Hamilton

CLIMATE ACTION PLAN

SPRING 2023

ABOUT THE 2023 CLIMATE ACTION PLAN

SPRING 2023
Prepared by the Hamilton College Sustainability Working Group

FORMER HAMILTON COLLEGE PRESIDENT Joan Hinde Stewart first signed the American College and University Presidents' Climate Commitment in 2007, committing Hamilton to institutional carbon neutrality by 2050. The initial 2009 Climate Action Plan, which was updated in 2017, kept a carbon neutrality target date of 2050 but did not include detailed plans for how to pursue neutrality and what types of activities the College might undertake to achieve its goal. In the meantime, nearly all of Hamilton's peer institutions had moved their carbon neutrality targets earlier than 2050, and several (Bates, Colgate, Bowdoin, Colby, Middlebury) declared carbon neutrality by 2020. At a global scale, we know that avoiding future climate catastrophe requires cutting global emissions nearly in half by 2030 and achieving global net zero by 2050. Given the increased attention to the urgency of climate action globally, Hamilton must lead by example and take action to address the climate crisis.

CARBON NEUTRAL 2030

The Hamilton College Sustainability Working Group was formed in 2019 as an ad hoc working group of administrators, employees, faculty, and students charged with updating the 2017 Climate Action Plan and developing a plan for how to achieve carbon neutrality. In March 2020, just prior to the start of the COVID-19 pandemic, the Sustainability Working Group met with members of the Board of Trustees and the president to discuss potential approaches to guide its work. In November 2021, the Sustainability Working Group gave a presentation to members of the Budget Committee and the Buildings and Grounds Committee of the Board of Trustees highlighting current emissions trajectories and the potential to advance the carbon neutrality target date to 2030. That same presentation was given to the full Board of Trustees at their December 2021 meeting. In March 2022, the trustees endorsed a resolution to move Hamilton's carbon neutrality target from 2050 to 2030.

The 2023 Climate Action Plan lays out concrete steps and targets for achieving carbon neutrality by 2030 and for continuing our efforts toward climate action into the future. The plan is based on implementing four key strategies:

1. Replace fossil fuel-based building heating systems with electrically powered heat pumps;
2. Manage Hamilton's lands to enhance carbon sequestration in our forests;
3. Significantly reduce other sources of greenhouse gas emissions by 2030; and
4. The limited use of carbon offsets in 2030. The plan was drafted by the Neutrality Strategy Working Group, a subcommittee of the Sustainability Working Group with input from the campus community.

The members of the Neutrality Strategy Working Group are listed in the Appendix to this document.

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SECTION I

Current and Historical Greenhouse Gas Emissions

A. **Scope and Boundaries of Greenhouse Gas Emissions Inventory**

As is standard convention in educational institutional greenhouse gas emissions reporting, Hamilton's greenhouse gas emissions inventory is broken into three categories:

SCOPE 1 EMISSIONS

Scope 1 emissions are "on-site emissions." They come primarily from natural gas usage for heating buildings and from Hamilton's gas- and diesel-powered vehicle fleet and maintenance equipment. Scope 1 emissions also include greenhouse gas emissions associated with leaky refrigerant gases and the fertilizer used on College lands.

SCOPE 2 EMISSIONS

Scope 2 emissions are associated with purchased electricity that is generated from the New York State electric grid. While New York State's grid has a large percentage of zero-carbon sources like wind, solar, hydropower, and nuclear power, about one third of New York's electricity currently comes from burning natural gas, which is a fossil fuel.

SCOPE 3 EMISSIONS

Scope 3 emissions are "off-site" emissions produced by the College's operations. They primarily come from employee transportation for commuting to work, official campus travel including air travel, and from the processing of our waste and wastewater.

B. **Methodology**

Hamilton's greenhouse gas emissions inventory is calculated annually. Annual emissions are then reported to Second Nature, a non-profit organization that maintains and helps institutions implement higher education carbon commitments. The baseline year for Hamilton's emissions was 2007, and emissions have been inventoried annually since then, with the most recent inventory completed for 2021 at the time of drafting this plan. Thus, Hamilton has tracked its emissions for 15 years.

Hamilton follows Second Nature's guidelines for emissions reporting. As is standard practice under Second Nature's accounting norms for institution of higher education, the College does not currently count up-stream or life-cycle emissions for purchased goods or food in its annual inventory of Scope 3 emissions, nor does the College — which is 100% residential — consider student commuting or student travel to campus in its annual emissions inventory. As Second Nature continues to revise its guidance for implementing campus carbon commitments, Hamilton will continue to review methodological approaches to emissions accounting.

C. **Emissions Trends**

Hamilton's greenhouse gas emissions have steadily declined since 2007, dropping from 17,360 metric tons of carbon dioxide equivalent ($MTCO_2e$) in 2007 to 10,044 $MTCO_2e$ in 2021 – a 42% reduction in 15 years. Throughout this period, emissions per student dropped from 9.5 tCO_2e to 5.2 tCO_2e. In 2021, Hamilton's forests absorbed 1,579 metric tons of CO_2e, making the College's most recent net emissions 8,465 $MTCO_2e$.

1 SCOPE 1 EMISSIONS TRENDS

Over the 15 years that Hamilton has tracked its emissions, Scope 1 emissions have ranged between 5,000 and 7,500 $MTCO_2e$, depending on the weather, which dictates heating loads, and there is **no clear trend in Scope 1 emissions over time**. During the 15-year period that Hamilton has tracked its emissions, the campus building footprint has substantially expanded its square footage. Thus, Hamilton has largely held its emissions associated with heating constant, while expanding its building footprint.

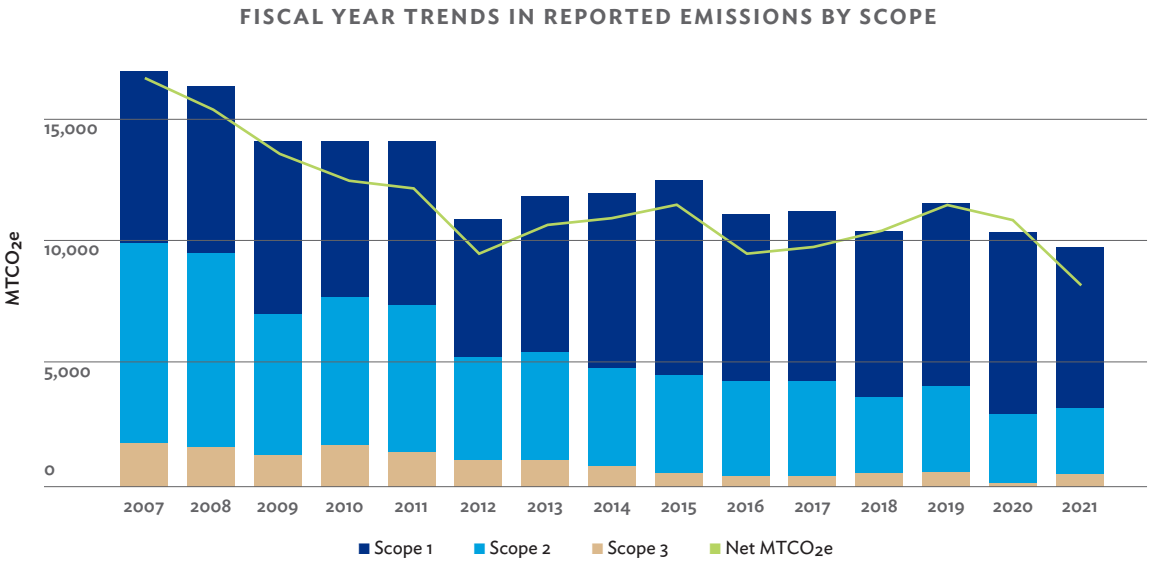


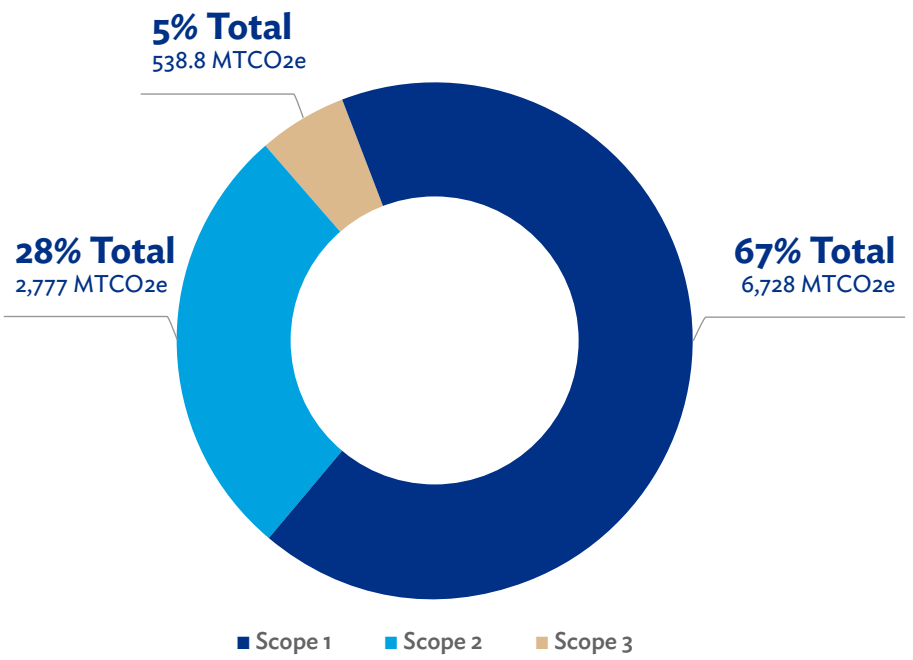
Figure 1. Hamilton's emissions inventory over the fifteen years from 2007 to 2021.

C. **Emissions Trends** *(cont.)*

FY21 EMISSIONS BY COLLEGE SOURCE

Scope	Emissions Source	Metric Tons CO_2e
Scope 1	Natural Gas Combustion	6,137.3
	Distillate Oil Combustion	202.3
	Vehicle Use	324.3
	Fugitive Refrigerants	57.7
	Fertilizer Application	6.7
Scope 2	Purchased Grid Electricity	2,776.9
Scope 3	College Travel: Vehicle	22.3
	College Travel: Air	131.9
	Employee Commute	151.1
	Transmission Line Losses	189.3
	Waste Management	18.3
	Wastewater	26.0
	FY21 Total Emissions Reported (MTCO2e)	**10,044.1**

FY21 EMISSIONS BREAKDOWN BY SCOPE



By far, the single biggest source of Hamilton's greenhouse gas emissions is burning natural gas to heat campus buildings *(61% of emissions)*.

2 SCOPE 2 EMISSIONS TRENDS

Hamilton's Scope 2 emissions from purchased electricity have declined dramatically over time, **from 8,334 MTCO$_2$e in 2007 to 2,777 MTCO$_2$e in 2021** because of the greening of the New York State electricity grid. Over the past decade, the greenhouse gas emissions intensity — emissions per megawatt-hour of electricity — has steadily declined in New York State as the state has deployed more renewable electricity sources and decommissioned coal-fired power plants. Thus, Hamilton's emissions associated with electricity purchasing have gone down. In fact, the single biggest contributor to Hamilton's emissions reductions to date has been the greening of the New York electricity grid (76% of the total reductions since 2007).

3 SCOPE 3 EMISSIONS TRENDS

Hamilton's Scope 3 emissions — those associated with commuting, travel, waste, and wastewater — have also declined, from **1,787 MTCO$_2$e in 2007 to 539 MTCO$_2$e in 2021**. These declines are primarily due to decreases in emissions associated with employee commuting, as vehicles have become more efficient and as miles traveled for commuting have declined. Emissions associated with College travel were substantially impacted by the COVID-19 pandemic and declined dramatically in 2020 and 2021, which we can anticipate increasing in the future as Hamilton-funded travel increases post-pandemic.

SECTION II

2030 Carbon Neutrality Strategy

CARBON NEUTRAL 2030

A. **Overarching Neutrality Strategy**

Hamilton is committed to achieving campus carbon neutrality by 2030 through the following initiatives. The overarching strategy to achieve carbon neutrality by 2030 can be summarized as follows:

1 REPLACE FOSSIL FUEL INFRASTRUCTURE IN BUILDINGS

Invest in energy upgrades to buildings to reduce reliance on fossil fuels for building heating (our biggest source of emissions), primarily through expanded use of ground-source and air-source heat pumps powered on electricity from a grid that continues to become greener (lower CO_2e emitted per megawatt-hour).

2 SEQUESTER CARBON IN FORESTS

Manage our roughly 1,000 acres of land to expand forest cover and to increase carbon sequestration in existing lands.

3 REDUCE ADDITIONAL EMISSIONS SOURCES

Continue to pursue efforts to reduce additional sources of emissions, including from vehicle use, fuel combustion for grounds maintenance, fugitive refrigerants, fertilizer use, and waste and wastewater-associated emissions. Emissions of these sources should be reduced by at least 50% by 2030, in conjunction with science-based targets for climate action.

4 LIMITED USE OF OFFSETS

Starting in 2030, purchase carbon offsets that are permanent, real, verifiable, and additional. These offsets to remaining emissions also should support the community surrounding the College and provide direct educational benefits to Hamilton students.

B. **Pathway to Carbon Neutrality in 2030**

Emissions Source	2021 Emissions (tons CO_2e)	Projected 2030 Business-As Usual Emissions (tons CO_2e)	Target 2030 Emissions Under Climate Action Plan (tons CO_2e)	Strategies for Reductions
SCOPE 1				
Building Heating	6,195	4,945	3,879	Renovating Buildings with Heat Pumps
Transportation and Grounds Maintenance	324	324	261	Vehicle Fleet and Equipment Electrification
Fugitive Refrigerants	202	202	175	Study Switching Refrigerants
Fertilizer Application	7	7	5	Conversion of Agricultural Lands to Forest Lands
Scope 1 Emissions Total	6,728	5,478	4,320	
SCOPE 2				
Purchased Electricity	2,777	1,447	663[1]	New York State Climate Act and Power Purchase Agreements
Scope 2 Emissions Total	2,777	1,447	663	
SCOPE 3				
Employee Commuting	189	189	160	Electric Vehicle Charging
College-Funded Travel	44	250	200	Increased Use of Remote Conferencing
Waste Processing	132	132	100	Waste Reduction
Wastewater Treatment	22	22	18	Study Water Saving Possibilities
Transmission Losses	151	72	73	
Scope 3 Emissions Total	539	665	551	
TOTAL EMISSIONS	10,044	7,590	5,534	
Forest Carbon Sequestration and Reforestation Efforts			-2,908	Reforestation and Forest Management
Offset Projects That Include Student Educational Benefits			-2,626	Estimated Offset Credits
Total Remaining Emissions in 2030			**0**	

1 Total estimated purchased electricity (in kilowatt-hours) would go up under our Climate Action Plan relative to BAU because of the heavier electrical demand of heat pumps and electric vehicles, but total estimated emissions under our Climate Action Plan are reduced by the purchase of electricity from renewable hydropower from New York State, as well as the greening of New York's electricity grid. Hamilton will continue to explore ways to further reduce our Scope 2 emissions by generating renewable electricity or entering renewable power purchase agreements.

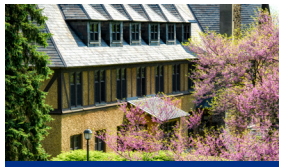
C. **Strategies for Scope 1 Emissions**

1 STRATEGIES FOR BUILDING HEATING

- **Replace fossil fuel-based heating infrastructure with electrically powered ground-source and air-source heat pumps in building renewals by 2030.**
- **After 2030, continue to pursue additional decarbonization efforts in campus buildings by replacing fossil fuel infrastructure with ground-source and air-source.**

As heating our buildings is the number-one source of greenhouse gas emissions at Hamilton by far (61% of total emissions), it makes sense to focus emissions reduction efforts on reducing this source. The optimal technological approach for heating is to replace fossil fuel infrastructure with electrically powered air-source and ground-source heat pumps (aka geothermal heat pumps). Heat pumps can provide both building heating and cooling and are powered by an increasingly low-carbon electric grid. Prior to the 2023 Climate Action Plan, Hamilton had already invested in ground-source and air-source heat pumps as an efficient and effective system of building energy management.

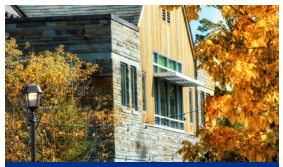
The following buildings have ground-source or air-source heat pumps:

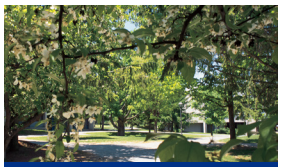

Skenandoa House


Taylor Science Center


Wellin Museum


Sadove Student Center


Johnson Center for Health and Wellness


List Hall


Root Hall

In 2021, in an effort to study potential pathways for emissions reductions, Hamilton commissioned an energy study that considered the possibility of fundamentally changing how energy for buildings works. Currently, most buildings have their own heating systems rather than a centralized district heating system or steam plant. The 2021 energy study considered various scenarios for centralizing heating on campus, but all proved extremely expensive. Instead, the study recommended a "feasible decarbonization" pathway that focuses on decarbonization of heating systems as buildings undergo renovation or renewal projects. This "feasible decarbonization" envisions the replacement of gas-fired boilers or oil-fired furnaces with geothermal heat pumps as buildings go through upgrades and renovations. Possible candidates for replacement of fossil fuel infrastructure include Beinecke Student Activities Village, Commons Dining Hall, and Benedict Hall, to name a few. Collectively through these efforts at decarbonization, we will reduce Hamilton's Scope 1 emissions by over **1,000 tons per year or more in 2030**. A timeline for decarbonization of additionally scheduled building renewals after 2030 will be developed in the 2027 Climate Action Plan in conjunction with ongoing campus master planning efforts.

C. **Strategies for Scope 1 Emissions** *(cont.)*

2 STRATEGIES FOR VEHICLE AND GROUNDS EQUIPMENT

- **By 2030, reduce fleet vehicle and equipment emissions by 50% or more from the 2007 baseline.**
- **Develop a comprehensive plan for gradual vehicle fleet electrification.**

Burning gasoline and diesel in Hamilton's fleet vehicles and grounds maintenance equipment represents 324 tons of CO_2 emissions annually, which have been reducing steadily since 2007. Electrification of vehicles and equipment is a clear strategy for further reducing emissions. As a result, a method of gradual electrification is underway. This process is being led by a Facilities Management staff subcommittee studying existing electric vehicle and equipment options, industry trends, approximate timing of new offerings, and strategy implementation requirements.

3 STRATEGIES FOR FUGITIVE REFRIGERANTS

- **By 2030, reduce fugitive refrigerant emissions by 50% from the peak year of 2020.**
- **The Sustainability Working Group and Facilities Management will collaborate to study potential replacements for existing refrigerants.**

Fugitive refrigerants are high global warming potential fluorinated gases that can leak from cooling systems used around campus. Lower global warming potential alternative refrigerants exist and can be deployed, but replacing cooling systems is costly. From 2007 to 2021, due to weather and cycles of building maintenance, emissions from fugitive refrigerants have ranged from six tons per year to 375 tons per year, with no clear trend. The Sustainability Working Group will collaborate with Facilities Management to study potential replacements for existing refrigerants that would lower overall emissions. The climate impact of fugitive refrigerants also should be considered in planning future renovations to the hockey rink on campus.

4 STRATEGIES FOR FERTILIZERS ON CAMPUS LANDS

- **By 2030, reduce fertilizer emissions by 60% from the 2007 baseline.**

Current emissions from fertilizer use are seven tons per year, primarily from nitrous oxide (a potent greenhouse gas) that is produced by microbial activities in response to fertilizer application on campus lands. As we gradually reforest former agricultural lands through the Land and Forest Stewardship Plan, reliance on synthetic fertilizer usage will be reduced over time.

D. **Strategies for Scope 2 Emissions**

1 STRATEGIES FOR PURCHASED ELECTRICITY

- **Hamilton is purchasing renewable electricity from a New York State hydropower project.**
- **Explore additional options for reducing Scope 2 emissions faster than the state's 2040 zero-carbon electricity target by considering potential power purchase agreements for renewable energy in New York.**

Purchased electricity represented 2,777 tons of CO_2e emissions in 2021, and we anticipate 2030 emissions to be further reduced because future electricity will come from less carbon-intensive sources. With the implementation of new heat pump projects, projected emissions in 2030 are estimated to be 1,463 tons CO_2e.

In 2040, New York State's climate law requires that the state have a 100% zero-carbon electric grid. However, Hamilton can reduce its emissions from electricity production more quickly than that. Electricity emissions can be further reduced through the purchase of renewable energy through power purchase agreements, which will allow Hamilton to receive renewable energy certificates (RECs) that entitle it to claim responsibility for generating renewable power. Hamilton recently entered into a contract to purchase renewable electricity from a hydropower station in Black Brook in northeastern New York. While Hamilton's Climate Action Plan focuses on direct emissions reductions on campus through the removal of fossil fuel infrastructure to heat our buildings, the College will continue to explore options to produce our own renewable electricity from solar power, as well as options for renewable power purchase agreements on a case-by-case basis.

Renewable energy sources like wind and hydropower can help reduce Scope 2 emissions.

E. **Strategies for Scope 3 Emissions**

1 STRATEGIES FOR EMPLOYEE COMMUTING

- **By 2030, reduce employee commuting emissions by 80% below the 2007 baseline.**
- **Advertise and expand opportunities for electric vehicle charging.**
- **Review and update the survey instrument used for estimating employee commuting emissions.**

Employee commuting to campus represents 189 tons of emissions per year. The estimate of these emissions comes from a community survey of commuting modes and estimates of the efficiency of employee vehicles. As electric vehicles become more prevalent, we can expect reductions in emissions associated with employee commuting. The Sustainability Working Group will work to provide more visibility for electric vehicle charging options on campus and will work with Facilities Management to expand the number of charging stations available for commuters on campus, while also considering campus parking needs. The Sustainability Working Group will also review and update the survey instrument used for estimating these emissions.

2 STRATEGIES FOR CAMPUS-FUNDED TRAVEL

- **By 2030, reduce travel-associated emissions to 200 tons CO_2 or less.**
- **Develop campus-wide strategies on the climate impacts of travel decisions that encourage a reduction in unnecessary travel.**

Campus-funded travel generates emissions from airplanes, trains, and automobiles used to facilitate official College business. Historically these emissions have ranged from 250 to 750 tons per year, but in 2021, due to the pandemic, emissions plunged to 44 tons. Under business-as-usual conditions, taking into account the likelihood that there will be some increased usage of remote options for future conferences, we anticipate travel emissions in 2030 to return to 250 tons per year. Efforts to reduce travel-associated emissions generally focus on the use of offsets, especially for airline travel for which there is no overall alternative that does not use fossil fuels, other than not traveling. The Neutrality Strategy Working Group considered whether a separate "travel offset" system should be used or whether travel emissions that remain in 2030 should be treated as any other remaining emissions that will be offset. The Neutrality Strategy Working Group concluded that there was not any particular reason to segregate these emissions from other emissions.

E. **Strategies for Scope 3 Emissions** *(cont.)*

3 STRATEGIES FOR WASTE PROCESSING

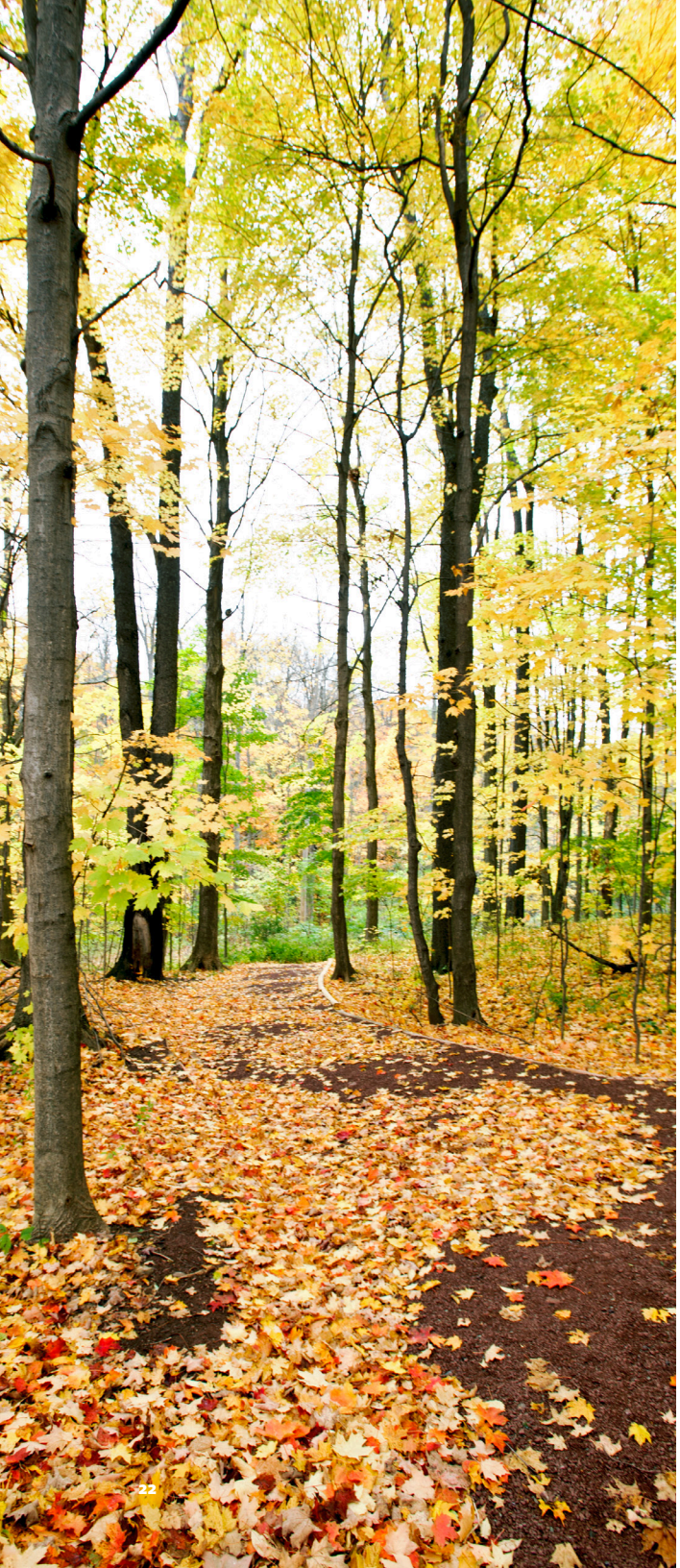
- **Long-term goal to reduce total amount of landfill waste by 90%.**
- **By 2030, reduce emissions from waste management by 50%.**

Emissions from solid waste disposal — the disposal of trash generated on campus — come from the landfills that manage waste and from the transportation of waste to those landfills. These landfills can be a source of methane, a potent greenhouse gas. Hamilton's waste is managed by a system that has a methane capture system, which historically led to Hamilton having negative emissions from waste. However, changes in EPA accounting methodologies in 2021 led to Hamilton increasing its emissions from waste, mostly because emissions reductions are no longer awarded for avoided landfilling from recycling, which is now considered standard practice. Over time, as Hamilton couples solid waste diversion initiatives with campus-wide engagement strategies through the Sustainability Action Plan, these emissions will go down accordingly. All relevant waste management stakeholders (including Facilities Management, food services, the Sustainability Working Group, and Environmental Protection, Safety & Sustainability) will work to maximize strategies and messaging around waste reduction and diversion tactics with a long-term goal of 90% reduction in landfill waste (by weight) and at least a 50% reduction in emissions from landfill waste disposal. More information about the waste reduction goals can be found in the Sustainability Action Plan.

4 STRATEGIES FOR WASTEWATER TREATMENT PROCESSING

- **By 2030, reduce emissions from treating wastewater to 18 tons or fewer.**

Hamilton's wastewater is treated by the Village of Clinton wastewater treatment plant. Its emissions are calculated based on the performance of this plant and the volume of wastewater that the campus sends to the plant. Emissions from wastewater have remained relatively constant over the last 15 years, ranging from 14 to 25 tons per year. The Sustainability Working Group will continue to collaborate with Facilities Management to study potential water-saving technologies in campus water systems. This includes both plumbed water-saving systems and the potential use for gray water for landscape watering in new building construction.



F. **Strategies for Carbon Sequestration in Our Forests and Lands**

Outside of its core campus, Hamilton currently has 803 acres of forested lands and 150 acres of open lands, which include a mix of about 50 acres of unmanaged open lands that were formerly in agricultural production and about 100 acres currently leased for agricultural production.

1 STRATEGIES FOR MANAGING EXISTING FOREST LANDS

- **Manage existing forest lands to sequester carbon through tree growth.**

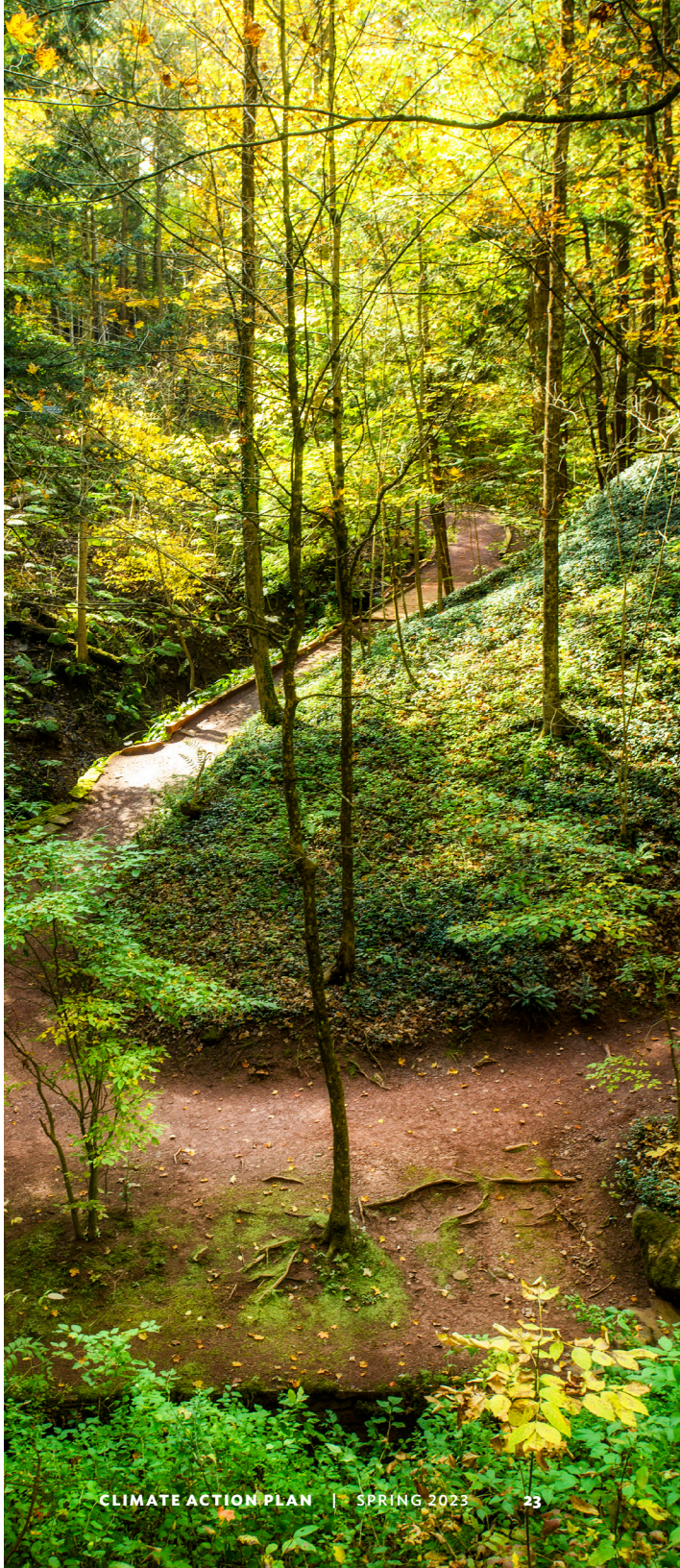
By managing existing forested lands to sequester carbon, Hamilton can reduce its net greenhouse gas emissions; however, the College must consider the additionality of these carbon removals (i.e., Are we removing more carbon from the atmosphere than would have occurred without Hamilton's actions?).

An assessment of the surrounding landscape in lands neighboring Hamilton shows that, if not for the College's existence and maintenance of its lands as forest, roughly 90% of those forests would likely have been cleared for agriculture or development. Thus, we are electing to account for 90% of the carbon sequestration — the carbon removed each year from the atmosphere from forest growth — as additional and as negative emissions in our inventory. This approach to carbon accounting is in line with the requirements of carbon inventory reporting to Second Nature.

Working with a certified forester, we have monitored the annual carbon sequestration in our 803 acres of forested lands in 2017 and 2022. The annualized increments of added forest carbon are shown in the table on the right, with annual estimates for each of four different forests on campus — the Rogers Forest, North Campus forests, the Kirkland and D'Agostino forests, and the Reservoir Forest. Thus, in 2030, we can anticipate that 3,002 tons CO_2 per year are sequestered in Hamilton's forested lands, representing (at 90%) **2,702 tons of *additional* sequestration**.

Forest Areas	Annual Sequestration estimate (tons CO_2e) (Based on 2017-22 Growth)	$MTCO_2e$ sequestered per acre per year
Rogers Forest	1,020	4.95
North Central Forest	174	2.63
Kirkland Forest	1,164	3.62
Reservoir Forest	644	3.03
Total tons CO_2e Sequestered Per Year	**3,002**	**5,478**
Sequestration Accounting for Additionality Reductions	2,702	

Forest management requires active work and engagement to remove invasive species and encourage the growth of native hardwood trees, which store more carbon per unit area. It also means that any emissions associated with forest clearing must be included in our inventory. In 2020, forest management activities at the Reservoir and Rogers Forests resulted in emissions of 2238 $MTCO_2e$. Small budget expenditures for ongoing forest management may be required to achieve these carbon reductions.



A reforestation plot with tree seedlings on campus land.

F. **Strategies for Carbon Sequestration in Our Forests and Lands**

2 STRATEGIES FOR REFORESTATION OF OPEN AND AGRICULTURAL LANDS

■ **Reforest 150 acres of open and agricultural land in a phased process.**

Hamilton currently has 90.5 acres in agricultural lease for corn production to feed dairy cows and an additional 59.5 acres of open, unleased, unmanaged former agricultural lands. These leases provide very modest revenue to the College. Reforesting these lands presents a strong opportunity for carbon sequestration. Reforestation projects also directly involve faculty and student research and Hamilton courses, providing direct educational benefits to students. Reforestation efforts require small budget expenditures for tree planting, student labor, and maintenance.

In 2021, the Sustainability Working Group began reforesting an approximately 17-acre tract of unmanaged, unleased former agricultural land on the north side of Rogers Glen (see Land and Forest Stewardship Plan). Efforts at reforesting this tract continued in Summer 2022 and are expected to continue gradually over the next decade. These reforestation efforts represent the commencement of a gradual reforestation of unmanaged lands on campus.

Gradual reforestation of all 150 acres of open and agricultural land in a phased in process from 2022 to 2027 would result in **208 tons CO_2e of additional sequestration per year** in 2030. However, because forest growth continues after 2030, the additional carbon sequestration in these lands will reduce the long-term annual reliance of the College on carbon offsets. By 2050, these growing forests would sequester 450 tons CO_2e per year. If only the current 59.5 acres of unmanaged, unleased agricultural lands were reforested gradually, this would result in 83 tons CO_2e sequestered per year.

F. **Strategies for Carbon Sequestration in Our Forests and Lands** *(cont.)*

3 STRATEGIES FOR SOIL CARBON AND INVASIVES REMOVAL

- **Develop plans to enhance carbon sequestration in soils.**
- **Develop plans to manage invasive species to enhance forest carbon sequestration.**

Beyond increasing the carbon stored in trees, additional land management activities could further increase carbon sequestration in Hamilton's lands. First, current efforts are underway by faculty and students to study the potential increases in soil carbon sequestration that will occur as mono-cropped agricultural lands are converted to forest lands through reforestation. The increased storage of carbon in reforested land soils would further decrease Scope 1 emissions and the Hamilton Experimental Forest Faculty Committee, working with the Sustainability Working Group, will develop estimates on increased soil carbon sequestration in Hamilton's lands for inclusion in the 2027 Climate Action Plan update.

Second, the North Campus Forest Tract is dominated by the invasive shrub Common Buckthorn. This forest currently sequesters carbon at about half the rate of the adjacent Rogers Forest tract, which is composed of native hardwood trees. Students and faculty are studying the potential for buckthorn removal to encourage natural regeneration of a native forest that would sequester more carbon. The Hamilton Experimental Forest Faculty Committee, working with the Sustainability Working Group, should develop estimates on increased soil carbon sequestration in Hamilton's lands for inclusion in the 2027 Climate Action Plan update.

Full details of the recommendations for and management of Hamilton's lands are included in the Land and Forest Stewardship Plan that accompanies this Climate Action Plan.

Students collect soil cores for carbon analysis from agricultural lands on campus.

F. **Limited Use of Carbon Offsets in 2030**

Even with the aforementioned efforts to reduce emissions, Hamilton will have approximately 2,600 metric tons of net CO2e emissions remaining in 2030. To achieve carbon neutrality by our target date, the College will likely have to purchase carbon offsets. The Neutrality Strategy Working Group — a subcommittee of the Sustainability Working Group — has been tasked with studying the potential types of offset projects that Hamilton could pursue. In so doing, the Neutrality Strategy Working Group has developed three principles to guide the purchase of offsets.

CARBON NEUTRAL H2030

1 LAST RESORT

As a general principle, the Sustainability Working Group encourages the purchase of carbon offsets as a final step to"offset the rest" — that is to account for the remaining emissions after progressive decarbonization activities and after forest carbon sequestration on campus lands are taken into account. We believe that with a carbon neutrality date of 2030, offsets should only be purchased starting in 2030 to cover remaining emissions because we should first focus on efforts to reduce emissions on campus directly.

2 PERMANENT, ADDITIONAL, REAL, VERIFIABLE

Offsets can be controversial. It can be hard to ensure that they represent real emissions reductions. Any offsets that Hamilton uses must be demonstrated as permanent, additional, real, and verifiable.

3 MISSION-DRIVEN AND LOCAL

Offsets can also be detached from the educational mission of the College — simply a line item on an annual budget. As such, the Sustainability Working Group recommends purchasing offsets from projects that substantively involve the fulfillment of the educational mission of the College. These projects should involve student learning and research to be coordinated through the Environmental Studies Program, in conjunction with other departments. These goals are likely best achieved by pursuing local offset projects in the communities surrounding Hamilton. Local offset projects also have an added benefit in terms of environmental justice. Rather than continuing to pollute locally while paying for offsets in remote locations, local offset projects provide environmental, social, and economic benefits that help ensure a just and sustainable future.

The Sustainability Working Group recommends that the Neutrality Strategy Working Group study and make recommendations for projects in the 2027 Climate Action Plan. The goal is to pursue these local projects ahead of time so that offset credits can be used starting in 2030.

SECTION III

Implementing the 2023 Climate Action Plan

A. **Preparing for After 2030**

After achieving carbon neutrality in 2030, Hamilton's commitment to climate action does not stop. Plans for continued decarbonization actions post 2030 will be outlined in the 2027 Climate Action Plan. There are several key considerations when planning for after 2030. Scope 2 emissions from purchased electricity are expected to drop to zero in 2040 as New York State achieves its statewide goal of 100% zero-carbon electricity by 2040. This would represent a reduction of nearly 1,500 tons CO_2e per year. Carbon sequestration in our reforestation forests will also increase after 2030, as new forests planted on campus lands grow. Projections are that reforestation sequestration will increase in 2040 to 444 tons CO2e per year from 208 in 2030. Even without additional deployment of heat pump systems post 2030 or any changes in the vehicle fleet (which will continue to electrify), these changes in Scope 2 emissions and reforestation would reduce our remaining net annual emissions to below 1,000 tons, greatly reducing our reliance on offsets in the future.

B. **Responsibility for Implementation**

All members of the Hamilton community play a role in helping the College take actions to advance its climate action goals. The 2023 Climate Action Plan provides a vision for how the campus will achieve its collective goal of carbon neutrality by 2030. The plan makes a set of recommendations for actions to achieve that goal. In all cases, the Climate Action Plan will be implemented by the appropriate College divisions through their normal activities and decision-making processes. The Climate Action Plan does not supplant existing plans, budgets, or authorities. Rather, it can serve as a guide and set of recommendations for College decision-making processes.

C. **Reporting on Progress**

As requested in the March 2022 resolution, the Sustainability Working Group will provide an annual written update on progress toward achieving carbon neutrality to the Board of Trustees. Members of the Sustainability Working Group will also provide annual updates on progress toward achieving carbon neutrality to Staff Assembly, Student Assembly, and the Faculty.

D. **Updating the Climate Action Plan – Next Plan in 2027**

The 2023 Climate Action Plan serves as a guide for achieving carbon neutrality by 2030 and updates the previous 2017 Climate Action Plan. The Climate Action Plan should be updated every five years by the Sustainability Working Group. The next Hamilton College Climate Action Plan should be completed in 2027.

The Taylor Science Center is one of seven campus buildings currently heated by a geothermal heat pump system. Additional installation of geothermal heat pumps is a key component of the 2030 carbon neutrality strategy.

SECTION IV

Appendix and Glossary

Members of the Neutrality Strategy Working Group

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Additional Neutrality Strategy Working Group Participants

ASHA GROSSBERNDT ’21

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AVERY MORGAN ’22

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Director of Planning and Project Management

ROGER WAKEMAN
Former Associate Vice President for Facilities and Planning

C. **Glossary of Key Terms**

ADDITIONALITY

Additionality refers to whether emissions reductions or carbon sequestration from offsets, RECs, or land management activities would not have otherwise occurred in the absence of the activity of the College. For example, since offset credits or carbon sequestration in Hamilton's forests can contribute to reducing net greenhouse gas emissions and achieving carbon neutrality, we need to make sure that the emissions reductions or carbon sequestration that those credits represent would not have otherwise occurred if Hamilton had not purchased the offsets or managed its forests in a particular way.

CARBON NEUTRAL

Carbon neutral means that the College's annual activities do not increase the net amount of greenhouse gases in the atmosphere. Thus, any emissions of greenhouse gases that do occur must be made up for by equivalent removals of greenhouse gases from the atmosphere (e.g., by carbon sequestration in forests) or through the purchase of offset credits that represent emissions reductions or carbon sequestration. When the College is carbon neutral, this means that its activities will not contribute to climate change.

CARBON OFFSETS

These are credits that represent emissions reductions or carbon sequestration that takes place elsewhere (i.e. not at Hamilton College). Hamilton can purchase these credits to represent and thus take "credit" for those emissions reductions or carbon sequestration. To be used, offsets should represent real emissions reductions.

CO_2E

Referred to as "carbon dioxide equivalent." Not all greenhouse gases produce the same amount of warming. For example, methane emissions are around 25 times more potent in terms of the warming they produce than carbon dioxide emissions over 100 years. To get all greenhouse gas emissions into the same units, we use conversion factors called Global Warming Potentials to convert emissions of non-CO_2 gases into units of "carbon dioxide equivalent."

GREENHOUSE GAS EMISSIONS

The emission of certain gases to the atmosphere that trap the Earth's long-wave radiation, thus contributing to climate change. These gases include carbon dioxide, methane, nitrous oxide, and some fluorinated gases. Many human activities lead to the emission of these gases, including burning fossil fuels like gasoline and natural gas, which releases carbon dioxide, and using electricity that is generated from the burning of fossil fuels in power plants. Other human activities that create emissions include certain agricultural and waste management activities and leaky refrigeration systems that can lead to the emission of methane and nitrous oxide and fluorinated gases.

RECS

Renewable Energy Certificates are similar to offsets. They represent the generation of renewable electricity and entitle the owner of the REC to claim "responsibility" for putting renewable electricity onto an electric grid. Since renewable electricity is zero-carbon electricity, the amount of RECs purchased by an entity represents zero-carbon electricity.

Hamilton