Second Nature

Carbon Offset Guidance

Draft Version for Public Comment – July 2016

Public Review Introduction

This document is intended as an update and expansion of the Carbon Offset & Markets section of the Second Nature Sustainability Planning & Climate Action Guide. Signatories of the Climate Leadership Commitments are invited to review and comment on the content of this document and provide feedback to Second Nature by **September 15, 2016**. Feedback should be provided via the online form.

Contributors

The following members of Second Nature's Offset Technical Advisory Group worked over the last year to contribute to this document and to the many discussions that led to its development. Some sections of this document were revised and updated from the previous Second Nature publications including *Investing in Carbon Offsets: Guidelines for ACUPCC Institutions, 2008*. The Technical Advisory Group would like to acknowledge and thank the authors of those publications.

Charles	Adair	Program Manager, Duke Carbon Offsets Initiative	Duke University
Heather	Adelman	Assistant Director	The Oberlin Project
Jenn	Andrews	Associate Director, Sustainability Institute	University of New Hampshire
TIm	Carter	President	Second Nature
Tani	Colbert-Sangre	Consultant	The Oberlin Project
Sally	DeLeon	Sustainability Project Manager	University of Maryland
Laura	Draucker	Director of Sustainability	Amherst College

Clara Changxin	Fang	Communications Manager	EarthDeedsL3C
Arthur	Frazier	Director, Facilities Management & Services	Spelman College
Alex	French	Sustainability Coordinator	Clarkson University
Daniel	Greenberg	Founder & CEO	EarthDeedsL3C
Meghan	Haley-Quigley	Sustainability Coordinator	Union College
Corey	Hawkey	Sustainability Manager	Arizona State University
Sean	Hayes	Executive Director	The Oberlin Project
Bob	Koester	Director, Center for Energy Research/Education/Service	Ball State
Linda	Kogan	Director, Office of Sustainability	University of Colorado-Colorado Springs
Ben	McCall	Associate Director for Campus Sustainability	University of Illinois at Urbana-Champaign
Deborah	McGrath	Professor of Biology	Sewanee University
Cullen	Naumoff	Director of Sustainable Enterprise	The Oberlin Project
Quint	Newcomer	Director & Resident Scientist	University of Georgia, Costa Rica
Brett	Pasinella	Senior Manager of Innovative Services	Second Nature
John	Pumilio	Director of Sustainability	Colgate University
Mark	Stewart	Senior Project Manager, Office of Sustainability	University of Maryland
Anne	Waple	VP & CIO	Second Nature
Aaron	Witham	Education & Outreach Coordinator	University of Vermont
Ruby	Woodside	Carbon Credit & Purchasing Program Intern	Second Nature

Table of Contents

Carbon Markets & Offsets

Internal emissions reductions are generally the first priority of colleges and universities committed to reducing their carbon footprint. In many cases, the amount of reductions that will be practically or economically instituted will be less than what is required to achieve carbon neutrality. Remaining GHG emissions can be offset by purchasing financial instruments that help pay for projects that reduce GHG emissions elsewhere (i.e., off campus) or by using institutional resources to create ("produce") these kinds of projects. In addition to taking those last steps in achieving carbon neutrality, carbon offsets may be used to meet your interim targets if internal reduction efforts fall short of planned progress.

The guidelines in this section seek to:

- Provide a framework for how offsets fit into climate action planning and can be balanced with other institutional efforts to mitigate carbon emissions and adapt to climate change.
- Outline and provide the principles by which high-quality offsets are defined; presenting not only offset project types, but also key issues to consider when evaluating offsets. The guidelines seek to clarify tricky issues related to project types, such as the permanence of reductions produced through forestry projects, and the concern for double counting in energy efficiency and grid-connected renewable energy projects.
- Describe the ways to ***purchase*** and ***produce*** offsets, and why an institution might consider one, the other, or both.
- Structure how institutions can use offsets within their GHG accounting framework to meet their climate goals.

Institutions of higher education play a unique role in carbon markets and in mitigation projects compared to other corporate or governmental actors; they are explicitly centers of innovation, research, and dissemination of knowledge. The spirit of the Commitments calls for the intellectual and research capacity of the Climate Leadership Network to engage with these topics, to improve emissions-reduction mechanisms, and to create innovative new approaches to GHG reductions.

An important goal of the Climate Leadership Commitments is to utilize the educational and research capacities of signatories to advance the science and practice of addressing climate change. The offset space represents a unique opportunity for signatories to demonstrate leadership in developing new and innovative offset protocols. Therefore, the Commitments allow for scope 3 emissions (see Tracking Greenhouse Gas Emissions) up to a total limit of 30% of the total campus emissions to be offset by "peer-reviewed" (limit of 20% of total campus emissions) or "innovative" (limit of 10% of total campus emissions) offset projects. See Considerations for Producing Offsets for further definitions and discussions of peer-reviewed and innovative offsets.

The goal of this section is to assist signatories as they incorporate offsets into their climate goals, and provide practical and concrete guidance to institutions as they consider investment in offsetting activities.

Offsetting within the Climate Action Planning Context

The Commitments foster a strategic approach to carbon management on campuses by providing signatories with a common framework through which they complete an inventory of their current GHG emissions, identify key target areas for reductions, and evaluate and prioritize potential solutions in a Climate Action Plan. Offsets can be an effective piece of a Climate Action Plan. As part of fulfilling their Commitment, however, each signatory determines for itself what role, if any, carbon offsets will play in their Climate Action Plan (see Strategic Framework: Defining Objectives & Setting Goals). These decisions will depend on the institution's unique circumstances, goals, and culture.

While incorporating offsets into Climate Action Plans is not necessary under the Commitments, this internalization of at least some of the true costs of carbon emissions is an important consideration in taking a strategic approach to carbon neutrality, and a potentially effective accelerator of internal reductions. It is possible to develop a plan that

does not include the use of offsets at any stage. While this may be difficult to imagine, and some contend that there will always be a certain portion of irreducible net GHG emissions (particularly scope 3 emissions), it is possible to imagine a future in which an institution creates no GHG emissions, achieving carbon neutrality without the need to purchase offsets.

The question of investing in internal reductions versus offsets need not be an either/or proposition. An effective, strategic approach might take varying approaches to the use of offsets in Climate Action Planning to achieve different goals. For example, offsetting might be approached by GHG scope (see Tracking Greenhouse Gas Emissions), offsetting scope 3 emissions (if they are generally considered to be "unavoidable") while at the same time working on internal mitigation projects to reduce scope 1 & 2 emissions. Producing and selling offsets to capitalize a Green Revolving Fund may be an effective strategy to accelerate internal mitigation.

Overall, signatories should think of carbon markets and offsetting as additional tools for achieving their climate and sustainability goals. Offset markets are designed to provide incentives and flexibility for achieving carbon neutrality as quickly as possible. The possibilities presented by developing institution-financed offset projects (i.e., "local" offsets) can also potentially meet other sustainability goals such as community education and economic development, particularly around the goals of the Resilience Commitment (see Resilience & Sustainability).

Offset Strategies

Least-Cost Approach

A common strategy is to evaluate the cost of offsets alongside the marginal cost of abatement (see Reduction Efficiency) of internal mitigation projects, comparing the cost-per-ton of on-campus projects to the price-per-ton of a carbon credit. Above a certain cost threshold for internal reductions, investments in offsets are more effective in terms of overall tons reduced per dollar invested. In some cases, it is economically more efficient to purchase or produce off-campus offsets than it is to implement very high cost measures on campus. Once the "low-hanging fruit" have been picked, offsets may be an attractive alternative to further on-campus work. However, some thought must be given to the value of carbon when determining a reasonable threshold (see Cost of Carbon).

Neutrality First Approach

Some institutions reverse the usual carbon management hierarchy and achieve carbon neutrality through offsetting before beginning other mitigation efforts. These institutions feel that the threat of climate change is so pressing that it is their moral responsibility to become immediately carbon neutral. Typically, such institutions have a manageable carbon footprint and also commit to reduce the number of offsets they purchase each year through on-campus mitigation efforts.

On that point, it is important to keep in mind that the very act of offsetting puts a price on GHG emissions. This price signal can drive internal emission reductions, because every ton of carbon that is not emitted represents one less offset that needs to be purchased. The short-term purchase of offsets can be an effective way to drive real reductions in global GHG emissions; internalizing the immediate costs of GHG emissions while accelerating the longer-term innovation in direct GHG emissions reduction techniques.

Reductions by Scope

Approaching offsetting by scope (see Tracking Greenhouse Gas Emissions) can be a particularly effective strategy for a Climate Action Plan. Moving from scope 1 to scope 3, control over and measurability of emissions decreases. An institution has direct management of its scope 1 emissions, but by definition scope 3 emissions are produced by a different entity (they are that organization's scope 1 emissions) and can often only be controlled though choice of vendor or reduction of those purchases or activities. Also, scope 1 emissions are very precisely calculated based on the direct fossil fuel use of an institution. Scope 3 emissions on the other hand can only be roughly estimated based on available data. Determining which sources of scope 3 emissions to track can also be open to interpretation. The Greenhouse Gas Protocol identifies 16 categories of scope 3 emissions. The Commitments only require signatories to track and report 2 of these – institution-funded air travel and student/faculty/staff commuting (see Tracking Greenhouse Gas Emissions).

Due to these differences in the nature of the emissions scopes, a campus might determine that focusing mitigation activity in one scope and offsetting activity in another would be their best approach to carbon neutrality. For example, if an institution is located in a region with a very carbon intensive electric grid, and little to no policy activity or investment in decarbonizing the electricity supply, it may be advantageous to aim for zero-carbon

electricity though purchases of offsets or renewable energy (RECs). An institution with many international research projects, might determine that reducing or eliminating air travel is not consistent with the teaching and research missions of the institution and opt to offset those emissions instead.

The uncertainty in estimating scope 3 emissions provides an excellent opportunity for signatories to utilize their research capacity to develop new and innovative offsetting practices for these emissions. These emissions are often unregulated and in many cases unaccounted for. By providing additional flexibility in developing new types of "local" offsets in this area the Commitments hope to provide new opportunities for signatories to account for and reduce their scope 3 emissions while at the same time bringing new research to the existing offset markets and protocols.

Producing & Marketing Offsets

It is possible for an institution to develop marketable offset projects as part of its overall mitigation process. For example, if a campus were to build an on-site renewable energy generation project, it is likely that the associated offsets (or RECs) would be available for sale on a state exchange or voluntary carbon market. Sold offsets cannot be counted towards an institution's carbon neutrality target, but this may still be an important tool for achieving carbon neutrality more quickly by generating funding that can be applied to further mitigation efforts (perhaps through the mechanism of a green revolving fund).

Offset sales can also be timed in such a way as to foster the achievement of a carbon neutrality target. For example, a plan might include the sale of offsets from a project until any debit accrued to finance the project has been repaid at which point the offsets would be retired toward the carbon neutrality target. This is the classic use of offsets – to finance a project that would not be possible without the additional source of funding. Another potential strategy, would be to sell as many offsets as possible from as many projects as possible (reserving the majority of the revenue to fund the next round of projects) within a limited timeframe leading up to the institutions carbon neutrality date, at which time all the offsets would be retired to achieve the target.

Several signatory institutions have used these types of strategies in their climate action plans. For example, a group of signatories partnered with the Chevrolet Corporation to develop a new protocol for verifying offsets generated through on-campus energy

efficiency work. Chevy then purchased these offsets and immediately retired them to benefit the climate (a corporate social responsibility effort, rather than applying them to offset Chevy's own emissions). This work continued with the Carbon Credit & Purchasing Program (C2P2).

Targeted Reductions

In some cases, it may be beneficial to purchase or produce offsets to mitigate specific emissions sources or meet additional sustainability goals. For example, an institution might decide to ensure all the activities of an overseas study abroad program are carbon neutral for educational purposes. Offsets might be purchased from projects within in the host country or the institution might finance projects to produce offsets at the study abroad site. Another case might be where a signatory determined an emission source generated "unavoidable" emissions that needed to be offset. For example, if a campus was deciding to invest in a geothermal system or a natural gas-fired cogeneration system, the projects could be evaluated including the cost of offsetting the thermal load of the cogeneration plant. If a campus were to unexpectedly fall short of an interim GHG target (see Interim Versus Long-term Targets), a limited-time purchase of offsets could be an effective strategy to meet the immediate goals without altering their Climate Action Plan until emissions were reduced to the target level.

Cost of Carbon

When making planning decisions about the use of offsets, it's important to take into account the rationale for putting a price on carbon emissions and what that price represents. This is particularly important if you are making decisions about when to purchase offsets based on a least-cost approach, for example.

Setting a price for carbon is considered by many economists and other policy experts to be a critical tool in addressing climate change[1]. The fact that markets treat carbon emissions (and other pollution) as "externalities" – meaning the costs of the damage done by them is not accounted for in their market cost – makes fossil fuels artificially cheaper than other energy sources. Internalizing the cost of carbon (through a carbon tax or cap-and-trade mechanism for example) is seen as a way of incentivizing markets to make more

[1] WRI, *Putting a Price on Carbon: A Handbook for US Policymakers* http://www.wri.org/publication/putting-price-carbon

investments in carbon-free technologies. Purchasing offsets is another easily available mechanism for an individual college or university to set a price for their own carbon emissions and can help drive carbon reduction on campus as well as in a larger societal context.

The question then becomes: what is an appropriate cost for carbon emissions? Currently, the price of an offset is determined solely by market factors – what the buyer is willing to pay. The majority of carbon offsets available to purchase on public exchanges are "voluntary" offsets. This means they represent reductions in carbon emissions undertaken voluntarily by the developers of the offset project; much like signatories of the Commitments have voluntarily agreed to reduce their campus' carbon emissions. This is opposed to "regulatory" or "compliance" reductions that are made to comply with a legal statute.

The voluntary nature of the carbon market has an impact on the price of carbon. If an institution is not required to buy offsets, there is a limit on their willingness to pay for them. Similarly, if every organization in the economy is not required to become carbon neutral, only those organizations that have voluntarily committed to neutrality have a demand for offsets thus also lowing the price though supply and demand.

Because the price of offsets is currently determined only by market forces, many people argue the cost is much lower than the costs of the damage done by climate change. The social cost of carbon ($SC\text{-}CO_2e$) attempts to address this issue by estimating the costs of damages from climate change on things like agricultural productivity, human health, property damages from increased flood risk, etc. In most cases the social cost of carbon is much higher than the average market price of a voluntary carbon offset.

It is therefore important to consider and determine an appropriate cost of carbon for your individual campus when making planning decisions around offsetting vs. on-campus mitigation efforts and around purchasing market offsets vs. investing directly in projects that will produce offsets (and may have other attributes that align with your campus' sustainability mission). For example, it could be an appropriate strategy to set aside funds equal to the social cost of your campus emissions. Those funds could then be used to purchase market offsets equal to your emissions and still have funds remaining for other sustainability investments (like a Green Revolving Fund, projects that do not have a positive

return on investment – such as many transit projects, or even other projects that have an impact on the climate which is minimal or difficult to measure but have other positive sustainability benefits – like bike-shares or community gardens).

The important thing to consider is that offsetting should not simply be thought of as way of quickly achieving carbon neutrality, but also as a way for your campus to internalize the costs of carbon emissions and their associated societal damages when making cost-benefit planning decisions.

The Concept of Carbon Offsets

The concept of carbon offsets is that the goal of reducing emissions is the same; it's about where you spend the money to make reductions happen. The simplest explanation of an offset in the context of higher education is that it is a mechanism to help someone else reduce their GHG emissions because it's more cost efficient than what it would take to reduce the same amount of emissions at the home institution.

In a more technical sense, a carbon offset is a reduction or removal of carbon dioxide equivalent GHG emissions (CO_2e) that is used to counterbalance or compensate for emissions from other activities. In other words, offset projects reduce GHG emissions outside of an entity's boundary, and thereby produce credits that can be purchased by that entity to meet its own targets for reducing GHG emissions within its boundary. This builds on the premise that reducing or avoiding one ton of carbon dioxide equivalent (CO_2e) by financially supporting an activity elsewhere is equivalent to reducing or avoiding one ton of CO_2e in one's own activities. Many markets around the world have developed to facilitate the purchase and transfer of ownership of such credits.

The geographic origins of GHG emissions are of little consequence because these gases are readily dispersed around the globe once they enter the atmosphere, and it is the global cumulative impact that is of concern when discussing global warming (NASA's Goddard Space Flight Center demonstrated this concept in a high resolution model, which can be viewed here: http://www.globalchange.gov/news/data-motion-how-carbon-dioxide-moves-around-planet).

Offsetting was introduced into the climate discussions in order to provide mechanisms for least-cost global GHG abatement, because the cost of reducing one ton of CO_2e elsewhere can be less expensive at times than mitigating one ton of one's own emissions, especially after one has already picked the "low hanging fruit" of energy efficiency and fuel switching.

The concept of carbon offsets is not without criticism. Many argue that given the magnitude of the challenge of addressing global climate disruption, it is essential for every organization to dramatically reduce, and eventually eliminate, their direct GHG emissions. From this perspective, reducing one's carbon footprint by purchasing offset credits can be criticized as not meeting the challenge of protecting the climate, which likely requires global cuts *by everyone* of 80% or more by 2050 compared to 1990 levels[2]. That magnitude of reductions cannot be achieved through offsets alone. Allowing organizations to "buy their way out" of having to reduce their own emissions only perpetuates current emissions levels and even continued growth in emissions levels. Additionally, the purchase of offset credits by U.S. entities may have intrinsic equity issues. The average U.S. citizen is responsible for 10 times as many emissions as the average global citizen. To allow U.S. institutions to neutralize emissions with offsets could imply that richer nations have a right to produce more per capita emissions than poorer nations.

These are important concerns; however, some mitigation activities may not occur without the financial incentive provided by the sale of offsets. Further, carbon offset activities can often reduce more carbon per dollar in the short run than more expensive internal emissions-reduction activities, which is why offsetting is a useful tool for institutions that don't have sufficient financial resources to achieve their mitigation goals in the more immediate timeframe. Offsets may also present less of a political or technical barrier than onsite emission reduction projects in some cases. From a global perspective, many argue that offsets are one of many critical mechanisms necessary to achieve an 80% reduction or more by 2050.

One responsible framework for considering offsets is the carbon management hierarchy. The hierarchy stresses the priority of carrying-out internal GHG mitigation strategies first, or at least supporting them with the most resources. Internal strategies include avoiding new

[2] IPCC, Fifth Assessment Report. https://www.ipcc.ch/pdf/assessment-report/ar5/syr/SYR_AR5_FINAL_full_wcover.pdf

emissions, reducing existing emissions, and replacing sources of emissions. In this context, offsets receive the least amount of support as a mitigation strategy, and as a result, will often come last or serve as a short-term mechanism only – to buy an institution more time while complicated on-site mitigation strategies are undertaken. Signatory institutions may choose to use them as such to meet self-imposed targets or achieve carbon neutrality as soon as possible. Each year, as further internal reductions are made, fewer annual offset purchases will be needed to maintain climate neutrality or a decreasing emissions profile on the way to neutrality. Even though offsets are potentially useful for reducing global GHG emissions, not all offsets are created equal. Some offsets represent real emissions reductions with corollary social benefits, whereas others do not.

It is in the interest of the signatories of the Second Nature Climate Leadership Commitments to ensure that investments in carbon offsets result in real GHG reductions and that carbon offset projects add value to their education, research, and service missions while helping to create a healthy, just, and sustainable society.

And so, the signatories of the Second Nature Climate Leadership Commitments have developed a set of principles for each institution should apply to ensure that all offsets are of the highest quality as they make direct investments in carbon offsets or participate in voluntary carbon markets as part of their efforts to achieve Carbon neutrality.

Those principles require that:

- **Offset projects are real and emissions reductions are additional:** Projects result in actual reductions of GHG emissions and that would not have otherwise occurred under a reasonable and realistic business-as-usual scenario.
- **Offset projects are transparent:** Project details (including project type, location, developer, duration, standard employed, etc.) are known to the institution and communicated to stakeholders in a transparent way to help ensure validity and further the goal of education on climate disruption and sustainability.
- **Emissions reductions are measurable:** Projects result in measurable reductions of GHG emissions.
- **Emissions reductions are permanent:** Projects result in permanent reductions of GHG emissions.

- **Emissions reductions are verified:** Projects result in reductions of GHG emissions that have been verified by an independent third-party auditor.
- **Offset projects are synchronous:** Projects result in reductions of GHG emissions that take place during a distinct period of time that is reasonably close to the period of time during which the GHG emissions that are being offset took place.
- **Offset projects account for leakage:** Projects take into account any increases in direct or indirect GHG emissions that result from the project activity.
- **Offset projects include Co-Benefits:** Projects should consider educational, social, economic development, and resiliency benefits of an offset.
- **Credits are Enforceable:** It is important that purchase of offsets be backed up by enforceable contracts.
- **Credits are registered:** Credits produced from project activities are registered with a well-regarded registry that has been evaluated using the accompanying criteria.
- **Credits are not double-counted:** Credits produced from project activities are not double counted or counted and claimed by any other party.
- **Credits are retired:** Credits are retired before they are claimed to offset an institution's annual greenhouse gas inventory, or a portion thereof.

The following section walks through each of these principles in detail and then discusses the additional co-benefits that offset projects can provide to surrounding communities.

Principles of High-quality Offsets

Real: Offsets Result in Net Reduction of Emissions

A critical quality concern is assuring that offsets are real. There must be emissions reductions that are, in fact, a result of the project activity and must result in an absolute net reduction of GHG emissions.

Additional: Project Passes Tests Showing it is Legitimately a Result of Offset Purchases

Additionality is a fundamental test of legitimacy for carbon offsets. Tests for additionality attempt to determine whether a project would or would not have happened without the incentives provided by carbon offset purchases.

Transparent: All Project Details are Provided

A primary concern about offset projects is that they need to be transparent, which means that the details of the project, including the type of project, duration, standards used, tests done, measurement, location, price, etc., are all known and made clear to the offset purchaser and any other stakeholders. Transparency is essential for ensuring that all other quality requirements are being met, and particularly relevant to the Commitments as transparency furthers the goal of education on climate change and sustainability initiatives.

Measurable: Can the Amount of Carbon Dioxide Offset by Project be Quantified?

Emissions reductions from offset projects must be measurable. Typically, GHG emissions are measured in CO_2e, or carbon dioxide equivalent. Measurement practices must be transparent, and demonstrated against a baseline of performance. Measurement can be complex depending on the type and duration of the project. In the case of bio-sequestration projects, for example, it is difficult to measure how much carbon is actually sequestered in a given timeframe by a forest. Therefore, baselines and emissions reductions have to be calculated conservatively. It is important to understand when selecting offsets, how accurately a project can be – and has been – measured.

Permanent: Is the Reduction Irreversible?

It is important that the reductions in GHG emissions or removal of GHGs from the atmosphere that are produced by a project during a specified time period be permanent and irreversible to ensure high-quality offsets for that time period. The concept of permanence does not refer to the idea that an offset project itself should "last forever" – offsets are time-specific temporary instruments. Instead, it refers to the risks associated with projects that remove GHGs from the atmosphere in such a way that those removals could be reversed at some point in the future. Permanence is particularly relevant to sequestration projects and relates to the ability of soil, vegetation, the ocean, or geologic structures to Permanently store carbon without releasing it at some point in the future.[3] Voluntary markets have attempted to deal with permanence issues in various ways, including through the use of reserve pools, buffers, temporary credits, and insurance.

[3] Although the issue of permanence raises challenges around ensuring that biological sequestration projects can produce high-quality offsets, such projects will be necessary in achieving the goal of returning atmospheric concentrations of CO2 to the 350 ppm level. As such, they can be imported parts of viable reduction strategies and valuable components of climate action plans.

Valid and Verifiable: Have Projects Been Evaluated by an Outside Party?

For an offset project to be considered legitimate, it needs to be validated and verified by an outside party, independent of the project developer. Preferably, validation and verification of projects will be carried out by separate entities. Validation determines that the baseline established and methodologies used for a project are legitimate. Verification provides the necessary quantifiable evidence that claimed emissions reductions are real and additional when compared to the baseline scenario. There are numerous third-party project auditors and the various offset standards in the voluntary market accept different forms of verification.

Synchronous: Is the timing of the Reduction Appropriate?

The WRI Protocol refers to the valid time length for a baseline scenario as "the time period over which baseline emission estimates, derived from a baseline scenario or for the Baseline Scenario performance standard, are considered valid for the purpose of quantifying GHG reductions. Once the valid time length for the baseline scenario expires, either no further GHG reductions are recognized for the project activity, or a new (revised) baseline scenario or performance standard must be identified." (WRI/WBCSD 2005, p.133) The baseline scenario time length can be static or dynamic and varies by project type.

Dynamic time lengths tend to be more appropriate for electricity supply and land use, and use change, and forestry (LULUCF) projects. Emissions reductions should only be considered valid offsets if they are from this valid baseline scenario timeframe, which should also match the timeframe for the emissions that are being offset by the project's reductions. It is important to consider whether credits are synchronous when choosing a contract type in an offset purchase because, as discussed in the "Investment Options" section, offset transactions can involve prompt delivery, forward delivery, or forward crediting, each with its own pricing and risk implications. These risks and price implications are amplified for forward delivery and crediting when anticipating an emerging regulatory scheme and regulatory carbon market.

Account for Leakage: Have Inadvertent Emissions Increases Elsewhere Been Accounted For?

Leakage refers to the unintended impacts that a project might have outside of the boundaries of the project itself. In other words, while the project may be reducing GHG

emissions within the project boundary, it may also cause an increase of emissions somewhere else as a result. Leakage is of particular concern within the context of forestry projects, where preservation or afforestation in one area may result in clear-cutting of a forest outside of the boundary of the offset project. Leakage cannot always be definitively accounted for and is addressed in different ways by different standards.

Include Co-Benefits: Does the Project Have Other Social, Environmental & Economic Benefits?

The primary goal of an offset project is to avoid, reduce, or sequester GHG emissions in order to reduce contributions to climate change. In addition to this environmental benefit, however, projects can have social, environmental, and economic benefits that can promote a more complete approach to sustainability. Projects should at least take into account all direct and indirect social and environmental impacts that its activities produce. In addition, project developers should seek to mitigate any harmful impacts and take steps to produce net positive impacts. These might include providing jobs to the local community, preserving wildlife habitat, or creating healthy buildings.

Enforceable: Are the Offset Investments Backed-up by a Contract?

Once signatories decide on an offset strategy and process, it is important that they have the appropriate enforcement framework as leverage to ensure investments meet all the agreed-upon criteria. Much of this can be accomplished through contract types.

Registered: Is the Reduction Counted Only Once?

Registries play an important role in the offset markets by tracking credits and maintaining clear ownership and chain of custody of credits. The report from WWF, "Making Sense of the Voluntary Carbon Market: A Comparison of Carbon Offset Standards," draws from testimony by Derik Breakoff of the World Resources Institute to explain the benefits of registries:

> "Carbon offset registries keep track of offsets and are vital in minimizing the risk of double counting (that is, to have multiple stakeholders take credit for the same offset.) Registries also clarify ownership of offsets. A serial number is assigned to each verified offset. When an offset is sold, the serial number and "credit" for the reduction is transferred from the account of the seller to an account for the buyer. If the buyer "uses" the credit by claiming it as an offset

against their own emissions, the registry retires the serial number so that the credit cannot be resold...

Obtaining offsets directly through a registry simplifies the delivery process significantly, as buyers simply establish an account into which the registry transfers the purchased offsets. In so doing, the buyer is assured of both the quality of the purchased offsets (as only offsets that meet the registry's standards are transacted) and their ownership of the offsets, since they are deposited directly into the purchaser's account...

There is no one single registry for the voluntary market. Governments, nonprofits, and the private sector have developed registries for the voluntary market. Some of the registries are tied to certain standards whereas others function independently. Most voluntary standard registries are stilling the planning stage and not yet operational...

Furthermore, buyers must obtain all rights to the emission reductions and assurance that the provider did not and walnut double-sleuthed offsets. This confirmation usually takes the form of a "transfer of title and ownership" document signed by the provider. However, unless the provider engages an independent third-party to verify its internal processes, the buyer cannot be sure that the provider has truly retired the stated amount of offsets. This form of delivery is often time- consuming, may require extensive negotiations, and demands a great deal of know-how on the part of the buyer. It is therefore only suitable for deliveries of large quantities of offsets." (WWF, p.39-40)

These guidelines call for credits to be registered with a well-regarded registry. While the standards for what makes a quality registry are not universally agreed-upon, and are likely to change, the following are some suggested characteristics of a suitable registry:

- Requires verification of emissions reductions by an independent third-party that is accredited by the jurisdiction in which either the project or the registry is located
- Maintains a serialized record of all emissions reductions that have been verified by an independent third-party verifier and certified by the registry as having been achieved by the project

- Maintains a clear record of the chain of custody for all emissions reductions certificates that have been certified by the registry and system to check the status of credits, including whether they have been retired
- Maintains contractual or legal standards for identifying who bears risk if project fails
- Maintains adequate requirements for transparency and annual public reporting of all significant project-related activities
- Covers a sufficient scope:
    - Includes all six major GHGs
    - Reports emissions reductions from project start-up to end of engineering lifetime
    - Requires annual reporting and publication of emissions data
- Establishes baseline emissions from historical data or from a directly comparable project that might be built in the same jurisdiction in the absence of the proposed offset project
- Requires reporting of direct emissions from project-related activities and indirect emissions from electricity used within project boundaries
- Maintains transparency of project type for registered offset credits
- Maintains transparency of key source documents

Double Counting: Is the Reduction Claimed by One Entity Only?

Double counting occurs when an emissions reduction credit gets used by more than one entity and/or for more than one purpose. For example, if a one-ton emissions reduction were counted toward meeting a city or state's reduction target, but was also sold as an offset to an outside institution, that would be a case of double counting. Since the goal of offsetting is to reduce the net GHG emissions put into the global atmosphere, counting the same reduction twice does not get us any closer to that goal. Double counting is of particular concern with regard to renewable energy projects and REC purchases.

Retired: Have the Credits Been Pulled Out of the Market?

When an offset credit is purchased, it can be retired so that it is only counted against the institution's inventory and can no longer be traded or counted against any other organization's emissions. Retiring offsets is a principle of the guidelines because the primary goal of offset purchasing under the Commitments is to offset emissions from the institution's annual GHG inventory. If offsets are to be recognized as offsetting a portion of

an institution's emissions inventory, they must be retired and not held for future trade. This does not necessarily preclude institutions from selling or reselling offsets without applying them to their own emissions.

There are three basic ways in which an offset credit can be retired:

- Through a third-party, such as a registry where the offsets are tracked. To ensure transparency, this is the suggested retirement method;
- By the original owner on behalf of the purchaser; or
- By the end-user after the credits are purchased and applied to offset their own emissions.

Co-benefits of Carbon Offsets

Educational Value: Carbon Offsetting Can Teach

The "core business" of higher education is to maintain a healthy, thriving civil society by educating students and originating knowledge through research. As schools work on reducing their own GHG emissions, engaging in the carbon offset markets can be one way of participating in, and contributing to, such education and research.

Engaging students in offset research, purchasing, or project building can teach students important technical skills that will prepare them for expected expansions in voluntary and regulatory carbon markets over the coming years. Through co-curricular opportunities or service learning courses, students could learn carbon standards, industry terms, financial mechanisms, and the social, economic, and environmental impacts of various types of offsets.

A core element of sustainability education is systems thinking. Even students who do not plan to work in the offset industry could benefit from the systems thinking exercises that can produce from offset discussions. From a social systems perspective, students can be challenged to consider the social repercussions for offset projects through like the following:

- What would certain communities do without access to carbon offset funds?
- Which aspects of their lives would be better or worse?

- How do power and privilege relate to these considerations?

From an economic systems perspective, students can study how the economy and investment strategies impact GHG emissions goals. They can wrestle with questions such as the following:

- What's the role of money in catalyzing carbon reductions?
- What's the role of knowledge or technology in catalyzing emissions?
- How can market forces both support and hold back efforts to build environmentally and socially-friendly communities?

For example, markets can be useful for sequestering carbon and protecting the ecosystem in a given forest, but then one must address leakage in the form of shifting of logging operations from the protected forest to an adjacent forest. Global markets for lumber and global markets for offsets can be at odds in such situations. Moreover, whenever economic forces are at odds, without precautions to ensure equity, winners and losers will emerge. More jobs may exist for ecological planners, while less jobs may exist for foresters and loggers.

Finally, an exploration of various environmental impacts can also be educational, given that many offset projects have either co-environmental benefits beyond GHG emissions reductions, or unintended negative environmental impacts. Students could explore what aspects of the environment are healthier or less healthy as a result of a given offset project.

A pedagogy based on systems thinking can combine the complex cause-and-effect relationships of offset projects across social, economic, and environmental domains into a rich educational experience. For example, when Green Mountain College bought offsets in 2015 to maintain their carbon commitment, students from five classes were given the task of vetting offset providers. They used Second Nature's carbon commitment guidelines to ask critical questions about the impacts of the various projects and the practices of the vendors. Most faculty and student participants agreed that the exercise was both meaningful and educational.

Social Benefits

Just as the social cost of carbon should be considered when pricing GHG emissions, the potential social cost of producing offsets should also be considered, especially when offset projects are located in marginalized communities or post-colonial countries. However, in cases where ethical considerations have been prioritized, the social co-benefits of offsets may be noteworthy.

Common social co-benefits may include increased educational opportunities, increased ability for marginalized communities to meet their needs, and increased collaboration between groups. Educationally, co-benefits have included opportunities for students to visit project sites and learn about systems dynamics as explained in the previous section. Other educational opportunities may be available to the local community. For example, at Seneca Meadows Landfill in New York, offset revenue helps to maintain nature trails and interpretative signage, while also facilitating methane capture and destruction. Other offset projects may make everyday life easier for people, like a project in Kenya designed to replace labor-intensive stoves with more efficient stoves to decrease carbon emissions and save people time. Sometimes, the development of an offset project builds a collaborative relationship where there wasn't one previously, such as a case where a humanitarian organization brings investment and useful technology to communities that don't have access to those resources through other channels. Such projects may become foundations for other exchanges of resources that are beneficial to both parties. Some offset projects also attempt to solve social problems between groups within the same community (such as competition over forest resources) by displacing the need for deforestation through more efficient farming techniques were land is the limiting factor or through more efficient burning techniques where supply of wood is the limiting factor.

Economic Benefits

Opportunities for economic co-benefits include job creation, increased revenue flow, and economic stability for under-privileged communities or innovative enterprises. For example, offset projects aimed at installing new technologies or building infrastructure may create jobs for construction workers and technical specialists. If a project increases the flow of people to a community, there may also be an economic multiplier effect from the money those people spend on food, housing, merchandise, and taxes. The projects themselves may be subject to taxes, and therefore create revenue for a community. Increased revenue flow may also benefit innovative businesses that need economic stability in order to

increase their customer base, hire more staff, and continue research and development. Such businesses may be important actors in creating a low carbon future.

Environmental & Ecological Benefits

Offset projects may include environmental co-benefits beyond the primary aim of reducing or mitigating carbon emissions. For example, offset projects that mitigate coal use are also mitigating acid rain deposition. Offset projects that preserve forests are not only sequestering carbon, but preserving ecosystems for the benefit of biodiversity protection and ecosystem services beneficial to humans. Other projects may work to actively restore ecosystems by planting trees or by managing existing forests to return them to a more natural, balanced state. Ecosystem restoration not only benefits organisms that live in them by providing habitat, but can offer wildlife corridors for organisms just passing through, thus having a truly global effect beyond carbon sequestration. The numerous environmental co-benefits of land use offset projects, especially forest sequestration projects, should be carefully considered when dealing with the difficulty of proving additionality for such projects.

Types of Offset Projects

A "carbon offset" is a reduction or removal of carbon dioxide equivalent emissions that is used to counterbalance or compensate for ("offset") emissions from other activities. Offset projects reducing GHG emissions outside of an entity's boundary generate credits that can be purchased by that entity to meet its own targets for reducing GHG emissions within its boundary. Offset credits can only be generated from such a project if the emissions reductions would not have otherwise occurred in the absence of a market for the credits. Carbon offsets can be produced in a number of ways:

- Energy conservation and efficiency, fuel switching, renewable energy, and carbon capture and storage projects can prevent or avoid the release of GHG emissions into the atmosphere – and hence may produce legitimate carbon offsets.
- Reforestation projects can remove carbon from the atmosphere and sequester it in biomass – at least temporarily – and hence may count as valid carbon offsets.
- Capturing the methane produced at landfills and flaring it (burning it in the atmosphere to convert it to less harmful carbon dioxide) can decrease the GHG emissions impact of landfills – and hence may produce valid carbon offsets. It is

even better – and more productive in terms of carbon offsetting – to burn the landfill-harvested methane in a boiler or turbine that generates electricity and useful heat, thus displacing the fossil fuels which would have otherwise been burned for those purposes. Such a combination strategy would increase the offset value.

- The destruction of industrial refrigerants (CFCs and HCFCs, for example) and other climate-warming gases is also beneficial from a climate protection perspective – and thus may be another means of producing "carbon" offsets. In all cases, however, certain conditions must be met before these kinds of projects can be regarded as producing legitimate, valid carbon offsets.

The types of projects that can produce carbon offsets involve the reduction of fossil fuel use. This is typically done through improving energy efficiency, which reduces demand for fossil fuel, or through introduction of renewable energy sources or alternative fuels.

Energy Efficiency Projects

Energy efficiency projects replace or improve products or systems so that they perform the same tasks using less energy, and therefore less fuel. One key benefit of energy efficiency projects is that they save money over time and investments in energy efficient equipment thus have a payback. Examples of this type of project would be converting a fleet of vehicles to a fleet of more fuel-efficient vehicles, replacing inefficient HVAC mechanical systems or water heating systems, renovating a building to be more efficient at retaining thermal energy, or replacing incandescent light bulbs with light-emitting diodes (LEDs). Efficiency opportunities exist in many creative applications across a range of industrial sectors. For example, some offsets produced from the installation of auxiliary power units (APUs) in tractor trailer trucks to produce heat and light more efficiently for truckers sleeping in their cabs than idling large diesel engines all night.

Energy efficiency projects are beneficial in their ability to reduce emissions through the conservation of energy and reduced fuel consumption. In the U.S. energy efficiency projects carry great potential due to the current extent of inefficiencies in building systems, transportation, and even manufacturing sectors. However, there are some challenges worth considering when undertaking energy efficiency activities as offset projects. Energy efficiency projects tend to have fairly straightforward accounting and methodology, but there can be challenges such as establishing a baseline, determining additionality, and the need for labor-intensive continued monitoring and evaluation. Continued monitoring is

important to ensure that reductions are consistent and not erased by a rebound effect from users consuming more energy because of a perception that the price is now cheaper or that they have to be less vigilant in minimizing their environmental impact. Even aside from a rebound effect, energy efficiency technology often requires maintenance to ensure that it sustains its efficiency over time. Furthermore, establishing clear ownership of the reductions is difficult, and the potential for double counting must be taken into consideration to ensure, for example, that upstream power generation entities do not also take credit for the reduction in emissions that come with the increases in efficiency by an end-use consumer. Currently, ensuring that indirect reductions resulting from energy efficiency projects are not double counted is very difficult. The complexities around this project type could grow as regulatory frameworks are imposed that cap emissions from the power generation sector.

Fuel Switching

Fuel switching projects reduce the amount of fossil fuels consumed and the associated emissions from such consumption by switching to cleaner or renewable fuel sources. Examples of this would be switching from oil to natural gas to power an on-campus electricity generating plant, or powering a fleet of vehicles with ethanol instead of gasoline or biodiesel instead of fossil diesel.

Fuel switching can produce legitimate offsets by reducing the amount of emissions produced from the use of the fuel for the same activity. Fuel switching offsets are permitted under most voluntary offset standards.

Renewable Energy

Renewable energy offset projects include both thermal and electric applications. Thermal projects may consist of building infrastructure for geothermal, solar thermal or biomass (e.g. wood chips). Electricity projects may consist of installations of photovoltaic solar power, wind, hydro, and biomass in the form of waste wood, wood chips, cow manure, or other organic products. Whether electric or thermal, these projects have the benefit of moving energy production away from reliance on fossil fuels and promoting long-term sustainability.

It is important to distinguish between renewable energy projects that are tied to the grid and feed electricity into it, and those that are stand-alone and provide energy for a specific

use or facility. Projects that produce electricity and are tied to the grid present unique challenges, such as the possibility for double-counting emissions reductions and the greater possibility that regulation played a key role in incentivizing the project. Electricity projects that are not grid-tied or thermal energy projects may have less potential for double-counting, but should still be examined to make sure they are additional to existing or proposed regulations. The environmental impacts of some of these projects are complex and can offer more than one offset product. For example, anaerobic methane-digestion-to-energy projects include capture of the GHG methane, transformation of that gas into less potent gases, and then creation of electricity as a means of displacing fossil fuels. Since many renewable energy projects have high up-front costs, offsets can play an important role in investing in such projects and getting them off the ground.

Investment in renewable energy projects is important for the development of the renewable energy market, bringing costs down in the future, and eliminating our dependence on fossil fuel. However, for signatories considering purchasing offsets from such projects, it will be important to ensure that it has met proper additionality standards and the offsets are not double-counted. With grid-connected projects, there is potential for double counting between the project developer and the utility, and uncertainty around how zero-emissions projects impact system average emissions rates (which other end-users use in calculating their GHG emissions). These issues are particularly relevant when dealing with the purchase of RECs. It may not consistently be appropriate to count the purchase of RECs as offsets. Punchers should take care to examine the REC to ensure that the carbon reduction benefits of the project are included ("bundled") with the purchase of the renewable energy.

Biological Sequestration

Forest-based activities include: planting forests (afforestation and reforestation); increasing the carbon density of existing forests through enhanced forest management; expanding the use of forest products that replace fossil fuels; and avoiding deforestation activity, also referred to as reduced emissions from deforestation and degradation (REDD).

Given the ability of forests and other biological systems to remove CO_2 from the atmosphere, and the fact that deforestation is a large source of anthropogenic GHG emissions, it is clear that any activities that promote the protection, replanting, and sustainable management of forests are positive and should be pursued and supported to fight global climate disruption. The co-benefits of these activities with regard to soil, water,

biodiversity, and human use are also significant and important. For these reasons, maintaining and restoring healthy forests is extremely valuable and all appropriate mechanisms should be employed by colleges and universities to those ends as part of their Climate Action Plans; however, offset projects may not be the most appropriate mechanisms for doing so.

For terrestrial projects permanence, or irreversibility, is a special concern. Planting trees on land that has not been forested previously may remove carbon from the atmosphere in the short term; however, forests may be lost altogether due to a disturbance such as forest fire or insect outbreak. In such cases the carbon sequestered by the forest would be re-released into the atmosphere, the removal would not be permanent, and any offset credits produced from the initial activity would no longer be valid, even though they would have already been applied to emissions inventories and retired in years past.

Placing a conservation easement on an existing forest does not necessarily reduce GHG emissions, because that forest may well have been conserved in the absence of the easement. While conservation easements have numerous other benefits, and should be pursued as part of institutional climate action plans, they are not likely (in many circumstances) to produce high-quality offsets. While easements may play a part in attempts to ensure permanence, factors beyond human control such as fire and insect outbreaks could still threaten the permanence of any removals of carbon from the atmosphere claimed through biological sequestration.

Leakage – a decrease in the amount of carbon sequestered by the project – is also a concern with terrestrial projects because planting or conserving forests in one area cannot prevent clear-cutting in another, possibly adjacent, area as a result of the project.

Different systems have handled this issue in different ways: to ensure permanence the Regional Greenhouse Gas Initiative (RGGI) system, for example, requires that afforested land be placed under a permanent conservation easement. REDD projects have particular concerns around additionality, as it can be difficult to determine if areas would be deforested or degraded in the projects' absence. There are several offset standards that even when allowing for forestry projects, will not permit REDD projects.

Although these issues raise challenges around ensuring that biological sequestration projects can produce high-quality offsets. As such, they can be important parts of viable reduction strategies and valuable components of climate action plans. The difficulties associated with securitizing such activities as offsets should in no way discourage institutions from making these important investments in conservation, reforestation, and avoided deforestation, and incorporating those activities into their climate action plans. An institution's investment strategy should focus on the dual goals of absolute reductions in emissions and on removing atmospheric carbon through sequestration, even though the latter may not qualify as offsets.

While there are legitimate barriers to counting campus biomass carbon sequestration as carbon offsets in your GHG inventory or taking credit for them in your plan, it still makes sense to protect campus green space and forested land – for all the traditional environmental and social reasons and because of climate change. When trees are cut down, they are lost as a carbon sink. Moreover, even if the carbon sequestration associated with campus biomass cannot be counted as an offset, it is still advisable to state in your GHG inventory summary or plan that your campus has X amount of forested land and those trees are sequestering Y amount of carbon annually. Publicizing that kind of information may help campus environmental advocates protect campus greenspace when plans are unveiled to start cutting trees on campus to clear land for that next campus research building, dormitory, or apartment complex. If that greenspace were to be removed (sold or harvested) the associated amount of carbon would need to be added to the institution's GHG inventory.

Geological Sequestration: Carbon Capture & Storage

This type of sequestration involves injecting CO_2 into underground geological formations to store it and prevent its release through the surface. This is typically done in unrecoverable coal seams, saline formations, declining oil fields, and gas fields. Proponents of geological sequestration suggest that this method has the potential to storing carbon for up to thousands of years.

There are several concerns over geological carbon sequestration. While some forms of this sequestration are better understood, some have not been implemented much and the potential for leakage of the CO_2 back into the atmosphere is unknown. Also, in the case of oil fields, the injection of CO_2 often has the benefits of revitalizing the oil field, which could

lead to further oil recovery and its burning and associated emissions. And in the case of coal beds, injection of CO_2 often releases methane, which can be captured and used for energy. Like any other sequestration project, it is important to consider that this type of offset project does not promote a shift away from fossil fuel consumption. Geological sequestration is also very expensive and not common practice at this time, and may have permanence/ reversibility concerns, in the case of an earthquake, for example.

Methane Gas Destruction

Methane is a potent GHG with a global warming potential 21 times that of CO_2 on a 100 year timeframe. There are two types of methane projects that can produce carbon offsets: methane capture and combustion, and methane capture for energy production. Methane is most often emitted from landfills, livestock, and from coal mining. Methane projects can capture the methane produced from such activities and simply flare it (i.e., burn it) so that it is released as CO_2, which is less potent than methane on a 100-year timescale and therefore represents an emissions reduction, or use it to produce heat and electricity. Some landfill operations alternate between flare and electricity generation activities depending on the concentration and quality of gas at various stages in the organic material's decaying process In the case of biofuel plants that use methane produced by anaerobically digesting agricultural or forestry waste to produce electricity, such projects are considered renewable energy projects rather than methane capture and are mentioned above in the renewable energy section.

Methane projects are currently a popular offset project type given their credibility, cost-effectiveness, and straightforward approach. It is usually quite easy to establish additionality for methane projects because there is generally no other source of revenue from the activity aside from the sale of offsets. Moreover, methane projects can include the ability to measure gases as they flow through a pipe, which can be a more straightforward way of estimating GHG emissions reductions than many other offset project types that rely more heavily on estimations or predictions.

Industrial Gas Destruction

Industrial gases are a special class of gases that are manufactured for use in the industrial sector, and many of them have high global warming potential. Examples of these gases include HFCs, PFCs, NF_3, SF_6, and others. Many HFCs and PFCs have global warming potentials of over 10,000 times that of CO_2 over a 100-year time horizon (EPA, 2016).

Destruction of industrial gases can provide a large number of emissions reductions at a very low cost. There is controversy over industrial gas destruction (usually HFC) as offset projects, but nonetheless, due to their low cost and exclusion from the CDM, their reduction credits are in high supply in the voluntary market.

Industrial gas projects create concerns around perverse incentives. Due to the high global warming potential of many industrial gases, it is important to phase out their use, and allowing for the generation of offsets from their destruction runs the risk of discouraging regulations needed to phase them out, or worse, creating incentive to build more factories that produce industrial gases, so that they can benefit from future carbon offset projects (SEI, 2011). In addition, industrial gas destruction provides few social and environmental co-benefits. For these reasons, industrial gas destruction offset projects may not be a good match for signatories' offset strategies. There are also few offset standards that accept these types of projects.

Purchasing & Producing Carbon Offsets

Offset Investment Options: Purchasing vs. Producing

Institutions have the option to either purchase offsets from a third-party vendor or to invest in/develop a project that produces offsets. It is important that institutions balance these options when acquiring offsets as they each have their strengths and weaknesses. Many institutions may choose to use a combination of purchasing, investing in, and developing offsets projects to acquire their offsets in order to balance total cost with co-benefits, project type, and educational goals.

An important goal of the Climate Leadership Commitments is to utilize the educational and research capacities of signatories to advance the science and practice of addressing climate change. The offset space represents a unique opportunity for signatories to demonstrate leadership in developing new and innovative offset protocols. Therefore, the Commitments allow for scope 3 emissions up to a total limit of 30% of the total campus emissions to be offset by "peer-reviewed" (limit of 20% of total campus emissions) or "innovative" (limit of 10% of total campus emissions) offset projects. See Considerations for Producing Offsets for further definitions and discussions of peer-reviewed and innovative offsets.

Purchasing

Purchasing offsets from a vendor is often the most straightforward option and institutions can find a wide array of offset projects to purchase from (see Selecting Offset Providers). When purchasing it is recommended that institutions purchase third-party verified offsets that are registered with a well-regarded offset registry to reduce risk and ensure the offsets meet the requirements of high-quality offsets. Purchasing offsets from a vendor provides institutions with the option to acquire a large number of offsets at once at a relatively low cost compared to developing or investing in a project. Additionally, third-party certification can further reduce risk and ensure the quality of the offsets purchased. However, these certifications often increase the price of the offsets.

When purchasing offsets, institutions have two main options:

- ***Retail***: Institutions can purchase offset credits through third-party retail providers. These providers can be either for-profit companies or non-profit organizations. Prices, project types, transparency, and quality standards vary among providers, and it is a "buyer-beware" market, so it is important to conduct thorough research before making a final selection.
- ***Wholesale***: Offset credits are available from some third-party providers in bulk, particularly from a bundle of projects producing a large numbers of credits. The wholesale price is typically lower than the retail price, but price will still vary among providers and project types. As with retail, prices, project types, transparency, and quality standards vary among providers, and it is a "buyer-beware" market, so it is important to conduct thorough research before making a final selection.

It is important that institutions choose the type of offsets they purchase carefully and that these offsets reflect the values of the institution. For example, an institution that has a study abroad program in a developing country where deforestation is an issue may choose to purchase avoided conversion forest offsets within that country. Similarly, an institution that does research on waste-to-energy might choose to purchase swine waste methane capture and destruction offsets. In addition to choosing specific offset types, institutions must also select what type of purchase contract they use and who to purchase from. The section below on Purchasing Offsets walks through these options.

Investing in Projects

Instead of going through a retailer, institutions may opt to invest directly in projects that they want to support. In exchange for money invested, the institutions can negotiate with the project developer for ownership of some or all of the emissions reductions produced by the project. This approach may provide more options with regard to project types and projects that are closer in proximity to an institution. In addition, investing in projects allows an institution to support innovative or unusual projects that may be more closely tied to the institutions core interests. However, this option is relatively rare and can carry high transaction costs, including the costs of third-party verification. It generally requires a significant amount of legwork on the part of the institution to identify and support the project. In this case, the institutions would need to evaluate the project and the emissions reductions for all of the offset quality criteria described in the guidelines and in the discussions that follow.

Developing Projects

Institutions may decide to develop their own carbon offset projects off campus (or outside of their system boundary). The credits produced by these projects could either be used to offset the institution's emissions, or potentially be sold in the carbon markets if the institution has a surplus. Developing projects has the benefit of providing educational and training opportunities to students, staff, and other stakeholders. Many schools are initially drawn to this approach, but it is important not to underestimate the costs associated with the time, expertise needed, and risk involved in carbon market project development, verification, monitoring, etc. An important distinction must also be made between investing in "in-house" projects, and on-campus emissions reduction projects. For example, an on-campus renewable energy project that reduces an institution's GHG inventory cannot also be counted as an offset for institution-funded air travel.

Considerations for Purchasing Offsets

Choosing the right offset provider can be a tricky process. There are many options to consider when selecting an offset provider, and the list of providers grows all the time. There are different kinds of offset providers – some are for-profit, some are non--profit; some develop the projects themselves, some secure the credits from other project developers; some provide offsets in any amount to individuals and small organizations, some primarily deal with large organizations purchasing large volumes of offset credits. Each of these options has pros and cons, and each institution's unique circumstances will be important in determining which provider(s) is the best option.

Tax implications, transparency, and the make-up of their portfolio of projects are among the key issues in selecting the right provider. For example, some non-profit offset providers categorize the purchase of credits as charitable donations, which could make it difficult or impossible for some institutions to purchase them, depending on existing charitable giving and purchasing policies.

It is beyond the scope of this document to thoroughly evaluate the range of offset providers, and which offer credits that would meet the principles of the Commitments. However, there are many organizations that work to provide this information and keep it up-to-date with this constantly changing market. For example, Business for Social Responsibility (BSR) has developed a suite of reports in recent years aimed at assisting businesses in navigating this space.

There are a number of traits by which to consider offset providers, including:

- Objective traits
  - Provider's supply/inventory access
  - Provider entity and project locations
  - Project portfolio or specific project type
  - Does the provider register credits?
  - Does the provider have services for energy audits, measuring footprint, carbon management plan?
  - Financials
- Subjective "fit" traits
  - Industry experience
  - Scope of knowledge
  - Staff backgrounds
  - Project types and prioritized characteristics

The range of wholesale and retail carbon prices on the voluntary market is significant: from less than $0.45 to around $45 per metric ton of CO_2e. Prices depend on several factors: implementation, verification, and monitoring costs; level of investment (i.e. direct project investment or purchasing through a broker). Sellers should consider the risks and benefits relative to prices and offset quality. Developing a portfolio of multiple offset projects of

varying types and benefits at verifying prices is often a strategic way of investing in project that reflect an institutions sustainability values while meeting their GHG reduction requirements at an affordable price.

Considerations for Producing Offsets

Some institutions may wish to partner and work closely with project developers to create offset projects specifically for the institution, or even bypass offset providers altogether and develop offset projects themselves. While these approaches can mean taking on additional work and additional risk for the institution, it can also be an effective way to ensure quality, and serve as a powerful educational experience for students. Institutions should not underestimate the time and expertise – and associated costs – of developing, validating, verifying, certifying, and monitoring offset projects.

The complexities involved with project development can be significant and it is beyond the scope of this document to address them; however, it is important to acknowledge that there are different strategies for offsetting beyond purchasing credits and some schools have already begun to evaluate developing projects outside of their campus boundaries, or are considering doing so. Figure 5 shows the basic elements of a generic project development cycle as well as an offset project cycle, based on the stages of a CDM project development cycle.

When producing offsets, institutions have three basic choices:

- Develop a project from an existing protocol via a well-regarded registry and go through third-party verification via a registered third-party verifier,
- Develop a project from an existing protocol via peer review,
- Develop a new protocol and pilot the project as an innovative offsets project.

The following sections walk through each of these processes in detail.

Producing Third-party Verified Offsets

The majority of an institution's offsets must be third-party verified in order to ensure the quality of these offsets. If an institution chooses to develop its own offset project, it can register this project with a well-known registry, go through third-party verification, and

then register any offsets that produce from the project. This process allows the institution to clearly show the quality of the offset and to sell any excess offsets produced.

To develop a project that is third-party verified, an institution must first identify the registry and protocol they will use for their project type. Protocols outline the requirements that the offset project must meet in order to qualify for registration with the associated registry. It is important to review protocols carefully as multiple protocols can apply to the same project type and can differ in the way they measure and calculate offsets. For example, the Climate Action Reserve's forestry protocols use a 100-year timespan to show permanence, whereas the American Carbon Registry uses a 40-year timespan. This can have significant impact on the project design.

Once an institution has identified the registry and protocol to use, it can either complete the entire project development process itself or hire a contractor/consultant to help develop the project. The options for contract help are numerous and can range from a set fee for assistance with project development to the contractor completing the project at a minimal cost, but then receiving a portion of offset sales or a set fee per offset registered.

All projects must go through third-party verification, a requirement that can be costly and time consuming. The institution must hire a third-party contractor to review their project and the data collected to ensure that the project meets the requirements outlined in the protocol. This contractor cannot be the same as a contractor hired to help develop the project in order to avoid conflict of interest. Though the process is onerous, it is necessary to ensure that all offsets are of the highest quality and result in real and additional carbon offsets.

To provide flexibility and encourage innovation in the field of offsets, the Commitments allow for scope 3 offsets up to 30% of your total campus footprint to forego third-party verification and use a peer review process instead.

Producing Peer-reviewed & Innovative Offsets

This guidance calls for the majority of credits to be marketable credits, produced through an accredited carbon program, and registered with a well-regarded registry. However, to address the potentially high cost of third-party verification, better provide educational opportunities with real-world application, expand the types of offset projects available, and

encourage the development of innovative offset projects, the Commitments allow for a small portion – up to 20% of total emissions – of an institution's carbon offset credits to follow the guidelines laid out in the sections below. Offsets from Peer-reviewed Projects and Innovative Projects are reported through the Second Nature Reporting System by each institution and monitored through a peer-to-peer network that will provide third-party monitoring and review. These projects will provide hands on educational opportunities for students, while preparing them to enter the workforce and impact sustainability with real-world carbon accounting and project management skills gained in pursuit of their campus' Commitments.

Why Peer-reviewed & Innovative Offsets?

Many existing carbon offset protocols assume a scale of project much larger than many colleges and universities are considering. In particular, the difficulty of fulfilling project requirements for monitoring and verification can add to project cost. This, in turn, makes it difficult for institutions to meet existing protocol requirements for developing small scale, local offset projects at a reasonable cost – projects that also engage students and the community in meaningful ways and provide significant co-benefits. Peer-reviewed offset projects are intended to unlock institutional access to these smaller-scale projects that would not be feasible following industry standard protocols.

Another challenge institutions face is that there are a limited number of protocols to choose from through existing registries (such as CAR, VCS or the Gold Standard). Colleges and universities are uniquely positioned to use their academic resources to develop new and innovative protocols and projects that tie back to their research on campus, local community needs, and educational goals. Once tested and established, these new project types can eventually be scaled through existing registries.

However, while these registries encourage the development of new protocols, it is a rigorous process that can take anywhere from a few months to a few years to complete. Until the protocol is officially accepted by the offset registry, any offsets produced through pilot projects cannot be counted and registered. This places significant risk on the institution in regards to developing innovative projects as the institution is essentially investing resources in the possibility that their innovative project type and future offsets from that project will eventually be accepted.

It is imperative to provide institutions with a less expensive way to verify offset projects and the flexibility to develop innovative project types, without penalizing first actors. By providing the following offset types, but capping the total offsets allowed from each, the Commitments aim to encourage innovative offset projects while still maintaining a rigorous standard for achieving climate neutrality.

The academic community can catalyze a hands-on approach to meeting carbon neutrality goals and broaden the options for addressing climate change. In following the example of academic journals, these real-world case studies in carbon offset implementation should be publicly available and evaluated akin to the accumulation of knowledge through the peer-review process.

Peer-reviewed Offset Guidelines

In following the example of academic journals, peer-reviewed offsets rely on the shared expertise of institutions with climate commitments. These offset projects are required to meet all requirements of high-quality offsets. However, for verification, institutions are allowed to consider peer institutions with considerable knowledge in offset projects as a qualified third-party project auditor. In this way, an institution that has developed an offsets project and wants to decrease verification costs, may have a peer institution verify that their offsets meet the principles of high-quality offsets. This review and the number of offsets produced by the project must be documented and available to the public through the Second Nature Reporting System.

As Colleges and Universities develop their own protocols for small-scale projects of various types within their climates and habitats, these protocols will become available for institutions pursuing the same project types within similar biomes. It is therefore recommended to consult existing web resources accessible through the Climate Leadership Network and existing project protocol libraries before undertaking the task to build a new protocol.

Offsets produced via peer-reviewed offset projects may not be sold by the institution. In addition, these offsets can only be used to offset scope 3 emissions and may not exceed 20% of total annual emissions.

These projects should be tracked by the institution that developed the project and all offsets produced from these projects must be tracked internally and retired accordingly just as they would if registered with one of the listed well-regarded registries. These offsets will be monitored via a peer-to-peer network. To avoid any conflict of interest, any institution that has had their work peer reviewed by another institution may not peer review the work of that institution within the same year. For example, if institution A reviews institution B's work, institution B cannot review institution A's work within the same year.

Innovative Offsets Guidelines

To reduce the risk of developing new protocols and project types, the Commitments allow institutions to track and apply carbon offsets from innovative projects for a portion of an institution's climate goals, regardless of whether they are accepted by an existing registry. Thus, an institution can develop new projects and count the offsets from these pilot projects, whether or not those projects eventually lead to a new protocol with an existing registry. Innovative offsets must still strive to meet the criteria for high-quality offsets, but have some flexibility to pursue project types that are not immediately viable. In addition, innovative projects must include a transition plan to show how the project will eventually be scaled through existing offset networks.

Innovative offset projects are required to meet the majority of the requirements of high-quality offsets. For each innovative offset project, institutions must complete a transitional document that outlines how the project will eventually be scalable, which "principles" are not met by the project, how each "principle" will be met by future iterations of the project type, and how this specific project contributes to meeting that goal. These projects are required to have a peer institution verify that their offsets meet the majority of the principles of high-quality offsets and that the transitional document provided shows strong evidence that this project type can meet all high-quality offset requirements in the near future. The transitional document, the peer review, and the number of offsets produced by the project must be documented and made available to the public through the Second Nature Reporting System.

Offsets produced via innovative offset projects may not be sold by the institution. In addition, these offsets can only be used to offset scope 3 emissions and may not exceed 10% of total annual emissions.

Example of Peer-reviewed & Innovative Offsets Accounting

If an institution must retire 100,000 offsets to meet its climate goals for the year 2025, then only 20,000 peer-reviewed offsets and 10,000 innovative offsets may be used to meet part of the goal. If these 30,000 offsets exceed the amount of scope 3 emissions generated by the campus, only that portion of the total may be used to offset the campus emissions; the remainder of the campus' scope 1 & 2 emissions would need to be offset using third-party verified offsets.

Offset Locality

For both Peer-reviewed and Innovative Offsets it is encouraged that projects are located relatively close to the institution developing the project. This helps reduce the risk of project reversal while allowing for site visits for student research and class trips. Local projects inherently reduce the risks that accredited programs attempt to mitigate through extensive monitoring and verification requirements, but they also enable environmental and social benefits for campuses' and their surrounding communities. It is up to the institution to determine what is considered "local", but some common definitions might include:

- The project is accessible by students from the College or University from which project funds produced without requiring greater than 1 day of round-trip travel to visit the project site; or
- The project is within the same state; or
- The project is within 100 miles of the College or University campus or study abroad program.

Resources for Developing Offset Projects

As more institutions develop offset projects, more resources will become available to the Network regarding climate action planning, offset project selection, innovative offset project types, and more. Second Nature will provide access to these resources.

Communicating Strategy & Offset Policy

Effectively communicating the elements of a carbon management policy, and the role offsets play, to stakeholders is one of the most important – and often most challenging – aspects of a strategy. An effective communications strategy can protect an institution from reputational risks associated with offsets by making it clear that offsets are not a way to

"buy one's way out of the problem," but instead are part of a broader strategy to reduce emissions and internalize the costs of carbon, while at the same time driving real reductions elsewhere.

It is not uncommon to hear remarks like "they're just doing it all with offsets," about organizations that make neutrality claims, when in fact those organizations have achieved significant internal reductions and have plans for more reductions in the future. Even when great effort is made to make these emissions-reduction actions and plans known to stakeholders, there can be a tendency to focus on the offsets, and discount other activities.

There may be no simple solutions to this dilemma, but it underscores the importance of communicating Climate Action Plans with stakeholders, and reinforcing the concept that offsetting activities are one element of a broader strategy, with the ultimate goal of eliminating GHG emissions.

For more information, contact:
Brett Pasinella, Senior Manager of Innovative Services, Second Nature
617-722-0036, innovation@secondnature.com