

MEMO

To: Dr. Matthew Dull

From: Morgan Ralph

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Subject: Virginia Tech Carbon Offset Purchasing Policy

Introduction to Climate Change

Climate Change is the considered one of the greatest challenges humanity faces in the 21st Century. Its catalyst and current driver is the rapid industrialization of the economy in the 19th century, or more specifically, the burning of fossil fuels such as coal, natural gas, or oil (United Nations, n.d.). The burning of these fossil fuels release Greenhouse Gases (GHGs) such as Carbon Dioxide (CO₂) and Methane (CH₄) into the atmosphere. Additionally, human activity such as driving a gas engine car or using natural gas for electricity, increases the amount of GHGs in the atmosphere. These GHGs are contributing to Climate Change by “trapping the sun’s heat and raising temperatures,” (United Nations, n.d.). The effects of Climate Change and rising global temperatures are devastating to the planet. In addition to the general warming of Earth, sea levels are rising, the temperature of the ocean is increasing, and natural disasters are becoming more intense (United Nations, n.d.).

In the United States, Higher Education institutions are focusing on Climate Change mitigation strategies to reduce GHG emission levels and overall rising global temperatures. Specifically, universities are focusing on their CO₂ emissions and carbon footprint. As Higher Education institutions examine their CO₂ emissions, universities are releasing statements in support of action against Climate Change.

Climate Action Commitment and Greenhouse Gas Inventory

At Virginia Tech, the university monitors GHG emissions by inventorying the campus's carbon footprint in a database (Division of Facilities, 2019). The Greenhouse Gas Inventory was created in 2007 to benchmark the university's carbon footprint and ultimately measure the progress it has made to curb its emissions over the last decade (Division of Facilities, 2019). The Greenhouse Gas Inventory Report is published for the public annually. In 2009, Virginia Tech created its Climate Action Commitment (CAC), which was later revised in 2014 and 2020 (Virginia Tech Climate Action Commitment, 2020). The purpose of the Virginia Tech CAC was to serve as a guide and implement framework for sustainability and environmental stewardship for the University (Virginia Tech Climate Action Commitment, 2020).

As part of the 2020 CAC, 15 key goals were introduced to Virginia Tech, with the idea to achieve these goals throughout the decade. Goal 1 of the 2020 CAC is to “achieve a carbon neutral Virginia Tech Campus by 2030,” (Virginia Tech Climate Action Commitment, 2020). This is a very ambitious goal for the Blacksburg campus as it has “2,600 acres, 213 buildings, [and] an airport,” (Virginia Tech Campus Locations, n.d.). The Blacksburg campus is also home to legendary Virginia Tech buildings like “Lane Stadium, Cassel Coliseum, Moss Arts Center, and the Corporate Research Center,” (Virginia Tech Campus Locations, n.d.). As of 2023, Virginia Tech's estimated CO₂ levels were approximately 268,362 metric tons, quite far from the net zero goal (Virginia Tech Greenhouse Gas Inventory, 2024). Similarly, Goals 2, 3, 4, discuss reducing GHG emissions and achieving the 2030 Carbon Neutral campus goal by utilizing renewable electricity sources both on and off-campus, and reducing energy consumption (Climate Action Commitment, 2020). Goal 15 of the 2020 CAC states that Virginia Tech wants to “develop pathways after 2030 to eliminate fossil fuels and Carbon Offsets by 2050,” (Virginia

Tech Climate Action Commitment, 2020). While these are important and necessary steps being taken to address increasing GHG emissions in the atmosphere and the compounding effects of Climate Change, what if they are not enough to support Virginia Tech's Carbon Neutrality by 2030?

Carbon Offsets

Throughout the 2020 CAC, the use of Carbon Offset credits is mentioned, with the Goal 15 overview being the first. As the 2020 CAC goes into further detail on how the 15 Goals will be achieved, the use of Carbon Offsets is mentioned as a potential pathway for Goals 1, 5,6, and 9. However, there is no clear, deliberate, language on how Carbon Offsets can be of use to the university. Carbon Offset credits are a certificate that “conveys a claim to avoided GHG emissions or the enhanced removal of GHG from the atmosphere,” (Carbon Offset Guide, n.d.). These credits allow an entity such as Virginia Tech to balance or offset GHG emissions to lower the campus carbon footprint. These purchased offsets could represent reforestation by planting trees in areas where they had previously been removed (Gurgel, 2022). By purchasing and using Carbon Offsets, Virginia Tech could achieve their 2030 Carbon Neutrality goal.

Stakeholders

Potential stakeholders that are interested in GHG emissions, Carbon Neutrality, and Carbon Offset purchases include the Division of Facilities, Board of Visitors and the University President, and faculty, staff, and students.

Division of Facilities

The Division of Facilities consists of “500 highly skilled and talented team members,” who focuses on “analyzing, planning, maintaining, and improving physical infrastructure, championing environmental stewardship and climate action through best-in-class sustainability

and energy management programming, and maintaining buildings, electrical/mechanical systems,” (About: Division of Facilities, n.d.). The Division of Facilities is tasked with maintaining the day-to-day campus while also planning for Virginia Tech’s future. Within the Division of Facilities, the Energy & Utilities team and Office of Sustainability manage Virginia Tech’s energy efficiency and green initiatives influential to the success of the CAC goals.

Board of Visitors and the Virginia Tech President

The Virginia Tech Board of Visitors is the overarching governing body for the university. The Board of Visitors consists of “14 members, 13 of whom are appointed by the Governor [of Virginia], the 14th member is the President of the Board of Agriculture and Consumer Services,” (Board of Visitors, n.d.). The Board of Visitors ultimately has the power to implement policy for Virginia Tech. The Virginia Tech President, directly under the Board of Visitors, guides the vision and sets goals for the University’s future (Office of the President, n.d.). The President also addresses concerns and needs on campus, ultimately working to find solutions. Both the Board of Visitors and the President of Virginia Tech lead Virginia Tech towards achievements in sustainability as an institute for Higher Education.

Faculty, Staff, and Students

As of 2025, there are approximately 13,000 Virginia Tech employees between faculty and staff, and approximately 38,000 students (Virginia Tech Human Resources, n.d.) (Virginia Tech Facts, n.d.). Virginia Tech’s faculty, staff, and students make up the heart of Virginia Tech. Without them, there would not be a university. Virginia Tech employees and students must be considered and included in major decisions, as they will be severely impacted.

Need for Carbon Offsets

While the Virginia Tech CAC presents key goals to address increasing GHG emissions in the atmosphere and the compounding effects of Climate Change, stakeholders should acknowledge the potential challenges of achieving the CAC goals within the decade. The lack of Carbon Offset credit framework at Virginia Tech presents a problem. There is not a detailed guide or definition provided as to how they will be purchased, introduced, and utilized. To supplement these actions and achieve total Carbon Neutrality for Virginia Tech by 2030, there are several potential avenues the university could take.

Policy Alternatives

Virginia Tech could address their path to Carbon Neutrality in a multitude of ways. They are as follows:

1. Business as Usual: Carbon Offsets are mentioned but not used by the university.
2. Virginia Tech could follow Carbon Offset purchasing protocols from peer universities like the University of Virginia or Duke University using the company Giving Green.
3. Virginia Tech could enact policy to only purchase Carbon Offsets via a committee that will only be utilized in and have an impact on Southwest Virginia.

Business-as-Usual

Virginia Tech could maintain a Business-as-Usual strategy. This would mean that the university would continue to address Carbon Offsets in their CAC, without an actual plan to purchase them. Essentially, Virginia Tech would use Carbon Offsets as a ‘last resort’ option that would only be used in an extreme push to achieve Carbon Neutrality. There would be no change in Virginia Tech policy.

Peer University Review

Virginia Tech could study and review peer universities on the East Coast that have implemented Carbon Offset policy into their Carbon Neutrality goals. Both Duke University and

the University of Virginia have allowed the use of Carbon Offsets in their sustainability initiatives, with Duke University even achieving Carbon Neutrality in 2024 with the use of Carbon Offsets (Duke Office of Climate and Sustainability, 2024). The strategy of both Universities has focused on the use of a “Carbon Removals and Offsets Task Force” or “Climate Commitment Advisory Council (CCAC)” to evaluate and decide on Carbon Offset projects (UVA Sustainability, 2024) (Duke Office of Climate and Sustainability, 2024). Virginia Tech could follow in the University of Virginia’s and Duke’s footsteps to create their own Carbon Offset Team and usage framework. The framework would provide detailed guidelines for how Carbon Offsets could be used at Virginia Tech, what sectors of campus could they most benefit, and how often the University will implement them. It would also provide a way to select and scrutinize offset projects. Additionally, like the University of Virginia, Virginia Tech would work closely with the organization Giving Green to select Carbon Offset projects. Giving Green is “a guide for individuals and businesses to make more effective climate giving decisions,” and the organization “[performs] rigorous research and [recommends] highly effective climate initiatives,” (Giving Green, n.d.). Giving Green works with partners to identify climate projects, such as Carbon Offset opportunities, and allows organizations to select and choose the ones they feel will be the most effective for their donation. Essentially, Giving Green works with clients like the role of a financial broker, but for Carbon Offsets.

Local Carbon Offsets

Virginia Tech could focus only on Carbon Offset purchases and projects that were in Southwest Virginia and Appalachia. To do this, a committee would be formed composing of key stakeholders: Virginia Tech Facilities, members of the Board of Visitors, faculty, staff, and students. This committee would feature GHG and Climate Policy experts as well as individuals

with a more general knowledge of carbon offset projects to allow for a diversity of opinions and decisions. The development of a committee would allow the university to focus on supporting the campus and community, while also achieving Carbon Neutrality. An example of a local carbon offset projects could include planting additional trees throughout campus and the Town of Blacksburg. This Policy Alternative would ensure the money invested into Carbon Offset projects would stay within and have an impact on Southwest Virginia.

Policy Alternatives Matrix

To determine the best course of action, a policy matrix ranking the Policy Alternatives was created. The criteria in which the Policy Alternatives were evaluated by are listed as follows:

1. Political Feasibility
2. Cost of Carbon Offset Components
3. Equity of Purchase
4. Effectiveness of Carbon Offset Purchase and Project
5. Applicability to Virginia Tech’s Climate Action Commitment

The definitions and reasoning of each criterion for this Policy Alternatives matrix can be found in Appendix 1. Overall, the criterion was used for its ability to “highlight the tradeoffs across options...[and] capture the tension between strengths and weaknesses,” (Meltzer and Shwartz, 2018, pg. 113). Each Policy Alternative was rated on a scale of Low, Medium, High. These weights refer to the likelihood of success for the criteria and Policy Alternative. They also assist in the determination of a recommended action. The Policy Alternative Matrix below displays these evaluations.

Policy Alternative Criteria	Business as Usual	Peer University Review	Local Carbon Offsets
Political Feasibility	Medium	High	Medium

Cost of Carbon Offset Components	Low	Medium	Medium
Equity of Purchase	Low	Medium	High
Effectiveness of Carbon Offset Purchase and Project	Low	High	Medium
Applicability to Virginia Tech's Climate Action Commitment	Medium	High	High

Figure 1: Matrix showing Policy Alternatives rated on the Policy Alternative Criteria.

Business as Usual

Business as Usual was evaluated as having a medium level of Political Feasibility. It is the status quo. There can be proponents and opponents of this Policy Alternative. It was rated Low for the Cost of Carbon Offset Components as there is currently no policy for the purchase of Carbon Offsets in the Climate Action Commitment. Both the Equity of Purchase and the Effectiveness of the Carbon Offset Purchase and Project were rated as Low. However, Business as Usual was rated Medium for Applicability to Virginia Tech's Climate Action Commitment as there is little mention of Carbon Offsets in the plan.

Peer University Review

The Peer University Review Policy Alternative was evaluated with generally high results to the criterion. It was considered to have a High Political Feasibility, Effectiveness of Carbon Offset Purchase and Projects, and Applicability to Virginia Tech's Climate Action Commitment. As both Duke University and University of Virginia have implemented policies that address these criterion, Virginia Tech may be more inclined to develop their own. However, implementing Carbon Offset policy based on Peer Universities was only rated as Medium for the Cost of Carbon Offset Components and the Equity of the Purchase. Carbon Offset projects can

vary in cost creating the need for individual projects to be reviewed. The Equity of projects would also need to be further reviewed on a case-by-case basis.

Local Carbon Offsets

The Local Carbon Offsets Policy Alternative had a medium rating based on the criterion. The Political Feasibility, Cost of Carbon Offset Components, and the Effectiveness of Carbon Offset Purchases and Project were rated as Medium. Local projects would be seen as moderately feasible as they have a local impact. The Cost and Effectiveness were rated as Medium because both criterion for the Policy Alternative can vary on a project-by-project basis. However, the Equity and Applicability to Virginia Tech's Climate Action Commitment was rated as High for Local Carbon Offsets. By implementing and purchasing Local Carbon Offsets, there is the possibility of tangible benefits to Blacksburg and Southwest Virginia. It would also directly apply to the Climate Action Commitment by directly influencing Virginia Tech's goals.

Key Areas of Tradeoff and Questions

When considering which Policy Alternative to choose based on the matrix, Areas of Tradeoff must be considered. There were 2 Policy Alternatives that had significant Areas of Tradeoff based on the criterion. The criterion "Effectiveness of the Carbon Offset Purchase and Project" and "Equity of the Purchase" have the largest variability between each Policy Alternative. Business as Usual was rated as Low for both Equity of Purchase and Effectiveness of Carbon Offset Purchase and Project compared to the Peer University Review and Local Carbon Offset Alternatives. The Peer University Review and Local Carbon Offset Alternatives were rated as medium and high for these Criterion.

Following the review of the Policy Alternatives Matrix, questions about the Policy Alternatives remain for Virginia. First, while the financial feasibility of each Policy Alternative

is weighed in the Policy Alternatives Matrix, the actual amount of money Virginia Tech will allocate to the purchase of Carbon Offsets has not yet been determined. This question would have to be addressed by all stakeholders and University Leadership. Additionally, the amount of Carbon Offsets Virginia Tech will need to utilize in order to achieve the 2030 Carbon Neutrality Goal must be calculated using the Virginia Tech Greenhouse Gas Inventory as a guide.

Recommendations

It is recommended that Virginia Tech utilize Carbon Offsets by implementing policy based on its peer universities. This decision is based on the second Policy Alternative presented. Virginia Tech can create protocol similar to that of the University of Virginia and Duke University for their Carbon Offset use. Both universities have enacted Carbon Offset Committees composed of faculty, staff, experts, and university leadership (UVA Sustainability, 2024) (Duke Office of Climate and Sustainability, 2024). These Carbon Offset Committees utilize the services of Giving Green, the non-profit organization that provides Carbon Offset programs. At Duke University, the use of Carbon Offsets allowed the University to become Carbon Neutral in 2024 (Duke Office of Climate and Sustainability, 2024). Based on the results of Duke University, Virginia Tech's identified stakeholders could form a Carbon Offset Review and Purchase Committee to determine which Carbon Offset projects will be most beneficial to reducing the University's Greenhouse Gas Emissions. By utilizing Carbon Offsets, the goal of Carbon Neutrality for the Virginia Tech campus is in reach and will assist in the mitigation of global Climate Change (Office of Sustainability-Division of Facilities, n.d.) (Energy & Utilities-Division of Facilities, n.d.).

Conclusion

To address and begin mitigating the effects of Climate Change, Higher Education institutions such as Virginia Tech must address their Greenhouse Gas Emissions. As part of their

plan to address Climate Change, Virginia Tech has published a Climate Action Commitment with Sustainability Goals and a Virginia Tech's proposed 2030 Carbon Neutrality. To achieve Carbon Neutrality, Virginia Tech must purchase and use Carbon Offsets by developing policy based on the strategies of its peer universities.

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Appendix 1

Political Feasibility

Feasibility, and for the purpose of the Policy Alternatives, Political Feasibility “assess how possible it is for the policy option to actually get adopted and implemented,” (Meltzer and Schwartz, 2018, pg. 119). A Policy Alternative that has more Political Feasibility, will be rated on a higher scale, as it is more likely to be approved by all stakeholder groups

Cost of Carbon Offset Components

While the Cost of Carbon Offsets Components does not directly refer to the actual dollar amounts of projects, it reflects the financial feasibility of the project. Financial Feasibility determines the “costs to whom” (Meltzer and Schwartz, 2018, pg. 121). These costs “do not have to be considered in quantitative terms only,” Meltzer and Schwartz, 2018, pg. 122). This criterion weighs Policy Alternatives on how likely they will be funded financially.

Equity of Purchase

The Equity of the Purchase applies to “who gets what, when, and how” (Meltzer and Schwartz, 2018, pg. 117). This evaluates the Policy Alternatives by how they will affect the Climate Action Commitment and Virginia Tech, Southwest Virginia, and the greater Climate.

Effectiveness of Carbon Offset Purchase and Project

The Effectiveness of the Carbon Offset Purchase and Project determines “how well each policy option addressed the central problem,” (Meltzer and Schwartz, 2018, pg. 117). This criterion applies to the Policy Alternatives and helps determine how effective it would be.

Applicability to Virginia Tech’s Climate Action Commitment

This criterion evaluates if the proposed Policy Alternative can apply to the goals and strategies in Virginia Tech’s Climate Action Commitment. If the Policy Alternative can, it is

rated as High, if it applies to some, but not all goals, it is rated as Medium, and if applies to 1, it is rated as Low. If a Policy Alternative does not address any goals, then it is rated as Not Applicable.