

Carbon Asset and Sustainable Investment Review

Winter Term 2021



Middlebury

INTD 1242: Carbonomics

Project 3

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Introduction and acknowledgements

In 2019, the Middlebury College Board of Trustees voted in favor of the Energy2028 initiative, another major step in the College's battle against climate change. The initiative is built on four major pillars: 100% renewable energy use, significant energy consumption reduction, divestment from fossil fuel companies, and an array of educational opportunities. To reach these goals, the College is faced with many challenges. The goal of this report is two-fold; one, to provide the College with a review of its existing reporting framework (as-is), and two, to articulate a series of recommendations in line with the Energy2028 objectives (to-be). There are three main sections to be analyzed in an as-is versus to-be framework: greenhouse gas reporting, carbon asset management reporting, and investment management reporting. The key takeaways from the first section are recommendations to create an emissions benchmark to track progress and to implement reporting criteria set by the Task Force on Climate-related Financial Disclosures (TCFD). The second section lays out financially accretive opportunities to sequester and store carbon, using Middlebury's current real asset base. In the final section on investments, we revisit the College's current endowment performance and sustainability reporting standards and propose two ESG-driven projects, namely the Forest Investment Project and the Regenerative Farming Project, to quicken our portfolio's exposure to ESG criteria.

This report was written by Middlebury students as a final project for *Carbonomics & Renewable Energy*, an interdepartmental class offered during the Winter 2021 term. Please find a list of all contributors below, directed by Professor of the Practice Frank Van Gansbeke.

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Glossary

Scope 1 Emissions: direct emissions from company-owned and controlled resources

Scope 2 Emissions: indirect emissions from the generation of purchased energy (a utility provider)

Scope 3 Emissions: indirect emissions that occur in the value chain of the reporting company, including both upstream and downstream emissions (emissions linked to faculty commuting)

Anthropogenic Emissions: emissions that are caused or produced by humans

Biogenic Emissions: emissions resulting from the activity of living organisms

Biomass: organic material, especially plant matter, that can be converted into fuel and is therefore regarded as an energy source

Internal carbon offsets: offsets that are owned and maintained by the reporting entity

External carbon offsets: offsets that are purchased from another entity

TCFD: The Task force on Climate Related Financial Disclosures

ROI: Return on investment, annual percentage return on a given investment

IRR: Internal rate of return, a cross-comparable rate that roughly corresponds to the percentage by which an asset would grow if proceeds could be reinvested.

MTCO: metric tons of CO₂ (carbon dioxide, the primary greenhouse gas responsible for anthropogenic climate change) equivalent; used to standardize quantities of other gases (e.g., methane) which have different warming propensity and/or endurance in the atmosphere

As-is: GHG reporting

Section I: Scopes and Related Terminology

When considering greenhouse gas emissions, it is crucial to first address the various sources of origin, or “scopes,” of emissions that are in some way attributable to a corporation, institution, or entity. Scope 1 emissions are those occurring as a direct result of an entity’s operation. In the case of Middlebury College, Scope 1 emissions primarily derive from methods for heating, cooking, and cooling on campus, i.e., thermal energy.¹ In 2008, #6 oil was the primary source for heating, as it produced steam that would heat 75% of the campus.² Since 2007, however, Middlebury College has decreased its use until 2019, when it completely eliminated the use of #6 oil on campus. Wood chips and natural gas replaced the use of #6 oil as the source for heating the campus. Scope 2 emissions are indirect emissions that result from electricity or energy purchased (primarily to meet demand for electric energy).³ Middlebury’s Scope 2 emissions result from its electricity consumption. Lastly, Scope 3 emissions for any entity include investments, franchises, leased assets, processing of sold products, use of sold products, transportation and distribution, etc.. Gasoline use for travel and landfill usage make up the largest proportions of Middlebury’s Scope 3 emissions.⁴

Biogenic and anthropogenic emissions are also included in Middlebury’s Greenhouse Gas report, reported as biomass. Biogenic emissions result from natural sources,⁵ whereas anthropogenic emissions result from human activity.⁶ Therefore, in the case of Middlebury, the burning of biomass (wood chips) would count as both. While there are substantial emissions resulting from the burning of wood chips, Middlebury does not include this in total emissions. Because biomass is organic material, it is not included in Scopes 1, 2, and 3, and thus not tabulated in the total.⁷ Currently, Middlebury’s scope of emissions only include core buildings on the Vermont campus. This means that the Middlebury Institute of International Studies in Monterey, the Bread Loaf Campus, and the Middlebury Schools Abroad are not included in our greenhouse gas emissions total.

In recent years, Middlebury has included carbon offsets in order to meet its energy goals. These offsets are described as internal, namely through forest conservation at Middlebury’s Bread Loaf campus, and external.⁸ The external carbon offsets intend to counteract the emissions from Middlebury’s Snow Bowl through purchases from the carbon offset provider, NativeEnergy.⁹

Section II: Summarizing Carbon Emissions FY08 – FY15

In 2007, Middlebury College set the highly ambitious goal of achieving carbon neutrality over a nine-year period. To reach this objective, the institution began to thoroughly account for all of its carbon emissions on a year-to-year basis to track improvements in an effort to, ultimately, reach their target of zero net carbon emissions. In this section, we summarize the College’s greenhouse gas reports from the year 2008 to the year 2020 through the lens of the three scopes and highlight how the allocation of Middlebury’s carbon inventory transitioned over time. The analysis will be supported by summary tables when necessary.

The years 2008 up to 2020 can be divided into two distinct periods: the transition period (2008-2015) and the net zero carbon emission period (2016-2020). The table below illustrates the average

¹ Middlebury College. n.d. Middlebury Carbon Emissions 2007-2017 GHG report.

² Ibid.

³ US EPA, OAR. 2020. “[Scope 1 and Scope 2 Inventory Guidance](#).” Data and Tools. US EPA. December 14, 2020.

⁴ Middlebury College. n.d. Middlebury Carbon Emissions 2007-2017 GHG report.

⁵ US EPA, OAR. 2015. “[Biogenic Emission Sources](#).” Other Policies and Guidance. US EPA. January 5, 2015.

⁶ University of Calgary. n.d. “[Anthropogenic Carbon Emissions - Energy Education](#).” Accessed February 9, 2021.

⁷ Greenhouse Gas Protocol. n.d. “[Calculation Tools](#).” Accessed February 9, 2021.

⁸ Middlebury College. n.d. Middlebury Carbon Emissions 2007-2017 GHG report.

⁹ Ibid.

carbon inventory per year in each period, broken down by the three emission scopes. Please note that internal and external emissions are considered Scope 3 emissions, but for the purpose of the upcoming analysis, they are presented as separate emission categories.

Category	FY08 - FY15	FY16 - FY20
Scope 1	15,908	7,751
Scope 2	747	936
Scope 3	2,811	3,606
Total Gross Emissions	19,466	12,293
Internal Offsets	0	-11,659
External Offsets	-590	-634
Total	18,876	0
Notes: values are in MTCDE (metric tonnes carbon dioxide equivalents) and represent the yearly average carbon emissions in each category over the time period. Totals are the average yearly carbon emissions in the time period.		

As illustrated in the summary table above, Middlebury's transition towards carbon neutrality was successful thanks to both a massive reduction in Scope 1 emissions and a tremendous rise in internal offsets. We take a look at both of these structural changes in Middlebury's carbon inventory below.

Indeed, it is apparent that one of Middlebury's primary means for achieving carbon neutrality was to substantially decrease their Scope 1 emissions, those that heat, cool, and power most of the campus. This was done by switching their primary fuel source from #6 oil to biomass gasification using locally sourced wood chips. The results of this transition were clear; first, in absolute terms, Scope 1 emissions have more than halved on a yearly basis from the first to the second period, while Scope 2 and 3 emissions have not. Relative to these other scopes, and when excluding offsets, we see that while Scope 1 emissions accounted for just under 82% of all carbon emissions over the first period, this number drops down to about 63% in the second period. To give an idea of the magnitude of this transition, Middlebury's #6 oil emissions in the year of 2008 represented 25,145 MTCEs, dropping to about 11,000 in 2012 and 1,000 in 2017. Since 2019, there are no more #6 oil emissions at Middlebury, illustrating the deliberate effort made by the College to switch from #6 oil to biomass gasification.

The tremendous rise in internal offsets is due to a plan, approved by the Trustees of the College in 2014, to conserve 2,673 acres of Middlebury's Bread Loaf campus in perpetuity. Although approved in 2014, the assessment and quantification of carbon credits, based on the sequestration levels of the Bread Loaf forests, only began in 2016. This explains why internal offsets were trivial until the second period, as shown in the table above. The level of carbon credits attributed to the Bread Loaf forests was and still is determined by Blue Source, a carbon accounting company, and a portion of these credits is then added to the College's carbon inventory. Ever since, Middlebury College has been a net-zero emitter of greenhouse gases.

To-be: GHG reporting

Section I: Improving GHG Reporting Towards Energy2028

In 2019, the Middlebury College Board of Trustees unanimously voted in favor of the Energy2028 initiative, another step forward in the College's fight against climate change. The plan consists of the following major commitments: using 100% renewable energy sources, significantly reducing energy consumption, and divesting from fossil fuel companies (and providing educational opportunities). The College will shift to using renewable natural gas to power its biomass-gasification plant and intends to reach 100% renewable electricity usage by investing in solar (and possibly hydroelectric) power. In this section, we come up with some recommendations to improve Middlebury's GHG reporting system in order to make it more accessible to the campus body and show how these changes might help the transition be as smooth as possible.

The first recommendation is to create a benchmark year to track emissions progress over the next eight years. Such benchmarks are vital for making analysis by students and faculty as painless as possible. In turn, the Middlebury community will have a stronger sense of progress towards the Energy2028 goals than might otherwise be the case. This can be a single year or a multi-year average; we recommend consideration of the years 2018 and 2019, as 2020 numbers are distorted because of Covid-19-related disruption. Once the benchmark is created, the GHG reporting team can send out end-of-fiscal-year updates to the community about their progress, thereby keeping everyone engaged and motivated.

This leads to the next recommendation, which is to provide more frequent, predictable, and accessible updates, either in the form of infographics or small written reports aimed at providing a clear picture of how well initiatives are faring at that point in time. We also recommend providing supporting explanations specific to each inventory class (what has been done, what is going to be done, room for improvement, etc.). We believe this is crucial in keeping the community actively engaged. An effective method of doing this is to report a table called an intensity ratio table. An intensity ratio is a summary table, like the one above, where the reporting columns, from left to right, would be the previous year, the current year, and the benchmark year. Rows would be the same as those in the table above. Intensity ratio tables allow the community to keep their eyes on both the short- and long-term goals and provide them with an idea of where they are succeeding and where they need to improve.

A final recommendation is made in the next section concerning the implementation of TCFD criteria. We believe that improving and boosting our GHG reporting methods can strongly impact the College's success in reaching the Energy2028 goals *and any future goals beyond that*. The fear would be to lose sight of the ultimate goal by forgetting about it. As such, building the described GHG reporting structure will keep the campus community actively engaged in the process and will hold everyone involved accountable.

Section II: TCFD Implementation and Recommendations

The Task Force on Climate-related Financial Disclosures (TCFD), founded in 2015, works to "improve and increase reporting of climate-related financial information."¹⁰ The TCFD aims to address the current shortcoming of financial markets to consider the risks and opportunities climate changes, specifically rising temperatures and sea levels, creates. Furthermore, the overall goal of the TCFD is to improve mainstream financial disclosures to consider climate risks and opportunities to improve financial considerations and allocation. While the recommendations the task force releases remain voluntary, these recommendations offer companies a structured way of reporting and assessing their climate risk and reduction targets. Specifically, the recommendations are divided into four core elements to governance, strategy, risk management, and metrics and targets (described in figure below).¹¹ An important aspect of

¹⁰ "[Task Force on Climate-Related Financial Disclosures](#)," n.d. Accessed February 7, 2021.

¹¹ Task Force on Climate-related Financial Disclosures. 2017. "[Recommendations of the Task Force on Climate-Related Financial Disclosures](#)," Pg. v,

TCFD is performing scenario assessments for both the physical and transitional risks an organization faces. The core recommendation proposed by the TCFD are listed in the chart below¹²:

As the implementation of TCFD reporting continues to grow within the corporate and academic communities, Middlebury College should consider adopting TCFD to help share and assess how the College is exposed and prepared for climate risks. According to TCFD's 2020 Status Report, around "60% of the world's 100 largest public companies support the TCFD, report in line with the TCFD recommendations, or both."¹³ Notably, Moody's Corporation (Moody's), one of the largest financial services and credit rating companies in the U.S., recently reported under TCFD and may readily be utilized as an example for Middlebury.

Moody's report highlights several areas of improvement that Middlebury can take into account moving forward. Moody's, as a financial services company, set sights on three areas of growth: "strategic investments in products and services, memberships and climate-change commitments, and research and development."¹⁴ As we detail later in this report, strategic investments and proper asset management are crucial to Middlebury's shift toward a sustainable future. In terms of research and development, Moody's performed comprehensive scenario analyses that addressed several timelines: the short-term (2025), medium-term (2030), and long-term (2040). These analyses measure the impacts of a number of different possible risks or opportunities that may arise, whether that be in the natural environment, market, or with

Recommendations and Supporting Recommended Disclosures			
Governance	Strategy	Risk Management	Metrics and Targets
Disclose the organization's governance around climate-related risks and opportunities.	Disclose the actual and potential impacts of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning where such information is material.	Disclose how the organization identifies, assesses, and manages climate-related risks.	Disclose the metrics and targets used to assess and manage relevant climate-related risks and opportunities where such information is material.
Recommended Disclosures	Recommended Disclosures	Recommended Disclosures	Recommended Disclosures
a) Describe the board's oversight of climate-related risks and opportunities.	a) Describe the climate-related risks and opportunities the organization has identified over the short, medium, and long term.	a) Describe the organization's processes for identifying and assessing climate-related risks.	a) Disclose the metrics used by the organization to assess climate-related risks and opportunities in line with its strategy and risk management process.
b) Describe management's role in assessing and managing climate-related risks and opportunities.	b) Describe the impact of climate-related risks and opportunities on the organization's businesses, strategy, and financial planning.	b) Describe the organization's processes for managing climate-related risks.	b) Disclose Scope 1, Scope 2, and, if appropriate, Scope 3 greenhouse gas (GHG) emissions, and the related risks.
	c) Describe the resilience of the organization's strategy, taking into consideration different climate-related scenarios, including a 2°C or lower scenario.	c) Describe how processes for identifying, assessing, and managing climate-related risks are integrated into the organization's overall risk management.	c) Describe the targets used by the organization to manage climate-related risks and opportunities and performance against targets.

new policy. While no one was fully prepared to handle the risk posed by the COVID-19 pandemic, Moody's scenario analysis aided in identifying the risks and creating a plan of action moving forward.¹⁵

¹² Task Force on Climate-related Financial Disclosures. 2017. "[Recommendations of the Task Force on Climate-Related Financial Disclosures](#)." Pg. 14

¹³ Financial Stability Board. n.d. "[2020 Status Report: Task Force on Climate-Related Financial Disclosures](#) - Financial Stability Board." Accessed February 9, 2021.

¹⁴ Moody's Corporation. 2019. "[Moody's 2019 Corporate Social Responsibility Report](#)."

¹⁵ Ibid.

Middlebury should first determine where it must improve in order to align with the recommendation of the TCFD. Already, Middlebury's current initiatives (e.g. Energy2028) help the College address both the TCFD's Governance and Metrics and Targets recommendation sections since the initiatives provide the Board of Trustees oversight of Middlebury's energy usage and reduction efforts. Nevertheless, to follow the other TCFD recommendations, Middlebury should assess its future and current climate risks and opportunities as well as improving its strategy in risk mitigation. Moving forward, Middlebury should perform scenario analyses that account for novel and/or disruptive situations, of the sort brought about by the COVID-19 Pandemic. Since the inception of remote learning in Spring 2020, Middlebury implemented a Hybrid Learning model, offering both in-person and online Zoom classes. Middlebury must include Zoom in its future Greenhouse Gas reports (as a Scope 3 source of emissions) and perform scenario analyses to project the schools reliance on Zoom in coming years. With so much uncertainty, risk and scenario analyses are paramount to Middlebury's success in sustainability.

Additionally, it is important to consider the various Middlebury campuses as they pose both different risks and different opportunities. As previously mentioned, the current assessment of energy consumption solely focuses on the Middlebury College campus in Middlebury, Vermont and excludes the Middlebury Institute of International Studies at Monterey, Middlebury study abroad schools, and the Middlebury Bread Loaf School of English. TCFD also places substantial weight upon financial transparency for its member institutions. In Moody's report, they note that "a cumulative lack of support and transparency for sustainability goals could detract from our (Moody's) brand value."¹⁶ When Middlebury advertises its emissions to be Carbon Neutral, it is necessary to clarify that the Greenhouse Gas reports exclude MIIS in Monterey or schools abroad. As an institution that prides itself on its progressive sustainability goals, we must hold ourselves accountable for complete transparency. In the future, Middlebury should strive to include both direct and indirect (Scopes 1, 2, and 3) emissions from these campuses to provide wholly accurate emissions data.

¹⁶ Moody's Corporation. 2019. "[Moody's 2019 Corporate Social Responsibility Report](#)."

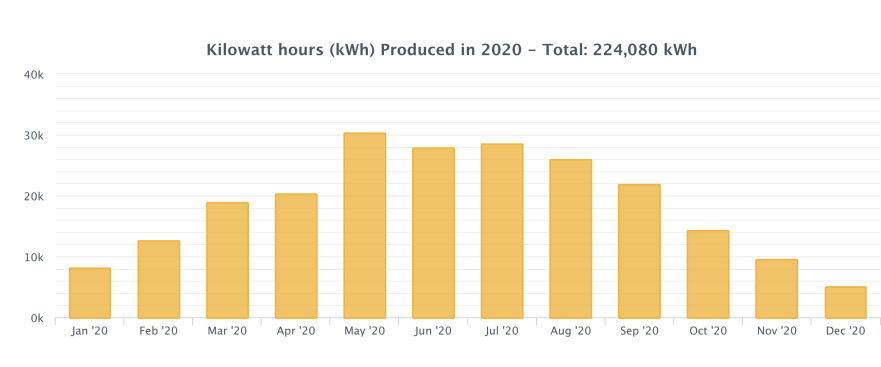
Carbon Asset Report

As-is Carbon Asset Report: Assets and Investments

Middlebury currently owns 6,000 acres of forest in Ripton, Vermont. Middlebury placed a land easement on 2,673 acres of this land to conserve the land and create carbon credits to be used to offset the College's GHG emissions or sold on the voluntary carbon credit market. The Vermont Land Trust and Bluesource LLC help manage the land and carbon credits. In order to achieve carbon neutrality, Middlebury College and the Snow Bowl have applied credits from this project, The Middlebury College Bread Loaf Conservation Project. Middlebury pays Bluesource \$3.50/MTCO₂ and credits currently cost \$10/MTCO₂ on the voluntary market in the United States. Purchasing carbon credits enables the College to maintain carbon neutrality at a reasonable cost. Carbon credits generated from forest conservation plans decrease with time, which incentivizes the continual reduction of emissions. Additionally, Middlebury College owns farmland around Addison County which the College leases to a variety of farmers. Middlebury also leases a large proportion of its lands out to local farmers in order to boost the local economy and productivity. As Middlebury prides itself on being a steward for the environment, the College ensures that its lessees abide by Vermont Required Agricultural Practices.¹⁷ As of the spring of 2017, the College has leased all of its agricultural lands to local dairy farmers, pending a transition to different crops and/or products, due to thin profit margins for dairy farmers.¹⁸ There are currently 1700 acres of agricultural land leased to these farmers.¹⁹ Furthermore, Middlebury developed various renewable and sustainable energy projects (listed below) to help reduce greenhouse gas emissions.

Solar Farm (As-is):

Middlebury currently houses a 143-kilowatt, 1.5 acre solar farm on campus.²⁰ These solar trackers, which track the sun to maximize energy production, purchased from AllEarth Renewables, produce 243,000 kilowatt-hours per year and feed electricity directly into nearby power lines.



²¹2020 Solar Power Generation, by month

¹⁷ Middlebury College. n.d. "[Middlebury College Lands - Guiding Principles](#)." Middlebury. Accessed February 9, 2021.

¹⁸ Antonucci, Gabriel, Matthew Barr, Sarah Glehill, Jordan Killen, Mandy Kimm, Sierra Moen, Donald Jones, Scott Waller, Jeremy Vandenberg, and Sebastian Zavoico. 2017. "[Designing a Model Landscape for Multiple Values: Envisioning a Sustainable Future for Middlebury College Lands](#)."

¹⁹ Middlebury College. n.d. "[Middlebury College Lands - Guiding Principles](#)." Middlebury. Accessed February 9, 2021.

²⁰ Middlebury College. n.d. "[Solar Power](#)." Middlebury. Accessed February 9, 2021.

²¹ allEarth Solar. 2021. "[Site #1148 Production Report | AllEarth Renewables Energy Production Report](#)." February 9, 2021.

In 2015, the College began to purchase electricity from nearby farms, which made 5% of campus electricity solar generated. Later, in 2016, the College also entered into an agreement with Wilber Solar on a 500 kilowatt project, which will increase the supply of solar electricity to 8% annually.

Biomass Gasification (As-is):

The \$12 million biomass gasification plant on campus was launched in 2009 to further the College's goal of a carbon neutral campus²². The use of biomass saves the College 1,000,000 gallons of #6 fuel oil each year (a 40% reduction in net emissions of carbon). The plant burns locally purchased wood chips, and uses approximately 25,000 tons of wood chips annually. Although the plant fails to be completely carbon neutral and still releases carbon into the atmosphere, the carbon released is minimal in comparison and can be sequestered by growing and maintaining forests. The plant's life expectancy is 25 to 30 years, which means the plant may be retired near 2040, and saves the College around \$1,000,000 per year.

Wind Power (As-is):

In 2005, Middlebury installed a 10-kilowatt wind turbine near the Material Recovery Center to power the lights and machinery²³. The turbine generates 15% of the electricity needed by the building, producing 8,000 kilowatt-hours annually. The College also began using wind power at the Snow Bowl in 2006, becoming the first U.S. ski resort to implement carbon neutral operations.

To-be Carbon Asset Report:

Solar Farm (To-Be):

Middlebury's latest addition to its supply of solar electricity will be a 5 megawatt solar farm south of campus. The project is expected to cost \$8-9 million, and is being built in collaboration with Encore Renewables. The solar farm will cover 30 acres of College land, which is currently being used for growing corn crops. Once finished, the solar farm will generate 30% of the College's electrical usage. The agreement with Encore states that Encore will own the infrastructure of the project but will lease the land from the College. Furthermore, the project gives Encore a credit that could be used by the College to help cover the premium it will pay for the renewable electricity.

Natural Gas Digester To Be

While Middlebury generates most of its heating and cooling energy through the biomass plant, various buildings on the main campus generate their own heat and are not connected to the biomass plant's system. In the past, the College solely utilized #6 oil and natural gas for heating and cooling buildings on campus, but plans to switch completely to renewable natural gas. The renewable natural gas will be sourced from Goodrich Farms, where the gas is produced by collecting food waste and manure. The digester will provide Middlebury with 100,000 Mcf a year through a pipeline.²⁴ The natural gas

²² Middlebury College. n.d. "[Middlebury College Lands - Guiding Principles](#)." Middlebury. Accessed February 9, 2021.

²³ Middlebury College. n.d. "[Wind Power](#)." Middlebury. Accessed February 9, 2021.

²⁴ Vanguard Renewables. 2019. "[Vanguard Renewables, Goodrich Farm, Middlebury College, and Vermont Gas Celebrate Groundbreaking for Facility That Turns Manure and Food Waste into Renewable Energy](#)." *Vanguard Renewables* (blog). August 22, 2019.

sourced from Goodrich Farms will provide 50% of the campus's heating and cooling, while the biomass plant will provide the other 50%. Once the digester is running, Middlebury will source 100% of their heating and cooling energy from sustainable sources.

Regenerative Farming Project

The Sustainable and Regenerative Farming Project was an idea sourced from the Netflix documentary *Kiss the Ground*. The film discusses how regenerative farming practices sequester more carbon from the atmosphere, allow farmers to grow multiple crops, are more resilient to unpredictable climate conditions, and are significantly more profitable than subsidized industrial agriculture that employs tilling, poisonous pesticides, and the destruction of the topsoil that feeds us. Middlebury already has the Knoll, which employs these sustainable farming practices. Through purchasing struggling farms in Addison County, Middlebury could set an example for the rest of the state and its farmers. As a byproduct it would also help struggling farmers, employ more Vermonters, feed Middlebury's students healthier food, and could possibly generate meaningful profits through the sale of produced goods. Furthermore, Vermont is well known for its local farms and their lack of distribution. By purchasing these farms and allowing them to enter the Middlebury network, hopefully what were once local farms can become well-known brands. Through consulting service offered by Middlebury Consulting Group (MCG) these farms could be consulted individually or as a whole (under one Middlebury College brand) to best devise a plan in which these farms become sustainable, profitable, and build brands among other things.

Investment Management Report

Executive Summary

The construction and management of an endowment the size of Middlebury College's ought to reflect the values of the school community, including those of its employees, students, and alumni. In Carbonomics and Renewable Energy, we have learned extensively about the interactions between the environment, the economy, and financial markets, the latter of which is a particularly powerful tool for efficiently facilitating action through the creation and alignment of incentives. In this section of our report, we will review the current ESG composition of the endowment, reflect on the endowment ESG goals, and outline concrete strategies for accomplishing and exceeding the sustainability goals laid out as part of the Energy2028 program. Given Middlebury's outspoken support for aggressive environmental action, we feel that Middlebury and the way its endowment is managed should set an example for other institutions around the world, akin to its Covid-19 response.²⁵ While the general trend of Middlebury's endowment reflects Middlebury's commitment to increase ESG investment and decrease fossil fuel exposure, this pace is not sufficient to accomplish Middlebury's investment allocation goals.

ESG Investment Landscape and Best Practices:

The growing awareness and adoption of ESG and sustainable investment principles among college and nonprofit endowments provides significant opportunities to study Middlebury College's peers to determine the best practices to emulate. In addition to being under the watchful eye of attentive students and risk-averse donors, the incredibly long investment horizons universities necessarily keep are particularly amenable to the incorporation of ESG analysis. This privilege of long-termism means that ESG consideration is an inevitability for fiduciaries charged with endowment management. Therefore, the authors firmly believe that those first-mover colleges and universities can establish a material and durable advantage both in generating excess returns and student opportunities for real-world, experiential learning. The following analysis of peer institutions, specifically Harvard and New England Small College Athletic Conference Colleges (NESCAC), offers important insights into how other similar institutions look to sustainably manage their endowments. An analysis of Yale's work is available in the appendix.

Harvard:

The high fixed costs of investment-specific ESG analysis means that, to date, the most comprehensive ESG and sustainable investing policies have been implemented by institutions such as Harvard Management Company (HMC), which is the fiduciary for Harvard University's endowment. A comparison of Middlebury's available information to the policies and actions of HMC offers a myriad of opportunities for improvement, not least in the area of information reporting itself. For example, Middlebury has a stated component of its investment policy, available online²⁶, which addresses environmental and social responsibility, but conspicuously omits mention of governance. It is the belief of the authors of this report, as well as leading investment managers such as Nuveen, a TIAA Company²⁷, that the three pillars of ESG are necessary, mutually reinforcing components of sustainable investing. This also is a view shared by HMC; active ownership (including exercise of voting rights) is one of HMC's three prongs in its "Approach to Sustainable Investing."²⁸ Therefore, we recommend consideration of whether Middlebury should incorporate governance into the relevant section of the investment policy.

²⁵ New York Times. n.d. "[Tracking the Coronavirus at U.S. Colleges and Universities.](#)" *The New York Times*, sec. U.S. Accessed February 9, 2021.

²⁶ Middlebury College. 2015. "[Investment Policy.](#)" Middlebury. January 2015.

²⁷ Nuveen. n.d. "[Policy Statement on Responsible Investing.](#)" Accessed February 9, 2021

²⁸ Harvard Management Company. n.d. "[Sustainable Investing: Investing for the Long-Term.](#)" *Harvard Management Company* (blog). Accessed February 9, 2021.

HMC is also a signatory (one of over three thousand, collectively representing over \$100 trillion in assets under management) to the UN Principles for Responsible Investing (PRI)²⁹. The Principles, of which there are six³⁰, were specifically written to address the operations and considerations of sophisticated financial actors. The Principles are listed below; the authors believe that their simplicity and widespread acceptance make them excellent guideposts toward deeper ESG consideration, and we recommend their consideration.

New England Small College Athletic Conference Colleges (NESCAC):

Due to its far smaller size, Middlebury's endowment is difficult to compare with the best-in-class mega-endowments. Lack of scale inherently means having to outsource the investment management process and makes the school less able to take advantage of elements such as active ownership. However, in comparison to some of Middlebury's NESCAC peers, the College is admirably ahead of the game; therefore, Middlebury should redouble its efforts to extend this leadership and cement it as irrefutable in the eyes of other institutions, including by adapting and emulating their best practices. Williams College, for example, includes only two paragraphs about impact investing in their 2020 Investment Report (which largely resembles the only paragraph on the topic in their stated Investment Strategy³¹), and indicates that their commitment is a "mere" \$30 million³² — a fraction of Middlebury's commitment to "sustainable exposure" investments on both a relative and absolute basis. As of June 2020, roughly 16.4% of Middlebury's portfolio was allocated to such "sustainable exposure" investments, though this is largely incidental to standard management decisions; only \$50 million has been specifically allocated to sustainable investments to date³³. It is worth noting both that the pace of change in allocation is not rapid enough to meet Energy2028 commitments, and that it is not readily clear what qualifies an investment as sustainable. Beyond this, it is unknown which investments are categorized as such, and whether the term allows for calculation of and benchmarking to publicly available ESG benchmarks, such as MSCI ESG Fund Ratings or more comprehensive offerings licensible from firms such as Moody's, S&P Global, or Sustainalytics. Indeed, many oil-and-gas companies were and are ESG-designated by certain data providers, and therefore off-the-shelf solutions must be augmented with common sense analysis and supervision. Amherst offers more of a learning opportunity — with an easy to navigate website, an Investment Policy Report made available to students³⁴, and a public Sustainable & Responsible Investments Report³⁵, it is easy for any student to contextualize and analyze Amherst's efforts. We therefore recommend that Middlebury look into improving information availability and centralization for the student body, subject to contractual constraints and confidentiality requirements, and updating such information regularly.

Regardless of the specifics of Middlebury's policies, it is critical to be direct and transparent about the policies themselves, the goals said policies are established to achieve, the criteria, also known as key performance indicators (KPIs), by which performance will be measured, and the processes by which impacted parties can offer input into the policies, goals, and KPIs under use; this maximizes the number of perspectives that can be brought to bear in decision making, which is potentially associated with higher returns and superior execution of fiduciary responsibilities³⁶. We hope this report serves not as a one-off slate of recommendations, but rather the jumping off point for informed discussion on the questions engaged herein, among more parties than have traditionally been a part of such conversations.

²⁹ Principles for Responsible Investment. n.d. "[About the PRI | Other | PRI](#)." Accessed February 9, 2021.

³⁰ 6 principles are located in Index

³¹ Williams College. n.d. "[Investment Strategy – Investment Office](#)." Accessed February 9, 2021.

³² Williams College. 2020. [Williams Annual Investment Report 2020](#). Accessed February 9, 2021.

³³ Investure. 2020. "[Q2 2020 Sustainability and Fossil Fuel Report](#)."

³⁴ Amherst College. n.d. "[Investments | Offices & Departments](#)." Accessed February 9, 2021.

³⁵ Amherst College. 2019. "[Investment | Sustainability Reports](#)." 2019.

³⁶ Amherst College. 2019. "[Investment | Sustainability Reports](#)." 2019.

Investment Management: to-be

Given recent trends favoring private methods of investment, the best returns for all NESAC endowments came from a mix of venture capital, private equity, and alternative investments. Therefore, we recommend a further commitment to venture capital and alternative investments, through initiatives such as a Forest Investment Project, Sustainable and Regenerative Farming Project, and/or Alumni Partnerships with PayPal and Salesforce in their respective Social Investing and ESG Funds, in concurrence with related Energy2028 timelines.

The Forest Investment Project

The goal of the Forest Investment Project is to help create a potential investment strategy plan that combines and meets both Middlebury's financial and sustainability targets. The benefits of investing in forest land includes a consistent income via selling carbon credits, the ability to protect and share historically significant land for future generations, and an important source of carbon sequestration to help ensure the College continuously meets its ambitious carbon-neutrality targets. Since the start of the sale of credits from these forest lands in 2016, the College has generated a net \$1.5 million in credits. Middlebury retains about half of these carbon credits to offset campus emissions and sells the rest on the public carbon market. The College pays no additional fees for the management, verification, or creation of these credits; all is handled by Bluesource in exchange for a royalty on sales. Assuming similar returns as Middlebury's existing investment, we can make a fairly accurate (if conservative) estimate of an **IRR of 3.8%** with a perpetual holding strategy.³⁷ This estimation is based on the data gathered from Middlebury's existing forestland and current market prices, extrapolated over five years.

Our calculations assume a \$5 million allocation. Current real estate listings indicate one acre of raw forest in Northern VT generally costs around \$1,000, which results in roughly 5,000 acres purchased. Middlebury's Bread Loaf forests generated 12 credits per acre at initiation, thereafter falling to a long-term average of 8.6 credits per acre as the forest matures. This implies net carbon credit production of about 250,000 credits in the first 5 years (after management fees to Bluesource) with 35,000 a year thereafter in perpetuity. Management fees are deducted from the total number of credits created. This in turn results in a \$5,000,000 purchase of forest land generating \$2,200,000 in profit over the first 5 years, corresponding to an annualized **ROI of 8.8%**; this compares very favorably to Middlebury's current cost of financing, where the College pays roughly 1.25% a year to borrow.³⁸

Alumni Collaboration Project

Many would argue that the greatest aspect of going to Middlebury College as a student or employee is the extensive alumni network that the College possesses. Middlebury has strong connections across industries, including finance (Goldman Sachs, Morgan Stanley, Bank of America, etc.) and technology (PayPal, Salesforce, etc.). These firms are at the bleeding edge of their industries, and are likewise committed to various ESG investing initiatives. PayPal CEO Daniel Shulman has long championed social equality, and PayPal has recently started a Social Investing Fund. Through this fund, PayPal allocated \$50 million in capital to the LISC Black Economics Development Fund, and another \$50 million towards Black- and Latinx-led VC funds.³⁹ These are the initial investments of a \$530 million commitment to the larger Socially Focused Venture Fund.⁴⁰ Salesforce has extended their long-standing strategy in the space with a \$100 million commitment to their *second* Venture Impact Fund. These funds, strictly focused on ESG venture capital, are attractive and the College would be well-advised to approach such funds about collaboration.

³⁷ The changes in carbon sequestration of a forest throughout its life poses a challenge to effective estimation. The dynamic and quickly evolving nature of the carbon market also complicates market predictions.

³⁸ Electronic Municipal Market Access. 2020. "[Vermont Education and Health Buildings Financing Agency Revenue Bonds \(Middlebury College Project\)](#)." November 18, 2020.

³⁹ Givens, Dana. "[PayPal Invests \\$50 Million in LISC Black Economic Development Fund](#)." December 21, 2020.

⁴⁰ PND Candid. "[PayPal to Invest \\$50 Million in Black- and Latinx-Led VC Firms | News | PND](#)." 10/29/2020.

Conclusion

If no other recommendations are taken away from this report, we believe it paramount to increase the transparency and availability of data as it relates to Middlebury's carbon asset and traditional investment management. It is clear that the world will experience unprecedented upheaval in the coming century, in no small part due to climate change, and therefore even the most rigorously reasoned and empirically substantiated recommendations can be laid to waste in an instant. The best way to deal with such uncertainty is not to conceal information and decision making, but to empower as many people as possible to prod the data, research strategies, engage in discussion, and propose recommendations. To do so, people need reliable, accessible information, which is sorely lacking at present.

That said, we nonetheless believe that there are many steps and goals Middlebury should undertake as soon as is feasibly possible, for (as the saying goes) all plans are wrong, but some are useful. First, we recommend that Middlebury establish concrete ESG goalposts, ideally on a similar timeline to that articulated in Energy2028 and future sustainability initiatives. Our personal recommendation is that 100% of the portfolio is evaluated on and aligned with comprehensive ESG criteria by 2028, with a longer term goal of increasing the weight of environmentally positive investments in the endowment. We also recommend that Middlebury look to deploy a greater share of its endowment into environmentally positive alternative investments; this can include climate change-focused venture capital funds, private equity vintages with an emphasis on environmental improvement, and even clean energy projects on Middlebury's own campus.

Whatever goals are chosen, it must be feasible for them to be compared to and evaluated by third parties. We therefore encourage Middlebury to align its future sustainability reporting with TCFD or another general standard, and to centralize all operational *and* financial sustainability data in a central repository, in analyzable formats. As a quip often (erroneously) attributed to Peter Drucker says⁴¹, "you get what you measure, what you measure, you manage, and you can't manage what you can't measure." For financial sustainability efforts to advance alongside operational sustainability efforts, Middlebury must articulate clear and measurable goals which third parties can easily assess accomplishment of.

This report is by no means exhaustive, and the opportunities for expanding and enhancing it are rivaled only by the binding time constraints inherent in producing it. For one, we are aware that, for a report which emphasizes the need for data-driven decision making and empirically-grounded analyses, there is relatively little financial or sustainability modeling included herein, though this is partially offset by the availability of the complementary reports. That said, there remain plenty of opportunities for novel analysis; future authors may endeavor to extend our analysis to the Scope 3 emissions produced by students at home during the pandemic, or to the evaluation of the carbon asset opportunities associated with lands Middlebury leases to local farmers. Finally, there is one primary area where this report is wanting, largely due to external circumstances -- promotion and awareness in the College community. Rhetoric does not reduce carbon emissions or produce additional RINs, and therefore the topics discussed herein are nigh useless without buy-in beyond this classroom. It is therefore imperative that each and every individual commits to pro-social, pro-environmental behaviors, regardless of one's particular skill sets. This report makes clear -- if investment management and financial modeling can be wielded as tools in the battle against climate change, then anyone can play to their strengths while fighting this war we all wage.

⁴¹ Drucker Institute. 2013. "Measurement Myopia * Drucker Institute." Drucker Institute. July 4, 2013. <https://www.drucker.institute/thedx/measurement-myopia/>.

Appendix -

6 Principles for Responsible Investing⁴²

- **Principle 1:** We will incorporate ESG issues into investment analysis and decision-making processes.
- **Principle 2:** We will be active owners and incorporate ESG issues into our ownership policies and practices.
- **Principle 3:** We will seek appropriate disclosure on ESG issues by the entities in which we invest.
- **Principle 4:** We will promote acceptance and implementation of the Principles within the investment industry.
- **Principle 5:** We will work together to enhance our effectiveness in implementing the Principles.
- **Principle 6:** We will each report on our activities and progress towards implementing the Principles.

Yale:

Yet another practice Middlebury would do well to consider comes from Yale, which has considered the ethical dimensions of investing since the late 1960s⁴³. However, Yale has gone a step further than many of its peers, and allocated endowment dollars directly to investments in clean energy, specifically wind farms. Given Middlebury's rural area, institutional environmental impact goals, and significant land holdings, we recommend Middlebury evaluate the extent to which investment assets can, in line with the fiduciary obligations of endowment management, be redeployed as so-called carbon assets. This would also be in line with a secular trend among large endowments towards higher alternative asset allocations, though this is not without controversy or potential pitfalls⁴⁴.

Yale's investments occurred in addition to an endowment-wide (i.e., including external managers) initiative to incorporate consideration of greenhouse gas footprint and the potential financial impact of climate change carbon taxation on investments, as well as avoiding investments in companies that "refuse to acknowledge the social and financial costs of climate change and that fail to take economically sensible steps to reduce GHG emissions."⁴⁵In addition, certain fund managers have extended this mandate to engage in conversation with corporate boards about implementing ESG processes such as quarterly emissions reporting⁴⁶. The authors of this report point to this as an example of the mutually reinforcing nature of comprehensive ESG principles. That said, the sensitivity of such dialogue with fund managers and company management, in addition to the inherently greater coordination required with Investure and other third parties to implement such a policy, may therefore limit the viability of such a policy at Middlebury.

⁴² Principles for Responsible Investment. n.d. "[About the PRI | Other | PRI](#)." Accessed February 9, 2021.

⁴³ Yale Investments Office. n.d. "[Social Responsibility](#)." Yale Investments Office. Accessed February 9, 2021.

⁴⁴ McDonald, Michael, and Tatiana Freitas. 2018. "[Harvard's Foreign Farmland Investment Mess - Bloomberg](#)." *Bloomberg.Com*, September 6, 2018.; McDonald, Michael, and Tatiana Freitas. 2019. "[Harvard Was 'Freaking Out': How a \\$270 Million Brazil Bet Tanked](#)." *Bloomberg.Com*, September 24, 2019.

⁴⁵ Yale Investments Office. n.d. "[2020 Update on Climate Change](#)." Yale Investments Office. Accessed February 9, 2021.

⁴⁶ Ibid

Forest Investment Economics

[illegible]

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