2024 GREENHOUSE GAS EMISSIONS INVENTORY REPORT

for Emory University and Healthcare

EMORY sustainability initiatives

This report was prepared for Emory's Office of Sustainability Initiatives by E Rowe Consulting.

Executive Summary

Since 2010, Emory, which for purposes of this report, includes Emory University (University) and parts of Emory Healthcare (EHC), has reduced its greenhouse gas (GHG) emissions by 32.62%.

From 2023 to 2024, Emory's GHG emissions increased by 1.28%, which means that Emory's current emissions are approaching 2019 levels after experiencing a sharp reduction during the COVID-19 pandemic. Emory's total emissions footprint in fiscal year 2024 was a net quantity of 226,915 MT CO_2e (metric tons of carbon dioxide equivalent). The significant emissions reductions made in 2021 as a result of the COVID-19 pandemic have been counterbalanced by annual increases in GHG emissions. At present, Emory's GHG emissions inventory includes all University and EHC properties along the Clifton Road corridor and Clairmont campuses, with the exclusion of the properties located at 1817-1841 Clifton Road (formerly referred to as the "Wesley Woods campus"). This GHG emissions inventory currently does not include University or Emory Healthcare facilities located beyond the Clifton corridor.

The principal drivers and obstacles in Emory's emissions reductions to date have been:

- **A 50.48% reduction in purchased electricity emissions (Scope 2 emissions).** By comparison, Emory's electricity usage has only decreased by 10.23%, meaning that the main source of these emissions reductions is from the Georgia Power electricity grid becoming less carbon intensive. While Emory has a goal of achieving 25% total energy use reduction from 2015 levels by 2025, the University has achieved a 16% reduction as of 2024.
- **A 17.45% decrease in stationary fuel emissions, including a 15.14% reduction in natural gas usage and a 67.72% decrease in distillate oil,** indicating that Emory is decreasing its demand for on-campus fossil fuels despite an increase in its built footprint.
- In contrast, **a 1.77% reduction in Scope 3 emissions (indirect emissions that are attributable to Emory's operations) since 2010 is impeding Emory's overall emissions reduction progress.** Since 2010, air travel emissions have increased by 152% and the number of miles flown has increased by 137%. Since 2010, air travel has been Emory's largest and most quickly growing source of emissions increases.

As part of the 2024 GHG emissions inventory, Emory leadership made the decision to delineate Emory University emissions and Emory Healthcare emissions to provide greater clarity on how these two parts of Emory's enterprise are driving emissions. EHC accounts for 27% of Emory's total GHG emissions footprint, producing a net quantity of 62,251 MT CO_2e. The largest sources of EHC's emissions are purchased electricity, stationary fuel, landfilled waste, and wastewater. Notably, the Emory University Hospital's electricity use accounts for 20% of Emory's total electricity-related emissions.

Emory Total Emissions: 226,915 MT CO_2e

Emory University Total Emissions: 164,664 MT CO_2e

Emory Healthcare Total Emissions: 62,251 MT CO_2e

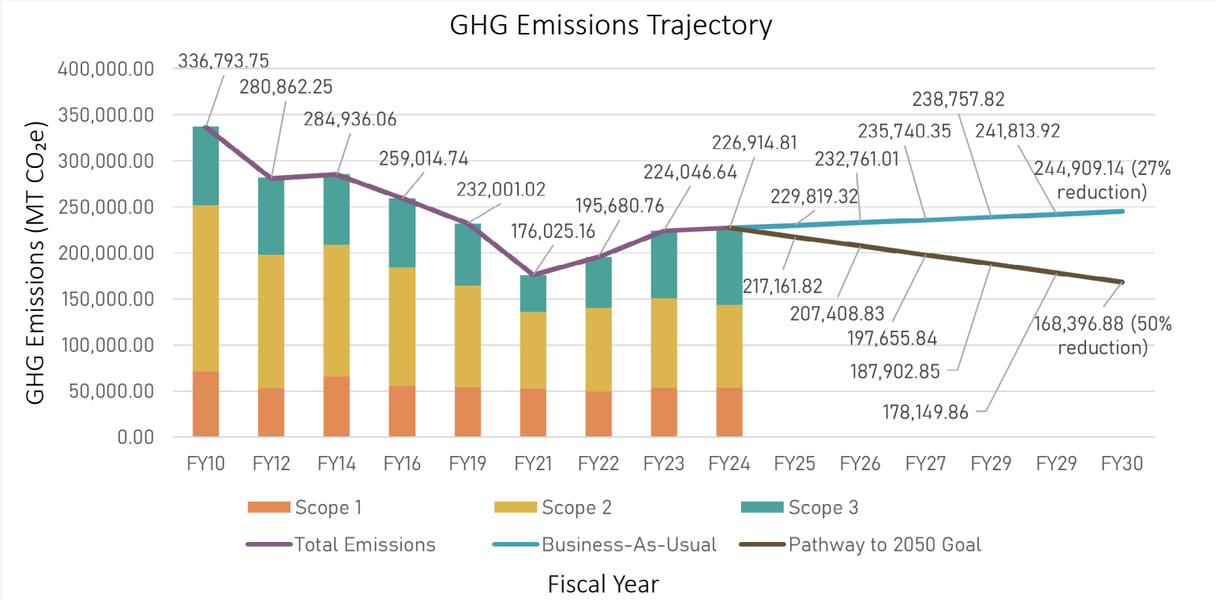

Figure 1. This stacked chart shows GHG emissions by scope from 2010-2023, and the trend line represents total GHG emissions. The business-as-usual blue line represents projected emissions if Emory continues to increase emissions at its current rate. The pathway to 2050 black line represents emissions if Emory tracks towards its 50% reduction goal. Emissions are shown in MT CO_2e.

In 2015, Emory made the decision to align its GHG emissions reduction goals with the latest scientific evidence and recommendations. In joining the UN Race to Zero Campaign and Second Nature's Presidents' Climate Leadership Commitment in 2021, Emory updated its GHG reduction goals by pledging to reduce its emissions by 50% by 2030 and net zero by 2050 from a 2010 baseline. With five years remaining for Emory to reach its 2030 goal, Emory must:

- **Decrease annual emissions by an average of 9,753 MT CO_2e each year from FY25-FY30,** which is an annual decrease of 2.9% from the 2010 baseline. At present, Emory's emissions are increasing year-to-year.
- **Continue to decrease demand for electricity through energy efficiency and other decarbonization investments.** Purchased electricity remains Emory's largest source of GHG emissions, and since most emissions reductions have come from changes to the Georgia Power grid, there remains robust emissions reduction potential for Emory through investment in energy efficiency. Decreasing electricity usage will also maximize the impact of Emory's on-site solar and decrease emissions from Fuel- and Energy-Related Activity (FERA) and Transmission and Distribution (T&D) losses.[1]
- **Develop holistic procedures to decrease air travel emissions**, taking into account the varying emissions impacts of short- and long-haul flights.
- **Refine the calculation methods for estimating commuting emissions** in order to develop more targeted intervention strategies to reduce commuting emissions, particularly for Emory University and Healthcare staff, a group with increasing commuting emissions.

1. In 2022, Emory's emissions reports began including FERA emissions. These emissions are automatically calculated by SIMAP (Second Nature's Sustainability Indicator Management & Analysis Platform), and all previous inventories were re-run to include FERA emissions. For more information on this methodology change, as well as the inclusion of T&D losses emissions, please reference Emory's 2022 GHG Emissions Inventory Report.

As part of its decarbonization strategy, Emory has made robust investments in renewable energy credits (RECs), which will bring Emory closer to its 2030 goal.

Emory will begin receiving RECs in return for its investment in Georgia Power's Customer Renewable Supply Procurement (CRSP) program in 2025, so these RECs were not included in this GHG emissions inventory. Emory's RECs support solar development in Georgia but can only be used to offset Emory's Scope 2 emissions. However, RECs are just one decarbonization strategy, and since GHG emissions continue to rise year-to-year, Emory must also prioritize other policy and investment options to achieve net-zero emissions by 2050. These on-campus investments and policies have other tangible and intangible co-benefits for Emory that should be considered, including reductions in operational costs and promoting stewardship of Emory's resources and campus culture. Since the amount of generation from the offsite solar funded through of Emory's purchase of RECs is not known at this time, and Emory's emissions are rising year-to-year, this report focuses on other investments, policies, and behavioral changes that contribute to Emory achieving its emissions reduction goals.

What are Renewable Energy Credits?

One Renewable Energy Credit (REC) represents the environmental attributes of one megawatt-hour (MWh) of solar energy produced. For every REC produced within a fiscal year, Emory can subtract the total quantity from its purchased electricity (Scope 2 emissions). RECs are common GHG mitigation tools used to reduce Scope 2 emissions, and it has been Emory's intention for the last decade to utilize RECs as one of several investment options to achieve net-zero GHG emissions. Since RECs are used to represent a purchase of carbon-free electricity, they are only used to reduce Scope 2 emissions. This means that Emory's RECs will have no impact on Scope 1 and 3 emissions, which currently make up 61% of Emory's total emissions. RECs are a single solution to emissions reductions, and will prove vital for Emory; however, Emory must also continue to advance the other on-campus emissions reduction recommendations outlined within this report.

Introduction

Emory evaluates its greenhouse gas (GHG) emissions, or carbon footprint, annually to monitor its efforts to reduce emissions 50% by 2030 and reach net zero by 2050 from its 2010 baseline year through strategies including energy efficiency, behavior change, clean and renewable energy sources, and new innovations. Emory began measuring and reporting its GHG emissions in 2010, with 2005 as the original baseline year for emissions reporting, and subsequently has completed a total of 10 inventories. The goal of these GHG inventories is to inform Emory's short- and long-term mitigation decisions, increase on-campus awareness of mitigation efforts, and provide accountability to these goals.

On October 13, 2021, Emory joined Second Nature's Presidents' Climate Commitment and the United Nations' Race to Zero Campaigns, two international nonprofits organizing coalitions of higher education institutions committed to achieving net-zero GHG emissions and building resilience to the impacts of climate change. Key components of Emory's climate commitments include publicly reporting its annual GHG emissions and reporting on climate action planning efforts to the Second Nature on-line public platform, SIMAP (the Sustainability Indicator Management & Analysis Platform). This 2024 inventory is the fourth to be shared under the Second Nature commitment. However, all of Emory's historical GHG inventories are accessible on SIMAP. In addition to publishing its GHG emissions inventories, Emory completed its 2023 Climate Action Plan (CAP) in October 2023 to ensure it is prepared to accelerate its emissions reductions, increase resilience, and continue to lead on climate and sustainability among peer institutions. A progress update on Emory's CAP is included later in this report. At present, Emory is committed to achieving a 50% reduction in total GHG emissions by 2030 from 2010 levels and net-zero GHG emissions by 2050.

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Since 2010, Emory has reduced its GHG emissions by 32.62%.

Emory emitted a net quantity of 226,915 MT CO_2e (metric tons of carbon dioxide equivalent) in 2024. Emory's GHG emissions by scope were:

- **Scope 1 (direct, on-campus emissions):** 53,910 MT CO_2e representing a 24.23% reduction from 2010 and a 0.05% increase from 2023. Scope 1 emissions comprise 24% of Emory's emissions for 2024.
- **Scope 2 (purchased electricity emissions):** 89,592 MT CO_2e representing a 50.48% reduction from 2010 and a 7.75% decrease from 2023. Scope 2 emissions comprise 39% of Emory's emissions for 2024.
- **Scope 3 (indirect emissions attributable to Emory's operations):** 83,413 MT CO_2e representing a 1.77% reduction from 2010 and a 14.19% increase from 2023. Scope 3 emissions comprise 37% of Emory's emissions for 2024.

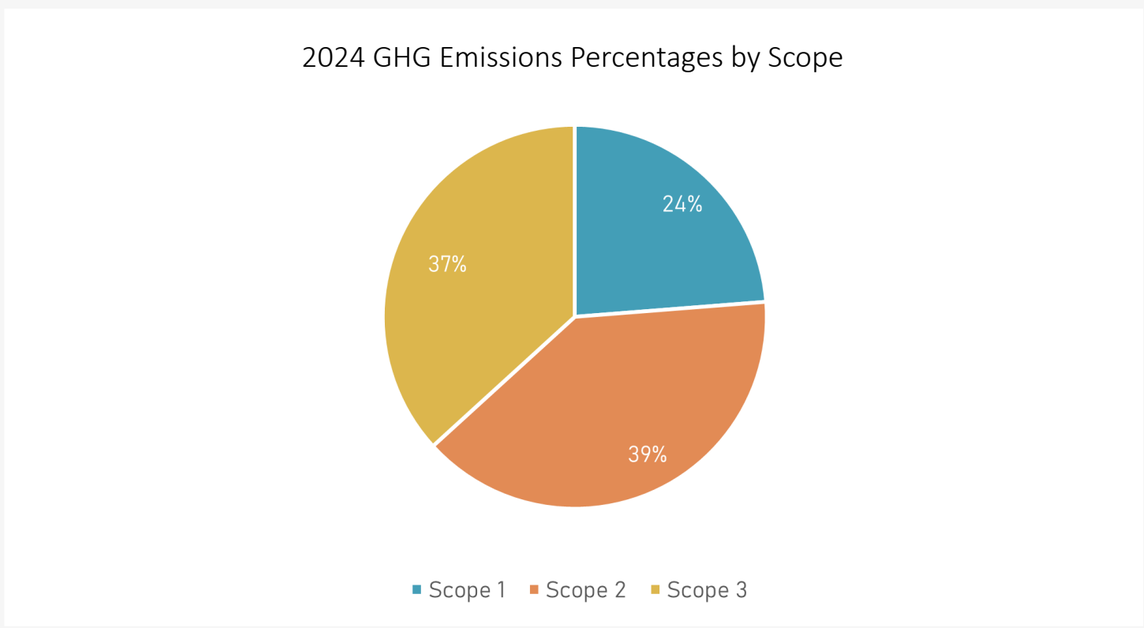

Figure 2. This chart shows the percentage of emissions by scope for 2024.

Achieving a 50% Reduction by 2030

In the landmark 2018 United Nations' Intergovernmental Panel on Climate Change (IPCC) report, climate scientists declared 2020 to 2030 the most critical decade for global decarbonization. The IPCC outlined that to maximize the likelihood that global warming could be stabilized to 1.5 °C of warming above preindustrial levels, global GHG emissions must decrease by at least 45% from a 2010 baseline by 2030 and reach net zero by 2050. If those reductions are not achieved, the remaining mitigation pathways to limiting catastrophic warming would become markedly slimmer. In response, Emory aligned with this 45% reduction requirement in the IPCC report and then later adjusted its emission reduction targets further as required by the UN Race to Zero and Second Nature Presidents' Climate Commitments to reduce GHG emissions by 50% by 2030 from 2010 levels (2030 goal) and net zero by 2050.

Now halfway through this critical decade, Emory has completed four GHG inventories, and each of these inventories provides insights into what Emory must achieve in the next five years to reach its 2030 goal:

- **2021 Inventory:** During the COVID-19 pandemic, Emory's day-to-day operations were significantly reduced. During this period, Emory nearly reached its 2030 reduction target, reducing emissions by 47.74%, which was driven by reductions in travel, electricity use, and energy demand from the Georgia Power grid.[1] While this report does not advocate for a reduction in operations similar to the COVID-19 pandemic shutdown, these data show that targeted policy interventions and relatively low-cost investments can achieve robust emissions reductions.
- **2022 Inventory:** Emissions began to rise in 2022, which was expected as Emory began to resume pre-pandemic business-as-usual operations this year. From 2021 to 2022, emissions increased 11.17%.
- **2023 Inventory:** Emissions continued to rise. While growth in emissions was expected as Emory fully resumed business-as-usual operations, some emissions sources exceeded pre-pandemic levels, including transportation and air travel. From 2022 to 2023, emissions increased by 14.5%.
- **2024 Inventory:** Emissions continued to rise in 2024, but the rate of emissions growth is decreasing as Emory approaches pre-pandemic emissions levels. From 2023 to 2024, emissions increased by 1.28%. While **Emory has achieved overall emissions reductions from 2010 to 2024**, Emory will not achieve its 2030 goal unless it reverses its current trajectory and reduces its emissions at a rate of 2.9% per year from 2025 to 2030.

1. For more information on how the emissions intensity of the Georgia Power grid is measured and its impact on Emory's GHG emissions, please refer to Emory's 2023 GHG Emissions Inventory Report.

Emory's emissions have grown annually after hitting a low point during the COVID-19 pandemic. Emissions continued to rise in 2024, but the rate of emissions growth is decreasing as Emory approaches pre-pandemic emissions levels.

Rapid Decarbonization is Possible through Policies and Behavioral Changes

In 2021, Emory reduced its GHG emissions by 47.74%, nearly meeting its 50% GHG emissions reduction goal. Some of these GHG emissions reductions were due to substantial changes in operations and behaviors on both Emory's campus and around the state due to the COVID-19 pandemic. While this report does not advocate for an emissions reduction strategy modeled after the COVID-19 pandemic policies, the dramatic drop in emissions in 2021 does highlight that Emory has the capacity with relatively low-cost interventions to reach its 2030 emissions goal. In addition to the tools Emory is already deploying to reduce its GHG emissions, campus-wide policies, personal actions, and reductions in energy demand (both on campus and statewide) have the capacity to positively move the needle toward Emory's goals. In fact, these will be essential for Emory to reach net-zero emissions by 2050.

Emory's track record of limiting GHG emissions increases as the campus and population grow also indicates that Emory's goals are achievable through policy and behavior change. While Emory's emissions have continued to increase year-to-year since 2022, Emory reduced its emissions per campus square foot and per Emory community member. For example, from 2019 to 2024, Emory's building footprint grew by almost 5.75%, but emissions per square foot decreased by 7.5%. Similarly, the number of students, faculty, and staff at Emory increased by 9.8% from 2019 to 2024, and emissions per person decreased by almost 11%. This demonstrates that the policies and programs Emory is leveraging to reduce emissions are working, but they must be accelerated in order to reduce total emissions as Emory continues to grow.

Both Emory's substantial GHG emissions reductions in 2021 and Emory's ability to limit emissions growth as the campus has grown demonstrate that it is possible to achieve robust and rapid GHG emissions reductions through the engagement of the entire Emory community.

Emory does not operate in a decarbonized economy, meaning that GHG emissions will not decrease on their own, and instead require robust policy interventions, financial investments, and active engagement of the entire Emory community.

Rapid operational decarbonization is required to meet both Emory's 2030 goal and net-zero emissions, meaning that maintaining business-as-usual is not enough. In 2021, Emory came close to achieving its goal of reducing emissions by 50%, however it has been unable to maintain these reductions due to policy changes as a result of the COVID-19 pandemic. Scope 3 emissions, which include emissions from air travel, commuting, and waste, tell the story of Emory's need to improve its emissions reduction momentum. Scope 3 emissions were reduced by 20.2% between 2010 and 2019 and were then slashed by 52.22% compared to 2010 levels in 2021. Since the COVID-19 pandemic, Scope 3 emissions have bounced back, increasing by 105.6% from 2021 to 2024. This increase has limited Emory's to-date Scope 3 emissions reductions to only 1.77% from 2010 levels.

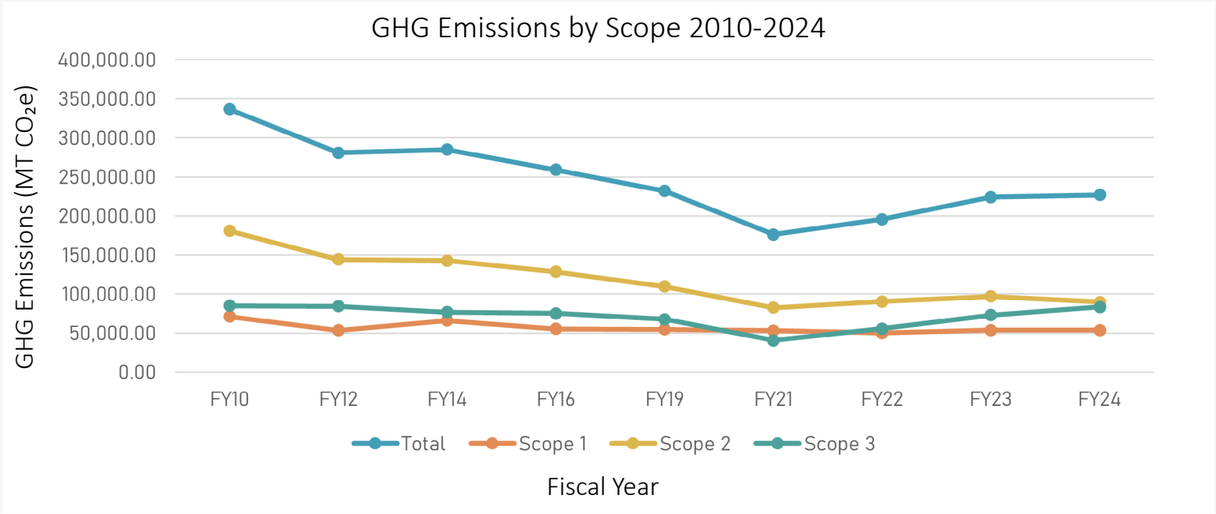

Figure 3. This chart shows changes in emissions from 2010 to 2024 for total emissions and each emissions scope.

For Emory to achieve its 2050 net-zero goal, it must make steady emissions reductions across all scopes.

In 2019, emissions decreased by a total of 31.11%, and in 2024 emissions decreased by a total of 32.62%. While Emory came close to achieving its 2030 goal in 2021 as the result of campus-wide changes in operations and demand for electricity during the pandemic, Emory has not made robust progress in reducing total emissions since 2019 through operational and behavior changes. During this same period, Emory invested in Georgia Power's Customer Renewable Supply Program (CRSP) to increase the quantity of solar energy within Georgia Power's grid. In return for this financial investment, Emory will receive renewable energy credits (RECs) alongside the electricity it purchases from Georgia Power. The Georgia Power solar facilities funded through the CRSP program became operational in January 2025, so RECs will not appear in Emory's GHG emissions inventory until next year. Based on projected production figures for this solar facility, these RECs are likely to significantly reduce Emory's Scope 2 emissions and bring Emory closer to achieving its 2030 emissions goal. However, the exact amount of generation from the off-campus solar and therefore the amount of RECs produced is not yet known.

However, if Emory continues to increase its emissions year-to-year as it did from 2023 to 2024, even at a small rate, these CRSP program RECs alone will not be enough for Emory to reach its 2030 goal. Further, for Emory to achieve its 2050 net-zero goal, it must make steady emissions reductions across all scopes, including Scopes 1 and 3, which cannot be impacted by REC purchases. While Emory's investment in CRSP is moving the institution closer to meeting its goals and is funding solar development in Georgia, Emory cannot fully rely on RECs to reach its 2030 goal or net-zero GHG emissions. Emory must continue to invest in other decarbonization strategies and programs to maximize the efficacy of Emory's CRSP investment.

Summary of 2024 Inventory Results by Scope

For each emission source reported below, the emissions comparisons are reported for the following time periods to assist in identifying trends in Emory's emissions and to illuminate the areas warranting action to achieve Emory's goals:

- **2010:** compares 2024 to 2010 to show the total reduction in emissions since the baseline year and long-term progress towards Emory's carbon neutrality goals
- **2019:** compares 2024 to Emory's last pre-COVID-19 pandemic emissions inventory, completed in 2019, to show progress towards Emory's 2030 reduction goal
- **2023:** compares 2024 to 2023 to show year-to-year changes in Emory's emissions

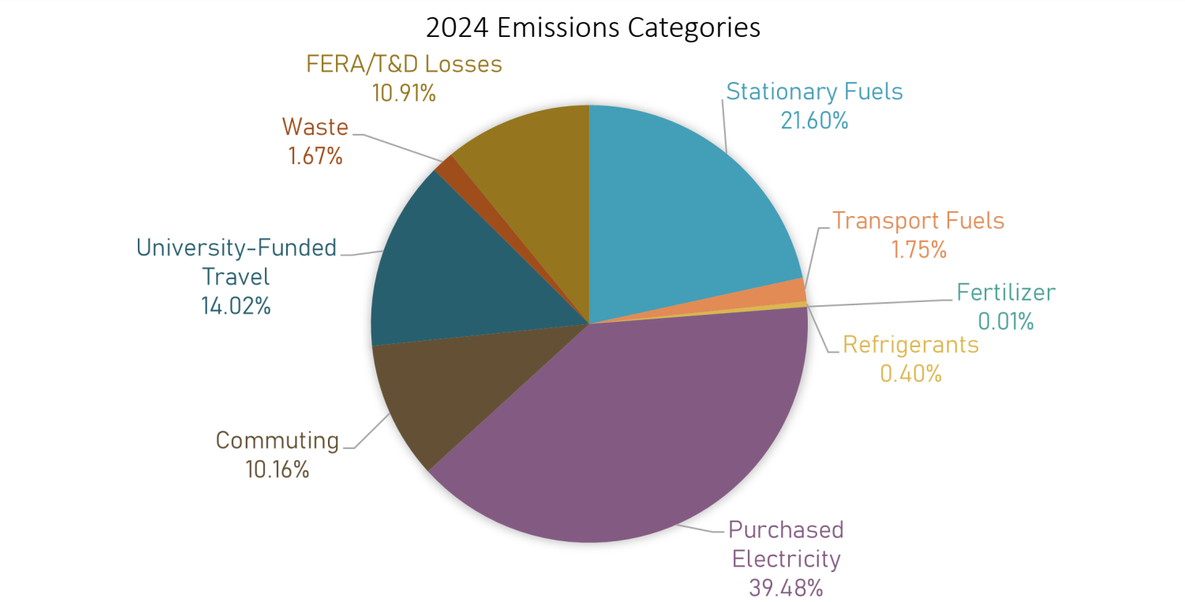

Figure 4. This chart shows the breakdown of Emory's GHG emissions with consolidated inputs to visualize how each of the overall emissions sources is impacting emissions.

Scope 1 Emissions

Scope 1 emissions are GHG emissions from sources controlled and owned by Emory, including stationary fuels, transportation fuels, refrigerants, and fertilizers. In 2024, they represented 24% of Emory's GHG emissions, the same proportion as in 2019.

Scope 1 emissions were 53,910 MT CO_2e and have decreased by 24.23% from 2010 and increased 0.05% from 2023.

Stationary Fuels (49,016.55 MT CO_2e)

Stationary fuels include the natural gas and distillate oil used on campus, which are used to heat Emory's buildings. Stationary fuel emissions have changed by the following percentages:

- **17.45% decrease since 2010**
- **2.45% decrease since 2019**
- **0.23% decrease since 2023**

The quantity of both natural gas and distillate oil used decreased from 2023 to 2024, which is an improvement from 2022 to 2023 during which time use of both fuel sources increased. To reduce the use of heating fuels on campus, Emory could investigate more efficient systems for heating its buildings, using alternative fuels in Emory's steam plant, and limiting the use of distillate oil on campus.

Transportation Fuels (3,972.33 MT CO_2e)

Transportation fuels include all fuels used to operate Emory's vehicle fleet, including the Emory Shuttle System. Transportation fuel emissions have changed by the following percentages:

- **111.75% increase since 2010**
- **7.22% increase since 2019**
- **2.97% decrease since 2023**

Transportation fuel emissions have been steadily rising from year to year; however, from 2023 to 2024, emissions from transportation fuels decreased. Annual fluctuations in this emission source are expected as Emory advocates for increased ridership of the Emory Shuttle system and transitions its fleet to include more electric vehicles.

Refrigerants (899.12 MT CO_2e)

Refrigerants are chemicals used in refrigeration and air conditioning systems that are highly potent greenhouse gases. Refrigerant emissions have changed by the following percentages:

- **90.92% decrease since 2010**
- **18.03% increase since 2019**
- **39.77% increase since 2023**

These chemicals produce GHG emissions when they leak from a system, and therefore, the emissions from refrigerants reported here represent the quantity of refrigerants that had to be replaced in Emory's HVAC equipment in fiscal year 2024. This can be quite variable from year-to-year, and there have been several substantive changes in data collection to improve the accuracy of reporting these emissions since 2022. Emory is instituting a refrigerant management and tracking system which will ensure uniform emissions reporting and reduce the number of emissions-causing refrigerant leaks on Emory's campus.

Fertilizer (21.75 MT CO_2e)

Fertilizer emissions include all organic and synthetic fertilizer used on Emory's campus, and emissions have changed by the following percentages:

- **13.10% increase since 2010**
- **412.97% increase since 2019**
- **41.69% increase since 2023**

Fertilizer emissions are the smallest emissions source at Emory, and fertilizer only produces nitrous oxide. However, as the reported global warming potential of this GHG increased, the emissions intensity of Emory's fertilizer use also increased (Appendix C). There have been inconsistencies in collecting fertilizer data in the past, including 2019, and OSI is investigating different data collection methodologies to streamline these efforts in the future and reasons for historic increases in the quantity of fertilizer used on campus. Emory could decrease its emissions from fertilizer by decreasing the volume of fertilizer used or using lower emission fertilizers.

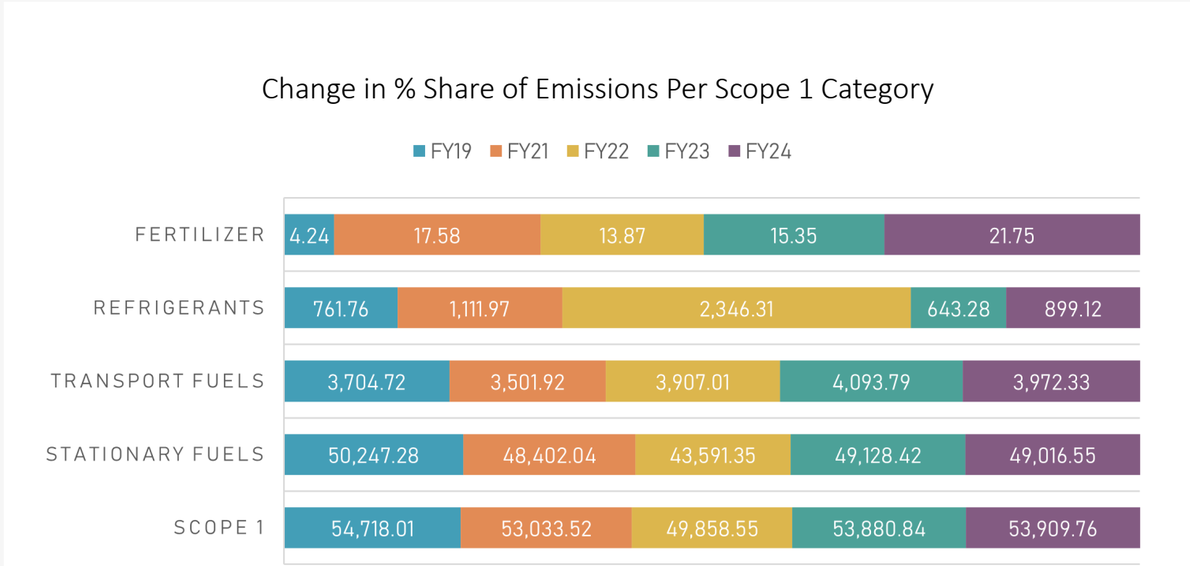

Figure 5. This chart shows the percent share of emissions for each Scope 1 emissions category in the GHG emissions inventory.

Scope 2 Emissions

The only source of Scope 2 emissions at Emory is the use of purchased electricity. Purchased electricity emissions occur where electricity is generated off-campus at utility facilities but are attributed to Emory as the end user of that energy. In 2024, they represented 39% of Emory's GHG emissions, which is a lower percentage than in 2023; however, purchased electricity remains the largest source of GHG emissions at Emory. In 2024, Emory was attributed 89,592 MT CO_2e from purchased electricity, and over time emissions from purchased electricity have changed by the following percentages:

- **50.48% decrease since 2010**
- **18.25% decrease since 2019**
- **7.75% decrease since 2023**

Purchased electricity remains the largest source of GHG emissions at Emory.

While purchased electricity emissions have steadily decreased year-to-year since 2010, with the exception of 2022 and 2023, purchased electricity remains Emory's largest source of GHG emissions and a reduction opportunity to meet its 2030 emissions goal. The expansion of Emory's on-campus solar development through solar power purchase agreements will continue to reduce Emory's purchased electricity emissions by eventually meeting 10% of Emory's peak electricity demand, but there remain gains to be made in investing in energy efficiency measures. These investments reduce Emory's demand for fossil fuel-produced electricity and increase the cost effectiveness of future renewable energy investments.

In addition to the emissions reported for electricity production, Emory also reduces FERA and T&D losses emissions. While these emissions are reported under Scope 3, they are both related to Emory's energy use, making reductions in Emory's energy demand an essential component of Emory's emissions reduction strategy.

Georgia Power's Integrated Resource Plan

Every three years, Georgia Power is required to file an Integrated Resource Plan (IRP) with the Georgia Public Service Commission (PSC), made up of five elected officials. The IRP outlines Georgia Power's estimates for energy demand within its service territory over the next 20 years, and its plans for meeting that demand. Following the approval of the IRP by the PSC, Georgia Power then submits a rate case, which determines what Georgia Power can charge its customers for electricity.

Since the IRP outlines how Georgia Power expects to meet electricity demand and the sources of electricity it will draw on, the IRP and subsequent hearings and litigation largely determine what the emissions intensity of Georgia Power's grid will be in the coming years, and therefore, its impact on GHG emissions for customers like Emory. In 2022, the PSC approved some emissions-reducing measures such as increasing utility-scale solar installations, retiring most of Georgia's remaining coal plants by 2028, and increasing energy efficiency programs. At the same time, the PSC approved power purchase agreements with other Southern Company subsidiaries that will increase the use of fossil fuels in Georgia Power's utility mix. In 2023, Georgia Power filed an off-schedule IRP to meet newly anticipated growth from entities like manufacturing and data centers, potentially creating a 17-fold load growth by 2031. While the PSC approved some GHG-reducing programs, Georgia Power received approval to further expand its fossil fuel capacity through power purchase agreements and new fossil fuel turbines impacting Emory's progress to will its 2030 goal through electrical grid-related GHG-emissions reductions.

Scope 3 Emissions

Scope 3 emissions are indirect emissions that are attributable to Emory's operations but do not fall under Scope 1 or 2. This Scope includes emissions from commuting, Emory-sponsored travel, study abroad travel, landfilled waste, wastewater, and other energy transmission and supply chain sources. In 2024, they represented 37% of Emory's GHG emissions and are close to becoming the largest scope of Emory's emissions. Scope 3 emissions were 83,413 MT CO_2e and have decreased by 1.77% from 2010 and increased 14.19% from 2023.

Air Travel (29,039.59 MT CO2e)

Air travel emissions include all air travel directly sponsored by Emory University. In 2024, SIMAP changed the calculation methodology for air travel to better align their methodology with methods used in the GHG accounting field. As a result, Emory's air travel emissions increased 50.44% from 2023, despite the number of miles flown increasing by 16.45% during the same period. Air travel emissions have changed by the following percentages:

- **152.18% increase since 2010**
- **60.98% increase since 2019**
- **50.44% increase since 2023**

Emory flew the second highest number of annual miles in 2024 since OSI began collecting GHG emissions data. Emory will need to institute campus-wide policies to reduce air travel emissions, especially now that these emissions account for almost 13% of Emory's GHG emissions. Such policies could include incentivizing lower emissions intensity travel for flights less than 300 miles and limiting the number of flights that campus departments can take that are over 2,300 miles.

Commuting (23,056.21 MT CO_2e)

Commuting emissions include emissions from all travel to and from Emory's campus for students, faculty, and staff. These emissions are estimated based on responses from Emory's annual transportation survey. Commuting emissions have changed for each campus population by the following percentages:

Staff (17,290.92 MT CO2e)

- **38.81% decrease since 2010**
- **44.42% increase since 2019 – until 2021 Healthcare staff were not included in the emissions inventory for commuting**
- **0.84% decrease since 2023**

Students (3,132.18 MT CO_2e)

- **4.99% increase since 2010**
- **26.49% decrease since 2019**
- **10.26% decrease since 2023**

Faculty (2,633.11 MT CO_2e)

- **20.70% decrease since 2010**
- **20.45% decrease since 2019**
- **23.18% decrease since 2023**

Scope 3 emissions have increased dramatically since 2021 and are close to becoming the largest scope of Emory's emissions.

Commuting emissions account for roughly 10% of Emory's total GHG footprint, and staff commuting alone accounts for 7.6% of Emory's total GHG emissions. Deciding how to commute to and from campus for work or class is one of the most important decisions individual community members can make to positively impact Emory's GHG emissions. Commuting emissions are a direct reflection of the individual behaviors of the Emory community. Attention is needed to refine the methodology for capturing commuting behaviors beyond the transportation survey used now, which is voluntary and may not reflect Emory's commuting behavior. Improved commuting data could facilitate the development of incentives and policies to decrease Emory's commuting emissions and achieve Emory's 2030 goal.

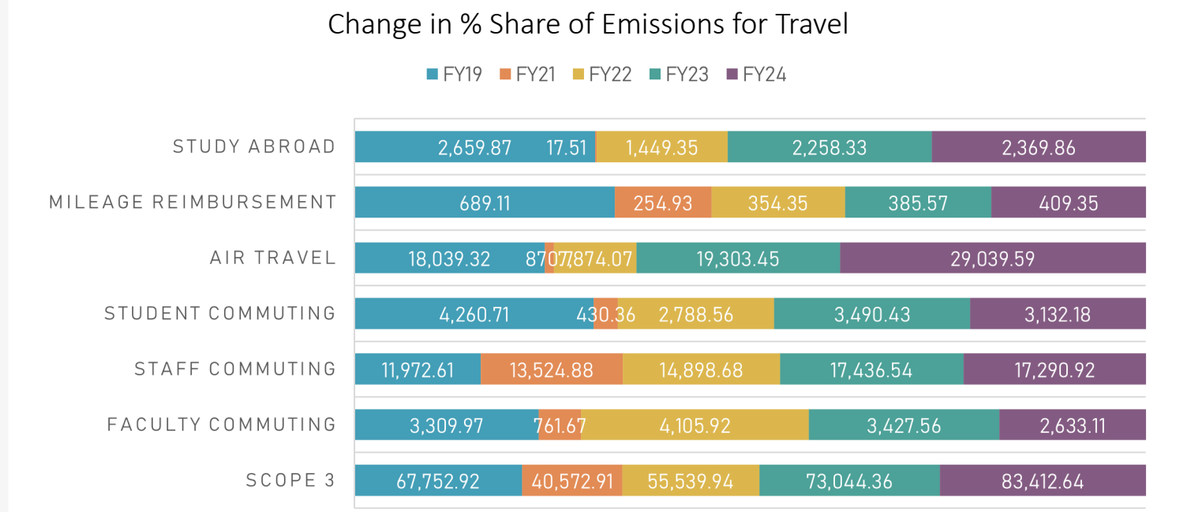

Figure 6. Travel is one of the principal drivers to changes in Emory's emissions from 2021 to 2024. This chart shows the percent share of emissions for travel for each travel type reported in the GHG emissions inventory.

Landfilled Waste (3,512.42 MT CO_2e)

Landfilled waste emissions include all the associated methane emissions produced at the landfills where Emory's waste is disposed of. Landfilled waste emissions have changed by the following percentages:

- There was an error in how landfilled waste was reported in the 2010 GHG emissions inventory, making comparisons difficult.
- **809.48% increase since 2019**
- **207.05% increase since 2023**

Emissions from landfilled waste have increased substantially in recent GHG emissions inventories for several reasons: 1) OSI added additional sources of landfilled waste emissions from Emory Healthcare to the GHG emissions inventory in 2024; 2) Emory's landfilled waste has increased since 2020; and Emory's new waste vendor distributed Emory's waste to a landfill that practices more emissions-intensive methane flaring rather than methane capture for energy generation.

There was sufficient information to include EHC's waste in the 2024 inventory for the first time since emissions tracking began in 2010. This inventory includes two of EHC's three landfilled waste streams, including municipal solid waste (MSW) and incinerated medical waste. Emory's autoclave medical waste was not included in this inventory because sufficient data was not available from Emory's vendor. This inventory accounts for roughly 5,800 tons of landfilled waste. While the inclusion of EUH drove most of the emissions changes for landfilled waste, the quantity of Emory University's MSW increased by 32% and emissions increased by 65% over the same period of time. To reduce landfilled waste emissions, Emory must ensure its waste management vendor disposes in landfills that capture methane for energy, and the Emory community must both decrease the amount of waste it produces and increase its recycling and composting rates.

Study Abroad (2,369.86 MT CO_2e)

Study abroad GHG emissions include all air travel for Emory-sponsored study abroad programs. Study abroad GHG emissions have changed by the following percentages:

- **33.72% decrease since 2010**
- **10.90% decrease since 2019**
- **4.94% increase since 2023**

These GHG emissions are calculated separately from Emory-sponsored business travel (as described above), because it is assumed by SIMAP that these are longer trips and are therefore multiplied by a lower emissions factor in alignment with EPA guidelines on measuring emissions for flights over 2,300 miles.

Other Emory-Funded Travel (409.35 MT CO_2e)

In addition to air travel, Emory measures the GHG emissions for all other sponsored travel which includes rail travel and mileage reimbursement. These other forms of travel have changed by the following percentages:

- **9.26% decrease since 2010**
- **40.60% decrease since 2019**
- **6.17% increase since 2023**

Rail travel and car travel have a significantly lower emissions intensity than air travel. As Emory develops policies and practices to reduce air travel emissions, these other forms of travel for domestic trips, as well as telecommuting and virtual meetings, will be critical to reducing overall emissions.

Wastewater (268.23 MT CO_2e)

Wastewater emissions include all emissions associated with the treatment of Emory's wastewater. Since Emory does not have meter data for wastewater, Emory uses the amount of potable water used minus the amount of water cycled through the WaterHub as a proxy measurement. Wastewater emissions have changed by the following percentages:

- There was an error in how wastewater was reported in the 2010 GHG emissions inventory, making comparisons difficult.
- **22.43% increase since 2019**
- **12.99% increase since 2023**

To decrease wastewater emissions, Emory will need to decrease the quantity of potable water used on campus both through behavioral change and water efficiency projects.

FERA & T&D Losses (24,756.98 MT CO_2e)

FERA and T&D losses emissions are associated with the production and transmission of energy. FERA (fuel- and energy-related activities) are the upstream emissions associated with the production of energy. T&D Losses are associated with the electricity lost during transmission and distribution of that electricity from Georgia Power's grid to Emory's campus. While Emory does not purchase this electricity, it is still attributable to Emory's GHG emissions since it is driven by Emory's demand for electricity. These figures are automatically calculated in SIMAP, and have changed by the following percentages:

FERA (19,854.79 MT CO_2e)

- **31.08% decrease since 2010**
- **2.32% decrease since 2019**
- **0.36% decrease since 2023**

T&D Losses (4,902.19 MT CO_2e)

- **56.16% decrease since 2010**
- **4.86% decrease since 2019**
- **9.81% decrease since 2023**

These two emissions sources account for 11% of Emory's emissions footprint and will continue to decrease as Emory reduces its demand for on-campus fossil fuels and purchased electricity.

Emory Healthcare Emissions Results

For the first time since measuring Emory's GHG emissions in 2010, Emory leadership made the decision to delineate Emory University emissions and Emory Healthcare emissions in this inventory. This has provided greater clarity on how these two parts of Emory's enterprise are driving emissions. EHC accounts for 27% of Emory's total GHG emissions footprint, producing a net quantity of 62,251 MT CO_2e in 2024. The largest sources of EHC's emissions are purchased electricity, stationary fuel, staff commuting, and landfilled waste. The EHC facilities included in the GHG emissions inventory include all facilities within the Clifton Corridor except for properties at 1817-1841 Clifton Road. Delineated emissions results were provided for stationary fuels, transportation fuels, purchased electricity, staff commuting, air travel, mileage reimbursement, waste, wastewater, T&D losses and FERA. The largest source of emissions from EHC, like Emory University, is purchased electricity. EHC produced a net quantity of 31,570 MT CO_2e, which is 35.24% of Emory's total purchased electricity emissions. The Emory Hospital accounts for 20% of Emory's electricity usage and corresponding emissions. This is unsurprising given the energy intensity of healthcare facilities but provides greater clarity on where reductions in energy usage will be the most feasible in the next five years.

EHC accounts for 27% of Emory's total GHG emissions footprint.

While purchased electricity is EHC's largest emissions source, EHC's landfilled waste is also notable because it represents a disproportionately large percentage of Emory's overall landfilled waste emissions. In 2024, EHC's landfilled waste accounted for 46.14% of Emory's total landfilled waste emissions. This percentage is likely to increase once EHC's autoclave medical waste stream is added into the emissions inventory. For EHC's other emissions sources, the breakdown of EHC's percentage share of Emory emissions within each emissions category is represented in the pie charts below:

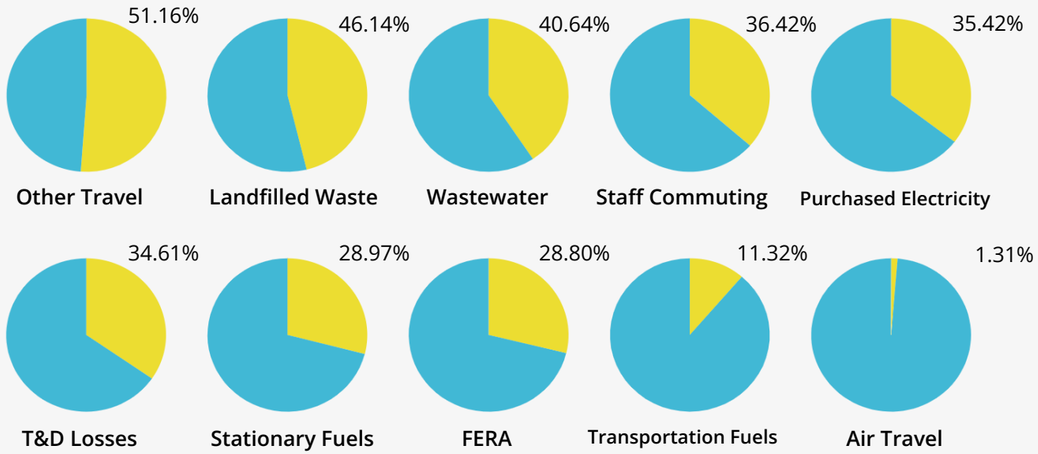

Figure 7. The pie charts show the proportion of total emissions for each category generated by EHC in yellow and the University in blue.

In light of Emory's 2030 emissions reduction goal, the results of EHC's emissions inventory highlight the importance of ensuring coordination between Emory's Office of Sustainability Initiatives and Emory Healthcare to streamline efforts to implement emissions reduction measures across Emory. Given the energy intensity of EHC's buildings, it will be critical to implement the same energy and water efficiency upgrades in these spaces as is practiced on Emory University's campus, such as reducing the energy intensity of labs and other comparable spaces. In addition, it is currently assumed Emory Healthcare staff have the same commuting behavior as Emory University staff, since the Emory transportation survey is not administered to EHC staff. Ensuring data collection across Emory's enterprise, and subsequently streamlined policy and programs interventions, is essential for achieving emissions reductions moving forward.

Progress on Emory's Climate Action Plan Recommendations

Two years after signing Second Nature's Presidents' Climate Commitment, Emory's Office of Sustainability Initiatives published its 2023 Climate Action Plan. This plan is recognized as a dynamic, living document and is intended to be responsive to changing technologies, policy conditions, and the integration of additional feedback from the Emory community. The 2024 GHG emissions inventory is the second to be completed since the publication of Emory's CAP, and while the results in this report do not address all the CAP goals, the following is a progress report on the initiatives relevant to the GHG emissions inventory.

GOAL

Analyze the impacts of aligning Emory's decarbonization pathway with the practices of the UN IPCC by adopting a 2019 emissions baseline for all future emissions inventories.

PROGRESS

In the UN IPCC's Sixth Assessment Report on Climate Change, published in 2023, the UN IPCC changed the baseline for its emissions reduction scenarios from 2010 to 2019 to reflect peak global GHG emissions. In doing so, the IPCC advocated for accelerating interim emissions goals even though the percent reduction figures stayed the same from the 2018 report and it did not clearly call for a change in the baseline reporting year from 2010 to 2019. By changing the baseline year for future emissions inventories and goal setting from 2010 to 2019, Emory would commit to more rapid decarbonization this decade, which the IPCC has advised is critical to achieving net-zero emissions by 2050 and stabilizing global temperature increases to 1.5 °C of warming. To reach a 50% reduction from a 2019 baseline, Emory's emissions must be less than or equal to 116,000 MT CO_2e, a 110,914 MT CO_2e reduction by the end of the decade (as opposed to a 58,518 MT CO_2e with a 2010 baseline). Given Emory's current decarbonization pathway, it seems unlikely Emory could achieve this more ambitious goal without additional investments in RECs or carbon offsets.

GOAL

To fulfill Emory's commitment to the UN Race to Zero pledge, it must adopt an interim goal of 50% emissions reductions by 2030.

PROGRESS

As of 2024, Emory has achieved a 32.62% reduction in total GHG emissions since 2010. For Emory to achieve its 50% reduction goal by 2030, it must reduce emissions by 9,753 MT CO_2e annually to reach its emissions goal of 168,397 MT CO_2e or achieve the goal with the use of RECs and/or carbon offsets.

GOAL

Incorporate more elements of Emory's enterprise into annual emissions inventories and climate action planning.

PROGRESS

While an expansion of Emory's' campus boundary would increase its current GHG emissions, these emissions are attributable to Emory's operations regardless of whether they are included in the inventory. For the first time, this GHG emissions inventory delineated University and EHC emissions to better understand how different elements of Emory's enterprise are driving changes in GHG emissions, and this analysis should be repeated in all future inventories.

GOAL

Prioritize energy efficiency in all campus buildings and operations.

PROGRESS

Decreasing Emory's demand for energy through improved energy efficiency is an essential strategy for Emory to reach its 2030 reduction goal. Emory is striving to achieve a 25% reduction in total energy consumption, and as of 2024, total energy consumption had decreased by 16%. The two primary programs Emory uses to increase campus energy efficiency are building recommissioning and Emory's Sustainable Performance Program (SPP) (Appendix C). Through recommissioning, buildings achieve an average 29% reduction in energy use. This program not only reduces demand for purchased electricity but also decreases the quantity of renewable energy required to offset emissions from electricity use. Expanding the SPP to EHC buildings would advance Emory's progress towards its GHG emissions reduction goals.

GOAL

Investigate hot water rather than steam and using alternative fuel for Emory's steam plant.

PROGRESS

Combined, the use of natural gas and fuel oil makes up 21.6% of Emory's emissions. These energy sources are primarily used to operate Emory's five 100,000 pound/hour steam boilers, which produce steam to heat Emory's buildings (Appendix C). At present, few significant emissions-reducing changes have been made to Emory's steam plant operation. Increases in energy efficiency and a change in operations in Emory's steam plant will be necessary to reduce Emory's Scope 1 emissions.

GOAL

Continue installation of on-site renewable energy.

PROGRESS

Since 2019, Emory's solar production has increased by 1,039%, and these arrays have a combined capacity of over 4 MW. Emory is continuing installation of 5.5 MW of on-campus solar with a goal of generating 10% of Emory's peak energy demand. This solar could reduce Emory's annual GHG emissions by 4,200 MT. For the first time since 2021, Emory's purchased electricity emissions and electricity consumption decreased in 2024.

GOAL

Decrease the greenhouse gas emissions from Emory's fleet and shuttle systems, including conducting an analysis to understand the causes of Emory's increasing transportation emissions.

PROGRESS

While transportation fuels for Emory's fleet and shuttle systems have increased since 2010, the quantity of fuels used and the corresponding emissions from these fuels both decreased in 2024 compared to 2023. This is the first year-to-year reduction since 2021. The amount of transportation fuels used decreased at a faster rate than emissions, indicating further analysis is needed into the types of fuels used at Emory. Emory's shuttle system is a critical resource in reducing commuting emissions. To maximize the benefits of Emory commuters using Emory's shuttle system, Emory should expand the use of less emissions-intensive fuels and continue its transition to a hybrid/electric fleet.

GOAL

Accelerate efforts to add electric vehicle charging stations to campus and maximize electrification of Emory's Shuttle System.

PROGRESS

Emory currently has 21 electric vehicle charging stations for commuter vehicles and installed six chargers for six electric commuter buses in Fall 2023. While expanded electric vehicle charging on campus will increase Emory's consumption of electricity, this is less carbon intensive than other transportation fuels.

GOAL

Investigate opportunities to decrease emissions from staff, student, and faculty commuting.

PROGRESS

At present, commuting accounts for 10% of Emory's GHG emissions. For Emory to reach its 2030 goal, it is critical to reduce commuting emissions, particularly for staff, the group with the largest carbon footprint for commuting of all three campus populations. Commuting decreased for all three commuter populations from 2023 to 2024; however, there were decreases in reported ridership of Emory's shuttle system and increases in the number of reported individual car trips for both staff and students. Emory is exploring options for more accurately gathering commuting data for staff and faculty, so future inventories may see significant changes in commuting emissions.

GOAL

Consider options for minimizing or neutralizing carbon emissions from Emory-sponsored travel.

PROGRESS

While travel emissions decreased during the COVID-19 pandemic, Emory has now exceeded 2019 business-as-usual air travel, reporting the second highest number of miles flown within a fiscal year since beginning emissions inventories in 2010. Emory traveled over 51.75 million miles in 2024, a 16.45% increase from 2023. 52 million miles is equivalent to going around the Earth's equator 2,100 times. Emissions from air travel increased almost 30%, due to both an increase in miles flown and a change in the calculation methodology for air travel (Appendix C). It is imperative that Emory consider policy changes and incentives to minimize the number of Emory-sponsored miles flown, particularly for flights over 2,300 miles which are the largest driver of Emory's air travel emissions. While these flights represent 35% of trips taken, they represent 71% of Emory's air travel emissions. Emory should consider developing carbon travel budgets for departments or adopting incentives for rail or car travel for domestic trips to reduce both emissions and operational costs. Nearly 50% of the flights taken in 2024 were either to attend or speak at conferences.

Emory traveled over 51.75 million miles in 2024, a 16.45% increase from 2023.

GOAL

Minimize Emory campus and healthcare waste sent to landfills.

PROGRESS

Emissions from landfilled waste increased over 200% in 2024, which was primarily due to the addition of two of EUH's three landfilled waste streams, including municipal solid waste and incinerated medical waste. While the inclusion of EUH waste drove the emissions increase for landfilled waste, the University's landfilled waste also increased from 2023 to 2024. University landfilled waste emissions increased by 65%, and the quantity of waste increased by 32% over the same period. Roughly 5,800 tons of waste was reported in the 2024 emissions inventory. Emory has engaged a new waste management vendor in 2025, and Emory leadership is hopeful that this change will result in increased waste diversion in future inventories and the use of landfills that capture methane for energy.

Looking Ahead to 2050

In conclusion, Emory must begin to achieve steady emissions reductions from now through fiscal year 2030 to reach its 50% reduction goal. If Emory's emissions continue to increase at current 2024 rates, Emory will only achieve a 27% emissions reduction by 2030 (without the inclusion of RECs), far short of its 50% goal. For every year that Emory's emissions continue to increase or remain constant, the higher the rate of emissions reductions will need to be in subsequent years and the smaller the impact Emory's REC investment will be. In addition, while Emory's current REC investment will be instrumental in reducing Emory's Scope 2 emissions through 2050, Emory must reduce Scope 1 and Scope 3 emissions, as well as any outstanding Scope 2 emissions, to reach net-zero emissions by 2050.

In addition, Emory will need to begin to prepare to expand its Scope 3 emissions reporting according to its 2023 Climate Action Plan. Within the last few years, SIMAP has updated their reporting methodologies to account for all 15 categories of Scope 3 emissions, as recommended by the GHG Protocol. Currently, Emory reports emissions within four of these categories. Emory has been exploring the possibility of expanding its Scope 3 emissions reporting, alongside other higher education institutions and industries. If Emory expands its Scope 3 reporting in the near future, its total emissions will increase and thereby impact the rate of emissions required to reach its emissions reduction targets. Regardless of whether these emissions are reported, they are still attributable to Emory's operations. Emory has always reported more of its Scope 3 emissions than required by Second Nature by reporting its landfilled waste and wastewater emissions. By expanding its Scope 3 reporting, particularly for Categories 1 & 2, which would account for Emory's purchasing of goods and services, such as food purchases, and the embodied carbon from construction activities, Emory would be continuing its commitment to be a national leader in campus sustainability and adhering to industry best practices in accountability and transparency.

As outlined by the IPCC, it is imperative that all governments, businesses, institutions, and individuals reach net-zero emissions by 2050 to protect the most vulnerable people and ecosystems on Earth from catastrophic climate impacts. Emory, and every individual that makes up the Emory community, has a responsibility to act and the potential to create meaningful change.

Appendix A: GHG Emissions Tables

Table 1. Total GHG Emissions (MT CO_2e)

Emission Type	Total Emissions	Healthcare Emissions	University Emissions
Total	226,914.81	62,250.91	164,663.90
Scope 1	53,909.76	14,648.65	39,261.11
Scope 2	89,592.42	31,569.92	58,022.50
Scope 3	83,412.64	16,032.34	67,380.30
Stationary Fuels	49,016.55	14,198.95	34,817.60
Transport Fuels	3,972.33	449.7	3,522.63
Refrigerants	899.12	-	899.12
Fertilizers	21.75	-	21.75
Purchased Electricity	89,592.42	31,569.92	58,022.50
Faculty Commuting	2,633.11	-	2,633.11
Staff Commuting	17,290.92	6,297.82	10,993.10
Student Commuting	3,132.18	-	3,186.06
Air Travel	29,039.59	380.57	28,659.02
Other Travel	409.35	209.44	199.91
Study Abroad	2,369.86	-	2,916.64
Waste	3,512.42	1,620.73	1,891.69
Wastewater	268.23	109.02	159.21
T&D Losses	4,902.19	1,696.59	3,205.60
FERA	19,854.79	5,718.17	14,136.62

Table 2. Percent Reductions

In the table on page 34, blue boxes indicate a reduction in emissions, and red boxes indicate an increase in emissions. The purpose of this table is to show the following emissions comparisons:

- **FY24-FY10:** compares FY24 to FY10 to show the total reduction in emissions since the baseline year and long-term progress towards Emory's carbon neutrality goals
- **FY24-FY19:** compares FY24 to FY19, Emory's most recent pre-COVID-19 pandemic inventory, to show progress towards Emory's 2030 reduction goal
- **FY24-FY23:** compares FY24 to FY23 to show year-to-year changes in Emory's emissions

Emission Type	Total Emissions	Healthcare Emissions	University Emissions
Total	32.62	2.19	-1.28
Scope 1	24.23	1.48	-0.05
Scope 2	50.48	18.25	7.75
Scope 3	1.77	-23.11	-14.19
Stationary Fuels	17.45	2.45	0.23
Transport Fuels	-111.75	-7.22	2.97
Refrigerants	90.92	-18.03	-39.77
Fertilizers	-13.10	-412.97	-41.69
Purchased Electricity	50.48	18.25	7.75
Faculty Commuting	20.70	20.45	23.18
Staff Commuting	38.81	-44.42	0.84
Student Commuting	-4.99	26.49	10.26
Air Travel	-152.18	-60.98	-50.44
Other Travel	9.26	40.60	-6.17
Study Abroad	33.72	10.90	-4.94
Waste	Historic Errors	-809.48	-207.05
Wastewater	Historic Errors	-22.43	-12.99
T&D Losses	56.16	4.86	9.81
FERA	31.08	2.32	0.36

Table 3. Percent Reductions in Usage by Emissions Activity

This chart shows changes in the usage of data inputs for each GHG emission source. Comparing the usage of emissions sources can provide insights into what is driving emission reductions and increases. For all categories, except solar, blue represent a decrease in usage, which should correlate with a decrease in emissions. For solar, an increase in solar production is marked in blue since an increase in solar should result in a decrease in Scope 2 emissions.

Emissions Activity	FY24-FY10 (%)	FY24-FY19 (%)	FY24-FY23 (%)
Natural Gas	15.14	3.41	0.19
Distillate Oil	62.72	-99.73	2.25
Solar	-	-1,039.07	-23.73
Transportation Fuels	-89.40	0.71	4.51
Fertilizer	0	-114.15	-27.32
Refrigerant	76.47	-16.67	-48.31
Purchased Electricity	10.23	-0.68	4.39
Faculty Commuters	-26.23	-27.15	0.08
Staff Commuters	28.11	-115.41	-4.57
Student Commuters	36.89	26.03	2.86
Mileage Reimbursement	-6.40	33.70	-12.83
Rail Travel	-	-	30.33
Air Travel	-136.70	-24.16	-16.45
Study Abroad Miles	20.97	12.39	-3.19
Waste	-	-57.92	-163.61
Wastewater	-	-19.90	-10.65

Appendix B: Understanding Greenhouse Gas Emissions

Greenhouse Gases

Greenhouse gases are gases that trap heat in the atmosphere. While these gases, with the exception of hydrofluorocarbons, are naturally occurring in the atmosphere, human activities over the last ~150 years have increased the concentration of these gases in the atmosphere. This in turn leads to an increase in global temperatures, also known as anthropogenic climate change. The primary sources of human-caused greenhouse gas emissions are the burning of fossil fuels (coal, oil, and gas) for energy and transportation. Carbon dioxide, methane, and nitrous oxide account for 82% of present-day warming worldwide.

Some greenhouse gases are more effective at trapping heat in the atmosphere than others. The most common anthropogenic emissions source is carbon dioxide, with carbon dioxide accounting for 79% of all U.S. GHG emissions. To compare and measure total GHG emissions, not just carbon dioxide, all greenhouse gases are converted into their carbon dioxide equivalent. For example, methane has a global warming potential (GWP) of 27, meaning one pound of methane emissions is equivalent to 27 pounds of carbon dioxide emissions. One pound of methane emissions is therefore denoted as 27 lb. CO_2e.

1.5 °C Temperature Target

To mitigate the worst impacts of climate change and protect the world's most vulnerable populations, global warming must stabilize at 1.5 °C this century.[2] This is not to say there are no climate change impacts for warming below the 1.5 °C threshold. To date, global temperatures have increased between 1.1-1.2 °C, which has already caused widespread global impacts. In 2024, global temperatures did hit 1.5°C of warming, but the long-term average of global warming is still between 1.1-1.2 °C. These temperatures relate to the increase in global mean surface temperature – it is expected that some regions, particularly around the poles will reach 3.0°C of warming even if the global mean is 1.5°C. Preventing every tenth of a degree of warming is critical for protecting human well-being and preserving the health of the planet.

2. Global Warming of 1.5 °C (IPCC – 2018)

Appendix C: Methodology

GHG inventories quantify GHG emissions and are used by a range of stakeholders to identify baseline emissions, track reductions, and inform future decarbonization planning. All base figures for calculations, graphs, charts, and tables in this report were generated through SIMAP (Sustainability Indicator Management and Analysis Platform), and all figures were generated in Excel. SIMAP was chosen for this report because it is an emissions calculator specifically designed for higher education institutions and the GHG reporting platform used by Second Nature for the Presidents' Climate Commitments reporting requirements. SIMAP utilizes an activity-based approach which calculates GHG emissions by multiplying the driver of a GHG producing activity, such as gallons of fuel used, by an emissions factor to calculate the corresponding GHG emissions.

SIMAP updates its emissions factors and Global Warming Potential (GWP) factors annually, utilizing data from the UN IPCC, Climate Registry, Greenhouse Gas Registry, and the U.S. Environmental Protection Agency, which includes the following changes for the 2024 inventory:

- **Emissions Factors Version 2024:** most of the emissions factors included within SIMAP are from the 2024 GHG Emission Factors Hub. EPA publishes these emissions factors annually, and SIMAP updates their emissions factors accordingly.
- **Global Warming Potential Version AR6 100-year:** the GWPs figures were updated to reflect the most recent figures from the UN IPCC on the 100-year impact of the impact of GHGs. The two major changes include the delineation of methane for non-fossil and fossil fuel sources of methane; and an increase in the GWP of nitrous oxide emissions. The IPCC also publishes the GWP for refrigerants.
- **Radiative Forcing Factor:** emissions from air travel are multiplied by a radiative forcing factor of 2.7 to account for the higher GWP from emissions released at higher altitudes.
- **Scope 2 Market-Based:** Emory updated its calculations for Scope 2 emissions from Location-Based to Market-Based in 2021 in accordance with the reporting requirements of Second Nature. Both approaches account for regional fuel mixes, meaning that regions with less renewable energy in their grid mix will have higher Scope 2 GHG emissions. The market-based approach allows an institution to account for any renewable energy purchased or sold by the institution. This will enable Emory to account for the retirement of Renewable Energy Credits (RECs) in future emissions inventories. In addition, OSI has continued to use Georgia-specific emissions factors for Scope 2, as published by the EPA.

This inventory was completed by a third-party consultant with internal support from Emory's OSI staff.

Emissions Sources and Scopes

Emory's emissions are largely from carbon dioxide (CO_2). Methane (CH_4), nitrous oxide (N2O), and hydrofluorocarbons (HFC) emissions represent only a small percentage of Emory's total inventory.

GHG calculations are delineated as either direct emissions sources (which are owned or operated by Emory) or indirect emissions sources (which are not owned or operated by Emory but are a result of Emory's operations). Emissions sources are further categorized by means of three different scopes:

- **Scope 1** includes all direct GHG emissions from sources owned or maintained by Emory. For example, Scope 1 emissions include burning fuels in Emory's boilers and operating fleet vehicles. Scope 1 emissions occur on Emory's campus.
- **Scope 2** includes all indirect GHG emissions from electricity purchased by the institution. Scope 2 emissions physically occur at the facility where electricity is generated but are attributable to Emory as the end user of the product.
- **Scope 3** includes all other indirect emissions. Scope 3 emissions are attributable to Emory's operations but are from sources outside the definitions of Scopes 1 and 2. At present, Emory reports Scope 3 emissions from Emory-funded travel; study abroad; student, facility, and staff commuting to Emory; and wastewater and landfilled waste generated by Emory. SIMAP also automatically calculates the emissions for transmission and distribution (T&D) losses and fuel- and energy-related activities (FERA).

Inventory Boundary & Timeframe

GHG emissions for this inventory are collected for the main campus of Emory University and Emory Healthcare located in the Druid Hills neighborhood of Atlanta, Georgia. This inventory includes in its scope all Emory buildings located on and around Clifton Road, the Briarcliff campus, the Clairmont Campus, and Emory National Primate Research Center. Healthcare facilities included are the Emory University Hospital and its adjacent buildings, Emory Clinic A, Emory Clinic B, the Winship Cancer Institute, the 1525 Clinic, and the Emory Rehabilitation Hospital. A university and a healthcare system have very different building requirements and energy demands, and it is rare for a university to include its healthcare system within its GHG emissions inventory, as Emory does.

All data are reported for fiscal year 2024, which ran from September 1, 2023 to August 31, 2024.

Utilities

Roughly 61% (down from 70% in the 2023 inventory) of the emissions in this inventory come from stationary fuels and purchased electricity, which together provide the energy necessary to operate Emory's buildings. This percentage does not account for FERA and T&D losses emissions, even though they are associated with Emory's energy usage, since they refer to indirect emissions associated with energy use, and this section focuses on Emory's direct energy emissions sources. For the purpose of this inventory, water usage is not included in this calculation because SIMAP only accounts for purchased chilled water, and Emory creates its own chilled water via electric water chillers. Emory's campus receives utilities from external sources through several electric, natural gas, and domestic water systems. As of 2024, Emory produced 5,014,976 kWh of solar power on campus – a 1,039% increase from 2019. In 2020, Emory began installation of 15,000 panels totaling 5.5 MW which will have the capacity to generate 10% of Emory's peak electricity demand and reduce emissions by 4,300 MT annually.

Emory operates a 500,000 pound/hour steam plant and three central chilled water plants to provide cooling, heating, and plug and process load energy to over 100 buildings. Plug and process loads are energy loads that are not related to general lighting, heating, ventilation, cooling, and water heating, and that typically do not provide comfort to occupants. Five large natural gas fired boilers in the central steam plant distribute steam throughout steam mains to buildings. The steam produces hot water and hot air for water heating and building comfort. The boilers recover energy from exhaust steam and control the amount of unburned oxygen to maximize energy efficiency. In 2016, a steam-turbine generator, which is part of a cogeneration/combined heat power (CHP) system utilizing the existing mechanical heat from the natural gas boiler, became operational. The heat is captured, generating a higher-pressure steam that turns a turbine that improves the efficiency of Emory's energy use. This system has the capacity to provide an additional 1 MW of electricity for the same level of natural gas usage. This electrification of energy systems is a critical pathway to carbon neutrality, since electricity can be produced from carbon-free sources, whereas there are no carbon-free alternatives for natural gas and other heating oils. At the time of this inventory, the cogeneration facility was undergoing repairs and therefore not included within the inventory.

In 2019, a system of 400-foot-deep geothermal wells were dug in nearby McDonough Field to provide 700 tons of heating and cooling capacity to the LEED Platinum-certified Emory Student Center. This system is not directly reported in the GHG emissions inventory since geothermal does not generate power. Instead, this system is indirectly reported through reductions in stationary fuel and purchased electricity usage.

Three chilled water plants use electrical centrifugal water chillers to produce 42°F chilled water. The chilled water is distributed to buildings through buried chilled water mains where it is used to dehumidify and cool the air. Some cooling is required year-round to dehumidify outside air before it is circulated to the interior area of buildings, which is then re-heated for occupant comfort. Heat absorbed from buildings is dissipated using evaporative water-cooling towers located outside the chiller plants.

Steam and chilled water loads have decreased as a result of a temperature control policy and weekend, evening, and holiday building shutdowns. A LEED Silver minimum requirement for all new construction and complementary Emory Sustainable Performance Program are major drivers of EUI reductions for Emory and result in energy efficiency and optimization.