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## Climate Action Plan Framework for University of Nebraska-Lincoln

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An Undergraduate Thesis Proposal

Climate Action Plan Framework for University of Nebraska - Lincoln

By Lila Peterson

Presented to

The Environmental Studies Program at the University of Nebraska-Lincoln

In Partial Fulfillment of Requirements

For the Degree of Bachelor of Science/Arts

Major: Environmental Studies

Emphasis Area: Natural Resources

Thesis Advisor: Prabhakar Shrestha

Thesis Reader: Dave Gosselin

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## **INTRODUCTION**

When the topic of climate change is brought up in discussion many Nebraskans may find it difficult relating to topics close to home. This is due in part to the fact that the most of the climate change news shows more information on the livelihood of polar bears in the Arctic, coral reef along the coast of Australia, or the desertification of the African continent. While these are devastating issues, there are many issues that we face as Nebraskans, and to date there is very little we have done to prepare our state for the impending changes we will face as a result of anthropogenic climate change. The cause of this change comes from human excessive use of greenhouse gases (GHGs). Greenhouse gas emissions can be byproducts from transportation, agriculture, and other industries. The GHG's causing the most damage to the atmosphere are carbon dioxide, methane and nitrous oxide. The combination of these three gases is causing the greenhouse effect which creates a thicker atmosphere and increases the albedo of the earth's surface. Albedo is the reflectivity of a surface, dependent on color of the surface. All surfaces of Earth's are slightly reflective so that energy from the sun can bounce back and be either released from the atmosphere or trapped to create heat energy. The most reflective surface of the planet is snow or ice. As more chemical inputs are added into the atmosphere more and more solar radiation is trapped that cannot escape, therefore warming the planet. If the solar radiation cannot escape it will bounce back down to the earth's surface which melts the largest source of snow and ice on the planet, the northern pole. This area is warming at a rate much higher than areas around the midlatitudes because of the way the oblong shape of the atmosphere. There is more accumulation of atmosphere and uv light at the Northern and Southern poles of the earth. This effect is exaggerated further as the snow and

ice melts, because there is less and less solar radiation being reflected, so more is absorbed by the earth's surface which as a result, raises temperatures (Henson).

According to the Intergovernmental Panel on Climate Change (IPCC) Special Report 1.5, humans have accounted for 1.0 degree Celsius rise in temperature above pre industrial levels and are likely to cause a raise of 1.5 degree celsius by 2030-2052. This rise in overall earth temperature is highly likely to cause increased extreme temperatures –hot and cold, increased drought occurrence –length and intensity, as well as an increase in heavy precipitation amount –duration and frequency. The increase in these events is catastrophic for many nations especially low lying coastal regions and small islands. These are not the only areas affected however, high elevation and high latitude regions are also being impacted (IPCC, 2018). Systems will be devastated, many of which will be unable to recuperate even in there was an immediate change to current behavior. Marine coral and arctic ecosystems will be the most severely impacted by the temperature rise. Anthropogenic climate change is a threat to the natural environment along with the built environment. Industries built around tourism will suffer and decline, along with crop yields in agricultural industries. There will also be an increase in morbidity due to heat related illnesses. The elderly and very young will be the largest proportion of this statistic (Henson).

So, while the first to be impacted may be far from nebraska, we will not be able to escape the grave impacts that anthropogenic climate change will bring to the world. The report “Understanding and Assessing Climate Change Implications for Nebraska” written by Deborah J. Bathke, et al., writes specifically about impacts that Nebraska has already felt, along with some projected changes that will create need for immediate adaptation and mitigation. One of the largest areas for concern is reduced snowpack in the Rocky Mountains which can lead to severe droughts along with other issues. Warming is a main cause of the reduced snowpack and will

continue to lengthen the frost-free season which has already increased by 5-25 days across the state. Climate change is a future, present and past issue. There are going to be more changes, we are seeing these changes now, and we can see the changes that have already happened. We as a culture need to stop presenting climate change as a far off event, it is has already happened and it is time to take action.

### **Climate Action and Resiliency Plans**

Creating a climate action plan (CAP) is a challenging task since there are many interpretations of what a plan entails. While there are many opinions, the definition given in the President's Official Climate Action Plan is widely accepted and used as a reference tool for many institutions. An abridged version would be a plan that focuses on actions to reduce greenhouse emissions and also support neighborhoods, economic prosperity, and social equity. These plans are generally focused on areas in greatest need such as road transportation, building energy, and waste. The Presidential CAP is essentially a portfolio of recommended policies to reduce GHG emissions. Essential components can range from building efficiency, waste management, renewable energy, vehicle use, and restoration of natural landscapes (President's Climate Action Plan. (n.d.)). In many plans the main focus is reduction of greenhouse gases. The President's Official CAP is only for the United States and is not an active plan, it is a set of proposed guidelines. Institutions around the world however, are introducing climate action plans to create a series of timelines for the reduction carbon emissions along with goals to adapt and mitigate the climate crisis.

The Paris agreement is a resiliency initiative first adopted in December of 2015 and now 195 parties have signed on in agreement. The Paris Agreement was made to strengthen the global response to climate change and to ensure the global temperature rise remains well

below 2 degrees Celsius. While the United States was once apart of the agreement it has since withdrawn from the list of signatories. Another global initiative that is working to toward a goal of resiliency is the United Nations. The UN has created 17 goals to work towards sustainability. These goals take into account the human element and that it is unrealistic to achieve true sustainability in a world that still has inequalities and therefore there are goals such as “No Poverty”, “Gender Equality”, “Quality Education”, and “Good Health and Well-Being.” Goal 13 of the UN Sustainability Goals gives five targets for adapting and mitigating climate change. These targets include integrating climate measures into policy, strengthening resilience to climate related hazards, improving awareness of climate change and more (UN Sustainable Development).

A resiliency plan is another term for essential a more inclusive climate action plan. Resilience is a topic that is more digestible for many people because it is creating a way for institutions to become resilient in many facets. This type of plan is essential a rebranded term for a CAP that can be presented to all people regardless of preconceived notions. In a resilience plan there can be more goals and initiatives in place. There can be more reporting and tracking processes in this type of plan as well since the term is newer and more pressure is instilled for results. Second Nature uses resilience within their recommended themes for a climate plan, which I will discuss in more detail later. Second Nature states that there are five dimensions to resilience, which are, infrastructure, economic, ecosystem services, health & wellness, and social equity & governance. The intention is that these five dimensions are able to bounce back from any disruptions in a system. Since the resiliency of these five systems is such an undertaking, resiliency plans are often necessary and can be used in place of a climate action plan or in addition to one.

In this paper both resilience plans and climate action plans will be mentioned. The decision on which verbage to use will come from the source being referenced. As a state, Nebraska is behind in creating an effective climate action plan, we are in the top ten energy consuming states in the nation due to our various energy-intensive industries (Bathke, 2014). Since universities around the country are leaders in climate action, it is imperative that the University of Nebraska - Lincoln (UNL) begins making steps toward a CAP or introduces a resiliency plan.

With many large scale institutions creating goals for climate sustainability, there was a need to create a standard for climate action plans in the US. This standard came from the American College & University Presidents Climate Commitment or ACUPCC. This started with the belief that all universities have a responsibility to protect the environment for the past, current, and future students of America by taking climate action. Beginning with a meer 12 institutions, ACUPCC has now grown to have over 600 signatories. With support from the organizations Second Nature and the Association for the Advancement of Sustainability in Higher Education, or AASHE, institutions are committed to create a “just, healthy, and sustainable society” (Second Nature, Network). This is not a commitment to be taken lightly as there are serious requirements with deadlines for signing the initiative. These requirements are –according to the Second Nature Commitments Implementation Handbook– to eliminate operational GHG emissions, to provide the education, research, and community engagement to enable the rest of society to do the same, and to publicly report progress on an annual basis. The time limit to complete these requirements and create a climate action plan is only three years, so an institution must work efficiently to complete the outlined goals. Second Nature gives examples of Climate Action Plan structures on their website and mentions that these

plans are meant as “statements of intent rather than binding commitments”(Second Nature, Examples of Climate Action Plan Structures).

## **METHODS**

### **Background**

To gain preliminary knowledge about the changes in climate, present and future, I used keywords “Climate change”, and “Nebraska.” this search returned the report written by Deborah Bathke and others “Understanding and Assessing Climate Change Implications for Nebraska.” for general information about climate change and its implications I used Robert Henson’s book “A Thinking Person’s Guide to Climate Change.”

### **Research Method**

The goal of this study is to perform comparative analysis of universities with current climate action plans and conduct a gap analysis to prepare UNL for the creation of a CAP. Asking the question “What is the most important element for UNL’s future climate action plan?” The methods and approaches from other universities will be researched to determine the main points in creating a CAP. Using comparison models from other universities in the nation, including from other land grant and BIG 10 conference schools. There are 4 universities in the BIG 10 that have implemented CAP’s for their campuses and have reached many goals that they have set out to complete. The BIG 10 schools who have created CAP’s are Illinois, Ohio State, Minnesota, and Maryland. I have selected to compare the University of Minnesota at the Twin Cities , Ohio State university, and Illinois at Urbana-Champaign because of their proximity to UNL and the similarities that each of these three schools will face in terms of climactic events. These three universities are also land-grant status. I will also be doing a



comparison of two institutions that Second Nature gives as examples for institutions to follow. These universities are University of California - Davis, another land-grant, and Arizona State University.

To compare these universities I will be using the general themes for a CAP from Second Nature. Second Nature gives these themes as well as examples of a plans structure that can help an institution when getting started on the path to creating a plan. There are seven total themes for a single plan. The first listed is strategic framework which is essentially explaining why the institution is creating a plan and why it is important to the institutions mission statement, along with any additional background information that is relevant. As part of strategic framework a school should include a planning team for plan initiatives, defined objectives and goals, a published CAP, and a resilience assessment.

The next theme is campus emissions. This is a fairly straight forward topic in definition but it requires a serious deadline for the future of emissions, in all sectors, with the ultimate goal of climate neutrality. This section would include figures or interactive graphs showing comparisons between a “business as usual” and a mitigation plan. The key components in this section being the climate neutrality date, greenhouse gas emission inventory, and scope 1, 2 and 3 GHG inventory. According to the EPA these scopes are the subdivision of the source of greenhouse gases. Scope 1 is direct emissions from an institution, such as on-site fossil fuel combustion and fleet fuel consumption. Scope 2 includes emissions that result from the generation of electricity, heat or steam purchased by the Agency from a utility provider. The third scope is more indirect sources such as contracted solid waste disposal and wastewater treatment. Another important factor of scope 3 emissions is those from employee travel (EPA, 2018).

The third topic to be addressed is mitigation strategies. In this section the institution will explain exactly how climate neutrality will be achieved and define the strategies they will be using. Components expected in mitigation strategies are well defined strategies, carbon neutrality goals across the three scopes, energy conservation measures, transportation alternatives, and waste minimization goals.

The fourth topic is the creation of resilience strategies. This is where a resilience plan and a climate action plan come together. Second Nature gives the five dimensions of resilience that I discussed earlier. The resilience strategies section must include future scenarios, vulnerability assessments, community partnership, and prioritization of urgent and important vulnerabilities.

Another theme essential to a CAP as defined by Second Nature is educational, research, community outreach efforts. This section gives information about how the institution will expand the importance of climate neutrality in curriculum and in research efforts. Here there will be subsections on education and how the institutions plans to involve the student body and the community in goals toward climate neutrality. The key components being cross disciplinary curriculum, systems based teaching, funding sustainability research and development.

An obvious theme required in the installation of a CAP is how the mitigation strategies and other neutralization efforts will be financed. The financing components are cost assessment, benefits assessment, financing options.

The seventh and final theme highlighted by Second Nature is the implementation & tracking of progress which addresses who will be responsible for ensuring that the goals presented will be achieved. The most essential components in this theme are data tracking, carbon/ghg inventories, tracking other plan elements.

## Rubric Creation and Formatting

The themes from Second Nature, will be combined to create a rubric to compare the effectiveness of a university’s plan and to serve as a guideline for the future creation of a plan for UNL. There are seven overarching themes that Second Nature identifies as essential, As I mentioned in previous paragraphs, (Strategic Framework, Campus Emissions, Mitigation Strategies, Resilience Strategies, Educational, Research, Community Outreach Efforts, Financing, and Implementation & Tracking Progress). These seven themes will serve as dividing elements for the rubric I have created. I chose to use these themes as the scoring guidelines for my rubric because they can be followed verbatim in the creation of a plan for any institution. I am using this rubric to score the plans that have already been created by my selected institutions to identify the topics where information is lacking or there could be more explanation. This analysis will be useful when UNL wants to create its own resilience plan so that extra care can be taken in these difficult topics and any shortcomings can be avoided.

Below is an example of a blank rubric.

<b>Scoring Rubric For The Creation Of A Climate Action Plan By A University.</b> To use this rubric give each theme component a “2”, “1”, or “0” rating depending on its level of completion. A “2” rating would mean that the component has been thoroughly executed. A “1” rating would mean that the component is partially completed but not in a published plan, this could mean that the component is discussed on a website. A “0” rating means that the component has not been executed at all and there is no mention of it in a current plan or visible by the public. There are seven themes with various components. Tally the individual component rating to create a subtotal for each theme. As an example, the subtotal should be “Subtotal : <u>7</u> out of 8”. Upon completion of rating each component for each theme, tally together the subtotals to find the overall rating. The Maximum rating is 50 out of 50. The grey cells delineate blank spaces that do not need to be written in.		
Themes as Defined by Second Nature	Rating (2, 1, 0)	Theme Rating
Strategic Framework		
- Planning team for plan initiatives		
- Defined Objectives and Goals		
- Published CAP		
- Resilience Assessment		
		<b>Subtotal : ___ out of 8</b>
Campus Emissions		
- Climate Neutrality Date		

- Greenhouse Gas Emission Inventory		
- Scope 1, 2 and 3 inventory separately		
		<b>Subtotal : ___ out of 6</b>
Mitigation Strategies		
- Well defined strategies		
- Carbon neutrality goals across three scopes		
- Energy conservation measures		
- Transportation alternatives		
- Waste minimization		
		<b>Subtotal : ___ out of 10</b>
Resilience Strategies		
- Future Scenarios		
- Vulnerability assessments		
- Community partnership		
- Prioritization of urgent and important vulnerabilities		
		<b>Subtotal : ___ out of 8</b>
Educational, Research, Community Outreach Efforts		
- Cross disciplinary Curriculum		
- Systems based teaching		
- Funding sustainability research and development		
		<b>Subtotal : ___ out of 6</b>
Financing		
- Cost assessment		
- Benefits assessment		
- Financing options		
		<b>Subtotal : ___ out of 6</b>
Implementation & Tracking Progress		
- Data Tracking		
- Carbon/GHG inventories		
- Tracking other plan elements		
		<b>Subtotal : ___ out of 6</b>
		<b>Total Rating : __ out of 50</b>

The institution will be given a “2”, “1”, or “0” rating. If the categories receives a “0” it means that the item is missing from the plan entirely and is not highlighted on the institutions website. A “1” rating is a partial completion. A partial completion can be if the university has done basic framework for a component and posted it publically but it is not a part of a published plan, or it is not fully complete within the plan. A “2” is the highest rating possible for a given component. To warrant a “2” the item must be completely addressed and executed or have a plan to be executed. There is a possibility of earning up to 50 points. The seven themes have components within them therefore each theme is worth a different amount of points. This does not mean that any one category is less important than another it just simply means that there are not as many subdivisions within the theme. The subdivisions within each theme come from Second Nature’s webpage for each theme. While each theme requires extensive information and a variety of overlapping steps, I chose the most essential to a specific theme. If an item could be included in multiple categories the theme that seemed to be the best fit for the given item was chosen. For example, resilience assessments were mentioned in strategic framework, mitigation strategies, as well as resilience strategies. In the rubric created, this item was placed in the strategic framework theme because of the fact that a resilience assessment should be executed before a CAP can be created to determine why the institution needs a CAP and what would benefit from the creation of a plan.

When using the rubric to grade a certain university, Second Nature was used as a resource for locating the CAP. If there was not a link to a CAP on Second Nature, the university’s website often had a link that could be followed to find the updated CAP online. When it came time to grade University of Nebraska - Lincoln, who does not have a plan, plan items were searched for individually and if the item was not explicitly stated in an apparent fashion, it would not be given credit. After completing the rubric for each university, the information was

displayed in a bar graph for easier understanding. The averages of each category were then taken to determine which theme needed extra attention when writing a CAP.

### **Completing the Rubric**

To fully utilize the rubric there are some special considerations to be made for some theme components. There are certain theme components that are not simple yes or no answers, or components that may be in a plan under different jargon than that selected by Second Nature. These components can still be award points but may require additional searching within a CAP to be found.

Within the strategic framework theme the components are planning team for plan initiatives, defined objectives and goal, published CAP, and resilience assessment. To locate the planning team within a climate action plan can requires additional searching. Different universities will call the planning team a range of names which can make it difficult to find using a simple search. Typically the mention of some kind of planning team is found in the introduction or first section of the plan. Other terms that could be found and deserving of points for this component are planning “committee”, “commission”, “board”, etc. The planning team or whatever the institution decides to call their group of individuals, should be assigned the mission of creating initiatives and goals for a climate action plan. These initiatives should have defined objectives and goals. To determine whether or not an institution has defined goals, there should be steps or a show of progression. Giving a score for a published CAP is a simple scoring, if there is a published plan through Second Nature the institution will receive full points. If there is not a plan through CAP, they will receive no points. This is similar with the resilience assessment. An institution should publish their resilience assessment through SEcond Nature. For this component a school does have the possibility of receiving partial points if they

have an assessment published but there are blank spaces within the assessment. To understand full what the resilience assessment should look like, view the assessments for Arizona State University in appendix A.

The next theme in the scoring rubric is the Campus emissions theme. This theme has three components which are climate neutrality date, greenhouse gas emission inventory, and scope 1, 2, & 3 inventory separately. To score the climate neutrality date there should be a defined date for full climate neutrality. A partial score will be given if there is a partial reduction date but no 100% reduction date. There were not any other phrases used in my selected group but, other terms for this could also be found as carbon neutrality, or emission neutrality. The inventory of greenhouse gas emissions should include numerical data or source information. This leads in to the inventory of scope emissions. To receive full credit there should be an inventory breakdown for all scopes of GHG emissions and if there is not, an institution cannot receive, 2 points. It is often more difficult to inventory the breakdown of scope three emissions so it is necessary to be diligent when completing the rubric and looking for his scope.

The third theme in the rubric is the mitigation strategies. The components are well defined strategies, carbon neutrality goals across three scopes, energy conservation measures, transportation alternatives, and waste minimization. This theme requires some more careful reading to determine if the institution has strategies in place. The well defined strategies component should be searched for as any written out strategies for the reduction of GHG's or any strategies toward mitigation. These must be written out and thoroughly explained within the plan. Then there must be goals for carbon neutrality across three scopes. These goals can be more thorough for a full score or less thorough for a partial score. Energy conservation goals should be looked for with anything related to electricity or even becoming LEED certified can be counted. To be considered for full credit, an institution should have multiple goals for

conserving energy. The transportation alternatives can be searched for as fleet alternatives, or increasing public transit users, and increase of infrastructure for walking and biking. If there are multiple proposed strategies the institution can receive full credit, or if there are only a few strategies The final mitigation strategies component is waste minimization. This component should include things like composting, recycling or reducing the amount of waste created. These goals should be well defined with project initiatives.

The fourth theme is resilience strategies with components: future scenarios, vulnerability assessments, community partnership and prioritization of urgent and important vulnerabilities. The future scenarios relates to emission reductions. Similar to the IPCC rcp scenarios. These do not necessarily have to be extremely thorough but they should be included to show the importance of a plan. The vulnerability assessments are related to resilience assessment set up by Second Nature. This is something that would be filled out within the resilience assessment so if they have not conducted this assessment there will be no mention of a vulnerability assessment. Though if a CAP mentions vulnerabilities they can receive partial credit. Community partnership is another component that may require searching for other terms. If a CAP mentions working with community or any form of outreach outside of the institution, it can receive credit. Planning for future outreach can earn partial credit. The prioritization of urgent and important vulnerabilities also works in conjunction with the vulnerability assessments but it can be counted for credit if an institution has mentioned vulnerabilities and will take action toward them first.

The next theme in the rubric relates to education, research, and community outreach. The components are cross disciplinary curriculum, systems based teaching and funding sustainability research & development. These components should be found in an education section of the CAP. The cross disciplinary component means that a course should be embedded



with the principles of a CAP. To count as credit there must be mention of including the mission of a climate action plan within the future or current course and even a list of courses that can be taken to learn more about the principles in the CAP. The systems based teaching should include teaching things as a system meaning teaching that all things are interconnected. To find this within a CAP one could look for courses that are interrelated. The funding research component should be stated either in the education portion or in the financing section and be a part of the universities mission.

The second to last theme in the rubric is the financing. The components in this theme are cost assessment, benefits assessment and financing options. typically financing the climate action plan will have its own portion due to the importance of the topic. Cost assessment can also be called a cost analysis and include both the costs and benefits. This section often includes graphs and a breakdown of costs. If a financing section does not include the benefits assessment it will not receive any credit. The options for financing are also required and can come from the institution or mention what grants will be utilized or if financing will come from outside sources.

The final theme is the implementation and tracking progress within this theme components data tracking, carbon/ghg inventories and tracking other plan elements. Data tracking can be in the form of graphs and tables that show how the emissions will be reduced. They will most likely be in the same section as the climate neutrality goals. The carbon/ghg inventories should also be in a graphical form and in the climate neutrality section. This is similar to the component of emissions inventories in the campus emissions theme but it should be including graphs. Tracking other plan elements should be any type of progression through the CAP. The tracking can be in the form of graphs or in a report that is published annually.

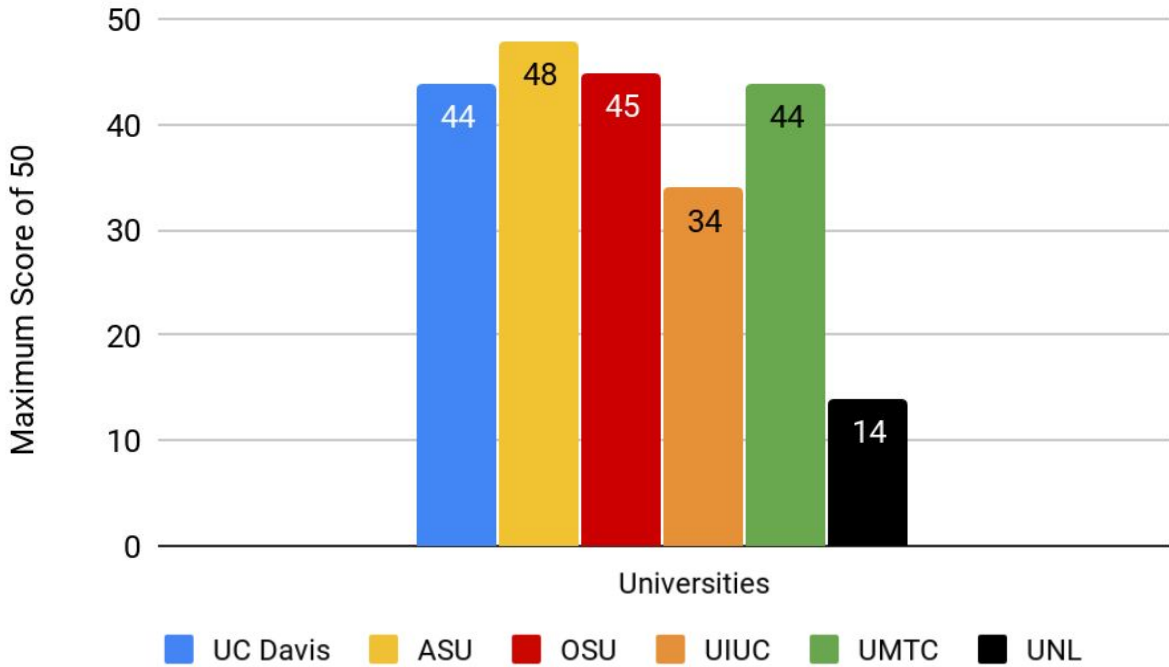
## RESULTS

### Rubric Scores

The completed rubric for each university can be found in Appendix C with individual theme breakdowns in Appendix B. The highest scoring university from the sample was Arizona State University with a score of 48 of 50. The next highest scoring university was The Ohio State University with 45 of 50, followed by University of California - Davis and University of Minnesota - Twin Cities with scores of 44 of 50, and then University of Illinois -Urbana Champaign with a 34 of 50. UNL was the lowest scoring overall with a score of 14.

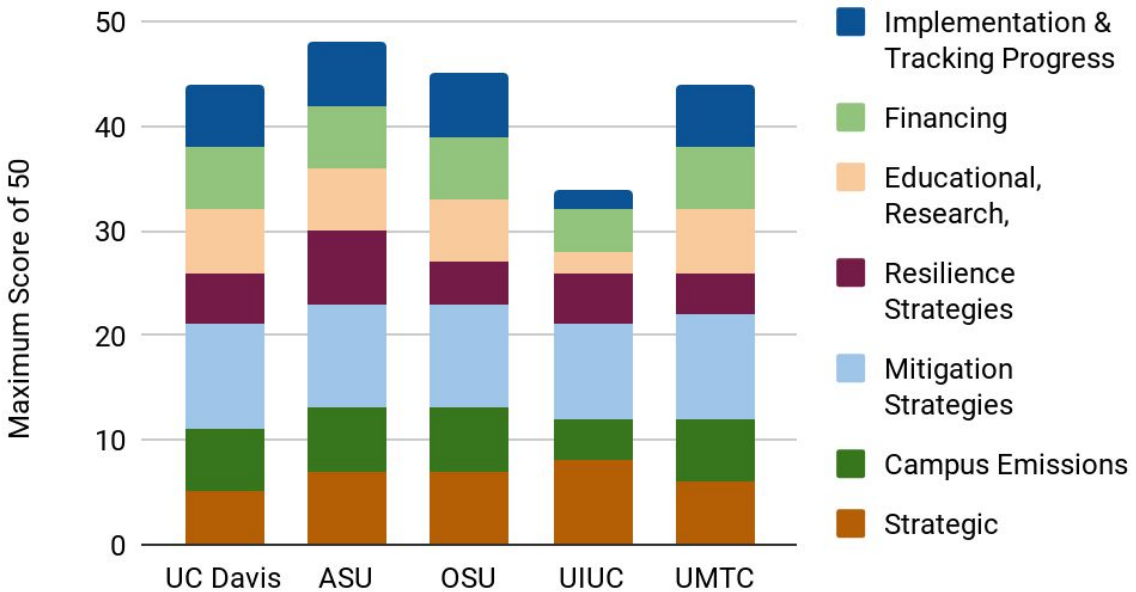
	<b>UC Davis</b>	<b>ASU</b>	<b>OSU</b>	<b>UIUC</b>	<b>UMTC</b>	<b>UNL</b>
<b>Strategic Framework</b>	5	7	7	8	6	2
<b>Campus Emissions</b>	6	6	6	4	6	3
<b>Mitigation Strategies</b>	10	10	10	9	10	2
<b>Resilience Strategies</b>	5	7	4	5	4	0
<b>Education, Research, Community Outreach</b>	6	6	6	2	6	2
<b>Financing</b>	6	6	6	4	6	0
<b>Implementation &amp; Tracking Progress</b>	6	6	6	2	6	5
<b>Totals:</b>	44	48	45	34	44	14

## University Totals



The graphs show the breakdown of scoring for each university.

## Climate Action Plan Rating



## Theme Averages & Gap Analysis

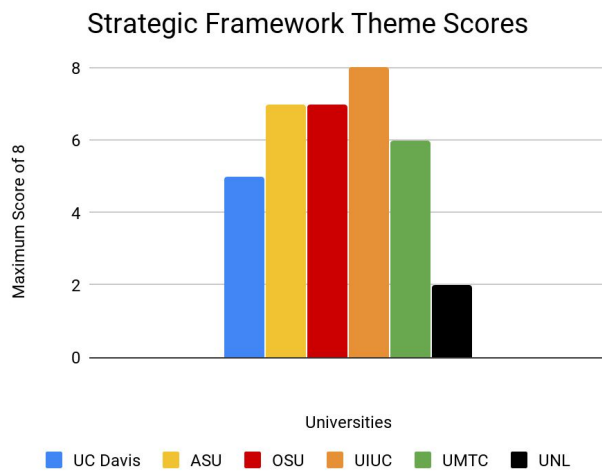
The average score excluding UNL from the rating was a 43 out of 50. To determine which category needs to most attention when UNL formally writes a CAP the averages from each theme were taken excluding the results from UNL's scoring because it does not have a published plan and would skew averages negatively. The averages are:

- Strategic Framework: 6.6 out of a possible 8
- Campus Emissions: 5.6 out of a possible 6
- Mitigation Strategies: 9.8 out of a possible 10
- Resilience Strategies: 5 out of a possible 8
- Education, Research, Community Outreach: 5.2 out of a possible 6
- Financing: 5.6 out of a possible 6
- Implementation & Tracking Progress: 5.2 out of a possible 6

Gap Analysis of University of Nebraska - Lincoln based on results of scoring rubric.					
Theme	Maximum Score	UNL's Score	Gap	Missing Components	
Strategic Framework	8	2	-6	Published CAP, defined objectives and goals, resilience assessment	
Campus Emissions	6	3	-3	Climate neutrality date, inventory for scope 3 emissions	
Mitigation Strategies	10	2	-8	Well defined strategies, carbon neutrality goals across three scopes, energy conservation measures, transportation alternatives	
Resilience Strategies	8	0	-8	Future scenarios, vulnerability assessments, community partnership, prioritization of urgent and important vulnerabilities	
Education, Research, Community Outreach	6	2	-4	Partial cross disciplinary curriculum and systems based teaching, no mention of funding sustainability research and development	
Financing	6	0	-6	Cost assessment, benefits assessments, financing options	
Implementation & Tracking Progress	6	5	-1	Partial tracking plan elements	
	Total:	50	14	-36	A comprehensive plan will raise total score

## Discussion

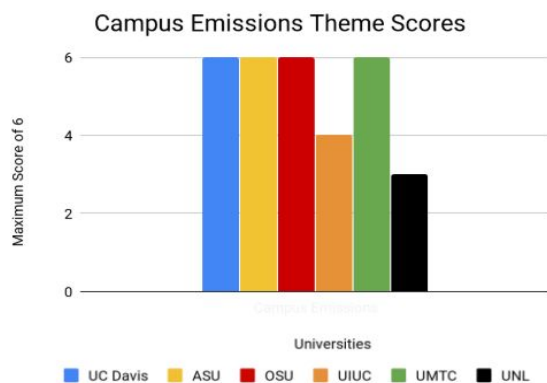
Due to the results of the various rubrics it can be determined that Second Natures themes are thoroughly followed when universities are creating their CAPs. Strategic framework



had an average score of 6.6 out of 8 which shows that more focus is need during the planning phase of the creation of a plan. The lack of resilience assessments from all schools except ASU and UIUC also caused low scores. The gap analysis shows that UNL is -6 points from the maximum score and lacking a

published CAP, defined objectives and goals, and resilience assessment. Publishing a CAP will help the university become a sustainable institution and allow for a single location that explains all sustainability objectives and goals. Utilizing a resilience assessment can help a university to understand where the weak points and vulnerabilities are on a campus.

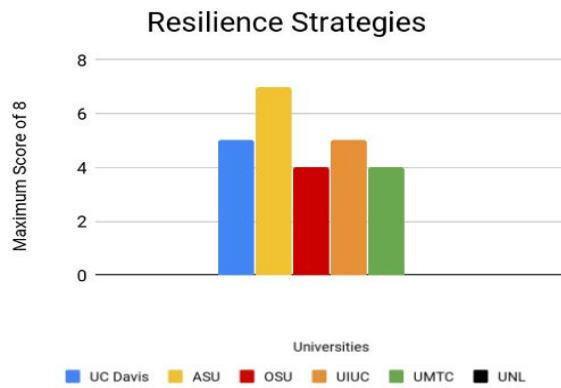
The campus emissions had an average rating of 5.6 out of 6 with the only outlier being UIUC that did not inventory their GHG emissions in the forms of three scopes. UNL received a 3



in this theme making a -3 gap from the maximum score. Lincoln does not have a climate neutrality date and emissions for scope 3 GHGs are not inventoried. Completing a GHG inventory aids in the creation of a climate neutrality date which is an

essential component for a comprehensive CAP or resilience plan. Without the separate inventory of emissions it would be difficult to truly claim the status of climate neutral.

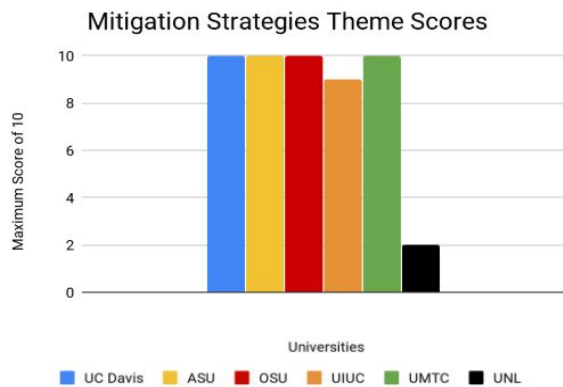
Creating the resilience strategies portion of a CAP was a theme that all universities rated struggled with. With an average score of 5 out of 8, it was the lowest scoring theme of the



seven from Second Nature. The theme is focused on key factors of resilience which include: future scenarios, vulnerability assessments, community partnership, and prioritization of urgent and important vulnerabilities. Universities lost points for not including vulnerability assessments in the

CAP. Only 2 of the 5 universities rated had published resilience assessments through Second Nature (links to these assessments can be found in Appendix A). ASU and UIUC both have published these assessments which provide crucial information about vulnerabilities relating to climatic events and other stressors. The lack of future scenarios in a CAP also caused universities to lose points. The importance of these scenarios reminds readers of the necessity for a CAP and shows the worst case scenarios if nothing was to be changed as well as a best case scenario if the plan progresses. For this theme, UNL received a 0 out of 8 which is not surprising due to the lack of a published resilience assessment. Identifying vulnerabilities for UNL can help the university become a community leader and set an example for the city, who also does not have a community climate action or resilience plan.

The theme related to mitigation strategies had an average score of 9.8 out of 10. The only school that had a score of lower than 10 was UIUC which does not have goals for climate neutrality for all scopes. UNL did not receive points for any of the theme categories with the exception of a 2 for waste minimization making a -8 gap from the desired maximum score. UNL



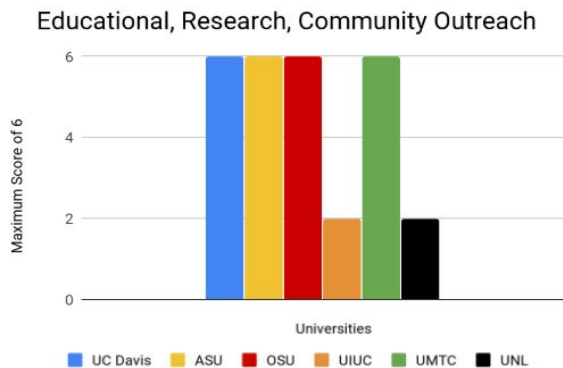
has published information on the sustainability page about efforts to reduce waste on campus.

Having defined mitigation strategies within a climate action plan shows the commitment to the cause of becoming a sustainable institution.

Creating these types of strategies will involve

multiple groups across the university including, staff, maintenance employees, utility companies, planners, and even students. Involving as many people in the process as possible will help relay the importance of an issue and increase the likelihood of follow through.

Another way to involve more members of a university system is through the next theme, Education/Research & Community Outreach. This theme had an average score of 5.2



out of 6. The only school to not receive a 6 rating

was UIUC who had little cross disciplinary course and no mention of systems-based teaching. These

topics are often difficult to identify from a CAP so it could be something that is mentioned in individual

course syllabi. There is also only mention of future

support for climate based research with no emphasis on its importance. This shows the

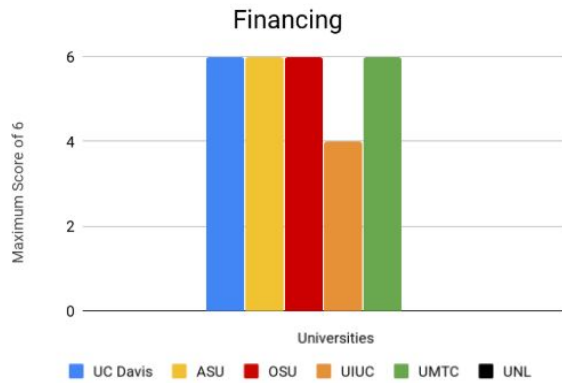
importance of clarity in a CAP for UNL. A plan should show the mission and values a university

has as a teaching and research institution . If UNL wants to show its commitment to

sustainable measures, the courses offered should reflect the goals of a CAP through cross disciplinary courses as well as teaching systems based concepts.

One theme that is a major concern for any institution who wishes to create a CAP is the Financing. An average of scores for this theme was 5.6 out of 6, with the only university to not

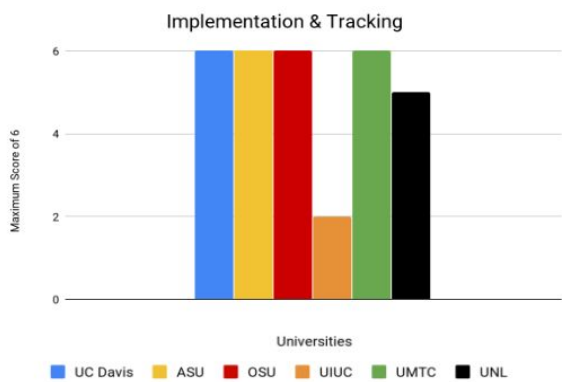
receive a perfect 6 being UIUC. Illinois was docked points because they did not provide



cost/benefit assessments for their strategies. This cost/benefit assessments are useful when presenting options to financiers of projects. These assessments can also bring in donors who wish to help the university accomplish sustainability goals. Creating cost/benefit assessments for mitigation

strategies at UNL is an essential step to show a board the importance of the creation and utilization of a CAP. Financing options are also needed to show that thorough research has been conducted on an item and that a goal is achievable.

The final theme to be considered is Implementation & Tracking Progress. This theme which averaged a 5.2 out of 6, relates to the tracking of emissions from carbon and GHGs as



well as other plan elements and strategies.

Tracking and publishing data is a way for a university to share the progress made toward the plan's goals. UIUC was the only institution to track plan elements other than carbon emissions.

Without showing the implementation of goals

within the plan, public and university members will lose trust in the plan and it could risk losing support. This could also result in a loss of interest from university members who may not understand the importance of an active and updated CAP. The University of Nebraska - Lincoln does track emissions and post them for public viewers, so it is ahead of the game in terms of tracking progress especially without a formalized CAP.



It is apparent that UNL would create a successful climate action plan if it followed the themes set forth by Second Nature. The following the example of Arizona State University would be a way to ensure that the future plan is comprehensive. Of the plans rated the only university that would not be recommended as a resource is University of Illinois - Urbana Champaign for their lower scoring result of 34 in the rubric. The best advice for UNL is to involve as many people in the research for the plan as possible and publish the steps taken in the plans creation. Utilizing Second Nature is an essential for resources, networking, an reporting plan elements.

## **Conclusions**

Due to the apparent changes in climate due to anthropogenic behaviors it is essential for humans to take action and change their way of life. If the world wishes to continue in a sustainable fashion there must be a plan of action to reduce the human impact on the world. A rise in temperature of 1.5 Celsius is not sustainable for many ecosystems and humans will suffer due to the increase in extreme climatic events such as drought, flood, and extreme storms. These changes are already unfolding across the world and it is now necessary for nations to become resilient to them if they wish to survive the upcoming centuries. The United States does not have an active plan toward resilience or climate action. The state of Nebraska is also not prepared to face these climatic forces. It is the responsibility of universities to set examples for the communities in which they reside to become resilient to present and future stressors.

Through the creation and utilization of a climate action plan in conjunction with a resilience plan, a university can set the example of a positive sustainable leader. An excellent resource for the creation of a CAP is Second Nature and the themes the organization has set

out. There is not one single element that is more important than another for the creation of a plan. For a plan to be successful and accepted UNL must execute all themes thoroughly. To reiterate and important topic, universities have a responsibility to protect the environment for the past, current, and future students of America by taking climate action eliminate operational GHG emissions, to provide the education, research, and community engagement to enable the rest of society to do the same, and to publicly report progress on an annual basis. UNL has a responsibility to its students, staff and educators, as well as the community it resides in to become an environmental leader. The time for climate action is now and UNL must be ready to make a plan. The University of Nebraska -Lincoln's Office of Sustainability has a mission to develop strategies and action plans, and provide support for sustainability initiatives within the UNL campuses and community. The framework is in place for UNL's action plan and hopefully receiving a score of 14 out of 50 will result in support for the creation of a future climate action plan.

Further studies can be done to determine whether or not location, institution type, etc., plays a role in the creation and implementation of a climate action plan. The universities selected for this study were mainly land-grant institutions with the exception of Arizona State University.

## **APPENDICES**

### **A. Resilience Assessments**

### **B. Theme Score Figures**

- Strategic Framework
- Campus Emissions
- Mitigation Strategies
- Resilience Strategies
- Educational, Research, Community Outreach
- Financing
- Implementation & Tracking Progress
- Total Scores

### **C. University Climate Action Plans and Rating**

- University of California Davis
- Arizona State University
- Ohio State University
- University of Illinois - Urbana Champaign
- University of Minnesota - Twin Cities
- University of Nebraska - Lincoln

## APPENDIX A

Arizona State University:

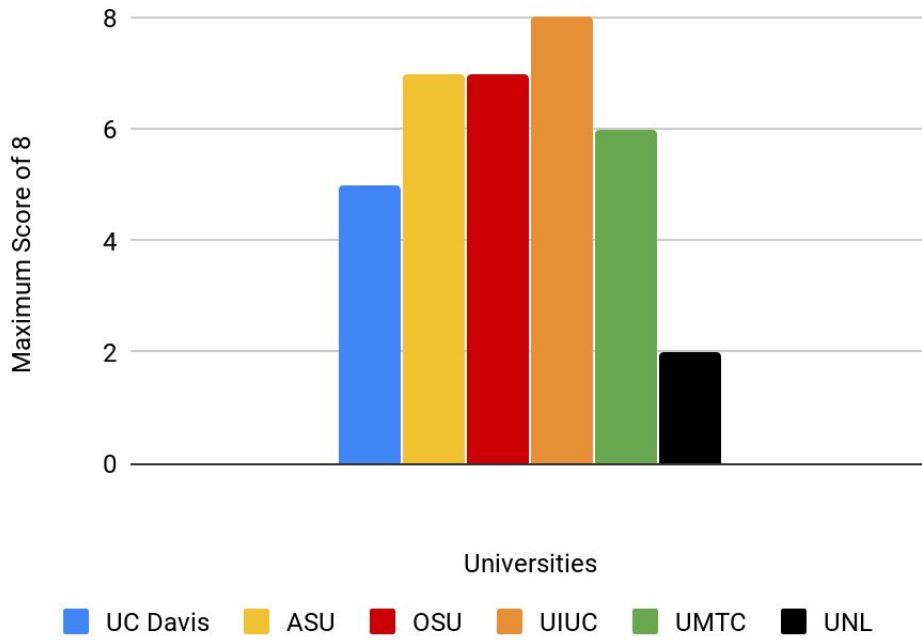
<http://reporting.secdnature.org/ip/resiliencePublic!146>

University of Illinois - Urbana Champaign :

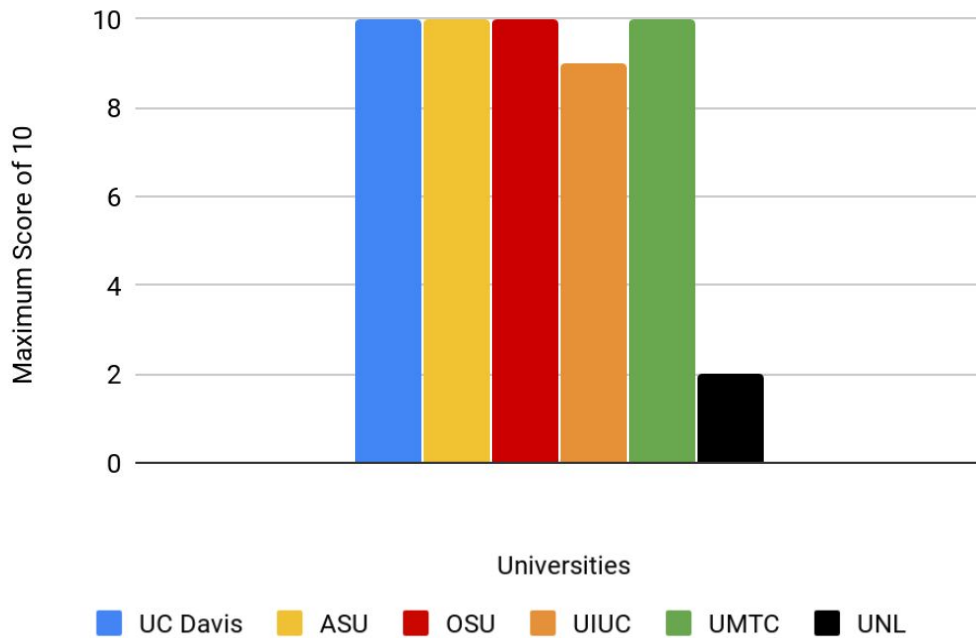
<http://reporting.secdnature.org/ip/resiliencePublic!1375>

## APPENDIX B

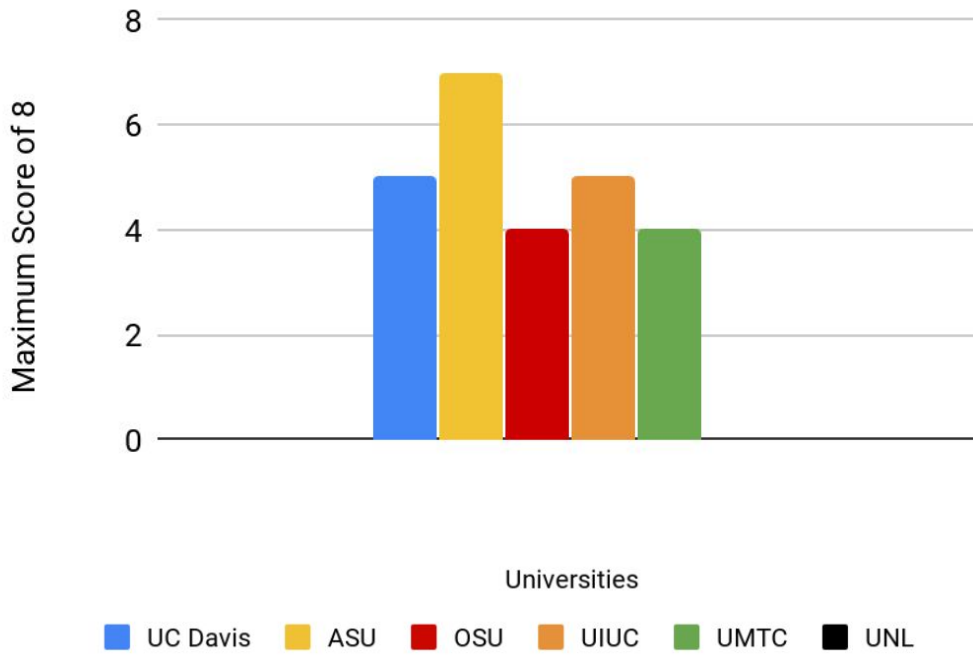
### Strategic Framework Theme Scores



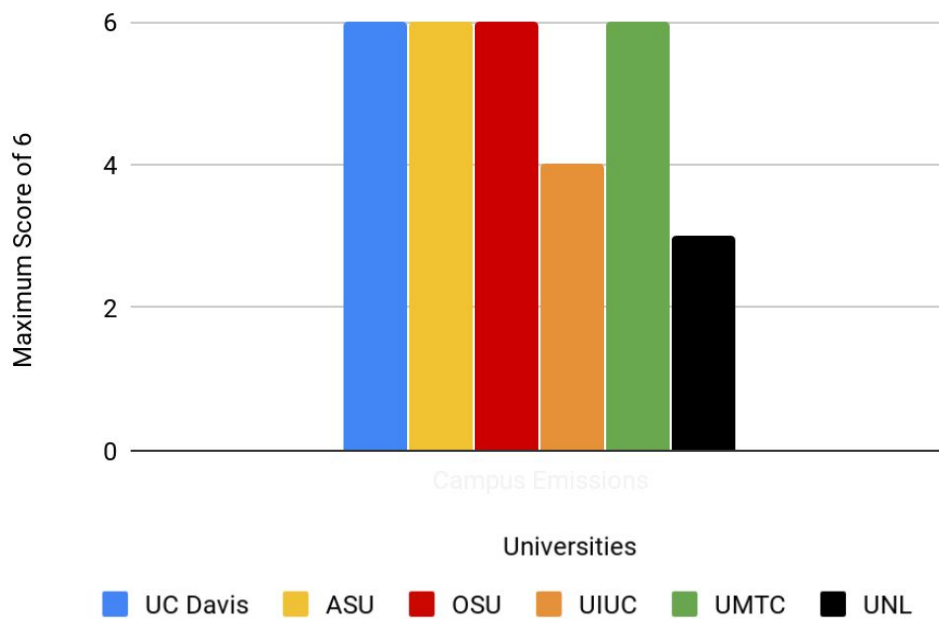
### Mitigation Strategies Theme Scores



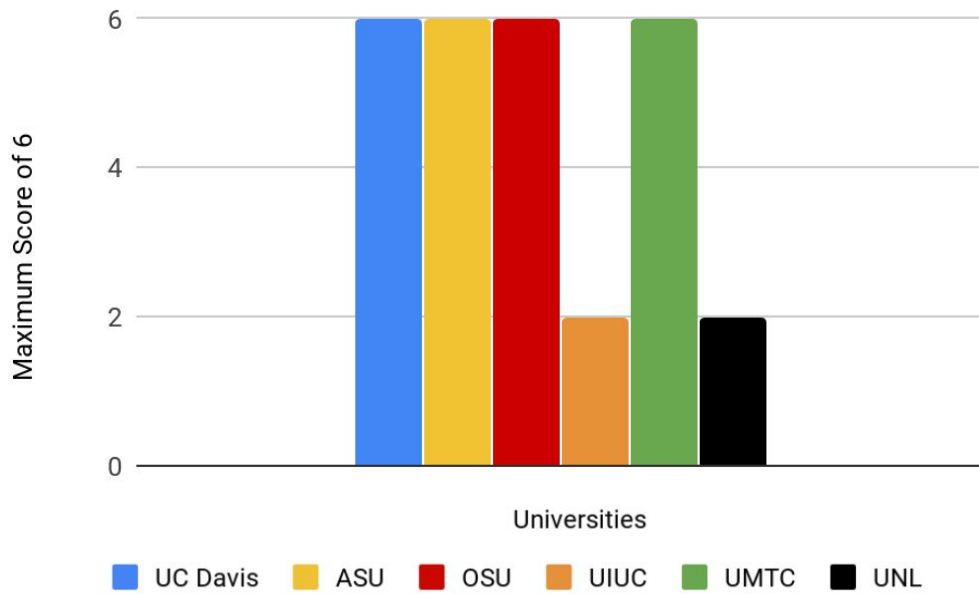
## Resilience Strategies



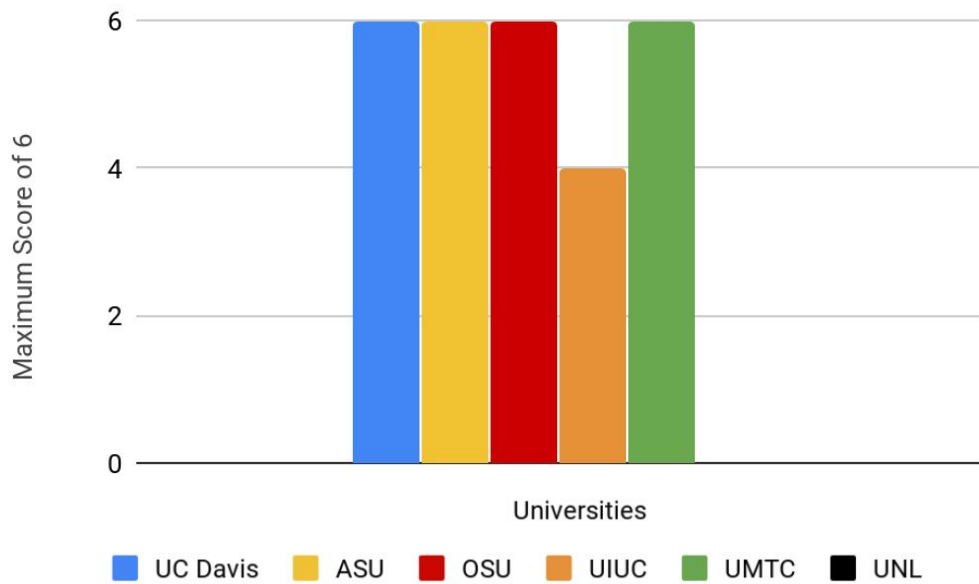
## Campus Emissions Theme Scores



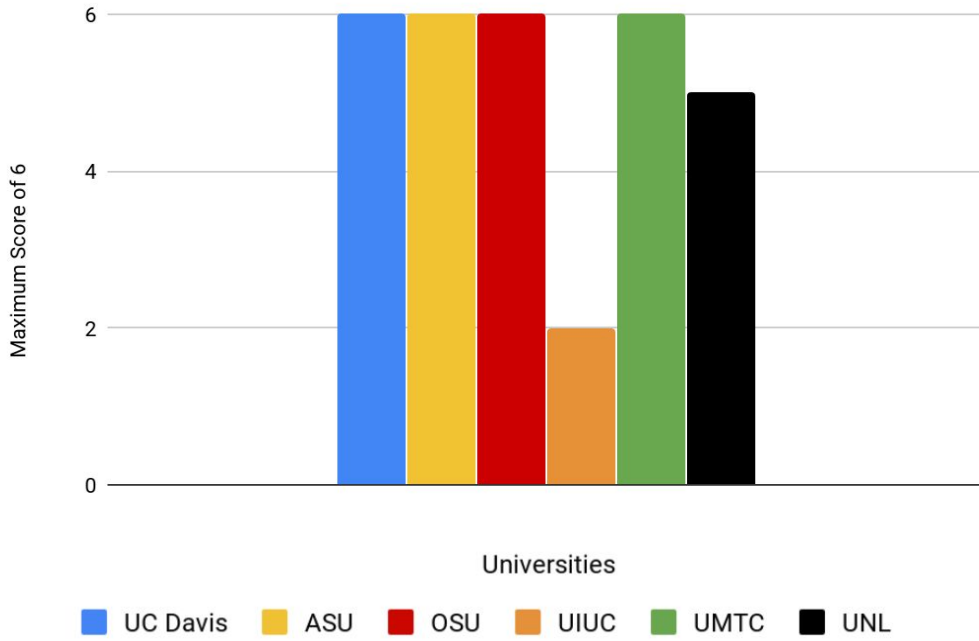
## Educational, Research, Community Outreach



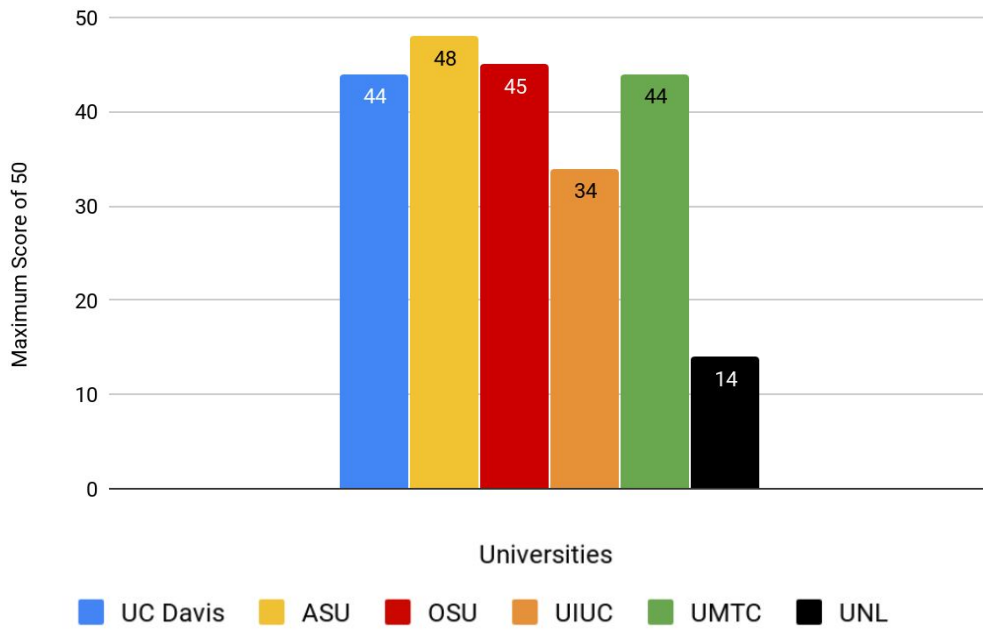
## Financing



### Implementation & Tracking



### University Totals





## APPENDIX C

### University of California - Davis CAP Rating

<b>Scoring Rubric For The Creation Of A Climate Action Plan By University of California - Davis</b> To use this rubric give each theme component a "2", "1", or "0" rating depending on its level of completion. A "2" rating would mean that the component has been thoroughly executed. A "1" rating would mean that the component is partially completed but not in a published plan, this could mean that the component is discussed on a website. A "0" rating means that the component has not been executed at all and there is no mention of it in a current plan or visible by the public. There are seven themes with various components. Tally the individual component rating to create a subtotal for each theme. As an example, the subtotal should be "Subtotal : <u>7</u> out of 8". Upon completion of rating each component for each theme, tally together the subtotals to find the overall rating. The Maximum rating is 50 out of 50. The grey cells delineate blank spaces that do not need to be written in.		
Themes as Defined by Second Nature	Rating	Theme Rating
Strategic Framework	(2, 1, 0)	
- Planning team for plan initiatives	1	
- Defined Objectives and Goals	2	
- Published CAP	2	
- Resilience Assessment	0	
		<b>Subtotal : <u>5</u> out of 8</b>
Campus Emissions	(2, 1, 0)	
- Climate Neutrality Date	2	
- Greenhouse Gas Emission Inventory	2	
- Scope 1, 2 and 3 inventory separately	2	
		<b>Subtotal : <u>6</u> out of 6</b>
Mitigation Strategies	(2, 1, 0)	
- Well defined strategies	2	
- Carbon neutrality goals across three scopes	2	
- Energy conservation measures	2	
- Transportation alternatives	2	
- Waste minimization	2	
		<b>Subtotal : <u>10</u> out of 10</b>
Resilience Strategies	(2, 1, 0)	
- Future Scenarios	2	
- Vulnerability assessments	0	
- Community partnership	2	
- Prioritization of urgent and important vulnerabilities	1	
		<b>Subtotal : <u>5</u> out of 8</b>
Educational, Research, Community Outreach Efforts	(2, 1, 0)	
- Cross disciplinary Curriculum	2	
- Systems based teaching	2	
- Funding sustainability research and development	2	

		<b>Subtotal : <u>6</u> out of 6</b>
Financing	(2, 1, 0)	
- Cost assessment	2	
- Benefits assessment	2	
- Financing options	2	
		<b>Subtotal : <u>6</u> out of 6</b>
Implementation & Tracking Progress	(2, 1, 0)	
- Data Tracking	2	
- Carbon/GHG inventories	2	
- Tracking other plan elements	2	
		<b>Subtotal : <u>6</u> out of 6</b>
		<b>Total Rating : <u>44</u> out of 50</b>

Link to climate action plan:

[https://sustainability.ucdavis.edu/local\\_resources/docs/climate\\_action\\_plan.pdf](https://sustainability.ucdavis.edu/local_resources/docs/climate_action_plan.pdf)

# Arizona State University

**Scoring Rubric For The Creation Of A Climate Action Plan By A University.**

To use this rubric give each theme component a "2", "1", or "0" rating depending on its level of completion. A "2" rating would mean that the component has been thoroughly executed. A "1" rating would mean that the component is partially completed but not in a published plan, this could mean that the component is discussed on a website. A "0" rating means that the component has not been executed at all and there is no mention of it in a current plan or visible by the public. There are seven themes with various components. Tally the individual component rating to create a subtotal for each theme. As an example, the subtotal should be "Subtotal : 7 out of 8". Upon completion of rating each component for each theme, tally together the subtotals to find the overall rating. The Maximum rating is 50 out of 50. The grey cells delineate blank spaces that do not need to be written in.

Themes as Defined by Second Nature	Rating	Theme Rating
Strategic Framework	(2, 1, 0)	
- Planning team for plan initiatives	1	
- Defined Objectives and Goals	2	
- Published CAP	2	
- Resilience Assessment	2	
		Subtotal : <u>7</u> out of 8
Campus Emissions	(2, 1, 0)	
- Climate Neutrality Date	2	
- Greenhouse Gas Emission Inventory	2	
- Scope 1, 2 and 3 inventory separately	2	
		Subtotal : <u>6</u> out of 6
Mitigation Strategies	(2, 1, 0)	
- Well defined strategies	2	
- Carbon neutrality goals across three scopes	2	
- Energy conservation measures	2	
- Transportation alternatives	2	
- Waste minimization	2	
<i>Continued on next page</i>		Subtotal : <u>10</u> out of 10
Resilience Strategies	(2, 1, 0)	
- Future Scenarios	2	
- Vulnerability assessments	2	
- Community partnership	2	
- Prioritization of urgent and important vulnerabilities	1	
		Subtotal : <u>7</u> out of 8
Educational, Research, Community Outreach Efforts	(2, 1, 0)	
- Cross disciplinary Curriculum	2	
- Systems based teaching	2	
- Funding sustainability research and development	2	
		Subtotal : <u>6</u> out of 6

Financing	(2, 1, 0)	
- Cost assessment	2	
- Benefits assessment	2	
- Financing options	2	
		<b>Subtotal : <u>6</u> out of 6</b>
Implementation & Tracking Progress	(2, 1, 0)	
- Data Tracking	2	
- Carbon/GHG inventories	2	
- Tracking other plan elements	2	
		<b>Subtotal : <u>6</u> out of 6</b>
		<b>Total Rating : <u>48</u> out of 50</b>

<https://sustainability.asu.edu/resources/climate-neutrality-at-asu/>

# Ohio State University

<b>Scoring Rubric For The Creation Of A Climate Action Plan By A University.</b> To use this rubric give each theme component a "2", "1", or "0" rating depending on its level of completion. A "2" rating would mean that the component has been thoroughly executed. A "1" rating would mean that the component is partially completed but not in a published plan, this could mean that the component is discussed on a website. A "0" rating means that the component has not been executed at all and there is no mention of it in a current plan or visible by the public. There are seven themes with various components. Tally the individual component rating to create a subtotal for each theme. As an example, the subtotal should be "Subtotal : <u>7</u> out of 8". Upon completion of rating each component for each theme, tally together the subtotals to find the overall rating. The Maximum rating is 50 out of 50. The grey cells delineate blank spaces that do not need to be written in.		
Themes as Defined by Second Nature	Rating	Theme Rating
Strategic Framework	(2, 1, 0)	
- Planning team for plan initiatives	2	
- Defined Objectives and Goals	2	
- Published CAP	2	
- Resilience Assessment	1	
		<b>Subtotal : <u>7</u> out of 8</b>
Campus Emissions	(2, 1, 0)	
- Climate Neutrality Date	2	
- Greenhouse Gas Emission Inventory	2	
- Scope 1, 2 and 3 inventory separately	2	
		<b>Subtotal : <u>6</u> out of 6</b>
Mitigation Strategies	(2, 1, 0)	
- Well defined strategies	2	
- Carbon neutrality goals across three scopes	2	
- Energy conservation measures	2	
- Transportation alternatives	2	
- Waste minimization	2	
		<b>Subtotal : <u>10</u> out of 10</b>
Resilience Strategies	(2, 1, 0)	
- Future Scenarios	2	
- Vulnerability assessments	0	
- Community partnership	2	
- Prioritization of urgent and important vulnerabilities	0	
		<b>Subtotal : <u>4</u> out of 8</b>
Educational, Research, Community Outreach Efforts	(2, 1, 0)	
- Cross disciplinary Curriculum	2	
- Systems based teaching	2	
- Funding sustainability research and development	2	
		<b>Subtotal : <u>6</u> out of 6</b>

Financing	(2, 1, 0)	
- Cost assessment	2	
- Benefits assessment	2	
- Financing options	2	
		<b>Subtotal : <u>6</u> out of 6</b>
Implementation & Tracking Progress	(2, 1, 0)	
- Data Tracking	2	
- Carbon/GHG inventories	2	
- Tracking other plan elements	2	
		<b>Subtotal : <u>6</u> out of 6</b>
		<b>Total Rating : <u>45</u> out of 50</b>

[https://fod.osu.edu/sites/default/files/ohio\\_state\\_climate\\_action\\_plan.pdf](https://fod.osu.edu/sites/default/files/ohio_state_climate_action_plan.pdf)

# University of Illinois - Urbana Champaign

## Scoring Rubric For The Creation Of A Climate Action Plan By A University.

To use this rubric give each theme component a "2", "1", or "0" rating depending on its level of completion. A "2" rating would mean that the component has been thoroughly executed. A "1" rating would mean that the component is partially completed but not in a published plan, this could mean that the component is discussed on a website. A "0" rating means that the component has not been executed at all and there is no mention of it in a current plan or visible by the public. There are seven themes with various components. Tally the individual component rating to create a subtotal for each theme. As an example, the subtotal should be "Subtotal : 7 out of 8". Upon completion of rating each component for each theme, tally together the subtotals to find the overall rating. The Maximum rating is 50 out of 50. The grey cells delineate blank spaces that do not need to be written in.

Themes as Defined by Second Nature	Rating	Theme Rating
Strategic Framework	(2, 1, 0)	
- Planning team for plan initiatives	2	
- Defined Objectives and Goals	2	
- Published CAP	2	
- Resilience Assessment	2	
		Subtotal : <u>8</u> out of 8
Campus Emissions	(2, 1, 0)	
- Climate Neutrality Date	2	
- Greenhouse Gas Emission Inventory	2	
- Scope 1, 2 and 3 inventory separately	0	
		Subtotal : <u>4</u> out of 6
Mitigation Strategies	(2, 1, 0)	
- Well defined strategies	2	
- Carbon neutrality goals across three scopes	1	
- Energy conservation measures	2	
- Transportation alternatives	2	
- Waste minimization	2	
		Subtotal : <u>9</u> out of 10
Resilience Strategies	(2, 1, 0)	
- Future Scenarios	2	
- Vulnerability assessments	0	
- Community partnership	2	
- Prioritization of urgent and important vulnerabilities	1	
		Subtotal : <u>5</u> out of 8
Educational, Research, Community Outreach Efforts	(2, 1, 0)	
- Cross disciplinary Curriculum	1	
- Systems based teaching	0	
- Funding sustainability research and development	1	
		Subtotal : <u>2</u> out of 6
Financing	(2, 1, 0)	

- Cost assessment	1	
- Benefits assessment	1	
- Financing options	2	
		<b>Subtotal : <u>4</u> out of 6</b>
Implementation & Tracking Progress	(2, 1, 0)	
- Data Tracking	1	
- Carbon/GHG inventories	1	
- Tracking other plan elements	0	
		<b>Subtotal : <u>2</u> out of 6</b>
		<b>Total Rating : <u>34</u> out of 50</b>

<https://sustainability.illinois.edu/campus-sustainability/icap/>



# University of Minnesota - Twin Cities

**Scoring Rubric For The Creation Of A Climate Action Plan By A University.**

To use this rubric give each theme component a "2", "1", or "0" rating depending on its level of completion. A "2" rating would mean that the component has been thoroughly executed. A "1" rating would mean that the component is partially completed but not in a published plan, this could mean that the component is discussed on a website. A "0" rating means that the component has not been executed at all and there is no mention of it in a current plan or visible by the public. There are seven themes with various components. Tally the individual component rating to create a subtotal for each theme. As an example, the subtotal should be "Subtotal : 7 out of 8". Upon completion of rating each component for each theme, tally together the subtotals to find the overall rating. The Maximum rating is 50 out of 50. The grey cells delineate blank spaces that do not need to be written in.

Themes as Defined by Second Nature	Rating	Theme Rating
Strategic Framework	(2, 1, 0)	
- Planning team for plan initiatives	2	
- Defined Objectives and Goals	2	
- Published CAP	2	
- Resilience Assessment	0	
		<b>Subtotal : <u>6</u> out of 8</b>
Campus Emissions	(2, 1, 0)	
- Climate Neutrality Date	2	
- Greenhouse Gas Emission Inventory	2	
- Scope 1, 2 and 3 inventory separately	2	
		<b>Subtotal : <u>6</u> out of 6</b>
Mitigation Strategies	(2, 1, 0)	
- Well defined strategies	2	
- Carbon neutrality goals across three scopes	2	
- Energy conservation measures	2	
- Transportation alternatives	2	
- Waste minimization	2	
		<b>Subtotal : <u>10</u> out of 10</b>
Resilience Strategies	(2, 1, 0)	
- Future Scenarios	0	
- Vulnerability assessments	0	
- Community partnership	2	
- Prioritization of urgent and important vulnerabilities	2	
		<b>Subtotal : <u>4</u> out of 8</b>
Educational, Research, Community Outreach Efforts	(2, 1, 0)	
- Cross disciplinary Curriculum	2	
- Systems based teaching	2	
- Funding sustainability research and development	2	
		<b>Subtotal : <u>6</u> out of 6</b>
Financing	(2, 1, 0)	

- Cost assessment	2	
- Benefits assessment	2	
- Financing options	2	
		<b>Subtotal : <u>6</u> out of 6</b>
Implementation & Tracking Progress	(2, 1, 0)	
- Data Tracking	2	
- Carbon/GHG inventories	2	
- Tracking other plan elements	2	
		<b>Subtotal : <u>6</u> out of 6</b>
		<b>Total Rating : <u>44</u> out of 50</b>

[https://dehs.umn.edu/sites/dehs.umn.edu/files/20141117\\_climateactionplanfactsheet.pdf](https://dehs.umn.edu/sites/dehs.umn.edu/files/20141117_climateactionplanfactsheet.pdf)

# University of Nebraska - Lincoln

<b>Scoring Rubric For The Creation Of A Climate Action Plan By A University.</b> To use this rubric give each theme component a "2", "1", or "0" rating depending on its level of completion. A "2" rating would mean that the component has been thoroughly executed. A "1" rating would mean that the component is partially completed but not in a published plan, this could mean that the component is discussed on a website. A "0" rating means that the component has not been executed at all and there is no mention of it in a current plan or visible by the public. There are seven themes with various components. Tally the individual component rating to create a subtotal for each theme. As an example, the subtotal should be "Subtotal : <u>7</u> out of 8". Upon completion of rating each component for each theme, tally together the subtotals to find the overall rating. The Maximum rating is 50 out of 50. The grey cells delineate blank spaces that do not need to be written in.		
Themes as Defined by Second Nature	Rating	Theme Rating
Strategic Framework	(2, 1, 0)	
- Planning team for plan initiatives	2	
- Defined Objectives and Goals	0	
- Published CAP	0	
- Resilience Assessment	0	
		Subtotal : <u>2</u> out of 8
Campus Emissions	(2, 1, 0)	
- Climate Neutrality Date	0	
- Greenhouse Gas Emission Inventory	2	
- Scope 1, 2 and 3 inventory separately	1	
		Subtotal : <u>3</u> out of 6
Mitigation Strategies	(2, 1, 0)	
- Well defined strategies	0	
- Carbon neutrality goals across three scopes	0	
- Energy conservation measures	0	
- Transportation alternatives	0	
- Waste minimization	2	
		Subtotal : <u>2</u> out of 10
Resilience Strategies	(2, 1, 0)	
- Future Scenarios	0	
- Vulnerability assessments	0	
- Community partnership	0	
- Prioritization of urgent and important vulnerabilities	0	
		Subtotal : <u>0</u> out of 8
Educational, Research, Community Outreach Efforts	(2, 1, 0)	
- Cross disciplinary Curriculum	1	
- Systems based teaching	1	
- Funding sustainability research and development	0	
		Subtotal : <u>2</u> out of 6
Financing	(2, 1, 0)	

- Cost assessment	0	
- Benefits assessment	0	
- Financing options	0	
		<b>Subtotal : <u>0</u> out of 6</b>
Implementation & Tracking Progress	(2, 1, 0)	
- Data Tracking	2	
- Carbon/GHG inventories	2	
- Tracking other plan elements	1	
		<b>Subtotal : <u>5</u> out of 6</b>
		<b>Total Rating : <u>14</u> out of 50</b>

## **APPENDIX E**

### Glossary of Terms and Abbreviations

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