CLIMATE ACTION PLAN RESEARCH REPORT

2021

Written by MSU undergraduate students:
Nicole Bondurant, Dominic Corradino, Nicholas Fitzmaurice, Cy Halvorson, Raye Myers, Megan Stone, Jessica Thompson, and Savanna Washburn

Advised by Dr. Julia Haggerty and Dr. Paul Lachapelle

Endorsed by the Campus Sustainability Advisory Council and the MSU Office of Sustainability

Forward

The next five years will set the course for our shared future. With each passing year, we learn of an increasingly dire carbon budget that we must meet to avoid the worst impacts of climate change. Our ability to respond depends upon scientists, business leaders, politicians, decision-makers, and an engaged public to coalesce around the common goals of reducing and sequestering greenhouse gas emissions in a rapid and sustained manner. Unfortunately, there is not a single set of technological solutions that will allow us to simply tinker around the edges of the issue. Nothing short of a transformation that addresses social development and environmental protection together will adequately prepare us for the challenges ahead.

Montana State University has taken meaningful steps to embed sustainability throughout the institution. From Facilities Services to the Office of Sustainability, the foundation of resource efficiency, innovative new construction, and waste diversion has been established. Further, a system of transparency, tracking, and accountability is in place with the Sustainability Tracking, Assessment & Rating System (STARS). The imperative of sustainability has long been fueled by a student body that has repeatedly voted to support recycling, public transit, and the Office of Sustainability. The work of carbon reduction requires a centralized team to help guide best practices and track progress, but the work is executed on a daily basis by a much larger body of students, staff, educators, contractors, and top leadership.

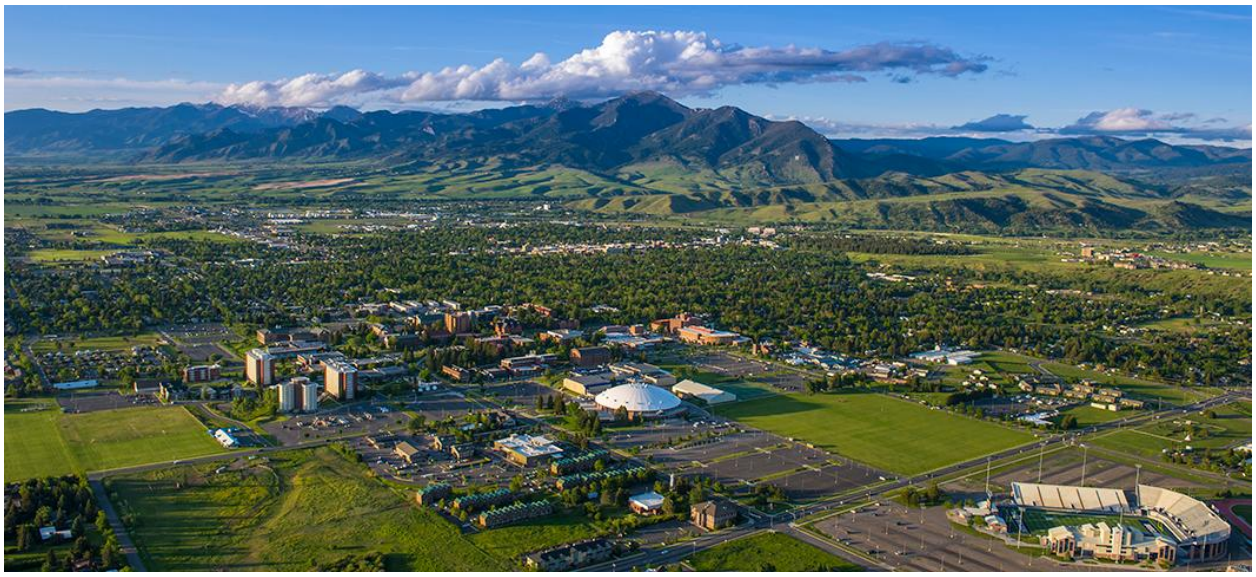
The authors of this report represent an astute group of future Montana leaders. These are leaders who recognize the weight of the problem they have inherited and have chosen to channel their sense of urgency into a process of understanding. They systematically surveyed comparable institutions, completed a literature review, and conducted interviews to assess the challenges that lie beneath the surface. They organized their findings into actionable steps that any institution of higher education could use as a guide to operationalize sustainability and be effective change agents in their communities, states, and beyond.

Prior to the City of Bozeman adopting the 2020 Bozeman Climate Plan, we endeavored to develop a comprehensive scope of work and an inclusive stakeholder group to advise the City on a range of technical and political issues. The resulting solutions and actions identified in the Bozeman Climate Plan serve as a roadmap for the community to achieve carbon neutrality by 2050. The role of Montana State University in the implementation of the Bozeman Climate Plan is evidenced by the frequent calls throughout the document for the City of Bozeman and Montana State to deepen and broaden efforts to support climate demonstration projects, policies, best practices, undergraduate research projects, and joint communication and outreach. The complementary key findings found in the MSU Climate Action Report, if fully implemented, would dramatically increase the probability that the Bozeman community will achieve carbon neutrality by 2050.

While the science of climate change can be overwhelming and even paralyzing, there are many signs of hope that society will undertake the marathon work that is necessary to secure a more promising future. The spirit of this report reminds me of one of the foremost legal minds and generational leaders for social change, Justice Ruth Bader Ginsburg, who said that “real change, enduring change, happens one step at a time.” Knowing that we will not likely solve the climate crisis with a sweeping revolution, we must win more hearts and minds to bring consistent daily incremental changes to the cause. The key findings from the CAP Research Report highlight strategic priorities to

develop a culture that will systematically develop, implement, and scale climate solutions in every facet of our institutions. The same lessons may be applied to state and local governments. Further, this work product once again demonstrates that universities are uniquely positioned to innovate, disseminate information, and accelerate climate action.

Natalie Meyer
Sustainability Program Manager
City of Bozeman, Montana
June 15, 2021



Aerial view of MSU campus and the City of Bozeman

Preface

This report was conducted under extraordinary circumstances—a reality that is highlighted by local and national events in these final few weeks of April 2021. As vaccination rates expand and MSU commits to returning to in-person learning for the upcoming fall semester, students and faculty are beginning to re-emerge from a long, dark tunnel of the pandemic (though tremendous uncertainty exists as to whether the end is truly in sight). At the same time, the nation is directing its attention to the urgency of combating climate change. On April 22nd, 2021, President Biden pledged to cut US greenhouse gas (GHG) emissions to fifty percent of 2005 levels by 2030, signaling a long overdue re-engagement of US leadership in the pressing global challenge of our time. For those of us involved in this report, the memory of its creation will always bring to mind both of these trends—weathering the pandemic and watching the emergence of new hope for climate action.

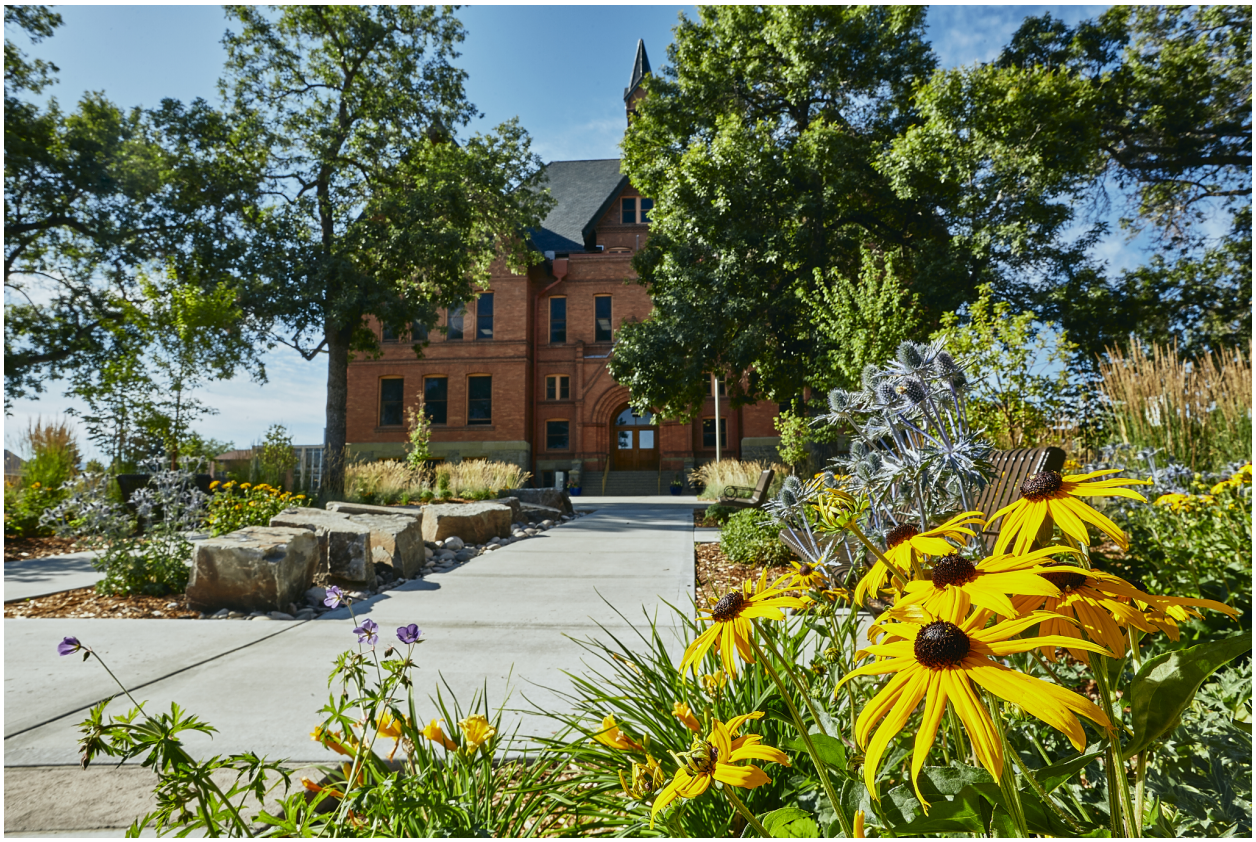
Indeed, the report would not likely have occurred were it not for the pandemic. In 2020, the exigencies of the Global COVID-19 pandemic created an urgent need for an all-hands-on-deck response from the Montana State University campus community. For the Campus Sustainability Advisory Council (CSAC), this meant hitting pause on a public process to secure the adoption of a new campus-wide sustainability plan so that we could assist and engage in an effective pandemic response. Yet, we wanted to maintain forward momentum in sustainability planning, particularly concerning the need for an updated set of greenhouse gas (GHG) emissions reduction targets. With that in mind, CSAC has spent the year continuing our shared education about MSU's carbon footprint and climate action planning as a sustainability practice in higher education. This report is a key feature in that set of activities, supervised by two faculty members and written by students for the benefit of CSAC and its greater constituency.

At the start of the spring term of 2020, the two of us, Julia Haggerty and Paul Lachapelle, sent out a call for student volunteers to produce a report on campus climate action planning. We offered independent study credit and a structured curriculum based on our shared expertise in public policy, community development, and planning. Eight students, the authors of this report, responded enthusiastically to the call. The charge from CSAC was to produce a report summarizing best practices in campus sustainability planning from academic literature and practitioners. This report provides a critical reference for CSAC and other stakeholders in sustainability and climate action planning at MSU and other campuses, sharing key lessons and detailed information about lessons learned from decades of sustainability planning on college campuses nationwide.

To complete this report, the students conducted a literature review, identified peer institutions, read dozens of climate plans, designed and executed semi-structured interviews with campus leaders, and practiced systematic data analysis. All work was conducted virtually and for most of the authors, as an added commitment on top of very full academic and work schedules. Their determination, professionalism, and collaborative spirit have been exceptional throughout the process, inspiring in so many ways. We are confident that the skills and awareness the students have gained in this research exercise will translate to future success in the many important endeavors they will undoubtedly pursue. We also gratefully acknowledge the participation of our colleagues at MSU and other campuses, particularly Kristin Blacker, MSU's Director of Sustainability. All have generously offered time and wisdom without which this report would not have been possible.

Most importantly, the student authors of this report are now experts in campus climate planning—poised for leadership in advising, engaging in, and advancing MSU's process of adopting climate targets as part of its updated sustainability plan. They will also help to inspire a generation of students committed to ensuring the targets are met in ways that are equitable and constructive. We are humbled by their accomplishment and excited to see their knowledge applied.

Julia Haggerty & Paul Lachapelle
April 28, 2021



MSU's Montana Hall

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Glossary

AASHE - The Association for the Advancement of Sustainability in Higher Education.

ACUPCC - American College and University Presidents' Climate Commitment.

Baseline - A minimum or starting point used for comparisons and measuring future progress.

Bottom-Up Management - A management approach where goals, tasks, and projects are informed by students and stakeholders.

CAP - Climate Action Plan.

CSAC - MSU's Campus Sustainability Advisory Council.

CSU - Colorado State University.

Energy Audit - An assessment of the energy needs and efficiency of a building or buildings.

GHG - Greenhouse Gas(es).

GHG Inventory - The total greenhouse gas emissions caused by an individual, event, organization, service, or product, expressed as carbon dioxide equivalent.

Land Grant University - An institution of higher education in the United States designated by a state to receive the benefits of the Morrill Acts of 1862 and 1890.

MSS - Multicultural Student Services.

MSU - Montana State University.

MUS - Montana University System.

RLF - A revolving loan fund (RLF) is a gap financing measure primarily used for the development and expansion of small businesses. It is a self-replenishing pool of money, utilizing interest and principal payments on old loans to issue new ones.

Scope 1 Emissions - Direct greenhouse gas emissions that occur from sources that are controlled or owned by an organization.

Scope 2 Emissions - Indirect greenhouse gas emissions associated with the purchase of electricity, steam, heat, or cooling.

Scope 3 Emissions - Scope 3 Emissions are the result of activities from assets not owned or controlled by the reporting organization, but that the organization indirectly impacts its value chain. Scope 3 Emissions

include all sources not within an organization's Scope 1 and 2 boundaries, such as directly financed air travel; faculty, staff, and student commuting; and solid waste removal.

SIMAP - Sustainability Indicator Management & Analysis Platform, managed by the University of New Hampshire. A carbon- and nitrogen-accounting platform that can track, analyze, and improve campus-wide sustainability.

STARS - The Sustainability Tracking, Assessment, and Rating System, managed by AASHE.

Top-Down Management - A management approach where goals, projects, and tasks are determined by faculty, staff, and administration.

UM - University of Montana.

USU - Utah State University.

WSU - Weber State University.

Executive Summary

In January 2021, eight Montana State University (MSU) undergraduate students set out to research the climate action planning process at universities across the country, with the help of two faculty advisors. Seeking to inform MSU's drafting and adoption of a new climate action plan (CAP), our research team began uncovering the nuances of climate action planning. Having completed our research, we compiled this final report and presented our findings to MSU's Campus Sustainability Advisory Council (CSAC) and Planning Council in April 2021.

To begin our process, we reviewed the scientific literature on climate action planning while simultaneously gathering information on numerous universities from across the country. The scientific literature helped us determine how we would analyze climate action planning and the institutional data we collected allowed us to compare each university to MSU. We looked for institutional similarities in these comparisons to decide which universities we would utilize for our case study. The four universities we chose to focus on are Colorado State University (CSU), University of Montana (UM), Utah State University (USU), and Weber State University (WSU).

Having chosen these universities, we set off to analyze each university's CAP and supporting documents. We also interviewed individuals involved with CAP development and implementation from each university. Following our findings from the scientific literature, we analyzed each CAP and coded our interview transcripts based on specific thematic categories. Having analyzed CAPs and interviewed individuals from each focus institution, we briefly summarized the climate action planning process at each university. Using our coded CAP analyses and interview transcripts, we then synthesized the data from each thematic category into key findings.

Having completed this thorough qualitative research process, we are prepared to share key findings to the MSU community, to inform future climate action planning on our campus. Though our findings are both extensive and nuanced, we aim to condense and summarize them here. For climate action planning to be successful at the university level, CAPs must accomplish the following:

- **Establish and secure a reliable, substantial, and centralized funding source.**
    - Many universities have created Revolving Loan Funds (RLFs) that accrue the monetary savings from current and past CAP projects to fund future projects. By not capping these funds, universities can fund more substantial and ambitious CAP projects to help reach their long-term goals.
- **Secure support and endorsement from top university leadership, primarily the President.**
    - Though extensive bottom-up leadership is necessary for a successful CAP, progress grinds to a halt when administrations do not support CAPs.
- **Conduct a comprehensive GHG emissions inventory baseline, tracking progress through annual inventories.**
    - GHG inventories are essentially a CAP's primary scorecard and without them, progress cannot be tracked.
- **Create a public carbon neutrality goal with interim benchmarks and detailed steps outlining how to reach them.**

    - Making goals public can help with accountability, and reaching interim benchmarks keeps universities on track to meet their overarching goals. These benchmarks also create space for celebrating progress along the way.
- **Engage campus and community stakeholders early and extensively in the planning process.**
    - This can be accomplished through campus curriculum, research expenditures, and town hall-style forums, among other avenues. Facilities personnel should also be directly involved with the climate action planning process to ensure the plan is aspirational yet actionable.
- **Establish institutional accountability mechanisms to ensure the implementation of projects, goals, and plan updates. Explicitly identify timelines, resources, and responsibilities.**
    - CAPs often make lofty goals, setting ambitious standards for future action. Universities can fall short in substantiating these goals when CAPs do not consider all the details. To overcome this issue, CAPs should explicitly address the individuals or parties responsible for completing each task, precise funding sources, necessary technology, requisite support from outside the university, and any other details that will help ensure CAP goals are met.
- **Communicate the economics of CAP projects effectively.**
    - It is becoming increasingly apparent that climate action is not only necessary for the preservation of our planet and the people on it, but that positive climate action strategies are economically viable and advantageous. Communicating the financial benefits and savings generates broader support for CAPs and accelerates the implementation process.
- **Acknowledge current data gaps and uncertainties and plan to address them.**
    - Universities will not have all the needed information available to them in their climate action planning process. This is especially prevalent in the reporting of Scope 3 emissions, as these sources are often more difficult to track. It is important that these shortcomings are noted in CAPs, and that future iterations attempt to resolve them.
- **Incorporate climate justice.**
    - The effects of climate change are disproportionately felt in traditionally underserved communities. Climate action must, therefore, take social issues into account, addressing the climate crisis through a lens of equity.

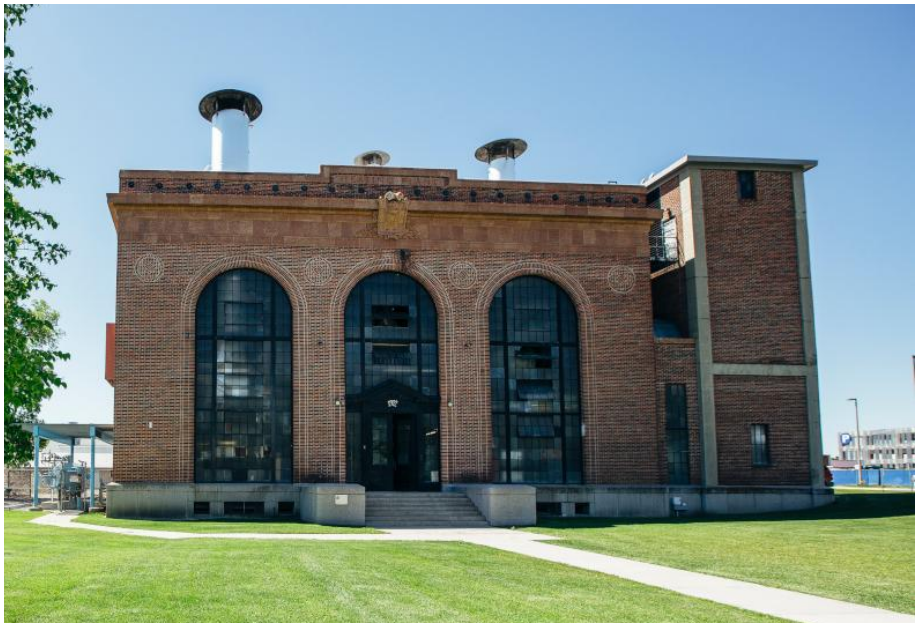
Climate action planning is a broad and ambiguous undertaking. As such, we acknowledge that our research is limited in scope for a number of reasons. However, our findings are substantiated by everything that we have heard and read. Our process has been thorough and our recommendations will prove beneficial in the climate action planning process at MSU, as part of the larger climate action planning process across the country. As our institution continues to learn about climate change mitigation strategies, our findings can serve as a launchpad for future climate action planning adaptations.

Introduction: Purpose & Context

Concerns regarding global climate change have been prevalent among institutions of higher education for decades as we experience increasing GHG emissions as well as other forms of environmental degradation. As a university community, MSU is responsible for taking action and implementing climate-conscious goals as a part of our "due diligence" in healing the world. Many institutions have stepped up as leaders by taking accountability for their GHG emissions and creating or updating their CAPs to delineate their goals; we hope to encourage MSU to do the same.

MSU first adopted a CAP in 2011 and has been able to make strides in meeting certain goals. We are hoping to bolster these efforts and align our updated CAP with current science that emphasizes the urgency and necessity of climate change mitigation. Indeed, goal 3.1 of MSU's draft Sustainability Plan commits to updating MSU's CAP and setting new objectives by August 2021. However, though this process is underway, it is likely that a new plan will not be completed by that deadline. To ensure that the process of climate action planning is as productive as possible, this report highlights several in-depth case studies of various universities that are similar to MSU.

This report contains information regarding implementation, politics, funding, developing a baseline, identifying data gaps, student and stakeholder engagement, and addresses which approaches were found to be the most successful. Several peer institutions were selected for our research based on similar demographics and characteristics to MSU, making them relevant case studies to our circumstances at MSU. Armed with this information, it is our goal to help MSU establish an attainable yet effective CAP. It is essential to garner support from university leadership to champion this combined effort of students, faculty, staff, and community members as we engage with these stakeholders in this ongoing endeavor.



MSU's Central Heating Plant

Approach

This research process took place over the Spring 2021 academic semester, at the end of which we wrote this report and presented our findings to CSAC and the MSU Planning Council. We began by conducting a literature review of prior climate action planning research. Simultaneously, we researched other universities to determine which institutions to use as our case studies. Upon completing the literature review and determining our case studies, we dove into the climate action planning processes within these institutions. Guided by our findings from the literature review, we conducted interviews with relevant individuals at each of our chosen case study institutions and analyzed each institution's CAP. We then coded the interviews and CAPs from each of these institutions to distill our findings.

Case Study Selection Process

To better understand the full scope and effectiveness of campus climate action planning, we selected four peer universities to act as case studies for our project. These universities were identified based on their similarities to MSU. The following paragraphs detail the selection process and criteria used for selection. Our group considered 22 U.S. colleges; however, we identified the following institutions to detail within our case study: USU, CSU, WSU, and UM.

To identify our case studies, four group members compiled a data matrix detailing specific institutional information. The entire data matrix can be found in Appendices, and a condensed version of the matrix can be found in Table 1 below, containing several data points for MSU and our focus institutions. This matrix allowed for a side-by-side comparison of key indicators to determine similar universities to MSU. This information included each university's cost of attendance, enrollment, endowment size, and climate, along with other data points. Given the scope and timeline of our research, we chose to pursue four case study institutions, selected upon the completion of the data matrix spreadsheet.

Although there were several criteria for case study selection, only the most important of these are detailed within this report. Perhaps the most important criterion in the data matrix was the political leaning of the state in which the universities are located. State politics often influence universities' approaches to climate change mitigation, affecting the level of support behind CAPs. Because Montana is a primarily conservative state, the group chose to prioritize universities located in red states. Of the four chosen universities above, only CSU operates in a liberal-leaning state. By focusing on schools in conservative states, the group was able to better understand climate action planning under political pressures similar to those faced in Montana.

Another important data point we focused on was available funding at each university. This was based on each school's cost of attendance and endowment size. An endowment gives a sense of the potential funding environment at a university and the institution's ability to recruit discretionary capital funding. As of 2019, MSU's endowment totaled $180.2 million, and the in-state annual tuition and fees cost $7,320. Of the four selected universities, USU has the largest endowment with $402.9 million, and WSU has the smallest endowment amount at $161.8 million. In-state tuition and fees for these

universities range from $5,090 to $12,260 annually. Although there is some variance in these amounts, these four colleges gave us an idea of university funding comparable to MSU.

Finally, each campus's physical climate and CAP status were taken into account. All four of the selected universities are located in northern latitudes, experiencing warm summers and cold winters, similar to Bozeman. Climate and weather significantly affect a university's approach to CAP planning and implementation, impacting GHG emission profiles, heating and cooling systems, energy-saving building techniques, and many other aspects of university operation. This made it crucial for our case study universities to be located in semi-arid, cold climates like MSU. We also ensured that our case study institutions have a current CAP, noting if they had signed onto the American College and University Presidents' Climate Commitment (ACUPCC) like MSU. The ACUPCC lays out a framework for campus climate planning, so signatory schools' goals should be in alignment with MSUs. Of the four chosen universities, all have a current CAP and are ACUPCC signatories.

Although this report discusses some of the decision criteria, many more data points were taken into consideration but not mentioned explicitly. For example, the universities' standing as public or private schools was accounted for when choosing these case studies. Based on the overarching themes of state politics, university funding, and climate, USU, CSU, WSU, and UM were the most suitable universities to analyze for this research.

TABLE 1

Condensed data matrix containing the following data points for MSU and our four focus institutions: City and State, Enrollment, Year Established, Public or Private, In-State and Out-of-State Tuition and Fees, and Endowment Size.

Institution Data							
University	**City, State**	**Enrollment**	**Established**	**Public or Private**	**In-State Annual Tuition/Fees**	**Out-of-State Annual Tuition/Fees**	**Endowment**
Montana State University	Bozeman, MT	16,766	1893	Public (Land Grant)	$7,320	$25,850	$180.2 Million (2019)
Colorado State University	Fort Collins, CO	33,413	1870	Public (Land Grant)	$12,260	$31,712	$376 Million (2019)
University of Montana	Missoula, MT	10,015	1893	Public	$7,412	$27,238	$205 million
Utah State University	Logan, UT	27,691	1888	Public (Land Grant)	$7,846	$22,804	$402.9 Million (2019)
Weber State University	Ogden, UT	24,048	1889	Public	$5,090	$15,272	$161.8 Million (2019)

Plan Review

For the plan analysis process, we began by briefly reading through each CAP from our selected schools: USU, WSU, UM, CSU, and MSU's 2011 CAP and 2016 Progress Report. This gave us a sense of what format the plans follow and what questions we should ask when formulating our coding worksheet, the next step in the process. The coding worksheet enabled a systematic approach for collecting data and evaluating CAPs according to a shared set of criteria. From there, we read MSU's CAP more thoroughly as a trial for our coding worksheet and to generate questions for the first interview, conducted with Kristin Blackler. We decided to revise the worksheet to include a question addressing the purpose of appendices and change the question "What barriers arose in the planning process?" to "Does the CAP mention gaps in data, uncertainties, or other challenges encountered?". Our worksheets can be found linked in the Appendices. With MSU as an example, our plan review group of four split into two teams to thoroughly read and analyze two of the four CAPs each, filling out the Master Worksheet along the way. This worksheet, built off of the first, is comprised of three parts: summary and main takeaways, potential interviewing questions and curiosities, and most substantial, analysis questions, answered with

direct quotes from the CAPs and summaries for each category. Finally, we created an analysis rubric, assigning a rating between one and four (1: Absent; 2: Problematic; 3: Present, Incomplete; 4: Fully Answers Question) to each institution for each coding metric: baseline, success metric, implementation, funding, stakeholders, gaps/uncertainties/challenges, and appendices.

Interview Methods

To further our understanding of the processes and strategies underpinning successful CAP development and implementation, a list of potential interviewees was created based on their ties to their respective institutional CAPs. The selection ranges from sustainability coordinators to student representatives involved in the projects, to those involved with acquiring the necessary capital to fund such initiatives. We aimed to speak to people involved at every level of the process, from the plan's conceptions to its design, development, and eventual implementation.

The questions we determined to be the most informative changed according to the specific interviewee. We developed an interview guide, leading conversations through a discussion about the interviewee's professional background, position at their institution, and involvement in their institution's CAP. From there, interviews switched gears towards describing the successes and challenges of CAPs, and the metrics by which success is measured. Furthermore, we felt it was important to not only obtain information related to empirical measurements of success but also to understand how the interviewees perceive the CAP's development and implementation to have gone thus far. We also sought to determine the barriers interviewees feel have stood in the way of their CAP's success or further execution.

We were particularly interested in understanding how interviewees have seen their institution's CAP involve members of the university and other community stakeholders. Perhaps the most enlightening findings from the literature review showed that a CAP's success is inextricably, at all levels, tied to stakeholder engagement. Finally, we were interested in understanding how institutions are setting up implementation and oversight plans.

Coding and Analysis

Having analyzed all CAPs using our coding worksheet and with all interviews completed and transcribed, we set out to extract the most pertinent information to our study. The main goal of this step was to identify common themes and topics across all of the interviews and CAPs, with the intent of garnering an understanding of what makes CAPs successful and effective. After a brief review of the transcripts and worksheets, we identified the following themes: funding, politics, measuring success, implementation, policy gaps, student and stakeholder engagement, priorities, and accountability/oversight. We assigned each theme a highlight color, combing through the interview transcripts to collect relevant quotations for each theme. These quotations, along with quotes drawn from our CAP worksheets, were compiled into theme analysis worksheets. These theme analysis worksheets divided the collected quotations into sub-themes which were briefly summarized. Having sifted through all of the interview and CAP data, we were able to summarize our findings by theme. The information collected in this process was the penultimate step in our data collection and analysis process and subsequently is where we began to see our key takeaways arise.

Literature Review

We conducted a literature review to learn what scholars have previously found while researching CAPs at institutions, particularly U.S. universities. For this literature review, we first identified a set of key questions to ask while reading through the relevant literature, before searching for peer-reviewed articles and adding those to a library using Mendeley, a reference management software. We divided those articles between our four-person literature review team, reading, taking notes, and summarizing our findings on annotation worksheets based on our key questions. After creating a draft summary, we compiled our answers into a final literature review, providing background and comparative-level information on the climate action planning process. This summary is organized around the questions we found to be most relevant to MSU's future climate action planning efforts.

A. HOW DO SUCCESSFUL PLANS DEVELOP A BASELINE?

To set realistic goals, universities must develop a baseline with a comprehensive understanding of their GHG emissions, consisting of direct and indirect emissions. Successful plans incorporate and conduct these GHG inventories, addressing Scope 1, 2, and 3 Emissions. A complete accounting of the current GHG footprint provides an essential baseline against which progress can be measured. These GHG emissions inventories are developed through sources such as individual questionnaires, focus groups, and empirical data collection (Bauer, et al. 2020; Macharis et al. 2019; Robinson, et al. 2017; Spirovski, et al. 2012). This data is also collected, calculated, and tabulated through volunteer efforts, course studies and research credit offerings, hiring summer, part-time, or full-time assessment coordinating positions, and contracting third-party groups to conduct the research (Helferty & Clarke, 2009).

One study indicates that universities with successful plans establish target and strategic vectors as the first step in developing a baseline. These vectors include the establishment of specific mitigation goals, such as the assessment of exactly which sources GHG emissions will be cut from, and broader strategic goals, such as ideas regarding community and stakeholder engagement (Ramisio, et. al. 2018).

B. BY WHAT METRIC IS SUCCESS MEASURED?

There are varied metrics to measure success, as there is no single standardized evaluation process. However, some metrics are more widely adopted, such as the Association for the Advancement of Sustainability in Higher Education (AASHE), which manages the Sustainability Tracking Assessment and Rating System (STARS), a comprehensive system that assesses the performance of campus sustainability plans. STARS has extensive criteria, with categories evaluating education, operations, planning, administration, and engagement, which help standardize evaluations of climate-related and other sustainability activities (White, 2014). Another evaluation tool researchers discuss is *The College Sustainability Report Card,* an interactive web-based tool that provides detailed sustainability profiles for hundreds of universities in the United States and Canada (Finlay, et al. 2012). The report card focuses on policies and practices in nine categories: administration, climate change and energy, food and recycling, green building, student involvement, transportation, endowment transparency, investment priorities,

and shareholder engagement. The evaluation system uses 52 indicators to award points resulting in an A to F grading system (Lopez & Martin, 2018).

In addition to studying standardized metrics such as STARS, one study focuses on assessing the role that non-academic staff and stakeholders play in successfully implementing supply/demand approaches (limiting paper towels, limiting toilet paper, reorganizing campus food plans, reducing available parking for students and faculty) (Katiliute, et. al., 2018). Along with GHG emissions reductions, success was also measured based on the level of student engagement (Helferty & Clarke, 2009) as well as the continuity of resilience efforts, relationships built, and ongoing mitigation strategies (Washington-Ottombre et al., 2018).

C. ARE THERE COMMON THEMES/GOALS PRESENT IN THE MOST SUCCESSFUL PLANS?

There are several thematic similarities represented in the literature that underscore common goals among the most successful plans. Outdated building stock is one common theme. With many universities taking steps to minimize their GHG emissions, old buildings pose a significant problem as inefficient energy consumers (Finlay, et al., 2012). Researchers concluded that retrofitting campus infrastructure can improve buildings' energy performance, saving campuses money in the long run. Recycled carpets, waterless urinals, energy star appliances, programmable thermostats, etc., are moderate cost options that can be implemented on campuses relatively easily (Helferty, et al., 2009). Retrofits are becoming a common way to modernize campus infrastructure. As universities seek ways to lessen their impact on the environment, retrofits will likely play a role.

Another common element incorporated into CAPs is including sustainability outreach into the university curriculum. Creating internships and study programs exploring climate change and sustainability is an effective way to engage students and promote further support of CAPs (Spirovski, et al., 2012; Robinson, et al., 2017; Bauer, et al., 2020). Education is crucial to the prolonged implementation of a climate action plan that encourages students and the community to invest in sustainable transitions (Semeraro & Boyd, 2017). Successful joint initiatives include coordinating residence hall challenges or other competitions that engage students in reducing energy consumption and learning about climate change (Helferty & Clarke, 2009). Lastly, integrating sustainability into the campus curriculum promotes bottom-up management in the planning process, invoking critical student and community perspectives. A curricular focus encourages adaptive co-management, with an emphasis on collaborations, networks, and defining resiliency (Washington-Ottombre, et al., 2018).

D. IS A BOTTOM-UP OR TOP-DOWN APPROACH USED IN THE PLANNING PROCESS?

There are many examples of CAPs using both top-down and bottom-up approaches in the planning process; evidence shows that a combination may be the most effective. A top-down process involves administrator-level decision-making to decide and coordinate various components of a plan. In contrast, a bottom-up approach champions student-led decision-making. Both methods are useful in implementing change. Student-led initiatives pressure university stakeholders to take immediate action, as one paper found that a bottom-up approach resulted in fewer delays and faster implementation (Spirovski et al. 2012; Bauer, et al., 2020). Faculty and staff are crucial to the CAP's structure and organization. Therefore, a shared power relationship between faculty and students effectively promotes

collective and individual participation in campus-wide efforts to address climate change (Macharis, et al., 2019). Integrating both management approaches allows for centralized messaging and organization from university executives and leaders, while also encouraging behavioral change born from establishing a sense of responsibility on behalf of students and non-academic staff (Ramisio, Katiliute, et. al., 2017, 2018). However, the literature shows that regardless of the quality of top-down management, without high-quality bottom-up management, CAPs often fail in their objectives (Katiliute, et. al., 2018).

E. HOW ARE CAMPUS CLIMATE ACTION PLANS FUNDED?

In researching funding for CAPs, very few plans discussed the details surrounding the financing of their program (White, 2014). While some papers mention the creation of specific funds for campus sustainability (Helferty & Clarke, 2009), other schools instituted fees to help support specific climate action activities. Many universities did not specifically budget for work related to executing CAPs. Rather, there was reliance on using university resources within the academic departments regarding science, research, and data analysis processes. In rare instances, some universities established grants that individual faculty could apply for to fund interns and expenses (Bauer, et al. 2020; Spirovski, et al. 2012).

F. HOW DO THESE PLANS ENGAGE AND INFORM STAKEHOLDERS?

One of the most important predictors of a successful CAP is the widespread engagement of stakeholders, both internal and external to the campus. These stakeholders include anyone who may be affected by climate change or the implementation of a CAP, such as students, faculty, staff, or community members with ties to campus operations. It is evidently critical that the community is involved and encouraged to play a role in the transition to sustainable development in higher education institutions. One paper suggested that interactive workshops effectively include stakeholders in the planning process while gaining important feedback. The interview method allows stakeholders to share their opinions, ask each other questions, work in groups, and present ideas (Macharis et al. 2019). Researchers have also concluded that programs educating students and the community on sustainable living instill a deeper understanding of the social, environmental, and economic impact of climate change. These programs provide hands-on learning experiences that encourage students and stakeholders alike to participate in sustainability planning (Finlay et al. 2012).

The literature points to a variety of different ways to successfully engage stakeholders. Some studies, for example, emphasized engaging external stakeholders through hosting or participating in university-sponsored sporting and cultural events (Ramisio, et. al., 2018). Others examined universities that had students working with members of multi-stakeholder committees (Helferty & Clarke, 2009). How stakeholders are included in climate action initiatives appears to matter less than the simple fact that the most successful plans focused on engaging stakeholders through enhanced communication and collaboration among diverse groups, establishing common goals and metrics for a shared trajectory (Washington-Ottombre et al., 2018). Furthermore, the literature overwhelmingly indicated that the most successful plans do not discriminate in the stakeholders they reached out to, as the stakeholders involved in climate action programs vary from local government officials to university students and general public representatives (Bauer, et al. 2020). Stakeholder engagement plays a pivotal role in the

success of campus CAPs, largely because thoughtful engagement works to reinforce the interconnected systems that form an institution and guide short and long-term goals (Semeraro & Boyd, 2017).

G. WHAT OBSTACLES PREVENT THE EFFECTIVENESS OF CAPS?

The ability to foster effective CAPs is inherently dependent on the physical environmental landscape. Colleges themselves face their own unique challenges, however, in making progress with CAPs. Coordination with local, state, and county officials often stumbles due to separate seasonal calendars and communication styles (Robinson, et al. 2017). This can be detrimental to colleges as coordinating efforts to align, communicate, and share data is imperative. Colleges also face the reality of inconsistencies in data collection and analysis, finding the ability to track certain areas nearly impossible (Bauer, et al. 2020).

One of the most common obstacles that impacts the effectiveness of CAPs is a lack of coordination in assessing campus initiatives and implementing them effectively. New and ambitious projects are much more difficult for campuses to implement, while traditional sustainability measures are generally more successful on campuses, including recycling and water conservation. However, large projects such as renewable energy transitions can be more challenging to implement successfully. Several factors that prevent campuses from fully transitioning into green spaces include financial burdens, inaction, and conservative attitudes of faculty and staff (Finlay et al. 2012). Financially, a lack of available funding and the elevated cost of eco-friendly services and goods like cleaning, heating, refrigeration, and food products are frequently noted barriers (Katiliute, et. al., 2017). Furthermore, the long lifespan of university infrastructure, much of which operates with considerable inefficiencies, was frequently noted as an obstacle encountered for achieving the goals outlined in CAPs (Katiliute, et. al., 2018).

Lastly, a factor frequently referenced as an obstacle was dealing with a diverse set of stakeholders, all with distinct values, who the universities had to appease to move the planning process along. This made it particularly difficult to define common benchmarks and metrics (Washington-Ottombre et al., 2018).

Case Study Summaries

We utilized our institutional data matrix to determine four universities to pursue as our climate action planning case studies. These institutions were identified as peer institutions to MSU, operating within similar political, environmental, financial, and infrastructural climates. As such, we deemed action at these universities to be projectable onto operations at MSU as potential future courses of action. The four selected peer institutions are Colorado State University, Utah State University, Weber State University, and the University of Montana.

Colorado State University

About CSU

Established in 1870, CSU is a land grant institution located in Fort Collins, Colorado. The University competes in the Division I Mountain West athletic conference with a total student population of over 33,000, paired with an institutional endowment of $376 million as of 2019. CSU has boasted a Platinum STARS rating since 2015, the first institution to reach that threshold, with summed Scope 1, Scope 2, and Scope 3 emissions of over 220,000 metric tons CO_2e, or 6.61 tons CO_2e per enrolled student (from 2019 STARS report). Though CSU resides in a northern latitude, Fort Collins, Colorado is generally exposed to milder winters than Bozeman, Montana. Politically, the state of Colorado has recently leaned blue.

About CSU's Plan

CSU published its first CAP in 2010, followed by fully updated plans in 2013, 2015, and 2018. CSU has no Office of Sustainability, so the institution's CAPs have been developed and implemented in conjunction with the President's Sustainability Commission, Facilities Management, Housing and Dining Services, various academic departments, and other entities on campus and in the city of Fort Collins. Carol Dollard, CSU's Energy Engineer in Facilities Management, spearheaded the creation of CSU's CAP

and continues to direct the plan's implementation and subsequent plan updates. The CAP at CSU is a focused GHG reduction plan, utilizing annual GHG inventories to track emissions reductions and inform new projects and CAP updates. CSU uses internal programs to track their GHG inventory, but double checks their numbers using SIMAP. The CAP currently sets the goal for CSU to rely on 100% renewable electricity by 2030 and to achieve carbon neutrality by 2050, though these timelines are likely to narrow with future plan updates.

Successes and Challenges

CSU has experienced many successes along with many challenges in implementing their CAP. Their 2050 carbon neutrality goal has been encouraging but challenging to obtain due to CSU's campus growth from 9.5 million square feet to 12.5 million square feet since the first CAP was written in 2010. Currently, CSU has been able to reduce emissions by 15% in the past 10 years, missing their mark of 25%. However, when standardizing GHG emissions against student population and square footage, emissions have reduced by about 35%. Carol Dollard, Energy Engineer at CSU, claims this has to do with successes attributable to technological development over the past 10 years, and the ability to implement green energy on campus, such as the new solar energy project. Additionally, CSU's CAP experienced challenges in regards to reducing Scope 3 GHG emissions due to airline travel as many scholars within their institution travel for research.

Interviews

1. Stacey Baumgarn: Energy Coordinator, interviewed by Nicole Bondurant.
2. Carol Dollard: Sustainability Coordinator, interviewed by Nicole Bondurant and Jessica Thompson.

Utah State University

About USU

USU is a public land grant university located in Logan, Utah, a conservative-leaning state. Established in 1888, USU has an annual enrollment of around 28,000 students and an endowment of about $403 million as of 2019. USU is located along a central latitude in a wintery climate. As of 2019, the University was reporting through STARS, with total emissions of approximately 86,000 metric tons of CO_2e, or 3.09 tons CO_2e per enrolled student.

About USU's Plan

Utah State developed its CAP in 2010 but, in 2020, committed to an updated sustainability plan that focuses on tracking and reducing the institution's GHG emissions. The new plan was developed after a resolution focused on assessing and mitigating emissions on campus was passed through the Faculty Senate last year, following a change in leadership. According to Zac Cook, the plan has been successful in centralizing leadership and interdepartmental collaboration within the institution. The 2020 Sustainability Plan focuses on achieving a high-ranking STARS status, tasking USU's Sustainability Council with oversight responsibilities as they strive to engage new community stakeholders. For implementation, USU monitors specific emissions reduction targets, including travel, food, recycling, and energy use across campus. Finally, the new plan focuses on developing a culture within the University rooted in sustainability. USU committed to assessing progress in 2020 and again in 2023.

Successes and Challenges

Before their 2020 Sustainability Plan, USU struggled with garnering the political capital to effectively develop and implement a CAP. However, a recent change in leadership and a subsequent change in priorities has given way for a more targeted and collaborative effort at reducing GHG emissions. This has not only resulted in an updated plan but, as of this year, a 7% reduction in campus-wide emissions. Notwithstanding, the University is still highly dependent on natural gas, which was cited by Zac Cook as the primary barrier standing between the University and a higher STARS ranking.

Interviews

1. Alexi Lamm: USU Sustainability Coordinator in the Facilities Planning Design Office, interviewed by Nicole Bondurant and Megan Stone.
2. Zac Cook: Energy Manager in the Utilities and Energy Management Department, interviewed by Dominic Corradino.

Weber State University

About WSU

WSU is located in Ogden, Utah, just north of Salt Lake City. Weber has an enrollment of around 24,000 students, slightly larger than MSU. The University was established in 1889 and is a public institution. In 2019, WSU reported a total endowment of $161.8 million, which is only slightly lower than MSU's endowment for the same year. The University currently has a silver STARS rating but is aiming for a gold rating in their next GHG assessment. As of 2020, their GHG emissions totaled approximately 46,000 metric tons of CO_2e or 1.93 metric tons of CO_2e per enrolled student. Weber's location in a conservative state with relatively cold, snowy winters makes it very similar to MSU in regards to geography and demographics.

About WSU's Plan

WSU's initial CAP was written in 2009, and a progress report was published in 2016. As an ACUPCC signatory, Weber's plan is mainly centered around achieving carbon neutrality by 2050. Throughout the document, several intermediate GHG reduction goals are set, and different emission mitigation strategies are suggested to reach these goals. These strategies are based on building and infrastructure upgrades, though behavioral changes are also included. The CAP recognizes that a paradigm shift by the student body, faculty, and staff is necessary for the plan's success. In contrast to more data-driven plans, this CAP is predominantly strategy-oriented.

Successes and Challenges

WSU has been very successful at implementing its CAP and meeting the benchmarks they have set out to achieve. They have been able to carry out many projects since the adoption of their CAP in 2009, decreasing the university's overall GHG emissions and lessening their contributions to climate change. This success is largely attributed to the university's green RLF. This started as a $5 million loan from the university with interest to the Energy and Sustainability Office to fund sustainability projects. With the actions taken by the Energy and Sustainability Office, this loan was paid back quickly, proving to the University and its stakeholders that sustainable practices can be economically viable. Any money saved from new sustainability projects is loaned out to the Energy and Sustainability Office for use in

future projects. The Energy and Sustainability Office has generated so much money for itself through this system that they have had to hold back on starting certain projects to prevent significant student and faculty displacement on the Weber State Ogden campus. This green RLF is a great source of pride among Weber faculty and has been praised as the main factor in Weber State's success as a nationwide leader in campus sustainability.

Since the implementation of the green RLF, Weber has not experienced many major obstacles in the implementation of their CAP. By proving to the University that increasing Weber State's sustainability can be financially beneficial, the Energy and Sustainability Office has been able to easily implement new sustainability projects without much pushback. They also take steps to decrease their GHG emissions in such a way that gets students, faculty, and the surrounding community excited about reducing their emissions. This includes taking note of community interests and helping them reduce emissions around those interests. For example, the community around Weber State is enthusiastic about lawn care. Thus, Weber started a lawn mower exchange wherein anyone can trade in their current gas-powered lawn mower for an electric one, free of charge. With this program, Weber State is helping to decrease GHG emissions in their surrounding community and educating the public about actions they can take to reduce their own emissions.

Interviews

1. Steve Nabor: Associate Vice President for Financial Services and CFO, interviewed by Dominic Corradino and Dr. Julia Haggerty.
2. Katherine Meyr: Student Sustainability Communications Coordinator for the Sustainable Practices and Research Center, interviewed by Nicole Bondurant and Dominic Corradino.
3. Jennifer Bodine: Energy and Sustainability Office, interviewed by Megan Stone and Dominic Corradino.

University of Montana

About UM

UM is located in Missoula, Montana, with a student population of about 7,700 and an endowment of $207 million. The cost of tuition is about $7,500 for in-state residents and about $26,000 for out-of-state residents. Missoula's northern location faces similar seasons to those experienced in

Bozeman. Montana has a fairly conservative state legislature, with one senator for each party and one Republican in the House of Representatives. However, the city of Missoula voted democratically in the past five presidential elections. As a public institution in the state of Montana, UM operates in the same political climate as MSU, making the university a valuable peer university for our case studies.

About UM's Plan

UM originally published its CAP in 2010, co-authored by UM's sustainability coordinator and ASUM's sustainability coordinator, with input provided through a technical working group. The Sustainable Campus Committee, composed of faculty, staff, administrators, and students, worked together to provide support and advice during the planning process. UM's CAP is technical and concentrates on GHG emissions reduction. Mitigation strategies gathered through the public engagement process were analyzed for emission reduction potential, energy savings, and costs. Three scenarios were created to reach carbon neutrality by 2020, all compared to a "business as usual" baseline. UM's Sustainability Council committed itself to monitor and report progress while adjusting for new goals. However, the carbon neutrality deadline of 2020 has passed, with limited public updates on UM's continued path to neutrality.

Successes and Challenges

The most persistent challenges include lack of funding, minimal stakeholder support, and declining enrollment. Projects with considerable emission reduction potential, such as biomass and wind energy, remain challenging to fund due to their high costs. Gaps in data collection are often cited as an issue, preventing further implementation of possible mitigation strategies. UM continues to see declining enrollment, which has created an institutional narrative of scarcity. A lack of resources prevents administrators from investing in CAP planning and implementation. However, UM has found success in implementing some of the mitigation strategies in their CAP, providing UM with informative quantitative data to be used as a framework in future plans.

Interviews

1. Eva Rocke: Sustainability Director, interviewed by Jessica Thompson and Nicholas Fitzmaurice.
2. Peter McDonough: Program Coordinator of Climate Change Studies Program, interviewed by Jessica Thompson and Megan Stone.

CAPs at a Glance

As mentioned under “Plan Review'' in the *Approach* section of this report, we created an analysis rubric to use alongside our plan worksheets in analyzing the CAPs from our focus institutions. In this rubric, we assigned ratings one through four to each institution’s CAP, corresponding individual coding metrics. These coding metrics represent the different questions we used in our CAP analysis worksheets: Baseline, Success Metric, Implementation, Funding, Stakeholders, Gaps/Uncertainties/Challenges, and Appendices. We used this framework to evaluate each university's CAP through a standardized categorization system. In addition to our four focus institutions, we also used this coding metric to rate MSU’s CAP for reference. The assessment rubric can be found in Table 2 below, and our ratings for each institution’s CAP can be found in Tables 3.1 and 3.2. This rubric is intended as another avenue for conceptualizing the data and insights synthesized through analyzing CAPs from our selected universities.

TABLE 2

CAP assessment rubric, outlining the question asked by each coding metric and the qualification criteria for each ranking value within corresponding coding metrics.

Coding Metric:	Question:	1: Absent	2: Problematic	3: Present, Incomplete	4: Fully Answers Question
Baseline	How does this plan develop a baseline?	This plan does not develop a baseline.	A baseline is discussed, but methods in developing this baseline are not discussed.	A baseline is discussed, as well as methods in developing this baseline. However, more information is needed to fully understand baseline.	A baseline is discussed, and the methods of developing this baseline are explained in full detail.
Success Metric	By what metric is success tracked and reported?	Success is not tracked or reported.	Plan discusses success in the abstract, but provides no metrics for actually tracking and reporting that success.	Plan discusses success and metrics for tracking and reporting it. However, plan has not been revisited to actually track and report progress.	Plan discusses success and metrics for tracking and reporting it. Plan reports progress towards success since original inception.
Implementation	What goals, strategies, or action items does the plan outline?	Goals, strategies, or action items are not addressed.	Goals are discussed ambiguously. However, strategies and action plans for implementation are absent.	Goals are discussed and are explicit. However, it is unclear how the CAP plans to reach those goals.	Goals are discussed explicitly and strategies / action items for implementation are adequately fleshed out.
Funding	How is this plan funded?	No information is provided on funding the plan.	Funding needs are discussed in passing. However, actual monetary amounts are not explicitly stated and sources of funding are not listed.	Funding the plan is discussed, with explicit reference to monetary demands of the plan. However, sources of funds are not listed or lacking.	Funding the plan is discussed, with explicit reference to monetary demands of the plan. Funding sources are stated and meet the needs of the plan.
Stakeholders	How did this plan inform/engage stakeholders?	Stakeholders are not discussed.	Stakeholders are discussed, but are not informed/engaged.	Effort is made to inform and engage stakeholders. However, more could be done.	Plans to inform and engage stakeholders are described explicitly, and these plans adequately involve stakeholders.
Gaps / Uncertainties / Challenges	What gaps in data, uncertainties, and challenges are identified in the plan?	No discussion of gaps, uncertainties, and challenges.	Passing reference to gaps, uncertainties, or challenges, but more information is needed.	Gaps, uncertainties, and challenges are discussed explicitly, but addressing them in the future is not discussed.	Gaps, uncertainties, and challenges are discussed explicitly, along with plans for addressing these in the future.
Appendices	What purpose do the appendices serve?	The document does not contain appendices.	The document contains appendices, but the purpose they serve is uncertain.	The document contains appendices and their purposes are apparent, but more appendices would be helpful.	The document contains appendices and their purposes are apparent. The appendices contain sufficient supplementary information.

TABLE 3.1

Assessment of CAPs from MSU, CSU, UM, USU, and WSU, based on the qualification criteria in Table 2, along with justifications for each rating (continued in Table 3.2).

	Coding Metric			
Institution	**Baseline**	**Success Metric**	**Implementation**	**Funding**
Montana State University	**4:** MSU developed a comprehensive GHG inventory in 2009 that the 2011 plan was based on.	**3:** MSU failed to fulfill its goal of creating CAP updates every two years. However, GHG inventories were gathered to track MSU's progress towards its 20% emissions reduction goal. STARS report was not mentioned.	**4:** MSU set the implementation goal of reducing emissions by 20% by 2025, and demonstrates how projected projects will achieve those emissions through projected GHG emissions figures. Projects are proposed for achievement of CAP goals.	**3:** Funding requirements of CAP projects are discussed, and potential funding sources are listed. However, no funding had been secured at the publication of this plan.
Colorado State University	**4:** CSU developed a comprehensive baseline that is well outlined in the plan.	**4:** CSU develops annual GHG inventories, regular STARS reports, and has published a number of updated CAPs	**4:** CSU's plan breaks implementation strategies into short-, medium-, and long-term projects that all together are projected to allow them to meet their 2050 neutrality goal.	**4:** CSU's plan developed a revolving Green Fund and identified other potential areas for funding. Costs and savings are extensively estimated for all proposed projects.
University of Montana	**4:** UM developed a comprehensive baseline centered around a 2008 GHG inventory.	**3:** UM's plan discusses tracking success through regular energy audits and CAP updates. However, the plan has not been revisited to actually track or report progress.	**4:** UM's plan lists several goals with strategies that lead to the achievement of the goal. The plan states various different items for implementation.	**3:** Some sources of funding are discussed in UM's plan, but explicit monetary amounts are scarce. Funding sources do not meet the needs of the plan.
Utah State University	**4**: USU created a comprehensive emissions portfolio establishing its baseline.	**3**: USU's plan commits itself to produce annual emissions reports to use as a framework to follow its progress.	**4**: USU outlined its implementation strategies focusing on energy, community engagement, and climate research.	**4**: USU's plan recognized its critical need for funding by providing a comprehensive list of financing opportunities. The appendices provided specific information on funding mechanisms.
Weber State University	**3:** WSU presents a baseline primarily with the Progress Report based on 2007 data.	**3:** WSU planned to have annual updates and comply with AASHE reporting.	**4:** WSU's CAP is unified through the 2050 carbon neutrality goal and defines benchmarks along the way.	**3:** The CAP does not state specific funding amounts, but multiple sources of funding are considered, such as federal and state grants and donations.

TABLE 3.2

	Coding Metric		
Institution	Stakeholders	Gaps/Uncertainties/Challenges	Appendices
Montana State University	**4:** MSU's plan discusses engagement with the City of Bozeman, MSU students/staff/faculty, and Northwestern Energy utility. These stakeholders are engaged thoroughly and extensively with plans for future engagement.	**4:** The CAP mentions a number of gaps in its data, particularly for its GHG inventory (Scope 3 emissions), in addition wastewater and paper. Strategies for addressing these limitations are discussed, and a number of them are addressed in the 2016 CAP update.	**4:** Extensive appendices are provided to elaborate on data discussed in the document, from the GHG inventory to commuter survey and more.
Colorado State University	**4:** The plan extensively engages with students, faculty, staff, and the City of Fort Collins in both planning and implementation.	**4:** CSU's CAP designates a specific section to uncertainties, in addition to discussing a number of projects that were considered but deemed not currently feasible. Future adaptations are discussed.	**3:** CSU's CAP has a short section of appendices, listing people that have been involved in planning and implementation and providing information on CSU's Nitrogen emissions. However, additional appendices detailing the proposed and completed projects discussed in the plan would be helpful.
University of Montana	**4:** The plan adequately discusses its engagement with students, faculty, and staff as well as the City of Missoula. UM implemented a high level of community engagement when planning action items for implementation.	**4:** UM's plan consistently states barriers to implementation for most action items listed. Many data gaps are recognized throughout the plan. Future plans for addressing these barriers are discussed.	**3:** UM's CAP contains a fairly comprehensive section of appendices, including ideas suggested through the public involvement process, recommended GHG reduction goals, comparison to other universities, and survey results. However, more appendices detailing implementation plans would be helpful.
Utah State University	**4:** The plan comprehensively discusses its role in engaging stakeholders. USU actively promotes sustainability on campus and in the greater community by hosting events, creating programs focused on community outreach, and integrating climate issues into its curriculum.	**2:** The plan vaguely mentions challenges and uncertainties. Funding is considered an issue, but the CAP fails to discuss financial difficulties in detail. Data gaps are noted but are not explained adequately.	**4:** USU's CAP provides a detailed appendix detailing the emissions inventory, student organizations and courses related to sustainability, research partnerships, and funding opportunities. Each section comprehensively described the planning and implementation process in richer detail. The financing section was instrumental in outlining tools and resources available to provide a solid foundation for USU's CAP to ensure its longevity.
Weber State University	**3:** The CAP recognizes that involvement from University President's Council, facilities management, the City of Ogden, as well as faculty, students, and staff will be required for successful implementation but often does not outline how or what this involvement will look like.	**2:** The CAP recognizes areas which lack of available data but does not go in-depth on other challenges or uncertainties.	**1:** No appendices are present.

Findings

Key Takeaways

For climate action planning to be successful at the university level, CAPs must accomplish the following:

- **Establish and secure a reliable, substantial, and centralized funding source.**
    - Many universities have created Revolving Loan Funds (RLFs) that accrue the monetary savings from current and past CAP projects to fund future projects. By not capping these funds, universities can fund more substantial and ambitious CAP projects to help reach their long-term goals.
- **Secure support and endorsement from top university leadership, primarily the President.**
    - Though extensive bottom-up leadership is necessary for a successful CAP, progress grinds to a halt when administrations do not support CAPs.
- **Conduct a comprehensive GHG emissions inventory baseline, tracking progress through annual inventories.**
    - GHG inventories are essentially a CAP's primary scorecard and without them, progress cannot be tracked.
- **Create a public carbon neutrality goal with interim benchmarks and detailed steps outlining how to reach them.**
    - Making goals public can help with accountability, and reaching interim benchmarks keeps universities on track to meet their overarching goals. These benchmarks also create space for celebrating progress along the way.
- **Engage campus and community stakeholders early and extensively in the planning process.**
    - This can be accomplished through campus curriculum, research expenditures, and town hall-style forums, among other avenues. Facilities personnel should also be directly involved with the climate action planning process to ensure the plan is aspirational yet actionable.
- **Establish institutional accountability mechanisms to ensure the implementation of projects, goals, and plan updates. Explicitly identify timelines, resources, and responsibilities.**
    - CAPs often make lofty goals, setting ambitious standards for future action. Universities can fall short in substantiating these goals when CAPs do not consider all the details. To overcome this issue, CAPs should explicitly address the individuals or parties responsible for completing each task, precise funding sources, necessary technology, requisite support from outside the university, and any other details that will help ensure CAP goals are met.
- **Communicate the economics of CAP projects effectively.**
    - It is becoming increasingly apparent that climate action is not only necessary for the preservation of our planet and the people on it, but that positive climate action strategies are economically viable and advantageous. Communicating the financial

benefits and savings generates broader support for CAPs and accelerates the implementation process.

- **Acknowledge current data gaps and uncertainties and plan to address them.**
    - Universities will not have all the needed information available to them in their climate action planning process. This is especially prevalent in the reporting of Scope 3 emissions, as these sources are often more difficult to track. It is important that these shortcomings are noted in CAPs, and that future iterations attempt to resolve them.
- **Incorporate climate justice.**
    - The effects of climate change are disproportionately felt in traditionally underserved communities. Climate action must, therefore, take social issues into account, addressing the climate crisis through a lens of equity.

Findings by Thematic Categories

Measuring Success

In measuring success for different institutions' CAPs, several subthemes arose. All focus institutions relied on AASHE's STARS reporting platform to measure the university's success. This particular reporting platform expands on all aspects of sustainability, not limited to, but including GHG emissions. This is an important reporting platform, but for CAP implementation, it can sometimes distract from the most important emissions reduction projects. For example, several universities reported that campus members expended energy towards waste reduction programs such as composting and recycling. While these programs are important for sustainability, they address only a small slice of GHG emissions. That being said, the STARS platform helps institutions create tangible goals for sustainability advancement as universities progress from bronze through platinum ratings, with interim progress monitored as well. The STARS report also highlights where institutions are lacking to help direct future attention and resources. In addition to STARS reporting, some institutions also produce intermittent reports through the Second Nature reporting platform.

Our case study universities also emphasized the importance of frequently and sufficiently tracking energy consumption and associated GHG emissions. CSU, in particular, discussed a specific tracking method for nitrogen emissions. Universities generally develop an emissions inventory with the inception of their CAP. Monitoring those emissions from year to year allows universities to keep track of their plan's successes and failures. It is necessary to conduct an emissions inventory on an annual basis, so planning, staffing, and funding should be managed accordingly to ensure that these inventories can be made successfully.

Another subtheme we identified in measuring CAPs' success is creating updated plans and/or progress reports. Most CAPs include a commitment to producing these updates every several years. However, it seems that universities have often struggled to follow through with these commitments. Several universities that committed to producing updates every two to three years have not done so in the past decade. Our focus institutions indicate that updating their plans is important to share the progress that has been made, update goals and plans for reaching them, and incorporate new

knowledge, technology, and data. Therefore, it may be helpful to outline a plan for how and when those updates will be produced. It should be noted who will produce that plan, when they will produce it, what funding and other resources they will need, what the update may contain, and a step-by-step outline for producing the update, whether that may be a full plan or a progress report. Updating CAPs is a significant undertaking, which should be noted in the climate action planning process.

To identify success, institutions generally strive for overarching goals such as carbon neutrality deadlines, following interim goals to get there. These interim goals are important for ensuring that the final goal is met and for providing uplifting benchmarks to those involved. When interim goals are met, universities can take a moment to celebrate their accomplishments thus far, reinvigorating their determination for the future. These interim successes can also be leveraged to help secure funding for CAP projects.

Institutions also touched on other metrics for measuring success, including student and faculty surveys, tracking monetary savings, enlisting students to track CAP progress, and heavily documenting all CAP progress for transparency with stakeholders. Student and faculty surveys along with extensive documentation are themes that arose in several institutions' climate action planning processes which can be used to help supplement other measurement practices. Tracking monetary savings is also important; however, not all CAP projects will save money, which may distract from the overarching goal of CAPs. Additionally, students are a vital resource to help track CAP progress. However, they should not be relied on as the sole means for tracking progress as they are often very busy and have a fast turnover rate within universities.

Implementation

Regarding the implementation of CAPs, we identified two major subthemes from the evidence collected. These include executive oversight and central leadership in establishing a baseline.

Regarding the executive oversight and centralized leadership of CAPs, one of the most commonly cited barriers to success is organizing collaboration between the different departments and personnel within universities. It was frequently noted that in the absence of support from the university president or the Faculty Senate, early versions of CAPs were unsuccessful, likely because the efforts lacked meaningful collaboration. Even with strong interest and adequate resources, it was clear that universities struggled to implement the provisions of a CAP without high-level and central support. This support seemed particularly important to a CAP's successful implementation because it allowed for the organization of subcommittees, provided the framework for interdepartmental collaboration, and was clear in assigning roles and responsibilities to different departments and individuals across campus. Put simply, it defined individual and departmental responsibilities and established a clear chain of command, engendering an increased level of responsibility among those assigned different roles.

Politics

Three subthemes: how a CAP is framed and proposed, executive support, and external politics, referring to the political climate of the state or region within which the institution operates, emerged through our research. One theme that was quickly identified across multiple interviews related to the

framing of CAPs. At almost every institution, it was clear that there were stakeholders who stood against the development of a CAP for political or ideological reasons. While the influence of these voices ranged from insignificant to seriously problematic, appeasement almost always took the form of reframing the issue. Both WSU and USU, in particular, expressed frustration in dealing with stakeholders uninterested in seeing a campus-wide effort to reduce GHG emissions or foster a culture of sustainability. However, when the issues were framed economically, cooperation, or at least compliance, generally followed. Furthermore, this reframing rarely posed much of a challenge as a shift towards energy and GHG emissions savings means that institutions save money on utility and energy bills. This provides a significant financial incentive for skeptical stakeholders to, at the very least, turn a blind eye to the development and implementation of a CAP.

Regarding executive support, when the driving factor pushing a CAP into effect does not come from the president or an executive committee within a university or is not at the very least fully and openly supported by such, it is clear that CAPs suffer significantly. This can be seen in institutions such as USU which, until a recent change in leadership, struggled to garner the support of their president and some high-level faculty. The lack of executive support contributed to a fractured, uncoordinated, and ultimately ineffective effort at both developing and implementing a CAP. However, once a change in leadership was made and a carbon reduction resolution, endorsed by the president, was passed through the Faculty Senate, the effort became coordinated and better organized. Furthermore, executive support appears to be critical to campus-wide collaboration and organization as individuals and departments are assigned tasks and, when properly managed, are much more consistent in accomplishing the outlined deliverables. In the absence of this support, efforts are fragmented, responsibilities are not taken seriously, and any attempts at progress within a CAP are inconsequential.

Finally, about external politics, it is worth noting the role that the state-wide political climate plays in an institution's ability to successfully develop a CAP. Many CAPs garner the support of those who lean to the political left, and as such, institutions located in overwhelmingly conservative locations may run into pressure and pushback from those who stand on the right side of the political aisle. It was clear, however, that any pressure felt in this way was easily overcome with the support of the institution's president. When a university president aligns themselves with these anti-CAP values or is subjected to external political pressures, the effectiveness of a CAP suffers significantly. In these cases, no useful solutions presented themselves save for a change in leadership.

Funding

Some aspects of CAP funding have proven very successful. One of the most dominant sub-themes around funding is RLFs, also called green revolving funds or energy reserve funds. Especially when implemented alongside the original CAP, these funds are an effective way to finance projects and “are really powerful tools for investing in the campus” (Stacey Baumgarn, CSU). The institution saves money as “the university invest[s] in itself, pay[ing] itself interest … at a higher rate than it would've achieved on the market” (Jennifer Bodine, Sustainability Manager, WSU). The extra savings are funneled back into the fund and to the university, enabling universities to implement sustainability, energy, and water conservation-related projects. Rather than searching for funding from miscellaneous sources, RLFs have institutionalized the process and eased the financial burden. CSU’s energy reserve fund, for

example, became “self-sustaining with annual allocations of savings from previous projects. The Energy Team in Facilities Management [then] develops a project list for the ERF each year” (CSU CAP, 17). Universities have observed that CAPs have enabled utility and energy savings, allowing them to implement efficiency projects, finance sustainability-related positions on campus, and fund future projects. By “recycling money from savings,” universities have seen the tangible benefit of not only focusing on the backlog of deferred maintenance but “taking it a step further and do[ing] things for energy efficiency” (Stacey Baumgarn, CSU).

In addition to successes, there have been significant roadblocks in funding. Without RLFs, schools have had to piece together funding from various sources such as taxes on parking permits or establishing student sustainability fees. Other potential sources listed in CAPs include “building endowments, utility company incentives, federal and/or state grants, donations, and/or increasing the institutional operating budget” (USU CAP, 4). Securing funding has proven difficult. Performance contracting is a potential option when the energy savings are sufficient enough to cover the cost of the project, but enough staff is required to help manage it. It has been especially difficult with budget cuts due to COVID-19 to aim for any new initiatives. Another hurdle for resolving funding scarcity is getting the university on the same page about how economically viable and cost-effective CAP projects can be; this understanding may come about with a “shift of mindset of looking at the actual costs of carbon and factoring that into [the] economic equation” (Zac Cook, USU).

There was a clear consensus that funding is essential to the successful implementation of CAPs. For example, “USU will not be able to make significant progress on its climate commitment without designated funding from the College” (USU CAP, 29). While funding is required for further climate action, limitations in money, research, and resources have meant that some plans have sat at a standstill or have had to “focus on low and no-cost strategies such as education programs, and those with very favorable paybacks that can help to finance the cost of later measures through their savings.” (CSU CAP, 41).

Baseline Data

When examining the role of baseline GHG inventories in developing a successful CAP, multiple subthemes emerge:

Creating a baseline is essential for a successful CAP, as it establishes an initial measurement for institutions to compare and assess their progress towards established goals. Later GHG inventories must be flexible and easily adjusted to take into account the continual changes on campus, such as new buildings or a growing student population. This is evident in most plans, as is the case with CSU where campus growth and increases in the use of clean energy sources needed to be taken into consideration in subsequent inventories. Some universities, such as CSU, update their GHG inventories every year to provide the most relevant and current data possible, ensuring that the plan remains a priority for faculty, staff, and students. We found that updating GHG inventories annually is the most effective method for tracking year-to-year CAP progress, though some universities have struggled to maintain this consistency, revisiting inventories every two, three, or even more years.

To understand their GHG emissions footprint, institutions will audit their GHG emissions through a GHG inventory, allowing universities to outline their Scope 1, Scope 2, and Scope 3 GHG emissions. Scope 1 inventories measure emissions due to on-campus stationary fuel combustion, fleet vehicles,

agricultural activities, fertilizers, and refrigerants. Scope 2 inventories measure indirect energy emissions and emissions associated with electrical purchases. Scope 3 inventories measure emissions associated with university-financed air travel, student, faculty, and staff commuting, electrical transmission and distribution losses, and solid waste disposal. Universities use many different tools to conduct their GHG emission inventories, but some common tools of measurement are Second Nature's Campus Carbon Calculator and SIMAP.

After establishing a baseline GHG emissions audit, a university must conduct an investment audit to help identify which energy efficiency projects would pay for themselves through the savings they produce. This information helps to establish a priority list for future projects to be completed.

After conducting investment and GHG emissions audits, universities can create feasible future goals to motivate and focus on new environmentally conscious behaviors on campus. Universities that have signed onto the ACUPCC share a common goal of carbon neutrality, achieving net-zero GHG emissions. Some universities set more ambitious goals than others, such as UM's benchmark for 2020, which proved a difficult goal to achieve given UM's lack of available funding and other resources.

Data Gaps

When assessing data gaps within CAPs, several subthemes arose:

Though technology has contributed to the improvement of environmentally conscious efforts on campus, it has also caused a false sense of security. New technology has progressed at an impressive rate since the wave of climate action planning just a decade ago, putting previously impossible projects within reach. Solar energy projects are a great example of this phenomenon, opening new actionable avenues for sustainability coordinators like Carol Dollard at CSU. However, as administrators and upper-division staff have overseen these technological advancements, they have sometimes become complacent, relying on future technological advancements instead of administering currently viable options. This ever-changing feasibility landscape can contribute to CAP challenges and missed opportunities. Now viable technologies may be overlooked due to outdated cost assessments, while the inability to predict future advancements and cost reductions can impede long-term CAP planning.

Another subtheme is the ability to engage faculty and students. Multiple faculty members involved with CAPs reported finding difficulty in collaborating with groups outside of their departments. Alexi Lamm, Sustainability Coordinator at USU, said about working with others, "a lot of people are kind of like one crisis at a time." This outlook can lead to data gaps as university faculty are not able to see the bigger picture surrounding the priority of CAP projects, creating a barrier to progress.

A lack of involvement from faculty or campus leadership can also lead to a lack of funding and involvement from other stakeholders. Without stakeholder buy-in, institutions may struggle to obtain funding for future projects, as lacking interest can suggest unimportance to administrators. Most institutions require research to evaluate the feasibility of planned projects; however, this can take several years or more to complete, especially if stakeholders, faculty, and students are not engaged and eager to facilitate the work.

Lastly, several institutions reported difficulties in collecting Scope 3 GHG emissions data, particularly related to air travel. Though air travel is the most time-efficient and, in some cases, the only

means of transportation for conducting research, study abroad, athletic programs, and student transportation to Bozeman, it can be the hardest to track.

Stakeholder Engagement

Many universities have integrated sustainability into their curriculum, intending to provide students with hands-on experience. Classes give students the ability to engage with crucial issues impacting the environment while giving them the tools to think critically about potential solutions. Instructors can encourage students to get involved on their campus or in their community by joining ongoing sustainability efforts. Students are better prepared to meet sustainability challenges when schools promote an interdisciplinary approach. Universities must embrace sustainability beyond campus-based projects and continue to integrate climate change topics into the educational framework.

Universities rely on events and clubs to promote sustainable efforts on campus. Whether that be through a fun event promoting hands-on activities or hosting a guest speaker, these activities encourage student involvement and increase awareness of sustainability issues and climate change. Universities often have a sustainability council that organizes events, fundraisers, and programs to educate the students, faculty, and staff about critical issues impacting the environment.

Commonly, universities utilized public meetings, media announcements, and surveys to inform the planning process. Considering the importance of stakeholders, especially those with the power to fund projects, institutions welcome their opinions. It is crucial that stakeholders feel a sense of ownership in the final CAP. Universities sought ways to understand what issues are important to stakeholders by asking for feedback on CAP rough drafts. These networking strategies encourage community-wide participation while giving universities essential feedback to advise their planning processes.

Priorities

Universities often focus on smaller projects that can be easily implemented, including composting and recycling. While these projects are tangible achievements that students and faculty alike can celebrate and take part in, their impacts on an institution's total GHG emissions are low. Each of the universities included in this study recognized the importance of energy efficiency. Campuses need to shift their focus from small-scale projects to more ambitious projects that will significantly impact GHG emissions. All four schools mentioned the importance of retrofitting old buildings to significantly improve efficiency. Increasing energy efficiency on campuses not only reduces GHG emissions but also saves money by reducing utility costs. It was noted that retrofit projects prioritized lighting and heating/cooling systems. Universities must prioritize large energy efficiency projects to have a considerable impact on GHG emissions.

Each university acknowledged the difficulty of securing funding, diminishing their ability to implement large-scale mitigation strategies. The four universities discussed their reliance on financing mechanisms, including grants, donations, utility rebates, institutional budget, and RLFs. Progress towards climate neutrality is impossible without financial backing for projects. As a result, universities emphasized the importance of seeking out more sizable funding. All four schools acknowledged the

importance of financing to prioritize large energy efficiency projects. CAP projects with considerable GHG emissions reduction potential inherently come with larger price tags, stretching funding options thin. Universities should seek out funding opportunities to fully implement their mitigation strategies, both large and small.

Accountability and Oversight

Universities often rely on a sustainability director or similarly positioned individual to oversee CAP implementation. Directors are primarily responsible for advising the planning process, reporting progress, and organizing sustainability educational outreach for students and faculty. There is a clear consensus that tracking and reporting progress is essential to legitimizing CAPs and holding universities accountable. STARS was the most commonly used evaluation system for tracking an institutions' sustainability performance. Each university found success in forming committees to support the planning and implementation stages of CAPs. Committees work closely with a university's sustainability office or equivalent body to oversee, implement, prioritize, and fund projects.

Unexpected/Other

After compiling evidence from each university's CAP and interviews with relevant individuals, a few sub-themes were established from results that fall beyond the scope of our predetermined research criteria. The first subtheme is a unique implementation of emission reduction initiatives. These action items include purchasing carbon credits, funding carbon sequestration, CSU's Renewable Energy Standard (RES) program, and many others. By analyzing actions that are unique to specific universities, ideas for mitigation can be adapted and developed for Montana State University.

Another subtheme is unique plan content, gathered from either the university's CAP or from interviews. An example of this is UM's decision to include a section describing what carbon offsets are and how they function. Any distinctive content could aid MSU in developing an updated CAP.

Lastly, some universities acknowledged the importance of including climate justice pursuits in their CAPs. For example, USU recognized that low-income communities and people of color are disproportionately exposed to environmental hazards. As a result, USU provides support for first-generation and underserved African American, Asian American, Native American, Pacific Island, and Latino students through their Multicultural Student Services (MSS).

Conclusion

As leaders in education and research, it is the responsibility of universities to inform and engage students, faculty, staff, and community members in solutions to pressing global challenges. While the effects of climate change continue to worsen, it is imperative that universities develop climate change mitigation strategies, not only to reduce their GHG emissions but to foster a mindset of sustainability and resilience that students will carry with them beyond their time in college. To better understand climate action planning at the university level, eight students wrote a detailed report, analyzing the climate action planning process at several U.S. universities to provide a framework and recommended practices for the development of an updated CAP at MSU.

The first step in this process was to establish four universities to act as case studies in the project. A comparability matrix was designed using factors such as endowment size, university population, and physical climate. Based on this comparison, the group chose to learn from UM, WSU, USU, and CSU. From here, we reviewed relevant literature and established a set of guiding questions for our analysis. To answer these questions, we gathered data from university CAPs and interviews with relevant individuals at these universities. The data from both of these sources guided the group toward a set of key findings and recommendations for MSU. First, the university must develop a central source of funding for CAP projects. The most successful CAPs utilize a type of RLF, although other sources were discussed. Secondly, to monitor success throughout the implementation process, a strong GHG emissions baseline must be established, revisited through annual GHG inventories. Finally, successful CAPs are supported and understood by various stakeholders and executives, who are engaged throughout the entire planning process. Mitigation strategies are more likely to be implemented with support from university officials. Our key findings should be emphasized when drafting and implementing an updated CAP at MSU, as they have produced successful results at similar universities.

The unique physical and cultural conditions at MSU enable the University to take on a position of leadership in future climate action. The surrounding mountainous landscape and communal love for the outdoors compel us to pursue climate change mitigation strategies for the preservation of both the land and the Montanan culture that we deeply value. It is the hope of this group that these findings will be seriously considered in future planning and climate change mitigation efforts at MSU.

MSU's Norm Asbjornson Hall

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Author Biographies

Nicole Bondurant is a sophomore at MSU majoring in Environmental Studies and minoring in Political Science. She is originally from Denver, Colorado, but was drawn to the small mountainous town of Bozeman to complete her undergraduate degree as the Rocky Mountain range makes her feel at home. By studying climate action planning, she has felt more connected to her school and has gained insights into what it takes to develop sustainability on a large scale. This knowledge will help her to continue her academic and professional journey of pursuing environmental policy and law.

Dominic Corradino is a senior at MSU studying Environmental Studies. Although he grew up in Virginia, Ohio, and Colorado, it was the geography around Bozeman that drew him north to enjoy the last best place while studying for his undergraduate degree. Born from his love of the outdoors, Dominic has always been passionate about protecting people and places from the deleterious effects of climate change. Through studying climate action planning, he has developed an appreciation for the complexities and bureaucratic obstacles that must be navigated to bring together even relatively small climate-focused initiatives. This work has also opened his eyes to an amazing group of students and faculty who are focused and similarly passionate about working to find solutions to the problems we face today and will face tomorrow caused by climate change.

Nicholas Fitzmaurice is a sophomore at MSU studying Industrial and Management Systems Engineering with a minor in Sustainability Studies. He is originally from Mazama, Washington, and his love for the outdoors drew him to pursue his undergraduate education in Bozeman. Through researching climate action planning at universities across the country, Nicholas has learned that addressing an institution's contribution to the climate crisis is a difficult and ambiguous process, requiring input from countless stakeholders and a high degree of adaptability.

Cy Halvorson is a junior at MSU studying Earth Science with a focus on GIS and Planning. Growing up in Boise, Idaho, Cy spent most of his free time in the mountains skiing, climbing, and mountain biking. This passion for the outdoors initially drew him to MSU and sparked his interest in protecting these places from the impacts of climate change. By studying climate action planning at the university level, he has gained a deeper understanding of the complexities, challenges, and collaboration that is required for the successful implementation of these plans.

Raye Myers is a second-year undergraduate student at MSU majoring in Liberal Studies with an Environmental Studies focus and a minor in Hispanic Studies. After growing up in Albuquerque, New Mexico, she decided to attend MSU to be close to mountains, fellow nature-lovers, and try out the colder weather. Studying CAPs has provided insight into the nuances of planning at an institutional level and conducting qualitative analysis. This knowledge will help to bolster her passion for climate literacy and justice.

Megan Stone is a freshman at MSU pursuing a major in Liberal Studies with a focus on Environmental Studies and a minor in Political Science. Though originally from Salt Lake City, Utah, and a lover of the Wasatch Mountains, she was drawn to Bozeman, Montana, for her undergraduate degree to explore a new mountain range and study ways to protect these beloved areas. Studying the climate action planning process has shed light on the complexities and subtleties involved in acknowledging and addressing climate change. It has also inspired hope that even in the face of a challenge as daunting as climate change, there are a lot of amazing people out there willing to help out and protect what so many of us love and cherish.

Jessica Thompson is a freshman at MSU majoring in Environmental Engineering. She is originally from Colchester, Vermont, and was drawn to MSU because of how much Bozeman and the surrounding community felt like a home away from home. After exploring several of our nation's parks, she felt a responsibility to do everything in her power to protect these lands for future generations. Through the process of studying climate action planning, she has discovered that climate science is a complex, interdisciplinary issue with many layers to sort through. An immense amount of collaboration is required to achieve success.

Savanna Washburn is a senior at MSU majoring in Environmental Studies with a minor in Sustainability Studies. She originally hails from Belgrade, Montana, where she grew up in an outdoor recreationist's paradise. Her love for the outdoors and interest in public lands inspired her to pursue her undergraduate education in Bozeman. Studying CAPs has allowed her to look at planning from a host of different perspectives. Successful plans require a lot of adjusting. Targets and goals are constantly changing; challenges are inherent in the planning process. Adaptation is essential to implementing a CAP, which requires a lot of patience but is ultimately rewarding.

Appendices

Location of Files

Climate Action Plan Report Project Files

- Background Reading
  - Study Group Powerpoint
  - Climate Action Plan 2011
  - Cool Campus Climate Planning Guide
- Literature Review
  - Final Literature Review Summary
  - Example Literature Summary
  - Researcher Contributions
  - How to Lit Review
- Reports
  - Draft Report
- Planning Analysis
  - Final documents
    - Codebook
    - CSU Worksheet
    - MSU Worksheet
    - UM Worksheet
    - USU Worksheet
    - WSU Worksheet
  - Revised Worksheet
  - Original Worksheet
  - Planning Analysis Buckets
  - Example Resources Coding Planning Documents 2021
- Interviews
  - Interview Logistics
  - List of CAP Interviewees
  - Interview Guide
  - Interview Recording and Transcribing Guide
  - Email and phone second prototype
  - Interviewing
  - Transcripts
    - Coded Transcripts
      - CSU Carol Dollard
      - CSU Stacey Baumgarn
      - MSU Kristin Blackler
      - UM Eva Rocke

- UM Peter Mcdonough
- USU Alexi Lamm
- WSU Jennifer Bodine
- WSU Katherine Meyr
- WSU Steve Nabor
- USU Zac Cook

- Trimmed Copies
  - UM Eva Rocke
  - UM Peter Mcdonough
  - WSU Jennifer Bodine
  - WSU Katherine Meyr
  - WSU Steve Nabor
- Uncoded Transcripts
  - USU Alexi Lamm
  - USU Zac Cook

- Plans Matrix Case Studies
  - Climate Action Plan Library
    - Colorado State University
      - 2010 Full Plan
      - 2010 Plan Summary
      - 2018 Plan
    - Montana State University
      - CAP Update 2.1
      - Climate Action Plan 2011
    - University of Montana
      - CAP
    - Utah State University
      - 2020 Sustainability Plan Update
      - CAP 2010
    - Weber State University
      - 2016 Sustainability Report
      - CAP 2009
    - Clemson University
      - Sustainability Action Plan
    - Colorado College
      - Carbon Neutrality Plan
    - Illinois State
      - CAP
    - Mississippi State University
      - CAP
    - New Mexico State University
      - 2014 CAP

            - CAP
        - Southern Connecticut State University
            - Climate Action Plan
            - Energy Plan
            - Hazard Mitigation Plan
        - Stanford University
            - CAP Steps
            - Third Edition CAP
        - University at Albany
            - CAP and Sustainability Plan
        - University of Massachusetts
            - CAP
            - Sustainability Policy
        - University of California Berkeley
            - CAP 2009
            - Carbon Neutrality Initiative
            - Feasibility Report 2007
        - University of Connecticut
            - CAP
        - University of Idaho
            - Cap
        - University of Maine
            - Master Plan
        - University of Nevada
            - Sustainability Report
        - University of New Hampshire
            - Endowment Report
            - CAP
        - University of North Carolina
            - CAP
            - Greenhouse Gas Report
        - University of Vermont
            - Climate Action Summary
            - Sustainability Report
    - CAP Matrix
    - Case Study Proposal
    - Selected Institutions
- Data Coding
    - CAP Theme Summaries
        - Accountability/Oversight
        - Baseline
        - Data Gaps

        - Funding
        - Implementation
        - Measuring Success
        - Politics
        - Student Stakeholder Engagement
        - Unexpected
    - CAP Synopses
        - CSU Synopsis
        - UM Synopsis
        - USU Synopsis
        - WSU Synopsis
    - Data-Writing-Assignments.xlsx
    - Synopsis Template
    - Coding Guide for Interview Transcripts
    - Data By Theme Template
- Administrative Info
    - TO DO MARCH 26 TO APRIL 15
    - Sign up for presentations
    - Master Calendar
    - Details on deliverables
    - Weekly Meetings
    - Independent Study Scope and Plan

Matrix

In narrowing our focus to four key institutions whose CAPs could provide the greatest insight into climate action planning at MSU, we developed an institution data matrix to compare institutions side-by-side. In addition to MSU, we collected data on 22 institutions from across the United States to populate this matrix. The matrix was extensive, ensuring that no aspect of these universities would be left out. The institutional data points we collected were: city and state, enrollment, year established, public or private, in-state and out-of-state tuition and fees, endowment size, student profile, athletic conference, state's political leaning, location's climate, STARS report, Scope 1-3 emissions, emissions offsets, net emissions, emissions per student, utility type, ACUPCC signatory status, CAP, and other related institutional plans. Upon gathering this information, our matrix team collaborated to hone in on the four universities from this matrix to explore further. We focused on key data points such as endowment size and student enrollment, in addition to politics, climate, GHG emissions, and quality of available reports and supporting documents.

	Institution Data						
University	City, State	Enrollment	Established	Public or Private	In-State Annual Tuition/Fees	Out of State Annual Tuition/Fees	Endowment
Montana State University	Bozeman, MT	16,766	1893	Public (Land Grant)	$7,320	$25,850	$180.2 Million (2019)
Colorado State University	Fort Collins, CO	33,413	1870	Public (Land Grant)	$12,260	$31,712	$376 Million (2019)
Southern Connecticut State University	New Haven, CT	9,331	1893	Public	$11,802	$25,206	$26.6 Million (2017)
University of Connecticut	Mansfield, CT	32,257	1881	Public (Land Grant)	$17,834	$40,502	462.4 Million (2019)
University of California Berkely	Berkeley, CA	42,347	1868	Public (Land Grant)	$14,254	$44,008	$4.79 billion (2019)
Stanford University	Stanford, CA	15,157	1885	Private	$56,169	$56,169	$28.9 Billion (2020)
Colorado College	Colorado Springs, CO	2,050	1874	Private	$60,864	$60,864	$803.8 Million (2019)
University of Vermont	Burlington, VT	13,548	1791	Public (Land Grant)	$19,062	$43,950	$562.5 million
University of Idaho	Moscow, ID	11,962	1889	Public (Land Grant)	$8,304	$27,540	$286 million
University of Maine	Orono, ME	11,561	1865	Public (Land Grant)	$11,738	$32,528	$365 million
Illinios State University	Normal, IL	20,878	1857	Public	$14,832	$26,356	$184.8 million
University of Massachussetts Boston	Boston, MA	15,989	1964	public	$14,677	$35,139.00	$922 million
University of Montana	Missoula, MT	10,015	1893	Public	$7,412	$27,238	$205 million
University of New Hampshire	Durham, NH	15,398	1866	Public (Land Grant)	$15,520	$32,860	$404 million
New Mexico State University	Las Cruces, NM	25,312	1888	Public (Land Grant)	$8,044	$25,666	$182.7 million
State University of New York University at Albany	Albany, NY	17,280	1844	Public	$7,070	$24,660	$75.1 million
University of North Carolina at Charlotte	Charlotte, NC	30,146	1946	Public	$7,096	$20,530	$230.4 million
University of Nevada, Reno	Reno, NV	21,003	1874	Public (Land Grant)	$9,366	$25,020	$377.4 million
Utah State University	Logan, UT	27,691	1888	Public (Land Grant)	$7,846	$22,804	$402.9 Million (2019)
Mississippi State University	Starkville, MS	22,986	1878	Public (Land Grant)	$8,910	$23,950	$528.7 Million (2019)
University of Rhode Island	Kingston, RI	14,687	1892	Public (Land Grant)	$15,332	$33,354	$149.2 Million (2019)
Clemson University	Clemson, SC	23,406	1889	Public (Land Grant)	$15,558	$38,550	$774.5 Million (2019)
Weber State University	Ogden, UT	24,048	1889	Public	$5,090	$15,272	$161.8 Million (2019)

University	Student Profile (HS GPA/ACT/SAT)	Athletic Conference	State's Political Leaning	Climate
Montana State University	3.57/25/1234	NCAA Division 1 Big Sky Conference	Conservative	Northern Latitude (Winter)
Colorado State University	3.62/25.2/1125	NCAA Division 1 Mountain West Conference	Liberal	Wintery, Central Latitude
Southern Connecticut State University	//1025	NCAA Division II Northeast-10 conference	Liberal	Northern Latitude (Winter)
University of Connecticut	//1306	NCAA Division I Big East Conference	Liberal	Northern Latitude (Winter)
University of California Berkely	(Middle 50%) 3.86-4.00/29-35/1330-1530	NCAA Division 1 paC-12 Conference	Liberal	Mild Winters
Stanford University	(Middle 50%) 3.95/31-35/1420-1570	NCAA Division 1 PAC-12 Conference	Liberal	Mild Winters
Colorado College	/32/1400	NCAA Division 1 Mountain West Conference	Liberal	Moderate Winter
University of Vermont	3.7/28-33/1200-1410	NCAA Division 1 America East Conference	Liberal (feel the Bern!)	Northern Latitude (Winter)
University of Idaho	3.44/23.2/1106	NCAA Division 1 Big Sky Conference	conservative	Northern Latitude (Winter)
University of Maine	3.29/24/1154	NCAA Division 1 America East Conference	liberal(ish)	Northern Latitude (Winter)
Illinios State University	3.07-3.83/21-26/1030-1200	NCAA Division 1 Missouri Valley Conference	liberal	Northern Latitude (Winter)
University of Massachussetts Boston	3.34/23/1040-1220	Division III // New England Hockey Conference	liberal	Northern Latitude (Winter)
University of Montana	3.3/24/1170	NCAA Division 1 Big Sky Conference	Conservative	Northern Latitude (Winter)
University of New Hampshire	3.5/25/1180	NCAA Division 1 America East Conference	Liberal	Northern, wintery
New Mexico State University	3.49/21/1033	NCAA Division I FBS Independent Schools	Liberal	Mild, arid, continental
State University of New York University at Albany	3.4-3.8/24-28/1130-1300	NCAA Division 1 Colonial Athletic Association	Liberal	Humid, continental
University of North Carolina at Charlotte	3.3-3.8/22-28/1110-1290	NCAA Division 1 Conference USA	Conservative	Humid, continental
University of Nevada, Reno	3.4/23/1180	NCAA Division 1 Mountain West Conference	Liberal	Continental, moderate wint
Utah State University	3.56/24/1170	NCAA Division 1 Mountain West Conference	Conservative	Wintery, Central Latitude
Mississippi State University	3.78/26.1/1230	NCAA Division 1 Southeastern Conference	Conservative	Humid Subtropical Climate
University of Rhode Island	3.6/26/1185	NCAA Division 1 Colonial Athletic Association	Liberal	Humid Continental Climate
Clemson University	/29.5/1320	NCAA Division 1 Atlantic Coast Conference	Conservative	Humid Suptropical Climate
Weber State University	3.25/21	NCAA Division 1 Big Sky Conference	Conservative	Wintery, Central Latitude

University	STARS Report?	Scope 1 Emissions (Metric Tons CO2e)	Scope 2 Emissions (Metric Tons CO2e)	Scope 3 Emissions (Metric Tons CO2e)	Carbon Offsets (Metric Tons CO2e)
Montana State University	Silver (2019)	19,320.40	10,295	20,254	2.8
Colorado State University	Platinum (2019)	74,000	106,100	40,730	1,214.60
Southern Connecticut State University	No, but registered	Unknown	Unknown	Unknown	Unknown
University of Connecticut	Platinum (2020)	106,858.91	0	15,668.19	5412.53
University of California Berkely	Gold (2018)	12,125	97,861	41,664	0
Stanford University	Platinum (2019)	36,074.31	29,445.37	47,982	0
Colorado College	Gold (2020)	8480.87	9150.8		2,500
University of Vermont	Gold	29,899.29	19,949	19,787	
University of Idaho	silver	5,146.36	11,521.39	21,318.12	
University of Maine	silver	30,438.00	12,538.00	17,000.00	
Illinios State University	bronze	15,483.70	600,243.70	18,490.10	
University of Massachussetts Boston	No, but registered	4795	15380	2737	
University of Montana	Yes (2017)	15,551	14,295	13,913	69.45
University of New Hampshire	Yes (2018)	29,572.19	0	23,613.16	2,388.80
New Mexico State University	Yes (2017)	32,129	26,438	0	0
State University of New York University at Albany	Yes (2018)	30,178	11,551	19,783	0
University of North Carolina at Charlotte	Yes (2016)	21,604	44,015	29,726	0
University of Nevada, Reno	No, but registered	14,358	41,536	30,007	unknown
Utah State University	Yes (2019)	51,455.81	10,842	23,271.31	unknown
Mississippi State University	No	24,735.79	61,579.62	2,981.23	unknown
University of Rhode Island	No, but registered	27,711.81	18,410.18	25,872.16	unknown?
Clemson University	Yes (2018)	35,486	73,020	49,604	unknown?
Weber State University	Yes (2019)	7,300.47	6,717.13	32,316.02	unknown?

University	Total Emissions (Metric Tons CO2e)	Emissions/Student (Metric Tons CO2e)	Utility Type	Signed onto ACUPCC?	Climate Plan	Other Institution Plans
Montana State University	49866.60	2.97	Shareholder Owned, for Profit	Yes	2011	
Colorado State University	220,830.00	6.61		Yes	2018	
Southern Connecticut State University	#VALUE!	#VALUE!	Fort Collins Utilities, Xcell Energy	Unsure	2019	Energy Master Plan, Hazard Mitigation Plan
University of Connecticut	122,527.10	3.80		Yes	2009	
University of California Berkely	151,650.00	3.58		Yes	2016	2009 Plan, 2007 Feasibility Study
Stanford University	113,501.68	7.49		No	2015	
Colorado College	17,631.67	8.60		Yes	2020	Carbon Neutrality Plan
University of Vermont	69,635.29	5.14		Yes	2020	divestment initiative
University of Idaho	37,985.87	3.18		Yes	2010	strategic plan (2016)
University of Maine	59,976.00	5.19		yes	2009	
Illinios State University	634,217.50	30.38		no	2008	
University of Massachussetts Boston	22,912.00	1.43		yes	2016	
University of Montana	43,759.00	4.37	non-profit public state higher-ed	Yes	2010	
University of New Hampshire	53,185.35	3.45	non-profit public state higher-ed	Yes	2009	CAP update 2014-2020
New Mexico State University	58,567.00	2.31	non-profit public state higher-ed	Yes	2017	
State University of New York University at Albany	61,512.00	3.56	non-profit public state higher-ed	Yes	2020	
University of North Carolina at Charlotte	95,345.00	3.16	non-profit public state higher-ed	Yes	2012	Greenhouse Gas Inventory
University of Nevada, Reno	85,901.00	4.09	non-profit public state higher-ed	Yes	2019	
Utah State University	85,569.12	3.09	non-profit public state higher-ed	Yes	2010	CAP summary
Mississippi State University	89,296.64	3.88	non-profit 501(c)(3) organizatio	Yes	2006?	MSU CAP
University of Rhode Island	71,994.15	4.9	non-profit	Yes	2010	
Clemson University	158,110.00	6.76	non-profit 501(c)(3) organizatio	Yes	no ->	Sustainability Action Plan
Weber State University	46,333.62	1.93	non-profit 501(c)(3) organizatio	Yes	2009	

Interview Contact List

- Utah State University
    - Alexi Lamm: Sustainability Coordinator
        - Email: alexi.lamm@usu.edu
    - Zachary Cook: Utilities Senior Energy Manager
        - Email: zac.cook@usu.edu
        - Phone: (435) 232-4107
- Colorado State University
    - Carol Dollard: Energy Engineer (Facilities Management)
        - Email: Carol.Dollard@colostate.edu
    - Stacy Baumgarn: Campus Energy Coordinator
        - Email: Stacey.Baumgarn@colostate.edu
- Weber State University
    - Jennifer Bodine: Sustainability Manager
        - Email: jenniferbodine@weber.edu
        - Phone: (801) 626-6421
    - Katherine Meyr: Student Sustainability Communications Coordinator
        - Email: katherinemeyr@weber.edu
        - Phone: (801) 626-6310
    - Steve Nabor: Senior Associate Vice President for Financial Services and CFO

        - Email: snabor@weber.edu
- University of Montana
    - Eva Rocke: Sustainability Coordinator
        - Email: eva.rocke@umontana.edu
        - Phone: (406) 243-4323
    - Peter McDonough: Climate Change Studies Program Coordinator
        - Email: peter.mcdonough@umontana.edu
        - Phone: (406) 214-9871

Interview Guide

Rational Statement

In considering how to optimize our understanding of the processes and strategies underpinning the development and successful implementation of campus CAPs, we have selected a list of potential interviewees based on their involvement and proximity to their respective institutions' CAPs. Our selection ranges from sustainability coordinators to student representatives involved in the projects, to folks whom we've deemed likely to be involved in acquiring the necessary capital to fund such initiatives. We aim to speak to people involved at every level of the process, from the plan's conception to its design, development, and eventual implementation; the list below reflects this.

The questions we have determined to be the most informative will change according to the particular interviewee, however, we have developed an interview guide that will help guide the conversation from a discussion about the interviewee's professional background, position at their institution, and their involvement in their institution's CAP, to one geared towards determining how successful, and by what metrics, their plans have been, and why they feel that is. Furthermore, we feel it is important to not only obtain information related to empirical measurements of success but also to understand how the interviewees perceive the CAP's development and implementation to have gone thus far. We are also concerned with asking questions regarding what barriers the interviewees feel have stood in the way of their CAP's success or further success.

We are particularly interested in understanding how the interviewees feel their institution's CAP has involved both themselves as well as other community stakeholders. Perhaps the most enlightening findings from the literature review showed that a CAP's success is inextricably tied to stakeholder engagement. Hence, as many of the interviewees themselves are stakeholders, we are interested in understanding how their institution's CAP has engaged them individually and other community stakeholders. Finally, we are interested in understanding how institutions are setting up implementation and oversight plans. We hope that we have identified a few individuals whose responsibility at their institution is to monitor progress and provide oversight and thus plan to ask, quite directly, about such protocols.

Guide:

- Sustainability Coordinator
    - Alexi Lamm (USU)
    - Kate Robinson (USU)

        - Tonie Miyamoto (CSU)
        - Diana Wall (CSU)
        - Jennifer Bodine (WSU)
        - Eva Rocke (UM)
    - Implementation
        - Becca Mueller (CSU)
    - Funding
        - Whitney Pugh (USU)
    - Student Rep.
        - Bryce Johnston (USU)
        - Kate Robinson (USU)
    - Facilities / Campus Operations
        - Zac Cook (USU)
        - Carol Dollard (CSU)
        - Brian Kerns (UM)

General

- Tell us about your role at your institution.
- What is your connection to the development or implementation of the Campus CAP?
- When was the present CAP implemented and what is its current status?
- Do you feel that your institution's CAP has so far been successful?

Questions from Julia Haggerty

- What would be different if you did not have a CAP?
- Is the STARS system a major influence on how your plan is written or designed (in terms of activities that are prioritized)? Would you say that what STARS prioritizes/weighs generally aligns with what needs to happen on your campus?

Sustainability Coordinator

- Who is monitoring the progress of the success of your plan? How is 'success' being measured?
- Are you hitting the benchmarks you originally set out to?
- What barriers have you run into in the implementation of your CAP?
- Are there any parts of your plan that have been more successful than others? Why?
- Do you feel like your CAP is well funded? Do you think it takes priority when money is being distributed?
    - What kind of barriers are there to gaining enough funding?

Implementation

- Are there any parts of your plan that have been more successful than others? Why?
- Who is monitoring the progress of the success of your plan? How is 'success' being measured?

- What barriers have you run into in the implementation of your CAP?
- Who is responsible for monitoring progress and how?
- How are you ensuring that the plan is being implemented?

Funding

- Do you feel like the CAP is well/sufficiently funded?
    - What do you think is acting as the barrier to the funding the plan needs?
- How was the funding originally acquired?
- Was there anything specific you feel, that allowed access to the capital that was acquired in the first place?
- Do you feel that stakeholder engagement led to access to more capital?

Student Reps

- What is your, or what has been the role of students, in developing and implementing the CAP?
- Why do you think it's important to get students involved in these plans?
- Do you feel like your role is important/critical to the success of the CAP?
- Do you feel like student voices/values are well represented in the plan?

Facilities / Campus Operations

- What is your plan for switching to renewable energy? How much progress has been made?
- What kinds of barriers have there been in making this switch?
- How has the implementation of your CAP affected your daily operations?
- Do you feel like the older and less efficient infrastructure on campus can become more efficient? Does your CAP address/take advantage of these?