A Guide to the Ethics of Climate Neutrality

Kate Cooper, Sophia Huang, and Hannah Maryanski

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Markkula Center for Applied Ethics
Center for Sustainability
Santa Clara University

Santa Clara University

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Executive Summary

Universities throughout the country have created Climate Action Plans to declare their commitment to climate neutrality. However, it is difficult to calculate all university emissions, and there are some questions regarding which emissions sources to count. Our research has focused on these gray areas, including commute, wastewater, solid waste, purchased goods, air travel, and investments. Clear emissions calculation methodologies don't exist for all these categories, and there is no universal agreement on who is responsible, even though some of these emissions are the largest sources of greenhouse gases. In this guide we also consider the ethics of carbon offsets and REC's. This guide provides ethical resources for institutions of higher learning that are considering climate neutrality commitments, with special consideration for Ignatian values in Jesuit Catholic institutions.

Key Terms

Carbon Offset: when purchased, represents one ton of greenhouse gases destroyed or removed from the atmosphere. Also called a Voluntary Emissions Reduction (VER).

Carbon Neutrality: net zero greenhouse gas emissions for an organization, institution, or individual.

Climate Neutrality: net zero greenhouse gas emissions achieved by eliminating or minimizing GHG emissions, with the use of carbon offsets to mitigate any remaining emissions. Roughly 45% of the anthropogenic greenhouse gases are gases other than carbon dioxide.

CO_2e, **Carbon Dioxide Equivalent:** emissions of non-CO_2 greenhouse gases expressed in terms of CO_2 based upon their global warming potential (GWP).

GHG, **Greenhouse Gas:** includes CO_2, CH_4, N_2O, O_3 and other gases that retain energy from solar radiation in Earth's atmosphere.

GWP, **Global Warming Potential:** the warming potential of a greenhouse gas over a certain period of time; by convention, CO_2 is assigned a GWP of 1, and everything else is compared relative to CO_2.

MOV, Multiple Occupant Vehicle: qualify as carpooling; preferred because of lower per-person GHG emissions.

MwH, Megawatt-Hour: a measure of energy equivalent to one megawatt used for one hour, or 3.6 billion joules.

REC, Renewable Energy Certificate: when purchased, represents the environmental benefits of one megawatt-hour of energy generated through clean, renewable methods.

SOV, Single Occupant Vehicle.

Introduction

In the 21st century, we are increasingly aware of global climate change. The scientific community supports the fact that greenhouse gases play a significant role in changing climate patterns, and people are realizing the need to change current lifestyles to reduce the world's atmospheric CO_2 concentration. As centers of academic and technical innovation, institutions of higher education are role models for sustainable practices, including climate neutrality. Jesuit Catholic colleges and universities also have a unique role—with our devotion to social justice, and the recent encyclical from Pope Francis exhorting us to protect the environment,[1] we should be at the forefront of developing ethical solutions for reducing and mitigating emissions. Not only is climate neutrality important for the environment, it is also important for people, especially vulnerable populations. Institutions of higher education train students to create social, economic, and technological solutions to solve climate change and help society, and can help set an example for a more sustainable lifestyle. Creating an environmentally aware and concerned culture will create more responsible citizens who ensure a sustainable future.

Accurate emissions accounting is a key part of the climate neutrality goal. Certain emissions (Scopes 1 and 2) have standardized accounting practices, but Scope 3 does not. Because educational institutions, particularly Jesuit ones, are committed to high ethical standards, we should be concerned with what we count in Scope 3. This guide will provide ethical frameworks that colleges and universities can use to think about our duty to be carbon neutral.

Ethics and Climate Neutrality

Santa Clara, like most universities, generates millions of pounds of carbon emissions each year. It is important for universities guided by values and mission statements to think about how those emissions impact the planet. There are many perspectives in environmental ethics, but this document will focus on ecocentrism and anthropocentrism. Simply put, an ecocentric perspective considers harm to the environment, and an anthropocentric perspective considers harms to people. Both viewpoints are important when forming a balanced understanding of the ethical aspects of climate neutrality.

According to the ecocentric perspective, the environment has moral status.[2] This means that the environment is valuable in itself – it has intrinsic, inherent moral value (not merely economic value to humans) – and deserves to be protected. Because the environment has intrinsic value, humans therefore have an obligation to protect it.[3]

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[1] Pope Francis, *Laudato Si*. June 2015. Web. 29 June 2015. http://w2.vatican.va/content/francesco/en/encyclicals/documents/papa-francesco_20150524_enciclica-laudato-si.html

[2] Warner, Keith Douglass and David DeCosse. "Thinking Ethically About the Environment." *Markkula Center for Applied Ethics.* May 2009. Web. 16 Dec. 2015. http://www.scu.edu/ethics/practicing/focusareas/environmental_ethics/short-course.html

[3] "Environmental Ethics." *Stanford Encyclopedia of Philosophy.* 3 Jan. 2008. Web. 2 Apr. 2015. http://plato.stanford.edu/entries/ethics-environmental/

There are several ethical principles related to this perspective, one of which is the principle of sufficiency. This idea recognizes that "all forms of life are entitled to enough goods to live on and flourish."[4] We should all agree that destroying human homes for no good reason is wrong. But what about the homes of the plants, animals, and ecosystems that make up our environment? Principles of justice say that all equals should be treated equally. In what sense are humans, plants, and animals equal? Like humans, do plants and animals have a right not to have their homes polluted or destroyed? Many philosophers claim that while humans differ from animals, "these differences do not provide a philosophical defense for denying non-human animals moral consideration."[5]

Aldo Leopold's "The Land Ethic," an excerpt from *A Sand County Almanac*, is a prime example of the ecocentric perspective. Leopold discusses how humans are a part of a community of complex, interdependent parts. Humans are a member, not a "conqueror," of this community, and they must have respect for other members. He identified a lack of social conscience towards the environment as a key driver for environmental degradation. Leopold states that in order for meaningful change to occur, people must value nature.[6] An ecocentric perspective invites us to consider whether we are acting as members or as conquerors of the community. When a school commits to climate neutrality, it is making a decision to be a member of this community.

An ecocentric viewpoint prompts us to consider how our GHG emissions exacerbate climate change and the harm it imposes on the environment. For instance, Earth's oceans, which absorb carbon dioxide, have become more acidic as they absorb the higher levels of carbon dioxide emitted by humans. This threatens the survival of many marine organisms and damages marine food webs. An ecocentric viewpoint also would be concerned with the overall warmer winters and extreme droughts from climate change as well as the many unintended consequences from these changes. For instance, these changes in the climate allow insect infestations to threaten forests and all the organisms that depend on this habitat.[7]

But climate change affects more than just the non-human environment. The anthropocentric perspective focuses on current and future impacts climate change has on humans.[8] Humans all over the world are experiencing the consequences of climate change to varying degrees. The United States has experienced some of those effects from extreme weather events like Hurricane Katrina, Superstorm Sandy, and 2015's "Snowpocalypse." These disasters have wreaked havoc on urban infrastructure and put our emergency response procedures to the test. Yet climate change also affects vulnerable populations in regions that contribute minimal greenhouse gas emissions to the atmosphere. Consider Manitoba, Canada, where warmer soil temperatures have caused the thawing of permafrost in the tundra. When permafrost thaws, it may create a

[4] Warner, Keith Douglass and David DeCosse. "What: Using Ethical Principles in Moral Reasoning about the Environment." *Markkula Center for Applied Ethics.* May 2009. Web. 16 Apr. 2015. http://www.scu.edu/ethics/practicing/focusareas/environmental_ethics/lesson3.html
[5] "The Moral Status of Animals." *Stanford Encyclopedia of Philosophy.* 13 Sept. 2010. Web. 2 Apr. 2015. http://plato.stanford.edu/entries/moral-animal/
[6] Leopold, Aldo. "The Land Ethic." *The Sand County Almanac.* New York: Oxford University Press, 1949.
[7] "Climate Change Impacts." *Environmental Defense Fund.* Environmental Defense Fund, n.d. Web. 16 Apr. 2015. http://www.edf.org/climate/climate-change-impacts
[8] Sandler, R. "Intrinsic Value, Ecology, and Conservation." *Nature Education Knowledge.* 2012. Web. 12 May 2015. http://www.nature.com/scitable/knowledge/library/intrinsic-value-ecology-and-conservation-25815400

"thermokarst" lake or pond where solid ground used to be. This causes a positive feedback loop by increasing surface albedo and releasing greenhouse gases, which in turn augment the greenhouse effect. In addition, the loss of solid ground has caused the relocation of native peoples and wildlife. Unfortunately, relocation is quickly becoming necessary for many vulnerable populations affected by climate change. One example is the Marshall Islands, a series of islands and atolls between Hawaii and Australia. On average, the Marshall Islands are six feet above sea level, so a sea level rise of even a few inches has severe consequences. In recent years, massive floods have become more common, causing damage to infrastructure, destroying homes, killing crops, and impeding even the most routine tasks, such as going to school or work. The situation in the Marshall Islands has become so dire that Christopher Loeak, President of the Marshall Islands, has stated simply, "We are fighting for survival."[9]

Finally, people from future generations will inherit a world that is worse off than the one we inherited. We are dirtying the air they will breathe, polluting the oceans they will swim in and use for food, and filling in the land with our trash. We should ask ourselves what kind of earth they will live in if we continue our consumption and pollution patterns.

While the anthropocentric perspective takes issue with the impacts of climate change on humans, it also recognizes the benefits humans derive from our emissions. For instance, despite the harmful emissions that cars generate, the freedom and mobility they have created is undoubtedly an advantage to those who can afford them. In addition, the anthropocentric perspective only considers the harm car emissions impose on humans. The harm to nature is less relevant because nature is seen as having instrumental value, which means that it is valuable so long as it satisfies human needs.

Our ethical analysis would not be complete if we were to leave out character, also known as virtue ethics. Thus, we must shift the focus from the external effects of someone's actions to their internal character. How proactive a university is about climate neutrality is a choice, and that choice reflects their institutional character. A school should consider whether their actions are in line with their mission statement or how they want to be viewed by others. More importantly, a university should question what kind of example its actions set for students and the community. These considerations are important when a school decides whether it will simply complete a checklist to become carbon or climate neutral, or behave as a leader in its community and strive to reach a higher standard.

Ethical thinking challenges us to look beyond the immediate effects of our actions. For instance, one may consider how our vehicle use contributes to rising sea levels that impact small island nations or how our lawn reduces the water available for people, crops, and ecosystems. These principles challenge us to look beyond the present and ask how our actions will impact the next

[9] Vidal, John. "'We Are Fighting for Survival,' Pacific Islands Leader Warns." *The Guardian.* 31 Aug. 2013. Web. 8 March 2015. http://www.theguardian.com/environment/2013/sep/01/pacific-islands-climate-change

generation, the next three generations, or even the next seven generations.[10] Finally, it challenges us to recognize the complex interconnectedness of ecosystems. Our actions often ripple out in unpredictable ways and can have significant impacts on the environment.

Carbon and Climate Neutrality

In order to stop the trend of increasing atmospheric CO_2 and greenhouse gas concentrations, it is necessary to focus on the amounts of greenhouse gases an institution is emitting. Conservation and efficiency are methods for decreasing carbon footprints, which impact future climate patterns. Calculating and decreasing annual greenhouse gas emissions can lead to net zero emissions, but a university has the capability and responsibility to take a further step. As an institution of higher education, the university is educating future generations to improve society, part of which includes sustainability. In addition to educating students to live carbon neutral lifestyles on campus, a university also has the power to help students develop good habits which they then go on to live out in their careers and lives even long after receiving their education. To achieve this, universities should include climate neutrality as their goal on top of carbon neutrality. Carbon neutrality focuses on the numbers, aiming for net zero greenhouse gas emissions that will prevent negative impacts of climate disruption. Climate neutrality ties in education of carbon neutrality, sustainability, and environmental concern and awareness. Universities are doing this by integrating values of sustainability into their courses, creating student-run programs, and doing educational outreach like energy challenges.

How to Categorize Carbon Emissions

Sources of carbon emissions differ by activity and location. These are divided into three standard scopes for all universities, corporations, and other institutions striving for carbon neutrality. Two useful questions to ask when categorizing an emission source are:

1. Are the emissions produced on site/campus?
2. Do the activities associated with the emissions occur on site/campus?

[10] Warner, Keith Douglass and David DeCosse. "Who, When, Where and How: The Distinctiveness of Environmental Ethics." *Markkula Center for Applied Ethics.* May 2009. Web. 16 Apr. 2015. http://www.scu.edu/ethics/practicing/focusareas/environmental_ethics/lesson2.html

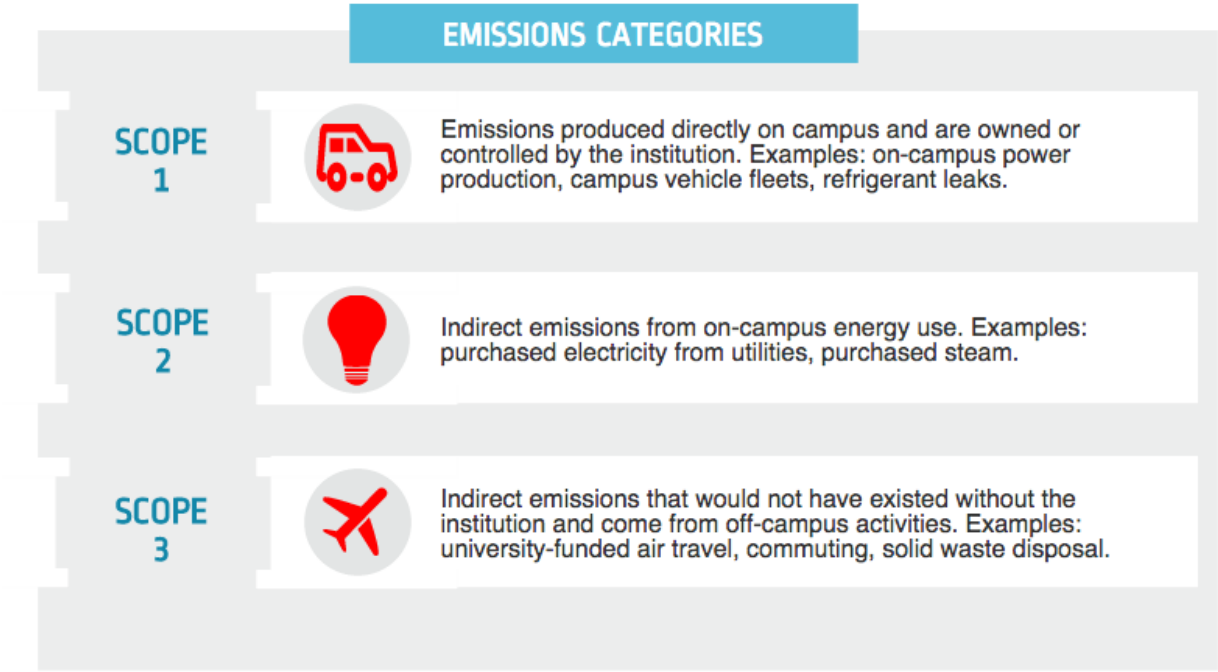

Figure 1: Emissions Categories

Scopes 1 and 2

The definitions of Scopes 1 and 2 are well-understood and standardized. This allows for straightforward procedures for counting and determining climate impact. Since Scope 1 emissions are owned and controlled by the institution, they can be accounted for by looking at, e.g., on-campus vehicle use. Similarly, Scope 2 emissions can be counted by looking at campus energy use records in conjunction with emissions information from the utilities provider.

To achieve climate neutrality in Scopes 1 and 2, institutions usually focus on a combination of reduction and offsetting strategies. A four-step system for reduction and offsetting, particularly for Scope 2, is appropriate because it places responsibility primarily on the institution.

1. *Efficiency*
   Reducing emissions through building to LEED standards, retrofitting old buildings, and installing high-efficiency light bulbs
2. *Conservation*
   Installing motion sensors for lights in office buildings, introducing campaigns and challenges for energy reduction
3. *Renewables*
   Installing PV panels or wind turbines on campus, choosing an energy mix with renewables
4. *Renewable Energy Certificates (RECs)*
   Funding renewable energy projects to offset Scope 2 emissions

Institutions should prioritize emissions reduction before offsetting. Emissions reduction strategies (steps 1-3) allow a college or university to take ownership of their own emissions by spending their own money on strategies on their own campus. However, not many institutions achieve neutrality by reductions only. Step 4 allows for ethical offsetting of the remaining emissions.

Scope 3

Scopes 1 and 2 are the most well understood, with standard calculations methodologies and relatively simpler, direct assessment. As a result, most universities that have declared a climate action plan include Scopes 1 & 2 in their annual GHG emissions report. Few universities, however, include emissions from sources like wastewater or purchased goods. Scope 3 is the most diverse and difficult to quantify out of all the scopes. It includes air travel, commute, solid waste disposal, wastewater treatment, investments, purchased goods, e-waste disposal, and other categories. One challenge in quantifying Scope 3 emissions is that Scope 3 activities are difficult to monitor and record. Institutions may not be able to track all the air miles flown during business conferences or all the commute hours from faculty, staff, and students.

In addition, there is no clear consensus on which group is, either partially or completely, responsible for the emissions. For example, should the manufacturer or consumer, or both, be responsible for reducing and offsetting GHGs from paper and other goods? We believe that as a Jesuit university, we have the obligation to take the initiative in considering our climate impact. It is understood that Scope 3 encompasses many sources of GHG, including one of the largest emitters, air travel. Such emissions would not occur without our institutional activities. As educational institutions, attempting to reduce these emissions would decrease our contribution to climate disruption and set a good example which would encourage others to decrease their climate impact as well, all contributing to the creation of a healthier environment.

Clear responsibilities and standardized calculations methods for Scope 3 emissions may not exist for all activities, but standard methods for calculating emissions do exist for commute, wastewater, solid waste, purchased paper, and air travel. The following is an analysis of various sources included in Scope 3, including the above mentioned sources as well as investments.

Commute

When faculty, staff, and students drive to campus, the university is accounting for them as part of its CO_2 emissions. Following is the breakdown of what affects the total emissions per year:

- Number of commuter students
- Number of faculty
- Number of staff
- Weeks per school year
- Average miles traveled per person per week
- Percentage of individuals traveling by different transportation modes (bike, walk, drive alone, carpool, bus, light rail, commuter rail)

- Fuel efficiencies for the above transportation modes
- Average number of gallons of fuel, if any, used for the total miles of commute

Universities can find data on fuel efficiencies from organizations like the U.S. Department of Transportation or from online greenhouse gas calculators. Data on how many people commute, for how many miles, and by what transportation modes are mostly estimated by using commuter surveys and parking permits, which show approximately how many people commute and from where they commute.

Commuter surveys are the most commonly used method by universities, and San Francisco State University has released results for one of the most comprehensive commuter surveys. The commuter response to incentives that would decrease SOVs is one result that may guide changes in future transportation systems. The greatest percentage of SOV commuters said that, to get them out of their vehicles, they would prefer free or discounted passes to local public transit, indicating the potential effectiveness of this strategy. Duke University has recently implemented such a transportation system with great success, as shown by their decrease in percentage of SOV commute.

University Highlight: Commute
Duke University

Duke University has decreased the number of single occupant vehicles driving to campus from 85% in 2004 to 70% in 2014 by providing incentives to use more public transportation. The university worked with the City of Durham and Durham Area Transit Authority to set up a new bus program, called Bull City Connector. The fare-free, hybrid-electric bus service travels routes connecting the campus to main streets and points of interest in the city. Many people use the Bull City Connector, but it is especially convenient for students and faculty who can now commute to campus with fare-free public transportation. Duke University has provided funds for the purchase of new, hybrid-electric buses and contributes to the bus service's annual operating costs while the city maintains and runs the service.

Water Consumption & Wastewater Treatment

Water consumed by a university is linked to GHG emissions because the transportation and pumping of water requires energy. Wastewater that results as a byproduct of institutions' water usage also produce GHGs when treated at wastewater treatment facilities. The energy used in delivering freshwater to campus is not by standard included in university Scope 3 emissions because emissions thereof are smaller than those from wastewater treatment. At some universities, such as Santa Clara University, these emissions are negligible because the water comes from local wells, requiring minimal transport.

When wastewater is sent to local treatment facilities, bacteria are typically used to decompose any organic matter in the water, causing release of CO_2 or CH_4. A university's GHG emissions will depend on, of course, how much wastewater they produce, but also the treatment type of local facilities. For more information, read "How Much GHG does SCU Emit Due to Waste?"

Universities are reducing water usage in many ways, not only to avoid GHG emissions but also due to importance of water conservation. Some successful methods that have been implemented include:

- Using drought-tolerant landscape plants
- Installing irrigation systems that automatically sense leaks and weather changes
- Dual-flush toilets and waterless urinals
- Purchasing water-efficient Energy Star appliances
- Replacing water-cooled compressors with air-cooled compressors
- Leak detection technology
- Updating laundry rooms with high-efficiency, front load washers

University Highlight: Reduced Potable Water Use
Santa Clara University

In the last 10 years, SCU's potable water use has reduced by 29% per person. The reduction was achieved through installation of water-efficient technologies, including low-flow showerheads, dual-flush toilets, waterless urinals, front-load washers, and sink aerators. In addition, campus landscape irrigation now consists of 85% recycled water, and facilities management is looking into expanding recycled water usage to 100% and replanting lawns with native, drought-tolerant grasses.

University Highlight: Irrigation
California State University, Los Angeles

Cal State-LA has reduced water used for irrigation by installing a wireless water management service. The system, developed by the company Water2Save, saves approximately 18 million gallons of water every year. Most of the water wasted from irrigation is due to evaporation and overwatering. By using forecasted and measured weather data, the system senses changes in air pressure and automatically adjusts watering schedules for more efficient watering.

Solid Waste Disposal

Municipal solid waste (MSW) generated by the campus can be disposed of on site as well as off site. Off-site disposal at local facilities can be categorized into two basic ways, incineration or landfilling. Incineration, or burning, of MSW emits CO_2 as a product of combustion. Landfilling creates the environment for anaerobic bacteria to break down some organic waste, emitting CH_4. This CH_4 is sometimes flared or recaptured to generate electricity depending on the facility. For more information, read "How Much GHG Does SCU Emit Due to Waste?"

University Highlight: Solid Waste Reduction
Santa Clara University

The amount of solid waste SCU produced has decreased substantially over the past decade as a result of successful recycling and waste diversion programs. In 2009, SCU replaced waste containers and labels in residence halls, offices, classrooms, and events for education on proper

waste disposal. Signs include pictures to indicate what should be recycled, composted, or landfilled, and the colors on signs and container labels are standardized: Recycling = Blue; Landfill waste = Red/Black; Compost = Green. Activities such as waste characterization provide students with the opportunity to sort and quantify the waste stream, making participants more aware of how their choices on waste disposal impact the landfill.

Year	2004	2014
Landfilled Waste Produced per Person (lbs)	400	160
Waste Diversion Rate	19%	58%
CO_2e Emitted from Landfilled Waste (lbs)	528,960	249,052

Table 1: Solid Waste at Santa Clara University.

Purchased Goods & Paper

Life cycle analyses of purchased goods show that all goods, such as furniture, paper, and electronics, emit greenhouse gases (GHGs) at some point of their production or transportation. Looking at the cradle-to-grave process of a manufactured good reveals that many intermediate steps are required to transport materials, produce goods, and deliver products. For example, a mere water bottle goes through a multitude of steps, including oil extraction, transportation from field to processing, plastic processing, bottle manufacturing, labeling, and transportation to sales site, before being purchased and consumed. A study from Cornell University shows that when 500,000 bottles (20-ounce size) are produced, the amount of GHGs emitted is equal to that from 30 passenger vehicles. Furniture and electronics will have even greater GHG emissions. Should universities be held accountable for emissions produced from purchased goods, and if so, how should they calculate them?

Thus far, paper is the purchased good most commonly included in university Scope 3 emissions. Universities consume a large amount of paper, more than plastics and metals, and emission calculation methodologies for paper are the most well-known. In order for a university to know how much GHGs it's emitting from purchased paper, it must know how much paper is purchased by weight and the percent recycled content of the paper. The manufacturing of paper emits GHGs because of the energy used. After use, if the paper is disposed of in landfills, CH_4 is produced as part of the decomposition process.

The amount of GHGs a given quantity of paper emits depends on the type of paper:

- Copy paper
- High-end catalog
- Newsprint
- Catalog, magazine

- Newspaper inserts
- Corrugated cardboard
- Percent Recycled Content (0-100%)

Paper can be bleached or unbleached, coated or uncoated, and vary in wood pulp content, so the different types of paper will emit different amounts of GHGs. Percent recycled content refers to the percentage of post-consumer recycled content used to manufacture the paper. The higher the percentage, the lower the GHG emissions. More information can be found at the Environmental Paper Network's paper calculator.

Other manufactured goods being considered by universities as part of their Scope 3 emissions, include:

- Textbooks
- Office supplies (e.g., pens, copier ink, etc.)
- Electronics
- Cleaning supplies
- Furniture
- Construction materials

Air Travel

Air travel is an understudied but significant contributor to most university emissions. Many universities do not track air travel. Those that do almost always track only air travel directly funded by the university. Emissions from air travel at Santa Clara University are no exception. In 2013, the 14.4 million miles of air travel funded by the university added over 16 million pounds of CO_2e into the atmosphere. These emissions account for 35.8% of SCU's total greenhouse gas emissions.[11] This figure only includes travel paid for by the university and from study abroad; the amount of emissions otherwise related to the university is likely much higher, as shown in the table below.

Which types of air travel should be included in a greenhouse gas emissions report? The following table outlines three options: one, only count emissions from university-funded air travel, two, count these emissions and air travel by students, or three, count all emissions from air travel associated with a university.

[11] "GHG Report for Santa Clara University." *ACUPCC.* ACUPCC, 22 Apr. 2014. Web. 13 Oct. 2014. http://rs.acupcc.org/ghg/3125/

Option 1	**Option 2**	**Option 3**
Count emissions from: ● University-funded air travel for purposes such as: ○ Athletic team travel ○ Faculty travel for conferences, projects, grants ○ Students traveling on behalf of the university ○ Consultants, speakers, lecturers, visiting professors, and visiting students providing "professional services" to the University[12] ○ Potential faculty/staff interviews	Count emissions from: ● Option 1 (University-funded air travel) ● Student air travel for purposes such as: ○ Summer orientation ○ Study abroad ○ Traveling during breaks - Thanksgiving Breaks - Winter Breaks - Spring Breaks - Summer Breaks	Count emissions from: ● Option 1 (University-funded air travel) ● Option 2 (Student air travel) ● Other air travel to a university from: ○ Prospective students - Admitted students day - Campus visits ○ Families - Family weekends - Campus visits - Move in days - Graduation

Table 2: types of air travel that schools should be tracking.

Schools ought to track air travel from option 2 or 3 and strongly consider including one of the options in their Scope 3 analysis for carbon reduction. These other sources of air travel degrade the environment just as much as university-funded air travel. Only counting Option 1 means the carbon emissions from these other activities are not represented just because of how they were funded. The air travel from current and prospective students and their families would not be occurring without the existence of the university. Therefore, the university would seem to have some share of the responsibility at least to include these emissions in their measurements, if not actually reduce them. Failing to track these other types of air travel means they will not be factored into a school's effort to achieve carbon neutrality; this gives a school little incentive to work with the student body to reduce its air travel.

Once an ethically appropriate amount of air travel is being tracked, schools can begin to design strategies to reduce air travel emissions. This section discusses a number of incentives and disincentives for air travel. More details available at "Addressing the Problem of Air Travel Emissions."

[12] "Traveling on University Business." *University Policy Library.* University of Minnesota, n.d. Web. 14 April 2015. http://policy.umn.edu/finance/travel

Action	Potential Drawbacks	Potential Benefits
Teleconferencing	No face-to-face contact	Saves money and reduces emissions
Reduce Air Travel That Cannot Be Substituted	Miss an event	Saves money and reduces emissions
Spread Awareness About Air Travel's Environmental Impact	No anticipated drawbacks	Air travel reduced and/or replaced with more sustainable traveling options
Educate Others About Alternatives	No anticipated drawbacks	Air travel reduced and/or replaced with more sustainable traveling options
Limit Air Travel Reimbursements	Could limit the ability to travel	Air travel reduced and/or replaced with more sustainable traveling options
Cap on Travel Budgets	Could limit the ability to travel	Air travel reduced and/or replaced with more sustainable traveling options
Make Carbon Offsets a Part of Study Abroad Costs	Study abroad would become more expensive	Partially offset and raise awareness about harm imposed on the environment
Reschedule Student Breaks and Orientation	Logistical inconveniences	Significantly reduce emissions associated with all forms of transportation
Track Air Mileage	Additional administrative work	More accurately measure progress and set targets

Table 3: Alternatives to and disincentives for air travel

Ethical Investments

A school can invest ethically by avoiding investments that support harmful actions to people or the environment. Many students have called on colleges to divest, or pull investments from unethical companies. In the 1970s and 80s, many businesses and universities withdrew investments from South Africa in protest of apartheid. Today, many colleges, foundations, religious institutions, cities, and even countries are divesting from fossil fuels. The call for divestment from fossil fuel companies rests on several numbers:

- First, it is almost universally agreed upon by governing bodies around the world that warming the earth above 2°C (3.6° F) is unsafe and the "highest rise we can afford if we

want a 50% chance of avoiding the worst effects of climate change."[13] We're about halfway there; currently the planet has warmed 0.8°C.

- In order to keep temperature increases below 2°C, scientists estimate that 565 more gigatons (a billion metric tons) of carbon dioxide can be emitted. If our current rate of fossil fuel consumption continues, we will have emitted 565 gigatons in less than 15 years.
- Currently, known oil, coal, and gas reserves have 2,795 gigatons of carbon.[14] Therefore, known reserves exceed safe levels by five times. If we are going to keep the earth from warming above 2°C, we need to voluntarily stop using fossil fuels.

Many other institutions like the Vatican's Pontifical Academy of Science and the Pontifical Academy of Social Sciences recognize these facts. The Vatican recently held a climate change summit and Pope Francis also recently delivered his encyclical *Laudato Si* on the environment and climate change (and encouraged movement away from fossil fuels, e.g. 23, 26, 165).

Financially hurting fossil fuel companies is neither realistic nor is it the intention of fossil fuel divestment, which calls for fossil fuel companies to gradually transfer to renewable energy. It is to be expected that other parties will buy the fossil fuel stocks a university sells. The point is, rather, for universities and institutions to make a symbolic gesture against fossil fuel consumption and its damages to the environment, future generations, and every person on this planet.

Fossil fuel divestment is being heavily debated across many university campuses. Some claim that divesting is unethical because it could damage a university's finances. They argue that if the university were to be hurt financially, it could put scholarships and faculty salaries at risk and raise tuition. However, the actual financial impact divesting would have is hotly debated. Others argue we have an ethical obligation to divest because our investments directly contradict a university's values. For instance, Santa Clara University's mission outlines the university's intention to instill conscience and compassion in its students and promote a "more humane, just and sustainable world."[15] Some argue profiting off of unsustainable practices that put everyone's well-being at risk contradicts this mission. Each university is in a unique position to make an ethical decision that shows others what they are willing to stand for.

Scope 3 Conclusion

Scope 3 includes the most diverse group of emissions sources, which produce a considerable portion of univeristy GHG emissions. As we feel the effects of climate disruption, university goals for climate neutrality are targeting activities that directly contribute to global warming and are expanding to Scope 3. Concerns associated with indirect Scope 3 emissions include the

[13] "Fast Facts and Figures." *United Nations Framework Convention on Climate Change*. United Nations, n.d. Web. 2 May 2015. http://unfccc.int/essential_background/basic_facts_figures/items/6246.php
[14] "Do the Math." *350.org.* 350, n.d. Web. 2 May 2015. http://math.350.org
[15] "University Mission, Vision, and Values Statement." *Santa Clara University.* Santa Clara University, 11 Feb. 2011. Web. 15 May 2015. https://www.scu.edu/jesuit/University-Mission.cfm

development of tracking methods for GHG emissions and agreement over accountability for offsets. We are starting to record emissions from activities like air travel and solid waste disposal and are implementing more advanced technologies while educating campus users on more efficient resource use. Activities as seemingly insignificant as driving to campus will have an effect on our communities and well-being. For an environmental perspective, it is ethically important for us to account for anthropogenic climate change. In light of the future of humanity, preservation of a healthy environment is our duty in order to sustain future generations on this planet.

Carbon Offsets and RECs

Emissions reduction is not the only way to achieve climate neutrality, for an institution can also offset, or counteract, emissions by funding outside projects. There are several ways an institution can offset emissions, some of which include carbon offsets and renewable energy certificates (RECs). Each of these offsetting methods has ethical implications, as does the concept of offsetting itself. When an institution is considering purchasing offsets or RECs, it should consider three questions:

1. Should the institution purchase any type of offset?
2. What type of offsets should be purchased?
3. When should the chosen type of offset be purchased?

Should the institution purchase any type of offset?

Although carbon offsets and RECs are not the same, they both follow the same basic concept of using an institution's money to remove greenhouse gas emissions that are not the institution's own. Various ethical frameworks can be used to support or reject offsetting.

We can apply the consequentialist ethical approach, which values the ends over the means. So if global greenhouse gas concentrations are lower overall as a result of carbon offsets or RECs (resulting in improved environmental and human health), carbon offsets or RECs are an ethical choice.

We can also apply the virtue ethics approach, which considers the morality of the ends and the means. Since the top global 1% is the population wealthy enough to purchase carbon offsets and RECs, but also the population that contributes the most greenhouse gas emissions, some argue that we "pay to pollute" by purchasing carbon offsets and RECs. If we are just purchasing carbon offsets and RECs to feel better about ourselves or to relieve guilt, a virtue ethic would say carbon offsets and RECs are probably not ethical. But if we are doing it with a genuine concern for the environment after doing everything else that can be done to reduce emissions, then it may be ethical.

It is well recognized that very few, if any, institutions can be climate neutral purely through emissions reductions. Currently offsets and RECs are a key element in achieving climate neutrality. Thankfully, systems are in place to ensure that offsets and RECs are responsible

choices. If an institution chooses its offset or REC strategy carefully, considering its own values and character, then offsets or RECs may be ethical strategies for achieving climate neutrality. The following sections can help an institution decide what type of offsetting strategy to purchase and when to purchase it.

What type of offsets should be purchased?

In order to answer this question, it is important to understand the difference between a carbon offset and a REC. A carbon offset represents one ton of GHG emissions reduced, sequestered, or destroyed, while an REC represents the environmental benefits of one MwH of energy generated from clean, renewable sources.[16] Therefore, carbon offsets can mitigate emissions from any of the three scopes, while RECs can only offset Scope 2 emissions.

The carbon offset concept is based on the Kyoto Protocol's Clean Development Mechanism and Joint Implementation programs, which allow countries to fund offset projects internationally. Money generated from carbon offsets is used in the developed and developing world to fund projects that include, but are not limited to, tree planting, landfill methane recapture, and hydroelectric projects. Offsets are relatively simple to purchase and can be accessed through a number of vendors, including the Nature Conservancy, TerraPass, and The Climate Trust. Since the legitimacy of carbon offsets has often been debated, several 3rd-party certifiers have emerged to validate offset projects. These verifiers have specific legitimacy standards, including additionality and leakage. For instance, almost all verifiers require that a project is "additional," or that the project would not have occurred without the offset funding. In addition, many require that projects do not have "leakage," which refers to when emissions are caused outside of the project parameters. These criteria may be somewhat effective, but critics are still skeptical. For instance, carbon offset projects usually aren't studied or verified in the long term. So, if a wind turbine producing electricity in a rural Indian village raises the standard of living and therefore also increases petroleum consumption, that could ultimately worsen emissions beyond their initial state. The author of this scenario, climate scientist Kevin Andersen, accordingly arrives at the conclusion that "offsetting is worse than doing nothing."[17]

Even if Andersen's scenario never plays out, many questions still need to be answered regarding the regulation of carbon offsets. For instance, how effective is tree planting as a carbon offset? Or when the trees die, as in the case of the band Coldplay's mango tree offsets, who is responsible?[18] In order to legitimize carbon offsets, a single, regulatory, governing body is needed, perhaps modeled after the UN's own Clean Development Mechanism body.

RECs are an alternative to carbon offsets that offer more certainty. When a renewable energy project (such as wind or solar) generates electricity, it produces both electrons and RECs. Since

[16] Barnes, Aimee. "REC vs. Carbon Offset: Do You Know the Difference? *Green Biz.* Green Biz, 12 March 2009. Web. 31 May 2015.http://www.greenbiz.com/blog/2009/03/12/rec-vs-carbon-offset-do-you-know-difference
[17] Andersen, Kevin. "The Inconvenient Truth of Carbon Offsets." *Nature* 434.7392 (2012). Web. 31 May 2015. http://www.nature.com/news/the-inconvenient-truth-of-carbon-offsets-1.10373
[18] Dhillon, Amrit and Toby Harnden. "How Coldplay's Green Hopes Died in the Arid Soil of India." *The Telegraph* 30 April 2006. Web. 31 May 2015. http://www.telegraph.co.uk/news/worldnews/asia/india/1517031/How-Coldplays-green-hopes-died-in-the-arid-soil-of-India.html

electrons are fed into the grid and are impossible to track, RECs were created to help buyers take ownership of the non-electrical, environmental benefits of renewable electricity.[19] To avoid double-counting, RECs are retired when the buyer makes an environmental claim.

Like carbon offsets, RECs are often certified through third-party agencies. For instance, the ACUPCC Implementation guide encourages institutions to purchase Green-E certified RECs. Green-E is the largest REC certifying body, and institutions can purchase Green-E RECs from a variety of sources.[20]

RECs face a unique challenge of marketing and communication. Marketers have to be careful to communicate that when a buyer purchases RECs, they are purchasing just the environmental benefits of renewable electricity, not the electricity itself. In addition, some regions of the U.S. do not have local renewable energy projects, so marketers to those regions have to communicate that the REC benefits will not be experienced locally. Rather, they are contributing to a "greater good."

Because of the standardization and verification issues associated with carbon offsets, RECs are the better choice. If an institution decides to purchase RECs, it should consider the location of the renewable energy projects. Some regions of the United States have access to REC projects in their local vicinity, so if that is the case, an institution should take ownership for local emissions. RECs may only be part of the solution in the future, however. RECs can only offset Scope 2 emissions, while carbon offsets can offset all three scopes. As the climate neutrality community delves further into what Scope 3 emissions to count and how to count them, carbon offsets may be a necessary element in achieving climate neutrality. Not all carbon offsets are created equal, so although some individuals have raised critiques, an institution can conduct its own research on the offset project and assess if it is the best representation of their values. Certainly, if an institution determines that they will purchase carbon offsets, it should purchase a third-party certified project.

When should the chosen type of offset be purchased?

To avoid the "pay to pollute" mentality, an institution should use RECs and offsets as a supplement to emissions reductions. A cost-benefit analysis is a useful tool in determining when to purchase an offset or REC. If possible, an institution should determine how many more tons of CO_2e need to be reduced or offset to reach carbon neutrality. From that point, an institution should determine the cost of the chosen offset strategy and then decide if that money could be used for emissions reduction strategies. For example, the U.S. Department of Energy reports that REC prices fluctuate depending on the market, but they are recently trending around $1/MwH.[21] If an institution is taking ownership of its own emissions, it is important that the institution

[19] "Renewable Energy Certificates." *EPA' Green Power Partnership.* The U.S. Environmental Protection Agency, July 2008. Web. 31 May 2015. http://www.epa.gov/greenpower/documents/gpp_basics-recs.pdf
[20] "Implementation Guide." *American College and University President's Climate Commitment.* 2009. Web. 31 May 2015. http://www2.presidentsclimatecommitment.org/pdf/ACUPCC_IG_Final.pdf
[21] "Green Power Markets." *The U.S. Department of Energy Green Power Network.* The U.S. Department of Energy. 3 April 2015. Web. 31 May 2015. http://apps3.eere.energy.gov/greenpower/markets/certificates.shtml?page=5

evaluates whether the money used to purchase RECs could be better used for on-campus energy reductions.

As Jesuit institutions, we value climate neutrality as a testament to our character, not merely as something we can slap on a brochure. With this in mind, offsets should be purchased only as a supplement to emissions reductions. For more information, read "The Ethics of Carbon Offsets," on which much of this section is based.

Conclusion

The decision to commit to carbon or climate neutrality is not a small one. Institutions that decide to take ownership of their GHG emissions are committing themselves to a high environmental ethical standard. As a relatively new field, climate neutrality has norms that are constantly being refined. When navigating the difficult questions about GHG accounting and the steps to achieve climate neutrality, institutions can choose to be ethical minimalists or ethical leaders.

Since the accounting of Scopes 1 and 2 is standardized and well-established, climate neutrality minimalists might only account for those scopes. Scope 3 accounting can be nebulous, open to many interpretations, and relatively uncharted. As institutions delve deeper into Scope 3, including emissions from commute, water consumption, wastewater treatment, solid waste disposal, purchased goods and paper, air travel, and investments, they open themselves to potentially significant increases in GHG emissions on their records. However, as Jesuit Catholic institutions of higher learning, we are challenged to be leaders in ethics, academics, and technology. Making the decision to be climate neutral is just the first step, something that can be slapped on a brochure. But making the decision to be an ethical leader in investing, offset purchasing, and Scope 3 accounting is more difficult. Institutions should consider their missions and values when taking steps toward climate neutrality. Sometimes the difficult thing is the right thing to do.

Tools and Resources

Website	Description
ACUPCC	American College & University Presidents' Climate Commitment. Source for university climate action plans and progress reports.
AASHE	Association for the Advancement of Sustainability in Higher Education.
Bronco Carbon Hoofprint Calculator	Carbon footprint calculator created by Santa Clara University students.
Ecocentrism and Anthropocentrism	Exploration of how human-centered and nature-centered perspectives influence how we use and interact with the environment.
Ethical Frameworks	A framework for thinking ethically, by the Markkula Center for Applied Ethics, Santa Clara Univeristy. This website also has sources specifically for environmental ethics.
Stanford Encyclopedia of Philosophy: Environmental Ethics	A brief introduction to environmental ethics with its history and applications in various fields.
STARS	Sustainability Tracking, Assessment & Rating System.
Campus Carbon Calculator	Workbook from the University of New Hampshire for calculating GHG emissions. Excel workbook includes Scopes 1, 2, & 3 (commute, air travel, solid waste, wastewater, and paper).