused, repurposed, or recycled through alternative waste disposal methods by 2025

HOW:

Increase lifetimes of IT equipment and/or recycle or refurbish equipment through the proper channels. Streamline process for all schools to utilize AHEC facility services for proper purchasing and handling (collaborate with AHEC Facilities services, [EnergyStar](#), [TerraCycle](#), [Bluestar](#), [EcoCycle](#), etc.)

Construction and Demolition waste will reduce carbon emissions by meeting all diversion requirements for all new construction, demolition, and renovations. 1) Follow Denver Consider It methodology to "Require City infrastructure projects to meet reduced carbon emissions standards for construction materials and to reuse, recycle, or compost construction waste when economically viable." (Utilize programs like the [CDPHE Contractor Challenge](#)). 2) Follow LEED v4 for [iD&C](#) and [C&D](#) waste management example to "Develop and implement a construction and demolition waste management plan that establish waste diversion goals for the project by identifying at least five materials (both structural and nonstructural) targeted for diversion. Approximate a percentage of the overall project waste that these materials represent. Provide a final report detailing all major waste streams generated, including disposal and diversion rates. (Construction and Demolition Waste Calculator <https://www.usgbc.org/resources/construction-and-demolition-waste-calculator>). 3) Follow: EPA/Local Resources: [Reusewood material drop-off and salvaged material finder](#) and EPA [Best Practices for reducing, reusing, and recycling construction and demolition materials](#)

Increase lifetimes of bulk equipment and/or recycle or refurbish equipment through the proper disposal channels offered by the university or AHEC. For faculty and staff; streamline process for all schools to utilize State Surplus and AHEC facility services for proper handling (collaborate with AHEC Facilities services). For student housing; create program for move out/move in days to capture and redistribute house furnishings and materials.

Identify and schedule annual waste diversion collection events: Strategically target high wasted producing times of year then schedule drives, drop-offs, and pick-ups appropriate to materials being collected (*hosted in a free store style day of for salvageable material*). High yield materials are furniture, electronics, office supplies, bulk equipment, etc. High waste generation times are move-in/move-out days in student housing, end/beginning of semester clean outs, pre-renovation or relocation for offices, etc.

Reduce food waste by identifying alternative avenues of food capture to address campus food insecurity. Coordinate the transfer of surplus food from food vendors/event coordinators to campus food pantries. Adopt Share Meals application for all events ran by students, staff, and faculty. Utilize food capture programs like We Don't Waste when high food yield event is taking place.

Goal 3: Pursue a zero-waste model for food related items purchased, consumed, and disposed of on campus

Benchmark: Pursue a zero-waste campus by reducing use of unsustainable consumer products (i.e. single use plastics) and replace with sustainable options (i.e. reusables/compostables) to 25% by 2025; 50% by 2030; and 100% by 2040

HOW: **Transition Auraria away from culture of disposal and single-use plastics through contract and procurement policy.** Cease from plastic that would normally be disposed of after one use (i.e. plastic bottles) by implementing alternatives in paper, cardboard, or aluminium. Create policy that refuses non-recyclable single use items such as items in plastic wrap or plastic containers, utensils, cups and lids, straws, stirrers, bags, and any disposable polystyrene (Styrofoam) products. Adopt policies like the [CU Denver Green Procurement Policy](#) or CU Boulder 8g LCB 06 - Plastic Bottle Phase Out Policy throughout all institutions for offices, vendors, and events

Standardize reusable or compostable to-go wear for all food vendors and on/off-campus groups hosting events with food. Create policy that mandates reusable or compostable plates, cups, silverware, etc. for all to-go items in order to reduce carbon footprint from single use plastics. Policy shall apply for all new on campus food vendor contracts/leases, campus approved caterers, staff/student organizations hosting events, event scheduling offices, etc.. Agreement will be placed in request for proposals, event booking platforms (i.e. EMS, ACES), and large contract agreements. Partner with food/product suppliers like SYDEXO to standardize reusable, returnable, or compostable togo containers in all food and resident halls. To alleviate cost and logistics concerns, ASCP to host a bulk procurement contract for compostable products (Eco-products, etc.)

Goal 4: Emphasize sustainable procurement of services, goods, and investments across campus

Benchmark: Perform campus-wide consumption based inventory to establish a baseline of campus purchases and investments by 2025, followed by ongoing investigations for ethical and sustainable alternatives/solutions

HOW: **Pursue campus wide investigation of Scope 3 emissions pertaining to food and consumer products and identify opportunities for sustainable alternatives.** Utilize platforms like the Good Food Purchasing Program, Real Food Challenge, etc. to track and establish a baseline for products coming onto campus. Utilize findings and program resources to identify alternative avenues for ethical purchasing (i.e. Local, Fair, women/minority owned. and third-party certified sustainable)

Pursue a campus wide standardization of sustainable purchasing by aligning with Denver's Environmentally Preferred Procurement Policy and/or the Federal Greening the Government Executive Order. Include procurement plan for all aforementioned items and prioritize the items not addressed in other sections including cleaning, construction, and every-day use commodities and services.

Investigate current status and align campus investments/endowments in ethical procurement and retirement contracts. Prioritize campus mission and values through actions such as: emphasize supplier diversity efforts for minority/women owned businesses, investigate potential divestment from Colorado Correctional Facilities (CCI) as a supplier and divestment from fossil fuels in PERA pension funds

Goal 5: Support a campus culture and campus plans/policies that embrace, celebrate and enhance campus constituent capacity to engage in zero-waste behaviors

Benchmark: Implement formal sustainable waste and procurement training for 50% of campus constituent base by 2025, 65% by 2030 and 80% 2035. All schools and AHEC will adopt ASCP training or implement their own into all internal programs by 2040 to reach 100%

Create and implement ongoing waste management training for campus community: All parties, including students, faculty, staff, vendors, and off-campus groups will receive standard training that provides an overview of proper waste management practices on the Auraria Campus. Trainings will be places in orientations, onboarding, contract signings, and professional development re-trainings

Expand training, resources, and staff so departments can meet work demands: Address employee capacity and uptick in work responsibilities appropriately for each implementation of a new program. Assist Facilities, Planning, Procurement, Events, etc. to ensure that have the support needed to successfully adjust to new roles, responsibilities, frameworks, finances, and employee expertise throughout implementation

HOW:	Implement educational and engagement platform for non-employee population: Provide hands-on educational and community service opportunities for students, community members, and staff/face volunteers to perform waste tracking, proper sorting, and campus care events. Uplift events like campus clean-up, waste audits, bin-side education, etc.
	Introduce waste management and sustainable procurement into interdisciplinary curriculum?
	Update contract agreements to include all outside contracted groups to abide by campus waste and procurement standards: Train contractors and technicians to understand and utilize the latest technology and standards to ensure that buildings across campus have proper waste sorting infrastructure, educational resources, sustainable structural composition, and environmentally preferred purchasing agreements

DRAFT

Appendix 2: Explanation of Goals and Benchmarks

❖ Overall GHG Emissions Target

➤ GHG Reduction Benchmark:

Overall GHG Reduction Goal:	Reduce emissions 50% below 2007 baseline by 2030, 80% by 2040 and achieve climate neutrality by 2050 (or 2040 in alignment with CDHE?)
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➤ Why This Benchmark Is Proposed:

- House Bill 19-1261 established statewide, science-based GHG reduction targets of 26% below 2005 levels by 2025, 50% by 2030 and 90% by 2050. The state is currently finalizing their [GHG Reduction Roadmap](#) to achieve these goals. All four institutions on this campus are state entities.
- The City and County of Denver’s Climate Action Task Force recommended adopting an even more aggressive goal of 60% by 2030 and 100% by 2040 ([see page 12](#)).
- Currently, the Auraria campus has reduced emissions by ~19% from our 2007 baseline. We expect to see our emissions decrease further in the next 10 years due to Xcel Energy’s [commitment](#) to 85% carbon-free electricity on the local grid by 2030.
- In initial conversations facilitated by the Colorado Department of Higher Education, several front range institutions were willing to discuss a 2040 carbon neutrality target. While we are confident that we can reach aggressive reduction levels in the near future, we acknowledge that to reach 100% carbon neutrality we will anticipate and rely on some of these energy technologies or organizations becoming more affordable and effective. For example, battery storage ability and capacity, Xcel energy meeting their reduction goals as it pertains to the electrical grid, and lower cost of renewable technologies. We know that we’re running out of time to make a meaningful impact on climate change so we will make any possible move to, at minimum, follow the IPCC guidelines on reduction timeline.
- There have been many corporations and organizations that have [committed to a 2040 goal](#) of carbon neutrality in whole or in part including: FedEx, General Motors, Amazon, Walmart, Microsoft, Unilever, Coca-cola, Best Buy and many others. There have also been many institutions of higher education that have done the same including: Syracuse, Brown, Portland State, California State University System, San Diego State University, University of Arkansas, University of Michigan, and many others. Our local Colorado College has already achieved carbon neutrality.
- Climate Change disproportionately impacts lower income communities and communities of color. Marginalized communities bear the brunt of the public health crisis wrought by air and water pollution, which is a bi-product of energy generation, transportation and waste. No one should have to wait to breathe clean air and drink clean water and environmental justice cannot wait until “tomorrow.”

- 2018 IPCC Report: To limit catastrophic climate change, we need to limit warming to 1.5° C (2.7° F). This means reducing GHG emissions 45% from 2010 levels by 2030, and 100 percent by 2050. (The IPCC is the Intergovernmental Panel on Climate Change run through the UN’s Environment Programme; this report was written by 91 scientists from 40 countries who analyzed more than 6,000 scientific studies).

➤ Dissenting Opinions/Concerns

- ?

❖ Energy

➤ Benchmark 1: Existing Buildings

Goal 1: Improve the energy efficiency of our existing buildings
Benchmark: Be in compliance with campus Building Performance Standard (TBD) by 2030 (see first "how" below)
Secondary Benchmark: Reduce energy consumption (across building portfolio) by 25% before 2030 (from 2019 baseline)

➤ Why This Benchmark Is Proposed:

- A Building Performance Standard (BPS) requires that a building perform with a certain energy efficiency. There are several methods of assessing this, such as Energy Use Intensity (“EUI” = energy consumption per square foot) or the EPA’s EnergyStar [building scores](#). This [white paper](#) outlines the need, efficacy and examples of Building Performance Standards.
- Based on research from peer institutions and case studies from major U.S. Cities who have imposed BPS, we are considering a BPS that includes three compliance pathways (by 2030):
 - **Prescriptive EUI:** buildings must meet or surpass sector and climate-zone specific EUI targets, as established by the most recent [ASHRAE 90.1](#) standard.
 - **EUI % Reduction:** Must reduce weather-normalized EUI by 15% from baseline year.
 - **EnergyStar Score:** Must achieve EnergyStar Score of 75 or higher (indicating performance 25% above the median score for building type)
- While we have some EUI metrics for Auraria’s buildings (see below), further analysis and metrics (and possibly guidance from a consultant) need to be pursued immediately to understand what is possible; a future Energy Manager will help tremendously with the effort of gathering and understanding building-energy consumption data
- There is currently an effort at the state capitol to impose a statewide Building Performance Policy, which would likely implicate Auraria. At the time of this writing, the publicly available information on this bill was limited, but included similar compliance options (EnergyStar and EUI). We expect to know more in the coming weeks.

State Bill - Proposed

- 50,000 sq ft and up
- Requires benchmarking
- Requires by 2026 buildings receive an ENERGY STAR score of 75 or higher –or- improve ENERGY STAR score by 15 points –or- hit a sector specific energy use intensity (EUI) target –or- reduce EUI 15%
- Alternate compliance options exist for buildings with solar panels.
- Targets may update the next compliance cycle



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- What peers and experts are doing/saying:
 - Greening the Government Executive Order (2019): calls for a 15% decrease in EUI FY22-23 (from FY14-15 baseline)
 - UCCS: Their 2010 CAP called for a 20% reduction in energy use intensity (by 2012 from 2007 baseline)
 - The US Dept of Energy (DOE): “Based on current analysis of the building sector and BTO program planning, BTO has established a goal of reducing building energy use intensity (EUI) 30% by 2030” ([see page 4](#))
- EUI allows for a normalized metric that takes into account square footage, building type and actual heating and cooling degree days. This normalized metric feels like the best way to control for building use changes, campus growth and extreme annual/seasonal weather.
- EnergyStar Portfolio Manager utilizes a national dataset (Commercial Building Energy Consumption Survey) to assign scores based on performance in relation to the national average. Note: Currently the “Colleges and Universities” building-use-type cannot earn an EnergyStar score/certification, however the EPA is working on developing a scorecard for these buildings. In the meantime, we can classify our buildings based on their uses (which are scored).
- Auraria’s EUI (non-weatherized) across the entire building portfolio (over 45 buildings and 3 parking garages spread across 150 acres), was 93.2 kBtu/square foot and Auraria’s source EUI was 284 (as calculated in the 2019 GHG inventory). EnergyStar Portfolio Manager is currently reporting a site EUI of 70 across Auraria’s building portfolio and this discrepancy needs to be investigated. The [median site EUI for colleges and universities is 84.3](#). It’s important to remember that this national average encompasses mostly residential colleges and universities that have residence and dining halls with 24/7 operations and increased occupancy (see pages 16 and 17 of [Auraria GHG Inventory](#)).
- [This spreadsheet](#) shows our site EUI over time from 2008 (based on previous GHG inventories). However, due to potential discrepancies in the way the GHG inventories have been conducted over the years, this might not be a helpful comparison. Although this spreadsheet suggests we may have lowered our EUI by ~19% since 2008, I wouldn’t put a *ton* of confidence behind that assertion. We have added a lot of more efficient LEED square footage, but I still think we have plenty of untapped potential in our older shared buildings (case and point: the [strategies matrix](#)). It seems that many of the BPS policies emerging use 2020 as a new baseline, anyways, so we should begin from the present day.

- A 2019 [study](#) by the Department of Energy/Lawrence Berkeley National Laboratory revealed an annual energy savings of 4% in the first year and 11% in the second year solely from tracking energy consumption through an energy management system (EMS). When organizations also implemented fault detection and diagnosis, median savings jumped to 9% in year one alone. AHEC hopes to hire an Energy Manager in the near future who would oversee our EMS system and identify interventions, so we expect to realize savings on the upper end of these medians.
- Dissenting Opinions/Concerns
 - If we've already achieved EUI reductions across our building portfolio since 2008, is it possible to go lower? Need to look back over time (this might be an argument for an efficiency standard by building type/climate instead of % reduction). If an individual building is exceeding performance requirements (x EUI or % over ASHRAE standard, or 75+ on Energy Star) then our focus and funding will move to buildings that are further behind.
- Benchmark 2: New Buildings

Goal 2: Ensure that any new buildings are net zero/do not increase campus emissions
<small>Benchmark: By 2030, all new buildings will be net zero energy</small>

- Why This Benchmark Is Proposed:
 - If Auraria hopes to achieve eventual carbon neutrality, our buildings need to eventually become carbon neutral (all building energy consumption is powered by carbon-free energy). We need to incorporate this into the design of new buildings ASAP.
 - The City/County of Denver defines Net Zero Energy (NZE) buildings as: 1) Highly energy efficient, 2) electrified, 3) powered by 100% renewable energy and 4) increasing grid flexibility/resiliency. Auraria might consider adopting a similar definition and pathway for compliance. The technical and financial logistics of achieving NZE and 100% building electrification (an important strategy to get to NZE) in our local climate/grid-context is being investigated as we speak.
 - The City/County of Denver just published their "[Net Zero Homes and Buildings Implementation Plan](#)" in January which calls for all new commercial buildings to be NZE by 2030; they plan to achieve this through the successive adoption of more stringent building codes, training and technical assistance for contractors, etc. As Denver is our neighbor/home (with more taxpayer \$ and staff to research and develop well-founded NZE building strategies), we can look to Denver to lead the way and determine what's possible or how we could go about pursuing this.

- More info on the announcement of the city’s commitment here: <https://www.spglobal.com/marketintelligence/en/news-insights/blog/ma-rebound-sparks-optimism-for-near-term-deal-activity>
- The city’s page on building energy here: <https://www.denvergov.org/content/denvergov/en/general-services/energy-office.html>
- <https://denverite.com/2021/01/26/denver-aims-to-ban-natural-gas-from-the-menu-of-energy-options-for-new-homes-and-buildings/>

➤ Benchmark 3: Renewable Energy

Goal 3: Procure more of our campus energy from renewable sources
Benchmark: 10% of electricity is powered "directly" by renewable energy (on or off site) by 2030; Support regional grid optimization, resiliency and the addition of renewables

➤ Why This Benchmark Is Proposed:

- Our [2018 PV Development Road Map](#) indicates that we have up to 8 MW of solar potential across our usable rooftop space on campus. However, it is only financially feasible and prudent to time solar installations with roof replacement, so adding on-site solar will take some time (and capital that we need to accrue).
- Currently we generate upwards of 2.65% of our electricity needs from on-site solar via the Library and Arts arrays, which total 854 kW production capacity. Our ATO contract with Xcel currently only allows for an additional 750 kW of installed capacity on-site (this is a supposed safety issue and the contract is currently under review with Xcel).
- An additional 750 kW of solar generation on site would bring our on-site generation to around 1,600 kW and could generate an estimated 2,464,698 kWh annually, which would get us up to around ~ 4% of electricity generated from on-site solar. However, if we invest in Goal 1 (reduce energy consumption in existing buildings) and reduce our electricity consumption by 11% by the end of 2022 (per DOE Better Buildings study data), this solar production would account for over 5.5% of our electricity needs.
- The remaining 4.5% could either come from additional on-site solar in the second half of the decade (if we can, in fact, adjust our contract with Xcel) OR from an off-site wind or solar array/participation in Xcel’s Renewables Connect program. The rest could be purchased through off-site solar gardens.
- Note: This benchmark refers to solar arrays that we “own” via outright purchase or leasing and is separate from the renewables that make up some of our electricity provided by Xcel Energy. Xcel energy has a plan to achieve 80% renewables on the electricity grid by 2030, but off-site grid power suffers efficiency losses during

transmission and distribution and does not allow Auraria to increase campus resiliency by pairing on-site solar generation with battery storage (aka, a microgrid).

➤ Dissenting Opinions/Concerns

➤ Benchmark 4: Behavior Based Conservation and Staff Training

Goal 4: Behavior-Based Energy Conservation; Staff Capacity, Engagement and Training
Benchmark: Interdepartmental Energy Conservation Team established by 2025; Energy Conservation signage is present and visible in 100% of campus buildings

➤ Why This Benchmark Is Proposed:

- Many schools have a behavior based component to their energy reduction strategy. This is arguably more difficult to measure, but some studies have shown that behavior based energy conservation measures can save a considerable amount of energy (ask Steve what that statistic/study source was)
- We cannot expect our building-related staff team members to identify energy conservation measures until they are appropriately equipped, empowered and encouraged to do so.

➤ Dissenting Opinions/Concerns

❖ Transportation

➤ Benchmark 1: Reduce SOV Travel

Goal 1: Reduce single occupancy vehicle (SOV) travel as much as possible
Benchmark: Reduce SOV rate of faculty and staff to <30% by 2030; Strive: Reduce the rate of SOV travel across all user groups (student, faculty, staff) from 30% to 25% by 2030

➤ Why this Benchmark Was Chosen:

- Currently, ~30% of Auraria’s community drives alone to campus (however the % is higher for faculty and staff at 36% and 32%, respectively). The average percent of SOV (single occupancy vehicle) travel for employees commuting to downtown Denver is 34.5% (source: [DDP](#)), but the DDP is seeing this number decrease over time as mobility and telecommute options improve. If Auraria can achieve a 30% SOV rate with market forces alone (scarcity of parking--only 6,000 spots), we believe we can decrease SOV travel an additional 5% via incentives, mobility programs and behavior change campaigns. We also believe that our faculty and staff can exceed the average SOV rate of our neighboring downtown employers and catch up to the student SOV rate (30%), so we are aiming for a 30% rate of SOV commute among faculty and staff, specifically.
- Furthermore, the Regional Air Quality Council is currently in the process of developing regulatory language to enforce an “Employer-Based Trip Reduction Program” (ETRP) that

would define a complaint SOV rate for Denver. This is all in an effort to reduce SOV travel in an effort to bring the Front Range back toward compliance with federal ozone pollution standards (we've been out of compliance with 2008 standards since 2012, and the standards have gotten more strict since then). Aiming high and getting ahead of the curve in moving beyond compliance will decrease our efforts when the program rolls out in 2023 (expected).

	Walk	Bike	Carpool	Bus	Drive Alone	Light Rail
Students	2.1%	4.0%	0.9%	10.6%	29.1%	53.2%
Faculty	4.4%	7.4%	2.5%	12.8%	36.0%	36.9%
Staff	2.5%	5.9%	1.9%	15.2%	32.0%	42.6%
All	2.2%	4.2%	1%	11%	30%	52%

- Dissenting Opinions/Concerns

- **Benchmark 2: Increase Transit**

Goal 2: Support the adoption of transit (bus and light rail) and reduce barriers to adopting transit-based modes of travel -- particularly where zero emissions modes of travel are not feasible

Benchmark: Increase the % of commuters using bus and rail as their primary mode of transit from 63% to 66% by 2030; Increase the % of commuters using light rail/bus at least 1x/week by 10% by 2030 (establish baseline during 2022 transit survey)

- Why this Benchmark Was Chosen:

- Currently, 63% of campus commuters use bus and light rail as their primary mode of commuting to/from campus. The average one-way trip distance of our campus commuters is ~15 miles, so we know that biking is not always feasible and transit is a critical part of our alternative transportation strategy. We set a modest goal (3% increase) for the percent of folks using *primarily* transit, and plan to add a question to future transportation surveys to assess the rate of commuters utilizing transit at least 1x/week. We feel we can move the needle on that metric more easily. Because the structure of our RTD Student and Eco passers are currently in flux, it was difficult to set benchmarks around RTD pass registration and utilization, However, new benchmarks around these metrics should be discussed and adopted once the longer term structure of the RTD pass programs is established.

- Dissenting Opinions/Concerns

- **Benchmark 3: Increase Bike/Micromobility Ridership**

Goal 3: Encourage and support the adoption of bike and micromobility travel (eScooters, walking, bike share, etc.) and reduce barriers to accessing and adopting micromobility--particularly for first/last mile connections or shorter distance commutes

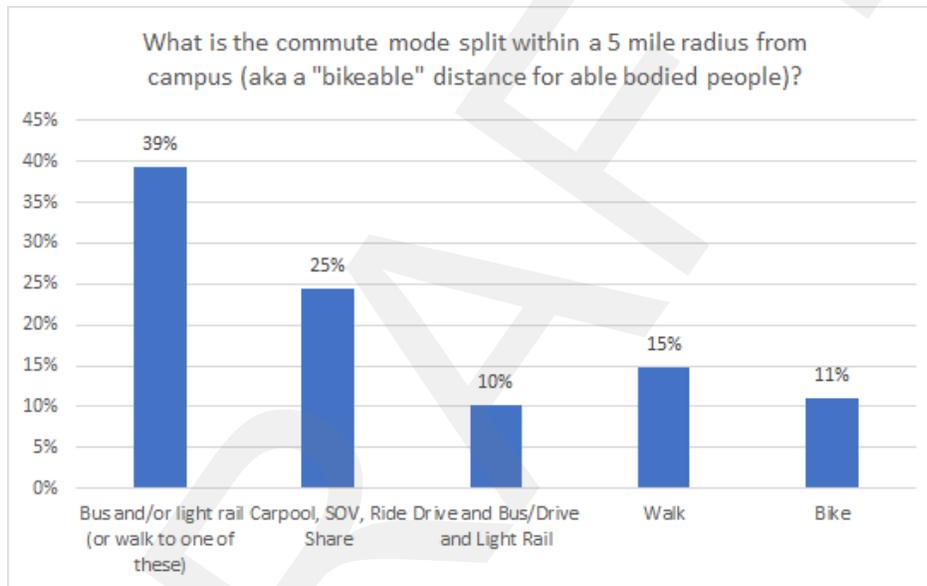
Benchmark: Increase biking/micromobility as a primary mode of transportation (from 4.2% up to 7%) for those able and willing

- Why this Benchmark Was Chosen:

- Currently, 4.2% of campus commutes to campus via bicycle (4% of students, 7.4% of faculty and 5.9% of staff, based on headcount). However, roughly 11% of the campus

population lives within 5 miles of campus (a *potentially* bikeable distance) and is currently using vehicle or transit as their primary mode of commuting to/from campus. This could be viewed as the segment of campus that could *potentially* adopt biking. However, while biking under five miles is possible and compelling for *some* persons, it is not accessible, safe or appealing to all and may not be possible for people experiencing physical disabilities. Therefore, we decided to strive for a more modest goal of increasing bike ridership by an additional ~3% of the campus population. With the opening of CU Denver’s residence hall in Fall 2021, there will be 550+ students living directly on campus, which should help in achieving this goal. Furthermore, micromobility was not a response option on the most recent transportation survey and micromobility systems (eScooter, eBike, etc.) have evolved considerably since the survey was conducted.

- (For reference, roughly 11% of our campus lives within 3 miles of campus).



- Dissenting Opinions/Concerns

➤ **Benchmark 4: Education and Outreach**

Goal 4: Increase awareness, education and outreach around all alternative transportation options and the impact of those choices on the environment, health, cost, etc.

Benchmark: 50% of survey respondent confirm that they have recieved transportation education and/ or participated in an alternative transportation event by 2025 (75% by 2030)

- Why this Benchmark Was Chosen:

- The ASCP is currently working to get a little air time in new/transfer student orientations and new hire orientations among the four institutions. Our goal is to be integrated into these programs and reach all newcomers to campus by the end of Spring 2022. We hope to reach existing/returning students and staff through semesterly events and programming on campus. This metric will be assessed via the ASCP’s Campus Sustainability Survey and/or the campus transportation survey.

➤ Dissenting Opinions/Concerns

➤ **Benchmark 5: EV/Fleet Conversion**

Goal 5: Support electric vehicle adoption by increasing EV charging infrastructure on-campus; Convert campus fleet vehicles to electric
Benchmark: 50% fleet conversion by 2025; 100% conversion of fleet to EV by 2030.

➤ Why this Benchmark Was Chosen:

- The main reason for the aggressive goal here is that there is an enormous focus and considerable funding at the state-level right now aimed at fleet conversion to EV. Vehicle electrification is also a clear priority for the state’s GHG reduction roadmap and for Xcel Energy, and electrification is necessary to transition away from fossil fuels. EVs are a controversial topic, with many in the sustainability industry divided on the topic.
- We haven’t established a benchmark in relation to EV charging stations because we don’t yet know what is appropriate to strive for. We have 34 responses to a November EV survey that assesses campus interest in increasing EV charging station and the responses are very mixed on whether or not that is a need for campus.

➤ Dissenting Opinions/Concerns

- Jackie: I am concerned that this is too aggressive and not based completely in the data we have and I'm also personally concerned about the unforeseen consequences of EVs (what's going to happen to all the vehicles everyone is getting rid of and all that material?). I don't think we should throw out perfectly good gasoline powered vehicles unless they are considerably less efficient and we can ensure that they will be dismantled and materials recycled properly. I think the pace of conversion should be established based on our list of existing vehicle makes/models/years and how much funding we can procure from Charge Ahead, etc.

➤ **Benchmark 6: Campus Culture and Planning**

Goal 6: Support a campus culture and campus plans/policies that embrace, celebrate and enhance the experience of alternative forms of transportation
Benchmark: 20% of respondents will agree with the statement that "Auraria incentivizes, encourages and plans for my adoption of alternative modes of transportation to campus" (as assessed via biannual campus survey or transportation survey) by 2026; 50% by 2030

➤ Why this Benchmark Was Chosen:

- This metric has never been quantified before and--because it’s partially based in physical space and policy--will take a few years to be realized. We wanted some way to highlight and assess the campus elements of an alternative transportation strategy that don’t fall into a specific mode of transportation. Aka, what is the campus doing to gently nudge people out of their vehicles and make it easier and more celebrated to utilize alternative transportation, instead?

➤ Dissenting Opinions/Concerns

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❖ Waste

➤ Benchmark 1: Municipal Solid Waste

Goal 1: Improve diversion rate of municipal solid waste generated on campus through the expansion of bin infrastructure and diversion programming

* MSW – waste type consisting of everyday items that are discarded by the public household, restaurant, and building waste. Not included in construction waste, businesses, or hazardous waste*

Benchmark: Increase diversion rate of municipal solid waste (across all campus institutions) to 35% by 2024; 50% by 2030; 100% by 2040 ([Denver Goal](#))
*Waste Diversion - the percentage of material diverted from the landfill to either recycling or compost

➤ Why this Benchmark Was Chosen:

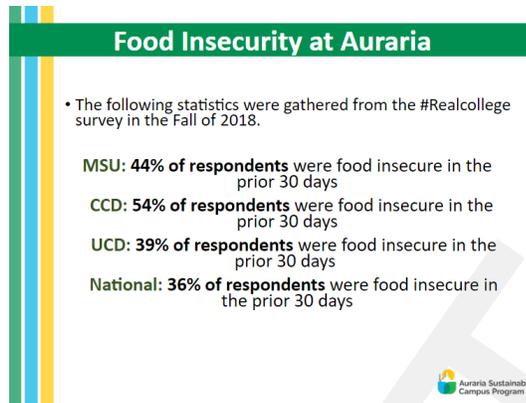
- As of the ASCP 2018 annual report, the Auraria campus diversion rate for municipal solid waste was 18%, 17% lower than the [national average of 35%](#).
- According to ASCP 2019 waste audits, 73% of our municipal solid waste could have been either composted or recycled ([ASCP, 2019](#)). This aligns with the disproportionate rate of recyclable and compostable MSW that annually ends up in our landfills nationally ([EPA, 2018](#)).
- Denver Climate Action Planning Task Force has proposed diversion rate goals for the City of 32% by 2021, 50% by 2030, and 100% zero waste by 2040 ([Denver Fact Sheet, 2020](#)).
- Tracking materials and installing waste diversion infrastructure falls under both the LEED v4 Gold prerequisites and electives for all [ID&C](#) and [C&D](#) projects.
- Promoting waste diversion helps the Auraria Campus align to the UN sustainable Development Goals of [Responsible Consumption and Production](#), [Life on Land](#), and [Sustainable Cities and Communities](#).
- What Peers are doing:
 - Many schools across the Nation and Globe are adopting behavior and infrastructural changes to address consumption and waste on their campus. Campaigns such as the “[Campus Race to Zero Waste](#)” help schools like UC Berkeley, Stanford, Western Colorado University, etc. reach their zero waste goals by tracking, training, and incentivizing sustainable changes on their campus.
 - Many colleges are building zero waste action directly into their Climate Action and Strategic Planning operations ([University of Buffalo](#), [University of Colorado Boulder](#), [Syracuse University](#), etc.)
- 30-40% of food in the US is wasted annually ([USDA](#)). A large portion of this is attributed to events and food vendors tossing food that doesn’t sell at the end of the night. Increasing compost at events will decrease our [GHG emissions](#) by diverting that organic material from the landfill, thus avoiding unnecessary methane emissions.

- Dissenting Opinions/Concerns
 - Is 100% waste diversion really possible since we have so many off-campus groups use our campus?

➤ **Benchmark 2: ALT Materials/Solutions (tite?)**

Goal 2: Track high waste producing activities and identify solutions for how to divert materials equitably and resourcefully
<small>Benchmark: Perform campus-wide consumption based inventory by 2023 that establishes a baseline of wasted products. Identify ways said products can be reused, repurposed, or recycled through alternative waste disposal methods by 2025</small>

- Why this Benchmark Was Chosen:
 - Our 2019 GHG inventory included a preliminary Scope 3 investigation based on readily accessible data for campus municipal solid waste (MSW) and air miles traveled, resulting in 17.54% of total emissions coming from Scope 3 ([ASCP, 2019](#)). This data is limiting because the EPA defines Scope 3 emissions as “a result of activities from assets not owned or controlled by the reporting organization, but that the organization indirectly impacts in its value chain ([EPA](#)).” There are externalities and additional emissions directly associated with the indirect value chain factors. Research has shown that externalities unproportionately affect low income/BIPOC/women populations. By identifying alternatives for purchasing and disposal we can address the social and environmental justice issues associated with Scope 3 factors.
 - Tracking materials and installing waste diversion infrastructure falls under both the LEED v4 Gold prerequisites and electives for all [ID&C](#) and [C&D](#) projects.
 - In 2018 600 million pounds of construction and demolition waste was produced in the U.S. directly ending in the landfill ([EPA](#), pp 19). In order to tackle this massive waste problem, many certification credits have been created to promote sustainable and responsible waste management sections (LEED, [CDPHE Contactor Challenge](#), and [Living Buildings Challenge](#)).
 - CU Denver’s Food Insecurity Study Indicated that *__see below__*% of Auraria’s were experiencing food insecurity. We can help alleviate this need by channelling otherwise wasted food to food pantries. Nationally food insecurity is also being addressed by the things like the [EPA Food Recovery Challenge](#), [We Don’t Waste](#), and [ShareMeals](#).



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- Material recovery, repurposing, and donations are very popular in other universities across the nation for move-in/move out days and beginning/end of the semester events.
 - Tufts [Move Out Donations](#)
 - [Alston Extravaganza/Free Store](#), Boston
 - Cornell [Dump and Run](#)
 - Wilson College [Free Store](#)
- Reviews from staff/faculty from the three institutions + AHEC is that bulk materials and electronics are not being channeled through the appropriate disposal process that the institutions and AHEC offers. Many items end up being left in hallways or thrown in the landfill. **Dumping of electronics, hazardous waste, and bulk materials is against the law.** References: [E-Waste Banned from Disposal in CO Landfills](#), [Resource Conservation and Recovery Act \(RCRA\)](#), [State Surplus](#)
- Global trends in extended producer responsibility, circular economy, and social-corporate responsibility are leading to increased opportunities to promote a circular economy. This can be done by more thoroughly tracking consumer materials and finding proper alternatives of disposal ([BlueStar](#), [TerraCycle](#), [EcoCycle](#) etc.)
- Tracking materials and promoting waste diversion helps the Auraria Campus align to the UN sustainable Development Goals of [Responsible Consumption and Production](#), [Life on Land](#), [Sustainable Cities and Communities](#), [Industry, Innovation and Infrastructure](#) and [Zero Hunger](#).
- Dissenting Opinions/Concerns
 - Increased cost because of labor hours needed to track and manage.
 - Increased cost of alternative disposal methods.

➤ **Benchmark 3: Plastic Product Replacement (title?)**

Goal 3: Pursue a zero-waste model for food related items purchased, consumed, and disposed of on campus
Benchmark: Pursue a zero-waste campus by reducing use of unsustainable consumer products (i.e. single use plastics) and replace with sustainable options (i.e. reusables/compostables) to 50% by 2025; 75% by 2030; and 100% by 2040

➤ Why this Benchmark Was Chosen:

- Colorado has passed [a bill](#) that will place a charge on certain to-go containers starting in 2022. We can get ahead of this charge by switching our products now.
- Research has shown that the majority of single use plastics are not recyclable through general municipal solid waste streams. They are also the highest form of pollution throughout the globe ([WWF](#)). Compostable alternatives allow the campus to maintain its grab-and-go structure while lowering its carbon footprint.
- Colorado and Denver are [bringing single-use plastic bans to legislation](#) in the coming election year, targeting styrofoams, plastic bags, and removing the state law that prohibits local governments from banning “specific types or materials or products.”
- State and Federal mandates such as the [Environmentally Preferred Purchasing](#) and [Greening the Government executive order](#) provide guidelines for state purchasing and contracts offices to entities to procure sustainable commodities and services.
- Students have expressed concern for the campus impact on the environment. CU students and universities have passed policy and resolutions for product alternatives and plastic bans. (i.e. [CU Denver Green Procurement Policy](#), CU Boulder 89 LCB 06 - Plastic Bottle Phase Out Policy, CU Boulder Sustainable Procurement Policy)
- Tracking materials and promoting waste diversion helps the Auraria Campus align to the UN sustainable Development Goals of [Responsible Consumption and Production](#) and [Life on Land](#)

➤ Dissenting Opinions/Concerns

- High cost of compostable compared to plastics. Especially a concern considering we are coming out of a COVID year and we already ask our vendors to provide such a low food cost.

➤ **Benchmark 4: Sustainable Procurement**

Goal 4: Emphasize sustainable procurement of services, goods, and investments across campus
Benchmark: Perform campus-wide consumption based inventory to establish a baseline of campus purchases and investments by 2025, followed by ongoing investigations for ethical and sustainable alternatives/solutions

➤ Why this Benchmark Was Chosen:

- Food and consumer products is a large portion of the campus budget amounting to **\$___ annually**. The distance, chemical load, dietary makeup (meat vs veggie), manufacturing/growing standards, and labor standards play a major role in not only carbon emissions, but have implications for the health and safety of all

persons and environments along the supply chain. Many entities have adopted methods for tracking the supply chain and finding sustainable alternatives. Such as:

- Denver's [Good Food Purchasing Program](#)
 - [Real Food Challenge](#) used by 80+ universities including local University of Denver and Colorado College.
 - Many schools are pursuing investigations in their investments. As a public serving institution we have a responsibility to ensure our endowments and investments are in the best interest of the people. This includes responsible reporting of all transactions involving the campus. Main points of concern:
 - [TIAA-CREF](#) is the AHEC student employment retirement fund BUT it is invested in prison industry, illegal occupations, and border militarization
 - 25% of the global imprisoned population is housed in the US. Higher Education is notorious for supporting free(prison/bonded) labor for products and services
 - Fossil free futures mean [fossil free funds](#)
 - State and Federal mandates such as the [Environmentally Preferred Purchasing](#) and [Greening the Government executive order](#) provide guidelines for state purchasing and contracts offices to entities to procure sustainable commodities and services.
 - Our 2019 GHG inventory included a preliminary Scope 3 investigation based on readily accessible data for campus municipal solid waste (MSW) and air miles traveled, resulting in 17.54% of total emissions coming from Scope 3 ([ASCP](#), 2019). This data is limiting because the EPA defines Scope 3 emissions as “a result of activities from assets not owned or controlled by the reporting organization, but that the organization indirectly impacts in its value chain ([EPA](#)).” There are externalities and additional emissions directly associated with the indirect value chain factors. Research has shown that externalities unproportionately affect low income/BIPOC/women populations. By identifying alternatives for purchasing and disposal we can address the social and environmental justice issues associated with Scope 3 factors.
 - Tracking materials and promoting waste diversion helps the Auraria Campus align to the UN sustainable Development Goals of [Responsible Consumption and Production](#), [Life on Land](#), [Reduced Inequalities](#), [Peace, Justice, and Strong Institutions](#), and [Decent Work and Economic Growth](#).
- Dissenting Opinions/Concerns
- Opening a legal can of worms...

➤ **Benchmark 5: Training/Engagement**

Goal 5: Support a campus culture and campus plans/policies that embrace, celebrate and enhance campus constituent capacity to engage in zero-waste behaviors

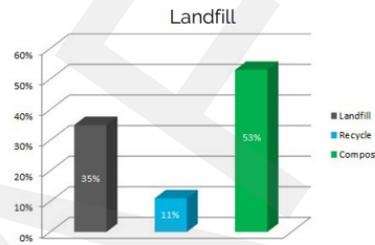
Benchmark: Implement formal sustainable waste and procurement training for 50% of campus constituent base by 2025, 65% by 2030 and 80% 2035. All schools and AHEC will adopt ASCP training or implement their own into all internal programs by 2040 to reach 100%

➤ Why this Benchmark Was Chosen:

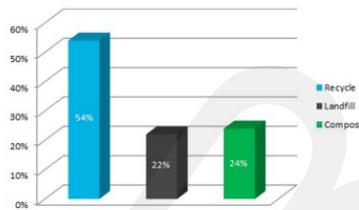
- Many municipalities use waste haulers other than GFL/Waste Management. Every waste hauler accepts different items in their stream. Proper training and education for all parties will lead to successful sorting of materials both on the front end and the back end. Consistent messaging is the only way to ensure that all parties are on the same page.
- Our current campus waste streams are [highly contaminated](#).

Campus-Wide Waste Cleanliness

Out of all of the waste that ended up in trash bins, **35%** was actually landfill, **11%** should have been recycled and **53%** should have been composted.

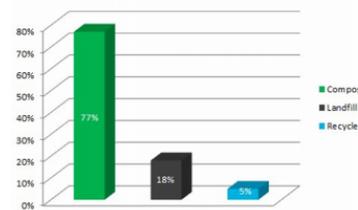


Recycle



Out of all of the waste that ended up in recycle bins, **54%** was actually recyclable, **22%** should have been sent to the landfill and **24%** should have been composted.

Compost



Out of all of the waste that ended up in compost bins, **77%** was actually compostable, **18%** should have been sent to the landfill and **5%** should have been recycled.

-
- Research has shown that consistent and ongoing training leads to successful programs. Representations of ongoing training resources:
 - [Denver/EcoCycle](#)
 - [UN Environmental Programme](#)
 - [Stanford](#)
- Proper education and training helps the Auraria Campus align to the UN sustainable Development Goals of [Reduced Inequalities](#), [Peace, Justice, and Strong Institutions](#), [Partnerships for the Goals](#), and [Quality Education](#).

- Dissenting Opinions/Concerns
 - Increased cost because of labor hours needed to track and manage and distribute trainings

DRAFT

Appendix 3: Building/Energy Project Brainstorm List													
Strategy Name	Description	MT CO2e reduced (estimated)	Cost Savings (Estimated)	Cost (estimated)	Potential Funding Sources?	Stakeholders/Responsible Party	Potential Timeline	Implement When:	Feasibility	Increase in Maintenance Costs?	Equity	Financial ROI (or some metric)	Cost/MT CO2e Reduced
Hire an Energy Manager/Energy Management Program (Interim)	Implement Interim Energy Management Program with the goal of identifying 5% cost savings from utility reduction-->Eventually hire an Energy Manager. See EnergyCap Optimization proposal and current SOW with BEE	3,590	\$650,000	\$30000 - \$100,000	ASCP	ASCP/Facilities	1-2 years	Anytime	High	No	High		
Recommissioning (RCx)	Pursue either Xcel's RCx/Building Tune Ups program more comprehensive program or work directly with an energy services contractor and pursue Fast Track for rebates with Xcel. RCx focuses on control strategy improvements, finding broken sensors and dampers, getting building back to best possible operations with small tweaks. Typically 3-6 month payback on investment. This strategy assumed savings across 5 selected AHEC buildings (Arts, PE, Admin, King, Plaza) to provide an estimate of MT GHG emissions savings.	850	\$62,000/year annual savings, \$77,000 net (after costs)/year average across 5 years	154000 for 5 buildings (~15 cents/square foot for RCx study +\$ to implement)	Xcel RCx Program	AHEC Facilities/future SEM team	1-2 years	Anytime	High	No	N/A		
Integrate BAS with occupancy/scheduling	This is outlined as ECM 14 in the 2016 TEA. Follow up with Roddy to understand who is currently operating the controls side of JCI.							Anytime					
HVAC Setpoints	Needs to start with high level conversation amongst the three institution around thermal comfort first. Needs to start with Rob.	Need to do the math	1-3% of heating/cooling costs - https://files.nc.gov/ncdeq/Environmental%20Assistance%20and%20Customer%20Service/IAS%20Energy%20Efficiency/Opportunities/Setback_Temperature_Control.pdf	\$0 - \$20,000	ASCP or Facilities	Roddy and Facilities	NOW	Anytime	Concerns about thermal comfort. Study: Lakeridou: Study showing that a 2 degree C increase in building temp did not cause substantial discomfort to the group	No	N/A	Heating/Cooling makes up roughly \$1 million per year, 1 % of that is \$10,000 so up to \$30,000 (conservatively) . Pay off is 2 years max (\$20,000 for 1% savings)	TBD
SCIENCE BLDG	We know Science is one of our largest energy hogs (22% of campus energy costs). What tangible projects can we look at to target Science energy consumption? Targeted RCx study? Green Labs? Behavior changes with hood closure? CO2 sensors? optimize ventilation system.							Anytime					
Lighting Controls	Occupancy sensors and timed dimming with daylight		4% of annual electric	Depends on where we need sensors and whether or not lighting controls are already built into BAS but occupancy sensors are ~\$100 each	ASCP or Deferred	ASCP, Facilities	Within 1 year	Anytime	Very Feasible	No		Electric is 82% of total utilities	
Window Film (Electrochromic Glazing)/Low Emissivity Window Films, Painted Glass, Adding second window panes (vs replace)	ECG can dynamically control solar heat gains of windows which improves cooling efficiency. For buildings with single pane windows, add low-e window films, painted glass or a second pane (as Boulder did in a historic building to get around historic protections) to avoid the unfavorable ROI associated with full window replacement. See comments for justification. (Bridge measure while we wait to hear about Project C (Building Envelope) funding in a few years).	Based on research done specifically in Denver: savings eq to 221,256 kWh which would be 250,683 lbs of CO2e/year or 113.71 MT. ACEEE p.13 33% of building HVAC energy use is due to heat gains and losses from windows.	\$1.81/m2: in a 50,000 sq. ft. building example this would equate to \$8,407.73 per year	TBD	ASCP or Deferred	ASCP, Facilities	2-5 years	Anytime	Seems reasonable, we already have some film remnants on Tivoli windows	Possibly, window cleaning?		TBD	
Upgrade all lights to LED	Formalize tracking program for replacements and map where we need to target older lighting		10-30% energy savings for lighting (p.11 ACEEE)									Under 5 years	
Scheduling													
Heat Pumps													
Net (or near net) Zero Energy Buildings (future)	Add a component to RFQ/RFP criteria requiring applicants to strive toward Zero Net Energy principles or below 35 EUI upon buildout												
Vacancy Sensors	Better than occupancy, these lights require folks to physically turn them on then they automatically turn off rather than automatically turning on (occupancy sensors)												
On-Site Solar Build out (within current ATO regs)	Complete build out of remaining 750 kW allowed in current ATO policy	~450 MT or 1 million lbs CO2e	~\$50,000 if on PG, ~\$60,500 if on SG	\$1,000,000	ASCP, philanthropic donations for fame? third party PPA, etc.	ASCP, Facilities	2-5 years		Medium	No	N/A	18 years	
Green Building Code	Design new buildings to satisfy the most aggressive IECC and IBC energy codes (and strive to achieve Denver's Green Code--Denver's stretch code--wherever possible)												

Appendix 3: Building/Energy Project Brainstorm List													
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EUI Achievement Standards for Existing Buildings	Energy Use Intensity (EUI): Achieve Source EUI ratings that are at least 20% lower than national average (as established by EPA/EnergyStar) for all existing buildings (based on building type) and at least 30% better for new builds												
Off-site solar (CSG)	Explore the potential of co-owning an off-site array through consortium with other front range institutions or purchasing a share of a community solar garden (the CU system procurement team is looking into this possibility and CU Boulder is potentially interested)	TBD	TBD	Plus \$70- \$100 per 380-W panel for certain lengths of time. \$500 per panel on a 5 year agreement, \$1400 per panel on a 20 year agreement (30% discount difference between shortest and longest term). Est. 1 panel produces 744-817 kWh/year (avg. 775). SO 1 panel on 5 year is .129/kWh, 1 panel on 20 year is about \$.09/kWh	ASCP only	ASCP, Facilities	TBD		Unlikely	No	Yes	It's at a loss	Dependent on investment
Daylight Harvesting	Install automated dimmers to account for natural light in a given zone so that we're not blasting lights at 100% when it's not necessary												
Advanced Power Strips	Phase out old strips and replace with APS - make part of procurement policy for individual offices, give away some for demonstrative purposes. These can potentially be controlled remotely and we could set schedule		GSA 2016, ACEEE p.10 - plug loads make up 5% of primary energy consumption in US commercial buildings. Targeting labs proved effective in a case study by Stanford	\$30 each	ASCP	ASCP	Now		Very	No			
Existing Building O&M Policy/Standards	Strive for LEED Gold EB O+M (criteria fulfillment, not paid certification) for 100% of renovations, make it a policy that LEED silver is obtained												
Project B" HVAC Infrastructure Replacement/AHEC Capital Renewal Proposal	Upgrade HVAC equipment in 9 buildings across campus (see AHEC's Project B Capital Renewal project proposal from 6/2019 for a full scope of work and cost estimate)	2,700	\$200,000/year (\$4 million over 20 years/lifespan)	\$19.6 million	CDHE Capital Renewal Funding (\$19.383 million and \$200,000 earmarked from the 3 institutions)	AHEC Facilities/Campus Planning	June 2022 through mid 2024	Contingent on state funding	Funding will be a barrier, especially with covid. AHEC was approved for funding last year and it was rescinded. Resubmitted to capital renewal this year and will know in March if we receive funding.	No	N/A	98	
HVAC Enhancements/Equipment Upgrades	Whole-building ventilation controls (senses CO2 to adjust airflow), multi-speed fans, economizers, fault detectors	TBD	est. 30% of commercial building energy use is HVAC (U.S. EIA) [1]	TBD	TBD	Facilities		Anytime	Very. We would want to focus on things that would still be relevant after a full HVAC replacement which is estimated to take place by 2025	No	N/A	est. 3-5 years	
"Project C" Capital Renewal Proposal (Building Envelope) per AHEC 2018 "Bible")	Window and roof replacement to improve thermal conditioning across priority buildings. Consider participating in BBI's Building Envelope Campaign for resources.	envelopes constitute ~30% of a building's energy consumption. Use this to estimate savings based off identified buildings						Contingent on state funding					
Xcel SEM Program (participate)													
VFDs													
Economizers													
Overhaul of Preventative Maintenance													
Air Sealant													
Demand Response (Xcel CPP)													
Interim Building Envelope Enhancements													
Cool Roofs	Changing coloration of rooftops to help reflect heat instead of absorb which would lower HVAC costs	.881 lbs of CO2/sq ft saved based on my research plus .0018 lbs of NOx/sq ft saved - 36 MTCO2e/year for est. life of 20 years - estimate based on Science building	\$1,036.81/year in cooling costs based on an average of surveyed participants	\$2/sq ft Science example: 55,880.47 sq. ft. which would come to \$111,760.94	ASCP or Deferred	ASCP, Facilities	1-3 years	Upon replacement	Great outlook. One concern from admin is the danger to workers' eyes and visibility but going with something a little less than pure white could solve this concern	No	N/A	~10 years	

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Waste Heat Recovery (furnace or boiler)													
Computer Network Optimization/Settings (I.T.)	The campus information technology team will maintain all campus-owned computers, displays, and related technology to always operate in energy saver mode, unless needed for a documented exception.												
Ground Source Heat Pumps?													
Thermal Energy Storage?													
Convert NG to electrical ASAP	No new natural-gas consuming equipment for space and water conditioning starting in 2022. For example, solar thermal systems, PV-driven heat pump systems, or off-set.												
Data Collection	Track and report building energy use consumption annually and comply with Denver benchmarking initiative												
Behavior Based Energy Conservation													
AC Servicing Minimums Policy	A policy option that NYC's Zero Energy Buildings team recommended on Energize Denver meeting: for anyone operating refrigeration or AC in a public location, they must do a minimum level of preventative maintenance (coil cleaning, filter replacement, etc.) for energy savings/emissions reduction and equipment operational benefit. It's somewhat analogous to auto emissions and safety regulations. For residential, "carrot" incentives is our suggestion.												
Retrofit Triggers	When performing building retrofits or upgrades, must trigger other relevant upgrades that capitalize on the building being opened up (ie: LED lighting, occupancy sensors, etc--need to make a checklist)												
Green Labs Program	See CU Boulder's Green Labs Program (one of the best in the country)												
EnergyStar Appliances	Replace/upgrade non EnergySTAR certified appliances to high performance--utilize rebates and incentives from Xcel												

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A Resolution in Support of a Declaration of Climate Emergency

Resolution History

Driven by a sense of innovation and the desire to improve the relationship between humankind and the environment upon which we so heavily rely, students across the globe have been instrumental in guiding sustainability efforts across educational institutions. The students on the Auraria Campus are no exception to this. Auraria students have consistently voted to implement green initiatives using their student fees, not because we want to but because we see the damage underway and the lack of action and effort taken by campus higher administration.

The Auraria student body made it clear that sustainability was a priority by voting to assess a student fee in 2011 to establish the Auraria Sustainable Campus Program (ASCP). Through this program, steps have been taken to make the campus more efficient, lessen our ecological footprint, decrease our reliance on fossil fuels, enhance satisfaction ratings, finances, and our overall appearance. However, more resources and emphasis need to be put toward these pressing climate and environmental issues so that a significant impact can be made much more quickly.

It should be recognized that the Auraria Campus and its three educational institutions lie at the epicenter of higher learning in downtown Denver. It is our responsibility to be leaders and innovators in urban sustainability as the 40,000+ students enter communities, regions, and the world. Therefore, today we are turning our attention to an existential threat to the campus, the communities, the world, and our future: climate change.

Greenhouse gas emissions are increasing at a faster rate than ever before, and this year average global temperatures are expected to exceed a 1.5°C increase from pre-industrial revolution times. In Colorado, the snowpack is expected to decrease by 50% in the coming century. Wildfires have increased in frequency and intensity, pests such as mosquitoes and pine beetles, and the more recent Japanese Beetle now linger year-round. Floods like those seen in Boulder in 2013 are becoming increasingly common. The impact of these changes will affect Colorado for generations.

The students of the Auraria Campus expressed the necessity for climate action not only by attending protests on the steps of the state capital, but also by voting in favor of a student fee in 2011, 2016, and again this Spring 2020, acknowledging that sustainable initiatives are a priority. For years students have been pushing for more significant sustainability efforts, but we can only tax ourselves so much. We, the student body, feel that there could still be more of a system and campus-wide effort to contribute resources towards greater sustainability instead of relying on the students to carry the costs exclusively through the Auraria Sustainable Campus Program.

Finally, we would like to recognize the University of Colorado Boulder's Student Government for being leaders in this initiative as they were the first to pass a similar resolution in the 2019 fall semester, leading the way for Colorado student voice, inspiring us to act on our campus.

Resolution in Support of a Declaration of Climate Emergency

WHEREAS, The Student Advisory Committee to the Auraria Board (SACAB) recognizes the responsibility to advocate for the interests and wellbeing of all students on the Auraria Campus, is dedicated to providing services designed to create and enhance a learning-focused campus environment,

WHEREAS, According to the Intergovernmental Panel on Climate Change (IPCC), global emissions of carbon dioxide have increased by almost 50% since 1990,

WHEREAS, Given current concentrations and on-going emissions of greenhouse gases, it is likely that by the end of 2020, the increase in average global temperature since pre-industrial revolution times will exceed 1.5°C,

WHEREAS, Impacts of climate change have already been felt in the Colorado community and threaten the health of students, strategic University partnerships, and higher education in the state,

WHEREAS, The IPCC cites significant institutional change as one of the few methods of ensuring that the global mean temperature does not rise 2.0°C above pre-industrial levels,

WHEREAS, Colleges and Universities contributes roughly 2% of all US greenhouse gas emissions which is roughly 1/4th of the state of California's total emission levels,

WHEREAS, The Auraria campus emitted 64,740 metric tons of CO₂ emissions in FY 2019,

WHEREAS, The Auraria campus is not currently poised to hit our 2020 or 2030 American College & University Presidents' Climate Commitment (ACUPCC) goals without investing in a climate action strategy,

WHEREAS, The Auraria Campus's current energy use intensity far exceeds the national average for colleges and universities,

WHEREAS, In 2018, 96% of students surveyed strongly or somewhat agreed that they are concerned about environmental issues,

WHEREAS, In 2018, 97% of students surveyed either strongly or somewhat agreed that it is important that the Auraria Campus continue to become more sustainable,

WHEREAS, Numerous students from the Metropolitan State University of Denver, University of Colorado Denver and Community College of Denver participated in the 7,500-person strong Climate Strike at Colorado's Capitol Building on that same date,

WHEREAS, Student-led and student-funded sustainability initiatives including but not limited to the Auraria Sustainable Campus Program, Recycling, Auraria Campus RTD Pass, and the Compost Expansion Referendum were created to guide leadership onto a sustainable path,

THEREFORE BE IT RESOLVED, The Student Advisory Committee to the Auraria Board (SACAB) officially declares a Climate Emergency.

BE IT RESOLVED, By honoring the call for action by the student body and community protesters at Denver's Capitol and in tradition with Campus voting; SACAB calls for the Auraria Board of Directors to do the following:

- i.** Jointly declare and announce a climate emergency, and publicly announce this on or by the start of the 2020 – 2021 Academic year.
- ii.** Adopt and maintain a campus-wide sustainability plan created by a collaborating group of students, faculty, staff, community members, and administration from all institutions of the Auraria Campus.
 - a.** SACAB emphasizes the necessity that administration (at all four institutions comprising the Auraria campus) participate actively in Auraria's Climate Action Planning process by ensuring that decisionmakers and key stakeholders are present and engaged with the Climate Action Planning task force meetings.

BE IT RESOLVED, SACAB calls upon the Board of Directors to review and re-commit to aggressive greenhouse gas reductions.

- i.** Specifically, SACAB calls on the Board of Directors to at minimum achieve to state reduction targets set forth in Colorado state statute: 26% by 2025, 50% by 2030, 90% by 2050 while publicly striving to reach carbon neutrality by 2050.

FINALLY BE IT RESOLVED, Upon passage, copies of this resolution shall be distributed to the student body, the Auraria Board of Directors, the Colorado General Assembly, Governor Jared Polis, Representative Diana Louise DeGette, and the media.

COMING SOON: ADDITIONAL APPENDICES

The following appendices will be added by the end of June:

- Appendix 5: Funding and Grant Opportunities List
- Appendix 6: Subcommittee Members
 - Buildings Subcommittee
 - Alternative Transportation Subcommittee
 - Other advisors
- Appendix 7: "P2s": Actionable Projects and Policies

DRAFT