

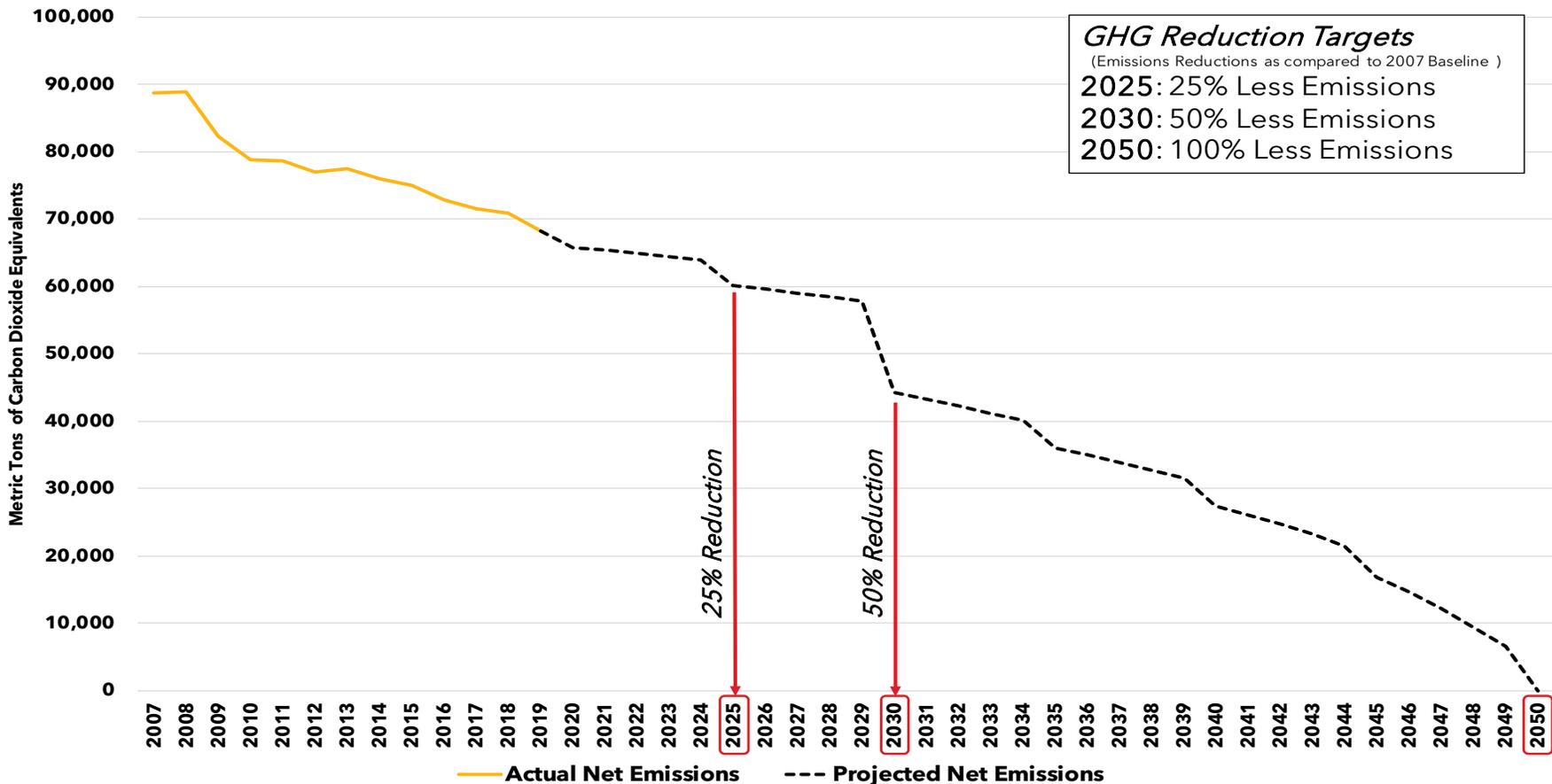
University of Maryland, Baltimore County

2020 Climate Action Plan



2050 Net-Zero Emissions

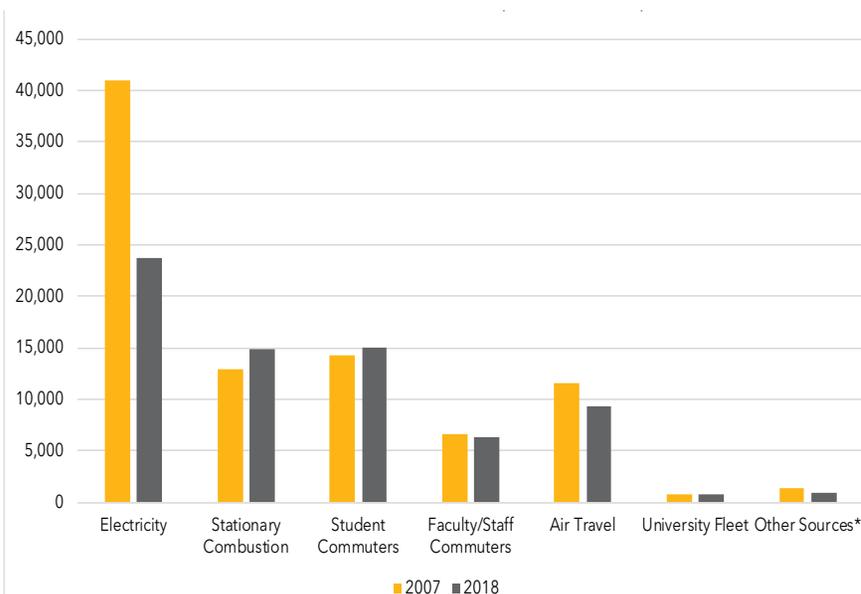
The 2020 UMBC Climate Action Plan (CAP) provides a road map for a continuous reduction of UMBC's greenhouse gas (GHG) emissions, towards **a goal of net-zero greenhouse gas emissions by 2050**, while improving UMBC's ability to adapt to a changing climate. Since 2007, UMBC has reduced net emissions by 20 percent while the campus has increased in size. The 2020 CAP summarizes strategies to continue to further reduce UMBC's emissions. While acknowledging that achieving net-zero emissions may have to come from the procurement of carbon offsets. However, as technology progresses there may be alternative emission reduction options to allow UMBC to meet its goal of net-zero emissions more efficiently. For additional information please visit CAP.UMBC.EDU



UMBC’s carbon footprint includes two energy components: electricity consumption (34% of 2018 emissions) and stationary combustion of natural gas (21% of 2018 emissions). Moving forward, there is still much more work to be done to achieve UMBC’s ultimate goal of carbon neutrality, *i.e.*, net-zero GHG emissions by 2050.

UMBC’s net-zero energy plan consists of four strategies: 1) Reduce energy consumption, 2) Increase the percentage of electricity coming from renewable energy sources to 100% by 2050, 3) Increase campus engagement efforts to effect behavioral changes, and 4) Offset any remaining GHG emissions via carbon offsets by 2050.

Successful execution of the net-zero energy plan through operational improvements, behavioral changes, efficiency upgrades, technological breakthroughs, strategic investments, and carbon offsets have the potential to stop new emissions and reduce existing emissions.

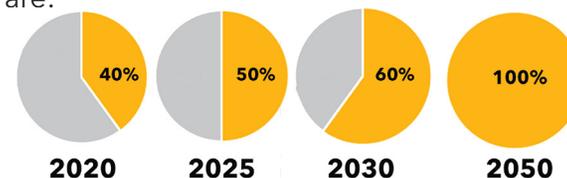


*Other Sources of emissions include: Solid Waste, Refrigerants, and Agriculture

1) Energy conservation is a key strategy for reducing energy consumption and emissions. By enhancing ongoing conservation initiatives and introducing new programs, UMBC has the ability to **avoid 12,000 MTeCO₂ of new annual emissions**. Key strategies include:

1. Deploy continuous HVAC improvements, 2. Implement new conservation strategies, *i.e.* building analytics, 3. Smart growth via improved space utilization and energy-efficient new construction, and 4) Implementation of more LED technology.

2) Increase UMBC’s percentage of renewable energy through the strategic procurement of wind and solar energy. UMBC will continue to explore options for onsite renewables, seeking a cost-effective blend of renewable energy procurement. The ultimate renewable energy goal is to increase from the current level of 33.3% to 100% of campus electricity from renewable energy sources; thus achieving **net-zero electricity**. The interim goals for renewable energy sourcing are:



3) Increase campus engagement efforts to catalyze energy saving practices.

4) Eliminate the carbon footprint attributed to stationary combustion of natural gas and fuel oil. After stationary combustion is reduced as much as reasonably possible, the ultimate stationary combustion goal is to offset all remaining GHG emissions via carbon offsets by 2050. Doing so, UMBC will achieve **net-zero stationary combustion**.

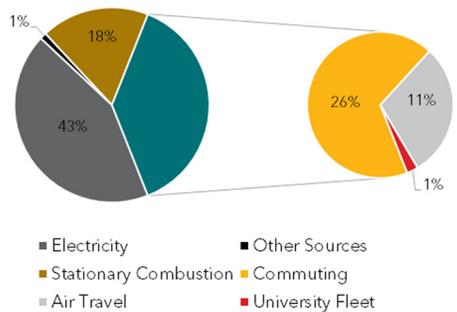
20% Reduction in Carbon Footprint from 2007 to 2018.

Transportation

Transportation GHG emissions arise from burning fossil fuels primarily for cars, trucks, buses, and commercial aircraft. Transportation, UMBC's second leading contributor of emissions, generated an estimated 31,400 metric tons of carbon dioxide equivalent (MTeCO₂) which accounts for over 44% of GHGs.

UMBC has reduced MTeCO₂ contributions from transportation by 6%, since 2008, through a reduction in sanctioned air travel, expansion of the transit system, and upgrades to higher-efficiency vehicles. Additional measures are focused on multi-modal transportation and EV infrastructure. Achieving further transportation GHG reductions is possible by focusing on increasing the efficiency of vehicles, changing travel habits, and purchasing carbon offsets for unavoidable GHG emissions.

Net Carbon Emissions by Major Source (Metric Tons)



UMBC's 177 **vehicle fleet contributes less than 3% of transportation's GHG emissions**; however, its composition, use, and practices are completely in the control of the university. UMBC's plan for fleet vehicle carbon is to move forward with these readily implementable strategies.

1. Reduce the number of miles traveled.
2. Replace older vehicles with, newer, more fuel-efficient vehicles.
3. Reduce or eliminate vehicle idling.
4. Purchase carbon offsets.

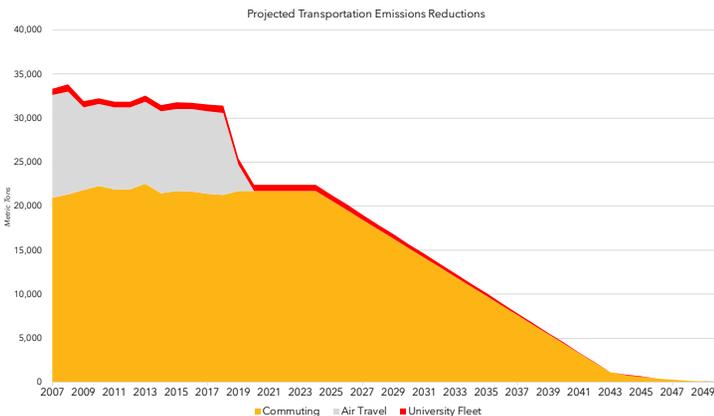


In FY 2018 **12.4 million miles of air travel** were completed by faculty, staff, and students while conducting university business. Strategies to be employed by UMBC to eliminate the impact of university related air travel are:

1. Encourage replacing air travel, when feasible, with virtual meetings.
2. Substitute lower emitting travel alternatives for air travel.
3. Explore a flight surcharge to purchase carbon offsets.

In FY 2018, **12,090 commuters contributed nearly 21,400 metric tons MTeCO₂** traveling to and from UMBC, mostly in single occupancy gas-and diesel-powered vehicles. To eliminate commuting's contribution to emissions UMBC proposes:

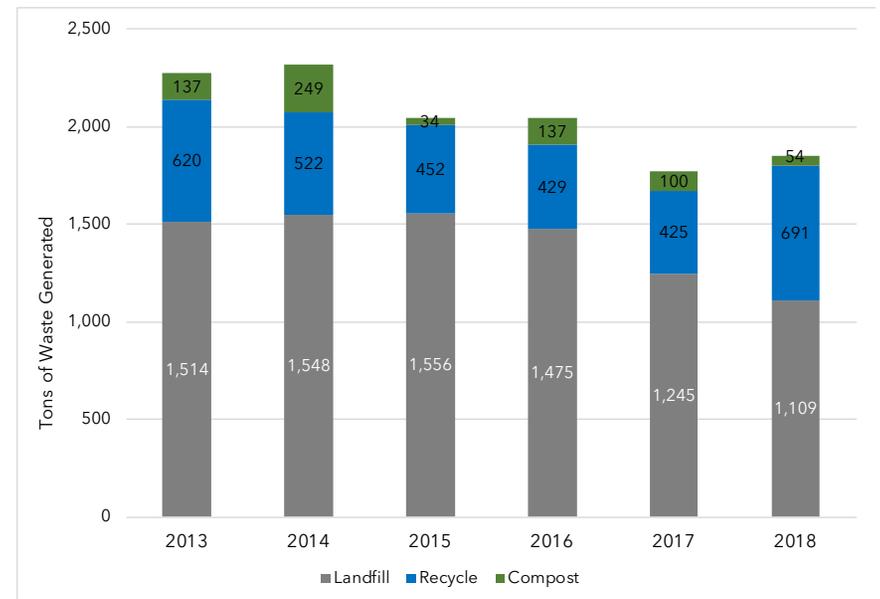
1. Explore commuting alternatives to reduce reliance on single-occupancy vehicles.
2. Provide on-campus sustainable transportation options.
3. Incentivize the use of fuel-efficient personal vehicles.
4. Reduce the number of weekly required trips.
5. Purchase carbon offsets.



Emissions associated with waste, specifically materials sent to the landfill, account for less than one percent of UMBC's emissions. UMBC is exploring a waste management strategy that **prioritizes waste reduction and increases organic waste diversion.** Diverting seven tons of waste from a landfill correlates to a carbon reduction of one metric ton.

In order to achieve our waste reduction goals, UMBC will investigate opportunities to **work with contracts and vendors to reduce waste** associated with purchasing, shipping, and receiving. Additionally, UMBC is considering strategies and practices to **increase the amount of food waste that is destined for composting.**

For every 7 tons of trash not land-filled, 1 metric ton of carbon emissions is reduced.



Academics & Engagement

UMBC's extensive record of incorporating climate change and environmental research into the academe has greatly influenced our climate action plan. UMBC's key research themes comprise Environmental Sciences and Engineering, especially Atmospheric Physics, Remote Sensing and Contaminant Remediation; Life Sciences & Biotechnology, including Marine Biotechnology and Health Sciences; as well as Health Equity, Policy Studies and Public Humanities and Art. These educational and research hubs, collaborate with various partners, to focus on issues related to climate change ranging in scale from local to global. UMBC recognizes that the study of climate, and more broadly sustainability, presents an interdisciplinary opportunity for students and faculty to incorporate basic environmental literacy into their discipline. **UMBC offers over 130 courses, in 34 different academic disciplines, which provide sustainability-learning opportunities** at both the undergraduate and graduate levels. Furthermore, the university is home to many clubs and organizations focused on a diverse range of issues related to sustainable stewardship.



UMBC will explore opportunities to **increase environmental literacy across the curriculum.** The proposed curricula would delve more deeply into the scientific, economic, governance, engineering, social, and ethical challenges that climate change and sustainability pose. Additionally, UMBC will investigate the feasibility of **developing and expanding program offerings designed for undergraduate and graduate students wanting to pursue professional careers in sustainability management.**

UMBC's new masters program, ICARE, focuses on developing a more diverse environmental science workforce.



Climate resiliency is the ability for UMBC to prepare for, adapt to changing conditions, withstand, and recover rapidly from disruptions. UMBC recognizes that a changing climate in the mid-Atlantic will have an impact on our campus. The best available scientific modeling projections indicate that as the century progresses **Maryland will generally experience a warmer and wetter climate.** As the campus continues to grow in the future, there will be opportunities for UMBC to improve its infrastructure and bolster adaptive capacity to the challenges of climate change.

CLIMATE CHANGE IMPACTS:

-  **Increased frequency and duration of severe storms**
-  **Warmer and wetter winters**
-  **Hotter and drier summers**

By 2040, the avg. maximum daily temp. is expected to rise by 3°F.

UMBC used the 100 Resilient Cities Climate Change framework for an initial look at the existing adaptive capacity and resilience of our natural, built, and socio-economic systems. Opportunities to increase our resilience within the context of the natural environment include increasing surveillance and mitigation of invasive species, maintaining and promoting biodiversity of native species and a better understanding of the campus' ambient air quality. Potential resilience initiatives within the built environment include increasing and maintaining robust contingencies for critical

systems, hardening of campus infrastructure to mitigate risks, understanding how increased flooding of Baltimore City will affect campus transit and



commuters. Finally, UMBC may be able to improve the resilience of socio-economic systems through evaluating supply chains of critical goods and services, ensuring that vulnerable campus populations have access to resources, and deploying alternative technologies and strategies to support our academic mission.

