

Climate Action Planning Analysis Worksheet:

Colorado State University

A) Summary and Main Takeaways:

Colorado State University's Climate Action Plan is well organized and full of valuable information. The plan adequately develops an emissions baseline, setting standards for tracking emissions reductions progress towards well defined goals of 100% renewable electricity and climate neutrality. The CAP lays out a complete list of projects to undertake, with timelines to complete them that, when projected out, will allow CSU to meet their goal of climate neutrality by 2050. These projects are divided into categories, and each category has several phases of implementation. These phases are further designated short-, medium-, and long-term, laying out a process for the plan's implementation. The CAP also discusses potential funding for the plan, creating a revolving Green Fund and proposing several other funding sources. Additionally, the plan engages with students, faculty, and staff, in addition to the city of Fort Collins, ensuring a holistic climate action approach and maximizing the impact of the plan. The plan also openly discusses its limitations, leaving room for future improvements and adaptations, and self-identifying itself as a "living document".

B) Potential Interviewing Questions and Curiosities:

- Is there more information somewhere about GHG reduction initiatives? The provided tables discuss the topic and phase 1, 2, etc with data on the initiatives without providing explicit detail on the phases/projects themselves.

C) Analysis Questions:

1. Does the CAP include information on creating a baseline?

Does the plan discuss its baseline? In other words, does the plan reference its natural greenhouse gas emissions (GHG) levels used to inform planning, goal-setting, and climate policy structure? There are several possibilities for setting a baseline. Some plans may focus on a single historical emissions level, while others may reference future baseline projections.

- "Develop a greenhouse gas (GHG) emissions inventory. Inventories are publicly available for fiscal years FY06-FY17." (4)
- "The University's greenhouse gas inventory is prepared annually using the Campus Carbon Calculator (CCC), created by Second Nature in partnership with UNH. The CCC tool was developed specifically to provide higher education institutions with a consistent approach to calculating campus greenhouse gas emissions and is recognized as an acceptable tool by the higher education community." (7).

- “The inventory is based on utility data, other University records, discussions with staff, and an annual online campus commuting survey. The units of metric tons of carbon dioxide equivalent (MTCO₂e) are used in the inventory and throughout this plan to account for the collective global warming potential of all six greenhouse gases including carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and various refrigerants.” (7).
- “The University has completed inventories for fiscal years FY06 through FY17 as shown in Figure 1 below.” (7)
- “Following ACUPCC guidance, CSU’s inventory includes all direct emissions, or “Scope 1” emissions such as those from on-campus stationary fuel combustion, fleet vehicles, agricultural activities, fertilizers, and refrigerants. Indirect energy emissions, or “Scope 2” emissions, from electricity purchases are also included. Other indirect emissions, or “Scope 3” emissions from directly financed air travel, student commuting, faculty/staff commuting, electrical transmission and distribution losses, and solid waste disposal are also included.” (8).

Summary: CSU created a very in-depth and comprehensive carbon footprint baseline analysis. Data was collected with a variety of sources in mind. Commuting surveys, utility data, university records, and staff discussions were all used to inform the GHG emission inventory. Using scopes one, two, and three, CSU evaluated their emissions in hopes of understanding what factors play the most significant role in enlarging their footprint. Using the Campus Carbon Calculator (CCS), specifically designed for Universities, CSU measured their baseline GHG emissions to track emissions reductions through the lifetime of this CAP.

2. By what measure is success tracked and reported?

Does this plan discuss how progress is tracked and reported? Does the plan reference a system that assesses its sustainability performance? Many different approaches can be used, but make sure to take note of STARS and AASHE.

- “This 2018 update provides an opportunity to demonstrate progress made toward the original goals and explain updates to the original plan.” (3)
- “Association for the Advancement of Sustainability in Higher Education (AASHE) awarded Colorado State University the first ever Platinum rating in the Sustainability Tracking, Assessment and Rating System (STARS) in March 2015. In March 2017, CSU repeated this accomplishment by receiving a Platinum rating under STARS version 2.1. To date, only three institutions have earned this rating – Colorado State University, Stanford University, and the University of New Hampshire.” (3)
- “Utilize STARS* as a framework to help set goals and assess progress” (6)
- “This 2018 Climate Action Plan update considers CSU’s projected emissions and identifies potential reduction and mitigation strategies between fiscal years FY10 and FY50. The business-as-usual forecast of emissions is primarily driven by increases in the intensity of electricity consumption in existing buildings (about 1 percent annually based on historical trends), and the construction of new buildings (growth averaged of 250,000 GSF/year through FY17, but a more conservative 150,000 new GSF is used for the model).” (9)

- “Using the N-Print calculator, CSU now has more accurate accounting of how CSU imports or produces nitrogen, how it is used, and how much nitrogen is lost to the environment.” (11)
- “Finally, implementation of strategies should be documented for future reference and reporting to the community and to decision makers. For instance, what was the actual cost of the strategy and when was it implemented? Who was involved and what were their tangible indications of success, such as number of participants, number of buildings retrofitted or kilowatt hours (kWh) of electricity reduced? This type of information can be used to celebrate success, adjust strategies, or develop new strategies.” (36).
- “Certain strategies contained in the plan can be implemented in a fairly short period of time while others will need to be phased over time. Establishing specific timelines for implementing various strategies will ensure that there is enough time to complete them before the target goal year is reached.” (36).
- “While this plan sets a long-term goal of climate neutrality, achieving interim milestones will help demonstrate tangible progress toward this goal over time. As discussed earlier in this plan, an interim goal has already been established to track progress.” (36).

Summary: CSU utilizes the STARS framework to measure and track their campus’ sustainability over time. The university was the first to obtain a platinum designation through the program, and has maintained this designation as other universities have joined the platinum ranks. In addition to their STARS reports, CSU performs and publishes annual Green House Gas inventories, tracking progress from the original baseline inventory towards the campus’s eventual goal of carbon neutrality. CSU has also made a number of interim goals on the way to complete neutrality to demonstrate tangible progress towards the overarching goal. CSU also utilizes N-Print calculator to track their Nitrogen emissions.

3. Does the CAP set goals, strategies, or action items for implementation?

Does the plan address potential next steps for the plan to be carried out? Take note if plans mention tracking progress or improvements. Does the plan provide recommendations, contain reduction and mitigation strategies, or set interim goals to ensure implementation?

- “Within two years, set a target date and interim milestones for becoming climate neutral. The CAP sets a carbon neutral target date of FY50. The Climate Reality Pledge adds the interim step of achieving 100% renewable electricity by 2030.” (4)
- “Under the guidance of Senate Bill 07-051, CSU has a policy that all new significant campus construction will be built to the U.S. Green Building Council’s LEED Gold standard or equivalent.” (4)
- “CSU encourages use of and provides access to public transportation for faculty, staff, students, and visitors. Students and staff can ride Transfort (the community bus system) free.” (5)
- “The University has participated every year in both the Grand Champion and Waste Minimization component of the national RecycleMania competition – regularly finishing in the top tier” (5)

- “On top of these efforts, in 2012 CSU adopted an “ Environmentally and Socially Responsible Procurement Policy” (ESRP). The purpose of this policy is to support campus sustainability at CSU and to provide guidelines, information, and resources in procuring products that will minimize negative impacts on society and the environment to the greatest extent practicable. In 2015, a Fair Trade component was added to this policy. An ESRP Program takes into consideration both the long and short-term costs associated with the full life cycle of the product. This policy will guide CSU employees who wish to purchase goods and services for CSU to finding more environmentally sound products, and may require the use of environmentally preferable products in many instances.” (5)
- “The CSU Climate Action Plan establishes a set of reduction and mitigation strategies that are divided between short-term (0-7 years), medium-term (7-20 years), and long-term (>20 years). Note that these timeframes were modified in the 2015 version of the CAP in order to align more closely with a CAP adopted by the City of Fort Collins. As depicted in Figure 3, these strategies are projected to reduce CSU’s net emissions to climate neutrality by FY50. In addition, the Climate Reality Pledge created the interim goal of 100% renewable electricity by 2040.” (9)
- “The University has made significant strides in increasing building energy efficiency and identifying conservation opportunities in a number of its facilities. This strategy focuses on a number of energy efficiency opportunities, grouped into six phases, which can be implemented over the short, medium, and long term based on anticipated payback. (lighting upgrades, heat recovery, demand control ventilation, control upgrades, heat-exchange upgrades, variable-air-volume terminals” (15).
- “The following sections identify a number of proposed greenhouse gas reduction and mitigation strategies for fulfilling the Climate Action Plan’s goal of making progress toward climate neutrality. These strategies are the reflection of work by the PSC to review priorities and strategies that can provide climate benefits while also providing the most significant economic, social, and environmental benefits to the University. Mitigation strategies roughly fall into three categories: [Energy Use in Buildings, Renewable Energy, Other]” (15)
- “Energy Use in Buildings•Building Energy Efficiency (4.1)•Outreach, Advanced Metering, and Behavioral Engagement (4.3)•Recommissioning and Retrocommissioning (4.4)•Computer Power Management, Server Consolidation and Server Virtualization (4.8)•High-Performance New Construction (4.14)” (15)
- “Renewable Energy •Cogeneration / CCHP (4.2)•Ground Source Heat Pump (GSHP) (4.9)•Solar Electricity (4.5)•Utility & State Policies (4.11)•Wind Power (4.13)” (15)
- “Other•Fleet Fuel Consumption (4.6)•Waste Diversion (4.7)•Commuting (4.10)•Carbon Sequestration in Forests & Grasslands (4.12)•Offset Airline Travel (4.15)•Emerging Technologies (4.16)•Reduce Nitrogen Emissions (4.17)” (15)
- “Laboratories have some of the most intense energy consumption of all spaces on campus. Facilities Management has therefore taken several steps to green our labs. One example involves a \$2,000 rebate available since 2015 to any researcher on campus who wishes to purchase a new, efficient ultra-low temperature freezer. This initiative has so far allowed for an estimated annual energy savings of 100,000 kWh/year.” (20)
- Photovoltaic solar systems are installed and operating on the Engineering building, Lake Street Parking Garage, Behavioral Sciences building, Academic Village, and the Research Innovation Center on the Foothills Campus. The 2 megawatt (MW) Chrisman Field facility, recently installed

on the Foothills Campus, is one of the largest solar plants on a University campus in the nation. (21).

- “Facilities Management has had a full time Recommissioning Engineer since FY13 who works with a Facilities Management Energy Team to troubleshoot and coordinate repairs of relatively small problems in building HVAC systems. In addition, he identifies larger capital needs in buildings that are using lots of energy and/or water or are challenged by big comfort or control problem.” (22)
- “In FY15, CSU installed 1,200 kW of solar on campus buildings in response to a City of Fort Collins incentive. These installations bring the total installed capacity on campus to nearly 6,700 kW.” (24)
- This strategy entails collaborating with the Colorado State Forest Service (CSFS) to sequester carbon dioxide (CO₂) by planting 5,000 or more acres of trees under conditions where biomass sequestration can be increased.” (29).
- “While this plan sets a long-term goal of climate neutrality, achieving interim milestones will help demonstrate tangible progress toward this goal over time. As discussed earlier in this plan, an interim goal has already been established to track progress.” (36).
- “The President’s Sustainability Commission formed a small subcommittee in November 2017 known as the Air Travel Team. The Air Travel Team has begun exploring and sorting through relevant data to determine potential reduction and offset strategies for CSU air travelers.” (38)

Summary: CSU set a carbon neutrality goal for 2050, and has since set an interim goal to derive electricity from 100% renewables by 2030. CSU outlines its emissions reduction strategies, split into short- (0-7 years), medium- (7-20 years), and long-term (>20 years) projects, which all together are projected to lower the universities emissions to neutrality by 2050. These strategies fall into a number of designated focusses, which each have several implementation fases that fit into the different implementation timelines. CSU focused heavily on implementation strategies aimed to reduce GHG emissions. Specifically, CSU’s agenda targeted energy-saving measures. Considering the infrastructure already existing on campus, CSU retrofitted old buildings. Energy efficiency measures such as lighting upgrades, heat recovery, demand control ventilation, control upgrades, heat-exchange upgrades, and variable-air-volume terminals were taken. Outreach remained an important cornerstone of CSU’s plan

4. How is the CAP funded?

Does the plan discuss funding efforts? In particular, where do sources of funding come from? Are these sources public or private entities?

- “Each section below summarizes the context for each strategy and provides projections of annual greenhouse gas emission reductions and costs. Cost estimates include:•One-time or first capital cost for implementing the strategy•Annual operations and maintenance (O&M) cost•Annual cost savings based on current utility rates•A simple annual return on investment (net annual cost savings/one-time cost)” (15)
- “In FY12, the Vice President of University Operations developed the Energy Reserve Fund (ERF). The fund was seeded with one-time money of \$500,000/year for the first 5 years. In

addition, savings from projects implemented with these funds return to the ERF in subsequent years. As a result, once the seed money ran out at the end of FY16, the fund was self-sustaining with annual allocations of savings from previous projects. The Energy Team in Facilities Management develops a project list for the ERF each year. A subcommittee of the Presidents Sustainability Commission also reviews the list of projects each year.” (17)

- “Small systems installed with building funds.” (24)
 - Solar installations
- “In the next several years, the cost of solar systems will likely reach “grid parity” with traditionally generated electricity. This has already happened in many areas of the country where electricity prices are higher. Once that point is reached, installing solar systems where the university retains the ownership of both the electricity and environmental attributes will become a net benefit for the university.” (24)
- The University can explore several opportunities to help fund implementation of the plan’s measures including: Utility rebates, federal incentives, grants, third-party ownership with power purchase agreement, lease-purchase or other financing mechanisms, performance contracting, capital campaigns, public/private partnerships, and revolving loan funds. (33).
- “Financing mechanisms, such as bonding and third-party financing, can be used to reduce the capital requirements associated with climate neutrality and to level out the cost of this plan. Furthermore, many of the strategies proposed in this plan result in positive net cash flows and can be largely self-funding.” (41).
- “Due to current and anticipated future budget limitations, priorities for funding this plan may focus on low and no-cost strategies such as education programs, and those with very favorable paybacks that can help to finance the cost of later measures through their savings.” (41).
- “The University can explore several opportunities to help fund implementation of the plan’s measures including: •Utility rebates•Third-party ownership with Power Purchase Agreement•Federal incentives•Grants•Lease-purchases or other financing mechanisms •Performance contracting•Capital campaigns•Revolving loan funds•Public/Private Partnerships” (41)

Summary: All of CSU’s proposed emissions reduction projects were analyzed to estimate costs, looking at one-time or first capital cost for implementing the strategy, annual operations and maintenance (O&M) cost, annual cost savings based on current utility rates, and a simple annual return on investment (net annual cost savings/one-time cost). The CAP proposes that these costs be funded through several sources, including the establishment of an Energy Reserve Fund (ERF), which was seeded with one-time deposits of \$500,000/year for the first 5 years, with all project savings returning to the fund for future projects. The fund became self-sustaining after those five years. Building funds were also discussed as a way to incorporate sustainability projects within building projects. Overall, the CAP discussed the following potential funding sources: utility rebates, federal incentives, grants, third-party ownership with power purchase agreement, lease-purchase or other financing mechanisms, performance contracting, capital campaigns, public/private partnerships, and revolving loan funds. Knowing that funding is limited the CAP stated that low- to no-cost projects would be prioritized, particularly projects that would lead to net savings.

5. How did the CAP inform/engage stakeholders?

Did the plan include discussions about stakeholder involvement? Specifically, how did the plan address engaging stakeholders in participating in the CAP?

- “We continue to build on this strong reputation around sustainability and clean energy through many programs on campus including the School of Global Environmental Sustainability (SoGES) and the Powerhouse Energy Institute.” (4)
- “Integrate sustainability into the curriculum and make it part of the educational experience.” (4)
- “Make the Climate Action Plan, GHG inventory, and progress reports publicly available.” (4)
- “The original CAP was developed through a collaborative process involving input from a campus task force, the campus community at large, and a consultant team. This 2018 update was prepared by Facilities Management staff and reviewed by the President’s Sustainability Commission.” (6)
- “Note that these timeframes were modified in the 2015 version of the CAP in order to align more closely with a CAP adopted by the City of Fort Collins.” (9)
- “Academic areas at CSU that address environmental sustainability are offered in all eight of the University’s colleges and span across programs in engineering, natural resources, forestry, public policy, environmental ethics, global and sustainable business, atmospheric science, soil and crop sciences, construction management, and many other programs.” (10)
- “It is also important to recognize the links between professional development, research and learning, and the opportunities moving forward as the CAP is implemented. Providing faculty with professional development opportunities in the realm of sustainability will help them integrate these topics into their research and teaching. Supporting faculty and staff efforts to publish their successful efforts will also help disseminate results widely. Furthermore, academic research drives new technologies and understanding, which in turn can be integrated to inform decisions and create beneficial outcomes for larger society. This generates a “feedback loop” that can help accelerate this plan’s goal of reaching carbon neutrality at CSU while benefiting broader society.” (10)
- “The School of Global Environmental Sustainability (SoGES) connects all eight colleges at CSU to foster innovation in interdisciplinary sustainability research and education.” (10)
- “Launched in 2008, SoGES is an umbrella organization that encompasses all environmental education and research at CSU. It is an interdisciplinary program that conducts the innovative research necessary to solve the most pressing human-environmental problems. The School provides innovative and challenging education programs to equip students – and the community – with the principles and the practices of sustaining the environment and meeting demands of the workforce for the environmental economy.” (11).
- “Through SoGES, the Student Sustainability Center participates in the Nitrogen Footprint project, in which 20 other universities and colleges track their nitrogen emissions and collaborate to reduce their nitrogen use. CSU joined the first cohort with six other universities and colleges in 2014.” (11)
- “CSU created the Energy Institute in 2013 to consolidate its vast energy research under one organization. Through its affiliated centers, the Institute aims to increase collaboration with industry and governmental partners to solve real-world energy problems and create new research and educational opportunities for CSU faculty and students.” (12)

- “SuperclusterThe Clean Energy Supercluster at CSU is an innovative model to rapidly move the University’s clean energy research into the global marketplace, creating new companies and jobs that enhance Colorado’s economy while improving lives throughout the world. The Supercluster consists of a University-wide multidisciplinary alliance of researchers, social scientists, and business experts working on innovative research and discovery.” (12).
- “As a land grant university, CSU plays a key role throughout Colorado in education, engagement, and outreach through Extension. The system of county offices puts Extension resources within easy reach of residents in all of Colorado’s 64 counties.” (14)
- “In 2016, CSU and the local utility companies collaborated to conduct a detailed study to understand the feasibility of this option in the medium term. The economics seemed promising until the gas utility quoted \$4 million+ to bring a high-pressure gas line to the site. As a result, this project has been pushed to a long-term project and one additional phase of utility scale wind power has been shifted to a medium-term project to keep the goals in the plan on track.” (19)
- “CSU has involved and engaged students in sustainability efforts for many years through curriculum, dozens of student organizations, and Residence Life. In addition, the Associated Students of Colorado State University (student government) has appointed a student Director of Environmental Affairs & Sustainability to increase outreach and involvement of the student community and, developed an Alternative Transportation Fee Advisory Board focusing on transit and transportation.” (20)
- “Housing & Dining Services has a Senior Sustainability Coordinator who administers the Eco Leaders program. There is one Eco Leader per residence hall. Eco Leaders help educate fellow students about sustainability issues, waste reduction, energy conservation, plan activities and implement campaigns. The Eco Leaders program started in 2011 and has grown each year since.” (20)
- “The Campus Energy Coordinator, a position in Facilities Management, is responsible for developing energy, water, and resource conservation engagement programs targeting faculty,staff, and students.” (20)
- The University administered an online commuting survey in September 2008. The survey was completed by 8,555 members of the campus community – approximately 26 percent of students, 39 percent of faculty, and 32 percent of staff responded. Of all the respondents, 42 percent reported commuting by personal vehicle (alone), 31 percent by bike, 11 percent by walking, 9 percent by bus, 5 percent by carpooling, and 2 percent reported other modes of commuting.” (27).
- “Waste Reduction Initiatives•Zero-Waste Team: A team of volunteers who act as a recycling/compost/trash bin “goalie” at football games in CSU’s new on-campus stadium. Volunteers educate and aid game attendees in proper waste sorting, with the ultimate goal of reducing CSU’s football game waste to zero•Annual Waste Audit: Each spring, during Recycle Mania, the Live Green Team hosts a waste audit where trash from several residence halls is dumped on the plaza and sorted. This audit helps to inform planning for strategies to divert additional waste.•Plate Waste Audit: Each semester, volunteers gather all food scraps at a select dining hall for a day to measure the total mass of food scraps and showcase it for students to raise awareness regarding food waste.•Move In: Each semester as thousands of students move onto campus, volunteers from the Live Green Team and the EcoLeaders help staff stations to divert cardboard and other recyclables from the trash.•Leave it Behind: Each semester as thousands of

students move off of campus, reusable items are collected and then sorted and offered in a giant community yard sale. Proceeds of the sale go to the EcoLeaders program.” (27)

- “Wind facilities would also become an educational laboratory to provide students a hands-on learning experience in renewable energy development.” (30).
- “Students are involved in exploring alternative transportation through a newly appointed Alternative Transportation Coordinator in ASCSU (student Government) and through membership of the Alternative Transportation Fee Advisory Board (ATFAB).” (31)
- “First, the Colorado Renewable Energy Standard (RES) is incorporated into the plan.” (33)
- “The Institute for the Built Environment (IBE) involves students in exploring efficient and sustainable building design and LEED project consulting.” (36)
- “Collaboration among the members of the campus community, faculty, researchers, and community partners will benefit the implementation of the plan.” (44)
- “The CSU CAP aligns well with the plans put forth by both the City of Fort Collins & the State of Colorado. Such partnerships can be leveraged to share resources and expertise and can ensure that sustainability becomes part of the fabric of the campus and the community.” (44)

Summary: CSU’s CAP engages students, faculty, and staff in sustainability efforts through the School of Global Environmental Sustainability (SoGES) and the Powerhouse Energy Institute. The university also modified its CAP to align with Fort Collins’ CAP, further engaging with the greater community. CSU’s extension programs also educate stakeholders throughout the state of Colorado. In the development of their CAP, CSU engaged with their utility company, as well as faculty, students, and staff, to collect data and assess the feasibility of their proposed projects and initiatives. CSU’s CAP is closely tied to students and faculty, through curriculum, student engagement, and research.

6. Does the CAP mention gaps in data, uncertainties, or other challenges encountered?

Does the CAP address where data may be insufficient or unavailable? Take note of barriers to planning and implementation, uncertainties in climate projections or future emission scenarios, inconsistencies in data collection, etc.

- “Some technologies that were considered for this plan but were not found to be viable at this time or are on the horizon today include synfuels, solar thermal, micro hydroelectric, anaerobic digestion for food and animal waste, additional cogeneration, plasma waste to-energy, algae biofuels, and other sequestration options such as capturing carbon for use on building materials.” (32).
- “In addition to federal legislation that may affect the price of carbon, there is the potential of increased stringency in the state’s RES. The majority of CSU’s electricity purchases are from utilities that are currently required to supply 10 percent renewable energy by 2020. It is conceivable that this requirement will be elevated within the timeframe of this plan.” (34).
- “As a living document, this plan will undergo regular reviews, and the opportunities to include new technologies will be many. A myriad of technologies on the horizon may become viable within the timeframe of this plan and alter the course of CSU’s path to climate neutrality.” (39)

- “Currently, CSU does not include food processing and consumption in its greenhouse gas inventory. Food processing and consumption is, however, the most significant source of CSU’s nitrogen use according to the N-Print calculator.” (40)
- “Much of the potential growth in CSU’s emissions will be driven by new construction, enrollment, and research growth, which are difficult to forecast in a continually fluctuating budgetary environment. While improving construction practices, efficiency and conservation in existing buildings can minimize the impact of this growth, the plan is still very sensitive to these trends.” (42).
- “Utility rates – The potential cost savings associated with most of the strategies in this plan are sensitive to utility rates. Accurately projecting utility rates through 2050 is an impossible task and subsequently dependent on the cost of fuels (e.g., coal, natural gas, and renewables) and the cost of carbon in a potentially monetized carbon future. Under these scenarios, it is generally safe to assume that the cost of utilities will increase and the savings associated with these strategies will improve from this conservative analysis using today’s rates with no escalation.” (42)
- “Legislation – In addition to federal legislation that may affect the price of carbon, there is the potential of increased stringency in the state’s RES. The majority of CSU’s electricity purchases are from utilities that are currently required to supply 10 percent renewable energy by 2020. It is conceivable that this requirement will be increased within the timeframe of this plan.” (42)
- “Financing mechanisms – Legislation, tax credits, renewable energy standards, and community goals can drive the introduction of new financing mechanisms that could enable CSU to achieve some of these strategies with a minimum of up-front capital.” (43)
- “Changing technologies and associated costs – The technological picture with respect to the built environment, renewable energy generation, and transportation is changing rapidly, particularly with the current focus on development in these areas. There are likely to be existing technologies that become increasingly viable and new technologies that will be introduced into future iterations of this plan.” (43)

Summary: The plan addresses a number of uncertainties associated with projections and proposed projects. It acknowledges that the CAP is inherently a living document and will be updated and adapted as more information becomes available. The CAP also mentions a number of technologies and projects that were considered, but subsequently deemed not viable given the resources at hand. It is particularly noted that projected costs/savings are variable and will likely change due to a number of factors in the future, from legislation to new technology, to better tracking methods.

7. What purpose do the appendices serve?

How extensive is the appendices section? Take note if they include extra graphs, tables, data, methodology, further detail and explanations, information on the planning process, etc.

- “The President’s Sustainability Commission (PSC) consists of representatives from a broad cross-section of campus units identified in the Appendix of this report.” (6)
- “See Appendix B for more information about CSU’s nitrogen footprint.” (11)

Summary: The appendices for CSU’s CAP serves to list those involved in sustainability efforts at CSU and the creation and implementation of the CAP, as well as providing information on CSU’s nitrogen footprint calculations.

8. Interesting notes and observations:

Does this CAP discuss anything else of interest? What observations did you make that might be of value further exploring? What about this CAP seems particularly unique or noteworthy?

- “CSU is now the proud owner of 26 electric vehicle charging stations. While only ~5% of the CSU fleet are alternatively fueled vehicles, these cars are very popular among staff. Analysis is currently underway exploring options and strategies to convert more of CSU’s fleet to hybrid and electric – to minimize vehicular emissions.” (25)
- “NESB Server Consolidation Prior to 2014, the Natural and Environmental Sciences Building had a server room on-site. The size of NESB’s chiller and the building layout made proper cooling of this room difficult and inefficient. Through collaboration between NESB faculty, Facilities Management, and university IT staff, the NESB servers were successfully relocated to a dedicated server room in an adjacent building, where they can be properly maintained, secured, backed-up and, use less energy.” (29)
- Colorado has wind resources consistent with utility-scale production. According to the National Renewable Energy Laboratory (NREL) in Golden, the state of Colorado alone has enough wind energy to supply 9 percent of the electricity consumption for the lower 48 states. That translates into 481 billion kWh per year of electricity. This proposed strategy is estimated to be about 20 percent of the potential wind energy resource on CSU lands. (30).
- “Colorado became the first state to create an RES by ballot initiative when voters approved Amendment 37 in November 2004. The original version of Colorado's RES required utilities serving 40,000 or more customers to generate or purchase enough renewable energy to supply 10 percent of their retail electric sales by 2015. Subsequent state legislation signed in 2007 and 2010 further increased the RES and made additional changes. Colorado’s RES now requires investor-owned utilities to increase their renewable energy portfolios to 30 percent, with cooperative and municipal utilities required to increase their renewable energy portfolios to 10 percent by 2020.” (updated plan, 33).
- “CSU receives electric power from multiple utilities – Fort Collins Utilities, Xcel Energy, and several rural electric associations served by Tri-State Generation and Transmission” (33)
- “This strategy entails implementing projects to sequester carbon on university owned lands. This could include either forests or grasslands. Ongoing research at CSU show that grasslands could actually be more effective at sequestering carbon than forests.” (34)

Summary: This section contains information on several aspects of the CSU that are more unique to CSU and Colorado or just don’t fit into our other seven categories. Topics include centralizing servers to reduce cooling infrastructure, electric vehicles in the campus fleet, potential wind energy, state mandated renewable requirements, specific utilities, and carbon sequestration.