A Comparative Study of Climate Action Plans in Liberal Arts Colleges: Planning Processes, Climate Action Strategies, and Implementation Techniques.

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Abstract

Actors around the country are taking action to mitigate and adapt to climate change. Municipalities and higher education institutions are part of this movement. Starting in the early 2000s, they began developing climate action plans (CAPs) to address climate change and its impacts, often focusing on emissions reductions in order to reach net zero carbon emissions. While a plethora of literature exists about CAPs in municipalities, there is little research about CAPs in higher education institutions. This study provides insight into CAPs in liberal arts colleges around the United States with a comparative analysis of 30 CAPs. Specifically, we researched CAP contents and the planning processes that formed the CAPs. This study finds that CAPs vary greatly in depth, length, organization, strategies included, formation processes, and implementation progress. Furthermore, CAP content and detail, while previously thought to be crucial to the effectiveness of a CAP, were generally not as important for creating an effectively implemented CAP as broad stakeholder involvement, administrative support, and financing strategies. Therefore, this study finds that, in general, CAPs should serve as launching points for action, goals, and support for climate action in institutions, but do not need to be strictly adhered to in order to make progress.

Introduction

As the impacts of climate change become more evident, various actors -- including municipalities, states, and higher education institutions -- are taking action and creating climate action plans (CAPs). CAPs are part of a larger movement that is attempting to mitigate and adapt to climate change. Climate action plans detail policies, strategies, and goals designed to reduce climate impact, often by reducing greenhouse gas emissions (Wheeler 2008). However, while an actor's adoption of a CAP can indicate a commitment to mitigating climate change, there is no standard formula for creating and implementing a CAP. Therefore, CAP formation processes vary and result in plans that differ in length, content, and ability to be implemented, leading to different levels of success (Bassett and Shandas 2010). Additionally, municipalities and states rely on public governing bodies to help create and implement a CAP, while CAPs at higher education institutions are implemented within the institution, which could lead to differences between municipal and higher education CAPs (Abbott 2012). Although municipal CAPs have been studied extensively, there is little research on CAPs in higher education.

Higher education CAPs evolved out of municipal and state plans. In the 1990s and early 2000s municipalities in the United States started to create CAPs, but CAPs did not gain traction in higher education institutions until the mid-2000s with the creation of the American College and University Presidents' Climate Commitment (ACUPCC) in 2006 (Wheeler 2008; Second Nature 2019). Signatories of the ACUPCC agreed to "develop a comprehensive climate action plan" to reduce their institutions' greenhouse gas emissions and strive for carbon neutrality (Second Nature "Climate Leadership Statement" 2019).

Following the creation of the ACUPCC, many higher education institutions across the United States, including 82 liberal arts colleges, developed CAPs and signed on to the American College and University Presidents' Climate or Carbon Commitments (Second Nature 2019). The lack of research on CAPs in higher education means that it is unknown how much variation there is in CAP content and creation processes. Because of this gap in the literature on CAPs, what works or does not work for higher education CAPs, or what innovative policies or processes are present in these CAPs, could easily go unnoticed by other institutions developing or updating their CAPs. This knowledge could help inform policies and processes other institutions or actors are undertaking in the broader sphere of climate change mitigation and adaptation. Consequently, this research reveals how liberal arts colleges are forming their CAPs, and what policies and attributes they are including. Additionally, it reveals what factors are correlated with a thorough CAP design. More specifically, it highlights what aspects of plan formation processes and policy attributes are working, are not working, or are innovative for different liberal arts colleges, and what factors are important in terms of implementation progress. This research defines "innovative" as policies, goals, or processes that are being employed by one or only a handful of colleges and that could provide guidance and new ideas for other institutions developing or updating their CAPs.

Literature Review

To better understand liberal arts colleges' CAPs, understanding typical attributes of successful planning, characteristics of municipal and state CAPs, characteristics of sustainability plans in higher education, and case studies of CAPs in specific higher education institutions is crucial. Investigating the existing literature in these fields provides a basis for this study.

Planning Literature

While a plethora of literature exists about how to best create strategic, comprehensive plans (Altshuler 2007; Godschalk et al. 2010; Bryson et al. 2012), Innes (1996) addresses critiques of comprehensive planning and highlights solutions for creating well-developed plans in the article "Planning Through Consensus Building: A New View of the Comprehensive Planning Ideal." He argues that consensus-building -- when experts and stakeholders are included in plan formation and use their personal knowledge and expertise to reach an agreement -- ensures that plans meet stakeholders' needs while addressing complex, controversial issues, such as sustainability. Innes concludes consensus-building is imperative for creating a well-rounded plan.

"Making Plans that Matter: Citizen Involvement and Government Action," by Burby (2003) builds on Innes (1996) and past scholarship. He agrees that including stakeholders and experts in the planning process is important but argues that to motivate action and implement a plan, it is imperative to include a broad, representative spectrum of dedicated stakeholders. Burby finds that plans are more likely to be implemented when the stakeholders involved are committed and passionate about the issue.

Municipal Climate Action Plans

A large body of literature exists about CAPs in municipalities (Wheeler 2008; Bassett and Shandas 2010; Tang et al. 2010; Shi and Chu 2015). Past studies include comparisons of CAPs across municipalities, investigations about plan creation processes and plan content, and discussions about what plan implementation strategies work best. This section overviews the highlights of municipal CAP literature.

The article "State and Municipal Climate Change Plans: The First Generation" by Wheeler (2008) provides one of the earliest comparative analyses of CAPs. Wheeler compared the context and complexity of state and municipal plans and conducted interviews with those involved in plan development. He identified that institutional commitment and the degree to which tasks were explicitly defined contributed to or inhibited CAP success. However, Wheeler also stated that analyzing CAP progress is difficult because few jurisdictions have released progress reports for their CAPs. In sum, Wheeler noted that while the first generation of CAPs helped raise awareness about climate change and set goals for improvement, most of the plans' proposed changes were inadequate and lacked the necessary "political and institutional commitment" to be put into action and reach target goals. This finding suggests more work is necessary to develop plans that actually lead to the completion of target goals.

Two years later, in the article "Innovation and Climate Action Planning: Perspectives from Municipal Plans," Bassett and Shandas (2010) conducted a similar comparative study of municipal CAPs. Similar toWheeler (2008), they conducted interviews and did comparative analyses of CAPs, also discovering many plans that were difficult to implement. They expanded on this finding by explaining that the complexity of plans varied greatly. Some plans were brief and outlined general goals while other plans were more detailed, quantifying costs and describing specific actions to be implemented. Bassett and Shandas (2010) also found that the planning process for CAPs and the CAPs themselves varied between cities based on city size and geographic location. Although local innovation, as in "it's something we've never done before," was occurring, it was hard to determine if policy innovation, or "notable changes adopted at a

wider scale, perhaps updating best practices," was occuring. Additionally, they highlighted the importance of stakeholder and community involvement in developing implementable CAPs.

Also in 2010, the study "Moving from agenda to action: evaluating local climate change action plans" by Tang et al. did a comparative analysis of CAPs, but expanded on past studies by creating a model to empirically evaluate the plans based on local awareness, analysis, and actions on climate change. They found that state mandates, community wealth, climate risk, and emission stress variables influenced the quality of local CAPs, albeit to different degrees.

The 2015 study "Explaining Progress in Climate Adaptation Planning Across 156 U.S. Municipalities," by Shi and Chu expands on factors that influence CAP quality and what cities are more likely to have CAPs. They discovered that smaller cities with fewer resources had a harder time raising the money needed for planning, and cities that had local coalitions and strong leadership dedicated to planning were more successful. Additionally, when municipalities perceived that their area could be greatly impacted by the changing climate, they were more likely to adopt a CAP.

In addition to general, comparative studies of municipal CAPs, studies about the integration and success of specific aspects of CAPs have been done. Boswell et al. (2010) analyzed how greenhouse gas (GHG) emissions inventories are being factored into CAPs in their study "An Assessment of the Link Between Greenhouse Gas Emissions Inventories and Climate Action Plans." While GHG emissions inventories largely inform goals and actions in CAPs, past studies have not closely examined how these inventories are developed and affect CAP planning. This study revealed that GHG emissions inventories are hard to estimate, and can, therefore, make it difficult for CAPs to provide actionable tasks that meet emissions reductions goals that correspond with actual emission outputs. Additionally, like Bassett and Shandas (2010), Boswell et al. (2010) advocated for broad stakeholder and planner involvement to help develop meaningful and successful CAPs.

While CAPs often focus on mitigating climate change -- defined as reducing and stabilizing emitted GHGs based on GHG emissions inventories -- little attention is given to whether adaptation strategies -- defined as strategies that help society adjust to the impacts of climate change -- are included in CAPs (Koski and Siulagi, 2016). The study "Environmental Harm or Natural Hazard? Problem Identification and Adaptation in U.S. Municipal Climate Action Plans," by Koski and Siulagi (2016) addressed this issue, finding that few CAPs include climate adaptation goals in addition to mitigation goals. Koski and Siulagi argued adaptation is imperative to include in CAPs so municipalities are better equipped for the impacts of climate change. They also discovered that cities located in or near areas experiencing the impacts of climate change, such as coastal cities, were more likely to include adaptation initiatives in their plans.

Sustainability in Higher Education

While the previous section overviewed CAPs in municipalities, planning in higher education is a seperate body of literature. Due to a relatively small amount of literature about CAPs in higher education, understanding sustainability plans in higher education can provide a good basis for understanding planning in general in higher education.

Different from CAPs, sustainability plans are comprehensive and can cover a wide array of issues -- both related and unrelated to specific climate change plans (White 2014).

Consequently, sustainability plans are often separate from CAPs in higher education institutions because, as opposed to sustainability plans, CAPs solely focus on climate action. However, some projects that focus on climate action and are included in CAPs can also improve general campus sustainability. Therefore, some institutions have combined their CAP and sustainability plan into one comprehensive document due to this overlap and to make it easier to implement their plan (Sustainable Furman Steering Committee 2009; Office of Sustainability 2013).

Sustainability goals in higher education vary from institution to institution. The article "Definitions and Frameworks for Environmental Sustainability in Higher Education," by Wright (2002) provided an early examination of these goals. She found that while sustainability efforts in higher education institutions were increasing, institutions often struggled to implement policies designed to achieve their environmental goals due to differences in staff member opinions and accountability.

Twelve years later, White (2014) explored this idea of successful sustainability policy implementation in "Campus sustainability plans in the United States: Where, what, and how to evaluate?" The study developed preliminary criteria for comparing sustainability plans and addressed what factors are important to include in the planning process. White noted that many sustainability plans started in the past five years, which made it difficult to evaluate their success, but highlighted factors that, when evaluated, could indicate how successful plans would be in the future. These factors included participation in the planning process, the measurability of the plan, and the implementation details provided in the plan.

In an attempt to determine which sustainability plans were successful, the study "An Alternative University Sustainability Rating Framework with a Structured Criteria Tree" by Shi (2013) evaluated the systems that ranked institutions' sustainability efforts. He found that most sustainability ranking systems were useful, but that they were often subjective and a more objective method of evaluating institutions would provide better results.

The literature also addresses many components of sustainability plans and movements that could make them more successful. In "Developing a Sustainability Plan at a Large US college of Education," Smith (2011) finds that sustainability measures can be most effective when they are developed at the curricular level as well as the operational level. In "Sustainability Reporting and Performance Management in Universities: Challenges and Benefits," Adams (2013) argues that more stringent reporting measures for sustainability plans in higher education would hold institutions accountable and increase plan success.

Other articles, such as "Students as Change Agents in a Town-Wide Sustainability Transformation: the Oberlin Project at Oberlin College" by Daneri (2015), focus on the personnel involved in the program's implementation and the consecutive success of the program. Daneri (2015) argues that while multi-stakeholder partnerships are effective when attempting to create environmental policy, these partnerships can be even more successful when they include student participation. When comparing student and faculty contributions to the Oberlin Project, a project that aimed to increase the sustainability of the local community, he found that students contributed key aspects to the core research and implementation process.

Similarly, in "Student-led campus climate change initiatives in Canada," Helferty and Clarke (2009) found that students can be essential to creating sustainability movements, especially when placed in leadership roles. In the article "Explicitly linking pedagogy and facilities to campus sustainability: lessons from Carleton College and the University of

Minnesota," Savanick (2008) evaluated what made certain sustainability projects successful. Her results were in agreement with Helferty and Clarke (2009), as she found successful sustainability projects had strong student leadership and faculty support. Additionally, she found that these projects had consistent academic funding and an educational component for students.

Brinkhurst (2011) also explores upper education's push for sustainability in "Achieving campus sustainability: top-down, bottom-up, or neither?" He found that faculty leadership is essential if an institution wants to create a lasting sustainability program.

Higher Education as a Role Model for other Sustainability Projects

There is little research on how sustainability initiatives in higher education impact the actions of other actors in regards to sustainability. This section explores the existing literature on how higher education institutions can effectively serve as a role model for other actors when creating and implementing sustainability initiatives.

In "The Critical Role of Higher Education in Creating a Sustainable Future," Cortese (2003) argues that higher education has a critical role to play in making advancements for sustainability, but that institutions need to work in interdisciplinary ways between departments and incorporate sustainability initiatives into the curriculum to make effective, long-term change. Additionally, he argues that institutions' sustainability efforts can serve as models for other communities, such as cities or municipalities.

Similarly, Wigmore (2010) in "Sustainability Assessment in Higher Education Institutions" notes that higher education institutions have a large role to play in spurring the environmental movement forward. In "Higher Education's Role in Adapting to a Changing Climate" Dyer and Andrews (2011) recommend that colleges work with their local community and serve as role models in sustainability policy. They emphasize that although campus sustainability programs have addressed mitigation strategies, they have not adequately focused on adaptation strategies.

Sustainability plans are inherently different from CAPs in that their purposes are different and sustainability plans encompass a much broader array of environmental work than CAPs do (White 2004). However, many of the findings about sustainability planning in higher education institutions are still applicable to CAPs in higher education institutions, primarily because sustainability plans and CAPs both contain an institutions' initiatives and often work towards an environmentally conscious goal.

Climate Action Plans in Higher Education

There is little research about CAPs in higher education institutions beyond studies about individual institutions. However, this background section provides information about CAPs in higher education and further expands upon the body of literature about general sustainability planning in higher education.

The article "Beyond the Inventory: Planning for Campus Greenhouse Gas Reduction" by Willson (2010) focused on a California State Polytechnic University's CAP as a case study for institutions with plans that were a part of the American College and University Presidents' Climate Agreement. Willson investigated the planning process, goals, and actionable tasks of the CAP. He found the Presidents' Climate Commitment holds schools more accountable for CAP completion than they would be otherwise because they are required to follow a basic structure

when they create their CAP, including target dates for emissions reductions and research and education aspects. They are also given deadlines for CAP completion and updates. Despite these requirements, he argued that there is still room for plan variability. Willson (2010) also found institutions that have signed onto the Commitment have to thoroughly integrate their CAPs into the other initiatives and goals of the institution, set realistic targets, and develop a planning process that integrates students and staff. They also need to work with the school's structure to be sustained over time.

"Campus Climate Action Plan Legacies and Implementation Dynamics" by Alexander (2014) found that examining climate action plans in institutions can help advise municipalities and local governments on how collaboration can help effectively create their sustainability plans and CAPs. She found that institutions who cooperate across administrative levels and academic departments when creating the CAP will be more effective when implementing their CAP.

The article "Hot Air: University Climate Action Plans and Disarticulated Federalism" by Abbott (2012) evaluated conditions that might influence CAP policy. He found that the politics of the area surrounding the institution are more likely to influence the success of an institution's CAP. Specifically, he argues that the aggressiveness of environmental policy within the state an institution is located in will determine how aggressive the CAP of an institution will be.

Our Study

While comparative studies have been done of municipal and state CAPs and a large body of literature exists about sustainability planning in higher education, little research has been done about CAPs in higher education. Additionally, the research about higher education CAPs has largely focused on individual plans and their processes; there has not been a comparative study of higher education CAPs and their planning processes. Consequently, this research fills this gap with a comparative study of CAPs in liberal arts colleges by answering the research question:

How do liberal arts colleges create climate action plans, what actions and goals do they include, and what aspects of their planning processes, policies, and goals are working well, not working well, or appear to be innovative?

Methodologies

This study reviewed CAPs from 30 liberal arts colleges (Appendix A) across the United States to understand what is included in higher education CAPs and to understand the processes that formed them. These colleges were selected by first narrowing the scope of the study to the 223 colleges classified as National Liberals Colleges by the U.S. News and World Report (2019). Out of those 223 colleges, 82 of them have signed onto the American College and University Presidents Climate or Carbon Commitments (ACUPCC), indicating they have a CAP and are committed to mitigating and adapting to climate change (Willson 2010, Abbott 2012; Second Nature 2019).

These 82 colleges were divided according to Census Bureau regions -- Northeast, South, Midwest, and West -- and an equivalent proportion of colleges from each region were selected for both quantitative and qualitative analysis (US Bureau of the Census, Figure 1). Approximately 33 percent of the liberal arts colleges that had signed on to the ACUPCC were in the South, 33 percent in the Northeast, 21 percent in the Midwest, and 13 percent in the West.

Based on these proportions and the study size of 30 CAPs, ten institutions and their CAPs were randomly chosen from the institutions in the South, ten from the institutions in the Northeast, six from the institutions in the Midwest, and four from the institutions in the West. This division ensured the proportional geographical representation of colleges across the United States.

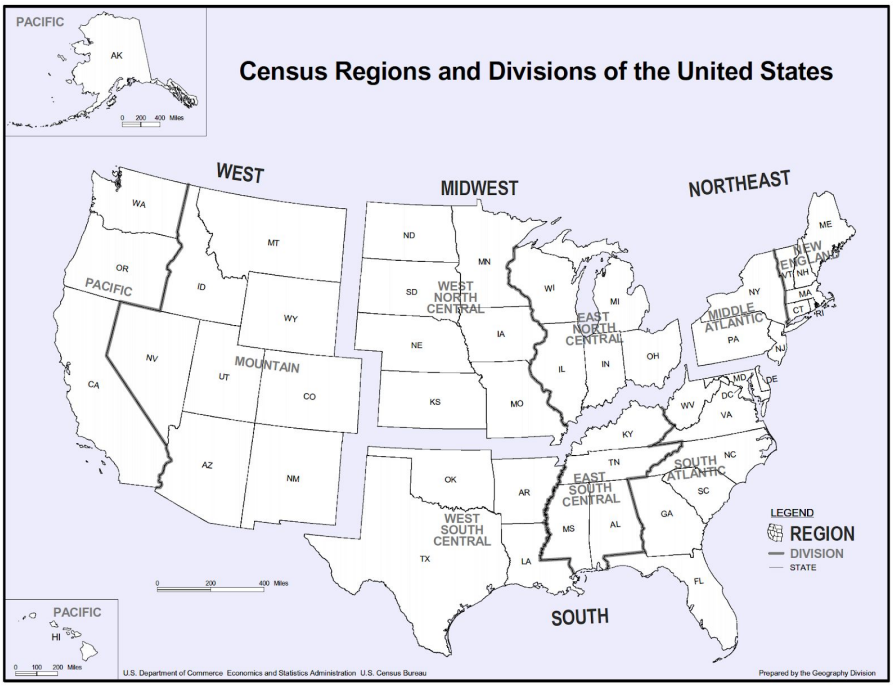

Figure 1: Census Bureau regions used to ensure geographical representation of institutions included in this study.

Climate Action Plan Attributes

For the quantitative analysis of the CAPs, general information about the plans and specifics about what attributes and policies each plan contains was collected (Appendix C; Appendix D). General information included CAP length, implementation year, whether the CAP was an update or the original document, the endowment of the college, and the year in which the institution aims to be carbon neutral. This information was largely sourced from the individual CAPs themselves, with plan update information coming from institution's websites, interviews, and the Second Nature Reporting website. Second Nature is the non-profit organization that is the governing body for the ACUPCC. It tracks and monitors institutions' progress and provides general information about climate action planning in higher education. Endowment size was obtained from the 2018 values listed on the U.S. News and World Report college profiles. Additionally, we collected data on outside factors or characteristics of liberal arts college locations (Tang et al. 2010; Bassett and Shandas 2010). These factors include whether or not the institution is located in a coastal state and if it is located in a rural, suburban, urban, or city area as classified by the US. News and World Report (2019).

The most recent CAP from each institution was analyzed. Analysis of plan specifics focused on the inclusion of the factors listed in Table 1. Factors were ranked on a scale from 0-3 unless otherwise indicated. On this 0-3 scale, zero means a factor was not present, a one means a factor was briefly mentioned but not explained in detail, two means a factor was present and

partially explained, and three means a factor was thoroughly explained (Abbott 2012; Tang 2010).

For factors that involve policies, programs, and actions, a one on the scale indicates that, in addition to not being explained, there was no path to implementation, a two on the scale indicates that it was only partially explained and/or it lacked a detailed path to implementation, and a three on the scale indicates that it had a detailed explanation and path to implementation. For mitigation strategies, Renewable Energy Credits (RECs), and carbon offsets, "A detailed path to implementation" is defined as a strategy that includes six characteristics: a specific project, a timeline for implementation, a person or department in charge of the project, financing for the project, a set project location, and an estimate about the amount of emissions it will reduce. These definitions were created by the authors based on the criteria past comparative studies have employed (Bassett and Shandas 2010; Boswell et al. 2010). In order to be classified as mentioned (a one on the scale), a goal must have one of these characteristics. In order to be classified as a partially explained strategy (a two on the scale), a goal must have 2-4 of those characteristics. In order to be categorized as a detailed strategy (a three on the scale), a goal must have 5-6 of these characteristics.

For education and community outreach -- factors that still involve policies, programs, and actions -- the 0-3 scale is still the same, but estimated emissions reductions are not considered. This is because emissions reductions are nearly impossible to estimate for behavior changes, such as those associated with education and community outreach. Therefore, a one on the scale means one of the above characteristics is mentioned, a two on the scale means 2-3 of the characteristics are mentioned, and a three on the scale means between 4-5 of the characteristics are mentioned.

For factors where a 0-3 scale was unnecessary, a 0-1 scale was employed. A zero indicates the factor was not present, and a one indicates the factor was present. Additionally, notes were made about any aspects of a plan that seemed to be unique or innovative (Bassett and Shandas 2010). For details about the ranking system for each factor listed in Table 1, see Appendix D.

General Factors	Factors Involving Policies, Programs, Actions
● Climate science primer (0-1) ● Local/Regional climate change impacts (0-3) ● Planning process description (0-3) ● GHG emissions inventory (0-3) ● GHG emissions forecast (0-3) ● Financing (0-3) ● GHG emissions reductions target (0-3)	● Mitigation - transportation (0-3) ● Mitigation - waste (0-3) ● Mitigation - energy efficiency (0-3) ● Mitigation - renewable energy generation (0-3) ● Mitigation - land use planning (0-3) ● Mitigation - food services (0-3) ● Adaptation policies/programs/actions (0-3) ● Carbon offsets (0-3) ● Renewable Energy Credits (0-3) ● Education (0-3) ● Community outreach (0-3) ● Monitoring and evaluation of plan (0-1)

Table 1: Attributes that were evaluated for each CAP (Bassett and Shandas 2010; Boswell et al. 2010).

After gathering this data for each CAP, the total score, or composite score, of each institution's CAP was calculated out of 53 based on our 0-3 and 0-1 scales (Table 1; Appendix C). This method was used to create a metric for how detailed an institution's CAP was. Additionally, a total mitigation score -- the composite score of transportation, waste, energy efficiency, renewable energy generation, land use planning, and food services -- was calculated out of 18 for each institution. This was done to better understand the level of detail of an institution's policies, goals, and plans for reducing their emissions. Thirdly, a total strategies score -- the composite score of the mitigation score plus carbon offsets, Renewable Energy Credits (RECs), education, and community outreach -- was calculated out of 30 for each institution. This was done to better understand the level of detail of an institution's policies, goals, and plans for reaching carbon neutrality.

In order to reveal any trends or correlations between plan attributes, general plan information, or outside factors, Pearson's Correlation Coefficient tests were run (Tang et al. 2010). These tests were done to help determine if outside factors, general plan information, or particular plan attributes correspond to the level of detail and policies included in each plan (Bassett and Shandas 2010; Tang et al. 2010).

Interviews

To expand this study beyond a quantitative analysis of what was written in institutions' CAPs, we conducted qualitative and qualitative analyses based on interviews. Interviews were conducted with a person highly involved in their institution's CAP currently work with the CAP at their institution at 24 of the 30 institutions included in this study (Appendix A). These interviews shed light on the specifics of an institution's CAP planning process, an institution's motivation for creating and implementing a CAP, the current status of an institution's CAP and what is working and what is not, and whether an institution's plan or processes are particularly innovative. Interview questions were geared towards gaining information that an institution's CAP did not contain (Appendix B). This interview process was modeled off of Wheeler (2008) and Bassett and Shandas (2010).

To synthesize these interviews, both qualitative and quantitative analyses were used. Common answers were noted, along with the institutions that mentioned them (Bassett and Shandas 2010). This method revealed common themes and trends about institutions' CAPs and planning processes. The total number of institutions that mentioned a particular topic was calculated for multiple interview questions in order to obtain a general understanding of how similar or different CAP planning processes are amongst institutions.

Additionally, themes and phrases that were unique to a particular institution were noted to better understand the differences between institutions' CAPs and planning processes. In particular, if an interviewee cited a unique factor that was either the key to the success of their CAP or a barrier to the success of their CAP, this response was noted. If an interviewee had specific, unique advice for other institutions developing or updating their CAP, specifics about unique processes they were using to improve their CAP, or innovative ideas for what they would have done differently if they were to rewrite their CAP, these responses were noted as well. This information helped to highlight the intricacies related to CAP planning and implementation in higher education institutions, and provided information about how institutions can better approach CAP planning and implementation in the future.

Results and Observations

This section details the results of the CAP attribute analysis and the results of the conducted interviews. It starts by summarizing the basic trends found in the CAP attribute analysis, then details the statistical tests and correlations between different CAP variables. Finally it describes the responses institutions gave to interview questions.

Climate Action Plan Attribute Analysis

General plan information and outside factor analysis provided background information about the institutions included in this study and their CAPs. Four of the 30 institutions included in this study were located in cities, 13 were in rural locations, 12 were in suburban locations, and only one was located in an urban location. Nineteen out of the 30 schools were located in coastal states. CAPs were, on average, 43 pages long, but when an outlier of 514 pages long was removed, CAPs were, on average, 27 pages long. The shortest plan was five pages and the longest was 514 pages. The CAPs were written between 2009 and 2019, and contain carbon neutrality goals ranging from 2015 to 2060. Twelve of the 30 plans were updates to original plans, while the other 18 plans were the original CAPs the institutions had created. This data can be found in Appendix C.

Total scores for CAP attributes from different institutions ranged from 3 to 41 (out of 53; Figure 2). On average, institutions scored 23. Total mitigation scores ranged from 0 to 14 (out of 18) with an average of 8. Total strategies scores ranged from 0 to 21 (out of 24) with an average of 13. Average scores across institutions for various plan attributes are in Appendix C. Mitigation strategies were, on average, a 1.3, which equates to a 1 on the 0-3 scale, indicating mitigation strategies were, on average, either mentioned or partially explained, but not fully explained. However, it is important to note that there might be different climate action initiatives or more detailed initiatives outside of an institution's CAP that are not reflected in these numbers. Therefore, these total scores numbers do not necessarily reflect the complete array of climate action initiatives, or indicate the success of an institution's climate action initiatives.

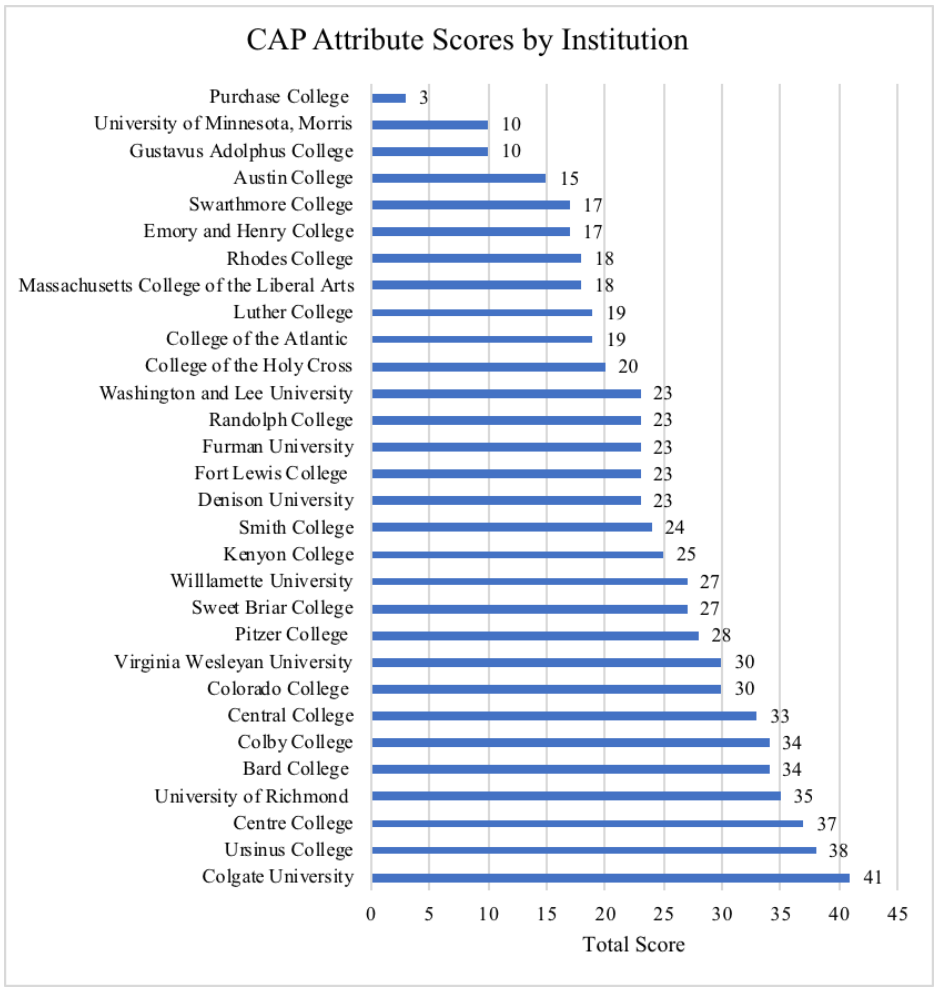

Figure 2: The total composite score of each institutions' CAP. Scores range from three to 41 out of a total of 53.

Statistical Tests

Different CAP attributes were tested with three variables: total score, total mitigation score, and total strategies score. However, correlations between CAP attributes and these three variables are not reported in this study, but rather the most applicable correlation(s) is reported.

Climate Action Total Score

We found that the length of a CAP was significantly positively correlated to the total composite score of the plan ($p= 0.016$, $r= 0.445$; Figure 3). This means that, for longer CAP documents, total composite scores increased.

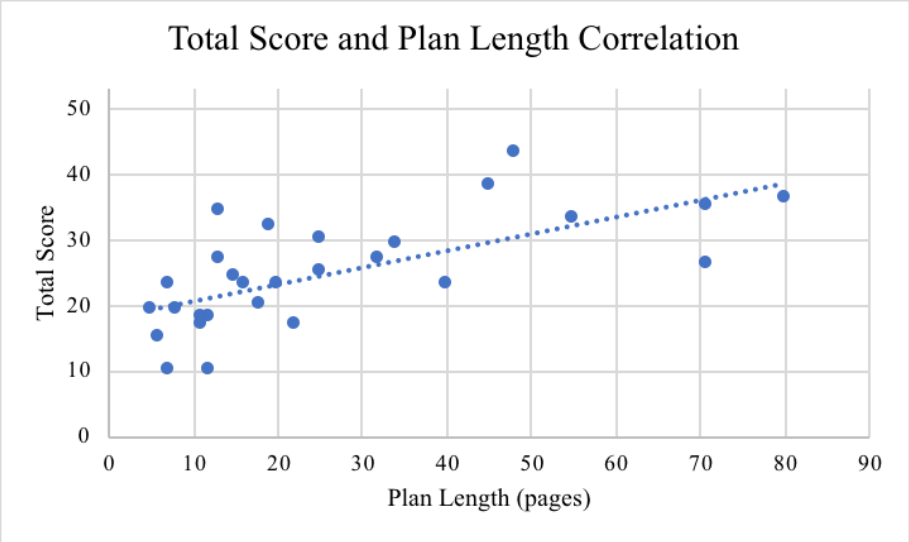

Figure 3: The correlation between the length of an institutions' CAP and the total composite score that CAP received. There was a significant, positive correlation between the two variables (p= 0.016, r= 0.445). Note: for this graph, the outlier of a 514 page CAP was removed.

Whether or not a plan was an update was not was significantly correlated to the total score, indicating that the detail of a CAP was not significantly changed when it was updated (p= 0.521, r= 0.197).

The length of time an institution took to write its CAP was not significantly correlated to the total score it received for it's CAP (p= 0.571, r= 0.123). We also found that endowment size was not significantly correlated to the total score (p= 0.244, r= 0.224). Similarly, the year a CAP was created was not significantly correlated to the total score (p= 0.254, r= 0.215), indicating that the detail of a CAP was not significantly impacted by the year it was created.

Climate Action Strategies

The depth of detail in the planning process was significantly positively correlated to the detail of total strategies in the plan (p= 0.043, r= 0.371; Figure 4). If planning processes were more detailed in CAPs, total strategies scores were generally greater.

Figure 4: The correlation between the depth of detail about an institutions' CAP planning process and the total strategies score that institution received. There was a significant, positive correlation (p= 0.043, r= 0.371).

The detail of financing in the plan was significantly positively correlated to the detail of total strategies in the plan (p= 0.004, r= 0.605; Figure 5). If financing strategies were more detailed, total strategies scores were generally greater.

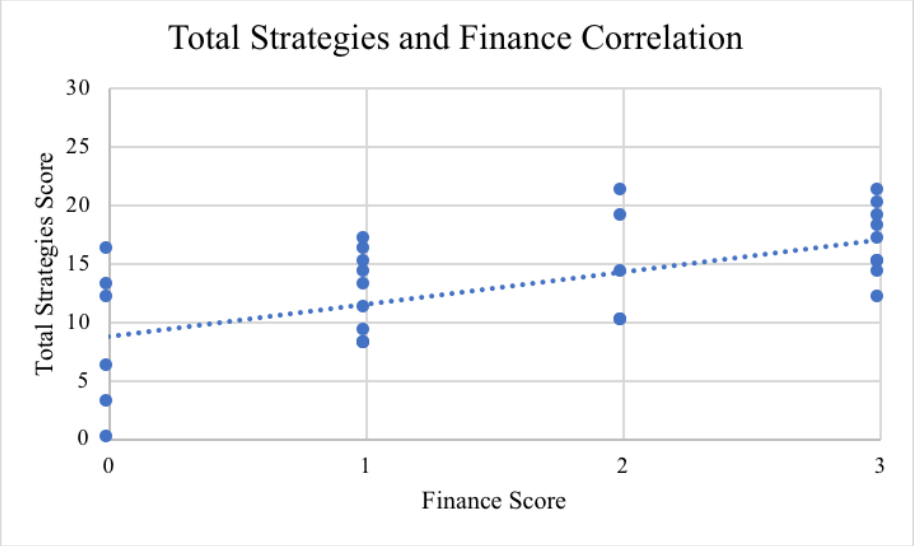

Figure 5: The correlation between how detailed an institutions' financing is and the total strategies score of each institution. There was a significant, positive correlation between financing and total strategies (p= 0.0004, r= 0.605).

However, there was no statistically significant correlation between an institution's location in a coastal state and a higher total strategies score (p= 0.746, r= -0.062).

Climate Action Mitigation Strategies

Whether a plan included a climate change primer was significantly positively correlated to the detail of mitigation strategies in the plan (p= 0.002, r= 0.548). If a plan included a general explanation of climate change, the mitigation strategies score was likely greater.

The presence and detail of an emissions forecast in a CAP was significantly correlated to the total mitigation strategies in the plan (p= 0.012, r= 0.453; Figure 6). If an emissions forecast was present and detailed, the total mitigation score was generally greater.

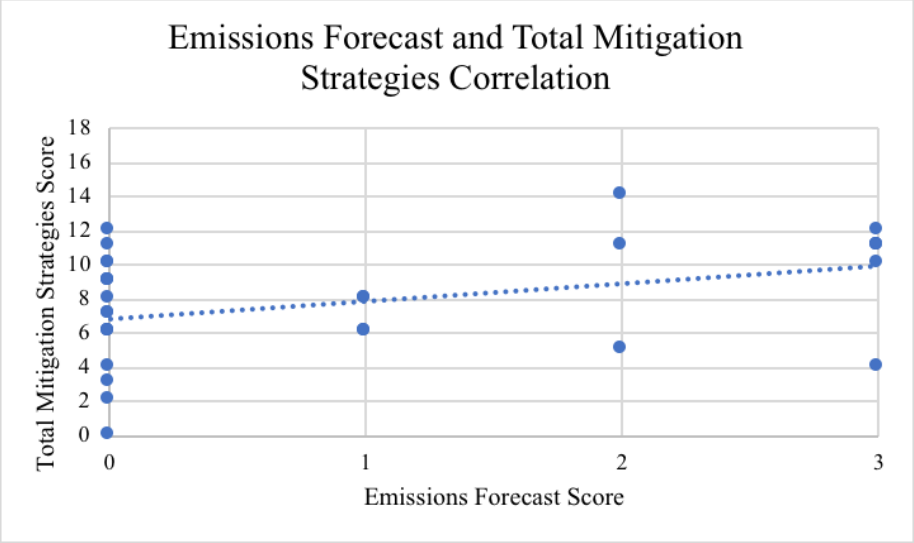

Figure 6: The correlation between the score an institution received for their emissions forecast and the score they received for their total mitigation strategies. There was a significant, positive correlation between the variables (p= 0.012, r= 0.453).

An institution's carbon neutrality date was not significantly correlated to the total mitigation score for their CAP (p= 0.459, r= 0.159), indicating that a school was not likely to increase the detail of their mitigation strategies even if they were closer to their carbon neutrality date.

Adaptation Strategies and Regional Climate Change Impacts

Whether a plan was an updated CAP was significantly positively correlated to the presence of adaptation factors in the plan (p= 0.002, r= 0.548). If a plan was an updated CAP, it was more likely to address adaptation or resilience. This relationship was true for the presence of adaptation factors and plans that were written more recently as well (p= 0.002, r= 0.541). However, there was not a significant correlation between whether or not a plan was an updated CAP and if the plan mentioned regional climate change impacts (p= 0.307, r= 0.193).

There was no significant correlation between institutions located in a coastal state and mentioning adaptation strategies (p= 0.087, r= 0.318). Similarly, there was not a significant correlation between whether an institution was located in a coastal state and if their CAP addressed predicted regional climate change impacts (p= 0.626, r= 0.093).

An institution's choice to mention regional climate change impacts and their community outreach score were not significantly correlated, indicating that predicted, regional climate change impacts did not generally impact institutions' decisions to detail community outreach projects within their CAPs ($p= 0.281$, $r= 0.202$).

Neutrality Date

An institution's carbon neutrality date and the year their climate action plan was created were not significantly correlated ($p= 0.706$, $r= 0.081$).

Financing

Endowment size was not significantly correlated to whether financing was mentioned in the plan ($p= 0.225$, $r= 0.232$).

Interview Analysis

Interviews were conducted to expand upon the quantitative analysis of CAP attributes. This section describes interview question responses, breaking down the questions into the following categories: *The CAP Creation Process*, which includes questions related to the initial development of an institution's CAP, *Implementing the CAP,* which includes questions related to the functionality and implementation of the CAP in the present, and *Future Climate Action Planning*, which includes questions related to the future of CAPs in higher education.

Interviews were conducted with 24 out of the 30 institutions included in this study (Appendix A). Two institutions did not respond, and four institutions responded but declined to participate. Institutions responded to the majority of questions, but some institutions did not know answers to specific questions and so they were not included in analyses of those questions. The list of interview questions can be found in Appendix B. Tables with information detailing which institutions had which responses can be found in Appendix E.

Climate Action Plan Creation Process

This section details the processes institutions went through to initially develop their CAP. It focuses on motivation for CAP development, timing, who was involved, what worked well, and what was a barrier to CAP creation.

Actor who started the CAP creation process

When institutions were asked who started the push for a CAP at their institution, responses included faculty, the president, students, their version of a sustainability office, or a combination of these groups (Figure 7; Appendix E, Table 3). Twenty-three institutions responded. Eight institutions said the president started the push for a CAP, six institutions said students started it, five said a combination of the groups started it, three said the sustainability office started it, and one said the faculty started it.

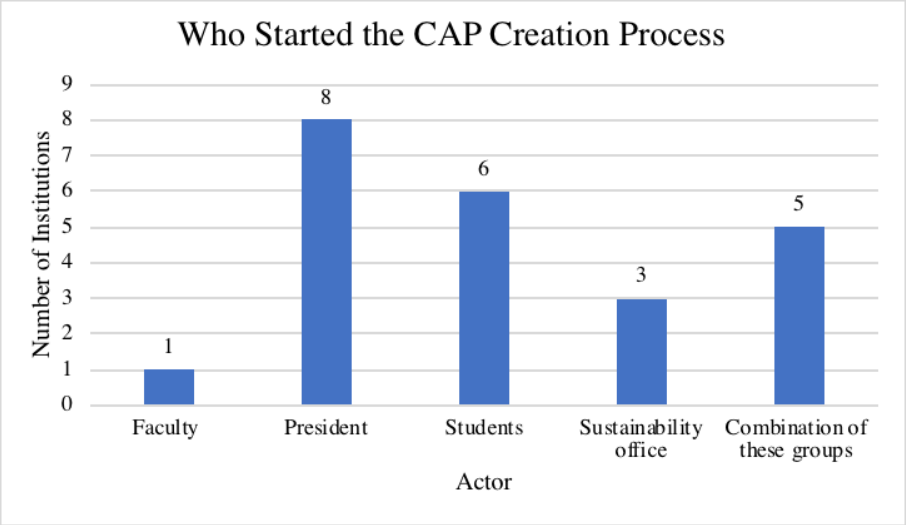

Figure 7: Institutions' responses about who started the push for a CAP at their institution. A total of 23 institutions responded.

Reason for signing onto the ACUPCC and creating a CAP

When asked why they signed onto the ACUPCC and created a CAP, 17 institutions responded, and some institutions cited more than one of these answers (Figure 8; Appendix E, Table 4). Eleven institutions responded that someone at the institution or the institution itself was committed to sustainability and it was the logical next step, five institutions responded that it was necessary to fight climate change, three responded that it aligned with the values of the institution, and two responded that it was the trend at the time. Furthermore, 13 institutions cited that the ACUPCC held them accountable throughout the process of developing, updating, or implementing their CAP.

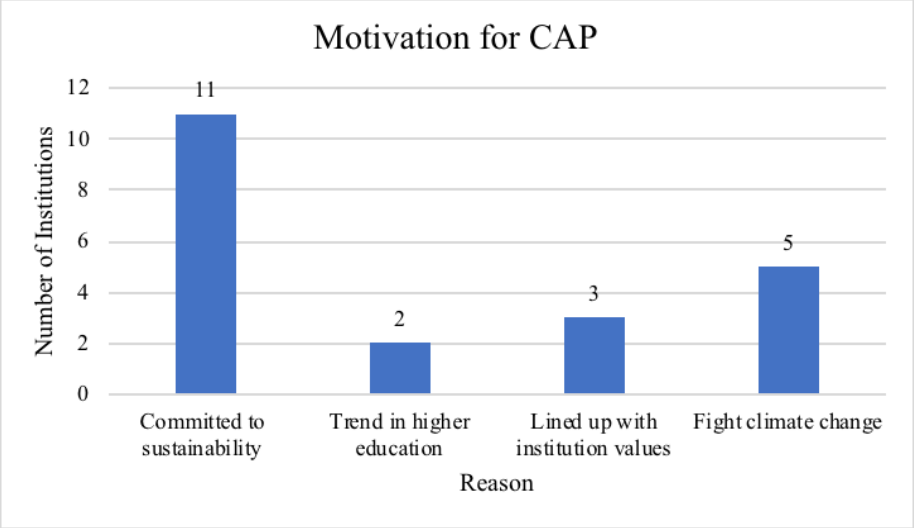

Figure 8: Institutions' reasons for signing onto the ACUPCC and developing a CAP. Seventeen institutions responded, and some gave more than one answer.

Length of time to create a CAP

When asked how long it took to develop a CAP, 23 institutions responded, and their responses varied greatly (Figure 9; Appendix E, Table 5). The responses ranged from one day and one person writing the CAP, up to several years with multiple groups working to develop the CAP. More specifically, four institutions said it took between zero and six months to develop their CAP, eight institutions said it took more than six months and up to a year, nine institutions said it took more than a year and up to two years, and two institutions said it took more than two years.

Two institutions in the "more than six months up to a year" time period said they felt the process was too short, and two institutions in the "more than one year and up to two years" time period said they felt the process was too long. Twelve institutions from across all the time slots felt that their time frame was about the right length of time for their institutions' CAP creation process. Eight institutions were unsure and did not say whether the timeline felt like it was too short, too long, or just right.

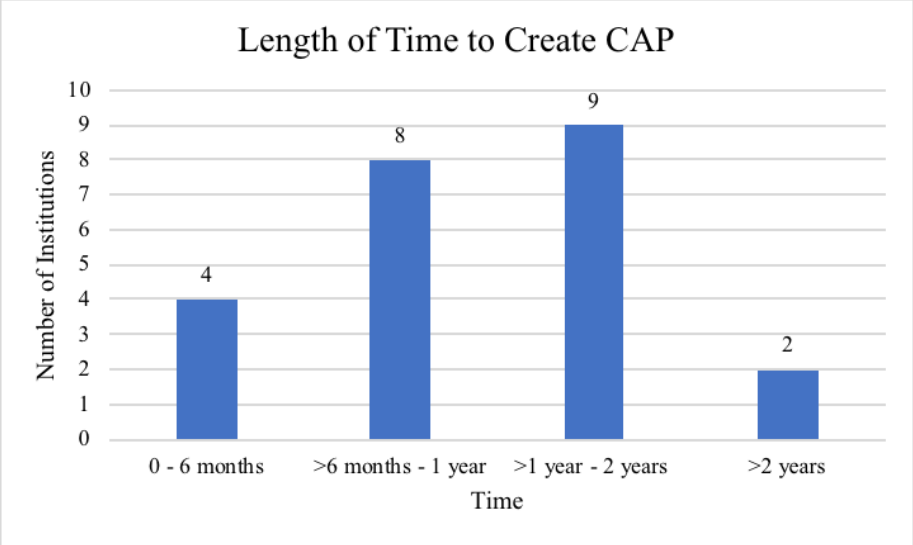

Figure 9: The length of time it took institutions to develop their original CAP. Twenty-three institutions responded to this interview question.

Administration and student support

Institutions were also asked whether it was difficult to gain administrative or student support for their CAP. In general, administrative support was not difficult to gain, and 18 out of the 24 institutions said they had administrative support for plan development (Figure 10; Appendix E, Table 6). However, four institutions said that, while their administration was supportive in theory, depending on finances, the administration would not support every goal within their CAP in practice. Additionally, some institutions stated that they had support from the administration that originally signed onto the ACUPCC, but that consecutive administrations did not always provide the same degree of support. Of the institutions that said it was difficult to obtain administrative support, finances and/or the prioritization of other projects seemed to be the main factors preventing administrations from supporting CAPs.

Some institutions expanded on what helped them gain administration support. The College of the Atlantic stated that by involving supportive alumni, they helped to show the administration that climate action was important and helped garner administrative support (Interview with College of the Atlantic 2020). Kenyon College said that the way students proposed their CAP to the President and administration was particularly effective in gaining administrative support. Students used a well-thought-out class project that they presented to the President in a logical and formal manner. The administration respected the time and effort of the students, which increased their support and accelerated the CAP creation process (Interview with Kenyon College 2020).

Similar to administrative support, student support was, in general, not difficult to gain for many institutions. Sixteen out of the 23 institutions that responded said they had student support, and four other institutions said they had some support, but not from the whole student body (Figure 10; Appendix E, Table 7). Furthermore, the four institutions who responded "yes" but did not have support from the whole student body said that either students are supportive in theory but not willing to change their behaviors in the name of sustainability, or that only a few students or a specific student group are supportive. When asked about the implications of having or not having student support, Washington and Lee University, who had trouble gaining student support, said that this resulted in the original CAP not containing many initiatives that involved student engagement or education (Interview with Washington and Lee University 2020).

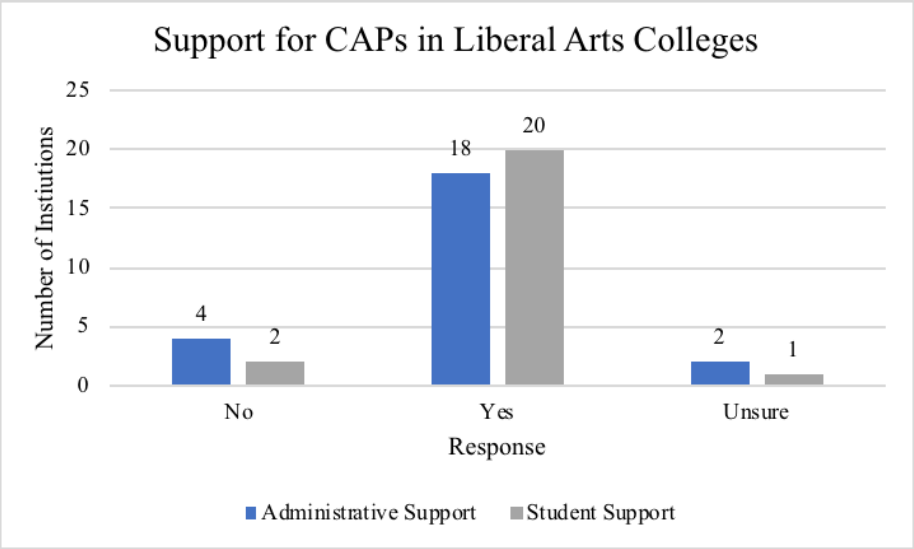

Figure 10: The number of institutions that had student or administrative support for the development of a CAP. Student support includes any support, so whether the whole student body was supportive or if an institution mentioned support from particular student groups on campus. All 24 institutions responded about administrative support, and 23 institutions responded about student support.

Actors involved in CAP creation

Generally, institutions responded that some sort of a combination of either faculty, staff, students, administration, sustainability offices, or individuals in facilities worked together to write their institution's CAP. Twenty-one out of the 24 institutions responded with this answer. Further, a committee or working group was often formed from these different stakeholders to

create the CAP, but sometimes a formal group was not created. Colgate University, College of the Atlantic, Denison University, Smith College, and the University of Richmond said that these stakeholders were broken down into various subcommittees charged with working on specific aspects of the CAP, instead of one general committee working on the entire CAP (Interview with Colgate University 2020; Interview with College of the Atlantic 2020; Interview with Denison University 2020; Interview with Smith College 2020; Interview with University of Richmond 2020).

Some institutions gave more specific answers or had more individuals involved in the CAP creation process than just stakeholders within the campus community. Randolph College was one of the 21 institutions that mentioned a large group of stakeholders, but they also emphasized that student research was the foundation of their CAP (Interview with Randolph College 2020). Central College, College of the Holy Cross, and Smith College said they also hired an outside consultant to assist the group of campus stakeholders (Interview with Central College 2020; Interview with College of the Holy Cross 2020; Interview with Smith College 2020). Colorado College said, in addition to campus community members, they also consulted with outside experts in different fields (Interview with Colorado College 2020). However, in general, local community members were not included in institutions' CAP planning processes.

What worked well during the planning process

When institutions were asked what worked well during the CAP planning process, or if anything expedited plan creation, they mentioned a variety of factors. Nineteen institutions responded, and some institutions mentioned more than one factor (Figure 11; Appendix E, Table 8). Factors mentioned by more than one institution included 12 institutions saying broad stakeholder involvement and collaboration was helpful, five institutions saying support from the administration was helpful, four institutions saying having a consultant or point person to act as a leader was helpful, two institutions saying creating specialized subcommittees to write different parts of the CAP was helpful, and two institutions saying a small group spearheading the process was helpful. Other answers, mentioned by one institution each, included linking the CAP to the college's values and goals, and starting with easier projects and initiatives to garner support from the campus community.

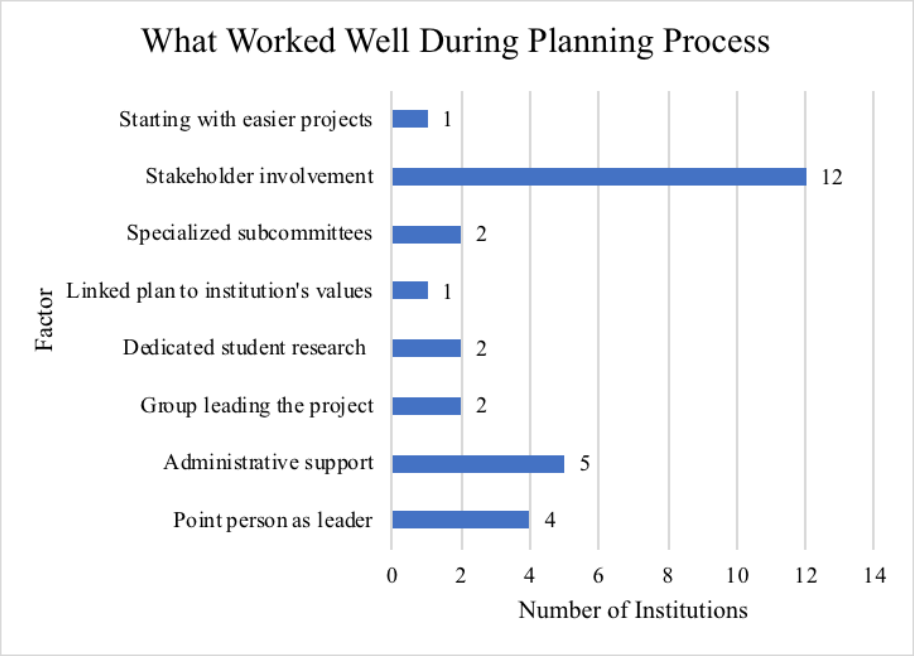

Figure 11: Institutions' responses about what worked well during the CAP planning process, or what expedited plan creation. Nineteen institutions responded, some with multiple answers.

Barriers faced during the planning process

When institutions were asked what barriers they faced during plan creation, there were a variety of responses from 20 institutions, and multiple institutions gave more than one answer (Figure 12; Appendix E, Table 9). The factors mentioned by more than one institution included 11 institutions saying they struggled to figure out how to finance projects, three institutions saying they struggled prioritizing the CAP over other tasks, three institutions saying there were worried about the feasibility of projects and committing to initiatives they might not have been able to execute, two institutions saying they struggled not having a sustainability chair or point person, two institutions saying they struggled with estimating and accessing necessary resources to write the CAP, two institutions saying they struggled to work with the local community, two institutions saying they struggled with developing their emissions inventory and forecast, and two institutions saying the plan creation process was not where barriers came up but rather with plan implementation. Two other institutions said they faced no barriers. One institution noted that a lack of long-term consistency in stakeholders involved in the process was a challenge.

Some institutions expanded on the barriers they faced by explaining how they overcame those barriers. The University of Richmond defused worries about project feasibility by stating that they could adjust climate action goals in the future (Interview with University of Richmond 2020). Randolph College said, due to a lack of a financial source, that, initially, their CAP would not have been approved by the Board of Trustees as an official document or plan. To overcome this barrier, they had the Board of Trustees approve the CAP as a proposal so they did not have to commit specific price tags. This strategy ensured that their college still had a plan to work from and preserved their ability to search and apply for funding in the future (Interview with Randolph College 2020). Colorado College overcame their need for a financial source by working with experts to figure out what was the best option and developing local community

partnerships and working with them on initiatives (Interview with Colorado College 2020). Luther College overcame the issue of trying to get financing for their CAP by using cost-benefit and other economic analyses to demonstrate cost savings and payback in the long-term (Interview with Luther College 2020). Kenyon College overcame competing priorities that prevented the administration from giving the CAP the time it needed. Motivated stakeholders did this by showing the administration that CAPs and climate action are important and relevant to the student body (Interview with Kenyon College 2020). More specifically, they made noise and worked with student advocacy groups to draw attention to student opinion and perspective.

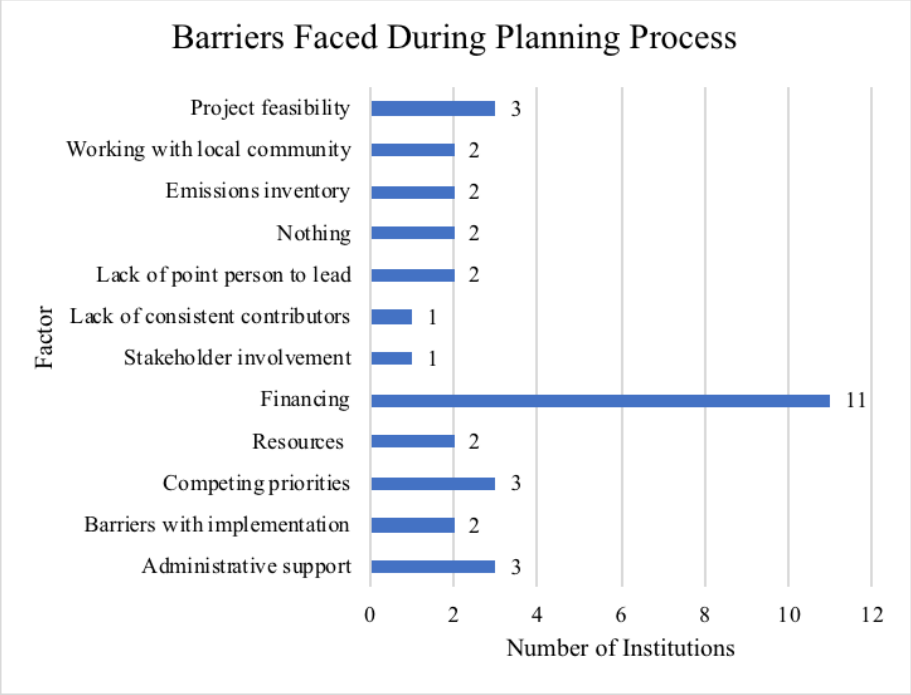

Figure 12: Institutions' responses about the barriers they faced during plan creation. Twenty institutions responded, and some gave more than one answer.

Implementing Climate Action Plans

This section details interview responses to questions about the functionality and implementation of each individual institution's CAP in the present. It focuses on funding sources, what is working well, what could be improved, and unique CAP aspects.

Financing the CAP

When institutions were asked how their CAP was financially supported, institutions had an array of answers, and some had more than one method of supporting their CAP (Figure 13; Appendix E, Table 10). Twelve out of the 23 respondents said funding comes from their endowment or operational budget, nine said from outside donors or grants for particular projects, six said they have some sort of green revolving fund, five said they had funding from donors or grants that is set aside for specific projects but their CAP as a whole is not financially supported, two said they have a dedicated sustainability fund, and two said they have a student sustainability fund/fee. One institution said they did not have a dedicated system for funding their CAP. Five

institutions said funding availability limited what they included in their CAP and what they are able to implement, one institution said finances did not affect what they included in their CAP or what they are able to implement, and two institutions said their financial situation expanded what they were able to include in their CAP and what they are able to implement. When institutions that receive funding from outside donors were asked if donors had any say in what their money was used for, three institutions said donors had general requests about the area their money funded -- requesting student education and student-led sustainability initiatives -- but that donors generally let the institutions use the money for what they thought would be the most beneficial.

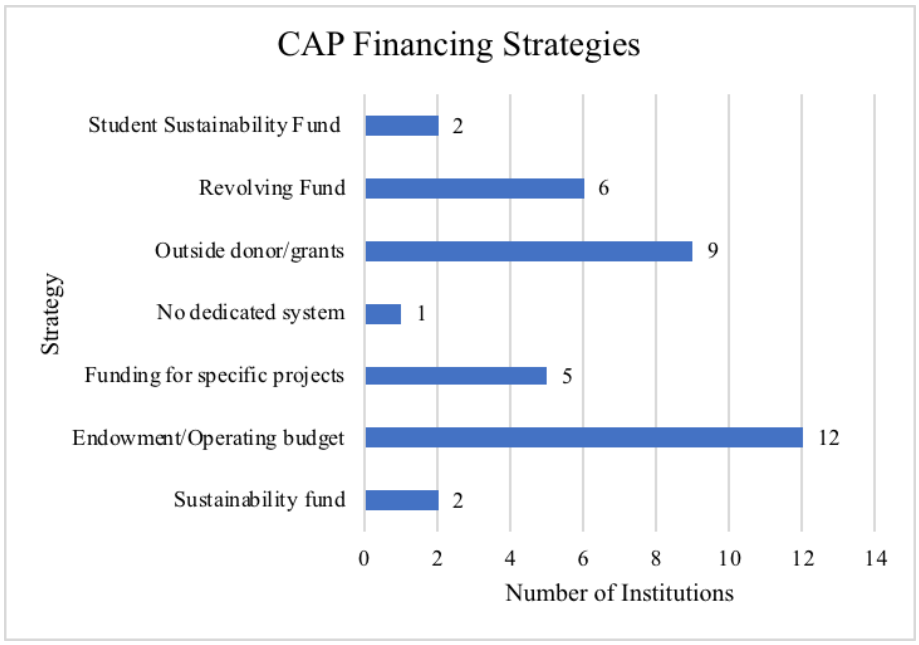

Figure 13: Institutions' responses about how they finance their CAP and the projects detailed in their CAP. Some institutions gave more than one strategy. Twenty-three institutions responded to this question.

Aspects of CAP and implementation that are working well

Institutions were also asked about what aspects of their CAP and CAP implementation are working well. Twenty-three institutions responded with a wide array of answers (Figure 14; Appendix E, Table 11). Eight institutions cited broad stakeholder involvement, four institutions cited the educational aspects of their CAPs, and three institutions each cited administration support, having specific reductions goals and timelines to increase accountability and student involvement.

Less common answers about what aspects of institutions' CAPs are working well included two institutions each citing working with individuals who implement the plan during the planning process, energy efficiency, flexibility of their CAPs, integrating their CAPs with other plans, integrating their CAPs with their institutions' values, and providing details for specific projects to make implementation easier. Similarly, one institution cited the importance of attending conferences that provide information about climate action, one cited the creation of a sustainability office, one cited their funding strategy, one cited hiring a consultant as a point person for the project, one cited their land management strategies, one cited their local community involvement, one cited their renewable energy strategies, one cited setting their

future goals as overarching policies instead of detailing specific projects, one cited their approach to resilience and adaptation, one cited technical upgrades being written into their plan, and one cited their waste strategies.

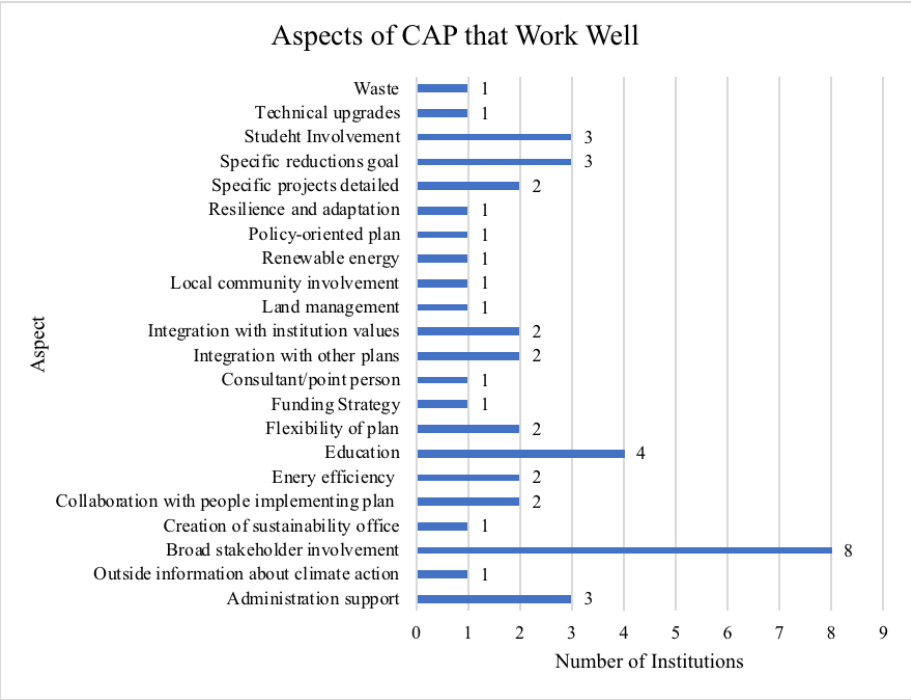

Figure 14: Institutions' responses about what aspects of their CAP are currently working well. Twenty-three institutions responded, and some institutions gave more than one answer.

Aspects of CAP and CAP implementation that need improvement

Institutions were also asked about what aspects of their CAPs were not working or needed improvement. Twenty-one institutions responded (Figure 15; Appendix E, Table 12). Five institutions said that funding strategies, the revision and update process, and transportation processes need to be improved. Three institutions said that administration support, campus community involvement, the clarity of their timelines, education, and plan specificity and detail needed to be improved. Two institutions said that energy efficiency, everything about their CAP, resilience and adaptation, and stakeholder involvement needed to be improved. One institution said they needed to be more ambitious with their goals, one needed to include economic analyses in their plan, one needed more staff to get tasks done, one needed to improve land management strategies, one needed to improve strategies that address indirect (Scope 3) emissions, one needed to involve the local community more, one needed to better organize their planning process, and one needed to set short-term, attainable goals.

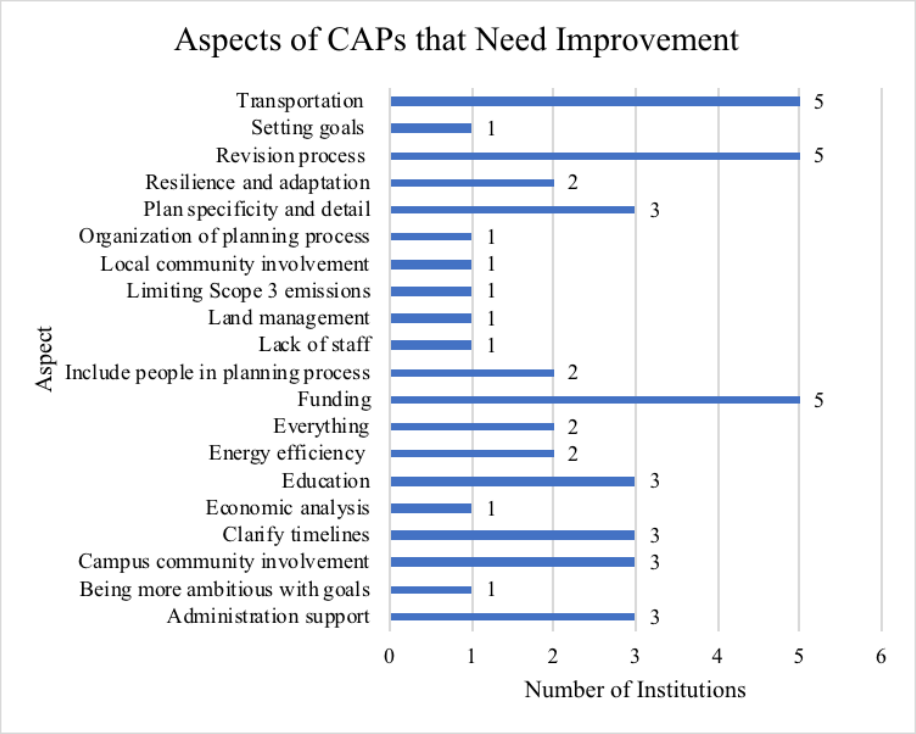

Figure 15: Institutions' responses about what aspects of their CAPs need improvement. Twenty-one institutions responded, and some gave more than one answer.

Unique or innovative CAP aspects

When institutions were asked whether there were any unique or innovative aspects of their CAPs or their planning processes, 16 out of 24 institutions believed there was something unusual or unique about their CAP or CAP planning process (Figure 16). Some institutions identified similar aspects as being unique to their institution, but in general, the aspects institutions identified were not the same as the aspects other institutions identified. These unique attributes are detailed thematically in the following sections, emphasizing why these attributes were or are beneficial, and thus why they could be useful for other institutions to consider.

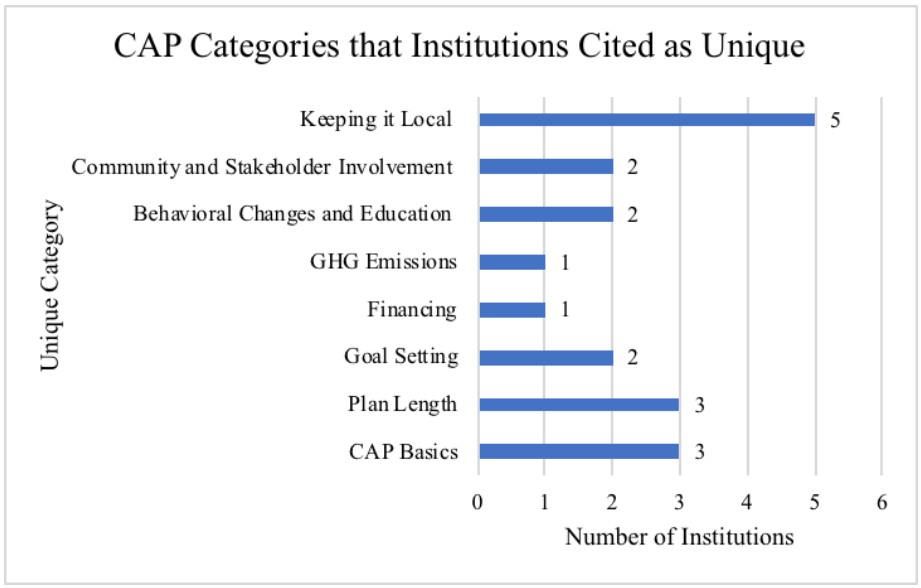

Figure 16: Institutions' categorized responses about what they consider to be unique or innovative about their CAP or CAP implementation. Sixteen out of the 24 institutions believed there was something unique about their CAP. Some institutions gave more than one answer.

CAP Basics. Washington and Lee University treat their plan as a living and working document. This allows them to make changes to their plan as new technologies arise and climate goals are completed. It allows them to work on programs and policies that are the best fit for the time, and makes the plan more accessible and easier to use and implement (Interview with Washington and Lee University 2019). Colorado College also made their plan a living document to make it easier to use and implement (Interview with Colorado College 2020).

Randolph College is in the process of integrating their CAP with their sustainability plan, resilience plan, and academic strategic plan. They want the values and goals of different plans to be aligned. They anticipate this will make CAP goals easier to implement as they can garner more support from people with different values and interests and reach people throughout the campus community. It will also allow their goals, and therefore actions, to address more than one issue at a time (Interview with Randolph College 2020).

CAP Length. Luther College's plan is intentionally short, only eight pages, because they believed this would make the plan accessible and more likely to be read and understood by everyone. By creating a shorter plan, they hoped to raise awareness of what the college's plan was in regard to climate action, and to involve more people. However, Luther College did not sacrifice detail; while their public CAP is short, their sustainability office works on climate action initiatives through internal documents that contain more detail (Interview with Luther College 2020).

In comparison to Luther's short plan, at 514 pages, Ursinus College's plan is longer than most CAPs. Ursinus College thinks that having a longer plan is an effective and valuable strategy because it allows for greater specificity within their climate initiatives. The CAP contains sections that are directed at specific departments and individuals, allowing individuals to reference the section of the CAP that pertains to their department. Ursinus College believes that

this will make departments more likely to read their part of the CAP and take initiative on climate action. Further, this breakdown by department makes it clearer who is responsible for what actions and the goals of each department, making implementation easier (Interview with Ursinus College 2020).

Virginia Wesleyan University also organized their CAP by department rather than by emissions source because they also believed it would make implementation easier. However, their plan is 19 pages long, which is short in comparison to Ursinus College's 514 page CAP, and is not broken down into as many sections as Ursinus College's CAP (Interview with Virginia Wesleyan University 2020).

Goal Setting. Colby College highlighted the fact that, while most institutions' carbon neutrality dates are decades or years in the future, they gave themselves a five-year timeline to reach carbon neutrality. They made their 2015 goal, saying their big goals and administrative support were helpful in working under a time crunch. Furthermore, involving people from the beginning who were not interested in climate action but were invested in the budget allowed them to work quickly. Additionally, setting a short-term neutrality date also helped motivate them to take action and push themselves to make changes, instead of waiting until later in the future. Setting short-term goals in any capacity could be helpful for other institutions because it would apply pressure to ensure projects actually get implemented. To ensure projects are implemented Colby College believes other institutions should involve individuals in charge of the budget even if they are not invested in climate action (Interview with Colby College 2020).

Colorado College also mentioned that they have reached carbon neutrality. They said that their 2020 goal is unique in that it is much sooner than many other institutions' neutrality goals, and in that they took big steps to meet the goal and stay on track (Interview with Colorado College 2020).

Financing. Fort Lewis College highlighted the fact that, although their budget is small, they are ambitious in their goals. This outlook allows them to make progress on their goals because they are motivated to search for funding sources for their projects. Fort Lewis College believes this strategy could be valuable for other institutions working under financial constraints (Interview with Fort Lewis College 2020).

GHG Emissions Considerations. Colgate University said that, unlike many institutions, they keep track of the carbon their property and trees sequester. This allows them to calculate how much of their emissions they are offsetting on their campus, giving them a more accurate picture of their emissions footprint. It also motivates them to maintain their grounds and keep their trees healthy (Interview with Colgate University 2020).

Behavioral Changes and Education. Willamette University wants to change student and faculty behaviors and lifestyles rather than just focusing on carbon neutrality. This way, after students and the campus community leave the college, they take those new habits with them. Furthermore, Scope 3 emissions should include student personal consumption and travel because they are part of the campus community. Since those factors are not included in GHG emissions inventories, those emissions are not being considered when an institution works towards carbon

neutrality. Therefore, lifestyle changes are important to truly minimize carbon footprints as much as possible, and Willamette University is focusing on this aspect on top of carbon neutrality, which is different than most institutions that are focused on carbon neutrality. However, they suggested that other institutions should be emphasizing behavioral and lifestyle changes more (Interview with Willamette University 2020).

Ursinus College focuses on behavioral changes in a different way. They have a green certification program that campus community members can go through to learn about behavioral and lifestyle changes to help reduce their individual footprint. This strategy is often overlooked in CAPs that generally focus on institutional-wide programs and policies (Interview with Ursinus College 2020).

Community and Stakeholder Involvement. The University of Richmond believes the ownership different departments took throughout their CAP planning process was unique. Different departments set their own goals and developed their own initiatives to work towards. Other CAPs planning committees often prescribed goals for departments, meaning that departments had less autonomy in the process. University of Richmond's strategy allowed different departments and groups to be more invested in the climate action goals they made (Interview with University of Richmond 2020).

At Centre College, students and faculty made a lot of progress by working together effectively even without a sustainability department, overwhelming administration support, or financial support. For example, students voted to tax themselves with a green fee, meaning they chose to create a fund for sustainability and climate action that is maintained with a small fee they each pay every semester. Centre College believes that, while they hope to hire a sustainability director in the next year, their successes demonstrate that with the right group of passionate and dedicated people, positive change can be made even without the resources and support that are commonly seen as necessary for success (Interview with Centre College 2020).

Keeping it Local. Smith College emphasizes local community outreach and collaboration in their CAP. They believe that student and college community involvement in the local community is valuable in that it allows for bigger strides in terms of carbon footprint reductions. It also gives students valuable work experience and connections and makes addressing challenges easier because they have more resources (Interview with Smith College 2020).

Luther College explained that while many institutions are discussing ways to offset the remaining emissions the institution has, either through RECs or carbon offsets, Luther College is already purchasing local RECs. Instead of looking regionally, nationally, or internationally, they looked locally and now are purchasing RECs from a wind turbine an hour away. They believe that using this locality is important in forming connections with the community, supporting the local area, and for accountability (Interview with Luther College 2020). Other institutions are currently discussing local projects, but the definition of local is unclear, and not all institutions are looking towards local options specifically.

The College of the Atlantic also highlighted the importance of locality. They committed to using some of their funding to invest in local, renewable energy projects because fossil fuel usage is a big issue. While investing locally is important for a plethora of reasons, they

emphasized the value of student involvement and education that can occur with local projects (Interview with College of the Atlantic 2020).

Kenyon College echoed this sentiment, arguing that all institutions are in the "same battle" but the difference is that different institutions have different approaches. They said their approach is different from other institutions because of their location. Since they are located in a rural area, they can focus on local carbon offsets in ways urban or city schools may not be able to. Consequently, they can see and personally measure the carbon offsets they are using. This focus on rural carbon offsets increases accountability, makes verifying offsets easier, and helps strengthen community relationships. Furthermore, similar to the College of the Atlantic, Kenyon College said that having carbon offsets close to the college can serve as an educational experience for students as well (Interview with Kenyon College 2020).

Central College is also located in a rural area and emphasized the importance and benefits of local projects more specifically. They discovered that their local landfill is below the EPA threshold requiring methane emission regulations, and so they worked with the landfill to capture the methane emissions and use them for energy. They created a solar-powered flare that combusts the methane and uses it for electricity, reducing emissions. This strategy benefits both Central College and the local community, and Central College thinks it is likely there are other institutions in rural locations that may be able to institute a similar project with their small, local landfills (Interview with Central College 2020).

Future Climate Action Planning

This section describes interview responses to questions about the future of each individual institution's CAP and about the future of CAPs in higher education. It focuses on whether or not institutions are on track to meet their carbon neutrality goals and advice for other institutions developing or updating their CAPs.

Goal tracking

Institutions were asked if they were on track to reach their interim and final carbon neutrality goals. Twenty-one institutions responded (Figure 17; Appendix E, Table 13). Nine institutions said they were on track, nine said they were not on track, and three were unsure.

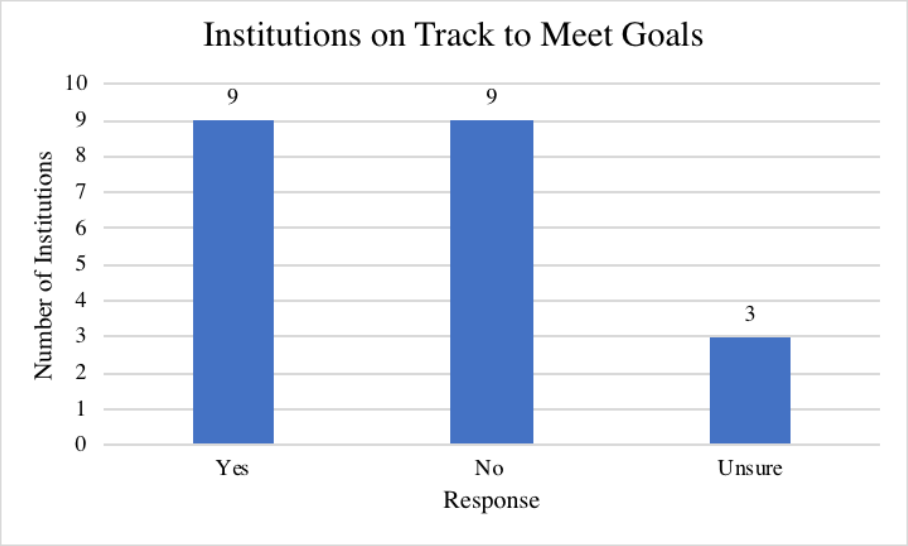

Figure 17: Institutions' responses to whether or not they are on track to meet their interim or final carbon neutrality goals. Twenty-one institutions responded. Some of the institutions that responded "no," said they were trending in the right direction.

Advice to other institutions

To conclude the interviews, institutions were asked if they had any advice for other institutions developing or updating their CAPs. All 24 institutions responded with advice, which generally stemmed from first-hand experience and their answers to the other interview questions discussed above (Figure 18). In particular, institutions referenced responses to the questions about what worked well for them, what barriers they faced, what needed to be improved, and what was unique about their CAP. This section is organized thematically.

Figure 18: Institutions' responses about what advice they have for other institutions updating or creating their CAP. All 24 institutions responded with advice, and some institutions had more than one piece of advice.

The Importance of a Sustainability Leader or Point Person and Community Involvement.

Willamette University recommended that institutions without a formal sustainability office or sustainability director should attempt to create a similar position because it makes it easier to create and implement a CAP. When a specific person or office is in charge of the CAP it is easier to implement projects and make changes to the CAP. They can ensure tasks get done and are prioritized (Interview with Willamette University 2020).

Washington and Lee University gave similar advice, and stated that having someone who is clearly in charge of both the planning and implementation processes is important to continue making progress on CAP goals. They clarified, however, that a point person should not function as a replacement for broad community involvement, which is still key (Interview with Washington and Lee University 2020).

Bard College, Central College, Centre College, Colby College, Fort Lewis College, Gustavus Adolphus College, Kenyon College, Massachusetts College of Liberal Arts, Swarthmore College, University of Richmond, and Virginia Wesleyan University emphasized this later point and reminded institutions that to be the most effective, involving as many people as possible in the CAP planning process is critical (Interview with Bard College 2019; Interview with Central College 2020; Interview with Centre College 2020; Interview with Colby College 2020; Interview with Fort Lewis College 2020; Interview with Gustavus Adolphus College 2020; Interview with Kenyon College 2020; Interview with Massachusetts College of Liberal Arts 2020; Interview with Swarthmore College 2020; Interview with University of Richmond 2020; Interview with Virginia Wesleyan University 2020).

Denison University agreed that broad stakeholder involvement is important when creating a CAP. They suggested dividing up stakeholders into working groups to address particular aspects of an institution's CAP. That way, individuals can focus on areas they are interested in or have expertise in, likely increasing their involvement. This distribution of stakeholders would also be an effective time management strategy that could allow the CAP to be developed or updated more efficiently (Interview with Denison University 2020).

Colgate University echoed this sentiment, stating CAP creators should gauge the political landscape of the institution, and evaluate if different stakeholders are likely to be on the same page in regards to climate action. These observations can help to inform how a CAP should be pitched at that particular institution. If stakeholders are not on the same page, different or targeted approaches could be more effective when attempting to garner their support (Interview with Colgate University 2020).

Bard College, Colby College, Centre College, and the College of the Holy Cross emphasized the importance of getting that support, particularly of the administration, recommending institutions work early on to garner administration support specifically (Interview with Bard College 2019; Interview with Centre College 2020; Interview with Colby College 2020; Interview with College of the Holy Cross 2020).

The University of Richmond and Bard College also said that getting students involved from the beginning and pushing for climate action is an effective way to garner support for CAP creation (Interview with Bard College 2019; Interview with University of Richmond 2020). The College of the Atlantic echoed this statement, reminding institutions to involve students throughout the process because students are the priority of an institution (Interview with College of the Atlantic 2020).

Economic Modeling. Colby College suggested that, to finance projects, institutions should do cost-benefit analyses and estimate how much money they will save in the long run from a particular project. This way, they can appeal to the administration and the individuals in charge of the institution's budget in a logical way (Interview with Colby College 2020).

Accountability. Furman University suggests other institutions find ways to "earthquake proof" their plans so that institutions are still accountable for following through with plans even if support disappears or administration changes. They struggled to maintain support and action after an administration change and are trying to figure out how to protect against that (Interview with Furman University 2020).

Gustavus Adolphus College briefly mentioned this as well, suggesting getting students, faculty, and a broad group of dedicated supporters involved is a way to keep an institution accountable if administration changes (Interview with Gustavus Adolphus College 2020).

Similarly, Kenyon College said that, in order to track progress and make sure initiatives are going as planned, that constant evaluating and updating of projects and the CAP itself is essential (Interview with Kenyon College 2020). Colorado College suggested the same, suggesting institutions compile and analyze their progress every year because it is easier to collect data that way and provides a clearer picture of an institution's progress. If institutions do this, they will be more likely to be on track because they will know exactly where they are at in terms of emissions and will therefore be held more accountable for those emissions (Interview with Colorado College 2020).

Austin College expanded on this idea, saying that, generally, institutions do not face consequences if they do not adhere to their CAP. To hold institutions accountable, developing consequences if goals are not reached could be valuable. For example, Austin College is working to have the administration report on the status of the CAP and its projects, even if they are not going well. This strategy would motivate an institution to make progress because negative progress reports could damage the reputation of an institution in regards to climate action. It would also make the campus community aware of how the institution was implementing CAP goals, and in turn possibly motivate the community to get involved and take action (Interview with Austin College 2020).

Goal and Priority Setting. Washington and Lee University recommended organizing projects and tasks based on which emissions are the top priority to reduce and then secondly on how quickly a particular project will reduce those emissions. This way, goals can be identified and prioritized in a productive way (Interview with Washington and Lee University 2020).

CAP and Sustainability Plan Integration. Willamette University recommended that institutions try to integrate their sustainability plans and CAPs because it is easier to focus on one plan than on multiple, and it is easier to get administrative support once for one plan instead of multiple times for multiple plans (Interview with Willamette University 2020).

Ursinus College echoed this sentiment, saying that their integrated sustainability plan and CAP worked well for them and makes goal implementation easier. They suggested other institutions try this technique (Interview with Ursinus College 2020).

More than integrating CAPs and sustainability plans, Randolph College advocated for the idea that institutions should integrate all their plans -- including their CAPs, sustainability plans, academic strategic plans, and more -- into one master plan. This strategy was unique to Randolph College, and because it made their plans easier to manage and implement, they believe it would be helpful for other institutions (Interview with Randolph College 2020).

Integrating CAPs with Institution Values. Smith College recommended synching an institution's CAP with the broad values of the institution to garner support and ensure progress is made (Interview with Smith College 2020). Willamette University also suggested this idea, saying when plan goals align with the values of an institution, it is easier to get administration on board and gives them a reason to fund climate action projects, in turn making implementation easier. Furthermore, Willamette University recommended that, if some aspects of a CAP do not fit explicitly with the values of the institution, focusing on aspects that do fit with the values of the institution can be one way to move forwards if other projects are stalled. For example, incorporating sustainability education into curriculums to give students a better understanding of their impact and to work towards lifestyle changes can often be directly linked to an institution's emphasis on education. If an institution prioritizes education, CAP goals related to education are more likely to be worked on and are more likely to get funding and support. This was a strategy Willamette University used to make progress (Interview with Willamette University 2020).

Washington and Lee University and Randolph College also emphasized the importance of incorporating climate action into education and the institution's curriculum to keep students and faculty involved, knowledgeable, and up-to-date about CAP goals (Interview with Washington and Lee University 2020). Randolph College also mentioned that strategy and reminded institutions that integrating sustainability and CAPs into curriculums in intentional ways is also important. If done deliberately, this integration can benefit the students by providing them with valuable, hands-on experiences that can assist them in their future career search (Interview with Randolph College 2020).

Local Community Outreach. Randolph College briefly mentioned that working with the local community can increase the effectiveness of CAPs, but that an institution should be conscientious of the language it uses when working with the local community, especially if the local community is more conservative (Interview with Randolph College 2020).

Central College echoed this sentiment. They suggested that institutions should work with their local community because municipalities have different ideas, resources, expertise, and experiences that can help inform best practices and make CAP implementation more effective and efficient. This strategy is also valuable for students because working with the community can provide hands-on experience that can be beneficial for job searching and resume writing in the future. Central College also suggested, like Randolph College, that if a community is more conservative, to frame projects in a different manner than "climate action." For example, economic development or community development could be less polarizing ways to talk about projects related to the community and an institution's CAP (Interview with Central College 2020).

Discussion

This section overviews the results of the quantitative and qualitative analyses of the study in the context of previous literature and general consensuses about CAPs. It discusses and compares the findings of the quantitative analyses of CAPs with our interview results, and explores inconsistencies and differences between the two.

Specifically we examine CAP length and the length of time institutions used to write their CAP. We also discuss the planning process of CAPs, if CAPs received administrative support, the year a plan was created, and CAP neutrality dates. Additionally, we discuss our findings regarding the presence of financing strategies in a CAP, how institutions tracked the goals of their plan, the presence of adaptation policies and policies targeting regional climate impacts, and how the presence of emissions forecasts in a plan affect our results. We then summarize the major findings of this study.

CAP Length and Length of Time to Write CAP

We found no significant relationship between the length of time an institution took to write its CAP and the total score it received for its CAP. Based on interview responses, however, this could be due to a few different reasons related to the planning process. Some institutions had fewer people working on the plan than others, extending the length of time it took to write a plan, however, this did not necessarily equate to a more-developed plan. Secondly, a plan that involved stakeholder meetings, revisions, and multiple stakeholders in the writing process could result in a higher quality plan than a plan that was created over the same amount of time but did not involve those components. Thirdly, for some institutions, hired consultants expedited the planning process and reduced the amount of time it took to write the CAP, but this shorter time frame did not necessarily equate to a less-developed plan. Fourthly, and similarly, some institutions included goals and policies that were already previously drafted or in other plans, and so their planning process was expedited. Again, this did not necessarily mean that their shorter planning process equated to a less-developed plan. Therefore, there are a variety of explanations for why there was not a significant correlation between length of time to write a CAP and the total score of the CAP.

On the other hand, plan length in pages was significantly positively correlated to the total CAP score. This indicates that the longer a CAP is in general, the more detail it includes or has the opportunity to include. This finding is consistent with previous literature (Bassett and Shandas 2010).

However, interviews with institutions bring up a different perspective, highlighting the fact that length is not necessarily important for CAP implementation and progress. For example, Luther College's CAP is intentionally short because it makes it more accessible and easier to read (Interview with Luther College 2020). Their plan is not as detailed, and did not receive as high of a total score as other institutions, but they have internal planning documents with more details to expand on their official CAP goals. On the other hand, Ursinus College's CAP is extremely long, but they believed organizing their plan by department was beneficial (Interview with Ursinus College 2020). These differences show that there is not necessarily one productive or "better" way to write a CAP, although it is important to note that both institutions did have specific details about projects and plans somewhere, if not in their CAP.

Planning Process

When schools included more information about the planning process, they often included lists of people involved, subcommittees, and different actors. This attention to detail and rigor in terms of describing planning processes was significantly positively correlated to higher total strategies scores. This possibly indicates that institutions with an array of individuals actively involved in the CAP creation process consequently have more detailed goals, policies, and projects in place to work towards their carbon neutrality goal.

In interviews, institutions backed up this theory. Twelve out of 20 institutions said that broad stakeholder involvement helped their planning process. When institutions were asked to give advice to other institutions, they mentioned this again. Fourteen institutions brought up the importance of broad stakeholder involvement in general. This is backed up by previous literature as well, which highlights the importance of broad stakeholder involvement for detailed and implementable plans (Innes 1996; Burby 2003; Bassett and Shandas 2010; Boswell 2010).

However, interviewees elaborated on broad stakeholder involvement and pointed out that there are multiple ways to have stakeholders involved. Specifically, institutions mentioned that getting students involved from the very beginning is particularly key in demonstrating to the institution that climate action is important, that creating a sustainability department if one does not exist can help to bring in more dedicated stakeholders, that giving different departments control over deciding what actions and goals they want to implement instead of telling them what to do increases involvement, and that developing subcommittees to work on different aspects of CAP development can allow people to contribute in the fields they are interested in and knowledgeable about. Therefore, it is important to note that while the planning process does influence the implementability and contents of a CAP, there are many different ways that this can be done and still create a detailed path to carbon neutrality.

Administrative Support

Previous literature has found that administrative support is a key aspect of the functionality of a CAP's creation process and implementation progress (Alexander 2014; Shi and Chu 2015), and we found similar results. While not addressed in the CAP analysis portion of this study, interview responses aligned with this previous literature. Five institutions said that strong administrative support during the planning process was helpful, and three said a lack of administrative support was a barrier to plan creation. Some institutions noted that their plan wasn't board approved, and as such, the administration made no promises to follow through with the goals and policies outlined in the plan, indicating that even a thoroughly designed CAP may not be implemented in the long run (Interview with Randolph College 2020). However, Centre College said they worked around the administration, and were able to make progress (Interview with Centre College 2020). Therefore, administrative support and involvement are important for climate action planning because the administration has a say over what actually can be implemented, but, in some circumstances, a dedicated group of stakeholders can still make progress without the administration.

Plan Year

In the past decade, as the urgency surrounding climate change has increased, climate action technologies and strategies have improved and there is generally more information and

resources available related to climate change and reducing emissions. However, we found no significant positive relationship between the year a plan was created and the total score an institution received. There are a variety of reasons that could help explain this lack of correlation. When some institutions completed the specific goals outlined in their original CAP, they decided to pursue broader policy goals in their update, rather than specific projects. This strategy could have decreased the mitigation scores of some institutions' updated CAPs, given the ranking system used in this study focused on specific project aspects that would help ensure implementation (Interview with Colgate University 2020). In this case, an institution's original CAP could have been more project-focused or specific, and consequently would have received a higher mitigation score than that institution's updated, broad policy CAP. Similarly, some CAP updates did not include the full range of strategies an institution was pursuing because they did not repeat all the strategies that were staying the same from their original CAP (University Sustainability Committee 2019). Therefore, while they were still implementing strategies from their original CAP, those strategies were not present in the updated CAP included in this study, and so their mitigation score might have been lower than it would have been if the original CAP was analyzed, or if the two CAPs were combined.

Further, there was no correlation between the year an institution wrote their CAP and whether, during interviews, the institution said they were "on track" or "not on track" to meet their carbon neutrality goals. This means that older plans, which might be outdated in terms of scientific or technological advances related to climate change, did not affect the progress of an institution's CAP implementation. Instead, other factors, discussed below in the *Goal Tracking* section, had a greater impact on CAP implementation progress.

Neutrality Dates

There was no significant correlation between neutrality date and mitigation scores, indicating that institutions with sooner neutrality dates were not any more likely to have higher mitigation scores than institutions with later neutrality dates. This result could be due to a number of factors. In some interviews, interviewees stated that the policies and goals outlined in their CAP, especially if the CAP was older, did not reflect all of the actions their institution was taking to achieve carbon neutrality. Therefore, some colleges with closer carbon neutrality dates could be undertaking mitigation strategies not mentioned in their CAP. For example, some institutions had an older CAP and kept those outdated plans up online as a formality, but were working beyond their plan in internal groups (Interview with Colby College 2020; Interview with Kenyon College 2020; Interview with Randolph College 2020; Interview with Smith College 2020; Interview with Willamette College 2020).

Financing

During interviews, some institutions indicated financing their plan was their primary barrier for implementing different climate action goals and policies. Further, past studies have shown that fewer resources and smaller funds make it difficult for plans to be created and/or implemented successfully (Shi and Chu 2015), which would suggest that a smaller endowment might limit the overall detail of a CAP. However, there was no significant correlation between total scores and endowment, which was the funding source for 12 out of 23 institutions' CAPs. A few possibilities could explain the lack of a significant correlation. Although all institutions in the

dataset are relatively similar in enrollment size, it is possible that an institution's student to endowment ratio could impact this score. If endowment had been calculated per student, a correlation may have been revealed. Additionally, it is likely that most schools chose to direct their funding from their endowment to areas other than sustainability, and so endowment size would not be correlated to CAP total score. This was mentioned by some institutions; their administrations prioritized and directed funding to initiatives besides sustainability or climate action. Further, only 12 out of 23 institutions said funding for their CAP came from their endowment or operating budget. The other 11 institutions had other funding sources, so this could be why endowment size and total score are not significantly correlated. Further supporting that endowment was not correlated to a CAPs total score was the lack of positive significant correlation between the financing in a CAP and an institution's endowment.

However, we found significant positive correlation between financing present in a plan and the total strategies score of the plan. This result indicates that if a plan has a set financing strategy, an institution is more likely to detail policies and actions to reach carbon neutrality. This was echoed in interview responses. According to interviewees, a lack of a financing source is a major barrier to successful plan implementation, and so if financing is detailed, project implementation and planning can be easier.

Goal Tracking

Throughout the interview process, it became evident that longer, more detailed plans did not indicate whether or not an institution was "on track" to meet their carbon neutrality goals. Instead, institutions provided a variety of different reasons for why or why not they were "on track." Like previous literature has mentioned, we found that, because CAPs are created by individual institutions, they follow no strict formula and vary in length and detail greatly (Bassett and Shandas 2010). Interviews highlighted the possible consequences of this lack of regulation, building on the previous literature. We found the degree to which liberal arts colleges are detailing and following through with their CAPs varies greatly because there are often no consequences if a CAP is not implemented. There is often relatively little accountability built into CAPs, meaning that even if a CAP exists, it will not necessarily be implemented because there are no consequences for not following through (Interview with Austin College 2020; Interview with Furman University 2020; Interview with Gustavus Adolphus College 2020; Interview with Kenyon College 2020). Therefore, even if an institution has a very detailed CAP, because of a lack of accountability, it does not necessarily mean that institution will be more on track to reach their goals.

This is likely also because of factors discussed in previous sections. For example, the barriers an institution is facing, and in particular financing or stakeholder or administrative support, seem to be more important for influencing whether or not a plan is on track than the detail or length of a plan. If financing or broad stakeholder support -- including administrative support -- are not present, institutions seem to be having more trouble with plan implementation (Interview with Bard College 2019; Interview with Centre College 2020; Interview with Colby College 2020; Interview with College of the Holy Cross 2020; Interview with Kenyon College 2020; Interview with University of Richmond 2020).

Adapting to Climate Change

The discourse surrounding climate change has shifted away from solely discussing mitigation to also including adaptation strategies as it becomes evident that some effects of climate change cannot be mitigated; however, most CAPs do not include adaptation strategies (Dyer and Andrews 2011; Koski and Siulagi 2016). This lack of adaptation strategies in CAPs in previous literature was consistent with our results, as only five institutions mentioned adaptation to climate change in their CAPs. Further, Koski and Siulagi (2016) found that CAPs developed for coastal locations, which are more likely to feel the effects of climate change, focused more on adaptation than CAPs developed for non-coastal locations. In this study, the five institutions that mentioned adaptation were located in coastal states; however, nineteen of the 30 schools were located in coastal states, and our analysis found no significant positive correlation between the presence of adaptation strategies and institutions in coastal states. This indicates that, while some institutions in coastal states may be thinking about adaptation, not all are.While the five institutions that mentioned adaptation in their CAPs were located in coastal states, newer plans were also found to be more likely to mention adaptation.

There was a significant, positive correlation between both plan year and the presence of adaptation measures, and updated CAPs and the presence of adaptation measures. This indicates that more recent plans are more likely to contain adaptation measures, possibly because adaptation is a relatively new concept. This means that, as institutions update their CAPs into the future, it is possible that we will see an increase of adaptation measures built into CAPs. Further, institutions that have not yet developed a CAP, but might in the future, also might be more likely to include adaptation measures than the CAPS that were created over the past two decades. In the broader context of climate action, this could be important because we cannot prevent the effects of climate change and therefore must work to adapt to them.

Regional Climate Change Impacts and Climate Change Science

Despite many institutions' emphasis or mention of local community outreach, few institutions focused on the bigger picture of climate change. There was no significant correlation between regional climate change impacts and local community outreach planning in CAPs. However, only seven institutions discussed regional climate change impacts in their CAPs, making it difficult to determine if there is a relationship between the two.

Emissions Forecast

Previous literature highlighted the importance of GHG emissions inventories and forecasts for creating CAPs that actually led to carbon neutrality (Boswell et al. 2010). Since measuring and predicting emissions is difficult, it can be hard to create detailed, specific projects that are meant to reduce projected emissions. This study found that there was a significant positive correlation between the presence of an emissions forecast and the total mitigation score of CAPs. This indicates that institutions that are finding ways to predict their emissions in the future are coming up with more detailed plans to mitigate those future emissions.

Discussion Summary

While CAPs can be an effective way to prompt institutions to start thinking about and planning for reducing their GHG emissions, there are several considerations to keep in mind

when evaluating CAPs. Although longer CAPS are often more detailed and contain more goals, it's important to note that this detail does not necessarily indicate that an institution will implement the projects in their CAP. Similarly, although a closer carbon neutrality date would seem to indicate an urgency for climate action, closer neutrality dates do not affect the detail of a CAP. In regards to implementation of CAP goals, CAPs with diverse stakeholder involvement are more likely to be implemented, and there are multiple ways to gather diverse groups of stakeholders and garner support. Further, administration support is incredibly important in regards to financing CAPs and implementing CAP goals, but there are alternative strategies institutions can use if their administration is not supportive. Additionally, CAPs generally have few accountability measures built into them, and this can affect the follow-through of an institution in regards to its CAP goals. Therefore, due to this lack of accountability, detailed plans are not necessarily better, especially if they are not implemented.

Despite the growing climate action discourse about adaptation strategies, most CAPs do not contain them. However, newer CAPs are more likely to contain adaptation measures, therefore, future CAP updates and CAPs might be more likely to address adaptation. Additionally, although regional climate change effects are becoming more evident, most CAPS do not include information about, or projects and goals concerning regional climate change mitigation strategies.

In sum, the content of a CAP does not always reflect the actions of an institution and a schools actions should be evaluated holistically. Instead of particular CAP attributes such as length or detail being used as a primary indicator of CAP progress, many factors influence CAP implementation progress and creation process. Therefore, CAPs serve as good starting points for climate action and can help to motivate stakeholders and jumpstart projects, but are not necessarily good indicators of what progress is actually being made.

Limitations

Despite these findings, this study has some potential limitations. Firstly, the CAPs selected for analysis were randomly selected based on geographical region, but may not be representative of the average CAP. We sampled 30 of the 82 liberal arts colleges that have created climate action plans and signed onto the ACUPCC, and so there is a possibility that the 30 plans selected were not representative of the entire 82.

The CAP attribute analysis is also limited; the ranking system used for this research is partially novel, and due to the wide variation in mitigation strategies among the different CAPs, the ranking system may not indicate the same detail for each climate action strategy. For example, some potential travel mitigation costs may be more difficult to quantify than the costs for carbon offsets, and so using the same 0-3 scale for both factors may not be the most effective way to represent the actual detail of CAPs. Furthermore, due to the small size of the scale, for the same attribute, a strategy that was given a two at one institution could have been more detailed than a strategy that was also given a two at a different institution, due to the range of detail that qualified as a two under our ranking system. The scale size does not discount the ranking system completely, however, as the 0-3 scale does capture some variation.

CAP scores may not always equate to CAP success or indicate effectiveness because an institution could have listed many ideas in a CAP without fully explaining them, so they would not have scored well in the study’s analysis. Therefore, the CAP scores provide an overview of

how detailed a plan is and, therefore, possibly how easily the plan might be implemented if other factors, such as support and financing, are in place.

The interviews were also limited. Some interviewees were not present at their institution for the entire duration of the planning process and, as such, had limited knowledge about the specifics of some parts of the CAP planning and/or implementation process. Furthermore, some interviewees could not give exact details about the specifics of plan formation in regard to their institution's CAP due to the older age of the CAP.

Additionally, only 24 out of 30 colleges that we contacted agreed to be interviewed. The remainder declined to participate or did not respond, indicating that there is a degree of non-response bias in our results. The interviewees that agreed to participate may have been more likely to be using or updating their current climate action plan.

Further Study

Based on the results and the implications of this study, there are many paths for further research. This section highlights areas for future study in regard to CAPs in higher education, including further study of climate action strategies, CAP updates, accountability of institutions, and possible subjects for future interviews.

This study did not evaluate the number of climate action strategies that CAPs contained. CAPs could be evaluated by the number of mitigation strategies they contain rather than the scale used in this study. Further study of climate action strategies could reveal if institutions with CAPs with a variety of projects and proposed goals are more likely to have implemented more climate action strategies.

Some interviewees stated that their CAP did not accurately predict or measure the actions their institution is taking to reduce their carbon emissions, implying that the standards laid out by the ACUPCC do not necessarily hold institutions accountable to their CAP. Further study of how different institutions handle accountability could inform future actions the ACUPCC could take in order to hold institutions and their presidents accountable for CAP updates and content.

Multiple schools have updated their CAP, and several have updated their CAP more than once. A comprehensive evaluation of all of the CAPs an institution created could lend insight into how an institution's emissions reductions are influenced by their past CAPs.

While this study focused on interviewing those who had been highly involved with the planning of the CAP, interviewing board members, institutions' presidents, and other college administrators could provide insights into the difficulties of financing a CAP.

Conclusion

This study provides insight into the current status of CAPs and CAP formation processes in liberal arts colleges around the country. An analysis of 30 CAPs was done, looking at factors including mitigation, general carbon emissions footprint reduction strategies, and basic information about the CAPs. Further, interviews were conducted with 24 out of the 30 institutions in order to collect information beyond what was included in the CAP documents about the institutions' CAPs and their planning processes. This is the first comparative study of CAPs in higher education, and it expands upon bodies of literature about CAPs in municipalities, specific institutions' CAPs, and sustainability planning in higher education institutions.

Results from both the CAP analyses and interviews reveal that CAP creation, CAP content and their implementation progress, vary greatly from institution to institution, and a multitude of factors lead to this variation. Important factors for the effectiveness of CAP planning processes included broad stakeholder support, administrative support, and financial sources. Important factors for the effectiveness of CAP implementation included these same factors, but also included the presence of actionable tasks and detailed goals. In general, institutions with detailed plans and administration support seemed to better understand how to implement their CAPs and reach carbon neutrality. However, although past literature indicated that detailed plans are important, plan detail was not found to be as important for plan implementation progress as the presence of administration support and funding for climate action projects. Consequently, a detailed CAP document, or a document that scored highly in the CAP analysis section of this study, does not necessarily indicate that institution is making progress or is on track to meet their carbon neutrality goals.

With this knowledge, it is important to note that while CAPs are an effective way to get institutions to start thinking about and planning for reducing their GHG emissions, they are not the end-all-be-all for actually reducing emissions in practice. Consequently, developing a CAP is still useful in creating a guide for carbon neutrality and getting key individuals involved so progress can be made, but following and implementing that CAP is not the only way to work towards carbon neutrality. Instead of being bound to the CAP they created, institutions can build on their CAP and the momentum they create, working within the means and values of their institution to reduce their emissions in whatever way is the most effective for them in the current moment.

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Appendices

Appendix A - List of Institutions

1. Austin College*
2. Bard College*
3. Central College*
4. Centre College*
5. Colby College*
6. Colgate University*
7. College of the Atlantic*
8. College of the Holy Cross*
9. Colorado College*
10. Denison University*
11. Emory and Henry College
12. Fort Lewis College*
13. Furman University*
14. Gustavus Adolphus College*
15. Kenyon College*
16. Luther College*
17. Massachusetts College of the Liberal Arts*
18. Pitzer College
19. Purchase College
20. Randolph College*
21. Rhodes College
22. Smith College*
23. Swarthmore College*
24. Sweet Briar College
25. University of Minnesota, Morris
26. University of Richmond*
27. Ursinus College*
28. Virginia Wesleyan University*
29. Washington and Lee University*
30. Willamette College*

All 30 institutions were included in the CAP attributes portion of this study. An * indicates the institution participated in the interview portion of this study as well. Twenty-four institutions participated in the interview portion.

Appendix B - Interview Questions

1. What persons or organizations started the push for a CAP?
2. Why did the college decide to create a CAP?
3. Why did your institution decide to sign on to the (ACUPCC) American College and University Presidents' Climate or Carbon Commitment?
4. How long did it take to develop the final CAP?
    a. Do you think the plan creation process was rushed or too long?
5. What worked well during the planning process? Did anything expedite plan creation?
6. What barriers did the institution face during plan creation?
    a. How were those barriers overcome?
7. Was it difficult to gain administration or student support?
    a. How did these factors impact the final CAP's content?
8. Who was involved in the planning process and what roles did they play?
9. How is the CAP financially supported?
    a. Did finances limit, not affect, or expand what was able to be included in the CAP in terms of goals and policies?
    b. Did the financial backer have certain stipulations or requests that needed to be included in the plan?
10. What aspects of the CAP do you think work well?
    a. Why do they work well?
11. What aspects of the CAP do you think could be improved?
    a. Why do they need improvement?
    b. How would you suggest improving them?
12. Is there anything unique about the CAP?
    a. Why is this unique?
    b. Do you think it's applicable to other institutions?
13. Are you on track to complete the goals outlined in your CAP?
    a. How do you judge if you're on track?
14. What would be your advice to other colleges developing a CAP?
15. On a scale of 1-5, how would you classify the institution's general political leaning? One being mostly conservative, 3 being moderate, and 5 being mostly liberal.
16. Do you have a separate sustainability plan and why?
17. Are you still using the first iteration of your CAP? Are you working from an update or are you in the process of updating your CAP?
    a. Why did you update the CAP, who is part of that process?

Appendix C - Full Table of Climate Action Plan Attribute Analysis

Institution	Location	State on the coast or not	2018 College Endowment	Year of Plan
Austin College	City	Coast	141.8 million	2016
Bard College	Rural	Coast	152.0 million	2017
Central College	Rural	Not coast	Not listed	2016
Centre College	City	Not coast	323.6 + milion	2009
Colby College	Rural	Coast	828.0 + million	2010
Colgate University	Rural	Coast	923.6 + million	2017
College of the Atlantic	Rural	Coast	57.4 million	2017
College of the Holy Cross	Suburban	Coast	783.2 + million	2009
Colorado College	City	Not coast	735.9 + million	2017
Denison University	Suburban	Not coast	850.4 + million	2015
Emory and Henry College	Rural	Coast	89.6 + million	2010
Fort Lewis College	Rural	Not coast	10.5 + million	2018
Furman University	Suburban	Coast	702.9 million	2009
Gustavus College	Rural	Not coast	183.7 million	2010
Kenyon College	Rural	Not coast	413.9 million	2018
Luther College	Rural	Not coast	167.3 + million	2009
Massachusetts College of Liberal Arts	Rural	Coast	12.8 + million	2009
Pitzer College	Suburban	Coast	141.5 million	2012
Purchase College	Suburban	Coast	76.5 million	2012
Randolph College	Suburban	Coast	158.1 million	2012
Rhodes College	Urban	Not coast	359.3 million	2009
Smith College	Suburban	Coast	1.9 billion	2017
Swarthmore College	Suburban	Coast	2.1 + billion	2019
Sweet Briar College	Suburban	Coast	74.8 million	2010
University of Minnesota, Morris	Rural	Not coast	15.6 million	2009
University of Richmond	Suburban	Coast	2.5 + billion	2010
Ursinus College	Suburban	Not coast	144.9 + million	2013
Virginia Wesleyan University	Suburban	Coast	58.7 million	2019
Washington and Lee University	Rural	Coast	1.6 billion	2019
Willlamette University	City	Coast	258.6 + million	2010
Average	–	–	543.6 million	2013

Institution	Plan Update or Original	Plan Length	Carbon Neutrality Date	Monitering of CAP*	Climate Science Primer*
Austin College	Update	6	2035	0	0
Bard College	Update	80	2035	1	0
Central College	Update	55	2053	0	0
Centre College	Original	45	2040	1	1
Colby College	Original	13	2015	1	0
Colgate University	Update	48	2019	1	0
College of the Atlantic	Update	5	2030	1	0
College of the Holy Cross	Original	18	2040	0	0
Colorado College	Update	25	2020	1	1
Denison University	Update	20	2030	1	0
Emory and Henry College	Original	22	Not listed	0	0
Fort Lewis College	Original	7	2050	1	0
Furman University	Original	40	2026	1	0
Gustavus College	Original	7	Not listed	1	0
Kenyon College	Original	25	2040	1	0
Luther College	Original	8	Not listed	0	0
Massachusetts College of Liberal Arts	Original	12	Not listed	1	0
Pitzer College	Original	34	2050	1	0
Purchase College	Original	Excel sheet	Not listed	0	0
Randolph College	Update	16	2050	0	0
Rhodes College	Original	11	2029	1	0
Smith College	Update	71	2030	1	1
Swarthmore College	Update	11	2035	0	0
Sweet Briar College	Original	32	2030	1	0
University of Minnesota, Morris	Original	12	Not listed	0	0
University of Richmond	Update	71	2050	1	1
Ursinus College	Original	514	2060	0	1
Virginia Wesleyan University	Update	19	2040	1	0
Washington and Lee University	Update	15	2050	1	0
Willlamette University	Original	13	2030	1	0
Average	--	43	2037	0.7	0.7

Institution	Regional Climate Change Impacts	Planning Process Description	GHG Emissions Inventory	GHG Emissions Reduction Target	GHG Emissions Forecast
Austin College	0	2	1	3	0
Bard College	3	2	3	3	3
Central College	0	3	3	3	3
Centre College	2	3	3	3	3
Colby College	0	2	3	3	2
Colgate University	3	3	3	3	2
College of the Atlantic	0	1	0	3	0
College of the Holy Cross	0	2	3	3	3
Colorado College	0	2	3	3	0
Denison University	0	3	1	3	0
Emory and Henry College	0	0	3	0	1
Fort Lewis College	0	1	2	3	0
Furman University	0	3	3	3	1
Gustavus College	0	1	3	2	0
Kenyon College	0	2	3	3	1
Luther College	0	0	2	1	0
Massachusetts College of Liberal Arts	0	2	2	2	2
Pitzer College	3	1	3	3	0
Purchase College	0	0	3	0	0
Randolph College	0	1	3	3	0
Rhodes College	0	0	2	2	1
Smith College	1	3	2	3	0
Swarthmore College	0	1	3	3	0
Sweet Briar College	0	2	3	3	0
University of Minnesota, Morris	0	2	2	0	0
University of Richmond	0	3	2	3	3
Ursinus College	3	2	3	3	3
Virginia Wesleyan University	1	2	3	3	0
Washington and Lee University	0	3	3	3	0
Willlamette University	0	3	3	3	0
Average	0.5	1.8	2.5	2.5	0.9

Institution	Financing	Mitigation - Energy Efficiency	Mitigation - Food Services	Mitigation - Land Use Planning	Mitigation - Renewable Energy Generation
Austin College	1	1	1	1	0
Bard College	1	3	2	0	2
Central College	3	3	0	1	3
Centre College	2	3	1	1	2
Colby College	3	3	0	1	3
Colgate University	3	3	2	3	1
College of the Atlantic	1	2	0	0	2
College of the Holy Cross	1	2	0	0	1
Colorado College	3	2	1	1	2
Denison University	1	2	1	2	1
Emory and Henry College	0	1	1	2	0
Fort Lewis College	2	2	2	0	1
Furman University	0	2	0	0	1
Gustavus College	0	1	0	0	1
Kenyon College	3	1	0	1	3
Luther College	1	1	1	1	2
Massachusetts College of Liberal Arts	1	2	0	0	2
Pitzer College	1	2	2	1	2
Purchase College	0	0	0	0	0
Randolph College	0	2	2	2	2
Rhodes College	2	2	0	0	2
Smith College	2	2	1	1	2
Swarthmore College	1	1	1	1	1
Sweet Briar College	3	3	2	1	3
University of Minnesota, Morris	0	0	0	1	2
University of Richmond	3	2	1	1	2
Ursinus College	2	3	1	2	2
Virginia Wesleyan University	3	2	0	2	2
Washington and Lee University	1	2	0	0	1
Willlamette University	3	2	1	1	2
Average	1.6	1.9	0.8	0.9	1.7

Institution	Mitigation - Transportation	Mitigation - Waste	Renewable Energy Credits	Carbon Offsets
Austin College	0	1	2	2
Bard College	2	1	1	2
Central College	2	2	1	3
Centre College	2	2	3	2
Colby College	2	2	1	2
Colgate University	2	3	2	2
College of the Atlantic	2	0	2	2
College of the Holy Cross	0	1	0	1
Colorado College	1	2	3	3
Denison University	2	1	1	0
Emory and Henry College	2	2	1	2
Fort Lewis College	1	2	2	1
Furman University	2	1	0	1
Gustavus College	0	0	0	0
Kenyon College	1	2	0	3
Luther College	1	1	3	1
Massachusetts College of Liberal Arts	0	1	0	0
Pitzer College	2	2	0	2
Purchase College	0	0	0	0
Randolph College	2	2	0	1
Rhodes College	1	1	0	1
Smith College	0	0	0	0
Swarthmore College	1	1	1	1
Sweet Briar College	0	1	2	0
University of Minnesota, Morris	0	0	0	0
University of Richmond	3	2	2	2
Ursinus College	2	2	1	2
Virginia Wesleyan University	2	2	1	1
Washington and Lee University	2	2	2	0
Willlamette University	2	1	1	2
Average	1.3	1.3	1.1	1.3

Institution	Education	Community Outreach	Adaptation	Total Score
Austin College	0	0	0	15
Bard College	3	1	1	34
Central College	1	2	0	33
Centre College	2	1	0	37
Colby College	3	3	0	34
Colgate University	3	0	2	41
College of the Atlantic	3	0	0	19
College of the Holy Cross	3	0	0	20
Colorado College	2	0	0	30
Denison University	2	2	0	23
Emory and Henry College	2	0	0	17
Fort Lewis College	3	0	0	23
Furman University	3	2	0	23
Gustavus College	1	0	0	10
Kenyon College	1	0	0	25
Luther College	2	2	0	19
Massachusetts College of Liberal Arts	2	1	0	18
Pitzer College	2	1	0	28
Purchase College	0	0	0	3
Randolph College	2	1	0	23
Rhodes College	2	1	0	18
Smith College	2	2	1	24
Swarthmore College	1	0	0	17
Sweet Briar College	3	0	0	27
University of Minnesota, Morris	1	2	0	10
University of Richmond	2	2	0	35
Ursinus College	3	3	0	38
Virginia Wesleyan University	2	1	2	30
Washington and Lee University	2	0	1	23
Willlamette University	1	1	0	27
Average	2	0.9	0.2	24

Institution	Total Mitigation Score	Total Strategies Score
Austin College	4	8
Bard College	10	17
Central College	11	18
Centre College	11	19
Colby College	11	20
Colgate University	14	21
College of the Atlantic	6	13
College of the Holy Cross	4	8
Colorado College	9	17
Denison University	9	14
Emory and Henry College	8	13
Fort Lewis College	8	14
Furman University	6	12
Gustavus College	2	3
Kenyon College	8	12
Luther College	7	15
Massachusetts College of Liberal Arts	5	8
Pitzer College	11	16
Purchase College	0	0
Randolph College	12	16
Rhodes College	6	10
Smith College	6	10
Swarthmore College	6	9
Sweet Briar College	10	15
University of Minnesota, Morris	3	6
University of Richmond	11	19
Ursinus College	12	21
Virginia Wesleyan University	10	15
Washington and Lee University	7	11
Willlamette University	9	14
Average	7.9	13.1

*Table 2: The raw data for all CAP analyses for the 30 institutions included in this study. Descriptions of each attribute can be found in Appendix D. Note that an * indicates a factor was evaluated on a 0-1 scale and other factors were evaluated on a 0-3 scale.*

Appendix D - Description of Attributes in Climate Action Plan Analysis

- Location - Based on the classifications used by the U.S. News and World Report. Institutions' "settings" can be classified as city, rural, suburban, or urban.
- State on the coast or not - Based on whether or not a state has any ocean coastline.
- 2018 College Endowment - Sourced from U.S. News and World Report for consistency. The 2018 values were the most recent values available.
- Year of Plan - Collected from the CAPs themselves. If CAPs did not specify, the year that Second Nature reports was the year used.
- Plan Update or Original - CAPs came from Second Nature's Reporting website because as part of the ACUPCC, which all 30 institutions signed onto, they must upload a CAP to Second Nature and also upload progress reports and CAP updates. If multiple CAPs were uploaded to Second Nature, the most recent CAP was analyzed and was classified as a "plan update." Some institutions had not uploaded the most recent version of their CAP to Second Nature, so we checked institutions' websites for more recent CAPs as well. Again, if an institution had more than one CAP, the newest one was analyzed and was classified as a "plan update." Additionally, interviewees also confirmed which plan was the most recent.
- Plan Length - Page numbers were used if the plan was numbered. Otherwise, the overall page count of the PDF file was used as the plan length.
- Carbon Neutrality Date - These were the dates written in the CAPs themselves.
- Climate Science Primer - This attribute was either present (1) or not present (0). To receive a one, a basic explanation of climate change and/or the effects of greenhouse gas emissions needed to be present in the CAP.
- Regional Climate Change Impacts - This attribute addressed whether or not a CAP specified any predicted local/regional changes due to climate change. A zero indicated it was not addressed at all. A one indicated one or two changes were mentioned (ex. The state is projected to experience increased rainfall.) A two indicated a few changes were mentioned. A three indicated that, for at least one change, specific details about that change were given.
- Planning Process Description - This attribute addressed whether or not a CAP specified how the CAP was formed. Factors that were considered included: how it started, who was generally involved (ex. staff, students, administration), a more in depth explanation of who was involved (ex. specific departments, organization names, specific people), where the ideas or background information for the CAP came from, the approval process, and plans for future updates and revisions. A zero indicated the attribute was not addressed at all. A one indicated one of these factors was included. A two indicated between two and four of these factors were included. A three indicated five or six of these factors were included.
- GHG Emissions Inventory - This attribute addressed the documentation of institution's GHG emissions. A zero indicated the attribute was not addressed at all. A one indicated only a total carbon dioxide equivalent (CO_2e) was given. A two indicated that a total CO_2e was given, plus either some breakdown of where the CO_2e was coming from, a graph, *or* an explanation of how the inventory was calculated. A three indicated that a

total CO2e was given, plus a breakdown of where the CO2e was coming from, a graph, *and* some explanation of how the inventory was calculated.

- GHG Emissions Reductions Target - This attribute addressed whether or not specific CO2e reduction goals were included in a CAP. A zero indicated no reductions targets were present. A one indicated that an institution said they were aiming to reduce their emissions, but included no specifics. A two indicated while an institution did not have a reductions target of 100% or carbon neutrality, they had a specific reductions percentage goal and year for the goal. A three indicated the institution had a reductions target of 100% and a year for the goal.
- GHG Emissions Forecast - This attribute addressed what institutions' "business-as-usual" emissions scenarios would be if they did not reduce their emissions. A zero indicated an institution's CAP did not include a forecast. A score of one indicated that a CAP mentioned what emissions were projected to do in a business-as-usual scenario. A two indicated that a CAP gave specific numbers for emissions projections, a reason for the predicted trend, *or* a graph showing the predicted trend. A three indicated that a CAP gave specific numbers for emissions projections, explained why that trend was predicted, *and* included a graph showing the predicted trend.
- Mitigation - Transportation - This attribute encompassed reductions strategies related to any sort of transportation, including air travel, study abroad, student commuting, faculty commuting, athletic team travel, and more. Factors evaluated included the plan having a specific project, and with that project a location/a specific type of transportation, a date goal, a person/group in charge, financing, and estimated reductions. A zero on the scale indicated transportation was not addressed. A one on the scale indicated one of the factors was included. A two on the scale indicated between two and four of the factors were addressed. A three on the scale indicated five or six of the factors were addressed, indicating the project was fully explained.
- Mitigation - Waste - This attribute encompassed reduction strategies related to any sort of waste, including solid waste, recycling, water waste, student move-out, and more. Factors evaluated included the plan having a specific project, and with that project a location, a date goal, a person/group in charge, financing, and estimated reductions. A zero on the scale indicated waste was not addressed. A one on the scale indicated one of the factors was included. A two on the scale indicated between two and four of the factors were addressed. A three on the scale indicated five or six of the factors were addressed, indicating the project was fully explained.
- Mitigation - Energy Efficiency - This attribute encompassed reduction strategies related to any sort of energy efficiency with building or tech upgrades, including the installation of LED lights, LEED building certifications, automatic light switches, computer updates, heating or air conditioning regulations, and more. Factors evaluated included the plan having a specific project, and with that project a location, a date goal, a person/group in charge, financing, and estimated reductions. A zero on the scale indicated energy efficiency was not addressed. A one on the scale indicated one of the factors was included. A two on the scale indicated between two and four of the factors were addressed. A three on the scale indicated five or six of the factors were addressed, indicating the project was fully explained.

- Renewable Energy Credits (RECs)- This attribute addressed whether a college planned to use Renewable Energy Credits as a way to reduce their carbon footprint and was classified as detailed (3), partially explained (2), or mentioned (1). In order to be classified as detailed, a carbon offset policy needed to include at 4-5 of the following five factors: a specific project, the cost of the REC, the location of the REC, the financing of the REC, a general purchase timeline for the REC, and estimated reductions for the REC. Partially explained RECs in the plan needed 2-3 of these factors. Mentioned RECs needed one of these factors. A zero on the scale indicated that the CAP did not mention RECs.
- Mitigation - Renewable Energy Generation - This attribute encompassed reductions strategies related to any sort of renewable energy generation, including on-site or off-site solar arrays, wind turbines, geothermal, biofuel, and more. Factors evaluated included the plan having a specific project, and with that project a location, a date goal, a person/group in charge, financing, and estimated reductions. A zero on the scale indicated renewable energy generation was not addressed. A one on the scale indicated one of the factors was included. A two on the scale indicated between two and four of the factors were addressed. A three on the scale indicated five or six of the factors were addressed, indicating the project was fully explained.
- Mitigation - Land Use Planning - This attribute encompassed reductions strategies related to any sort of land use planning, including grounds management such as fertilizer and lawn care, garden planning, natural land preservation or restoration, carbon sequestration projects, and more. Factors evaluated included the plan having a specific project, and with that project a location, a date goal, a person/group in charge, financing, and estimated reductions. A zero on the scale indicated land use planning was not addressed. A one on the scale indicated one of the factors was included. A two on the scale indicated between two and four of the factors were addressed. A three on the scale indicated five or six of the factors were addressed, indicating the project was fully explained.
- Mitigation - Food Services - This attribute encompassed reductions strategies related to any sort of food services, including food waste, composting, sustainable/local food sources, trayless dining, reusable or compostable dishes and silverware, and more. Factors evaluated included the plan having a specific project, and with that project a location, a date goal, a person/group in charge, financing, and estimated reductions. A zero on the scale indicated food services were not addressed. A one on the scale indicated one of the factors was included. A two on the scale indicated between two and four of the factors were addressed. A three on the scale indicated five or six of the factors were addressed, indicating the project was fully explained.
- Monitoring of CAP - This attribute was either present (1) or not present (0). To receive a score of one, a CAP had to mention that the institution was planning to update the CAP or monitor their emissions in the future.
- Education - This attribute encompassed any sort of education taking place on the institution's campus for the institution’s community, including departments and classes, new student orientation, EcoRep programs in residential buildings, workshops, faculty training, the creation of a sustainability office, and more. Factors included a specific project, location/department for the project, a date goal, a person/group in charge, and

financing. Estimated reductions were not included because there is no accurate way to estimate how education would translate to behavioral changes and reduced emissions. A zero on the scale indicated education was not addressed. A one the scale indicated one of the factors was included. A two on the scale indicated two or three of the factors were addressed. A three on the scale indicated four or five of the factors were addressed, indicating the project was fully explained.

- Community Outreach - This attribute encompassed any sort of community outreach and group projects between the campus and local communities, including restoration or conservation projects, workshops, city planning, volunteer programs, and more. Factors included a specific project, location for the project, a date goal, a person/group in charge, and financing. A one on the scale indicated that one of the factors was addressed. A two on the scale indicated two or three of the factors were addressed. A three on the scale indicated four or five of the factors were addressed, indicating the project was fully explained.
- Financing - This attribute addressed the financing of the CAP and was classified as detailed (3), partially explained (2), or mentioned (1). Financing received a three if the finances for at least one project were fully explained. Financing received a two if the finances for a project were partly explained, and received a one if finances were mentioned. A zero on the scale indicated that the CAP did not mention financing for a specific project or for the CAP as a whole.
- Adaptation - This attribute encompassed any adaptation or resilience policies, programs, or goals included in an institution's CAP. Factors included a specific project, location/department for the project, a date goal, a person/group in charge, and financing. A zero on the scale indicated adaptation was not addressed. A one the scale indicated one of the factors was included. A two on the scale indicated two or three of the factors were addressed. A three on the scale indicated four or five of the factors were addressed, indicating the project was fully explained.
- Carbon Offsets - This attribute addressed whether a college planned to use carbon offsets as a way to reduce their carbon footprint and was classified as detailed (3), partially explained (2), or mentioned (1). In order to be classified as detailed, a carbon offset policy needed to include 5-6 of the following six factors: a specific project, the location, a general purchase timeline, a person/group in charge, a general purchase timeline, and estimated reductions for the offset. Partially explained carbon offsets needed 2-4 of these factors. Mentioned carbon offsets needed one of these factors. A zero on the scale indicated that the CAP did not mention carbon offsets.
- Total Score - This score was the combined total of all attributes in a CAP that were ranked from 0-1 or 0-3 (Table 1). It included: the climate science primer, regional climate change impacts, planning process description, GHG emissions inventory, GHG emissions reductions target, GHG emissions forecast, plan monitoring, plan financing, transportation, waste, energy efficiency, renewable energy generation, land use planning, food services, carbon offsets, Renewable Energy Credits (RECs), education, community outreach, and adaptation strategies. It was calculated out of 53 for each institution.
- Total Mitigation Score - This score was the composite score of all of the attributes that were considered to be mitigation strategies. These strategies included: transportation,

waste, energy efficiency, renewable energy generation, land use planning, and food services. It was calculated out of 18 for each institution.

- Total Strategies - This score was comprised of all of the attributes that were considered to be climate action strategies. These strategies included: all factors included in the total mitigation score, carbon offsets, Renewable Energy Credits (RECs), education, and community outreach. It was calculated out of 30 for each institution.

Appendix E - Interview Results Tables

Group	**Institution**
Faculty	Smith College (1)
President	College of the Atlantic, College of the Holy Cross, Gustavus Adolphus College, Massachusetts College of Liberal Arts, Swarthmore College, Ursinus College, Virginia Wesleyan University, Washington and Lee University (8)
Students	Austin College, Bard College, Colby College, Denison University, Kenyon College, Luther College (6)
Sustainability office	Colorado College, Fort Lewis College, Furman University (3)
Combination of above groups	Central College, Centre College, Colgate University, Randolph College, Willamette University (5)

Table 3: Institutions' grouped responses to the interview question, "What persons or organizations started the push for a CAP?" Twenty-three institutions responded.

Reason	**Institution**
An individual, a group, or the institution as a whole was committed to sustainability	Austin College, Bard College, Centre College, Colby College*, Colgate University, Colorado College*, Randolph College, Smith College, Swarthmore College, University of Richmond, Virginia Wesleyan University (11)
It was the trend amongst higher education institutions	Denison University, Willamette University* (2)
Lined up the values of the institution	College of the Holy Cross, Kenyon College* Willamette University* (3)
Necessary to fight climate change	Colby College*, Colorado College*, Gustavus Adolphus College, Kenyon College*, Massachusetts College of Liberal Arts (5)

*Table 4: Institution's grouped responses as to why they signed onto the ACUPCC and created a CAP. Seventeen institutions responded. *Institutions gave answers that fall under multiple categories.*

Time	**Institution**
0-6 months	Bard College, Central College, College of the Holy Cross**, Gustavus Adolphus College (4)
More than 6 months - 1 year	Centre College*, Denison University**, Luther College, Massachusetts College of Liberal Arts**, Randolph College*, University of Richmond**, Virginia Wesleyan University**, Willamette University** (8)
More than 1 year - 2 years	Austin College**, Colby College**, Colgate University***, College of the Atlantic, Colorado College**, Fort Lewis College**, Furman University, Smith College, Swarthmore College** (9)
More than 2 years	Kenyon College, Ursinus College** (2)

*Table 5: Institutions' bin responses about how long it took them to develop their original CAP and whether that process felt too long, too short, or was the right length of time. An * indicates an institution felt the process was too short, ** indicates an institution felt the process was the right length of time, and *** indicates an institution felt the process was too long. Twenty-three institutions responded to this question.*

Response	**Institution**
No	Centre College, Colgate University, Denison University, Gustavus Adolphus College (4)
Yes	Austin College*, Bard College, Central College*, Colby College, College of the Atlantic, College of the Holy Cross, Colorado College*, Fort Lewis College, Kenyon College, Luther College, Massachusetts College of Liberal Arts, Randolph College*, Smith College, University of Richmond, Ursinus College, Virginia Wesleyan University, Washington and Lee University, Willamette University (18)

Unsure	Furman University, Swarthmore College (2)

*Table 6: Institutions' responses about whether they had administrative support for the creation of their CAP. All 24 institutions responded. An * indicates that the administration was supportive in theory, but, due to finances, may not be always supportive or approve of all initiatives in the CAP in practice.*

Answer	**Institution**
No	Denison University, Washington and Lee University (2)
Yes	Austin College, Bard College, Centre College, Colby College, College of the Atlantic, College of the Holy Cross, Colorado College, Fort Lewis College, Gustavus Adolphus College, Kenyon College, Massachusetts College of Liberal Arts, Randolph College, Swarthmore College, University of Richmond, Ursinus College, Willamette University (16)
Yes, a few students, but the general student not particularly involved/updated	Central College, Luther College, Smith College, Virginia Wesleyan University (4)
Unsure	Furman University (1)

Table 7: Institutions' responses when asked about whether they had student support for the creation of their CAP. Twenty-three institutions responded.

Factor	**Institution**
A consultant or point person acting as a leader	Bard College, Centre College, College of the Holy Cross*, Fort Lewis College (4)
Administrative/Presidential support	Colby College*, Massachusetts College of Liberal Arts, Smith College*, Virginia Wesleyan University*, Willamette University* (5)
A group spearheading the project	Central College*, Smith College* (2)
Dedicated student/intern research	College of the Atlantic*, Randolph College, (2)

Linked the plan to the institution's values/mission/goals	Smith College* (1)
Specialized subcommittees instead of one large group	Denison University*, University of Richmond (2)
Stakeholder involvement and working together	Central College*, Colby College*, Colgate University, College of the Atlantic*, College of the Holy Cross*, Colorado College, Denison University*, Kenyon College, Luther College, Smith College*, Virginia Wesleyan University*, Willamette University* (12)
Starting with easier projects to garner support	Gustavus Adolphus College (1)

*Table 8: Institutions' responses about what worked well during the planning process or what expedited plan creation. An * indicates that an institution gave more than one response. Nineteen institutions responded.*

Factor	**Institution**
Administrative support	Centre College*, Gustavus Adolphus college*, Smith College* (3)
Barriers come with implementation	Bard College, College of the Atlantic* (2)
Competing priorities made prioritizing CAP difficult	Kenyon College*, Luther College*, Virginia Wesleyan University (3)
Estimating and having access to necessary resources	Central College*, Colby College* (2)
Financing for projects	Central College*, Colgate University, Colorado College*, Fort Lewis College*, Gustavus Adolphus College*, Kenyon College*, Luther College*, Randolph College, Smith College*, Ursinus College, Willamette University* (11)
Involving all stakeholders	College of the Atlantic* (1)
Lack of long-term consistency in the people involved in the process (ie. new hires, students graduate)	College of the Atlantic* (1)
Not having a sustainability chair/point person	Colby College*, Willamette University* (2)

to take the lead	
Nothing	College of the Holy Cross, Denison University (2)
Emissions inventory and forecasting	Centre College*, Massachusetts College of Liberal Arts (2)
Working with the local community	Central College*, Colorado College* (2)
Worries about feasibility of projects and committing to initiatives they might not have been able to execute	Centre College*, Fort Lewis College*, University of Richmond (3)

*Table 9: Institutions' responses about what barriers they faced during plan creation. An * indicates an institution gave more than one response. Twenty institutions responded.*

Source	**Institution**
Dedicated sustainability fund	College of the Atlantic*, Luther College* (2)
Endowment/Operating Budget	Colby College, College of the Atlantic*, College of the Holy Cross, Colorado College, Fort Lewis College*, Gustavus Adolphus College*, Luther College*, Massachusetts College of Liberal Arts, Randolph College, Smith College, Washington and Lee University, Willamette University* (12)
Funding for particular projects but not in general	Austin College*, Centre College*, University of Richmond, Virginia Wesleyan University, Willamette University* (5)
No dedicated system	Swarthmore College (1)
Outside donor/grants for particular projects	Austin College* (student initiatives), Bard College*, Central College (education), Denison University* (education and student initiatives), Fort Lewis College*, Furman University*, Gustavus Adolphus College*, Kenyon College*, Luther College* (9)
Revolving Fund	Bard College*, Centre College*, Colgate University, Denison University*, Furman University*, Kenyon College* (6)

Student Sustainability Fund/fee	Austin College*, Centre College* (2)

*Table 10: Institutions' responses about how their CAP is financially supported. An * indicates an institution uses more than one method to support their CAP. Willamette University, Virginia Wesleyan University, University of Richmond, Luther College, and Colby College said finances were limiting to what they included in their CAPs and what they are able to implement. Colby College also said some parts of their CAP were expanded based on the funding options available. Colorado College said their financial state expanded what they included in their CAP and what they are able to implement. Washington and Lee University said finances did affect what they included in their CAP. Twenty-three institutions answered this interview question.*

Aspect	**Institution**
Administration support	Colby College*, University of Richmond*, Washington and Lee University* (3)
Attending conferences/outside sources that provide information about climate action	Gustavus Adolphus College (1)
Broad stakeholder involvement	Colby College*, College of the Holy Cross*, College of the Holy Cross*, Kenyon College*, Luther College*, Smith College, Swarthmore College, University of Richmond*, Virginia Wesleyan University* (8)
Creation of a sustainability office	Virginia Wesleyan University* (1)
During the planning and updating process, working with the individuals who implement the plan	Massachusetts College of Liberal Arts*, Washington and Lee University* (2)
Energy efficiency	Denison University*, Willamette University* (2)
Education	College of the Atlantic*, Randolph College*, Virginia Wesleyan University*, Willamette University* (4)
Flexibility of plan	Centre College, Colorado College (2)
Funding strategy	Kenyon College* (1)
Having a consultant/point person for the project	College of the Holy Cross* (1)
Integration with other plans	Furman University*, Randolph College* (2)

Integration with school's values and campus	College of the Atlantic*, Furman University* (2)
Land management	Denison University* (1)
Local community involvement	University of Richmond* (1)
Renewable energy	Austin College (1)
Policy-oriented for all future changes instead of detailing specific projects	Colgate University (1)
Resilience and adaptation	Randolph College*(1)
Specific project goals are very detailed for ease of implementation	Fort Lewis College, Ursinus College (2)
Specific reductions goals and timelines increasing accountability	Colby College*, College of the Atlantic*, Luther College* (3)
Student involvement	Randolph College*, Smith College*, Willamette University* (3)
Technical upgrades written into plan	Massachusetts College of Liberal Arts* (1)
Waste	Denison University* (1)

*Table 11: Institutions' responses about what aspects of their CAP and CAP implementation are working well. An * indicates an institution had more than one response. Twenty-three institutions responded.*

Aspect	**Institution**
Administration support	Austin College*, Bard College*, Gustavus Adolphus College* (3)
Being more ambitious with goals	University of Richmond (1)
Campus community involvement	Austin College*, Denison University*, Gustavus Adolphus College* (3)
Clarify timelines	Centre College*, Fort Lewis College*, Swarthmore College* (3)
Economic analysis	Centre College* (1)
Education	Denison University*, Luther College,

	Massachusetts College of Liberal Arts* (3)
Energy efficiency	Austin College*, College of the Atlantic* (2)
Everything	Kenyon College*, Willamette University* (2)
Funding	Austin College*, Central College*, College of the Atlantic* Furman University, Massachusetts College of Liberal Arts* (5)
Include more people in the planning process	Colgate University, Washington and Lee University* (2)
Lack of staff for what needs to get done	Randolph College (1)
Land management	College of the Atlantic* (1)
Limiting Scope 3 emissions	Willamette University* (1)
Local community involvement	Smith College* (1)
Organization of planning process	Washington and Lee University* (1)
Plan specificity and detail	Centre College, Kenyon College*, Swarthmore College* (3)
Resilience and adaptation	Gustavus Adolphus College*, Smith College* (2)
Revision process	Bard College*, Centre College*, College of the Holy Cross, Kenyon College*, Massachusetts College of Liberal Arts* (5)
Setting shorter-term, attainable goals and then developing new goals after	Fort Lewis College* (1)
Transportation	Austin College*, Colby College, Virginia Wesleyan University, Washington and Lee University*, Willamette University* (5)

*Table 12: Institutions' responses about what aspects of their CAPs and CAP implementation need improvement. An * indicates an institution had more than one response. Twenty-one institutions responded.*

Response	Institution
Yes	Colgate University, College of the Atlantic, College of the Holy Cross, Colorado College,

	Denison University, Fort Lewis College, Randolph College, University of Richmond, Virginia Wesleyan University (9)
No	Austin College, Bard College, Centre College, Furman University, Kenyon College, Luther College, Swarthmore College, Ursinus College, Willamette University (9)
Unsure	Central College, Gustavus Adolphus College, Massachusetts College of Liberal Arts (3)

Table 13: Institutions' responses about whether or not they are on track to meet their interim or end carbon neutrality goals. Twenty-one institutions responded.