Carbon Offsets at Williams College

Campus Environmental Advisory Committee Working Group on Carbon Offsets[1]

Overview

To reach carbon neutrality by 2020, Williams College has committed to buying carbon offsets. Carbon offsets are arrangements that will allow us to compensate for our own greenhouse gas emissions by investing in a greenhouse gas reduction or sequestration project somewhere else. These arrangements can take many forms, from forest conservation to renewable energy development to landfill methane capture. In theory, almost any method of reducing greenhouse gases any place in the world can be traded as an offset. But most so-called "verified" offsets—those traded on the voluntary market that Williams plans to enter—take place in the Global South, where the price per ton of carbon is lowest.

In their 2015 "Statement on the College's Role in Addressing Climate Change," president Adam Falk and the Board of Trustees wrote,

> We are sensitive to the impression that the college will be 'buying' some portion of its way to carbon neutrality. However, the purchase of high-quality, audited carbon offsets enables projects that represent true and immediate net reductions in global carbon emissions, and we will always prioritize lowering our own energy use above purchasing carbon offsets and RECs [Renewable Energy Certificates] on the market. Indeed, the most important reason for postponing the purchase of carbon offsets until 2020 is so that we *first* challenge ourselves strenuously to reduce our own consumption of fossil fuels. Ultimately, though, with current technology it is not possible for the college, or any similar institution, to achieve full carbon neutrality without the contribution of such offsets and credits.

The decision to buy offsets is controversial. Our purpose in this report is neither to take sides in that controversy nor to explore the technical dimensions of offsetting.[2] Rather, it is to recommend

[1] Henry Art, Director of the Center for Environmental Studies and the Environmental Studies Program, Rosenburg Professor of Environmental Studies and Biology, Emeritus; Ralph Bradburd, David A. Wells Professor of Political Economy; Nicolas Howe, Associate Professor of Environmental Studies (chair); Amy Johns, Director of the Zilkha Center for Environmental Initiatives; Jessica Munoz, Class of 2019; Chris Winters, Associate Provost.

[2] For a Williams-specific overview of carbon offsets, see the 2017 Zilkha Center report, "Carbon Offsets at Williams College" (Appendix A). For more comprehensive guides to offset investing for colleges and universities, see Second Nature's "Carbon Markets & Offsets Guidance," https://secondnature.org/wp-content/uploads/Carbon-Markets-and-Offsets-Guidance-1.pdf, and Cool Effect's "Universities and Carbon Credits: Lowering the Impact of Higher Education," https://externalassets.cooleffect.org/lib/content/wp-content/uploads/2019/03/13163015/CoolEffect_UniversityCarbon.pdf.

principles and strategies for purchasing the offsets that will be required to achieve carbon neutrality, and to suggest protocols for overseeing and evaluating those offsets over time.

As we explain below, our primary concern is how to identify offsets that are consistent with the College's educational mission. We believe that the College should not only buy the highest-quality verified offsets, but also strive to find the appropriate balance between offsets that offer low cost and offsets that offer meaningful educational opportunities, which we will call "mission-linked" offsets.

Mission-linked offsets

Williams explains its Sustainability Principles and Goals in the following way:

> Williams is committed to protecting and enhancing the natural and built environment in which we learn, work, and live, and to supporting the global effort to advance environmental sustainability. These efforts rely on the involvement of all members of the campus community. To succeed, initiatives must be not only environmentally responsible but also socially fair and economically sound.
>
> *The College's greatest contribution is through educating our students*, who will go on to become environmental stewards through their many roles as scientists, lawyers, investors, politicians, manufacturers, writers, advocates, artists, teachers, parents, consumers, and citizens. *We do this through our teaching, research, and co-curricular offerings, and by demonstrating and embracing sustainable practices in the development and operations of our campus*.[3]

Although the members of this committee hold a wide range of views on offsets, we agree that where practical the College should pursue offsetting projects that concretely support these principles and goals. If Williams were to treat carbon offsets as merely an expedient way to balance its carbon budget, it would miss an important opportunity to educate its students about the climate crisis, and it would send the wrong message about how to confront it. As an educational institution, we have a responsibility to foster stewardship by asking students to actively engage in environmental problem-solving.

That said, Williams must think realistically about how carbon offsetting can serve our specific educational goals as a liberal arts college. As our mission statement emphasizes, "Our purpose is not to offer specialized or professional training, but to develop in our students strong writing, speaking, and quantitative abilities, as well as analytical and interpretive talents, tested in relation to a wide range of issues and disciplines." How can offsets serve this purpose?

In practice, carbon offsetting is a highly complex undertaking that demands attention to all facets of environmental sustainability: economic, ethical, ecological, technological, political, and sociocultural. The offsets market is volatile, risky, and confusing—"the Wild West" as several of

[3] https://sustainability.williams.edu/sustainability-principles-and-goals.

the experts we have consulted characterized it. There are many different entry points into this market, and it is difficult to know whom to trust. Even the most respected and well-established registries have supported projects that ended up failing, sometimes with serious human rights implications.

However we feel about carbon offsets, we must be clear about what offsets mean in basic philosophical terms. We *choose* to emit a significant portion of the carbon we are planning to offset. We could choose to build less, fly less, and consume less. We could also choose to run our campus entirely on renewable energy, though certainly not in the immediate future. Carbon neutrality is an ambitious and laudable short-term goal, but future generations will judge us harshly if we use it an excuse to continue making environmentally irresponsible choices. We are not required to live such carbon-intensive lifestyles, nor are we required to compensate for those lifestyles by buying offsets.

That said, we are hopeful that our choice to buy offsets can be used not just to balance our carbon budget, but also to encourage the kind of critical, self-reflective inquiry that is at the heart of our educational mission. To that end, we urge the College to prioritize offsets that satisfy two criteria: visibility and depth.

Visibility

For offsets to be educationally valuable, they must be visible. By "visible," we do not mean "transparent." Transparency is a basic principle of offset verification and an expectation of all responsible offset purchasers. After all, to feel fully confident that an offsetting program is actually doing what it is supposed to do, one needs detailed, reliable information about that program's performance. But an offset could be transparent and barely visible at the same time—buried in an organization's books, relegated to a corner of its website, mentioned briefly in a brochure. Conversely, it could be prominently featured in an institution's promotional materials and touted as evidence of its commitment to sustainability while remaining inaccessible to serious scrutiny. For offsets to be truly visible to the College community, they should be open to in-depth analysis, and that analysis should be actively promoted as a meaningful learning opportunity.

In practice, visibility could be achieved in a variety of ways. At the very least, the College should maintain a comprehensive webpage dedicated to explaining its offset investments, perhaps on the Zilkha Center site. And just as it publicizes its progress toward reducing on-campus emissions through annual reports, the College should also provide regular public updates on the performance of the offsetting projects it is supporting. Finally, and perhaps most importantly, in its communications the College should provide as much information as it can on the specific places and communities where those projects actually take place. After all, if it buys offsets at the individual project level—and given the risks of buying offsets from brokers who bundle carbon credits, we strongly believe that it should—it will be building a concrete financial relationship with those communities, one that we should acknowledge and honor.

Depth

For offsets to support the College's educational mission, they should enable critical environmental thinking. This is what we mean by "depth." What is critical environmental thinking? To borrow language from the mission statement of the Williams Environmental Studies Program, "Environmental issues call upon citizens, organizations, and governments to grasp complex scientific concepts, address conflicting human values, and make difficult economic, political and ethical choices." Offset investments that do not ask us to do this kind of difficult, cross-disciplinary intellectual work are shallow and are not in keeping with our commitment to confronting climate change.

In practice, depth is best achieved through direct curricular engagement. Although the College cannot require faculty or students to integrate the college's offsets program into course curricula, it can seek to pursue offsetting opportunities that are more likely to attract interest from a broad range of faculty and academic units. For example, projects to promote clean cookstove technology in the Global South would have clear and compelling connections to our curricula in Anthropology, Economics, Biology, Public Health, Women's, Gender and Sexuality Studies, and Computer Science, not to mention the Center for Development Economics.[4] By contrast, an investment in methane capture at a local landfill could offer limited educational opportunities for faculty and students who are not interested in waste management policy or chemical engineering, subjects we do not stress in our curriculum.

This is not to say that educational depth can only be attained through traditional academic means. On the contrary, the College should encourage departments and programs to collaborate with with units such as the Zilkha Center, the Davis Center, and the Center for Learning in Action to open co-curricular avenues for studying offsets. Our point is simply that those avenues should lead toward the kind of substantive, rigorous academic inquiry that is the College's main reason for existence. Because there is no such thing as a purely scientific, social, economic, philosophical or political solution to the climate crisis, we should seek out offsets that inspire us to think across disciplinary boundaries while building on our traditional academic strengths.

Educational frameworks

What might mission-linked offsets look like in practice? Duke University's innovative Carbon Offsets Initiative provides a useful starting point. To offer educational co-benefits, its projects must provide students, faculty, and staff with opportunities for:

1. Research
    - Data collection and availability
    - Faculty publication opportunities

[4] The success of cookstove initiatives depends on understanding cultural foodways and local ecological and economic conditions. Diseases caused by smoke inhalation are a massive global public health problem that disproportionately affect women and girls. And an increasing number of cookstove projects rely on digital sensors and other forms of computer technology. This is just a thumbnail sketch of the issues to which we are alluding.

- Ability to create institutional knowledge on the project subject area

2. Participation in Designing the Project
   - Involving students in creating project-planning materials

3. Participation in Implementing the Project
   - Allowing students to volunteer or collect data from the project

4. Visiting and Touring the Project
   - Location of the project – ensuring proximity to Duke University
   - Accessibility – providing students, staff, or faculty with access to the site[5]

Duke has chosen to prioritize local, state, and regional offsets, and it has partnered with major corporations to develop its own offsetting schemes. As we explain below, we do not think it is realistic or perhaps even desirable for Williams to take a similar approach, at least not in the immediate future. In the short term, this eliminates the second criterion (project design) from our immediate consideration and complicates the third and fourth.

We are thus left with one major avenue for creating educational co-benefits: faculty and student research. While we know of two Williams professors in the early stages of research on carbon offsets, we do not currently employ any faculty experts on this subject. Our first class on offsets, a tutorial with Professor Ralph Bradburd in Economics, will be offered in 2019-2020. We could easily imagine incorporating research on offsets into a long list of classes from all three academic divisions, but we would be doing just that: using our imaginations. So in concrete, practical terms, how can we turn offsets into meaningful research opportunities?

One option might be simply to hire a professor who studies carbon offsets. But even if we assume that such a professor's expertise could be brought to bear on the specific kinds of offsets that Williams buys, such a hire would raise thorny questions about the boundary between operational and academic needs. It would be like hiring a professor of sustainable architecture to help us design new buildings—worse, in fact, because we will definitely need new buildings over time to serve our students' needs, whereas our decision to invest in carbon offsets is entirely voluntary. In any event, using faculty FTE to serve such a controversial purpose would undoubtedly incite even greater controversy about an already controversial subject. Moreover, given the deep and widespread skepticism about offsets that exists in much of academia, there is no reason to believe that such a faculty expert would support the college's offsets investments or wish to involve students in studying them at all.

A less problematic option might be to charge a staff member, either new or existing, with creating and coordinating offsets-related research opportunities. Such an "offsets coordinator" could also be responsible for communicating about offsets to the public and the college

[5] Duke University Carbon Offsets Initiative, Guide to Carbon Offsets and Co-Benefits, https://sustainability.duke.edu/sites/default/files/cobenefitsguide.pdf.

community, developing classroom tools (such as the Williams Wedge Project[6]), communicating with registries and project managers, and developing institutional partnerships. But this option also presents problems. For one thing, our total offset investment might not be large enough to justify the cost of such a position. For another, without guaranteed faculty involvement there would be no way to ensure that such a person could actually create the kind of in-depth, meaningful educational experiences that we want. At worst, this person would provide mere academic window-dressing for the College's offsets investments. That said, under optimal conditions (i.e. close faculty involvement and highly visible, accessible offsetting projects) it is possible to imagine such a person enriching our curriculum in important ways.

Other possibilities for creating research opportunities include recruiting experts and practitioners to teach Winter Study Courses; encouraging students to conduct independent studies and write honors theses; funding student internships; creating experiential learning programs through the Center for Learning in Action; and inviting experts to campus for lectures and workshops. With the exception of Winter Study, however, all of these options would require some degree of faculty involvement, which again cannot be mandated. Since the study of offsets does not "belong" to any one discipline, there is no reason to expect that any program or department should take ownership of this task.

In sum, creating meaningful educational opportunities out of carbon offsets is a challenge, but one we should accept. Staffing constraints and cost of course development will be perennial concerns. It will be important to evaluate the full marginal costs of fielding any new course. For a small liberal arts college, finding faculty with relevant expertise will always be challenging. And even if they are found, courses on offsets will face significant logistical obstacles. Courses that involve travel, especially to distant parts of the world, are complicated and expensive—and in some cases, because of the carbon footprint of the travel itself, inappropriate.

Judging from our conversations with experts, certain kinds of projects would seem to offer richer educational opportunities than others. We encourage the College to prioritize projects that (a) rely on science and technology that students can be reasonably expected to understand; (b) have proven, transparent track records; and (c) clearly illustrate the interconnectedness of economic, social, political, and natural systems. Examples that experts often point to are clean cookstoves and biogas digesters, although many others undoubtedly exist.

Local offsets

In their 2015 statement, President Falk and the Trustees committed to investing "in projects that reduce carbon emissions in our local region, helping to offset the impact of our own emissions." Many members of the Williams community believe that the College should favor investing in local offsetting projects over offsets traded on the global market. Many others worry that the potentially high costs of such projects will strongly outweigh their benefits, and that our money would be better spent on projects that can mitigate carbon at scale, provide social and

[6] https://ces.williams.edu/publications/ces-notes/ces-notes-2017/the-williams-wedge-project/

environmental co-benefits to people in the developing world, and facilitate carbon mitigation in places where it would not happen without foreign investment.

Local offsets may offer several advantages over standard verified offsets: more educational opportunities for students; more visibility to the college community; local engagement; and opportunities for new institutional partnerships. Moreover, they could help ease legitimate moral and political concerns about paying low-emitting, environmentally vulnerable communities in the Global South to compensate for the lifestyles of high-emitting, environmentally resilient communities in the Global North (although similar concerns apply to domestic offsetting projects in marginalized communities).

Nevertheless, if offsets are to be educationally valuable, we must challenge our community to think critically about all of the values we wish them to support. For many, teaching our students about cost-effectiveness and economic efficiency matters, as does the potential for carbon markets to drive sustainable development and innovation in other parts of the world. For them, investing in local offsetting projects with very high cost per ton of carbon would be not only financially imprudent but ethically suspect.

We believe that Williams should pursue opportunities to work on projects to reduce and sequester GHG emissions in the local community, but only if they meet the most rigorous standards of additionality, reasonably cost-effective carbon emissions reduction, and our standard of educational depth. In practice, this makes local offsetting very difficult, which is why we urge to College to also think about ways to support local mitigation efforts in different ways. While this committee does not think that local offsetting projects should be ruled out, it does think that they should be approached with caution.

Developing local offsets is challenging for several reasons. First and perhaps foremost, demonstrating that an offset is truly additional—that it would not have happened without the offsetter's investment—is very difficult, particularly in states like Massachusetts that actively support carbon mitigation efforts. It is important to recognize that additionality can be understood as a moral requirement, not just a technical issue. For a project to have a net environmental benefit, it cannot be an inevitable result of "business as usual." For example, it would not be a legitimate offset to simply add a conservation easement to land at no risk of deforestation or development. And even if a project is additional, third-party verification can be prohibitively expensive. Third, the scale and complexity of project protocols are intimidating, especially for a small college with limited technical expertise.

Some college and universities—most notably those affiliated with the Offsets Network—are working to find ways to get around these obstacles. They see local offset projects as a way to test and promote innovative carbon reduction strategies. Williams should continue to explore ways to collaborate with other colleges and universities on innovative offsetting projects. But to initiate such a project on its own would require the active, sustained leadership of at least one faculty member with the full support of his or her academic unit and a renewable pool of engaged students.

Forest management and conservation

One possible avenue for local offsetting is forest conservation and management. Williams is located in a globally important carbon sink, and it is has a long tradition of forest-related academic study. This region has a diversity of forest types, from the northern forest, to northern hardwood forests, to transitional oak-hickory forests that may enable it to respond to climate change more gracefully than other regions will be able to do.

While lands that will remain forested regardless do not contribute additionality, lands that have been harvested for timber historically might well be considered to be legitimate candidates to qualify for carbon-sequestration offset production. However, they should be managed in a fashion that guarantees the annual carbon removal of wood from the site is less than the annual addition of carbon to the standing woody biomass *and* the annual addition of carbon to the soil is more than the annual respiratory loss of soil organic matter through decomposition. This is where verification-validation is necessary and undoubtedly is the expensive part of the scheme.

Most of the Hopkins Memorial Forest has been declared to be non-additional since the College would not be harvesting or developing it anyway. However, there are some Western Massachusetts projects that are underway, fostered by the New England Forestry Foundation and others, that we might consider. More locally, there is potential for the Bullock Lot and several other town-owned woodlots on the Taconic Slope along with College-owned woodlands Berlin Pass, Stone Hill, Mount Hope Farm, and Pine Cobble, all of which have been logged in the past and could be managed so as to either solely sequester carbon in the future, or have verified logging plans that removed less carbon than is annually being stored. The advantages to the College in developing these sites for enhanced carbon sequestration (compared to business as usual) are manifold. It would link the local region to the global carbon sequestration challenge; it would enable the use of these lands for educational purposes; it possibly could be a local economic stimulus; and it would demonstrate the active involvement of the College in the process of sustainable land use. If the dynamic environmental history of this region is any guide, we cannot be complacent about the future of forest management. Increased demand for forest products and other environmental pressures could manifest quickly, as indicated by the recent, failed attempt to develop a biomass-burning electricity plant in Pownal, Vermont, a project whose impact on local forests could have been great.

An example of a site for a possible forestry project is the portion of the Hopkins Memorial Forest that consists of the open lands of the former Wire Bridge Farm, currently used for the production of hay and corn silage. It could be devoted to a more rapid sequestration of carbon than is expected under the current use, and thereby create additionality. Williams College could purchase the remaining open lands of the Wire Bridge Farm to the north, and then establish an offset program that would also serve the educational mission of the College. One-third of the land could be used as a control to measure the carbon sequestration by haylands and meadowlands. The remaining land could be used as experimental woodlots to determine the rate of carbon accumulation by intentionally planted, high-productivity forest plantations and by natural reforestation processes (biotic succession). The site would need to be verified by

third-party accreditors, but also could be used by various courses such as ENVI 102 - *Introduction to Environmental Science* or BIOL 329 / ENVI 339 *Conservation Biology*.

That said, forest management projects need to be carefully analyzed to determine the cost per ton of carbon sequestration/removal, taking into account not only planting costs, but also management costs over time and the possibility of carbon release as a consequence of climate-change induced threats to the long-term viability of currently endemic tree species. This analysis would demand a long-term effort from our faculty and students, and we do not currently have a framework for its initiation.

Co-benefits

Williams could, in theory, invest in offsets with no co-benefits whatsoever. Although in doing so it would sharply diverge from all other colleges and universities that we know of, it could plausibly argue that attaining carbon neutrality by the cheapest, most efficient means available is in fact the best way to support its educational mission, perhaps by freeing up capital for more important educational projects. However, we believe that this argument would be flawed.

To understand why co-benefits are important, it helps to put our emissions in quantitative perspective. In 2018, the roughly 3,000 students, faculty, and staff who belong to Williams emitted 24,045 tons of greenhouse gases. Thanks to its recent investment in a utility-scale solar project in Maine, its purchased electricity emissions will be reduced by 80-90% in 2020. The remaining emissions related to electricity will be significantly reduced through energy conservation, future on-site solar projects, and/or shorter term purchases of renewable electricity off campus. Our largest source of emissions, on-campus combustion of natural gas, is much more difficult to address. Those emissions, along with travel-related emissions (which have been steadily increasing over the past five years), will need to be offset for at least the next several years. Annual offset purchase is estimated to be 19,000 metric tons. If, for sake of argument, we assume an average offset cost of $10 per ton, that would amount to a total expenditure of $190,000 in 2020.

To put that figure in perspective, consider the costs of some recent College building projects (in millions): The Log ($4.6), the Williams Bookstore ($10.5), Weston Field ($23.7), and Sawyer/Stetson ($85.9). If we combine completed, active, and planned capital projects, the College has invested $590 million in physical space since 2009.[7]

Our point is this: compared to such expenditures, our offsets investments will be quite small, and they should get smaller and smaller as we lower our on-campus and travel-related emissions. One could argue, therefore, that our offsets will be largely symbolic. But symbols matter, especially in an educational context. Take our $5.6-million Environmental Center, which does very little to reduce our collective environmental footprint but serves as a visible, public symbol of our environmental values and aspirations. Our offsets will serve as a similar kind of symbol,

[7] Provost's Report on Building, March 2018. https://provost.williams.edu/files/Report_on_Building_13fAB-1.pdf

and if they come without co-benefits they may be perceived as symbolizing only one value: minimizing budgetary outlays.

Duke University's Carbon Offsets Initiative has divided co-benefits into five useful categories: educational opportunities; social engagement and equity; environmental health and conservation; scalability of project type; partnerships and public relations. Like many of its peer institutions, Williams must decide which of these categories to prioritize, and at what geographical scale. As we have made clear, we believe that educational co-benefits must come first. However, those co-benefits are highly dependent on the others. For example, Duke has chosen to prioritize local, state, and regional offsets. It has partnered with Google and Duke Energy to install a waste management system at an 8,600-head hog farm in North Carolina that produces roughly 2,500 verified offsets and 300 renewable energy credits annually. This operation provides educational co-benefits by offering research and touring opportunities to its students, social co-benefits by improving local quality of life, and environmental co-benefits by reducing air and water pollution. It is also developing a scalable model for livestock waste management. From our perspective, this project is educationally valuable *because* Duke has the capacity through its schools of engineering and environmental science to develop and study high-tech, scalable systems. According to the Offsets Network, the project's current offset cost per ton is $60-100. Relying largely on local projects like these, Duke estimates that it will have to offset roughly 55,000 tons of carbon dioxide equivalent to reach carbon neutrality by 2024.

Clearly, Williams cannot pursue projects like these, at least not in the foreseeable future. We therefore encourage the College to prioritize the co-benefits of social engagement, equity, environmental health and conservation—all of which respond to what has clearly become the preeminent concern of our faculty and students, climate justice.

Climate justice

Is it ethically permissible to pay people in the developing world to compensate for emissions that rich countries choose not to cut themselves, especially when it is the poor and marginalized who are bearing the brunt of climate change? On this question, experts hold a wide range of opinion, as do the members of our committee. However, we do agree that Williams has a responsibility to educate its students about the environmental justice implications of carbon offsets. We also agree that it has a duty to avoid any offsetting schemes that might have any negative social consequences.

Even the highest-quality verified offsets can have unintended negative social and environmental effects, and Williams has a responsibility to avoid these. This risk is especially great in the Global South, where offsetting projects can exacerbate inequality, damage livelihoods, and degrade ecosystems. These effects can be difficult to see from afar, even for the certifying agencies responsible for monitoring and compliance. Large-scale hydro-electric and forestry projects are notoriously problematic in this respect, and we believe that Williams should avoid these altogether. But we believe that Williams should approach all offsets in the Global South with caution, recognizing that even the most apparently benign schemes involve asymmetrical power relations.

Just as we should require good scientific information about carbon management, so should we require good information about project governance and community involvement. Unfortunately, the social science and humanities disciplines best-equipped to study these factors are often excluded from institutional decision-making about carbon markets. We therefore encourage the College to include these voices in its in-house offset oversight.

Oversight

To minimize risk, the College should invest in a portfolio of offsetting projects. Even if this portfolio is small, it is unlikely that Williams will be able to translate each project into meaningful educational opportunities. But it should make every effort to invest in a small number of projects—or perhaps even one significant project—that meets all of the criteria described above and affords students and faculty multiple opportunities for multi-disciplinary inquiry.

Managing this portfolio will be an important task that should involve faculty, staff, and students. We recommend the establishment of an offsets task force that meets at least twice per semester, consisting of the director of the Zilkha Center, the chair of Environmental Studies, one student, and two additional faculty members. Because the learning curve is steep, members of this group should serve multi-year terms. At many colleges and universities, offsets are considered the purview of economists, scientists, and sustainability officers. We do not believe that this approach is sufficiently inclusive or in keeping with our liberal arts mission. Many of the most troublesome questions surrounding offsets are ethical, social, and political. Therefore, Williams should seek to involve faculty in this working group with diverse backgrounds in the sciences, social sciences, and humanities.

Offset vendors and institutional partnerships

Teaching students to think critically about markets is an essential part of our educational mission. In our classes, we ask them to actively question the social and environmental impacts of their economic choices, not to act as passive consumers. We want them to "look beneath the hood" and see for themselves whether things are worth buying. For this reason, Williams should seek more than just a seal of approval from an offset registry such as the Gold Standard when buying its own offsets, even though this seal of approval is an essential starting point.

In practice, gathering good information about individual offsetting projects can be difficult, especially for a small college with limited resources. Site visits can be expensive and logistically complicated, and they may not give a clear picture of what is happening on the ground. Project data can require technical expertise to interpret correctly. Policy contexts can vary greatly from project to project.

Therefore, we encourage the College to consider working with an organization that specializes in providing additional layers of scrutiny to verified projects, especially with respect to the extremely important question of additionality. Ideally, such an organization would not only help

ensure that all projects meet the highest standards of environmental integrity and additionality. It would also facilitate educational opportunities by helping the college communicate with stakeholders and examine project operations. At the very least, we should only work with vendors who have an official grievance mechanism, facilitate dialogue with project managers, enable easy access to project data, and are willing to facilitate site visits.

Partnering with other educational institutions on offset investments offers clear benefits. For one thing, it would expand the range of faculty and staff expertise. For another, it would promote academic cross-pollination. And for another, it would increase our confidence in project oversight, particularly if the partner institution has relevant graduate programs and experience studying the offsets market.

Conclusion

Many questions remain about how to approach carbon offsetting. Geography is a significant sticking point. Based on our conversations with the Campus Environmental Advisory Committee (CEAC) and other members of the College community, it is clear that disagreements over the value of local offsets will persist. Despite this committee's generally cautious stance on local offsetting, we believe the College should seize opportunities to develop innovative, reasonably cost-effective local projects should they meet our educational standards. We have heard good educational arguments for pursuing local offsets, and these arguments should be carefully considered as the college develops its offsets portfolio. We have also heard good moral arguments for using offsets to help marginalized and underserved communities in our own region, and these should be carefully considered, too.

A second sticking point is long-range strategy. The metaphor of "battlefield medicine," which was suggested by one of the experts we consulted, seems apt. Offsets are a short-term solution to our carbon pollution problem. The only question is *how* short-term. As it develops its offsets portfolio, we urge the College to explicitly factor offsets into its long-term strategic planning, and to maintain an ongoing public dialogue about the time horizon of its offset investments. In the meantime, we should be on guard for any signs of moral licensing, especially when it comes to decisions with long-term implications for campus energy use. If, for example, we were to use offsets as a license to construct a large, unnecessary building, we would be violating the spirit of our Sustainability Principles and Goals even if our immediate net emissions cancel out. Offsets cannot be used as an excuse for delaying the kinds of lifestyle changes that climate change clearly demands, including more restraint in our approach to campus development.

Achieving carbon neutrality is an important benchmark of progress, but achieving it through the purchase of offsets does not deliver the same message as achieving it through decarbonization. Although there is no denying that a campus fuel switch would be extremely expensive or that radically reducing air and automobile travel would be very difficult, many members of the Williams community believe that these will be necessary steps in the not-too-distant future. They believe we have an educational and moral responsibility to show our students that while decarbonization will require difficult trade-offs and sacrifices, it is necessary and possible. Humanity simply cannot offset its way out of the climate crisis. Offsets are a short-term solution

to the longest of long-term problems. As a 225-year-old college with, we hope, an even longer future ahead of us, we of all institutions should be teaching our students to think about the long-term health of our planet.

In the meantime, we must acknowledge that technology and limited resources are not the only obstacles to radically reducing our emissions. We *choose* to emit much of the carbon that we are now proposing to offset. We are not required to fly as often or as far as we do; we are not required to have so many buildings; we are not required to consume or waste as much food. We are not required to live such carbon-hungry lives.

Williams College has committed to buying carbon offsets to achieve carbon neutrality by 2020. We believe it should treat those offsets as a bridge toward the much more ambitious but necessary long-term goal of a phasing out fossil fuels on campus and drastically restricting air travel until less-polluting transport methods are available. In the meantime, it should use offsetting as an educational tool, not just a financial instrument. Our relative climate impact is small, but our societal impact is large. To educate the next generation of environmental leaders, we should engage our students in the offsetting process. We should teach them to think critically about the role of carbon markets in combating climate change, and to investigate how those markets connect them to global economic, political, and environmental systems. Offsetting should be an opportunity to learn.

Appendix A

Carbon Offsets at Williams

In 2015 the President and the Board of Trustees set an ambitious goal to achieve carbon neutrality by the end of 2020. To get there the college has been implementing efficiency and conservation projects, moving toward 100% renewable energy, and challenging members of our community to change their behavior. But there is a limit to how much we can reduce emissions on campus, especially in the time frame necessary to achieve our goal by 2020. We cannot, for example, easily escape our fossil-fuel driven central heating plant, and travel will continue to generate emissions.

If we want to become carbon neutral by 2020, we will therefore need to invest in carbon offsets. The question then becomes: which ones? Offsets differ considerably in price, quality, the type of projects, and their locations. If we invest in this market, we need to be assured that the offsets we purchase create verifiable reductions in greenhouse gas emissions and that they do not substitute for direct investments in emissions reductions on our own campus. As a first step, it is worth taking a closer look at the current state of the carbon offsets market and the pros and cons of using offsets to help meet our own climate goals.

What are carbon offsets?

Carbon offsets are tradable units measured as the reduction of one ton of carbon dioxide equivalent emission (CO2e). Developers undertake projects that "produce" these carbon reductions that they then package into tradable units called offsets. The developers sell the offsets to buyers who want to reduce their carbon footprint. Projects can reduce emissions in a number of ways. Some store carbon naturally by replanting trees on cleared land. Others generate renewable energy, destroy harmful greenhouse gases, or replace unclean energy with renewable energy.

The table below gives examples of a wide range of project types. These projects can take place all over the world. From the standpoint of climate change, what matters is the net change in carbon emissions, not how or where it happens.

Project type	Example
Renewable energy that displaces fossil-fuel sources	· Wind · Solar
Forestry and land use	· Reforestation of previously cleared land

Methane destruction	· Landfill methane capture · Anaerobic digestion of manure and capture of resulting methane
Efficiency and fuel switching	· Community-based efficiency programs (such as weatherization of low-income homes) · Industrial efficiency programs (reducing energy use in manufacturing processes)
Household devices	· Clean cook stove distribution · Water purification device distribution (reduces need for boiling water)
Transportation	· Improvement of public transportation infrastructure · Fuel switching from diesel to biogas powered heavy vehicles
Destruction or lower production of non-methane potent greenhouse gases	· Reducing production of nitrous oxide during fertilizer manufacturing

Who buys offsets? And why?

There are two markets for carbon offsets: the *compliance* market and the *voluntary* market. The compliance market consists of the offsets traded to comply with legislative imperatives, such as California's "Global Warming Solutions Act of 2006." Such purchases are mandatory for a set of regulated industries, but Williams College is not in such an industry.

The voluntary market, in contrast, has arisen in response to organizations, like Williams, that want to voluntarily lower their carbon footprints. While Williams' entry into the carbon offset market would be relatively new, the voluntary offset market has been around for over a decade. Over $4.8 billion offsets have been bought and sold. Of 377 colleges that participated in AASHE's "STARS" rating system, 85 had purchased offsets, including peer liberal arts colleges like Colby, Dickinson, Oberlin, and Middlebury.

How much do offsets cost?

While the carbon-reducing impact of one offset is, by definition, the same regardless of where or how it is achieved, the cost of reducing that carbon can differ dramatically between projects. As such, the market for voluntary carbon offsets is characterized by huge variability in price.

Adding to that variability is the fact that buyers of offsets care about, and will pay a premium for, many factors (other than price), including the project type, project standard, and project location. Colleges like Williams, for example, might care whether a project is located close to campus, how it impacts the local community, and what standard has been used to verify that it has the promised carbon-reducing effects. Offsets that carry a desirable set of features will command a premium price.

Figure 1 shows the average prices of offsets sold in 2016, broken out by project type, location, and standard. Project types include different categories of renewables, forestry, and methane; locations include large regions such as North America and Asia; and standards include registries like Gold Standard, Verified Carbon Standard, and the Clean Development Mechanism. The variation in the prices across these categories suggest that buyers perceive large differences in the quality of offsets. A ton of reduced carbon may be a ton of reduced carbon, but it matters how that reduction occurs, where it happens, and how it is measured.

It is also worth noting that the current prices of carbon offsets are generally lower than the social cost of carbon, which is a measure of the long-term damage caused by a ton of carbon produced in a given year. The social cost of carbon is "meant to be a comprehensive estimate of climate change damages and includes, among other things, changes in net agricultural productivity, human health, property damages from increased flood risk and changes in energy system costs, such as reduced costs for heating and increased costs for air conditioning" (EPA, 2016). Using integrated models of climate change and economic growth, the EPA has calculated the social cost of one ton of greenhouse gas emissions to be $36 in 2015, increasing to $69 by 2050 (all in 2007 dollars) (EPA, 2016, p. 4). So, while the future of carbon offset pricing is unknown, we might consider the social cost of carbon as a reasonable upper limit.

Figure 1: Carbon offset price broken out by project type, project registry and project location. (Hamrick and Gallant, 2017, p. 8)

How do we know if an offset is "real"?

Nobel prize-winning economist George Akerlof explained how in a market in which it is hard for buyers to assess relative quality we should worry that lower-quality products will drive out higher-quality products. Akerlof called this "the market for lemons." Using the used car market as an example, Akerlof explained that information asymmetry between buyers and sellers drives the price of all used cars down to the average price—somewhere between bad-quality "lemons" and good-quality "peaches." As the price falls, owners of "peach" cars will exit the market leaving only lemons behind. That further drives down the average price until the market collapses. The solution is trusted third-party verification of used car quality.

Just like the "certified pre-owned" process that has evolved in the used car market, an entire industry of registries, auditors, and brokers has evolved around carbon offsets to avoid the adverse selection problem described above. While this has resulted in a more complex market structure, the essential features are relatively straightforward: there are suppliers of offsets and consumers of offsets, with intermediaries standing in between who perform the functions of setting standards and verifying quality.

The chart below shows how the process works. Project developers undertake emissions-reducing projects which must abide by standards developed by independent carbon registries. The projects produce tradable offsets whose quality is verified by third-party auditors before being priced and offered for sale to buyers either via brokers or directly.

How do these trusted third parties assure quality?

The central challenge in the offset market is assuring buyers (in a way that is credible and verifiable) that the offsets they might buy represent true reductions in global carbon emissions. Third-party certification is therefore critical to the proper functioning of the offset market.

Certification in the offset market operates through carbon registries and auditors. Carbon registries create the standards, or methodologies, for quantifying the emissions reductions resulting from projects. Third-party auditors then determine whether offsets adhere to those standards.

Standards aim to ensure that an offset's promised emissions reductions are *real, permanent, and additional*:

- *Real* - The promised reduction occurred without being overstated in any significant way.
- *Permanent* - The promised reduction will not be "reversed." For example, a replanted forest may run the risk of being cut down by loggers or burned down by a fire. It is not always possible to guarantee permanence (fires may happen), but it is sometimes possible to limit the likelihood of such reversals or appropriately discount the emissions impact of a project.
- *Additional* - The promised reduction would not have occurred in the absence of carbon market incentives. This component is important because if the project would have happened anyway then the buyer's investment is not actually accomplishing a real carbon reduction.

Demonstrating additionality is a critical piece of determining whether a project reduces greenhouse gas emissions in a meaningful way, but it is one of the more challenging aspects of the process. To be additional, a project must demonstrate that the emissions reductions would not

have occurred without the project—an exercise in comparing the project to an appropriate baseline.

The baseline for a project can be calculated in a few ways, depending on the project. The project developer can examine emissions data for previous years' performance, or a baseline can be constructed using local common practices and legal requirements. In order to demonstrate additionality, projects must pass either a three-pronged test, showing that the project would not have happened otherwise, or a performance standard test showing that it would not have happened to as great an extent.[8]

The job of a third-party auditor is to ensure that a project does what it claims to do. The auditor collects a variety of physical, documentary, and testimonial data, which all inform an assessment of the project's real impact: whether the reductions are real, how confident one should be in the size of the reductions, the eligibility for a given standard, and the sources and magnitude of potential errors, omissions, and misrepresentations.

What are the pros and cons of carbon offsets?

Investing in high-quality, audited carbon offsets will be a necessary part of the college's strategy to reach carbon neutrality by 2020. But doing responsibly requires a careful examination of both the pros and the cons of marketable offsets.

<u>The pros</u>

There are several key advantages to purchasing offsets:

Global reach

An investment in offsets can lead to larger reductions in global emissions than a direct investment locally. It would be surprising, in fact, if the lowest-hanging fruit in global emissions reduction happened to be found in northwestern Massachusetts. Carbon offsets allow us to take advantage of a much wider set of projects that might create larger reductions in carbon for each dollar we invest.

Outsourcing of expertise

The existence of a network of trusted carbon registries, auditors, and brokers gives us, as a consumer, access to a level of technical expertise that we could never replicate in-house. For example, Williams could never send representatives to evaluate each project site that it supports, nor could it justify employing technical experts in every type of project. It would not be cost-effective to develop that expertise.

[8] With the *three-pronged test*, the project developer must demonstrate that the project (1) is not required or mandated by laws/regulations; (2) exceeds common practice; and (3) overcomes one or more barriers. With the *performance standard test*, the project must show that reductions produced are greater than those required by regulations and laws.

Co-benefits

Offset project often generate additional environmental, social, and economic benefits. Cookstoves and water filtration can improve air and water quality; afforestation projects can strengthen biodiversity; and wind projects can create jobs through the construction and operation of turbines. While it can be challenging to account for all of these co-benefits, it is important to recognize that some projects will generate larger positive spillovers than others.

Learning and teaching opportunities

Participating in the carbon offset market creates opportunities to teach and learn. The carbon offset market is likely to expand dramatically over time. We can teach our students about the risks and opportunities of such a market and involve them directly in the process of selecting our portfolio of offsets each year. Of course, we will sometimes make mistakes, and some projects may end up being less effective than we hope. Because we will be purchasing offsets each year, we can learn from those mistakes, and share our knowledge with students, faculty, and staff on campus and with our peer institutions. Offsets will play a critical role in helping many institutions meet their sustainability goals, and we have the opportunity to be a leader by using this market to reduce our college's carbon footprint.

The cons

While there are numerous benefits to investing in offsets, there are also some important concerns and limitations:

Leakage

Leakage refers to increases in greenhouse gas emissions that do not occur within the project's boundaries, and therefore may not be counted against the total reductions of the project. For example, leakage might arise in the case of a forest preservation project if the improvements in forest land increased eco-tourism that caused additional visitors to fly to the area, with a consequent rise in emissions.

Risk

While carbon offsets are required to meet standards related to permanence, all projects contain some element of risk. For example, a forest planted as part of a reforestation project is subject to natural risks (fire, pests) and economic/political risks (a change in government could lead to a change in land ownership or regulatory environment). There are also risks related to mismeasurement, moral hazard, operations, and technology. In some cases, programs like the Verified Carbon Standard require that risky offset projects build in a "buffer pool" that can be used to make up for projects that underperform relative to expectation.

Impact of incorrect baseline assumptions

Whether a project actually generates the amount of emissions reduction that it claims depends on the accuracy of the calculation of the baseline scenario. If a project has an inaccurately high baseline, then the project will appear to reduce more emissions than it does in reality.

Moral licensing

Another concern is that a purchase of carbon offsets will cause the purchaser to become less attentive to other methods of emission reduction. This can be simply due to competition for resources—money spent on carbon offsets cannot be spent on alternative projects. But it could also be due to a form of moral self-licensing (Merritt, Effron, and Monin, 2010, p. 344). The concern here is that purchasing offsets will cause individuals or institutions to slacken their emissions reduction efforts in other areas. There is currently no evidence suggesting that moral licensing is a problem in the offset market, but it is worth being aware of the both the perception and the possibility of substituting offsets for other actions.

Unintended non-emission consequences

The creation of carbon offset projects – especially in developing areas – can produce a host of social and political consequences. Forest preservation projects in particular require the acquisition of large land areas, and that necessarily introduces the question of whether the land transfer was just. Carmody and Taylor describe a process of "ecolonization" that consists of actions by powerful international actors to secure access to natural resources (including sinks for carbon), often involving land grabbing, to the detriment of indigenous and local communities (Carmody and Taylor, 2016, p. 102).

Local offsets

Most of the discussion so far has centered on marketable, third-party verified offsets. But some carbon offset opportunities exist in the local community. Williams (working with Amherst, Smith and Hampshire Colleges) has implemented a pilot project to review the feasibility of supporting local energy efficiency and weatherization projects, with the colleges taking direct credit for the emissions reduction. There are significant logistical barriers to such projects, and the cost per ton of carbon is usually higher than for offsets sold through the carbon markets, but local projects provide several advantages. First, the college can monitor and analyze the projects in a way that is difficult for purchased carbon offsets (which is useful both for verifying the emissions reductions and for learning the skills and challenges of such analysis). Second, the college can confirm that the projects have co-benefits (and fewer negative unintended consequences) and that those co-benefits accrue to our local community.

Our recommendation:

The college's stated commitment requires the purchase of carbon offsets, at least in the short term, to meet our goal of achieving carbon neutrality by 2020. Carbon offsets have the potential to generate meaningful reductions in the college's carbon footprint without compromising its commitment to directly reducing emissions. The following recommendations are specific ways to ensure that the college's purchase of carbon offsets yields real emissions reductions and supports the college's broader goals. These recommendations also reflect discussions of the Campus Environmental Advisory Committee (CEAC).

1. Purchase Green-e climate certified carbon offsets.
Green-e is a non-profit organization that provides an additional layer of verification of carbon offsets. It sets standards for carbon offsets, monitors the retail process for carbon offsets, and prevents double-counting or inaccurate disclosure.

2. Purchase offsets that comply with a standard that addresses social, environmental, and economic impacts beyond greenhouse gas emissions. Consider local projects, too.
Where feasible, carbon offset projects should lead to social co-benefits. That is, benefits to the communities most impacted by the project. The existence of social co-benefits increases community support and thus may increase the long-term viability of the projects. In some cases, we may find projects in our backyard that generate substantial emissions reductions and create large local benefits.

3. Carefully monitor land use and forest projects.
Many of the concerns discussed above are most relevant to land use and forest projects. While there are probably examples of such projects that do not suffer from incorrect baseline estimates, negative social impacts, and high degrees of leakage, those risks are significantly greater for land use projects. Williams should avoid such offsets or at least require an additional level of assurance before their purchase.

4. Maintain a portfolio approach.
The risks related to carbon offset projects vary depending on the particular project type, geography and registry. Purchasing offsets from a variety of different project types is one way to mitigate the risk that any particular project will under-perform emissions reductions. In addition, Williams should consider working with peer institutions to take advantage of scale economies and shared knowledge.

5. Establish further goals and milestones for emission reduction independent of offset purchase.
In order to address the potential moral-licensing effect of the purchase of carbon offsets, Williams should set additional emissions and/or energy use reduction goals beyond 2020 that are independent of the purchase of carbon offsets.

6. Establish a working group that oversees the college's carbon offset purchases.
Such a working group should include students, faculty, and staff and would be tasked with guiding and monitoring the college's offset portfolio—both local and purchased.

References

American Carbon Registry. (2015). *The American Carbon Registry standard*. Retrieved from http://americancarbonregistry.org/carbon-accounting/standards-methodologies/american-carbon-registry-standard/acr-standard-v40-january-2015.pdf

Bento, A., Kanbur, R., and Leard, B. (2016, May 11). On the importance of baseline setting in carbon offsets markets. *Climatic Change*, *137*, 625-637.

Bento, A., Kanbur, R., and Leard, B. (2016). Supplementary Material for On the importance of baseline setting in carbon offsets markets. Retrieved from https://static-content.springer.com/esm/art%3A10.1007%2Fs10584-016-1685-2/MediaObjects/10584_2016_1685_MOESM1_ESM.pdf

Carmody, P., and Taylor, D. (2016). Globalization, land grabbing, and the present day colonial state in Uganda: ecolonization and its impacts. *Journal of Environment and Development*, *25*(1), 100-126. http://dx.doi.org/10.1177/1070496515622017

Haim, D., White, E. M., and Alig, R. J. (2015, April). Agricultural afforestation for carbon sequestration under carbon markets in the United States: leakage behavior from regional allowance programs. *Applied Economic Perspectives and Policy*, *38*(1), 132-151.

Hamrick, K., and Gallant, M. (2017). *Unlocking potential: state of the voluntary carbon market 2017*. Retrieved from Forest Trends website: http://www.forest-trends.org/documents/files/doc_5591.pdf#

Jacobsen, G. D., Kotchen, M. J., and Vandenbergh, M. P. (2010). *The behavioral response to voluntary provision of an environmental public good: evidence from residential electricity demand* [Working Paper]. Retrieved from National Bureau of Economic Research website: http://www.nber.org/papers/w16608.pdf

Merritt, A. C., Effron, D. A., and Monin, B. (2010). Moral self-licensing: when being good frees us to be bad. *Social and Personality Psycology Compass*, *4/5*, 344-357.

United States Environmental Protection Agency [EPA]. (2016). *Social cost of carbon.* Retrieved from https://www.epa.gov/sites/production/files/2016-12/documents/social_cost_of_carbon_fact_sheet.pdf

Verified Carbon Standard. (2016). *AFOLU Non-permanence risk tool*. Retrieved from http://database.v-c-s.org/sites/vcs.benfredaconsulting.com/files/AFOLU_Non-Permanence_Risk_Tool_v3.3.pdf