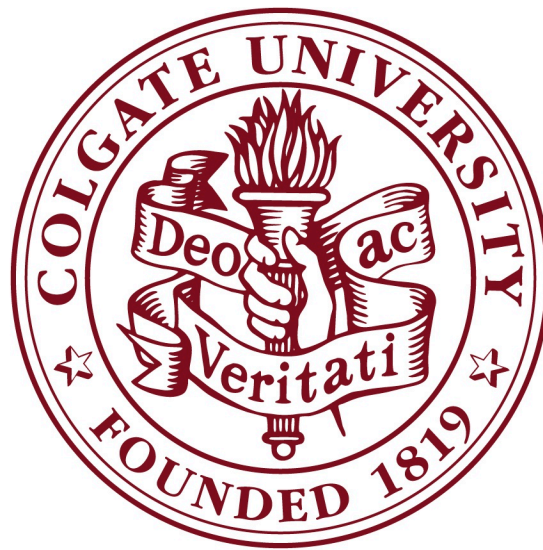


Colgate University

Interim Report

Carbon Offsets Working Group
Sustainability Council



January 2018

INTRODUCTION

Colgate University accepts responsibility for its contribution to global climate change and is preparing to thrive in a low-carbon future. By achieving carbon neutrality in 2019, Colgate is committed to 1) reducing greenhouse gas emissions on campus and 2) investing in high-quality carbon offset projects that eliminate remaining emissions from Colgate's operations. Significant sources of emissions such as air travel, commuting, ground transportation, and some forms of energy use are currently impossible to eliminate without extraordinary cost or disruption to our academic mission. Since Colgate cannot eliminate all on-campus emissions by 2019, purchasing offsets to achieve carbon neutrality is necessary. Investing in offsets creates an opportunity for education and innovation. It also creates a strong financial incentive to reduce on-campus emissions that would obviate the need to purchase future offsets on an annual and ongoing basis. While implementing on-campus projects that continue to reduce Colgate's greenhouse gas emissions remains the top priority, the university must also choose among a myriad of carbon offsets options to achieve its institutional goal of carbon neutrality by 2019.

The Carbon Offsets Working Group was established during the 2016 fall semester to research carbon offset options and propose recommendations for investing in offsets to help meet our 2019 carbon neutrality goal. The Carbon Offsets Working Group is a subcommittee of the Sustainability Council. The Working Group has met over a dozen times since its formation and has completed a number of research efforts between meetings. This research includes: a review of reports and approaches developed by other institutions, interviews with colleagues at other colleges and universities (e.g., Duke, Middlebury, Clarkson, and others), interviews with organizations who specialize in various aspects of project development and the offset market (e.g., Second Nature, TerraCarbon, Bluesource, Renewable Choice), conversations with members of Students for Environmental Action (a student organization on campus), and collaboration with ENST 390 students throughout the 2017 fall semester with their research project on forest carbon offsets.

As specified in Colgate's [Bicentennial Plan for a Sustainable and Carbon Neutral Campus](#), the Working Group is evaluating and recommending offset options that:

- consider renewable energy certificates (RECs) or green tags to mitigate Colgate's emissions associated with electricity consumption;
- place a high value on academic and research opportunities;
- consider community-based and/or local investment options;
- are high-quality offsets that are either third-party certified or have direct and measurable carbon and community benefits;
- consider options for socially responsible, community-based, economic, and environmental co-benefits;
- make appropriate budgetary recommendations for Fiscal Year 2019.

The purpose of this interim report is to provide an initial assessment of our research that includes a list of the most promising offset options for the university to consider.

RECOMMENDED STRATEGIES FOR CARBON OFFSETS

To achieve carbon neutrality, Colgate's Carbon Offsets Working Group recommends investing in a diversified portfolio of offset projects in any given year. Colgate's portfolio of offset projects might include a mix of:

- local and global projects;
- third-party certified projects purchased from a vendor as well as the development of new projects that utilize a peer-reviewed process for project verification;
- low-cost verified offsets through an existing registry as well as premium offsets that include value-added co-benefits (such as social, local, or environmental benefits);
- project types such as forestry-based, renewable energy, and methane capture.

The Carbon Offset Working Group also recommends giving individuals or departments flexibility in the type of verified offsets they would like to invest in. By providing a short-list of vetted options, we believe that individuals may take more ownership and be more engaged in the university's investments in carbon offsets.

Finally, the Carbon Offset Working Group recommends keeping this group or an analogous group as a standing subcommittee of the Sustainability Council. Since investing in offsets will be an ongoing annual endeavor, it will be necessary to monitor existing investments, evaluate new opportunities for future offset investments, and continue to keep Colgate's administration and our campus community informed and engaged in our offset options and investments.

COLGATE'S GREENHOUSE FOOTPRINT AND SOURCES OF EMISSIONS

In Fiscal Year 2017, Colgate's gross greenhouse gas emissions were 14,709 metric tons of carbon dioxide equivalents (MTeCO₂) or "tons" for short. Different sources of Colgate's emissions result in different opportunities for investing in carbon offsets and fall under three scopes:

- **Scope 1:** emissions from on-campus combustion of fossil fuels (such as natural gas, fuel oil #2, kerosene, and propane), vehicle fleet emissions, refrigerants, and fertilizers. In FY 2017, Colgate's Scope 1 emissions were 8,548 tons or 58 percent of the university's emissions.
- **Scope 2:** emissions from purchased electricity. In FY 2017, Colgate's Scope 2 emissions were 391 tons or 3 percent of the university's emissions. Electricity emissions were far below our historic emissions in FY 2017 due to the fact that 95 percent of our electricity was generated from carbon-free hydroelectricity instead of 84 percent typical in other years.
- **Scope 3:** emissions from commuting, Cruisers, air travel, paper use, and solid waste. In FY 2017, Colgate's Scope 3 emissions were 5,770 tons or 39 percent of the university's emissions.

Biogenic emissions are a fourth source or sink of emissions depending on how Colgate manages its forested lands. When the university removes trees, it adds to our footprint and when we manage our forested lands well, it serves as a carbon sink. In FY 2017, Colgate released 91 tons of stored carbon through the removal of 2.5 acres of trees in preparation for the construction of two new residence halls. The rest of Colgate's forested lands sequestered 1,578 tons of carbon through annual tree growth. As a result, the net biogenic emissions were -1,487 tons in FY 2017.

When Colgate's net biogenic emissions are subtracted from our Scope 1, 2, and 3 emissions, our total footprint in FY 2017 was 13,221 tons.

Assuming that our institutional footprint remains about the same in FY 2019, **Colgate will have to invest in about 13,000 to 14,000 tons of offsets**. This assumes that campus-wide operational efficiency gains make up for the increased emissions associated with the opening of three new campus buildings (Benton Hall and two new residence halls).

According to [Second Nature's Carbon Markets and Offset Guidance](#)¹ report published in 2016, Scope 1 and Scope 2 emissions must be high-quality, third-party certified offsets that meet an established set of principles for legitimate carbon offsets. Additionally, Scope 1 and Scope 2 offsets need to be registered through a well-regarded registry such as the American Carbon Registry (ACR) or the Climate Action Reserve (CAR). Scope 2 emissions from electricity consumption can also be offset through the purchase of Renewable Energy Certificates (RECs) that are certified through a reputable program such as [Green-e Energy](#).

However, there is a lot more flexibility when considering offset options for Scope 3 emissions. Scope 3 emissions can be difficult to measure and are sometimes based on estimates. Additionally, Scope 3 emissions are always shared emissions (some other person's or entity's Scope 1 emissions). For this reason, Second Nature's Offset Guidance specifies that *"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" or "innovative" (limit of 10% of total campus emissions) offset projects."* This opens the door for universities such as Colgate to develop non-certified, peer-reviewed projects that are smaller scale at a potentially reduced cost. This can result in high impact locally-based projects.

OFFSET OPTIONS

Throughout the calendar year 2017, the Carbon Offsets Working Group researched and evaluated carbon offset options for Colgate. Here we list the most promising options under each scope with the pros and cons for each type.

SCOPE 1

COLGATE FOREST CARBON PROJECT

Verification: American Carbon Registry

Protocol: Improved Forest Management

Carbon Offsets: up to 9,000 tons annually for 9 years (81,000 total)²

Initial Cost: \$240,000 to \$330,000

Annual Cost: estimated \$30,000-\$35,000 inventory and monitoring fees every 5 years

Cost per Offset: \$3-\$4 per ton³

Project Overview:

In 2013, Colgate completed its first forest carbon inventory for its 1,059 acres of forested land. The inventory revealed that Colgate's forests contain 165,491 tons of stored carbon while sequestering an additional 1,578 tons of carbon annually (as our forests grow). The Carbon Offsets Working Group engaged [Bluesource](#) and [TerraCarbon](#) to explore the option of developing Colgate's forest into a carbon offset project following the American Carbon Registry's Improved Forest Management (ACR IFM)

¹ Colgate University is a signatory to [Second Nature's Carbon Commitment](#) and publicly committed to carbon neutrality by 2019.

² Highly speculative. Needs further evaluation.

³ From "Colgate University Campus Forest Offset Project Analysis." by Bianco, Dalstein, Feikens, Post, Rosenthal, Winward, 2017 (fall), ENST 390.

protocol. Additionally, students in ENST 390 (fall 2017) researched this potential project more thoroughly and provided us with an important evaluation, additional information, and recommendations.

A preliminary, high-level assessment indicates that Colgate's forest might generate approximately 9,000 tons of offsets annually for 9 years for a total of 81,000 tons of offsets if we follow the ACR IFM protocol. The estimated startup cost of developing and certifying this project under the ACR IFM registry could be somewhere between \$240,000 to \$330,000, which includes ongoing forest management and monitoring. Instead of selling the offsets generated, Colgate could retain them to help meet our carbon neutrality goal over the project's credit period (9 years).

Based on the ACR IFM protocol, Colgate would need to manage its forests following the protocol guidelines over a 40 year period. The ACR IFM protocol would not be a costly departure from the way we currently manage our forested lands.

Based on these preliminary estimates, the Colgate Forest Offset Project could be a low-cost option for helping to meet our carbon neutrality goal. High-quality certified carbon offsets cost about \$6-\$10 per ton. Therefore, if Colgate purchased 81,000 tons of offsets at this price, it would cost the university between \$486,000 to \$810,000 total over the 9 year period (more than double our estimates for the certified Colgate Forest Offset Project). The university could also choose to market and sell some of the offsets to help cover the cost of establishing the project. But we would incur additional marketing and retail costs and we would have to buy additional offsets to cover the ones we sold instead of retired. This could make sense if we were to find cheaper high-quality offsets on the open market, however at this time, the Working Group supports retaining all offsets produced to offset our own emissions.

Alternatively, the project could be developed using a peer-review process instead of going through the ACR as allowed in Second Nature's Offset Guidance. See Scope 3 Colgate Forest Offset Project below for more on that approach.

PROS:

- An opportunity for low-cost, high-quality, local offsets through an established registry.
- Could serve as a powerful educational and research experience for students and faculty.
- Elevate the important role of forest carbon in overcoming climate change.
- Result in a better managed, higher-value Colgate forest.
- Provide further incentive to reduce the likelihood of future land conversion.
- Further establish Colgate as an innovative leader in campus sustainability solutions.

CONS:

- High development and startup costs could cause sticker shock.
- Colgate would need to invest significant time and human resources into project development and analysis (more than simply purchasing offsets off the open market).
- Project might not develop in time for offsets to be available for initial carbon neutrality date in 2019.

Based on our preliminary findings, the Carbon Offsets Working Group recommends undertaking a deeper dive into this project and investing in a sensitivity (feasibility) analysis. TerraCarbon can complete this assessment which would give us more insight into the costs, benefits, and options of undertaking this project. The estimate for completing the sensitivity analysis is a one-time \$15,000 fee. TerraCarbon's proposal with deliverables can be found [here](#).

PATAGONIA SUR FOREST CARBON OFFSET PROJECT

Verification: Verified Carbon Standard

Protocol: Reforestation

Carbon Offsets: 5,000 tons annually until 2026

Initial Cost: \$0

Annual Cost: \$50,000

Cost per Offset: \$10 per ton

Project Overview:

In Fiscal Year 2012, Colgate entered into an agreement with Patagonia Sur for the purchase of 5,000 tons of forestry-based offsets per year for 15 years. The reforestation project is in The Patagonia Sur Nature Reserve in the Palena province of southern Chile in Valle California. Over the course of the 15 years, approximately 225,000 native trees will be planted on roughly 428 acres of land that is the Colgate University Forest. The Patagonia Sur reforestation project received Verified Carbon Standard (VCS) certification. Importantly, the agreement has created academic and research opportunities for students and faculty within the Colgate Forest and The Patagonia Sur Nature Reserve.

Because it takes approximately 80 years for the native trees in Patagonia to sequester 0.5 tons of carbon per tree, the project also includes an investment in real-time, Certified Emissions Reductions (CERs) under the Clean Development Mechanism (CDM). In FY 2017, Colgate's investment in these offsets supported a new biomass cogeneration power plant of 30 MW in the Complejo Nueva Aldea Forestry complex located in Chile's VIII region. The project uses biomass residues (sawdust and bark) from nearby third-party sawmills as a renewable fuel source to cogenerate heat and power.

Even though Colgate's contract extends to 2026, the university has options to withdraw from the contract with no penalty if we decide to invest in another project.

PROS:

- An established project meeting the highest offset standards through the Verified Carbon Standard (VCS).
- The VCS certified reforestation project coupled with the additional investment in CERs under the CDM means Colgate can be very confident it's making a solid investment in mitigating the impacts of global climate change.
- Ecological and social co-benefits associated with reforestation of native trees in a severely degraded ecosystem.
- Opportunities for continued educational and research experiences for students and faculty in a part of the world where Colgate currently does not have a lot of other established programs.
- Elevate the important role of forest carbon in overcoming climate change.

CONS:

- Perception that Colgate is part of a land-grabbing scheme and owns land in Patagonia.
- Might be an opportunity to invest in alternative third-party certified offsets at a lower cost.
- Geographic distance makes it difficult for many at Colgate to have a direct connection with the project.

PURCHASING THIRD-PARTY VERIFIED OFFSETS FROM AN ESTABLISHED VENDOR

Verification: Verified Carbon Standard, Gold Standard, Green-e or any other reputable standard

Protocol: depends on project type

Carbon Offsets: depends (range up to 14,000 tons annually)

Initial Cost: \$0

Annual Cost: depends (range up to \$140,000 annually)

Cost per Offset: \$6-\$10 per ton is a reasonable range for high-quality offsets though offsets can be purchased for lower and higher costs.

Project Overview:

Purchasing high-quality certified offsets from an established vendor is the most straightforward option to invest in carbon offsets. There are many types of offset projects available such as methane capture, renewable energy, and reforestation in many locations (e.g., local, national, and global).

PROS:

- Reasonably priced, high-quality certified offset projects are readily available for investment.
- Decisions can be made on short-notice with no long-term commitments or contracts necessary.
- Avoid risks, time, and costs associated with developing a new project.

CONS:

- Can sacrifice educational, social, environmental, and local benefits when purchasing off-the-shelf carbon offsets.
- If not done carefully, may result in little community engagement or change in practices by the university.
- Perception of buying our way out of the problem.

SCOPE 2

PURCHASING RENEWABLE ENERGY CERTIFICATES (RECs) FROM A CERTIFIED VENDOR

Verification: [Green-e Energy](#) or another reputable certification

Protocol: RECs

Carbon Offsets: all emissions associated with Colgate's electricity consumption (potential range 350 - 2,000 tons annually)

Initial Cost: \$0 (no additional development, design, or marketing costs)

Annual Cost: estimated range is \$1,500 to \$23,000

Cost per Offset: estimated range is \$0.75 to \$11.50 per ton

Project Overview:

A Renewable Energy Certificate (REC) or Green Tag is a certificate that represents the generation of one megawatt-hour (MWh) of electricity from a new source of renewable energy. When purchasing RECs, Colgate invests in the environmental attributes (benefits) of that renewable energy source. Investing in RECs is an investment in renewable, carbon-free energy that reduces and avoids greenhouse gas emissions.

Colgate has relatively low greenhouse gas emissions associated with our consumption of electricity since most of our power is generated from hydroelectricity. In any given year, between 5 percent (1,500 MWh)

and 16 percent (4,600 MWh⁴) of our electricity is carbon-based. The current range for Green-e certified RECs is \$0.75 to \$5.00 per MWh, depending on quantity purchased, vendor, and specific project. At these prices, Colgate can anticipate spending \$1,500 to \$23,000 annually in RECs to offset our emissions from electricity (depending on the cost and the amount of fossil fuel electricity the university consumes).

Purchasing high-quality Green-e Energy from an established vendor (e.g., TerraPass, NativeEnergy, Sterling Planet, Renewable Choice, etc.) is the most straightforward option to invest in RECs. However, it is also important to emphasize that the university does not have to purchase RECs to offset our Scope 2 emissions. Traditional certified and registered offsets are acceptable. Since existing RECs and certified offsets can be purchased on short notice with no lag time for project development, the Working Group recommends that the university weighs the cost and quality for various REC and offset options before making a final decision.

PROS:

- High-quality certified RECs are readily available for investment and can be purchased at a substantially lower cost than traditional offsets.
- RECs are the most widely accepted option for offsetting emissions from electricity.
- Decisions and purchases can be made on short-notice with no long-term commitments or contracts necessary.
- Avoid risks, time, and costs associated with developing a new project.

CONS:

- Can sacrifice educational, social, environmental, and local benefits when purchasing off-the-shelf RECs.
- If not done carefully, may result in little community engagement or change in practices by the university.
- Perception of buying our way out of the problem.

SCOPE 3

COLGATE FOREST CARBON PROJECT

Verification: Peer-reviewed

Protocol: Improved Forest Management (as a model)

Carbon Offsets: ~4,400 tons annually for 9 years (39,600 total)

Initial Cost: Uncertain (potential design, verifier, and monitoring fees)

Annual Cost: estimated \$30,000-\$35,000 inventory and monitoring fees every 5 years

Cost per Offset: Uncertain

Project Overview:

The project could be developed using a peer-review process instead of going through the ACR as described above under Scope 1 options. This would allow approximately 4,400 tons⁵ of Colgate's Scope 3 emissions to be offset annually starting in or after 2019. A peer-reviewed approach to the Colgate

⁴ To convert MWh to MTeCO₂ (tons), MWhs are multiplied by a variable emission factor that is determined annually based on Colgate's electricity mix.

⁵ Note that this differs from the 9,000 annual tons using the American Carbon Registry verification model under Scope 1 emissions. The Second Nature protocol only allows for a maximum of 30% of campus emissions to be offset using a peer-review approach.

Forest Carbon Project might result in lower startup and management costs. On the negative side, since the amount of offsets we can use per year would be restricted under the peer-review process, we would have to spend money investing in other types of offsets. Colgate would also lose the option of selling any offsets under Second Nature's Offset Guidance for peer-reviewed offsets.

PROS:

- An opportunity for low-cost, local offsets through Second Nature's new peer-reviewed process.
- Could serve as a powerful educational and research experience for students and faculty.
- Increased networking opportunities and research partnerships with peer schools.
- Elevate the important role of forest carbon in overcoming climate change.
- Result in a better managed, higher-value Colgate forest.
- Provide further incentive to reduce the likelihood of future land conversion.
- Further establish Colgate as an innovative leader in campus sustainability solutions.

CONS:

- Overall cost of offsets over the length of the project could be higher than pursuing third-party verified and registered offsets through ACR. This needs further evaluation.
- Legitimacy of project could be questioned on campus and across higher education. Colgate would need to ensure that this project is resulting in a change in forest management practices that would not have happened without the project (additionality). Placing some of our forested lands into permanent conservation easements would help demonstrate additionality and reaffirm Colgate's commitment to permanently protect some of our forested lands.
- Colgate would need to invest significant time and human resources into project development and analysis (more than simply purchasing offsets off the open market).
- Project might not develop in time for offsets to be available for 2019 carbon neutrality date.

Based on our preliminary findings, the Carbon Offsets Working Group recommends undertaking a deeper dive into this project and investing in a sensitivity (feasibility) analysis. TerraCarbon can complete this assessment which would give us more insight into the costs, benefits, and options of undertaking this project. The estimate for completing the sensitivity analysis is a one-time \$15,000 fee.

CONSERVATION EASEMENT

Verification: Peer-reviewed (Innovative)

Protocol: Improved Forest Management (as a model)

Carbon Offsets: ~1,500 tons annually (or approximately 10 percent of gross emissions)

Initial Cost: Uncertain (~\$7,000 in easement transaction costs plus potential design, inventory/monitoring, and verification fees)

Annual Cost: Uncertain (potential inventory and monitoring fees every 5 years)

Cost per Offset: Uncertain

Project Overview:

The Carbon Offsets Working Group also explored the opportunity of working with landowners and land trusts to place existing forests under permanent conservation easements. The idea here is that Colgate would financially cover the transaction costs (~\$7,000) to place existing forests under permanent conservation in exchange for the carbon credits. The landowner would get permanent protection of their land as well as all associated tax credits.

This project could be developed under Second Nature's new guidelines for peer-reviewed, innovative projects that could help reduce development and verification costs. The innovative guidelines allow a peer-review process for Scope 3 emissions up to 10 percent of total emissions. In Colgate's case, approximately 1,500 tons of offsets could be generated under the peer-review, innovative guidelines.

PROS:

- An opportunity for low-cost, local offsets through Second Nature's new peer-reviewed (innovative) process.
- Could serve as a powerful educational and research experience for students and faculty.
- Increased networking opportunities and research partnerships with peer schools.
- Elevate the important role of forest carbon in overcoming climate change.
- Good public relations value as it demonstrates a commitment to local/regional land conservation.
- Result in a better managed, higher-value New York State forested lands.
- Would virtually eliminate the potential for future land conversion.
- Further establish Colgate as an innovative leader in campus sustainability solutions.

CONS:

- Initial development and ongoing monitoring costs are uncertain. This needs further evaluation.
- Would need to be sensitive to how this project was communicated to reduce risk of misinformation in our community and beyond.
- Investments in time and labor are greater than purchasing offsets from an established project and vendor.
- Project might not develop in time for offsets to be available for initial carbon neutrality date in 2019.

URBAN OFFSETS

Verification: Climate Action Reserve, Verified Carbon Standard, American Carbon Registry, Gold Standard, or another reputable standard

Protocol: depends on project type

Carbon Offsets: small-scale (up to 1,500 tons annually)

Initial Cost: \$0

Annual Cost: estimated \$15,000 annually

Cost per Offset: \$10 per ton

Project Overview:

Urban Offsets offers an innovative approach to carbon offsetting. They combine high-quality third-party verified offsets with a local tree planting project to produce a bundled offset package. Colgate would partner with Urban Offsets and Hamilton's Village Tree Committee (chaired by NYS DEC forester, Greg Owens) to plant street trees throughout the Village. After the trees are planted, it takes time for the trees to sequester carbon, in the meantime, Urban Offsets invests in third-party verified offsets on Colgate's behalf. The cost to Colgate for the bundled package would be about \$10 per ton (this covers the verified offsets as well as the costs to plant the street trees).

For an estimated \$15,000, Colgate would work with the Village and the Tree Committee to plant 100 street trees. The cost would cover the additional purchase of verified offsets and could offset the university's emissions associated with commuting at about \$10 per ton.

PROS:

- An opportunity for low-cost, local offsets that are both verified and innovative.
- Could serve as an educational and research experience for students and faculty.
- Good public relations value as it demonstrates an investment in our local community. Could also help to further establish good working relationships with our neighbors.
- Elevate the important role of street trees in residential communities.
- Further establish Colgate as an innovative leader in campus sustainability solutions.

CONS:

- Initial development and ongoing monitoring costs are uncertain. This needs further evaluation.
- Would need to be sensitive to how this project was communicated to reduce risk of misinformation in our community and beyond.
- Time and labor investments are greater than purchasing offsets from an established project and vendor.

SUMMARY OF POTENTIAL OFFSET PROJECTS

Scope 1	Pros	Cons
<p>Colgate Forest Carbon Project</p> <p>Carbon Offsets: 9,000 tons annually for 9 years (81,000 total)</p> <p>Initial Cost: \$240,000 - \$330,000</p> <p>Ongoing Cost: \$30,000-\$35,000 every 5 years</p> <p>Cost per Ton: \$3-\$4</p>	<ul style="list-style-type: none"> -An opportunity for low-cost, high-quality, local offsets through an established registry -Could serve as a powerful educational and research experience for students and faculty -Elevate the important role of forest carbon in overcoming climate change -Result in a better managed, higher-value Colgate forest -Provide further incentive to reduce the likelihood of future land conversion -Further establish Colgate as an innovative leader in campus sustainability solutions 	<ul style="list-style-type: none"> -High development and startup costs could cause sticker shock -Colgate would need to invest significant time and human resources into project development and analysis (more than simply purchasing offsets off the open market) -Project might not develop in time for offsets to be available for initial carbon neutrality date in 2019
<p>Patagonia Sur Forest Carbon Offset Project</p> <p>Carbon Offsets: 5,000 tons annually until 2026</p> <p>Initial Cost: \$0</p> <p>Annual Cost: \$50,000</p> <p>Cost per Ton: \$10</p>	<ul style="list-style-type: none"> -An established project meeting the highest offset standards through the Verified Carbon Standard (VCS) -The VCS certified reforestation project coupled with the additional investment in CERs under the -CDM means Colgate can be very confident it's making a solid investment in mitigating the impacts of global climate change -Ecological and social co-benefits associated with reforestation of native trees in a severely degraded ecosystem -Opportunities for continued educational and research experiences for students and faculty in a part of the world where Colgate currently does not have a lot of other established programs -Elevate the important role of forest carbon in overcoming climate change 	<ul style="list-style-type: none"> -Perception that Colgate is part of a land-grabbing scheme and owns land in Patagonia -Might be an opportunity to invest in alternative third-party certified offsets at a lower cost -Geographic distance makes it difficult for many at Colgate to have a direct connection with the project
<p>Purchasing Third-Party Verified Offsets</p> <p>Carbon Offsets: up to 14,000 tons annually</p> <p>Initial Cost: \$0</p> <p>Annual Cost: up to \$140,000</p> <p>Cost per Ton: \$6-\$10</p>	<ul style="list-style-type: none"> -Reasonably priced, high-quality certified offset projects are readily available for investment -Decisions can be made on short-notice with no long-term commitments or contracts necessary -Avoid risks, time, and costs associated with developing a new project 	<ul style="list-style-type: none"> -Can sacrifice educational, social, environmental, and local benefits when purchasing off-the-shelf carbon offsets -If not done carefully, may result in little community engagement or change in practices by the university -Perception of buying our way out of the problem
Scope 2	Pros	Cons
<p>Purchasing Renewable Energy Certificates (RECs)</p> <p>Carbon Offsets: 350 - 2,000 tons annually</p> <p>Initial Cost: \$0</p> <p>Annual Cost: estimated range is \$1,500-\$23,000</p> <p>Cost per Ton: \$0.75 to \$11.50</p>	<ul style="list-style-type: none"> -High-quality certified RECs are readily available for investment and can be purchased at a substantially lower cost than traditional offsets. -RECs are the most widely accepted option for offsetting emissions from electricity -Decisions and purchases can be made on short-notice with no long-term commitments or contracts necessary -Avoid risks, time, and costs associated with developing a new project 	<ul style="list-style-type: none"> -Can sacrifice educational, social, environmental, and local benefits when purchasing off-the-shelf RECs -If not done carefully, may result in little community engagement or change in practices by the university. -Perception of buying our way out of the problem

SUMMARY OF POTENTIAL OFFSET PROJECTS (continued)

Scope 3	Pros	Cons
<p>Colgate Forest Carbon Project</p> <p>Carbon Offsets: ~4,400 tons annually for 9 years (39,600 total)</p> <p>Initial Cost: Uncertain (potential design, verifier, and monitoring fees)</p> <p>Annual Cost: estimated \$30,000-\$35,000 inventory and monitoring fees every 5 years</p> <p>Cost per Offset: Uncertain</p>	<ul style="list-style-type: none"> -An opportunity for low-cost, local offsets through Second Nature’s new peer-reviewed process -Could serve as a powerful educational and research experience for students and faculty -Increased networking opportunities and research partnerships with peer schools -Elevate the important role of forest carbon in overcoming climate change -Result in a better managed, higher-value Colgate forest -Provide further incentive to reduce the likelihood of future land conversion -Further establish Colgate as an innovative leader in campus sustainability solutions 	<ul style="list-style-type: none"> -Overall cost of offsets over the length of the project could be higher than pursuing third-party verified and registered offsets through ACR. This needs further evaluation -Legitimacy of project could be questioned on campus and across higher education. Colgate would need to ensure that this project is resulting in a change in forest management practices that would not have happened without the project (additionality). Placing some of our forested lands into permanent conservation easements would help demonstrate additionality and reaffirm Colgate’s commitment to permanently protect some of our forested lands. -Colgate would need to invest significant time and human resources into project development and analysis (more than simply purchasing offsets off the open market) -Project might not develop in time for offsets to be available for initial carbon neutrality date in 2019
<p>Conservation Easement</p> <p>Carbon Offsets: ~1,500 tons annually (or 10 percent of gross emissions)</p> <p>Initial Cost: Uncertain (~\$7,000 in easement transaction costs plus potential design, inventory/monitoring, and verification fees)</p> <p>Annual Cost: Uncertain (potential inventory and monitoring fees every 5 years)</p> <p>Cost per Offset: Uncertain</p>	<ul style="list-style-type: none"> -An opportunity for low-cost, local offsets through Second Nature’s new peer-reviewed (innovative) process -Could serve as a powerful educational and research experience for students and faculty -Increased networking opportunities and research partnerships with peer schools -Elevate the important role of forest carbon in overcoming climate change -Good public relations value as it demonstrates a commitment to local/regional land conservation -Result in a better managed, higher-value New York State forested lands -Would virtually eliminate the potential for future land conversion -Further establish Colgate as an innovative leader in campus sustainability solutions 	<ul style="list-style-type: none"> -Initial development and ongoing monitoring costs are uncertain. This needs further evaluation -Would need to be sensitive to how this project was communicated to reduce risk of misinformation in our community and beyond -Investments in time and labor are greater than purchasing offsets from an established project and vendor -Project might not develop in time for offsets to be available for initial carbon neutrality date in 2019
<p>Urban Offsets</p> <p>Carbon Offsets: small scale (up to 1,500 tons annually)</p> <p>Initial Cost: \$0</p> <p>Annual Cost: estimated \$15,000</p> <p>Cost per Ton: \$10</p>	<ul style="list-style-type: none"> -An opportunity for low-cost, local offsets that are both verified and innovative -Could serve as an educational and research experience for students and faculty -Good public relations value as it demonstrates an investment in our local community. Could also help to further establish good working relationships with our neighbors -Elevate the important role of street trees in residential communities -Further establish Colgate as an innovative leader in campus sustainability solutions 	<ul style="list-style-type: none"> -Initial development and ongoing monitoring costs are uncertain – this needs further evaluation -Would need to be sensitive to how this project was communicated to reduce risk of misinformation in our community and beyond -Time and labor investments are greater than purchasing offsets from an established project and vendor

NEXT STEPS (Spring Semester 2018)

1. Retain TerraCarbon (\$15,000) to complete a sensitivity analysis of the Colgate Forest Carbon Project and complete a re-inventory of Colgate's forest carbon.
2. Solicit feedback from Colgate faculty, administrators, staff, and students regarding the offset options highlighted in this report.
3. Prepare a final report with offset recommendations based on further research and feedback from the Colgate community with a deadline of by July 1, 2018.

Carbon Offsets Working Group

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