UNLV
REBELCAP
CLIMATE ACTION PLAN

University Of Nevada, Las Vegas
2024

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LAND ACKNOWLEDGEMENT

The University of Nevada, Las Vegas wishes to acknowledge and honor the Indigenous communities of this region, and recognize that the university is situated on the traditional homelands of the Nuwu (noo·woo), Southern Paiute (pai·oot) People.

We offer gratitude for the land itself, for those who have stewarded it for generations, and for the opportunity to study, learn, work, and be in community with this land.

We encourage everyone in this space to engage in continued learning about the Indigenous peoples who work and live on this land since time immemorial – including the Las Vegas Paiute Tribe and the Moapa (moh·aa·puh) Band of Paiutes.

As one of the most diverse universities for undergraduate students in the United States, UNLV believes it is important to recognize and appreciate the use of Southern Paiute land as part of its mission to be a welcoming and inclusive place for working and learning.

[1] Learn more about the Nuwuvi People:
https://www.unlv.edu/about/statements-compliance/land-acknowledgement/nuwuvi

LETTER FROM THE PRESIDENT

Dear Campus Community,

At UNLV, we recognize our responsibility to lead by example in addressing climate change in the desert southwest. Our university's Climate Action Plan, the Rebel CAP, is pivotal in this effort. It outlines innovative ways we will reduce our carbon footprint and promote sustainability in all aspects of university life. These efforts aim to create long-term value for our alumni and students and contribute positively to the state of Nevada.

UNLV is proud to be the first Nevada System of Higher Education institution to launch a climate action plan. We believe it has the potential to drive meaningful change and inspire others to join us in this collective effort.

Environmental sustainability and social justice are interconnected as climate change disproportionately affects vulnerable populations. Therefore, diversity is a cornerstone of our sustainability initiatives. When developing the plan, we sought feedback from our diverse population through surveys and in-person gatherings. As we implement the plan, we will use these varied perspectives to design equitable policies and practices.

The Rebel CAP outlines comprehensive strategies and goals to significantly reduce greenhouse gas emissions. Key components include:

1. **Carbon Neutrality Commitment:** We aim to achieve carbon neutrality by 2057 through an initiative called '100 by 100.' This ambitious goal, of achieving 100% carbon neutrality by UNLV's 100th anniversary, will guide our efforts to minimize emissions from energy use, transportation, and waste generation.
2. **Renewable Energy Expansion:** We will increase the use of renewable energy sources to power our facilities and reduce our reliance on fossil fuels.
3. **Sustainable Campus Operations:** New initiatives to improve energy efficiency, enhance recycling and composting programs, and promote water conservation will be integrated into daily operations.
4. **Curriculum and Research Integration:** Our academic programs will incorporate sustainability principles to prepare students across disciplines to address global environmental challenges.
5. **Community Engagement:** We will collaborate with local partners and stakeholders to foster a culture of sustainability both on and off campus.

Achieving these goals will require a joint effort from our campus and local communities. Your ideas, engagement, and commitment to sustainability are essential as we work towards a more resilient and environmentally responsible future.

I invite you to review our Rebel CAP and explore opportunities for collaboration and dialogue. We can harness the power of diversity to drive meaningful change and set a precedent for sustainability in higher education. Thank you to the many members of our community who have worked to produce this plan.

Sincerely,

Keith E. Whitfield, Ph.D.
President

EXECUTIVE SUMMARY

Approach

Between the Summer of 2023 and the Spring of 2024, The University of Nevada, Las Vegas ("UNLV") created the Rebel Climate Action Plan ("Rebel CAP") with a team of students, staff, and faculty led by Facilities Management and the UNLV Sustainability Task Force ("STF"), with support from Brailsford & Dunlavey ("B&D"), Affiliated Engineers Incorporated ("AEI"), and Cascadia Consulting Group ("Cascadia"). Focused on the goal of carbon neutrality by 2057, or sooner, the UNLV campus community completed a series of constituent engagement meetings, surveys, data validation and modeling, and life-cycle-cost analysis, resulting in an actionable, realistic, and economically feasible pathway for UNLV to reach its goal.

Impact

The Rebel CAP outlines a core set of initiatives that, if funded and implemented, would reduce greenhouse gas ("GHG") emissions from campus and lower the overall cost of campus operations. The plan includes a bold strategy to eliminate operational GHG emissions through complete electrification of campus energy and related building systems, paired with increased procurement of onsite and offsite renewable energy. In addition to direct climate action initiatives that address emissions, this plan includes climate-related initiatives in the areas of academics and research, buildings and energy, green procurement and policies, stewardship and climate justice, sustainable transportation, waste management, and water resource management. The Rebel CAP is a university-wide strategic plan, intentionally designed to guide UNLV institutional decision-making.

Responsibility

A climate action plan at a higher education institution must consider the education of the next generation of leaders and innovators to address the urgent challenges facing our planet and build a more sustainable future. The plan must also consider UNLV's role as a member of the larger Southern Nevada community. While the Rebel CAP emphasizes climate action at UNLV, it was developed with local, regional, national, and international sustainability and climate-related goals and mandates in mind. This plan intends to document the initiatives and actions UNLV is uniquely positioned to take as an institution.

Why Now?

As a leading higher education research institution embedded in the Southern Nevada community, UNLV has a responsibility to leverage its expertise and use campus operations to mitigate the negative impacts of the climate crisis locally, regionally, and beyond. Empowered by student activism, aligned with Senate Resolution 52-365[2], inspired by the All-In Clark County[3] plan for a sustainable future, and guided by local, regional, national, and international directives,[4] UNLV made the commitment to define bold strategies to achieve its climate action goals.

Planning Context

Planning Boundary

An important first step in establishing the baseline GHG inventory, as part of a Climate Action Planning exercise, is establishing the organizational boundary. For the purposes of this planning effort, this includes the following locations:

- Maryland Campus: a 350-acre campus that houses the academic core of UNLV
- Shadow Lane Campus: UNLV Medical and Dental facilities
- Satellite buildings: Administrative, clinical, and athletic locations in Las Vegas
- North Campus: 2009-acre satellite campus to be developed (Not included in historical GHG inventory)
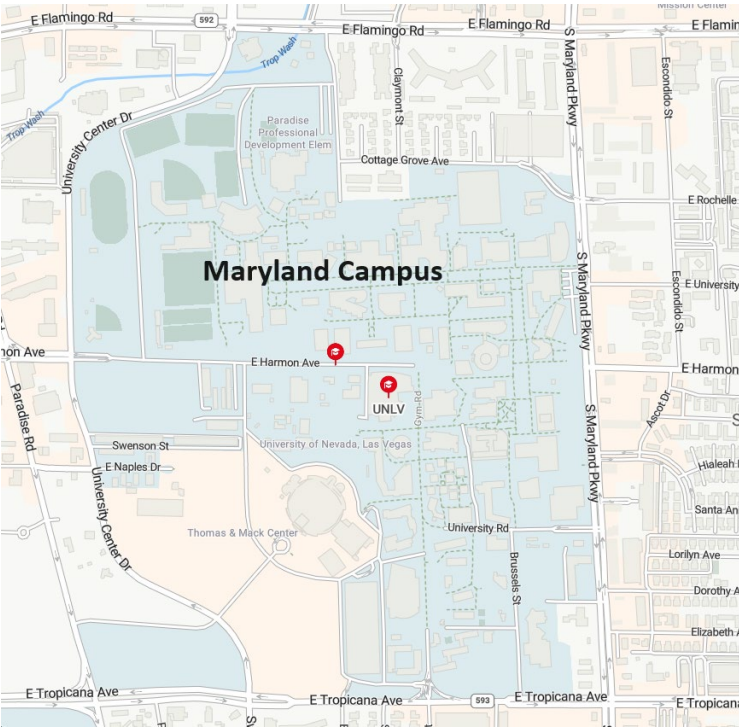

Figure 1: UNLV Maryland Campus Map

Figure 2: UNLV Shadow Lane Campus Map

[2] https://unlvscarletandgray.com/news/csun-adopts-resolution-for-climate-action-plan/
[3] https://allinclarkcounty.com/
[4] See Appendix A for context aligned with the Rebel CAP, including a peer institution review
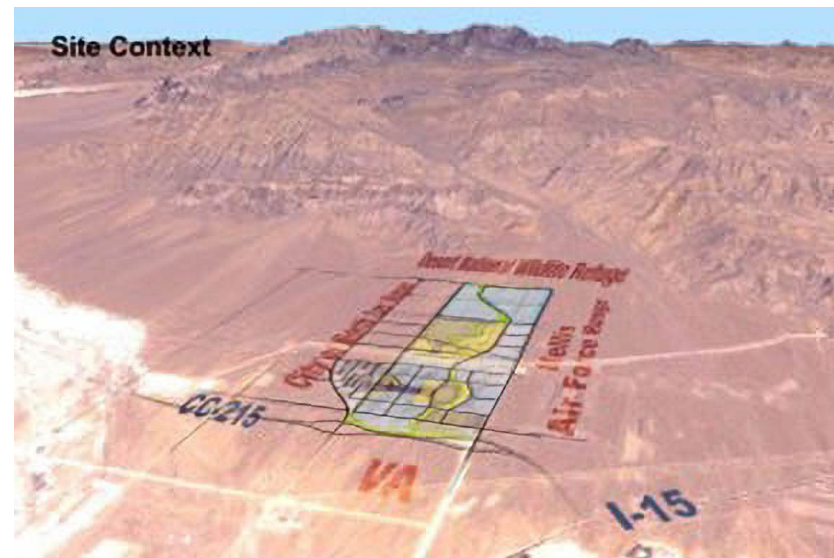
Figure 3: UNLV North Campus

Greenhouse Gas Emissions Inventory

During the Rebel CAP development process, the planning team gathered the data required to establish a historical GHG inventory for the years 2018 to 2022. This inventory was UNLV's first comprehensive emissions baseline and was a critical first step to help the planning team understand the sources and scale of UNLV's emissions. The inventory includes GHG emissions from the Maryland campus, Shadow Lane Medical and Dental Facilities, and a few satellite locations. The categories of GHG emissions data tracked are shown in Appendix H. GHG inventories are an important tool to monitor the impact of climate action initiatives; however, they are also imperfect estimates. This plan recommends that UNLV continue improving and refining this inventory as data quality improves and reporting protocols evolve in response to emerging science. UNLV's GHG inventory is comprised of three "scopes":

- **Scope 1 Direct Emissions:** Based on available data, the only reported direct emissions included are those from the combustion of natural gas. Future efforts should include gathering activity data for using diesel, propane, and motor vehicle fuels and emissions from leaked refrigerants or applying agricultural fertilizers. Based on a review of GHG inventories at similar higher education institutions, adding these additional sources could add an additional 5-10% to UNLV's current Scope 1 emissions.
- **Scope 2 Indirect Energy Emissions:** UNLV's Scope 2 emissions are from the production of grid electricity purchased through NV Energy.
- **Scope 3 Indirect Emissions:** UNLV's Scope 3 emissions sources include commuting, university-funded air travel, solid waste, and electricity transmission and distribution losses ("T&D Losses"). Like Scope 1, UNLV should consider expanding data tracking efforts to include additional Scope 3 sources in future inventories.
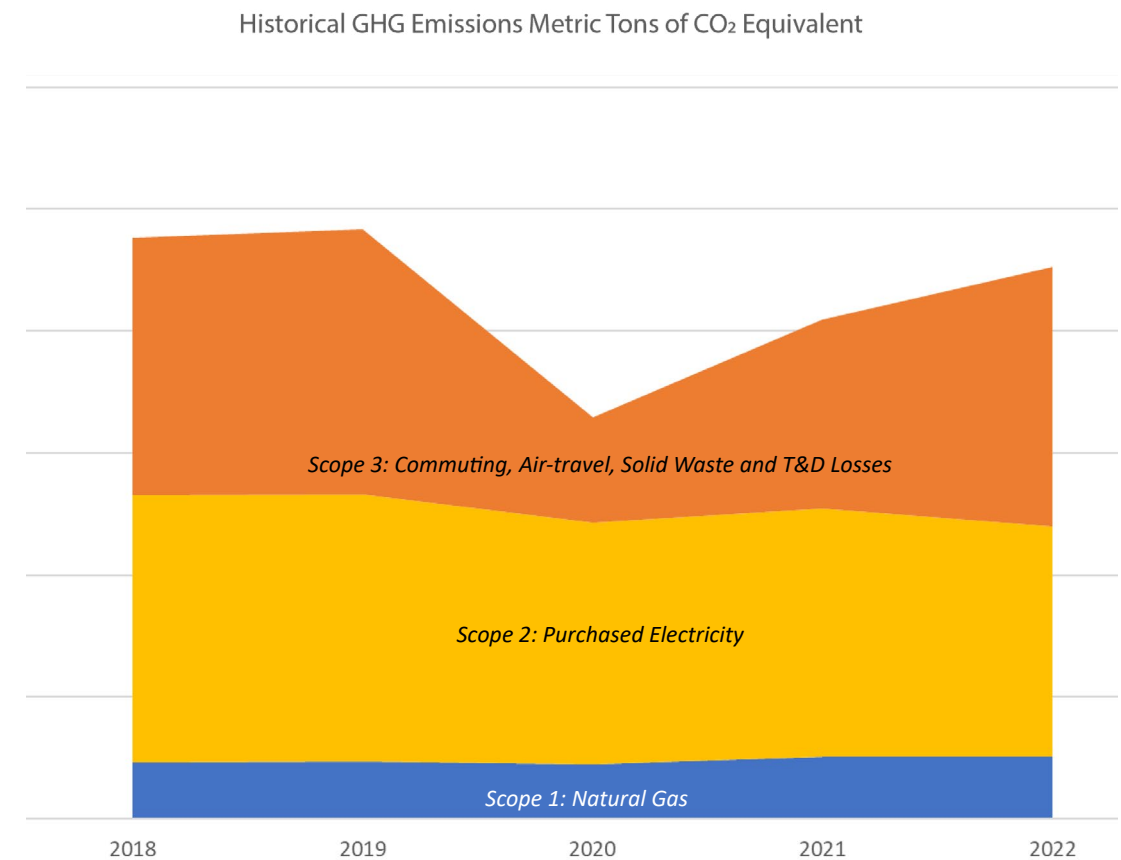
Historical GHG Emissions Metric Tons of CO_2 Equivalent

Figure 4: Historical GHG emissions from all sources (2018 - 2022)

Figure 4 illustrates the relatively large impact UNLV's electricity purchases have on GHG emissions from campus operations. Scope 2 emissions show a slight decline over time. This is due to a relatively stable electricity demand on campus and a gradual reduction of carbon emissions from electricity generation as NV Energy adheres to the Renewable Portfolio Standard ("RPS") set by SB358 in 2019[5]. The percentage of renewable energy required by the RPS will increase at a scheduled rate until it reaches 50% in 2030. This is projected to continue until 100% of electricity production is renewable by 2050.

The Scope 3 emissions are dominated by air travel and commuting. At this point, the GHG emissions represented in Figure 4 are derived from estimated "per FTE" emission factors[6]. While indicative of the scale of commuting and air-travel emissions, UNLV should work toward a more accurate assessment of commuting and air-travel activity. UNLV should perform an analysis of its university-funded travel as well as a survey of the commuting behaviors of its students, faculty, and staff.

A more detailed breakdown of the individual sources of emissions is shown in Figure 5. This is a snapshot of the latest year of reported emissions, 2022.
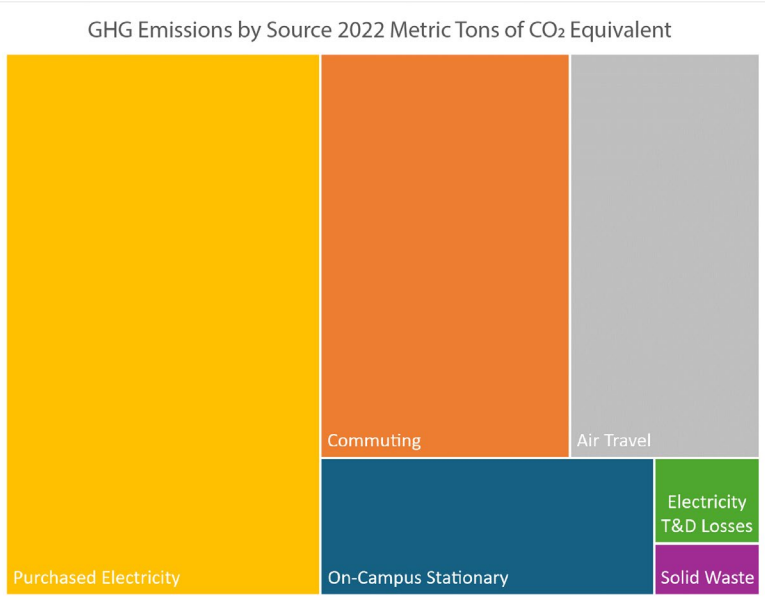

GHG Emissions by Source 2022 Metric Tons of CO_2 Equivalent

Figure 5: GHG Emissions in 2022 by source activity

Figure 6 shows the distribution of GHG emission contributions by location. The Maryland campus is responsible for the overwhelming source of emissions, with 94.3% of GHG emissions.
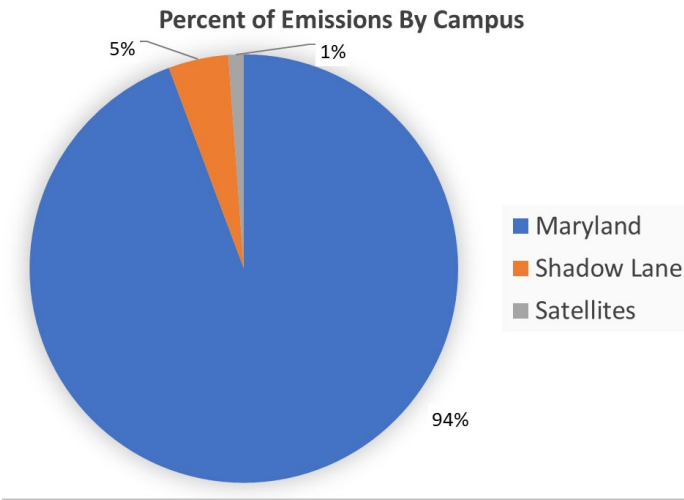

Percent of Emissions By Campus

- Maryland
- Shadow Lane
- Satellites

Figure 6: GHG Emissions contributions by campus location

[5] https://www.leg.state.nv.us/App/NELIS/REL/80th2019/Bill/6651/Overview
[6] These factors are derived from over 2,300 historical emission reports made by 4-year colleges to Second Nature, from 2007 to 2020.

Business-as-usual Forecast

The Business-as-usual Forecast ("BAU") is a key modeling tool the planning team used to develop this plan. The BAU represents a base-case scenario that forecasts what would happen if the current campus district energy systems, vehicle fleet, and related operational practices were to continue their current, as planned, trajectories. The BAU assumes that current systems and equipment will be replaced or rebuilt at the end of their useful lives and that additional capacity will be added to support current and new building loads to continue providing reliable energy services.

The BAU Scope 1 and 2 GHG emissions forecast is driven by forecasted needs and based on how the projected energy supply system will meet the campus's current and future energy demands. The BAU Scope 3 projection is based on estimated student and employee FTE growth.

The BAU Forecast does not consider any macroeconomic or market trends that will affect GHG emissions. Improved fuel efficiency in vehicles and airplanes, the adoption of renewable fuels, increased production of renewable energy feeding into the grid, and the increased adoption of zero-emission vehicles ("ZEV") will all have an impact on GHG emissions. Rather than making a specific prediction on how these trends might play out over the coming decades, the planning team integrated these trends into the solutions and portfolio modeling discussed later in this plan to better illustrate their specific relative impacts.
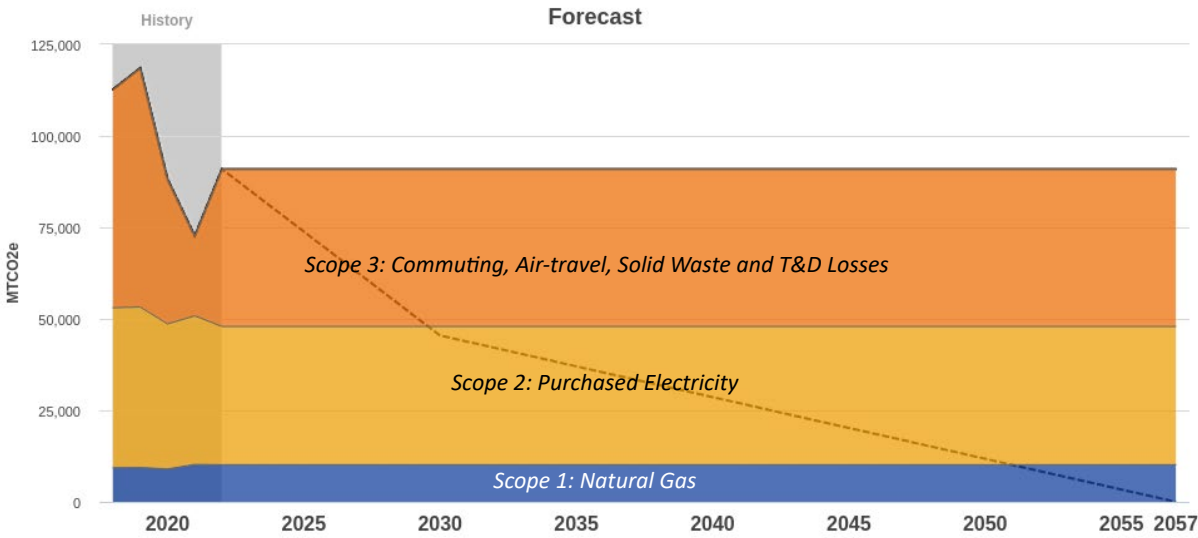

Figure 7: Historical GHG emissions & forecasted BAU in relation to an emissions reduction goal for Scopes 1, 2, & 3

The Charge

The Rebel CAP emphasizes that UNLV must prioritize its commitment to addressing the climate crisis through emissions reduction with support from leadership and equitable partnerships. It must have clear policies and expectations while being achievable and realistic. "The Charge" was developed by the Sustainability Task Force

1. to guide decision-making within the planning process,
2. to align the plan with UNLV's Top Tier 2.0 Mission, Vision, and Values, and
3. to articulate the University's unique position to lead collegiate climate action in Nevada.

THE CHARGE

The Rebel Climate Action Plan ("Rebel CAP") is the University of Nevada, Las Vegas' roadmap to achieving its emissions reduction goals and contributing solutions to address the climate crisis in the desert Southwest. Through an equitable and inclusive process, the Rebel CAP builds on and enhances our impact as a regional and national leader in education, innovation, and research. The Rebel CAP leverages the UNLVs Top Tier 2.0 Mission, Vision, and Values and the University's unique position to lead collegiate climate action in Nevada.

Therefore, through the Rebel CAP the University must:

• **Eliminate Emissions.** Go beyond the Paris Accord to reduce emissions by 50% or more by 2030 and 100% by 2057.
• **Prioritize Commitment.** Ensure that addressing the climate crisis is a top and lasting priority for UNLV in educational experiences, research, scholarship, professional, and creative activities and supports students, faculty, and staff in establishing and achieving collective goals.
• **Leverage Leadership.** UNLV will build upon Nevada's position as a leader in climate action locally, regionally, and globally.
• **Illustrate Partnerships.** Leverage UNLV partnerships to build community through the Rebel CAP process and apply a climate justice and equity lens in all recommendations.
• **Embed Action.** Establish clear policies for embedding climate action throughout the institution. Set clear expectations, including guidance on an achievable timeline, realistic financial implications, and clearly outline roles and responsibilities.

Engagement

The Rebel CAP planning process was designed to be collaborative and include input from as many groups as possible. With support from the consultant team, a core team of staff and students guided the plan development process with guidance from the STF. Seven topic-specific working groups conducted research and provided recommendations to develop this plan:

1. Academics & Research
2. Buildings & Energy
3. Green Procurement & Policies
4. Stewardship & Climate Justice
5. Sustainable Transportation
6. Waste Management
7. Water Resource Management

In addition, UNLV engaged the campus community in a variety of touchpoints:

• Rebel CAP Launch Event. UNLV hosted the Rebel CAP launch event in September 2023 to publicly announce the project. During the event, participants were engaged in a gallery walk to share UNLV successes and areas for improvement related to the working group topic areas.

- Rebel CAP Survey. Over 400 participants shared their perspectives on climate action solutions for UNLV through the Rebel CAP Survey.
- Tabling Events. Rebel CAP Core Team representatives hosted tabling events to inform the campus community about the plan development process and share information about UNLV sustainability and climate action.
- Working Group Recommendations. Initial recommendations formed by the working groups were shared on the UNLV website for public comment.

In an effort to monitor and evaluate the inclusiveness of the process across all campus demographics during Rebel CAP development, UNLV conducted a demographic survey at various engagement activities .

Equity

Incorporating social equity and justice throughout the UNLV Rebel CAP not only underscores the UNLV commitment to both equity and environmental justice, but also represents a strategic effort to advance climate action goals while simultaneously addressing structural disparities and injustices. By integrating equity and inclusivity throughout this plan – including emissions reduction strategies, energy-efficiency initiatives, and sustainable practices – the university ensures equal access to benefits and resources for the whole university community. By centering equity in the planning process, UNLV recognizes the diverse impacts of climate change on different community groups and acknowledges that the Rebel CAP is an opportunity to engage diverse voices and foster a more resilient, just, and sustainable future.

To ensure equity was at the heart of each working group's recommendations, a comprehensive equity methodology was designed that included the identification of key equity priorities and opportunities in each working group , coordination between the Stewardship & Climate Justice working group and other Rebel CAP working groups, and an in-depth equity review of each recommendation.

CLIMATE ACTION RECOMMENDATIONS

The following table summarizes the Climate Action Recommendations, organized by the seven working group areas. A more detailed chart, including a short description[11], lead implementer(s), implementation timeline, emissions reduction impact, and financial implication, can be found in Appendix G[12].

Theme	Title	ID	GHG Impact (Direct/Indirect)	Included in Roadmap
Umbrella Recommendation	Sign the Second Nature Carbon Commitment	U 1	Indirect	No
Umbrella Recommendation	Establish a Sustainability Office	U 2	Indirect	No
Umbrella Recommendation	Formalize a Sustainability Advisory Council	U 3	Indirect	No
Umbrella Recommendation	Complete a Sustainability Tracking, Assessment & Rating System (STARS) Report	U 4	Indirect	No
Umbrella Recommendation	Integrate the Rebel CAP into Accreditation Consideration	U 5	Indirect	No
Academics & Research	Adopt a Sustainability Graduation Requirement	AR1	Indirect	No
Academics & Research	Create an Academic and Research Sustainability Institute	AR 2	Indirect	No
Academics & Research	Establish a Sustainability Course and Faculty Inventory	AR 3	Indirect	No
Academics & Research	Enhance Educational Programming	AR 4	Indirect	No
Academics & Research	Sustainability Awareness in Orientation	AR 5	Indirect	No
Academics & Research	Utilize Campus as a Living Lab	AR 6	Indirect	No
Academics & Research	Align Online Course Schedule	AR 7	Direct	Yes
Academics & Research	Adopt Institutional Learning Outcomes	AR 8	Indirect	No
Academics & Research	Administer Literacy Assessment	AR 9	Indirect	No
Buildings & Energy	Perform a Building Energy Assessment and Audit	BE 1	Indirect	No
Buildings & Energy	Perform an Onsite Energy Generation Assessment and Audit	BE 2	Indirect	No
Buildings & Energy	Improve Data Collection	BE 3	Indirect	No
Buildings & Energy	Share Data Assessment and Assurance Findings	BE 4	Indirect	No
Buildings & Energy	Implement an Advanced Energy Management System	BE 5	Indirect	No
Buildings & Energy	Improve Building Energy Efficiency	BE 6	Direct	Yes
Buildings & Energy	Explore a Virtual Power Purchase Agreement	BE 7	Direct	Yes
Buildings & Energy	Increase Onsite Renewable Energy & Storage	BE 8	Direct	Yes
Buildings & Energy	Provide Energy Education	BE 9	Indirect	No
Buildings & Energy	Exceed Energy Code & LEED Requirements	BE 10	Direct	Yes
Buildings & Energy	Implement an Energy Management System	BE 11	Indirect	No
Buildings & Energy	Develop a Green Labs Program	BE 12	Indirect	No
Buildings & Energy	Formalize & Fund an Energy Efficiency Program	BE 13	Direct	Yes

Theme	Title	ID	GHG Impact (Direct/Indirect)	Included in Roadmap
Buildings & Energy	Enhance Construction & Renovation Standards	BE 14	Direct	Yes
Buildings & Energy	Optimize Buildings for Electrification	BE 15	Direct	Yes
Buildings & Energy	Electrify Thermal Systems	BE 16	Direct	Yes
Green Procurement & Policies	Join the Sustainable Purchasing Leadership Council (SPLC)	GPP 1	Indirect	No
Green Procurement & Policies	Adopt a Sustainable Investment Policy	GPP 2	Indirect	No
Green Procurement & Policies	Supply Storage Space to Programs	GPP 3	Indirect	No
Green Procurement & Policies	Provide Procurement Awareness	GPP 4	Indirect	No
Green Procurement & Policies	Establish an Equipment Inventory	GPP 5	Indirect	No
Green Procurement & Policies	Adopt Food and Beverage Purchasing Guidelines	GPP 6	Indirect	No
Green Procurement & Policies	Enhance the Social Sustainability and Supplier Inclusion Program	GPP 7	Indirect	No
Green Procurement & Policies	Establish a Procurement Task Force	GPP 8	Indirect	No
Stewardship & Climate Justice	Expand Community Recycling Assistance	SCJ 1	Indirect	No
Stewardship & Climate Justice	Adopt Equitable Engagement	SCJ 2	Indirect	No
Stewardship & Climate Justice	Hire Sustainability-focused Faculty	SCJ 3	Indirect	No
Stewardship & Climate Justice	Formalize Diversity and Sustainability Coordination	SCJ 4	Indirect	No
Sustainable Transportation	Enhance Bike Infrastructure	ST 1	Indirect	No
Sustainable Transportation	Expand RTC Partnership	ST 2	Indirect	No
Sustainable Transportation	Increase Bus Service Access	ST 3	Direct	Yes
Sustainable Transportation	Expand Electric Vehicle (EV) Infrastructure	ST 4	Direct	Yes
Sustainable Transportation	Introduce Park and Ride Shuttle Program	ST 5	Direct	Yes
Sustainable Transportation	Adopt Fleet Vehicle and Equipment Electrification Policy	ST 6	Direct	Yes
Sustainable Transportation	Explore Solar Covered Walkways	ST 7	Direct	Yes
Sustainable Transportation	Implement Commute and Air Travel Offset Programs	ST 8	Direct	Yes
Waste Management	Establish a Data Tracking, Storage, and Sharing Protocol	WM 1	Indirect	No
Waste Management	Establish Waste Minimization and Diversion Goals	WM 2	Direct	Yes
Waste Management	Expand Post-consumer Composting	WM 3	Direct	Yes
Waste Management	Hire a Zero Waste Manager	WM 4	Indirect	No
Waste Management	Create a Waste Education Task Force	WM 5	Indirect	No
Waste Management	Develop a Bin Expansion and Standardization Protocol	WM 6	Indirect	No
Water Resource Management	Improve Infrastructure and Leak Identification	WRM 1	Indirect	No
Water Resource Management	Continue Drought Resistant Landscaping	WRM 2	Indirect	No
Water Resource Management	Explore Cooling Tower Replacement	WRM 3	Indirect	No
Water Resource Management	Maximize Rainwater Utilization	WRM 4	Indirect	No
Water Resource Management	Create a Water Conservation Research Inventory	WRM 5	Indirect	No
Water Resource Management	Develop Water Reclamation & Potable Demand Infrastructure	WRM 6	Indirect	No

Modeling Impact

The planning team developed an energy, emissions, and costs model to forecast the combined impacts of the Climate Action Recommendations. The following "Wedge Diagram" shows the modeled aggregate emissions reduction that UNLV could achieve through the full implementation of this plan. For a more detailed description of the modeling process, assumptions, and detailed energy and cost implications, see Appendix I.
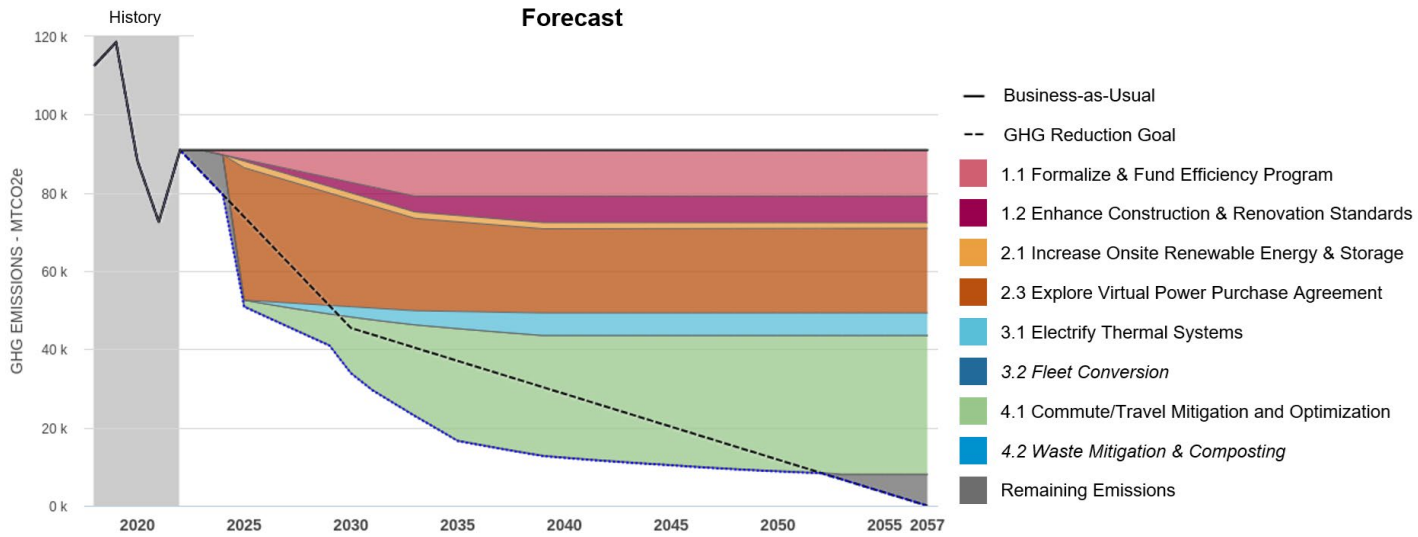

Figure 8: GHG Mitigation Wedge Chart

A Summary of Insights

- **Efficiency First:** A significant reduction in energy use can be made through a funded efficiency program as well as adhering to enhanced construction and renovation standards for new and renovated spaces. This energy savings would lead to the reduction of GHG emissions from onsite combustion and grid electricity.
- **Energy Transition:** Many "Energy Transition" recommendations propose shifting from natural gas combustion to grid-purchased electricity. Since the majority of UNLV's current emissions come from purchased electricity, this may seem counterproductive. However, if these strategies coincide with increased renewable electricity, "electrification" becomes a viable emissions reduction strategy.
- **Scope 3 emissions reductions are likely to come from a wide variety of sources.** Accordingly, the efforts to address them are spread across a multitude of recommendations and solutions. For example, GHG emission reductions from commuting or air travel are reduced through a combination of mitigation and voluntary offset programs for commuting and air travel.

Also, the model assumes that the commuter fleet will continue to "green" over time with the adoption of zero-emission vehicles, such as Battery Electric Vehicles ("BEV").

- **Indirect Impacts:** Many of the recommendations in this plan do not have impacts that can be easily shown in a GHG reduction chart. However, UNLV will need a comprehensive set of strategies to achieve UNLV's larger climate action goals, including:
  - Providing organization and leadership for all sustainability efforts on campus.
  - Incorporating water conservation efforts into energy and emissions reduction programs.
  - Incorporating educational programming opportunities into energy, water, sustainability, and waste reduction.
  - Ensure diversity, equity, and inclusion are considered across all initiatives and programs that grow from this plan.
- **Strategic Direction over Perfection:** The planning process highlighted several areas where better data is needed, additional studies will be required, or gaps remain. UNLV's Rebel CAP will need to continue to evolve over the coming years and decades to add additional clarity to the path ahead. However, this plan does show a strategic path forward. While the final mile remains hazy, the first steps are clear.

IMPLEMENTATION

Key Next Steps

Through extensive consultation with campus staff, students, and the broader campus community through the Sustainability Task Force, topic-specific working groups, multiple in-person events and online surveys, the core team identified crucial first steps to successfully implement the Rebel CAP. Based on The Charge, UNLV's stated goal is to achieve carbon neutrality by 2057 with an interim goal of 50% in GHG Emissions by 2030. This will require immediate actions to meet the short-term goal and long-term, sustained action from the entire institution. This section intends to organize and summarize the Climate Action Recommendations, key initiatives and related organizational changes UNLV should administer and fund to implement this plan.

1) Develop Climate Action Programs

UNLV has opportunities to reduce operational costs and GHG emissions with a focus on improving energy efficiency, increasing the use of renewable energy, and transitioning campus infrastructure for a post-fossil-fuel world. Each of these efforts will need programs with staff focused on defining, prioritizing, and implementing projects or programs as part of regular campus operations.

Optimize Energy and Water Use – Reduce the demand for resources.
- **Formalize and fund an energy efficiency program.** This includes implementing building-level metering, energy audits, and campus-wide delivery of standardized energy conservation measures. There is also an opportunity to enhance students' educational experience through their inclusion in this effort.
- **Enhance Construction & Renovation standards.** UNLV will take a leadership position when renovating or constructing new spaces by designing and building beyond current energy and building code requirements.

Drive Renewable Energy Deployment – Maximize the use of renewable energy.
- **Expand onsite renewables.** Look for additional opportunities to build rooftop solar PV generation, solar-covered walkways, and carport-based systems. Solar PV can be paired with battery storage for resilience. Attention should be paid to IRA incentives for these efforts. EV charging can also be expanded when Solar PV is expanded.
- **Expand offsite renewables** to bring UNLV's electricity purchase to 100% renewable.
- Add renewable thermal resources such as ground-source heating and cooling wells and heat-recovery technologies.

Embrace the Energy Transition – Replace fossil-fuel combustion with modern, efficient electric alternatives:
- **Replace fossil-fuel equipment** for building thermal comfort, domestic hot water, and cooking, with more efficient electrified systems, including heat pumps and induction cooktops.
- **Replace internal combustion vehicles and equipment** with electric alternatives as equipment reaches its end-of-life.

Leverage Procurement and Contracts – Incorporate climate action outcomes in policies and agreements.
- **Create a procurement task force** to establish environmentally preferable purchasing and contract goals.
- **Establish a clear and consistent procurement framework** for all university sectors to enhance and centralize environmentally preferred purchasing and contract policies.

Manage and Reduce Solid Waste – Actively manage waste generated on campus:
- **Implement policies to track** campus waste, reduce the tonnage of waste, and increase diversion from landfills.
- **Establish waste reduction goals** in alignment with waste data to reduce waste generated and increase waste diverted from landfills. Increase composting of organic waste.

Water Conservation – Reduce water demand and manage use.
- **Install water reclamation infrastructure** to capture grey or rainwater for suitable applications.
- **Reduce potable water use** in campus facilities by installing low-water use fixtures.
- **Identify, map, and share UNLV water infrastructure,** including pipes, nodes, and valves. Adopt a protocol to quickly identify and fix leaks, including analyzing high-water usage campus areas.

2) Build a Sustainability Office

Sustainability efforts at UNLV have occurred at many places around campus – in facilities, student government, and the educational experience. This energy for change can be better harnessed and directed from a central nexus of sustainability.

- **Allocate Permanent Funding.** In addition to determining an organizational location for a Sustainability Office
- **Hire a Sustainability Director,** once the office is funded, and support staff to coordinate activities across UNLV.
- **Improve Sustainability Data Quality.** Centralizing and coordinating data collection will be critical to monitoring climate action progress.
- **Coordinate the campus community:** UNLV has existing staff and departments to manage actions related to campus buildings, energy, grounds, purchasing and contracts, and transportation. A sustainability office will provide UNLV with coordination between departments and provide connections to UNLV's academic and research units.

3) Evolve capital planning, budgeting, and funding models

UNLV must reevaluate current budgeting processes and financial controls to fund projects and programs defined above, while also adjusting investment and procurement protocols to embed a culture of climate action.

- **Leverage deferred maintenance for climate action.** Co-optimize spending to address deferred maintenance also to accelerate energy efficiency and meet GHG emissions reduction goals.
- **Formalize a revolving energy efficiency fund** to enable faster and repeated adoption of energy efficiency measures.
- **Capture federal, state, and regional incentives.** With the recent passage of landmark federal legislation, there has never been a better time to fund climate action.
- **Explore public-private partnerships.** Creating a renewable future is capital-intensive with lower long-term operating costs. Private capital sees higher education institutions as long-term, low-risk areas of investment. UNLV should explore how to leverage private capital to meet institutional goals.

4) Leverage Institutional Planning, Student and Faculty Action

As a higher education institution, UNLV is responsible for embedding climate action into the student and faculty experience. UNLV will seek opportunities to increase campus engagement around climate change issues through various teaching and learning avenues.

- **Accreditation Consideration.** To ensure the Rebel CAP is adopted as a strategic plan that informs university decision-making, UNLV will incorporate sustainability into its mission and self-study planning documents for consideration during the Northwest Commission on Colleges and Universities accreditation process.
- **Enhanced Educational Programming** by establishing climate change degree programs encompassing various disciplines to ensure that all UNLV students have access to sustainability, climate change, and environmental justice learning opportunities.
- **Campus as a Living Lab.** Utilizing the UNLV campus infrastructure as a laboratory for education and research opportunities by connecting operational emissions reduction projects and programs to course curricula and co-curricular learning to improve hands-on education and workforce development opportunities for students.
- **Diversity and Sustainability Coordination** is paramount to formalizing connections between diversity, equity, inclusion, and sustainability efforts. UNLV staff will be intentional when establishing membership in related councils and committees.
- **Equitable Engagement.** The Rebel CAP is everyone's responsibility at UNLV. Implementing the Rebel CAP will require engaging diverse student perspectives to ensure equitable outcomes.

Accountability

The success of the Rebel CAP is dependent on university-wide collaboration to move aspirations to actions. The entire UNLV campus, from academics through operations and student affairs, has a responsibility to be aware of the recommendations outlined in the Rebel CAP and to incorporate these goals into annual programming, financial planning, and progress reports.

The UNLV President is the sponsor of this plan. Cabinet will support the implementation of plan recommendations with staffing and resources. Rebel CAP oversight, implementation guidance, annual progress updates, and general communication will be the responsibility of the Office of Sustainability, once formed, with advisement from the formally recognized Sustainability Advisory Council.

Business Affairs will oversee funding for the Rebel CAP. Planning and Construction will lead the efforts for capital planning and design. Facilities Management will address maintenance of existing facilities and energy monitoring. Academic Affairs and Student Affairs will lead efforts to establish educational connections and enhance the student experience as outlined in this plan. UNLV Philanthropy & Alumni Engagement will lead efforts to align with investment partners seeking ESG-focused investments and climate resiliency-focused fundraising.

The Rebel CAP is intended to be a 5-year strategic plan. A comprehensive update to this plan is anticipated by 2030. In the interim, annual progress reports will be organized by the Office of Sustainability and shared with the President.

Appendices

- Appendix A: Strategic Alignment & Peer Institution Review
- Appendix B: Engagement Structure
- Appendix C: Rebel CAP Survey
- Appendix D: Demographics Surveys
- Appendix E: Equity Framework
- Appendix F: Equity Considerations & Review
- Appendix G: Recommendations
- Appendix H: GHG Emissions Reporting
- Appendix I: Modeling Assumptions and Emission Reduction Roadmap

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UNLV Top Tier 2.0 Strategic Alignment
- Casey Wyman, VP, Business Affairs / CFO
- Alexandra Nikolich, Chief of Staff, Business Affairs
- Kyle Kaalberg, Ph.D., Executive Director, Strategy and Strategic Initiatives
- Jean Vock, Former SVP, Business Affairs / CFO
- Kimberley Case-Nichols, Former Chief of Staff, Business Affairs
- Faculty Senate

UNLV Leadership
- President's Cabinet
- Office of the President
- Office of the Executive Vice President and Provost
- Provost's Senior Leadership Team
- Business Affairs Senior Leadership Team
- Office of Government and Community Engagement
- Division of Philanthropy and Alumni Engagement

Sustainability Support Team
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- Julia Subick, UNLV '24, Social Media Practitioner
- Trinity Reynoso, UNLV Sustainability

- Tarek Zahid, UNLV Energy Engineer
- Facilities Management Team
- Rebel Recycling
- UNLV Student Garden Club

Technical Support Team
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- Haysam Selim Abdelhamid, Systems Administrator
- Edwin Cardona Cortez, Software Applications Engineer
- Aaron Venzon, FM Technology Student Worker

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- Andie Davis, UNLV Campus Community Garden Coordinator, Facilities Management
- Division of Integrated Marketing and Branding
- Heather Ortiz, Director of Communication, Business Affairs

Rebel CAP Launch Event Speakers
- Clark County District A Commissioner Michael Naft
- Assembly District 11 Candidate Cinthia Moore
- Alison Sloat, Ph.D., Professor in Residence, College of Sciences

Events
- UNLV Student Union & Event Services
- Aramark Collegiate Hospitality

Appendix A: Strategic Alignment & Peer Institution Review

Strategic Alignment

In addition to "The Charge," the core team conducted intentional research at the start of the planning process to understand the local, regional, national, and international contexts where the Rebel CAP should align. The team reviewed and documented directives that influence UNLV decision-making and integrated these into the Rebel CAP planning process, as appropriate. The Rebel CAP is not a stand-alone document but a strategic plan that considers interconnected climate action priorities for UNLV. Strategic alignment with driving factors is outlined in the table below.

Area	Guiding Directives	Description
Local	SR 52-365	• CSUN requests the creation of a Climate Action task force or university committee committed to the creation and adoption of a University Climate Action Plan • Recommend the creation and adoption of this CAP for UNLV within the next 9 months
	Design, Construction, & Sustainability Standards	• The mandate for UNLV is to be the beacon concerning environmental sustainability and energy/water efficiency

	Top Tier 2.0 - Vision, Mission, & Values	• UNLV Values call for Collaboration and Stewardship
		Core areas include the following objectives:
		  • effectively and strategically manage limited resources to maximize return on investment
		  • expand and enhance ability to gather input from UNLV's faculty, staff, students and constituents to inform critical decision-making

	Peer Institutions	• Comparison of UNLV Aspirant and Peer institutions to understand relationship between sustainability and climate action goals
Regional	All-In Clark County	• Focus areas are Clean & Reliable Energy, Connected & Equitable Mobility, Diverse & Circular Economy, Resilient & Healthy Community, Smart Buildings & Development, and Sustainable Water Systems • 2040 goals include reducing GHGs attributable to buildings in Clark County by more than 50%; reducing annual water consumption, measured by gallons per capita per day, by 30%; increasing tons of organic waste diverted from Landfill County-wide by more than 800%; and increasing average monthly transit ridership by more than 80%
	SB 254	• GHG reduction goals from 2005 levels: 28% reduction by 2025; 45% reduction by 2030; Net-zero by 2050
	2023 Nevada Recycling and Waste Reduction Report	• Goal for state recycling rate of 25%
	Nevada System of Higher Education - Board of Regents E&S Policy	• Commitment to protecting the environment, reducing the System's dependence on non-renewable energy sources, and promoting the construction, maintenance, and renovation of buildings that are environmentally responsible, economically feasible, and healthy spaces to work and live
National	Better Buildings Initiative	• Improve energy intensity of the entire U.S. portfolio by at least 20% within 10 years
	Better Climate Challenge	• Reduce GHG emissions across their U.S. building or plant portfolio by at least 50% over 10 years. To be a goal achiever, organizations must meet the 50% reduction target without using GHG offsets. • Develop an organization-wide plan with GHG emissions reduction milestones
International	UNSDGs	• Goal 9: Industry, Innovation and Infrastructure • Goal 11: Sustainable Communities and Cities • Goal 13: Climate Action
	Paris Agreement	• GHG emissions must peak before 2025 at the latest and decline 43% by 2030
	Association for the Advancement of Sustainability in Higher Education ("AASHE") Sustainability Tracking, Assessment & Rating System ("STARS")	• A transparent, self-reporting framework for colleges and universities to measure their sustainability performance

Figure 1: Rebel CAP Strategic Alignment with Guiding Directives

Peer Institution Review

As part of Top Tier 2.0, UNLV has adopted aspirational and comparative peer institutions consistent with NSHE. Benchmarking climate action initiatives with peer institutions highlights where UNLV ranks among its rivals. UNLV identified different ranking systems, as well as other key statistics, to compare themselves to other institutions. The primary tool utilized in this process was STARS ("Sustainability Tracking Assessment & Rating System"), a transparent, self-reporting framework for colleges/universities to measure their sustainability performance. UNLV was a STARS rated institution in 2015.
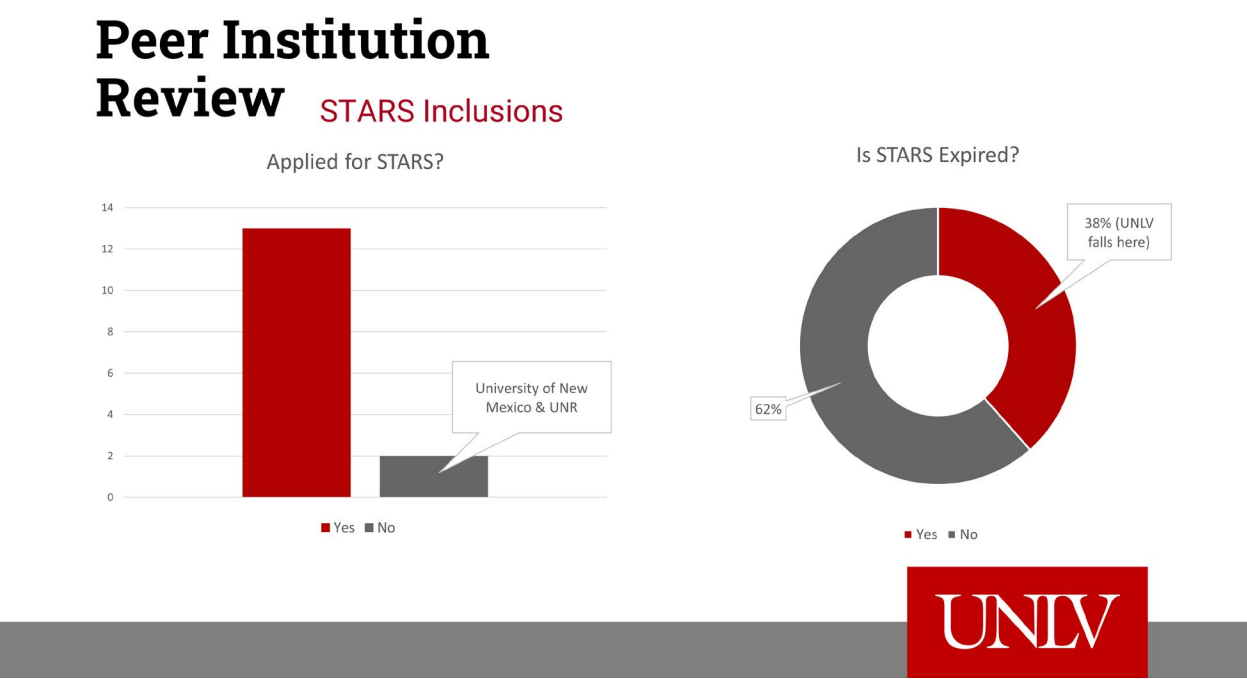
Figure 2: Initial STARS Findings

Figure 2 illustrates that of the peer institutions identified by UNLV, a majority have applied for a STARS rating in the past. However, 38% of these institutions' applications have been at least three years removed (UNLV included), and therefore are considered "Expired" (institutions must re-apply every three years to keep their STARS report current).

The main result of a STARS application is an overall rating. STARS gives ratings based on the information that is provided in the application (i.e., Greenhouse Gas Emissions, types of programs to deplete emissions, and other pertinent information). An institution is then given a score between 0 and 100, as well as a discrete rating of Bronze, Silver, Gold, or Platinum, as seen below:

STARS Overall Score
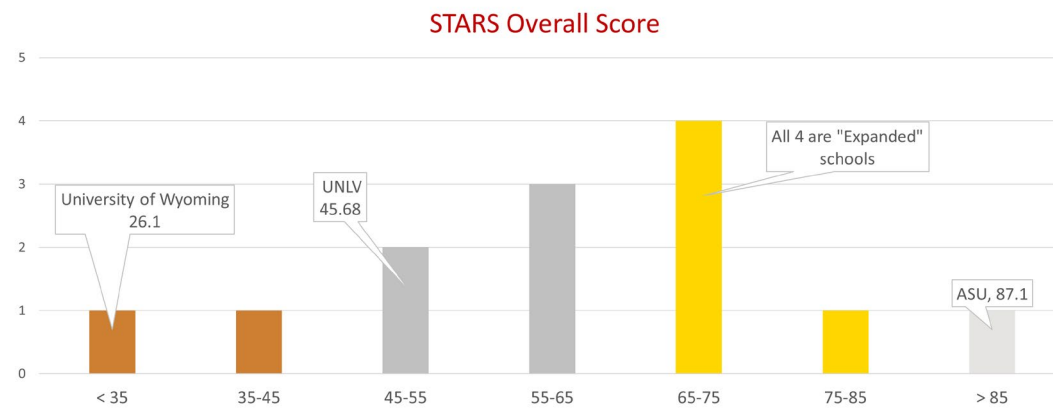
Figure 3: STARS Ratings for Peer Institutions

As seen above, UNLV falls slightly above the distinction between Bronze and Silver (45.68). To achieve the rating of "Bronze," an institution must receive a rating of between 35 and 44.99. For "Silver," an institution must receive between 45 and 64.99. (Arizona State University is not a member of UNLV's peer institutions as defined by NSHE – it is included as a "gold-standard" that UNLV can look to for climate-specific aspirations.)

A more in-depth comparison between different types of peers and their respective ratings is shown here:

STARS Rating Levels by Peer Type
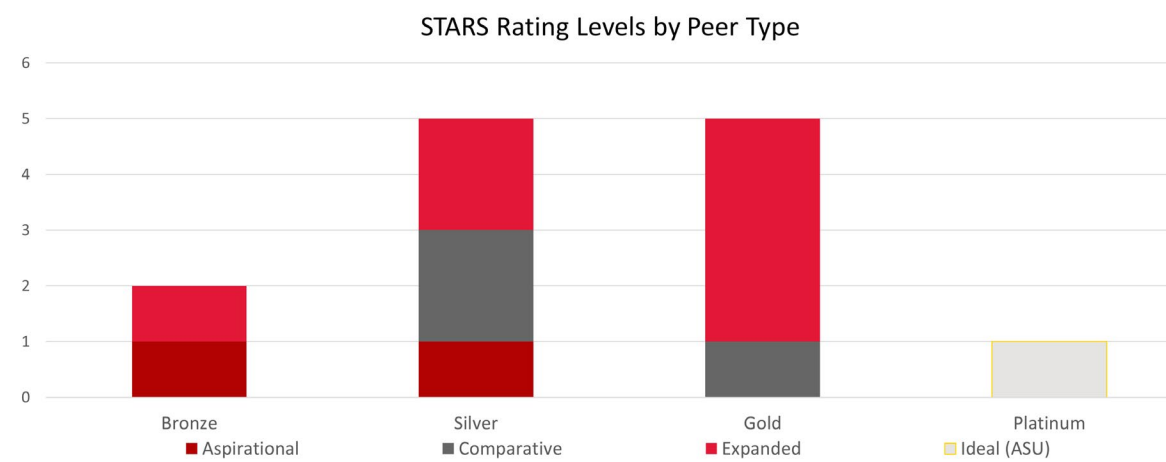
Figure 4: STARS Ratings by Peer Type

Interestingly, both "Aspirational" schools have STARS ratings of Bronze or Silver, whereas UNLV more closely aligns with its "Comparative" schools.

Though STARS is a great overarching rating system for comparing schools, two other rating systems were incorporated in the comparison. The Sierra Club Cool Schools ranking system, which ended in 2021, was open to all United State and Canada four-year, degree-granting undergraduate colleges and two-year community. The Princeton Review's "Green Colleges" is another ranking system utilized in this comparison. Both Sierra Club and Princeton Review use STARS data as a baseline for their ranking platforms.
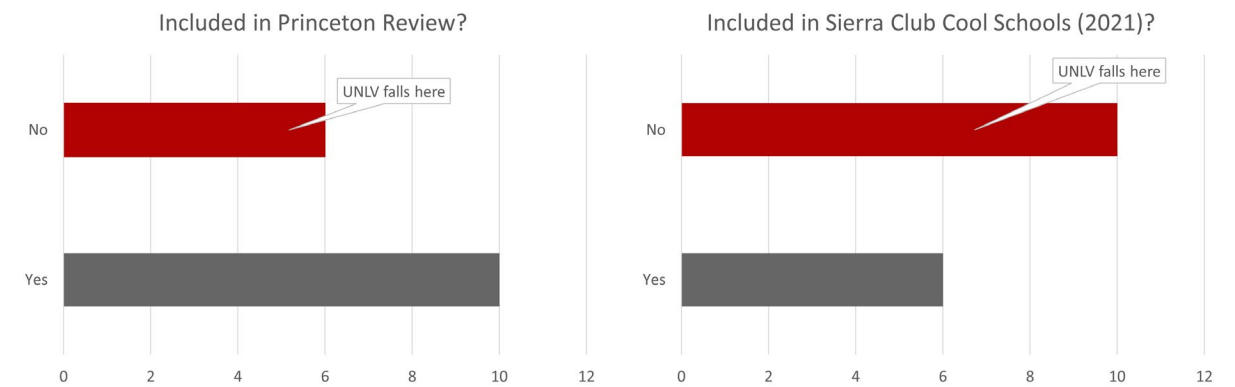
Figure 5: Princeton Review and Sierra Club Cool Schools

As seen above, UNLV was not included in either ranking system. Though Sierra Club Cool Schools has not created a ranking system since 2021, this list is a recent comparison of schools. It is anticipated that the current work being done by the University will lead to similar recognition in national ranking platforms.

Appendix B: Engagement Structure

An engagement structure was organized to ensure cross-campus collaboration, involvement from subject-matter experts, and touchpoints with leadership for decision-making.

Core Team
- B&D and UNLV Team
- Weekly to Bi-Weekly Meetings
- General Oversight and Coordination

Executive Leadership
- Review and Approve Recommendations
- Periodical Engagement

Sustainability Task Force
- High-level, Multi-disciplinary Membership
- Monthly / Bi-monthly Meetings
- Make Recommendations to Executive Leadership
- Provide Feedback to Working Groups & Consultants
- Working Group Leads

Working Groups
- Key Constituents and Subject Matter Experts
- Topical Deep Dives
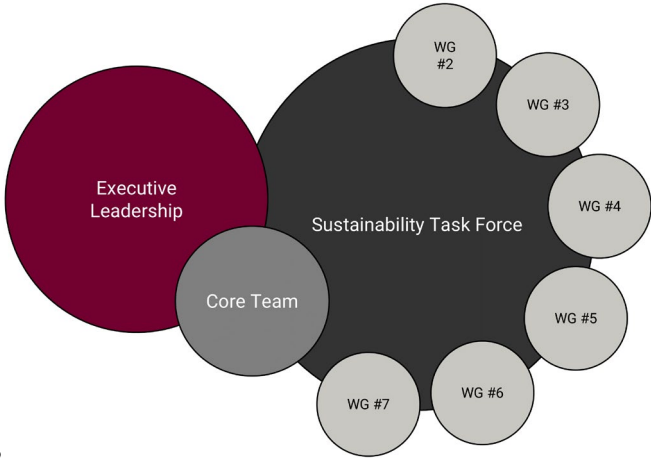- Present Findings to Sustainability Task Force
- Regular Meetings, as necessary

Figure 1: UNLV Rebel CA.. Engagement Structure

Core Team Members

Name	Title
Zachary Billot	CSUN Official; Student/Student Researcher, Brookings Mountain West
Andie Davis	UNLV Campus Community Garden Coordinator, Facilities Management
Musa Pam	Associate Vice President, Facilities Management
Tara Pike	Sustainability Coordinator/Recycling Manager, Facilities Management

Sustainability Task Force

Name	Title
Levent Atici	Executive Director of Undergraduate Research, Anthropology
Deborah Bergin	Director of Planning & Facility Partnerships, Planning & Construction
Christine Bergman*	Professor, Hospitality
Zachary Billot	CSUN Official; Student/Student Researcher, Brookings Mountain West
Lisa Davis*	Executive Director of Graduate Student Services, Lee Business School
Andie Davis	UNLV Campus Community Garden Coordinator, Facilities Management
Annakaren Sanchez	Administrative Assistant II to the AVP for Facilities Management

Name	Title
Alfredo Fernandez-Gonzalez	Professor, School of Architecture
Robert Futrell	Professor, Sociology
Monica Garcia	President, College of Liberal Arts Alumni Chapter
David James*	Associate Professor, Civil and Environmental Engineering & Construction
Don Johnson	Assistant Director of Facilities Operations, Facilities Management
Helen Neill	Associate Professor, Public Administration
Musa Pam*	Associate Vice President, Facilities Management
Tara Pike*	Sustainability Coordinator/Recycling Manager, Facilities Management
Krystyna Stave	Associate Professor, Public Administration
John Treston*	Executive Director and University Architect, Planning & Construction

Working Group Lead/Co-Lead

Working Groups

Academics & Research

Name	Title
Emma Frances Bloomfield	Associate Professor, Communication Studies
Shi-Lynn Campbell	Communications Assistant, Business Affairs
Taylor Cayro	Sales & Marketing Coordinator, Student Union & Event Services
Heejin Cho	Professor of Energy Technology, Mechanical Engineering; ASME Fellow
Lisa Davis*	Executive Director of Graduate Student Services, Lee Business School
William Doyle	Associate Professor in Residence, Honors College
Jake Florez	Student
Marie-Odile Fortier	Assistant Professor, Civil and Environmental Engineering and Construction
Kaylie Kurland	Graduate Assistant, Educational Psychology, Leadership, and Higher Education
Mike Kwiecien	Senior Project Manager, Planning and Construction
Colette LaBouff	Director, Beverly Rogers, Carol C. Harter Black Mountain Institute
Jay Nietling	Computer Systems Programmer, HiPSEC, Physics and Astronomy
Musa Pam	Associate Vice President, Facilities Management
Riley Ramos	Research Assistant, Auditory Cognition; Undergraduate Student, Engineering
Alyssa Renteria	Data Visualization and GIS Specialist
Danielle Roth-Johnson	Director of Gender and Sexuality Studies, Interdisciplinary, Gender, and Ethnic Studies; Professor-in-Residence

Name	Title
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Jason Steffen	Assistant Professor, Physics and Astronomy
Annie Vong	Student Researcher, Brookings Mountain West
Nicole Wargo	Inspired Sustainability Advocate
William Sipe	Assistant Professor in Residence, Honors College
Megan Wilson	Retention, Progression, & Completion Coordinator, Graduate College
Phillip Zawarus	Associate Professor, Architecture

Buildings & Energy

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Shi-Lynn Campbell	Communications Assistant, Business Affairs
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Marie-Odile Fortier	Assistant Professor, Civil and Environmental Engineering and Construction
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Jay Nietling	Computer Systems Programmer, HiPSEC, Physics and Astronomy
Musa Pam	Associate Vice President, Facilities Management
Riley Ramos	Research Assistant, Auditory Cognition; Undergraduate Student, Engineering
George Rhee	Professor, Physics and Astronomy
Melikabella Shenouda	Career & Professional Development Graduate Assistant, Liberal Arts
Allie Smith	Alumni?
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Green Procurement & Policies

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Marie-Odile Fortier	Assistant Professor, Civil and Environmental Engineering and Construction
Malcolm Greer	Undergraduate Student, Political Science and Government
Kaylie Kurland	Graduate Assistant, Educational Psychology, Leadership, and Higher Education
Colette LaBouff	Director, Beverly Rogers, Carol C. Harter Black Mountain Institute
Linda Lister	Professor of Voice, Music
Musa Pam*	Associate Vice President, Facilities Management
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Jake Florez	Student
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Malcolm Greer	Undergraduate Student, Political Science and Government
Jordan Guimarey	Undergraduate Student, Environmental Sciences
David James	Associate Professor, Civil and Environmental Engineering & Construction
James Kearney*	Grounds Superintendent, Facilities Management
Mike Kwiecien	Senior Project Manager, Planning and Construction
Colette LaBouff	Director, Beverly Rogers, Carol C. Harter Black Mountain Institute
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Steve Pastorino	Director of Business Development, Blackhawk Network
Alyssa Renteria	Data Visualization and GIS Specialist
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Zoe Terico	Document Specialist
Annie Vong	Student Researcher, Brookings Mountain West
Phillip Zawarus	Associate Professor, Architecture
Erin Zimmerman	Director, Writing Center

Working Group Lead/Co-Lead

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Jillian Buckholz	Sustainability Advisor, Brailsford & Dunlavey
Mike Chang	Director, Cascadia Consulting Group, Inc.
Kayla Jolly	Associate, Brailsford & Dunlavey
David Karlsgodt	Director of Energy & Sustainability Advisory Services, Brailsford & Dunlavey
Kevin Laycock	Energy and Climate Advisor, Brailsford & Dunlavey
Megan Lee	Associate, Cascadia Consulting Group, Inc.
Brett McQuillan	Senior Sustainability Consultant / Senior Mechanical Engineer, Affiliated Engineers, Inc.
Karen Summerville	Director of Communications & Public Engagement, Brailsford & Dunlavey
Victoria Wyrough	Associate, Brailsford & Dunlavey

Appendix C: Rebel CAP Survey

Throughout the development of the plan, a key engagement component was a survey of technologies, strategies, approaches, and systems that could potentially be deployed to strengthen the sustainability efforts at UNLV. The Rebel CAP Survey, an online tool to measure perspectives and share information on a variety of climate action solutions, offered the general campus community the opportunity to learn about various emissions reduction strategies and share which strategies they'd like to see employed at UNLV.

Who Responded?

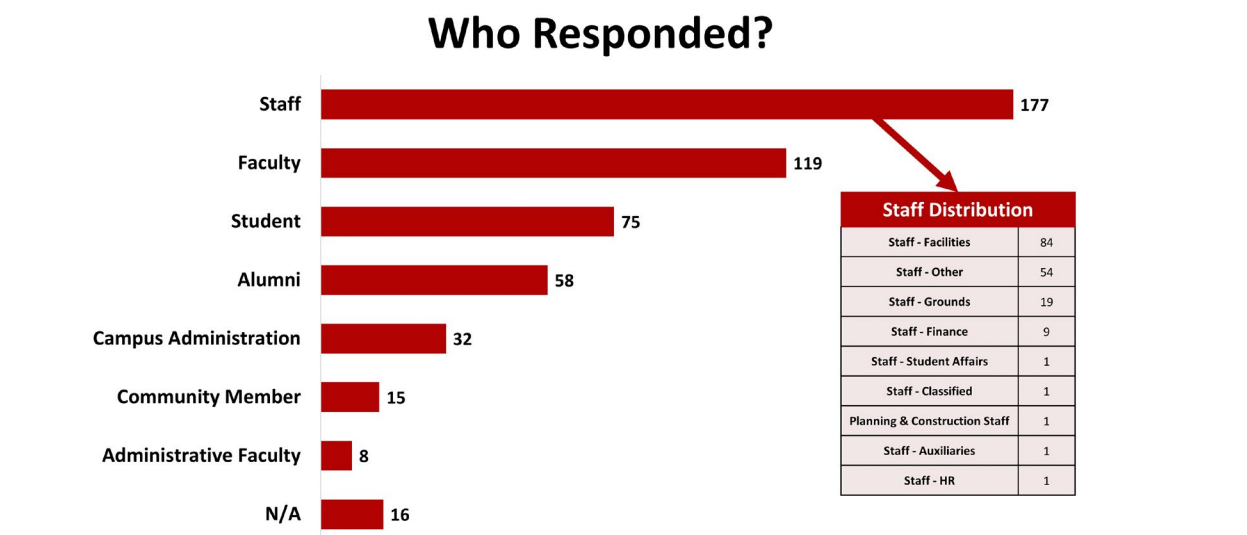| Staff Distribution	
Staff - Facilities	84
Staff - Other	54
Staff - Grounds	19
Staff - Finance	9
Staff - Student Affairs	1
Staff - Classified	1
Planning & Construction Staff	1
Staff - Auxiliaries	1
Staff - HR	1

Figure 1: Rebel CAP Survey Responses by Campus Affiliation

Responses from the Rebel CAP Survey came from a diverse collection of individuals with a significant number of respondents coming from staff (grouped as a whole – see table in Figure 25) and faculty. The opinion of students, alumni and campus affiliates are also significantly represented in the responses. The most popular climate actions identified were related to waste reduction and diversion, improvements pertaining to the efficiency of HVAC/ & lighting, green building standards, and promoting a culture of sustainability that could influence behaviors across campus.

Name	Score	First Choice 10 Points	Second Choice 8 Points	Third Choice 5 Points
Education & Behavior Change	1140	68	45	20
Green Building Standards	983	56	36	27
Remote Work & Learn Options	554	34	18	14
Heating, Ventilation, and Air Conditioning (HVAC) Upgrades	514	22	28	14
Onsite Solar - Photovoltaics (PV)	501	31	12	19
Improved Commuting	490	16	30	18
Water Conservation Policies/Practices	424	13	23	22
Waste Reduction	414	18	13	26
Grounds Management Policies/Practices	347	18	14	11
Smart Buildings and Grid Infrastructure	310	9	15	20
...	...	...	...	...

Figure 2: Top Ranked Solutions

Note that these solutions were ranked based on a weighted scale, depending on first, second, and third choices of responses. These, as well as the responses to other questions from the Rebel CAP Survey, were taken into consideration when determining solutions that were the best fit for UNLV.

Appendix D: Demographic Surveys

In an effort to monitor and evaluate the inclusiveness of the Rebel CAP planning process across all campus demographics, we conducted a demographic survey of various engagement activities , including working group meetings, core team meetings, and sustainability task force meetings.

We compared survey results to existing demographic information provided by UNLV to evaluate the extent to which the Rebel CAP engagement process accurately represented the campus community. To be as comprehensive as possible, we asked additional detailed questions that were not previously collected by the university – such as those pertaining to more specific race/ethnicity identity, gender identity, and disability. Data points lacking a comparative reference from the university's shared data are marked with an asterisk (*) below. This summary can help inform future engagement efforts to ensure broad and inclusive participation.

Overall Demographics (students, faculty, and staff):

- Female-identifying individuals comprised 50% of respondents, while male-identifying individuals constituted 46%, resulting in a 7% overrepresentation of females and a 3% underrepresentation of male-identifying individuals.
- 4% of respondents identified as transgender, non-binary, or gender nonconforming*.
- 11% of respondents identified as having a disability*.
- White or Caucasian and Pacific Islander or Native Hawaiian individuals were overrepresented by 16% and 5%, respectively.
- BIPOC individuals, excluding Pacific Islander or Native Hawaiian identifying individuals, were underrepresented, particularly among Hispanic/Latinx identifying individuals.
- Students represented 32% of respondents, staff 46%, and faculty 21%*.
- The majority of respondents were in the 50-64 age range (36%), followed by 40-49-year-olds (21%), and those 20-21 (14%).

Students:

- Most students identified as Seniors (50%), followed by Sophomores (25%), and Graduate Students (13%). No students identified as Freshmen or Juniors*.
- Over half (63%) of students identified as first-generation students*.
- Students were primarily affiliated with the Lee Business School (22%), with additional participation from students in the College of Education, Howard R. Hughes College of Engineering, College of Fine Arts, Honors College, William F. Harrah College of Hospitality, College of Liberal Arts, and College of Sciences*.
- 89% of students identified as full-time, with 11% identifying as part-time, resulting in a 16% underrepresentation of part-time students.

Staff:

- Most staff identified their occupational category as Management Occupations (33%), followed by Public Service Staff (17%). Other staff were affiliated with Business and Financial Operations Occupations, Computer, Engineering, and Science Occupations, and Office and Administrative Support Occupations*.
- All staff identified as full-time, constituting a slight overrepresentation compared to part-time staff (+1%).

Faculty:

- 40% of faculty were tenured, and 40% were not on the tenure track*.
- 20% identified as professors, and 40% identified as associate professors*.
- 100% of faculty were full-time, constituting a 2% underrepresentation of part-time faculty.

Appendix E: Equity Framework

An Equity Framework was used throughout the planning process to guide and operationalize decision-making. This framework is designed to operationalize fairness and inclusivity across multiple phases – ensuring that there is equitable representation from diverse groups, designing participation processes that allow people agency and access to decision-making spaces, and considering the potential benefits and disbenefits that proposed recommendations and strategies can have on certain groups. Utilizing this framework at the onset of the planning process prompted the Sustainability Task Force to comprehensively integrate equity considerations at each phase of the planning process. For additional details related to each section of the Equity Framework and related discussions in engagement meetings, see Appendix F.
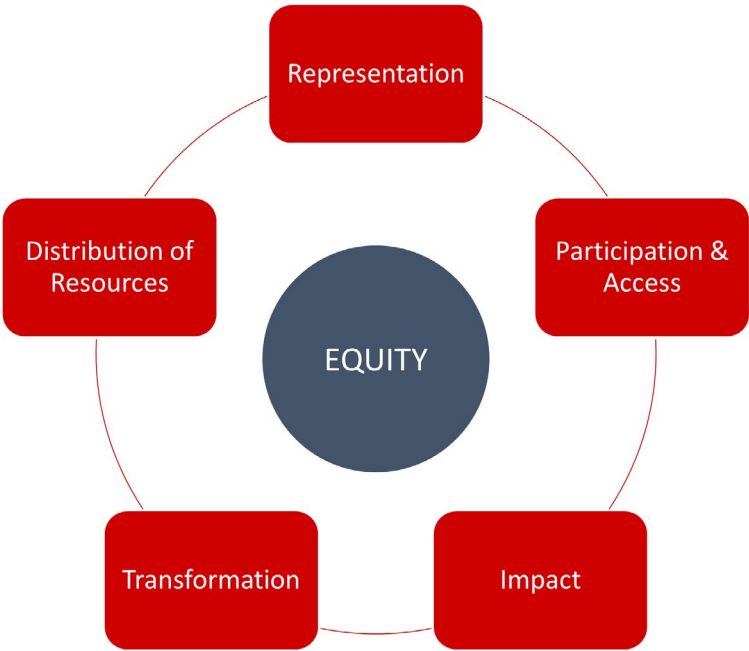

Figure 1: Equity Framework

Representations

- **Diverse Representation:** Intentional inclusion and visibility of individuals from various backgrounds, identities and perspectives is essential across all university levels. This can involve promoting diversity in leadership positions, boards, committees, and other decision-making bodies to reflect the broader community demographics.
- **Inclusive Policies:** Implementing policies that ensure fair representation by actively seeking out and providing platforms for marginalized groups to participate. This could include gender, racial, ethnic, and socio-economic diversity initiatives.

How can UNLV ensure **diverse representation and inclusion** of students and student groups, faculty, staff, and community members from various backgrounds (cultural, racial, socioeconomic) in the CAP development process? Examples: Ensure critical perspectives are represented at each phase of the process.

Participation & Access

- **Accessible Platforms:** Ensuring equitable access to information, opportunities, and platforms for participation. This may involve providing resources such as translation services, accessible venues, or digital tools to accommodate diverse needs.
- **Empowerment:** Empowering underrepresented groups by designing spaces and decision-making processes that empower – rather than silence – their perspectives. It is crucial to create environments where everyone feels safe and empowered to contribute.

How can UNLV **remove barriers to participation** and **ensure equitable access** to information, resources, and decision-making opportunities for all stakeholders involved in the CAP? Examples: Ensuring equitable decision-making processes; inclusive facilitation techniques; equity guardrails.

Impact

- **Equitable Assessment:** Taking a closer look at policies, programs, and initiatives with equity at the forefront means assessing their impact on various groups, both positively and negatively. This can involve collecting disaggregated data to identify disparities and gaps to adjust strategies accordingly.
- **Adaptive Strategies:** Adjusting strategies in response to feedback and assessment results is key to ensuring that interventions effectively meet the unique needs of marginalized communities without worsening existing disparities.

How will UNLV assess and address the **potential differential impacts of climate initiatives** on various communities and groups, particularly those vulnerable to climate risks and injustices? Example: Conducting an equity assessment of strategies and actions.

Transformation

- **Structural Change:** Digging deep to tackle the roots of inequality means taking on systemic changes, like reexamining the policies and practices perpetuating inequities and making real structural shifts to create more equitable systems.
- **Cultural Shift:** Encouraging a cultural shift requires sparking a change in how organizations and societies view and champion equity, creating a space that fosters open conversations, challenges bias, and fully embraces diversity.

How can UNLV's CAP actively promote transformative change and **challenge systemic barriers** to environmental justice? Examples: Creating new policies that address cross-sectoral systematic barriers.

Distribution of Resources

- **Resource Allocation with Equity in Mind:** Equitable resource allocation involves not just prioritizing underserved areas but also integrating budgeting strategies that deliberately direct campus resources to bridge gaps in opportunities, infrastructure, and services, fostering fair distribution and strategic investments in historically marginalized communities.

How will UNLV prioritize the **equitable allocation of resources, funding, and support** for climate initiatives to ensure that historically underserved communities receive assistance in adapting to and mitigating climate impacts? Examples: Equitable implementation frameworks; ongoing/future engagement efforts; budget requests.

Appendix F: Equity Considerations & Review

Prior to the development of any recommendations, the Sustainability Task Force brainstormed equity considerations and opportunities for each working group to ensure that equity was prioritized in their work. Working Groups' recommendations underwent rigorous review using adapted guidelines from the Government Alliance on Racial Equity ("GARE") toolkit . This comprehensive analysis aimed to assess potential racial impacts, beneficiaries, inclusivity of voices, accessibility, community partnerships (including engagement with tribes), and adequate resourcing.

Working Group	Equity Considerations Identified by Sustainability Task Force Members
Sustainable Transportation	• Subsidized bus passes based on grade or income levels for employees and family income levels for students. • Consideration for the affordability of transportation for commuting students. • Diversify modes of transportation beyond cars. • Integrate plans with the Maryland Parkway BRT and transit center. • Provide charging facilities and secure parking for electric scooters. • Address e-scooters as an equity issue, considering their affordability and quick accessibility. • Accommodate student mobility on campus with secure lockable racks and charging stations. • Focus on providing reliable, affordable transportation options for all, including rural and disadvantaged communities. • Consider transportation practices and research affecting health, cultural, social, and economic factors.
Green Procurement & Policies	• Prioritize locally sourced products and services. • Establish understandable and public-facing green standards. • Ensure bans on certain products allow for requests by individuals with disabilities. • Engage diverse campus stakeholders in reviewing UNLV's supplier diversity. • Prioritize local, small, and minority businesses in procurement. • Define UNLV's commitment to social impact and sustainability across all functions. • Undertake initiatives for responsible waste management, emissions reduction, and conservation.
Buildings & Energy	• Involve diverse student groups in planning. • Add shade wherever possible, especially for older and mobility-limited individuals. • Explore shaded walkways with solar panels. • Ensure cost considerations do not burden students with increased facility fees. • Provide hydration station accessibility and consider dry cooling. • Foster clean energy policy and deployment strategies through research and demonstration efforts.
Waste Management	• Investigate diversity in the local garbage and recycling industry workforce. • Engage diverse communities and community-based organizations.
Stewardship & Climate Justice	• Ensure underserved communities benefit from the state's transition to cleaner energy. • Investigate and allocate resources to ensure disadvantaged communities receive a significant share of overall benefits.
Academics & Research	• Investigate equitable research practices for a more inclusive higher education environment. • Define what equity looks like for students and faculty.
Water Resource Management	• Implement efficient irrigation for green shared to produce cooling effects. • Set goals for public and private entities managing water resources so as to ensure that the public has access to safe, clean, and reliable water supply. • Consider the impact of climate change on future water resources.

During recommendations review, the following questions were considered:

- What are the equity, particularly racial equity, impacts of this recommendation?
- Who are the primary beneficiaries, and could specific groups be adversely affected by this recommendation?
- Does this recommendation create any positive outcomes for individuals or groups?
- Have diverse voices been actively included or sought out in shaping these recommendations?
- Is this recommendation easily accessible to all stakeholders?
- How can partnerships and relationships with key community groups, such as tribes, be enhanced?
- Are there adequate resources, funding, and community engagement planned for implementing this recommendation?
- Are historically underserved or underrepresented community groups actively involved in this recommendation?
- How will the impacts of this recommendation be documented and evaluated in terms of achieving anticipated outcomes and community impact?
- Does this recommendation use inclusive and appropriate language, avoiding terms like 'stakeholder' to ensure inclusivity?

Appendix G: Recommendations

Umbrella Recommendations

KEY: **$** = Under $250K **$$** = $250K - $1M **$$$** = $1M - $2.5M **$$$$** = over $2.5M
*Direct Emissions Impact & Aligns w/ Rebel CAP Survey ^ = Indirect Emissions Impact & Aligns w/ Rebel CAP Survey
Note: Not all recommendations were addressed in survey

ID	Title	Short Description	Lead(s)	Implementation Timeframe	GHG Impact (Direct/ Indirect)	GHG Impact Modeled	Financial Implication	New Revenue	New Cost	Cost Driver	Potential Funding Source(s)
U 1	Sign the Second Nature Carbon Commitment	Become a signatory of the Second Nature Carbon Commitment.	University Administration	Near (0-2 years)	Indirect	No	$	No	Yes	Dues	General Fund
U 2	Establish a Sustainability Office	Create and staff the UNLV Office of Sustainability to oversee the coordination of Rebel CAP implementation.	University Administration	Near (0-2 years)	Indirect	No	$$	No	Yes	Personnel	General Fund; Donor Support
U 3	Formalize a Sustainability Advisory Council	Transition the existing Sustainability Task Force to the formal UNLV Sustainability Advisory Council, sponsored by the Academic Affairs and Business Affairs, with ex-officio members with cross-campus representation to advise the Office of Sustainability and Rebel CAP implementation.	University Administration	Near (0-2 years)	Indirect	No	$	No	No	Staff Time; Faculty Time; Student Time	General Fund
U 4	Complete a Sustainability Tracking, Assessment & Rating System (STARS) Report	Register as a STARS participant and complete a STARS Report within one year of registration.	University Administration; Sustainability Advisory Council, Office of Sustainability	Mid (2-5 years)	Indirect	No	$	No	Yes	Dues	General Fund
U 5	Integrate the Rebel CAP into Accreditation Consideration	UNLV will adopt the Rebel CAP as an integral part of its NWCCU Vision, Mission, Strategic Plan, and Funding and Resource allocations in Standards One and Two.	University Administration	Near (0-2 years)	Indirect	No	$	No	No	Staff Time	General Fund

U 1: Sign the Second Nature Carbon Commitment
Officially join the Second Nature Climate Leadership network by becoming a signature of the Second Nature Carbon Commitment. Second Nature signatories commit their campuses to specific emissions reduction goals, including regular greenhouse gas reporting, a climate action plan, a formalized governance structure to implement the plan, and integration of climate education into the curriculum.

U 2: Establish a Sustainability Office
Create and staff the UNLV Office of Sustainability to oversee the coordination of Rebel CAP implementation. The Office of Sustainability will be responsible for the following:
- Overseeing the implementation and oversight of the Rebel CAP
- Acting as a clearing house for all efforts related to sustainability occurring in Clark County, and therefore encouraging partnerships and avoiding the duplication of efforts.
- Participating in vetting all major contracts, such as the one that provides food service (ex. official food service vendor contract).
- Institutionalizing the creation and submission of annual reports to the Sustainability Tracking, Assessment & Rating System ("STARS"), managed by the Association for the Advancement of Sustainability in Education ("AASHE").

U 3: Formalize a Sustainability Advisory Council
Transition the existing Sustainability Task Force to the formal UNLV Sustainability Advisory Council, sponsored by Academic Affairs and Business Affairs, with cross-campus representation among ex-officio members, to advise the Office of Sustainability and Rebel CAP implementation.

U 4: Complete a Sustainability Tracking, Assessment & Rating System ("STARS") Report
The Association for the Advancement of Sustainability in Higher Education ("AASHE") Sustainability, Tracking Assessment & Rating System ("STARS") is a transparent, self-reporting framework for colleges and universities to establish a baseline of how sustainability is integrated into academics, engagement, operations, and planning and administration. UNLV will register as a STARS participant and complete a STARS Report within one year of registration.

U 5: Integrate Rebel CAP into Accreditation Consideration
To ensure the Rebel CAP is adopted as a strategic plan that informs university decision-making, UNLV will consider progress to meet plan objectives in the Northwest Commission on Colleges and Universities ("NWCCU") accreditation process. Integral parts to consider include UNLV's NWCCU Vision, Mission, Strategic Plan, and Funding and Resource allocations, specifically as action and assessment components of planning and reporting in NWCCU Standard 1C - Student Learning, Standard 1D - Student Achievement, Standard 2E - Financial Resources and Standard 2G - Physical and Technology Infrastructure.

Academics & Research

KEY: $ = Under $250K $$ = $250K - $1M $$$ = $1M - $2.5M $$$$ = over $2.5M
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ID	Title	Short Description	Lead(s)	Implementation Timeframe	GHG Impact (Direct/Indirect)	GHG Impact Modeled	Financial Implication	New Revenue	New Cost	Cost Driver	Potential Funding Source(s)
AR 1	Adopt a Sustainability Graduation Requirement	Include a 3-credit general education requirement in sustainability for all undergraduate degree programs.	Office of the Registrar, Faculty Senate General Education Committee, Undergraduate Faculty Senate Curriculum Committee, Office of the Executive Vice President and Provost	Near (0-2 years)	Indirect	No	$	No	No	Faculty Time	General Fund
AR 2	Create an Academic and Research Sustainability Institute	Create an academic and research institute focused on sustainability and climate action.	Academic Affairs, Facilities and Operations, Student Government, University Administration	Mid (2-5 years)	Indirect	No	$$	No	Yes	Faculty Time; Program Budget	General Fund; Donor Support; Grants
AR 3	Establish a Sustainability Course and Faculty Inventory	Conduct an inventory of sustainability and climate action courses, research, and faculty expertise.	Academic Affairs	Near (0-2 years)	Indirect	No	$	No	No	Staff Time	General Fund
AR 4	Enhance Educational Programming^	Establish comprehensive sustainability and climate change degree programs encompassing various disciplines.	Office of the Executive Vice President and Provost, Deans, Academic Department Chairs and Program Directors	Mid (2-5 years)	Indirect	No	$	No	Yes	Faculty Time	General Fund; Grants; Foundation
AR 5	Sustainability Awareness in Orientation	Incorporate sustainability and climate action into new student and staff orientation.	Human Resources, Office of the Registrar, Graduate College, Sustainability Advisory Council, Office of Sustainability	Near (0-2 years)	Indirect	No	$	No	No	Staff Time	General Fund
AR 6	Utilize Campus as a Living Lab	Utilize UNLV campus infrastructure as a laboratory for education and research opportunities.	Finance & Administration, Academic Affairs	Near (0-2 years)	Indirect	No	$	No	Yes	Faculty Time; Staff Time	General Fund; Grants; Donor Support
AR 7	Align Online Course Schedule	Align online classes to particular days per week by college or department to minimize commuting.	Academic Affairs	Mid (2-5 years)	Direct	No	$	No	No	Faculty Time; Staff Time	General Fund
AR 8	Adopt Institutional Learning Outcomes	Adopt one or more institutional level sustainability-focused learning outcomes that apply to the entire student body.	University Administration, Academic Affairs, Faculty Senate	Mid (2-5 years)	Indirect	No	$	No	No	Faculty Time; Staff Time	General Fund
AR 9	Administer Literacy Assessment	Adopt sustainability-focused literacy assessment tool and administer it to the entire student body.	Student Affairs	Mid (2-5 years)	Indirect	No	$	No	Yes	Faculty Time; Dues	General Fund; Grants; Donor Support

AR 1: Adopt a Sustainability Graduation Requirement

Incorporating sustainability and climate change into undergraduate education is essential for preparing students to address the complex challenges of the 21st century, fostering a sense of responsibility, and ensuring that the future workforce is equipped with the knowledge and skills needed for a sustainable and resilient future.

Note: This requirement may simultaneously satisfy other general education requirements. Changing part of the undergraduate core curriculum may need NSHE approval.

- Equip students with a comprehensive understanding of sustainability's social, ecological, and economic dimensions.
- Develop critical thinking skills.
- Become adept at analyzing and addressing multifaceted sustainability problems.

AR 2: Create an Academic and Research Sustainability Institute

The institute would explore being a grant-funding body for internal sustainability and climate action academic and research projects.

- A faculty fellow or director position would manage the institute.
- The institute would house a Faculty Learning Community program. This would be an annual faculty think tank focused on moving an idea to action within a single academic year (one semester of research/one semester for implementation) to further the mission of the Institute.

AR 3: Establish a Sustainability Course and Faculty Inventory

A governing body will keep an accurate, up-to-date inventory to monitor progress on sustainable academics and research. The inventory may also serve as a subject matter expert database for communicators. The institute (AR 2) will house this inventory once it is formed.

- Courses related to sustainability and climate action (by college, department, division, etc.)
- Faculty teaching or researching sustainability and climate-related courses
- Faculty with an academic background in sustainability or climate action and their contact information

AR 4: Enhance Educational Programming^

Efforts to enhance our university's educational programming include:

- Establishing comprehensive sustainability and climate change degree programs
- Registering with the Sustainability Tracking, Assessment & Rating System (STARS) Program
- Promoting our campus as a living laboratory
- Providing hands-on, interdisciplinary learning opportunities
- The sustainability and climate change degree programs encompass various disciplines to address the multifaceted challenges of our changing environment. Examples include:
  » Bachelor's degree in sustainable studies or climate science. This degree could integrate courses in environmental science, renewable energy, policy analysis, and sustainable business practices.
  » Master's program in climate and sustainability management that includes specialized areas such as climate policy, environmental economics, and sustainable development.
  » Doctoral program in climate and sustainability sciences that could focus on advanced research methodologies and the development of innovative technologies. This program can produce experts who contribute to academic discourse and lead groundbreaking initiatives.

Registering with the Sustainability Tracking, Assessment & Rating System ("STARS") program will allow UNLV to track sustainability efforts, engage the community, create a baseline for continuous improvement, and integrate sustainability into teaching, learning, and research.

Utilize UNLV's infrastructure and operations as living environments for multidisciplinary learning and applied research that advances sustainability on campus.

Interdisciplinary research opportunities, practical fieldwork, and collaboration with industry partners would be key components of these programs, ensuring students gain hands-on experience and contribute to cutting-edge solutions.

AR 5: Sustainability Awareness and Orientation

To comprehensively embed climate action, social justice, and sustainability into the UNLV community, it is recommended that these topics be included in new student, faculty, and staff orientation programs. By incorporating dedicated sessions within the orientation framework, UNLV will provide essential education on the current state of the environment, social justice, climate change impacts, and each individual's role in addressing these challenges.

AR 6: Utilize Campus as a Living Lab

UNLV will support multidisciplinary learning and applied research that advances sustainability on campus by utilizing campus infrastructure as a laboratory for education opportunities. By connecting operational emissions reduction projects and programs to course curricula and co-curricular learning, UNLV is preparing students to address similar issues in their personal and professional lives.

AR 7: Align Online Course Schedules

Aligning online courses to the same day of the week reduces campus commutes and directly impacts emission reduction goals related to commuting. UNLV academic departments and programs will coordinate the online course schedule to create consistency among in-person versus virtual learning experiences.

AR 8: Adopt Institutional Learning Outcomes

Learning outcomes help students gain a specific skill set and level of knowledge around a particular topic or series of topics. Intentionally designing learning outcomes related to sustainability and climate will ensure all UNLV students understand these concepts and how to apply them on and off campus. Dedicated institutional learning outcomes also support "U 5: Accreditation Considerations" as they give accrediting bodies an assessment standard.

AR 9: Administer a Literacy Assessment

UNLV will adopt and administer a sustainability-focused literacy assessment tool to the entire student body. An assessment gives UNLV the opportunity to determine if its sustainability-related educational opportunities impact students, the level of impact, and insight into areas of improvement.

Buildings and Energy

KEY: $ = Under $250K **$$** = $250K - $1M **$$$** = $1M - $2.5M **$$$$** = over $2.5M
*Direct Emissions Impact & Aligns w/ Rebel CAP Survey ^ = Indirect Emissions Impact & Aligns w/ Rebel CAP Survey
Note: Not all recommendations were addressed in survey

ID	Title	Short Description	Lead(s)	Implementation Timeframe	GHG Impact (Direct/Indirect)	GHG Impact Modeled	Financial Implication	New Revenue	New Cost	Cost Driver	Potential Funding Source(s)
BE 1	Perform Building Energy Assessments and Audits	Evaluate energy performance of campus buildings to identify opportunities for improved energy efficiency, reduced energy consumption, and minimized environmental impact.	Facilities Management	Mid (2-5 years)	Indirect	Yes	$	No	Yes	Faculty Time; Staff Time; Equipment	General Fund; Grants
BE 2	Performs Onsite Energy Generation Assessments and Audits	Evaluate energy performance of potential energy generation systems to identify opportunities for improved energy generation efficiency and installation of additional renewable energy generation and energy storage systems.	Facilities Management, Purchasing, Planning and Construction	Near (0-2 years)	Indirect	No	$	No	Yes	Faculty Time; Staff Time; Equipment	General Fund; Grants
BE 3	Improve Data Collection	Improve data collection related to GHG emissions that include, but are not limited to, building and campus level energy, water, reclaimed water, and waste data.	Facilities Management	Mid (2-5 years)	Indirect	No	$	No	Yes	Faculty Time; Staff Time; Equipment; Software	General Fund; Grants
BE 4	Share Data Assessment and Assurance Findings	Publicly post building use data for research and academic purposes.	Facilities Management	Mid (2-5 years)	Indirect	No	$	No	Yes	Faculty Time; Staff Time; Equipment; Software	General Fund; Grants
BE 5	Implement an Advanced Energy Management System	Implement an advanced energy management system equipped with real-time monitoring and reporting capabilities that are integrated with smart meters, sensors, and renewable energy sources to provide a comprehensive, up-to-the-minute overview of energy consumption patterns, renewable energy generations, and associated carbon emissions.	Facilities Management	Mid (2-5 years)	Indirect	No	$$	No	Yes	Faculty Time; Staff Time; Equipment; Software	General Fund; Grants
BE 6	Improve Building Energy Efficiency	Implement energy conservation measures that reduce building energy use intensity.	Facilities Management	Near (0-2 years)	Direct	No	$$	No	Yes	Staff Time; Program Budget	General Fund; Federal Funding
BE 7	Explore a Virtual Power Purchase Agreement	Apply to the Nevada Public Service Commission for retail access to electricity on the open market or with a firm to purchase renewable energy. As per RE3, replace 100% of grid purchased electricity with renewable electricity via a VPPA	Facilities Management	Long (5+ years)	Direct	No	$	No	Yes	Staff Time	General Fund; Federal Funding
BE 8	Increase Onsite Renewable Energy & Storage*	Increase the amount of solar panels (i.e., rooftop, parking lot, walkway, etc.) with battery storage to supply added renewable energy to UNLV campuses.	Facilities Management, Planning and Construction	Long (5+ years)	Direct	No	$ - $$$$	Yes	Yes	Staff Time; Equipment; Infrastructure Upgrades	General Fund; Federal Funding
BE 9	Provide Energy Education^	Design informational documents to display and communicate energy use, conservation efforts, community impacts, efficiency advice, trends, and regional considerations.	Office of Government and Community Engagement, Office of Diversity	Near (0-2 years)	Indirect	Yes	$	No	Yes	Staff Time; Materials	General Fund; Grants; Donor Support
BE 10	Exceed Energy Code & LEED Requirements	Set a goal to exceed the State of Nevada minimum requirement to meet LEED Silver, or equivalent, in designing and constructing all public works on UNLV campuses.	Business Affairs, Facilities Management, Planning & Construction	Near (0-2 years)	Direct	Yes	$	No	Yes	Staff Time; Certification	General Fund; Efficiency Savings; Utility
BE 11	Implement an Energy Management System	Install additional building meters to track energy consumption at the building level.	Facilities Management	Near (0-2 years)	Indirect	Yes	$$	No	Yes	Staff Time; Equipment	General Fund; Efficiency Saving

ID	Title	Short Description	Lead(s)	Implementation Timeframe	GHG Impact (Direct/Indirect)	GHG Impact Modeled	Financial Implication	New Revenue	New Cost	Cost Driver	Potential Funding Source(s)
BE 12	Develop a Green Labs Program	Develop or adopt existing green labs program protocol to establish best practice thresholds for energy, water, and recognition for faculty research and staff management.	Facilities Management, College of Sciences, Fine Arts, Engineering, Health Sciences, Nursing, Dental Medicine, School of Medicine, Risk Management, Safety	Near (0-2 years)	Indirect	No	$	No	Yes	Staff Time; Equipment; Dues	General Fund; Grants; Efficiency Savings
BE 13	Formalize & Fund an Energy Efficiency Programs	Strategic Energy Management at Maryland and Shadow Lane campuses resulting in a 25% energy use reduction over ten years. Projects estimated to have an average 7-year payback.	Business Affairs, Facilities Management	Near (0-2 years)	Direct	Yes	$	Yes	No	Staff Time; Materials	General Fund; Efficiency Savings; Grants; Federal Funding
BE 14	Enhance Construction & Renovation Standards*	Build new buildings and retrofits to a higher energy efficiency standard than code.	Facilities Management; Planning & Construction	Near (0-2 years)	Direct	No	$	No	No	Staff Time	General Fund
BE 15	Optimize Buildings for Electrification*	Investments in campus buildings and campus electric distribution to prepare buildings to move away from fossil fuel to electrified systems such as Low Temperature Hot Water heating and heat-pump technology.	Business Affairs, Facilities Management; Planning & Construction	Long (5+ years)	Direct	No	$ - $$$$	No	Yes	Staff Time; Equipment	General Fund; Efficiency Savings; Grants; Federal Funding
BE 16	Electrify Thermal Systems*	Electrify current natural gas systems. This can include HVAC systems as well as other uses, such as domestic hot water heating. Convert to more efficient heat pump technologies.	Business Affairs, Facilities Management; Planning & Construction	Long (5+ years)	Direct	Yes	$ - $$$$	No	Yes	Staff Time; Equipment	General Fund; Efficiency Savings; Grants; Federal Funding

BE 1: Perform Building Energy Assessments and Audits

These processes typically involve a detailed analysis of various aspects of a building's energy usage, including the performance of HVAC (heating, ventilation, and air conditioning) systems, lighting, insulation, and the overall building envelope. They are crucial for organizations and institutions looking to align with energy efficiency goals, environmental sustainability initiatives, and climate action objectives. This process is crucial for organizations and institutions looking to align with energy efficiency goals, environmental sustainability initiatives, and, as mentioned earlier, climate action objectives.

Assessment Phase
- Data collection
- Energy benchmarking
- Thorough examination of the building's systems and components.
- Identify areas where energy is used inefficiently or upgrades that could lead to significant energy savings.

Audit Phase
Energy audits may be conducted by internal teams or external professionals with expertise in building energy efficiency. The audit will result in the following:

- In-depth investigation, including energy modeling, to quantify potential energy savings and prioritize recommendations.
- Actionable recommendations for optimizing energy use, reducing operational costs, and enhancing the sustainability of buildings.

BE 2: Perform Onsite Energy Generation Assessments and Audits

These processes typically involve a detailed analysis of the existing energy generation systems onsite, which are currently limited to rooftop solar arrays and emergency power generation plants. This will allow us to identify opportunities for improving energy generation efficiency and installing additional renewable energy generation and energy storage systems.

Like the building energy assessment and audit, this process is crucial for organizations and institutions looking to align with energy efficiency goals, environmental sustainability initiatives, and climate action objectives.

Assessment Phase
- Data collection
- Energy benchmarking
- Thorough examination of the energy generation systems and components
- Identify areas where energy is being generated inefficiently or where upgrades could lead to significant energy generation.

Audit Phase
Energy audits may be conducted by internal teams or external professionals with expertise in building energy efficiency. The audit will result in the following:

- A more in-depth investigation, often including energy modeling, to quantify potential energy savings and prioritize recommendations.
- Actionable recommendations for optimizing energy generation, reducing operational costs, and installing additional renewable energy generation and energy storage systems.

BE 3: Improve Data Collection
Improve data collection related to GHG emissions that include, but are not limited to, building and campus level energy, water, reclaimed water, and waste data.

BE 4: Share Data Assessment and Assurance Findings
Regularly post building use data to the UNLV websites for research and academic purposes. Data will be accompanied by an explanation of how it was obtained and estimated uncertainties (e.g., kWh usage on a given day).

BE 5: Implement an Advanced Energy Management System
The advanced energy management system should be equipped with real-time monitoring and reporting capabilities. This will enable proactive decision-making, optimize energy efficiency, and foster a continuous commitment to sustainability and carbon neutrality.

- Integrate with smart meters, sensors, and renewable energy sources.
- Provide a comprehensive and up-to-the-minute overview of energy consumption patterns, renewable energy generation, and associated CO2 emissions.
- Establish clear performance benchmarks and key performance indicators to assess the effectiveness of energy-saving initiatives.

BE 6: Improve Building Energy Efficiency
Based on the outcome of the building audits, implement energy conservation measures that reduce building energy use intensity. Potential measures include:

- LED upgrades (including outdoor lighting and elevators).
- HVAC upgrades (such as converting constant volume systems to variable air volume systems).
- The addition of door and window sensors.
- Data center optimization projects.
- Central plant upgrades.

BE 7: Explore a Virtual Power Purchase Agreement (Renewable Energy)
Upon an approved application with the Nevada Public Service Commission, UNLV will gain retail access to electricity, purchase power on the open wholesale market, and/or contract with a firm to purchase renewable energy. Community support will be harnessed by working with select casino(s) currently utilizing retail access to electricity (e.g., MGM Grand).

BE 8: Increase Onsite Renewable Energy and Storage*
Efforts will reduce dependence on outside energy purchases and increase the amount of renewable energy used on our campuses. Potential actions include:

- Adding rooftop solar panels with battery storage to fully harness the energy available from an average of 300 sunny days a year.
- Installing solar-powered covered walkways in areas most exposed to the sun (e.g., walking paths from the residence halls to the library or classrooms, or from the parking garages to opposite ends of the Maryland Campus).
- Increasing onsite renewable energy sources and energy storage is vital to maximize the continued use of solar energy during evenings and other times when solar capacity is reduced.

BE 9: Provide Energy Education^
Create informational documents that are specifically targeted to their appropriate audience. The information should be easily digestible, displayed in buildings frequented by the public, and translated into multiple languages when possible.

The informational documents that display some or all of the following:

- Data collected detailing on-campus energy consumption and, where possible, ways individuals can help improve conditions.
- Energy conservation efforts, including impacts to the UNLV community, UNLV physical campus/space, and the larger Las Vegas/Clark County region.
- Guidance for making steps toward energy conservation on campus and at home.
- Data/research from UNLV students, faculty, and staff that centers on energy conservation tips, general conservation knowledge, and community initiatives that will better inform the community of trends and realities of energy consumption/needs that impact the Las Vegas/Clark County region.

BE 10: Exceed Energy Code and LEED Requirements
The established code should exceed the State of Nevada minimum requirement (LEED Silver) in the design and construction of all public works on campus by achieving Gold or Platinum status or equivalent.

The code should also Comply with energy codes and standards required by the State. This includes the latest edition of the NRS 701.220, NAC 701.185 (R-153-17AP), NAC 701.195-NAC 701.245, Rulemaking and adoption: presently July 28, 2021 adoption notice, ASHRAE Standard 90.1, and the IECC, ISO 50001 (for energy management onsite) and additional EV requirements and disclosure standards.

BE 11: Implement an Energy Management System
This implementation will include the following:

- Installing additional building meters to ensure that energy consumption is tracked at a building level throughout campus.
- Identifying opportunities to install additional building automation controls to maximize performance monitoring in buildings that are the highest energy consumers.
- Installing a comprehensive energy management system to track energy consumption data at the UNLV campus.

BE 12: Develop a Green Labs Program
The Green Labs Program will recognize research faculty and staff who follow sustainable practices within their laboratories and facilities. Green Labs will follow best practices for energy, water, and waste, and they will also develop projects to reduce energy including ultra-low temperature freezer upgrades, fume hood upgrades, and sash sensors. Enhancement to a Green Labs Program will include the following:
- Provide professors with best practice guides and technical bulletins that include energy-efficient and sustainable laboratory operations information. These resources are available from the International Institute for Sustainable Laboratories.
- Combining laboratory safety inspections with sustainability audits. The biosafety/chemical hygiene officer could partner with a professional in the Office of Sustainability to create related policies and procedures, and the laboratory inspections could be performed simultaneously.
- Having professors align their laboratories with the My Green Lab programs in support of the Rebel CAP sustainability goals.
- Achieving Green Lab Certification.

BE 13: Formalize & Fund Energy Efficiency Programs

Implement a Strategic Energy Management plan at Maryland and Shadow Lane campuses and at satellite facilities. This should include an array of improvements, such as envelope improvements, BMS and energy monitoring, space optimization, behavior modification, and HVAC upgrades. These efforts should target a 25% energy use reduction over ten years. Projects are estimated to have a 10-year payback (on average) and will take 10 years to implement.

BE 14: Enhance Construction & Renovation Standards*

Build new buildings and retrofits to a higher energy efficiency standard than code. This can include adherence to building certifications such as LEED or target approaches that require meeting building EUI goals or even the Living Building Challenge. The plan assumes that approximately 30% of the campus will be renovated over the next 15 years. On average, the improved space is assumed to use 50% less energy than the current building space.

BE 15: Optimize Buildings for Electrification*

As buildings undergo capital improvements and deferred maintenance is taken care of, spending should target investments in campus buildings and campus electric distribution to prepare buildings to move away from fossil fuel to electrified systems. These new systems can include Low Temperature Hot Water heating, VRF systems, and heat-pump technology. Adopt and amend building standards supporting decarbonization, such as the New Buildings Institute Decarbonization Code overlay.

BE 16: Electrify Thermal Systems*

Electrify all current natural gas systems. Convert to more efficient heat pump technologies or appropriate electric technologies. Includes thermal systems, process loads and domestic hot water. Electrification will start in 2026 and be complete by 2040. As modeled in the Rebel CAP, there is an assumption of O&M savings of 20% compared to BAU.

Green Procurement and Policies

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ID	Title	Short Description	Lead(s)	Implementation Timeframe	GHG Impact (Direct/Indirect)	GHG Impact Modeled	Financial Implication	New Revenue	New Cost	Cost Driver	Potential Funding Source(s)
GPP 1	Join the Sustainable Purchasing Leadership Council ("SPLC")	UNLV will join SPLC to support the creation of a sustainable procurement program that delivers measurable, meaningful impact.	Business Affairs	Near (0-2 years)	Indirect	Yes	$	No	Yes	Staff Time; Dues	General Fund; Grants; Donor Support
GPP 2	Adopt a Sustainable Investment Policy	Adopt and communicate a sustainable investing policy that integrates environmental, social, and governance (ESG) factors into the investment decision-making and management processes.	Business Affairs; General Counsel	Mid (2-5 years)	Indirect	No	$	No	No	Staff Time	General Fund
GPP 3	Supply Storage Space to Programs	Identify space for departments and programs to store supplies for reuse.	Facilities Management	Near (0-2 years)	Indirect	No	$	Yes	Yes	Staff Time; Space Upgrade; Equipment	General Fund; Grants; Cost Savings
GPP 4	Provide Procurement Awareness	Create web content, written materials, and programs that educate the UNLV community on sustainability procurement in the areas of food donation, selection of products and services, event planning, zero waste policies, general contract language guidance, and item tracking.	Purchasing and Contracts	Near (0-2 years)	Indirect	No	$	No	Yes	Staff Time; Materials	General Fund; Grants
GPP 5	Establish an Equipment Inventory	Prioritize and track procurement of energy-efficient equipment, appliances, and instrumentation. Track items sold, discarded, and recycled.	Purchasing and Contracts	Near (0-2 years)	Indirect	No	$	No	No	Staff Time; Software	General Fund
GPP 6	Adopt Food and Beverage Purchasing Guidelines	Adopt and publicly post sustainability and emissions reduction purchasing guidelines for dining that address data tracking, food waste, plant-based items, reusable/compostable wares, refillable containers, elimination of single-use plastics and Styrofoam, Green Restaurant certification, and partnering with programs like Zero Foodprint.	Dining; Purchasing and Contracts	Mid (2-5 years)	Indirect	No	$	No	Yes	Staff Time; Certification	General Fund
GPP 7	Enhance the Social Sustainability and Supplier Inclusion Program	Adopt a socially sustainable supplier inclusion program and establish a sustainability statement to include in all contracts that highlight UNLV's dedication to vendors that prioritize sustainability and social justice and publish UNLV sustainable purchasing guidance to assist vendors responding to requests for proposals.	Purchasing and Contracts	Near (0-2 years)	Indirect	No	$	Yes	No	Staff Time	General Fund
GPP 8	Establish a Procurement Task Force	Establish a procurement task force to re-design the UNLV procurement policy to include robust data tracking of all campus purchases, adoption of environmental certification programs for janitorial, paper, and electronic certification programs, prioritization of reusable or recyclable items, guidance on SWAG purchases, and best practices for bundling small purchases.	Business Affairs; Purchasing and Contracts	Near (0-2 years)	Indirect	No	$	No	No	Staff Time	General Fund

GPP 1: Join the Sustainable Purchasing Leadership Council ("SPLC")

By joining the Sustainable Purchasing Leadership Council ("SPLC"), UNLV will be able to do the following:

- Support the enhancement of our sustainable procurement program to ensure it delivers measurable, meaningful impact.
- Leverage their procurement for positive environmental and social benefits through coaching, peer learning groups, in-person summits, etc. Members of the SPLC can leverage their procurement for positive environmental and social benefits.
- Collaborate with peers and leaders across the value chain to innovate, aggregate demand, and amplify impact.

GPP 2: Adopt a Sustainable Investment Policy

The sustainable investing policy will integrate environmental, social, and governance ("ESG") factors into the investment decision-making and management processes. ESG factors consider a material impact on the financial performance of an investment, as well as the environmental and social outcomes of the investment. This results in the alignment of investment practices with sustainability values.

- Engage with external managers responsible for managing UNLV's endowment funds on their sustainable investing practices.
- Set expectations for external managers to consider relevant ESG factors in the portfolio analysis and

monitoring, and to have a willingness to dialogue with employees on sustainability issues.

- Evaluate external managers on their performance based on their ESG integration and impact and reward those who demonstrate leadership and innovation in sustainable investing.
- Communicate the sustainable investing policy and practices to all shareholders.

GPP 3: Supply Storage Space to Programs
Identify space for college programs to store supplies so they can be reused rather than disposed of after events (e.g., course supplies, theater sets, etc.).

GPP 4: Provide Procurement Awareness
Efforts will include providing food waste education, creating workshops, updating the Sustainable Purchasing Program page, and changing verbiage on the UNLV Dining Sustainability page.

- Food waste education: Prevent food waste by informing UNLV and its community about the Bill Emerson Good Samaritan Food Donation Act of 1996 (42 U.S. Code § 1791) which provides limited liability protection for people who make good-faith donations of food and grocery products to nonprofits that feed the hungry. The act also provides limited liability protection, both civil and criminal, for those who distribute food and groceries, such as food banks.
- Workshop creation: Create workshops for campus departments to learn how to select products and services (i.e., those not required to go through the bid process) that align with our Rebel CAP goals.
- Updates to the Sustainable Purchasing Program page: Include new purchasing policy, verbiage related to sustainability in RFPs, what is tracked, etc.
- Changes to the UNLV Dining Sustainability page: Include more specific language.

GPP 5: Establish an Equipment Inventory
Items will include equipment, appliances, and instrumentation. This effort will also Identify departments currently using older equipment and appliances and help them replace this equipment with energy-efficient items.

GPP 6: Adopt Food and Beverages Purchasing Guidelines
- Allow students to opt-in to text message notifications that let them know when food left from events is available for free.
- Make aspects of UNLV's contract with the campus food vendor related to sustainability transparent on our webpage.
- Work with the campus food vendor to add sustainability-related verbiage to customer surveys.
- Use UNLV's social media channels to share the surveys and encourage respondents to address their preferences for plant-based food offerings.
- Request the data the campus food vendor tracks related to sustainable choices made to supply food services at UNLV.
  » For example, purchases from small and diverse business owners, food purchased directly from farms, the percentage of meals served that are plant-based, etc.
- Request the same for the companies the campus food vendor contracts with to provide food services to UNLV.
- Require all food venues on campus to use reusable or compostable utensils and food containers.
- Require all food venues on campus to allow customers to use their own refillable cups and food containers for their purchases. These containers could be distributed as UNLV swag items.
- Prohibit plastic bags and Styrofoam food and beverage containers in all food service establishments.

- Partner with Zero Foodprint.
- Obtain Green Restaurant® Certification for the Dining Commons and Rebel Grounds.

GPP 7: Enhance the Social Sustainability and Supplier Inclusion Program
UNLV's Social Sustainability and Supplier Inclusion program promotes the inclusion of diverse suppliers. Those suppliers, and their larger corporate counterparts, are required to provide the university with green alternatives to commonly used products and are highly encouraged to introduce innovative green solutions based on our requirements.

- Add language to contract templates that reflects our goal to engage with suppliers who are environmentally responsible and diverse in ownership.
- Require a sustainability statement from service vendors when submitting a proposed contract, bid, and RFP. Offer preferable consideration on contracts, bids, and RFPs to firms submitting viable, cost-effective, environmentally responsible responses.
- During the upcoming and future bids and RFPs for transportation services, explore additional options or efforts suppliers are making to provide carbon-neutral services. Understanding the current status and direction of the transportation services industry can help inform future procedures and considerations when contracting these services.
- Publish comprehensive information on our website to assist vendors in complying with UNLV's sustainability policies.

GPP 8: Establish a Procurement Task Force
Establish a procurement task force to re-design the UNLV procurement policy to include robust data tracking of all campus purchases, adoption of environmental certification programs for janitorial, paper, and electronic certification programs, prioritization of reusable or recyclable items, guidance on SWAG purchases, and best practices for bundling small purchases. Improvements will include the following:

- Instating an institution-wide policies to:
  » Purchase cleaning products with a Green Seal™ or EcoLogo™ certification.
  » Purchase all paper, timber, and card products that are deforestation-free by purchasing only 100% Recycled or FSC-certified goods when technologically compatible.

- Sourcing supplies in plastic containers that Republic Services is able to recycle or sell.
  » For example, #1 polyethylene terephthalate ("PET"), #2 high-density polyethylene (HDPE), and #5 polypropylene ("PP"), can often be recycled due to durable end markets.

- Exploring reusable items for UNLV swag.
- Reviewing purchasing categories to ensure similar items are being tracked reliably. This will enhance the data quality needed for tracking green purchasing practices.
- Tracking and evaluating all small dollar purchases. Purchasing will provide units with examples of common purchases that have advantages relating to their sustainability.
- Bundling small department/unit purchases at the university level. This effort will lead to volume discounts and the potential for requiring more sustainable choices.
- Having a purchasing task force for each department that will create internal policies for purchasing small dollar items that have sustainability-related advantages.

Stewardship and Climate Justice

KEY: $ = Under $250K **$$** = $250K - $1M **$$$** = $1M - $2.5M **$$$$** = over $2.5M
*Direct Emissions Impact & Aligns w/ Rebel CAP Survey ^ = Indirect Emissions Impact & Aligns w/ Rebel CAP Survey
Note: Not all recommendations were addressed in survey

ID	Title	Short Description	Lead(s)	Implementation Timeframe	GHG Impact (Direct/Indirect)	GHG Impact Modeled	Financial Implication	New Revenue	New Cost	Cost Driver	Potential Funding Source(s)
SCJ 1	Expand Community Recycling Assistance	Expand Rebel Recycling program to low-income and/or BIPOC communities that do not have a residential recycling program.	Rebel Recycling	Mid (2-5 years)	Indirect	No	$$$	Yes	Yes	Staff Time; Disposal	General Fund; Grants; Donor Support
SCJ 2	Adopt Equitable Engagement^	Engage diverse student body in the implementation of the Rebel CAP.	Student Involvement and Activities, Student Government	Near (0-2 years)	Indirect	No	$	No	Yes	Staff Time	General Fund; Student Fees
SCJ 3	Hire Sustainability-focused Faculty	Hire cohorts of new, tenure-track faculty with expertise in sustainability regardless of discipline.	Academic Affairs	Mid (2-5 years)	Indirect	Yes	$ - $$$$	No	Yes	Faculty Time	General Fund; Donor Support
SCJ 4	Formalize Diversity and Sustainability Coordination	Formalize coordination between diversity, equity, and inclusion and sustainability efforts by establishing an ex-officio membership on councils and committees organized by each entity.	University Administration	Near (0-2 years)	Indirect	No	$	No	No	Staff Time	General Fund; Grants; Donor Support

SCJ 1: Expand Community Recycling Assistance

UNLV understands its role as a member of the Las Vegas community. To expand sustainability and climate actions off-campus, support local communities and community members that are part of the larger municipal area, UNLV will expand the Rebel Recycling program to low-income and/or BIPOC communities that do not have a residential recycling program.

SCJ 2: Adopt Equitable Engagement^

- Develop presentations about the Rebel CAP to share with various student organizations to foster conversation about the plan and seek perspectives from UNLV's diverse student body.
- Encourage engagement from students and equitable representation of students in outreach, administration, and educational efforts associated with Rebel CAP.

SCJ 3: Hire Sustainability-focused Faculty

UNLV will emphasize filling new faculty positions with individuals that have experience and expertise in sustainability within their fields. Regardless of discipline, new faculty positions being recruited to UNLV will outline that the candidate must have sustainability expertise and contribute to ongoing research, teaching, and learning in this subject area or their discipline when employed by the University. During their first year in the position, this cohort will participate in regular meetings to design a collaborative project to advance sustainability-related teaching, learning, and/or research at UNLV.

SCJ 4: Formalize Diversity and Sustainability Coordination

Intentional coordination between diversity and sustainability at UNLV helps effectively address these issues and places an emphasis on the connection between the two areas. Staff and faculty actively working on issues related to diversity and sustainability at UNLV will coordinate diversity, equity, and inclusion and sustainability efforts by establishing an ex-officio membership on councils and committees organized by each entity.

Sustainable Transportation

KEY: $ = Under $250K **$$** = $250K - $1M **$$$** = $1M - $2.5M **$$$$** = over $2.5M
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Note: Not all recommendations were addressed in survey

ID	Title	Short Description	Lead(s)	Implementation Timeframe	GHG Impact (Direct/Indirect)	GHG Impact Modeled	Financial Implication	New Revenue	New Cost	Cost Driver	Potential Funding Source(s)
ST 1	Enhance Bike Infrastructure	Continue installation of bicycle infrastructure, such as the expansion of bicycle lockers and a campus bike path.	Parking and Transportation Services, Planning and Construction, Facilities Management, Maintenance	Near (0-2 years)	Indirect	No	$$	No	Yes	Staff Time; Equipment; Construction	General Fund; Grants; Donor Support
ST 2	Expand RTC Partnership	Continue and expand partnerships with RTC, including the College Transit Pass and Club Ride programs.	Business Affairs, Parking and Transportation Services	Near (0-2 years)	Indirect	No	$	No	Yes	Staff Time; Partnership; Materials	General Fund; Grants
ST 3	Increase Bus Service Access	Increase bus routes to encompass all parts of the City of Las Vegas.	Business Affairs, Parking and Transportation Services, Office of Government and Community Engagement	Mid (2-5 years)	Direct	No	$$$	No	Yes	Staff Time; Partnership; Materials	General Fund; Grants; Federal Funding
ST 4	Enhance Electric Vehicle ("EV") Infrastructure	Continue participation in Nevada Energy incentive programs to increase the number of EV charging stations and parking spaces on campus. Prioritize EV infrastructure in all parking lot renovation and construction projects.	Parking and Transportation Services, Facilities Management	Near (0-2 years)	Direct	No	$$$	Yes	Yes	Staff Time; Infrastructure; Software	General Fund; Grants; Donor Support; Federal Funding
ST 5	Introduce Park and Ride Shuttle Program	Introduce a Park and Ride Shuttle service to UNLV with regular schedules, routes, EV, and bicycle infrastructure.	Parking and Transportation Services, Planning and Construction, Facilities Management	Mid (2-5 years)	Direct	No	$$$	No	Yes	Personnel; Equipment	General Fund; Grants; Federal Funding
ST 6	Adopt Fleet Vehicle and Equipment Electrification Policy	Adopt a policy to purchase electric and hybrid vehicles and equipment when fossil fuel-powered vehicles and equipment reach the end of life.	Facilities Management, Purchasing	Near (0-2 years)	Direct	Yes	$$	No	Yes	Staff Time; Equipment	General Fund; Grants; Donor Support; Federal Funding
ST 7	Explore Solar Covered Walkways	Explore the viability of installing solar panel-covered walkways over highly trafficked pedestrian walkways on the UNLV main campus.	Facilities Management, Planning & Construction	Mid (2-5 years)	Direct	Yes	$ - $$$$	No	Yes	Staff Time; Equipment; Construction	General Fund; Grants; Donor Support; Federal Funding
ST 8	Implement Commute and Air Travel Offset Programs	Implement policies and incentive programs to reduce overall commuting and university-funded air travel. Include voluntary Offset Programs to further reduce Scope 3 emissions for Commuting and Air Travel. Also reflects the shift from internal combustion engines to zero-emission vehicles in commuter vehicles and the resulting reduction in GHG emissions.	Business Affairs; Purchasing and Contracts	Near (0-2 years)	Indirect	No	$	No	No	Staff Time	General Fund

ST 1: Enhance Bike Infrastructure

Efforts will include:

- Expanding bike locker installations throughout campus to increase safety for bike riders and encourage increased use of alternative forms of travel on campus.
- Implementing a bike path around campus to promote bicycle and scooter usage while increasing pedestrian safety through proper signage and segmentation of intracampus traffic.

ST 2: Expand RTC Partnership

Work with RTC to increase the number of campus community members who can use the RTC's U-Pass Program. These enhancements will include discussions about:
- The feasibility of a Park-and-Ride Shuttle service to UNLV
- Increasing bus routes to campus to encompass all parts of the city.

ST 3: Increase Bus Service Access

To provide the campus community with access to non-traditional modes of transportation to not only satisfy their commuting needs, but to decrease emissions released by traditional forms of transportation, UNLV will work with local transit agencies to expand bus services access to encompass all areas of Las Vegas.

ST 4: Enhance Electric Vehicle ("EV") Infrastructure

Continue working with Nevada Energy to take advantage of their various incentive programs to increase the number of electric charging stations on campus.

Goals:
- Identify other funding sources to help mitigate the costs of future installations.
- Continue to install updated infrastructure when required.
- When projects like new parking lot construction or modifications are budgeted for, installing the EV infrastructure should be considered.

ST 5: Introduce Park-and-Ride Shuttle Program

This park-and-ride shuttle program will allow commuters to park their vehicles at strategically selected locations around the city and board a shuttle that will take them directly to UNLV.

Shuttle Operations and Features
- Shuttles will run on a set schedule so that commuters can conveniently be returned to their vehicles when campus business has been completed.
- Shuttle service locations will be equipped with secure bike lockers/cages for patrons utilizing the service.

ST 6: Adopt Fleet Vehicle and Equipment Electrification Policy

UNLV will adopt a policy to purchase electric and hybrid vehicles and equipment when fossil fuel-powered vehicles and equipment reach the end of life. Transitioning the campus fleet to low- and zero-emission vehicles supports emissions reduction goals and has a co-benefit of improved local air quality as a result of less vehicle exhaust.

ST 7: Explore Solar Covered Walkways

UNLV will explore the viability of installing solar panel-covered walkways over highly trafficked pedestrian walkways on the main campus.

ST 8: Implement Commute and Air Travel Offset Programs

Transportation-related GHG emissions are a major contributor to UNLV's carbon footprint. UNLV will actively implement policies and incentive programs to reduce overall commuting and university-funded air travel. Programs will include opt-in and voluntary offset programs to further reduce Scope 3 emissions for commuting and air travel.

Waste Management

KEY: $ = Under $250K   **$$** = $250K - $1M   **$$$** = $1M - $2.5M   **$$$$** = over $2.5M
*Direct Emissions Impact & Aligns w/ Rebel CAP Survey ^ = Indirect Emissions Impact & Aligns w/ Rebel CAP Survey
Note: Not all recommendations were addressed in survey

ID	Title	Short Description	Lead(s)	Implementation Timeframe	GHG Impact (Direct/Indirect)	GHG Impact Modeled	Financial Implication	New Revenue	New Cost	Cost Driver	Potential Funding Source(s)
WM 1	Establish a Data Tracking, Storage, and Sharing Protocol*	Establish a Waste Data Collection Protocol emphasizing construction and demolition materials, landfill tonnage and destination, recycling by material type, organic waste, surplus leaving campus or being repurposed, refrigerants, laboratory, dental and medical hazardous waste, and vendor waste removed from campus.	Rebel Recycling, Facilities Management, Planning and Construction, Custodial, Grounds, Surplus, Dining, Student Union and Event Services, Housing and Residential Life, Medical Campus, Athletics, Purchasing	Near (0-2 years)	Indirect	Yes	$	No	Yes	Staff Time; Personnel; Student Internship; Materials; Equipment	General Fund; Grants; Donor Support; Waste Hauler
WM 2	Establish Waste Minimization and Diversion Goals*	Establish waste minimization and reduction goals in alignment with the Waste Data Collection Protocol findings.	Rebel Recycling, Facilities Management, Planning and Construction, Custodial, Grounds, Surplus, Dining, Student Union and Event Services, Housing and Residential Life, Medical Campus, Athletics, Purchasing	Near (0-2 years)	Direct	Yes	$	No	Yes	Staff Time; Personnel; Student Internship; Materials; Equipment	General Fund; Grants; Donor Support; Waste Hauler
WM 3	Expand Post-consumer Composting*	Expand post-consumer organic waste recycling program with University Dining.	Rebel Recycling, Facilities Management, Custodial, Dining	Mid (2-5 years)	Direct	Yes	$$	No	Yes	Staff Time; Infrastructure; Materials; Waste Hauling	General Fund; Grants; Donor Support; Waste Hauler
WM 4	Hire a Zero Waste Manager^	Hire a Zero Waste Manager in Facilities Management to guide waste decisions across campus.	Facilities Management	Near (0-2 years)	Indirect	No	$	No	Yes	Personnel	General Fund; Savings
WM 5	Create a Waste Education Task Force^	Create a committee composed of faculty, staff, and paid student interns to focus on strategies to educate the campus community through campaigns and events.	Rebel Recycling, Facilities Management, Planning and Construction, Purchasing	Near (0-2 years)	Indirect	Yes	$	No	Yes	Staff Time; Student Internship; Materials	General Fund; Grants; Donor Support; Waste Hauler
WM 6	Develop a Bin Expansion and Standardization Protocol*	Research and develop a protocol for expanding exterior waste bins, incorporating recycling bins in classrooms, centralizing office waste disposal for office occupants, and standardizing bin and signage designs.	Rebel Recycling, Facilities Management, Planning and Construction, Custodial, Grounds, Surplus, Dining, Student Union and Event Services, Housing and Residential Life, Medical Campus, Athletics, Purchasing	Near (0-2 years)	Indirect	Yes	$$	No	Yes	Staff Time; Student Internships; Infrastructure; Materials; Design	General Fund; Grants; Donor Support; Waste Hauler

WM 1: Establish a Data Tracking, Storage, and Sharing Protocol*

By expanding and standardizing auditing practices, UNLV can identify areas of improvement. Establish a data collection protocol for tracking volumes of waste minimization, waste diversion, waste disposal, and issuing annual reports on findings. Expand waste auditing to capture data at the building level.

WM 2: Establish Waste Minimization and Diversion Goals*

Establish waste minimization and waste diversion goals. These goals should be broad and specific to each university's waste minimization and diversion program and align with the UNLV Rebel CAP.

WM 3: Expand Post-consumer Composting*

To increase waste diversion, UNLV will expand its current composting infrastructure and operations. Expansion will require post-consumer composting to be available in all buildings, including educational spaces, dorms, office kitchens, etc.

WM 4: Hire a Zero Waste Manager^

Hire a Zero Waste Manager and the appropriate support staff to help guide waste decisions across campus. This new role would oversee student-facing Zero Waste programming and institutional sustainability efforts, such as developing Zero Waste training for staff and coordinating zero waste events.

WM 5: Create a Waste Education Task Force^

Commission a diverse and empowered Waste Education Task Force, composed of faculty, staff, and students, to focus on:

- Development of cost-effective, accurate, and sustainable ways to document the amount and types of waste leaving the campus.
- Writing a Zero Waste Strategic Plan to divert and reduce waste streams.
- Development of outreach programs to educate the campus community through events and focused campaigns about waste reduction initiatives (i.e., toner cartridge recycling, source reduction, clean and dry recycling habits, etc.

- Creation of social media accounts and campaigns to engage the campus community, educate the general public about waste management and waste management efforts at UNLV, and promote events.
- Organization of waste management-related competitions to increase participation and education.
- Outlining zero waste event protocols
- Educating campus about zero waste and each unit's role in accomplishing the goals.

WM 6: Develop a Bin Expansion and Standardization Protocol*

Expansion and standardization efforts will include:

- Expanding the number of outdoor recycling bins and increasing staffing to handle additional bin collection.
  » Communicative bins, such as BigBelly, would allow the current staff to likely maintain collection at additional bin locations or sustain daily communication with Grounds staff. The most efficient and effective method would be for Grounds to empty the bins and bring the clear or light-colored bags to the recycling center.
- Working with the custodial team to pilot recycling bins in classrooms.
- Expanding construction and demolition waste recycling, food waste diversion, and municipal solid waste recycling.

Water Resource Management

KEY: $ = Under $250K   **$$** = $250K - $1M   **$$$** = $1M - $2.5M   **$$$$** = over $2.5M
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Note: Not all recommendations were addressed in survey

ID	Title	Short Description	Lead(s)	Implementation Timeframe	GHG Impact (Direct/Indirect)	GHG Impact Modeled	Financial Implication	New Revenue	New Cost	Cost Driver	Potential Funding Source(s)
WRM 1	Improve Infrastructure and Leak Identification^	Identify, map, and share UNLV water infrastructure, including pipes, nodes, and valves. Adopt a protocol to quickly identify and fix leaks that includes analyzing high-water usage areas on campus.	Business Affairs, Facilities Management, Planning and Construction	Near (0-2 years)	Indirect	No	$$	Yes	Yes	Staff Time; Infrastructure; Software	General Fund; Grants; Donor Support; Water Utility; Cost Savings
WRM 2	Continue Drought Resistant Landscaping^	Continue efforts to replace non-functional high-water turf grass with low water use vegetative ground covers.	Business Affairs, Facilities Management, Planning and Construction, Grounds, Real Estate	Near (0-2 years)	Indirect	No	$	Yes	No	Staff Time; Equipment; Materials	General Fund; Grants; Donor Support; Water Utility
WRM 3	Explore Cooling Tower Replacements	Explore options to increase efficiency and reduce water usage at all water-cooling towers with Southern Nevada Water Authority, including dry cooling and ground source heat exchange.	Planning and Construction, Facilities Management	Mid (2-5 years)	Indirect	No	$$$$	No	Yes	Staff Time; Infrastructure	General Fund; Grants; Donor Support; Water Utility
WRM 4	Maximize Rainwater Utilization^	Maximize utilization of rainwater that falls on UNLV by creating directional irrigation infrastructure and establish a policy to turn off irrigation during rain events.	Business Affairs, Facilities Management, Planning and Construction	Near (0-2 years)	Indirect	No	$$	No	Yes	Staff Time; Equipment; Materials	General Fund; Grants; Donor Support; Water Utility
WRM 5	Create a Water Conservation Research Inventory	Create an inventory of water conservation activities happening at UNLV, the City of Las Vegas, and in Nevada including faculty research, water conservation initiatives, and partner organizations active in water conservation.	Academic Affairs, Business Affairs	Near (0-2 years)	Indirect	No	$	No	No	Staff Time	General Fund; Grants; Donor Support; Water Utility
WRM 6	Develop Water Reclamation & Potable Demand Infrastructure*	Work with SNWA to develop nonconsumptive greywater reclamation infrastructure that can utilize greywater multiple times before discharge to the sanitary sewer. Reduce potable water demand in campus facilities with low water use fixtures.	Business Affairs, Facilities Management, Planning and Construction, Grounds, Real Estate	Near (0-2 years)	Direct	No	$	No	Yes	Staff Time; Equipment	General Fund; Grants; Donor Support; Water Utility

WRM 1: Improve Infrastructure and Leak Identification^
Data tracking and metering will allow us to do the following:

- Identify areas of continued high water consumption.
- Locate undocumented portions of UNLV's water delivery network, including pipes, nodes, and valves to support sub-meter installations.
- Obtain funding to support equipment that generates pipe location data information that can be integrated into UNLV's data systems.
- Implement a survey to locate current water leaks in the distribution system and within buildings.
- Communicate and share UNLV's most recent water audit with planners to identify areas with the most feasible, cost-effective conserving steps (for example, reduction of water leaks).

WRM 2: Continue Drought Resistant Landscaping^
Continue UNLV's efforts to replace non-functional high-water turf grass with low-water use vegetative round covers by doing the following:

- Engage with UNLV's Alison Sloat on possible ways in which UNLV can participate as either a research site or a test implementation site for Sloat's $5 Million urban forest initiative.
- Obtain additional outside expert engagement and advice through scheduled campus meetings with individuals who have the appropriate expertise, such as:
  » SNWA's Kent Sovocool, who has expertise in landscape irrigation conservation and water-conserving technologies,
  » UNLV's Dale Devitt, who has expertise in water conservation for landscape irrigation, especially turf,
  » UNLV's Landscape Architecture faculty,
  » City of Las Vegas' staff implementing their urban tree program.
  » Springs Preserve staff
  » Norm Schilling of Schilling Horticulture
  » Dr. Fred Landau (retired UNLV Life Sciences professor).

WRM 3: Explore Cooling Tower Replacements
Schedule a meeting with SNWA to evaluate the potential of obtaining subsidies to replace cooling towers and install climate-appropriate (native) shade trees.

WRM 4: Maximize Rainwater Utilization^

Maximize the amount of rainwater that falls on UNLV by creating directional irrigation infrastructure and establish a policy to turn off irrigation during rain events.

WRM 5: Create a Water Conservation Research Inventory

Create an inventory of water conservation activities happening at UNLV, the City of Las Vegas, and in Nevada including faculty research, water conservation initiatives, and partner organizations active in water conservation.

WRM 6: Develop Water Reclamation & Potable Demand Infrastructure*

Work with Southern Nevada Water Authority ("SNWA") to develop nonconsumptive greywater reclamation infrastructure that can utilize greywater multiple times before discharge to the sanitary sewer. Reduce potable water demand in campus facilities with low water use fixtures.

Appendix H: GHG Emissions Reporting

Table 1 outlines the geographic and operational boundary of the GHG emissions reporting. The emissions reported are the result of the activities within the Maryland Campus, Shadow Lane Campus and a few satellite buildings. As indicated in the table, some data was not available for multiple categories of GHG emissions. Collecting this data and calculating the GHG emissions should be a focus of future data collection efforts.

	Maryland Campus	UNLV Medical and Dental Facilities*	Satellites
Scope 1 - Direct Emissions			
Stationary Combustion (Natural Gas)			
Direct Transportation	No Data	No Data	No Data
Process Emissions (Agriculture & Fertilizers)	No Data	No Data	No Data
Fugitive Emissions (Refrigerants)	No Data	No Data	No Data
Scope 2 - Indirect Energy Emissions			
Purchased Electricity			
Scope 3 - Other Indirect Emissions			
Commuting*			
Air Travel*			
Solid Waste			
Wastewater			
Electricity T&D Losses			
GSF	**4,852,887**	**499,277**	**355,433**

Table 1: UNLV's Climate Action planning boundary and data availability

GHG emissions from Commuting and Air Travel are based on estimated emissions per FTE of faculty, staff and students. Efforts should be made to collect more accurate travel and commuting data.

Appendix I: Modeling Assumptions and Emissions Reduction Roadmap

The assumptions made for each solution shown in the Rebel CAP wedge chart provided in the Solution Portfolio section are documented below. Cost implications and the emissions reduction potential of each solution are also outlined.

Solutions Name	Modeling Assumptions	Net CAPEX	Net Commodity	Net O&M	Cash Flows	Avg. GHG Impact	% of Avg Forecasted GHG
		$millions	$millions	$millions	$millions	MTCO2e / yr	MTCO2e
1.1 Formalize and Fund Efficiency Program	Strategic Energy Management at Maryland and Shadow Lane campuses resulting in a 25% energy use reduction over ten years. Projects estimated to have a 10-year payback (on average) and will take 10 years, on average, to implement	$33.34	($72.91)	($19.32)	($58.89)	(10,182)	-10.88%
1.2 Enhance Construction & Renovation Standards	Build new buildings and retrofits to a higher energy efficiency standard than code. 30% of campus will be renovated over the next 15 years. The improved space is assumed to use 50% less energy than current building space.	$0.00	($3.23)	$0.00	($3.23)	(5,341)	-5.54%
1.3 Optimize Buildings for Electrification	Investments in campus buildings and electric distribution to prepare buildings to move away from fossil fuel to electrified systems such as Low Temperature Hot Water heating and heat-pump technology. Includes adopting building standards supporting decarbonization such as the New Buildings Institute Decarbonization Code overlay	Impacts not modeled					
2.1 Increase Onsite Renewable Energy & Storage	Install additional onsite Solar PV projects at multiple locations. These can be roof top or parking canopy installations. Include battery storage to enhance campus resilience. Modeled assumtions includes 2.5 MW of capcity, 20% capacity factor and a CAPEX factor of $2/watt	$5.00	($11.29)	$0.00	($6.29)	(1,556)	-1.71%
2.2 Increase Electric Vehicle (EV) Charging Stations	Expand EV charging facilities on campus. Can be done in conjunction with Solar PV parking canopies	Impacts not modeled					
2.3 Explore Virtual Power Purchase Agreement	Replace 100% of grid purchased electricity with renewable electricity. Modeled as cost neutral. Purchase amount is made after demand reduction, from efficiency improvements, as well as additional supply as onsite solar PV is brought online.	$0.00	$11.24	$0.00	$11.24	(23,689)	-24.57%
3.1 Electrify Thermal Systems	Electrify current NG system. Convert to more efficient heat pump technologies. Includes thermal systems, process loads and domestic hot water. Electrification will start in 2026 and be complete by 2035. O&M savings of 20% compared to BAU.	$147.52	($16.88)	($37.00)	$93.64	(5,271)	-5.30%
3.2 Fleet Conversion	Convert current fleet vehicles to Electric. 5 year transition. 2025 to 2030	Impacts not modeled - pending mobile fuels data					
4.1 Commute / Travel Mitigation & Optimization	Reduce Scope 3 Commuting emissions through a variety of programs.	$0.00	$0.00	$0.00	$0.00	(25,950)	-28.55%

Solutions Name	Modeling Assumptions	Net CAPEX	Net Commodity	Net O&M	Cash Flows	Avg. GHG Impact	% of Avg Forecasted GHG
4.2 Waste Mitigation & Composting	Reduce waste by 20% and increase compsting by xx%	$0.00	$0.00	$0.00	$0.00	(182)	-0.20%
4.3 Sustainable Procurement Policy	Implement purchasing policies that emphasize more sustainable suppliers and goods.	Impacts not modeled - pending procurement data					
4.4 Water Reclamation & Potable Demand	Install water reclamation facilities to capture grey water or rainwater for use in suitable applications, such as landscape irrigation. Reduce potable water demand in campus facilities with low water use fixtures	Impacts not modeled - pending water data					
5.0 Engagement	UNLV will look for opportunities to increase campus engagement around climate change issues through a variety of avenues – Curricular & Co-Curricular design, change management focused roll-out of initiatives, Behavior Change programs and through Climate Justice initiatives	No impacts to model					

Figure 1: Rebel CAP Portfolio Cost, Impact, and Modeling Assumptions

Notes:

- The Offsite Renewable Energy solution is modeled with a $10/MWH cost premium. PPAs require significant decisions around location, certainty, quality, and reporting resolution (annual vs. hourly matching).
- ZEV share of vehicles on the road is forecasted to reach 12% in the US by 2030 (Energy Information Administration & National Renewable Energy Lab), and 70% globally by 2050 (Bloomberg New Energy Finance EV Outlook 2023, pg. 4).

Commodity Costs

The baseline scenario involves continuing to pay for the current distribution of commodities, natural gas, electricity, gasoline, etc., at an annual inflation of 2.5%. The Rebel CAP Recommended Portfolio uses the same square footage, with no growth in commodity consumption modeled, but an increase in commodity unit costs due to inflation.

Operation & Maintenance Expenses

Operation expenses under the BAU scenario are based on Fiscal Year 2018 to 2023 Work Order history for Maryland and Shadow Lane campuses, including auxiliaries and academic core. The projection from today to 2057 uses a 2.5% escalation rate for future years. The Recommended Portfolio is based on previous spending, with some savings assumptions applied given the cost reductions the electrified energy system would yield. These assumptions are outlined in the following table. Altogether, the Rebel CAP Recommended Portfolio results in a 23% reduction in operation and maintenance costs. In the model, 35% of operation and maintenance savings are tied to SEM and 65% to electrification. Savings phase in gradually and are fully realized by 2035.

Item	FY19	FY20	FY21	FY22	FY23
BAS	$1,373	$1,252	$3,372	$664	$1,113
Electrical	$725	$610	$679	$481	$704
Equipment/Tools	$49	$37	$70	$128	$176
HVAC	$2,941	$1,311	$1,302	$1,608	$1,381
Planning	$223	$329	$46	$63	$5
Preventive Maintenance	$910	$978	$1,409	$1,799	$2,220
Utilities	$0	$0	$0	$0	$2,959
Grand Totals	$6,220	$4,517	$6,879	$4,744	$8,559

Figure 2: Academic Core Operation and Maintenance Expenses (Thousand $)

Item	FY19	FY20	FY21	FY22	FY23
BAS	$495	$451	$1,215	$239	$401
Electrical	$261	$220	$245	$173	$254
Equipment/Tools	$18	$13	$25	$46	$63
HVAC	$1,060	$472	$469	$580	$498
Planning	$81	$119	$16	$23	$2
Preventive Maintenance	$328	$352	$508	$648	$800
Utilities	$0	$0	$0	$0	$1,066
Grand Totals	$2,241	$1,628	$2,479	$1,709	$3,084

Figure 3: Auxiliaries Operation and Maintenance Expenses (Thousand $)

BAU Projection for O&M is based on an average of fiscal years 2018 to 2023. This was done to capture years that fall before and after COVID and some fluctuations seen in the historical data.

Capital Expenses

The modeling time horizon of 2024 – 2057 will require significant capital renewal to campus energy infrastructure. Based on referred maintenance records, the BAU includes the documented immediate and near-term phases of deferred maintenance (till 2038) as well as projection to 2057. A capital escalation rate of 3% was applied to future years.

Academic Core	Phase					
Item	Backlog	A	B	C	X	
	2022	2023 - 2027	2028 - 2032	2033 - 2037	2038 - 2057	Totals
Electrical	$6,223	$5,117	$4,603	$15,215	$36,623	**$67,782**
Exterior Shell	$9,250	$7,297	$10,563	$4,332	$22,890	**$54,332**
HVAC and Equipment	$9,278	$14,345	$14,792	$30,121	$56,382	**$124,918**
	$24,751	**$26,759**	**$29,958**	**$49,668**	**$115,895**	**$247,032**

Figure 4: Academic Core Deferred Maintenance Report Summary (thousand $)

Auxiliaries	Phase					
Item	Backlog	A	B	C	X	
	2022	2023 - 2027	2028 - 2032	2033 - 2037	2038 - 2057	Totals
Electrical	$6,791	$9,688	$9,819	$10,941	$48,156	**$85,395**
Exterior Shell	$6,284	$7,097	$7,496	$8,884	$39,101	**$68,862**
HVAC and Equipment	$13,235	$20,425	$20,994	$22,348	$98,363	**$175,366**
	$26,310	**$37,210**	**$38,308**	**$42,174**	**$185,621**	**$329,623**

Figure 5: Auxiliaries Deferred Maintenance Report Summary (thousand $)

The details behind the above summaries of Maryland and Shadow Lane deferred maintenance projection are shown below. These represent the categories of deferred maintenance that have an impact on energy consumption in UNLV's buildings.

Item	Phase					
	Backlog	2023	2028	2033	2038 and later	Totals
Electrical	**$6,223**	**$5,117**	**$4,603**	**$15,215**	**$36,623**	**$67,782**
Building Distribution	$3,918	$1,150	$1,819	$11,420	$23,996	$42,304
Campus Distribution	$0	$0	$0	$0	$0	$0
Fixtures/Lighting	$1,975	$2,541	$1,722	$244	$795	$7,277
Generation	$275	$876	$627	$2,776	$10,927	$15,481
Secondary Service	$55	$550	$435	$775	$905	$2,720
Exterior Shell	**$9,250**	**$7,297**	**$10,563**	**$4,332**	**$22,890**	**$54,332**
Openings	$5,403	$3,214	$8,037	$1,277	$17,356	$35,287

	Phase					
Item	Backlog	2023	2028	2033	2038 and later	Totals
Roof	$3,847	$4,083	$2,526	$3,055	$5,534	$19,045
HVAC	$9,278	$14,345	$14,792	$30,121	$56,382	$124,918
Air Handling	$987	$7,285	$9,536	$2,524	$3,067	$23,399
Building Distribution	$115	$115	$98	$5,844	$41,025	$47,197
Controls	$5,678	$3,744	$1,107	$362	$4,375	$15,266
End Use HVAC	$0	$64	$57	$369	$78	$568
Fuel Supply/ Management	$0	$0	$0	$0	$0	$0
Generation	$2,498	$1,852	$3,645	$20,244	$7,494	$35,733
Ventilation	$0	$1,285	$349	$778	$343	$2,755
Grand Total	$24,751	$26,759	$29,958	$49,668	$115,895	$247,032

Figure 6: Detailed categories of deferred maintenance for Maryland and Shadow Lane (thousand $)
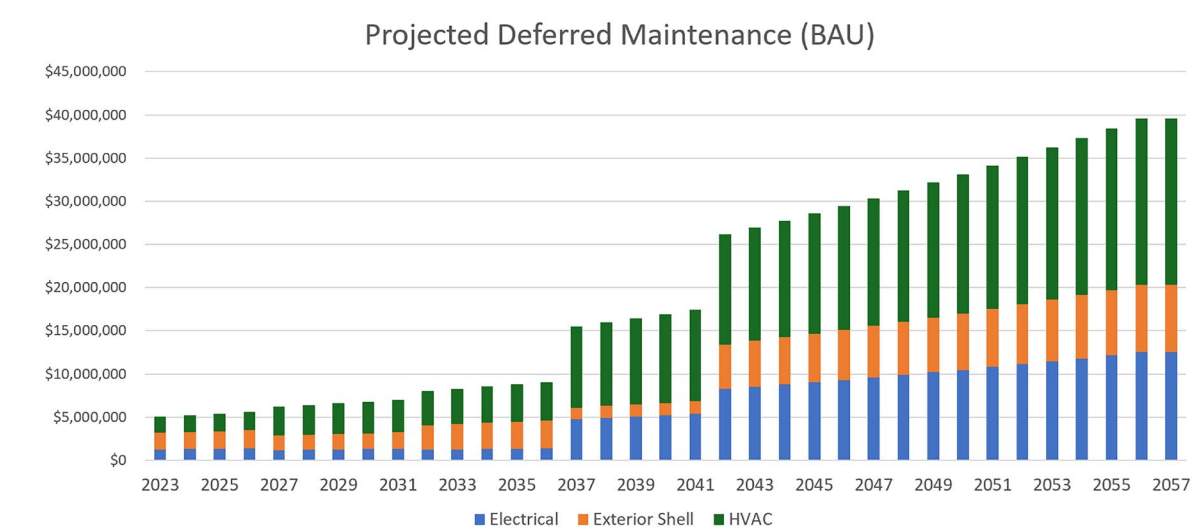
Figure 7: Deferred Maintenance (CAPEX Spending) Projection

The Rebel Cap Recommended Portfolio applies assumptions to the various categories within the BAU capital renewal (e.g. deferred maintenance, normal capital renewal, etc.) to estimate the likely capital cost energy efficiency and electrification. The net capital investments resulted in a 37% increase in capital expenses compared to the BAU portfolio. Please note that incentives provided by the Inflation Reduction Act (IRA) were not applied to the electrification solution and any additional onsite renewable energy investment and could result in a more similar financial requirement if incorporated.

Emissions Reduction Roadmap

The Emissions Reduction Roadmap outlines the themes and initiatives recommended in this plan. The Roadmap Themes are shown in the left column of the image below, and the associated initiatives are

organized in boxes that are aligned horizontally adjacent to each theme. It is important to note that implementing some initiatives will impact others' carbon emissions reduction potential. For example, the "1.1 Formalize & Fund Efficiency Program" will reduce the amount of energy used on campus and, therefore, reduce carbon emissions. That will result in fewer emissions remaining to be addressed by the "3.1 Increase Onsite Renewable Energy & Storage" and "3.1 Electrify Thermal Systems". In general, the plan is intended to be implemented top-to-bottom, left-to-right. However, many initiatives can and should be pursued in parallel.
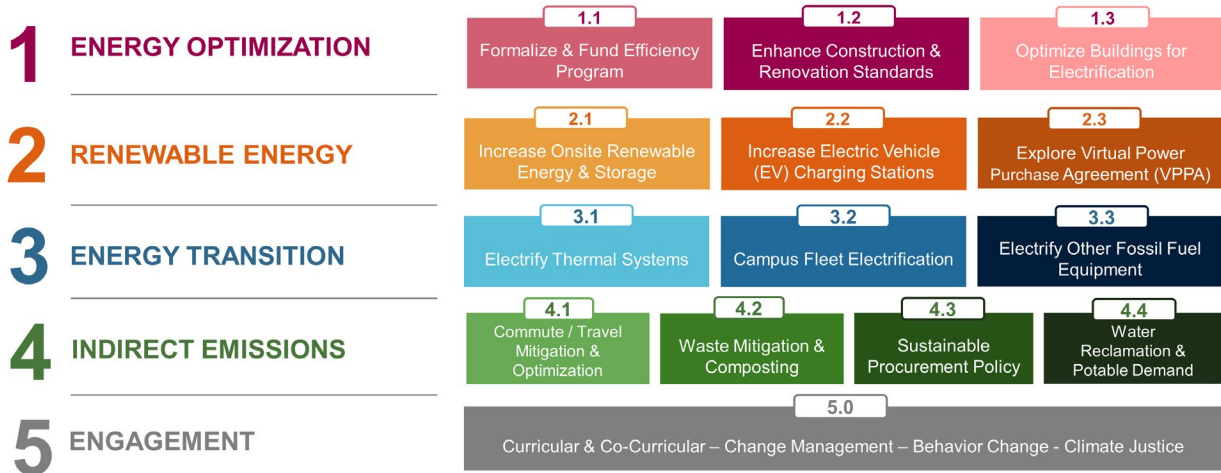

Figure 8: Rebel Climate Action Plan Roadmap

The creation of the road map was through a multi-month long process involving UNLV's Rebel CAP Core Team at UNLV, the consulting team, a community wide "Ideas Assessment" that gathered input from faculty, staff and students and, an array of Working Groups that generated and vetted recommendations for the Rebel CAP. In Figure 8, "starred" items indicate a strong alignment with the themes and initiatives derived from the Rebel CAP Survey.

The consulting team developed a life-cycle carbon, energy and cost model to quantify the impacts of proposed recommendations relative to the Business-as-usual reference case. The modeling shows the above impacts from the present day till 2057, the carbon neutrality target year. Table 2 below summarizes the set of initiatives (also known as Solutions). Detailed assumptions about each Solution can be found in Appendix I.

Modeled Solutions	Overview
1.1 Formalize and Fund Efficiency Program	Strategic Energy Management at Maryland and Shadow Lane campuses resulting in a 25% energy use reduction over ten years. Projects estimated to have aa average 10-year payback
1.2 Enhance Construction & Renovation Standards	Build new buildings and retrofits to a higher energy efficiency standard than code
1.3 Optimize Buildings for Electrification	Investments in campus buildings and campus electric distribution to prepare buildings to move away from fossil fuel to electrified systems such as Low Temperature Hot Water heating and heat-pump technology. Adopt and amend building standards supporting decarbonization such as the New Buildings Institute Decarbonization Code overlay.
2.1 Increase Onsite Renewable Energy & Storage	Install additional onsite Solar PV projects at multiple locations. These can be roof top or parking canopy installations. Include battery storage to enhance campus resilience

Modeled Solutions	Overview
2.2 Increase Electric Vehicle (EV) Charging Stations	Expand EV charging facilities on campus. Can be done in conjunction with Solar PV parking canopies
2.3 Explore Virtual Power Purchase Agreement	Replace 100% of grid purchased electricity with renewable electricity
3.1 Electrify Thermal Systems	Electrify current natural gas systems. This can include HVAC systems as well as other uses, such as domestic hot water heating. Convert to more efficient heat pump technologies. Electrification complete by 2040
3.2 Fleet Conversion	Convert current fleet of university owned vehicles to electric over a 5-year transition. EV conversion can happen as ICE vehicles reach end-of-life. 2025 to 2030
4.1 Commute/Travel Mitigation and Optimization	Implement policies and incentive programs to reduce overall commuting and university-funded air travel. Include voluntary Offset Programs to further reduce Scope 3 emissions for Commuting and Air Travel. Also reflects the shift from internal combustion engines to zero- emission vehicles in commuter vehicles and the resulting reduction in GHG emissions.
4.2 Waste Mitigation & Composting	Implement policies to track campus waste, reduce the tonnage of waste and increase diversion from landfill. This can include additional composting, recycling, or re-use programs.
4.3 Sustainable Procurement Policy	Implement purchasing policies that emphasize more sustainable suppliers and goods.
4.4 Water Reclamation & Potable Demand	Install water reclamation facilities to capture grey water or rainwater for use in suitable applications, such as landscape irrigation. Reduce potable water demand in campus facilities with low water use fixtures
5.0 Engagement	UNLV will look for opportunities to increase campus engagement around climate change issues through a variety of avenues – Curricular & Co-Curricular design, change management focused roll-out of initiatives, Behavior Change programs and through Climate Justice initiatives

Table 2: Initiatives modeled in the Climate Action Plan

Solution Portfolio

The consulting team in conjunction with the Core Team, combined the initiatives that have a direct impact on GHG emissions into a Recommended Portfolio. The model, as shown below in this section and the Business Case section, shows the impacts on GHG emissions, energy demands, operations & maintenance costs ("OPEX") and capital costs ("CAPEX") between 2024 and 2057.

This portfolio does not contain all the initiatives listed as some items do not have a direct impact on GHG emissions or a baseline of emissions had not been established for a particular category. For example, at the time that this report is being developed, UNLV had not yet gathered mobile fuel data to calculate a GHG emissions baseline for campus fleet vehicles. The reduction from electrification of the campus fleet is not shown as a baseline has not yet been established.

Case / Portfolio	Overview
BAU Reference Case	Business-as-Usual Reference Case. This is a planning base-case used to show the cost and impact of continuing current business operational practices into the future. As modeled, it does not reflect any planned growth or space optimization.
Recommended Portfolio	A portfolio of 8 initiatives centered around energy demand reduction through energy efficiency, a rapid pursuit of renewable electricity with a shift from fossil fuel infrastructure to equipment to systems powered by clean electricity.

The following "wedge" chart shows the impact of each initiative/solution as modeled against the BAU reference case. The GHG Reduction Goal is Carbon Neutral by 2057 with an interim reduction goal of 50% of current emissions by 2030. Where the portfolio does not meet the goal, the model shows offsets, but this can also be considered "remaining emissions that are not addressed by current solutions" if no offsets are purchased.
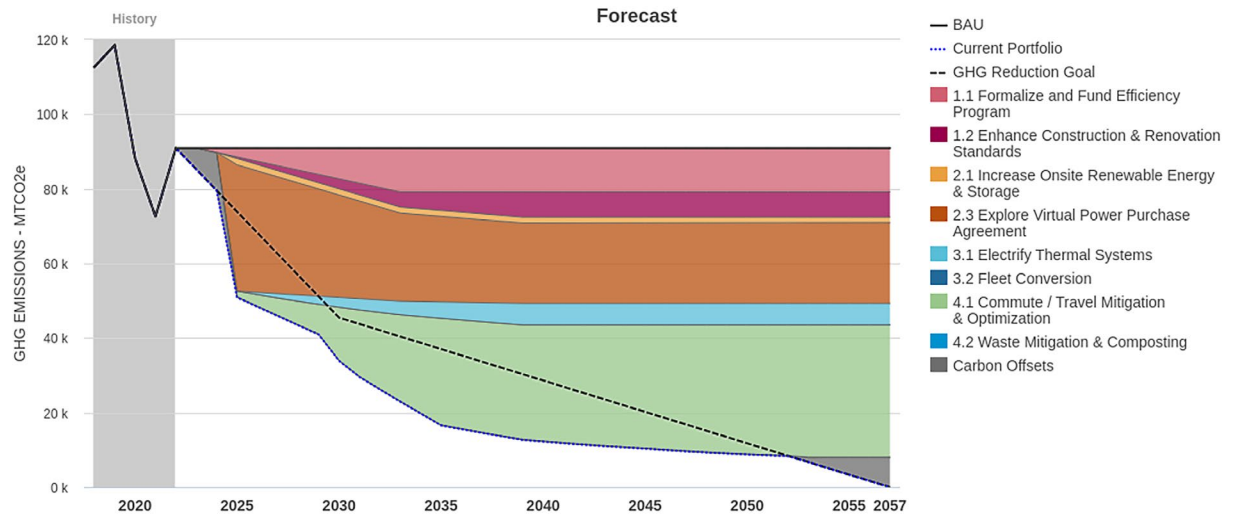

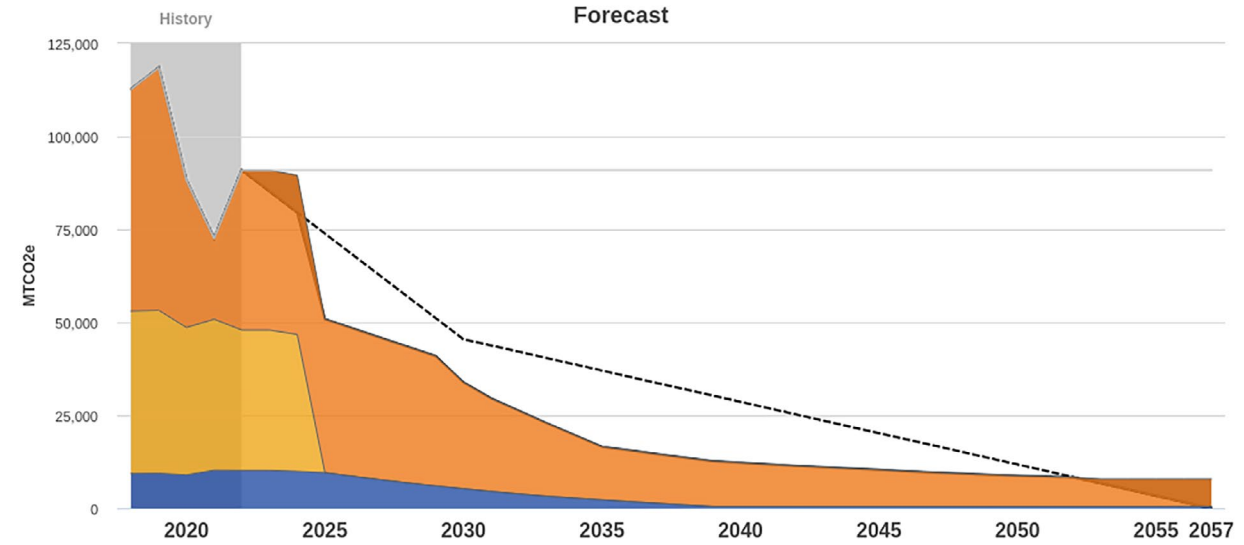*Figure 9: Wedge Chart showing emissions reductions from solutions in Recommended Portfolio*

Figure 10: GHG reduction projection for Roadmap and Recommended Portfolio

Insights

- A significant reduction in energy use can be made through a funded efficiency program as well as adhering to enhanced construction and renovation standards for new and renovated spaces.
- With electrification, the GHG emissions shift from natural gas to grid purchased electricity. Scope 2, emissions from purchased electricity, was already a majority of UNLV's emissions but can be addressed with an increase in onsite renewable energy as well as the purchase of offsite renewables via a VPPA or renewable electricity purchases direct from NV Energy.
- Scope 3 emissions reductions, as shown in the green wedge above, are a combination of mitigation, voluntary offset programs for commuting and air-travel and a recognition that the commuter fleet is "greening" over time with the adoption of zero-emission vehicles, such as Battery Electric Vehicles ("BEV").

Energy Impacts

The following charts show the impact that the Recommended Portfolio would have on commodity (natural gas and electricity) purchases.
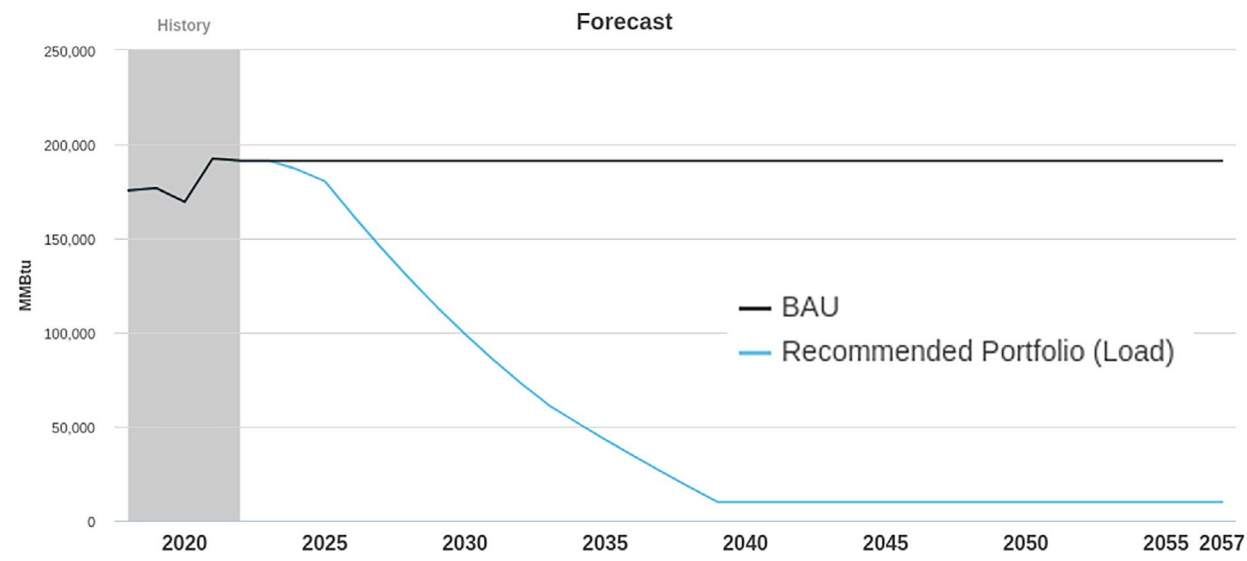
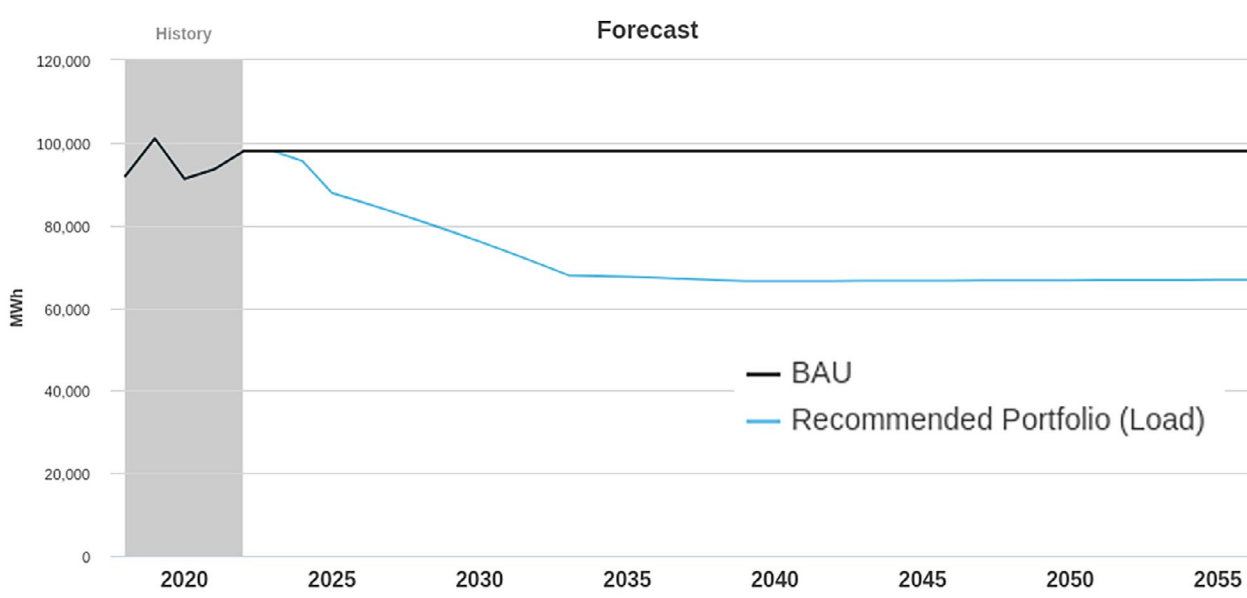*Table 3: Annual Natural Gas Demand Forecast*

Table 4: Annual Electricity Demand Forecast

Insights

- Natural Gas demand is greatly reduced to near zero through a combination of efficiency improvements in the near term and, significant infrastructure changes to UNLV's heating systems via electrification in the long term. Some natural gas remains for process loads, such as sterilization, cooking and domestic hot water.
- There is an initial reduction in purchased electricity due to energy efficiency gains from improvements in the buildings and adhering to more efficient building standards with new buildings and major renovations.

Business Case

The team used the financial components of the Business-as-Usual reference case as a baseline to explore the potential financial implications of the Rebel CAP Solutions and Portfolio. The BAU Business Case quantifies the future costs associated with maintaining the current campus energy systems. The financial planning baseline, and comparative analysis, makes the very important assumption that UNLV will adequately fund campus infrastructure and energy systems to maintain the expected levels of service of a R1 research institution for decades to come. It is a long-range plan that provides a higher-level, institution-wide perspective on the financial tradeoffs of different strategic directions. It does not navigate the political complexities of annual budgeting or near-term capital planning. As such, the estimates in this plan should not be construed as a specific ask for funding, nor as a commitment by UNLV to fund a particular project.

Furthermore, while the team made every effort to use the best available data to generate estimates, the goal of the numbers is to start a conversation, not establish a construction budget. All models are wrong, some are useful. The intent is to provide UNLV leadership and community members with an order-of-magnitude estimate of various paths forward to help set the institution on a path to reach its stated goals in a financially responsible way, in alignment with UNLV's mission and values.

The financial baseline is summarized by the following categories:

| Financial Category	Description
Commodities	Annual cost of utilities including purchased electricity, natural gas, water, and other fuels required to deliver energy services to the University.
Non-Commodity OPEX	Annual Operations and Maintenance Costs including utility-related labor, direct operations and maintenance costs, service contracts.
CAPEX	Required Capital Costs for campus infrastructure beyond annual budget allocation for operations and maintenance. For example, replacing end-of-life equipment, adding equipment to maintain or respond to reliability or regulatory standards.
Social Cost of Carbon	A shadow price that attempts to put a dollar value on the harm to the economy caused by one ton of carbon dioxide pollution. This plan used the current value, as per the Biden administration, of $51 / MTCO2e with a 5% escalation rate.
x	
Inflation Rate	2.5%, used for commodities and Non-commodity O&M Costs
Capital Escalation Rate	3%, used for all CAPEX costs
Discount Rate	5%, used to show future cashflows in current dollars
Modeling Time Horizon	2024-2057 or 33 years

Commodities
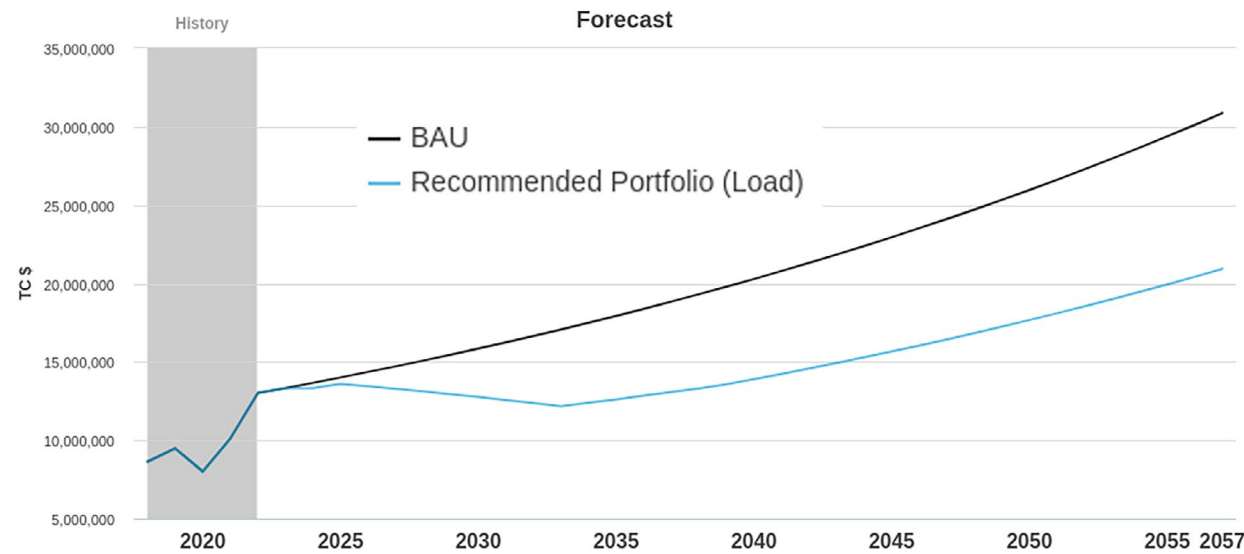
Figure 11: Annual Cost of Commodities (Natural Gas and Electricity) in then-current dollars ("TC $")

Insights:

- Due to efficiency gain, commodity spending for both Natural Gas and Electricity decreases in the near term.
- With a switch from relatively inexpensive natural gas to more expensive electricity, commodity costs will rise after 2030 with additional electricity and rising electricity costs.

Non-commodity OPEX

Non-commodity OPEX can be a more challenging element to accurately describe for the financial model. Unlike commodities, which have regular bills, reports and accounting line items, Non-commodity OPEX is inherently distributed across many operational budgets. Additionally, the targeted Non-Commodity OPEX is that which relates to energy use in campus buildings. The team was able to leverage detailed records of work orders from fiscal year 2019 to 2023 for the Academic Core and Auxiliaries. The team focused on work orders that addressed energy related infrastructure such as HVAC systems, or envelope improvements. Using this data, adjusting for inflation to produce a rough-order-of-magnitude estimate for the BAU reference case.
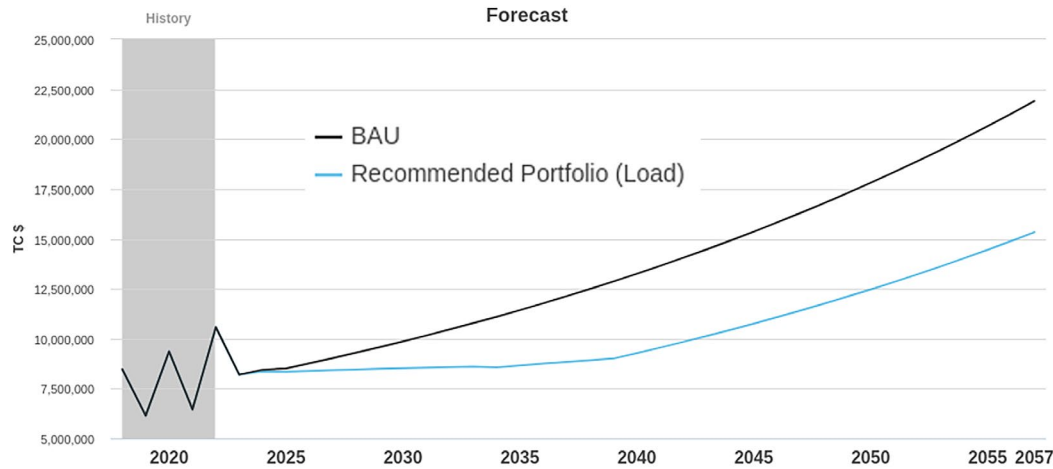

Figure 12: Annual Non-commodity OPEX in then-current dollars ("TC $")

Insights:

- Some fluctuation was seen in historical year's spending. Projection is based on an average of FY18 to FY23.
- The investment in upgrading to new, and more efficient, heating and cooling equipment will result in lower O&M costs for the energy system on campus.
- The electrified system that will replace the fossil fuel infrastructure typically has a reduced O&M impact.

CAPEX

Based on an analysis of past deferred maintenance backlogs, the team focused on trying to understand the required CAPEX for the various strategic paths forward using a combination of known capital projects, deferred maintenance backlogs, asset renewal schedules, and recent capital project budgets. We broke down required capital into the following categories:

| CAPEX Categories	Description
Energy Efficiency	Investments intended to lower the overall energy demands of a building including, lighting upgrades, controls, commissioning, etc.
Building Renewal	Investments in the buildings to maintain core systems. E.g., Air-handlers, building envelopes.
Energy Transition	Investments intended to electrify fossil fuel systems where feasible. This would include, heating and cooling system, process steam loads, and domestic hot-water systems.
On-site Renewable Energy	Investments in expanding on-site renewable energy, primarily Solar PV.
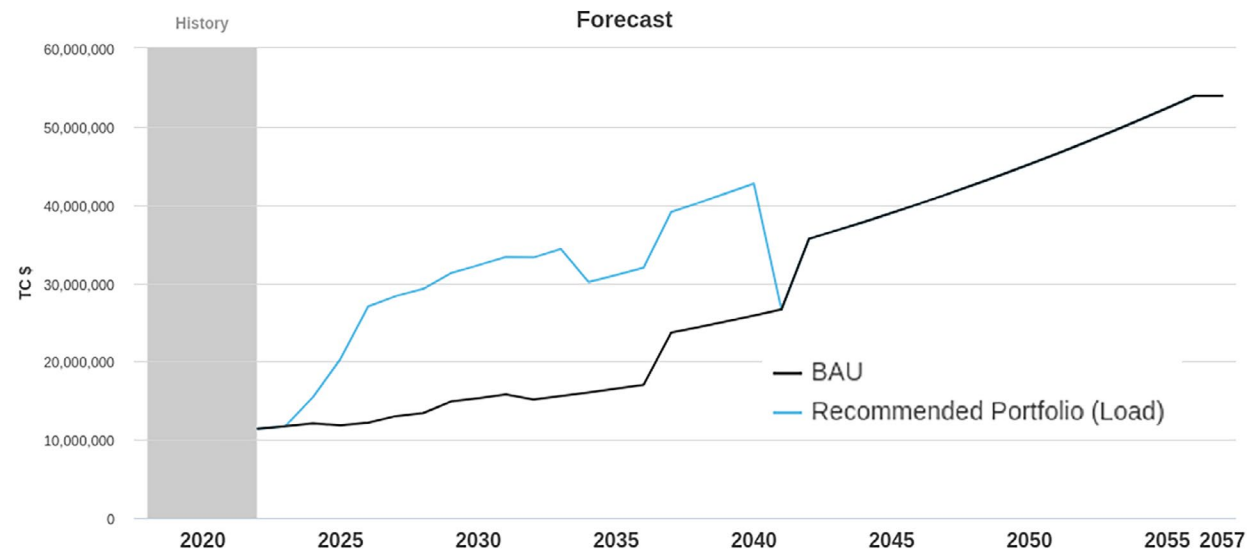
Figure 13: Annual CAPEX in then-current dollars ("TC $")

Life-cycle Cost Comparison

To understand the full financial picture, the team combined the Commodities, Non-Commodity OPEX and CAPEX for each Case. Using the discount rate, each forecast was rolled-up into a 2024 present value to show the entire 2024 – 2057 forecast as single financial value. This enables a life-cycle cost comparison to consider the current value of all future capital and operating costs in a side-by-side comparison.
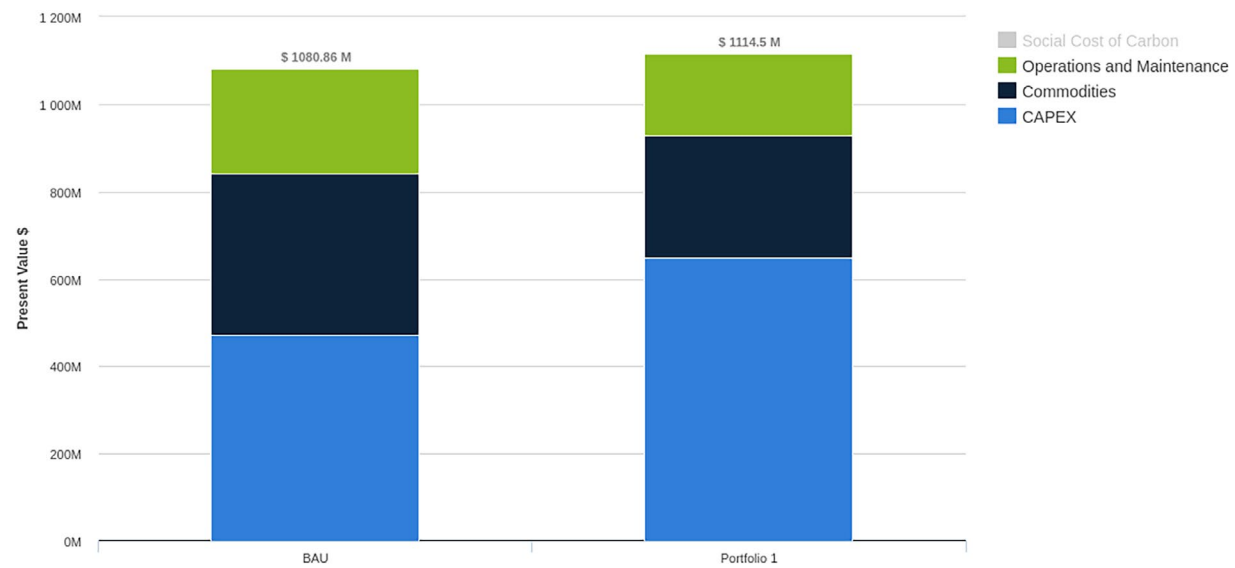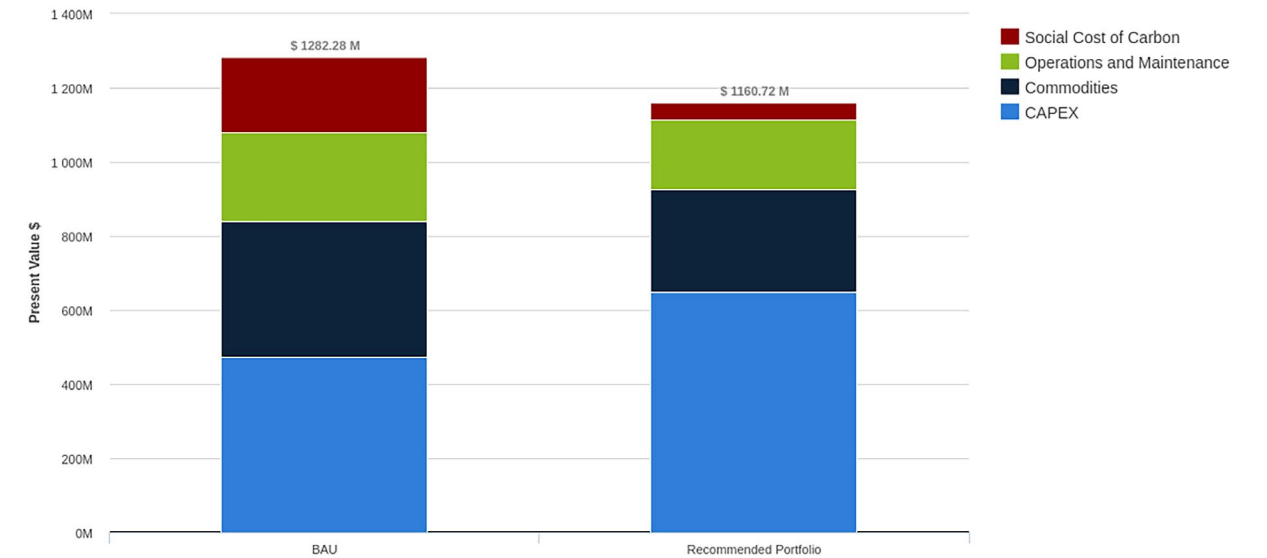

Figure 14: Life-cycle Cost Comparison in 2024$

Figure 15: Life-cycle Cost Comparison + Social Cost of Carbon in 2024$

Insights:

- The Recommended Portfolio has significantly higher required capital than the BAU, but lower operating and commodity costs.
- Capital spending increase also represents spending on deferred maintenance. A capital spending plan focused on improving the efficiency of energy systems through investment in newer equipment and energy infrastructure on campus, will also address deferred maintenance.
- A reduction in GHG Emissions also reduces carbon risk[1]

[1] Transitional and physical carbon risk as defined by the EPA: https://www.epa.gov/climateleadership/climate-risks-and-opportunities-defined