Mass General Brigham

Our Progress, Our People

Sustainability Impact Report

From our Chief Financial Officer

Two years ago, we issued our inaugural Sustainability Impact Report and reaffirmed our institutional mission: to protect and enhance the health of our community by addressing its most pressing challenges. Among these is climate change, a crisis that continues to disproportionally affect the most vulnerable and underserved. Today, we offer an update highlighting key areas of progress, successful new programs, and emerging innovative collaborations aimed at mitigating the health effects of climate change and reducing our own contributions to it.

Now, as then, we must acknowledge these efforts represent a journey, not a destination. Success will be measured in years and decades, rather than weeks and months. Though progress takes time, we are confident in our success because we are bringing to bear our most powerful and valuable resource to confront this enormous challenge: our people, 80,000-strong.

It's not an exaggeration to say that each of these individuals, wherever they work, plays a vital role. Some strive to envision and launch large-scale, impactful initiatives, from how we construct our clinical buildings to how we purchase and use energy. Others lead and implement changes in our clinical, operational practice, and research, evolving the way we work to reduce our own impact on the environment. Just as important, they are joined by countless others who think, act, advocate and contribute in small but meaningful ways every day, helping advance this critical work, and most importantly, fostering a culture of sustainability at Mass General Brigham.

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In the pages that follow, we will share some of the achievements from the past two years, as we continue to make progress in reducing our own impact on climate change and advancing our sustainability goals. We will also highlight new programs, initiatives, and ideas that inspire hope and pride. But most meaningful to our organization, and demonstrated here, are the people who are powering this progress. Without their contributions and commitment, such progress would be impossible, and our hopes for the future much dimmed. Their efforts drive meaningful change, and this report stands as a testament to their devotion and the culture they continue to build.

Niyum

Niyum Gandhi
Chairman, Climate and Sustainability Leadership Council
Chief Financial Officer and Treasurer, Mass General Brigham

Expanding access to renewable energy through the power of collaboration

Mass General Brigham is expanding its climate strategy through a major regional collaboration that is helping bring new wind and solar projects onto the U.S. power grid. As the health system works toward increasing its power supply from renewable energy, it has taken a leading role in a first-of-its-kind energy aggregation that links hospitals, universities, nonprofits, and public agencies across Greater Boston.

The effort, known as the Consortium for Climate Solutions, pools the purchasing power of Mass General Brigham, Harvard University, MIT, and a group of additional institutions to support the development of two large-scale renewable energy projects. Through virtual power purchase agreements, the Consortium is enabling 408 megawatts of new clean-energy capacity: the Big Elm Solar project in Bell County, Texas, which began operating in 2024, and the Bowman Wind project in North Dakota, expected online this year.

For Mass General Brigham, the initiative represents a significant step in reducing the health sector's carbon footprint—an industry responsible for roughly 8.5 percent of U.S. emissions. The system already receives 80 percent of its electricity from renewable sources, and the new agreements help accelerate progress toward its climate goals while contributing to national grid decarbonization.

"Through this Consortium, Mass General Brigham is accelerating the development of large-scale renewable energy, reducing the healthcare sector's impact on the environment, and supporting the clean energy transition nationwide. This collaboration reflects our commitment to contributing to healthier communities and a more sustainable future," said Dennis Villanueva, director of utilities, energy strategy, and procurement at Mass General Brigham. The two projects supported by the consortium will generate clean electricity equivalent to the annual use of 130,000 U.S. homes over the 15-year contract period. They are also expected to deliver economic benefits in their host regions, including an estimated $64 million in tax revenue, 750 construction jobs, and $100 million in

photo by Apex Clean Energy

long-term income for farmers and landowners who lease their land for renewable infrastructure.

While Mass General Brigham is the largest health-care participant, the consortium includes a broad mix of organizations. PowerOptions, a 500-member energy consortium, enabled additional institutions—such as the City of Cambridge, Beth Israel Lahey Health, Boston Children's Hospital, Dana-Farber Cancer Institute, Tufts University, the Massachusetts Convention Center Authority, the Museum of Fine Arts, and GBH—to join under the same negotiated terms. The aggregation was facilitated by 3Degrees, a global climate solutions provider.

For Mass General Brigham, the collaboration underscores a broader strategy: reducing emissions within its own operations while contributing to cleaner energy systems nationwide. As the system continues to advance its sustainability goals—from energy sourcing to waste reduction to climate-resilient infrastructure—the renewable-energy partnership marks a significant step toward long-term decarbonization.

Fighting the heat: a call to action for public health

Extreme heat is no longer a distant climate concern—it is a public health emergency unfolding in real time. The number of heat-related deaths is increasing rapidly. The toll is not just measured in lives lost, but in the strain on our healthcare systems: surging emergency visits for illnesses like respiratory, kidney, and cardiovascular disease, and nearly $1 billion in added healthcare costs each summer.

In response to this emerging public health threat, IBM issued a call to nonprofit and government organizations, focused on technology-driven projects to advance city resiliency. Out of more than 100 applicants, Mass General Brigham was among five organizations selected to participate in this new cohort of IBM Impact Accelerator projects.

Born of this call-to-action is an effort to develop an AI tool for healthcare systems and community health centers confronting health impacts from extreme heat. The tool, which will be initially tested across Mass General Brigham hospitals, will be built to help predict hyperlocal extreme heat events, identify at-risk patients, and deliver reliable, automated warnings when a heat wave is imminent.

Leading this effort is Paul Biddinger, MD, chief preparedness and continuity officer at Mass General Brigham and an Emergency Medicine physician.

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–Paul Biddinger, MD

often life-threatening harm to medically vulnerable populations and our communities," says Biddinger.

In addition to warning individuals of incoming heat waves, the new solution will inform patients of resources available to them, while helping clinicians to take preventative action by screening for, and intervening upon, patient risk factors. It will also be designed with security features to protect the patient information and health information used to support the solution and to provide access to such information only within each health system using the tool and its patients.

"We care deeply about the health impacts of extreme heat," adds Biddinger. "Through this innovative collaboration we aim to use real-time data and actionable messages to improve care for everyone."

Mass General Brigham recognized for climate action with The Joint Commission's Sustainable Healthcare Certification

The health sector is responsible for approximately 8.5% of U.S. greenhouse emissions, making climate action an urgent priority for organizations committed to improving human health. Mass General Brigham is taking a leadership role in addressing this challenge and was recently recognized with The Joint Commission's Sustainable Healthcare Certification for its progress in addressing environmental impact across the system. To qualify for the certification, healthcare organizations must report emission data across at least three of six key categories, including energy use, purchased electricity, anesthetic gas use, inhaler use, fleet fuel consumption, and waste disposal. Mass General Brigham reported data and progress in energy use, purchased electricity, and anesthetic gases—areas where the system has made significant, measurable strides. Today, approximately 80% of electricity across Mass General Brigham comes from renewable sources, and the system strives to reach 100% by the end of this year. Investments in rooftop solar at several facilities and participation in community solar programs further support these efforts. The system is also leading the way in energy conservation. Three of our community hospitals—Martha's Vineyard Hospital, Newton-Wellesley Hospital and Salem Hospital—have been named Mass Save Climate Leaders for their ongoing investment in reducing energy use. Another key focus area is anesthesia care. By reducing the use of high climate-impact anesthetic gases and modernizing delivery systems, Mass General Brigham is working toward a goal of cutting anesthesia-related emissions by at least 50% by 2030, without changing the high standard of patient care. Together, these efforts reflect Mass General Brigham's commitment to protecting patient health today while safeguarding the environment for future generations.

Innovative service encourages research labs to embrace environmental sustainability

Biomedical research is essential to advancing human health—but it also carries an environmental cost. At Mass General Brigham, a systemwide program known as the Lab Sustainability Initiative, is helping research teams rethink how science is done, with sustainability at the forefront.

"Healthcare contributes about ten percent of greenhouse gas emissions in the United States, and five percent of the greenhouse gases globally."

–Ann-Christine Duhaime, MD

Originally launched at Massachusetts General Hospital (MGH), the Lab Sustainability Initiative, has grown into a collaborative effort across the enterprise to reduce the environmental impact of research while maintaining the highest standards of scientific quality. While it may not be the biggest cause of climate change, "healthcare contributes about 10 percent of greenhouse gas emissions in the United States, and 5 percent of the greenhouse gases globally," says Ann-Christine Duhaime, MD, physician-investigator in the Department of Neurosurgery at Mass General and associate director (research) for the Center for the Environment and Health at Mass General Brigham. "Within the healthcare sector, biomedical research has a significant environmental impact; like operating rooms and other high-technology sites, laboratories use a lot of energy and resources. What we do there can have ripple effects, influencing the culture and environmental awareness of our trainees and professional networks, and also encouraging the sustainability of our supply chains. It also offers an opportunity to educate a large workforce and to integrate sustainability across roles within an institution, such as researchers, building engineers, and waste managers. Finally, it often aligns with improved efficiency and significant financial savings."

Often partnering with My Green Lab, a nonprofit company specializing in research sustainability, the Lab Sustainability Initiative consultation service offers the Mass General Brigham research community a customized consultation to identify ways to reduce the environmental impact of their labs and research processes, including minimizing energy/carbon emissions, toxic chemicals, water, and solid waste. Preliminary results show that this is a cost-effective approach that can be customized to different types of labs, improves sustainability metrics, and is generally enthusiastically embraced by researchers. The initiative also emphasizes evidence-based change to help support investigators. For example, ongoing studies by Mass General Brigham researchers are examining whether adjusting freezer temperatures can significantly reduce energy use without compromising the integrity of specific types of samples stored for various durations.

Beyond operational improvements, the Lab Sustainability Initiative is fostering a culture shift—encouraging researchers to view sustainability as integral to scientific excellence. Through education, data driven evaluation, and systemwide collaboration, Mass General Brigham is demonstrating how incorporating sustainability into all our processes, including research, can all help decrease our pollution and environmental impact for the health of our employees, patients, and communities.

The Cooperative: Transforming healthcare delivery to strengthen health resilience in a changing environment

Accelerating environmental threats take a tremendous toll on health. Conditions like heat stroke, asthma flares, heart attacks and pregnancy complications are on the rise as extreme temperatures, poor air quality, and catastrophic storms become more common.

The Cooperative equips clinicians and healthcare systems with the tools, data and expertise they need to help patients stay healthier in a changing environment. Led by Mass General Brigham, this highly collaborative initiative adapts care delivery by pairing the most effective treatments with proactive approaches that increase health resilience.

Multisector collaboration forms the foundation of The Cooperative's approach. "We are bringing together stakeholders across healthcare, public health, community-based organizations, local and state governments, academia and other key sectors to co-develop solutions. Our goal is to innovate scalable healthcare interventions that reflect community needs, improve patient outcomes and can be integrated into clinical workflows—complementing public health and community efforts," said Renee N. Salas, MD, MS, MPH, founding director and emergency medicine physician at MGH.

Over time, these healthcare adaptations will help lay the groundwork for broader system change—embedding patient resilience into everyday care, better aligning resources across sectors, and supporting prevention-based models.

Mass General Brigham Sustainability Champions

This progress wouldn't be possible without the dedication and unwavering commitment of the people of Mass General Brigham, whose work is driving meaningful and lasting change. Here, we recognize just some of the extraordinary Mass General Brigham staff members who make this progress possible and turn ideas into actions—our sustainability champions.

Nicholas (Nick) Nagykery, research technician, MGH

"At Mass General Brigham, my goal is to be a catalyst—motivating researchers to turn sustainability from intention into impact, and My Green Lab provided our team with the tools and support necessary to make that possible. With colleagues across our labs, we've recycled more than three quarters of a ton of plastics and cut energy use equivalent to 27 tons of CO_2—proof that small, persistent changes and a culture of environmental sustainability deliver big, lasting impact."

John Ebert, Manager of Building Services, Mass General Brigham Healthcare Center, Waltham

"Working in hospital facilities at MGH Waltham has shown me firsthand how building systems directly shape patient comfort, safety, and community health. There's real impact when we reduce energy use and waste without ever compromising care. Sustainability is a shared effort among our patients, staff, and the communities we serve. The measurable wins – lower energy use, less waste and healthier indoor environments – keep me motivated even when balancing clinical needs with infrastructure constraints."

Jason D'Antona, PE, LEED®AP, Director of Engineering, Real Estate & Facilities

"In healthcare, every efficiency gain strengthens our ability to deliver more affordable, resilient care for our patients, which is why sustainability is both a technical and organizational imperative for me. At Mass General Brigham, I advance this work by developing enterprise-wide energy strategy, implementing facility-level efficiency projects, and using analytics to ensure our investments deliver real operational and emissions reductions. I'm proud that we've achieved measurable reductions in both greenhouse gas emissions and operating costs while maintaining system reliability."

Lucinda Everett, MD, Associate Anesthetist at MGH and Clinical Process Design Director of Mass General Brigham eCare:

"Through my work in anesthesia and data reporting, I see how small changes, such as reducing anesthetic gas waste, can lower environmental impact while maintaining the same high standard of patient care. Integration across Mass General Brigham departments creates an opportunity to standardize and implement best practices developed at individual sites and continue driving improvement."

Progress and updates on existing initiatives

Conservation spotlight: HVAC.

Since 2024, Mass General Brigham has continued to build on its systemwide HVAC conservation efforts, expanding the scope and scale of measures aimed at improving energy efficiency and reducing environmental impact. Over the last six years the system has enacted 136 comprehensive lighting and heating ventilation/air-conditioning (HVAC) energy conservation measures throughout the Mass General Brigham system. These projects have helped eliminate the following each year:

35.2 million
kWh of electricity

111,970 MMBtu
of natural gas

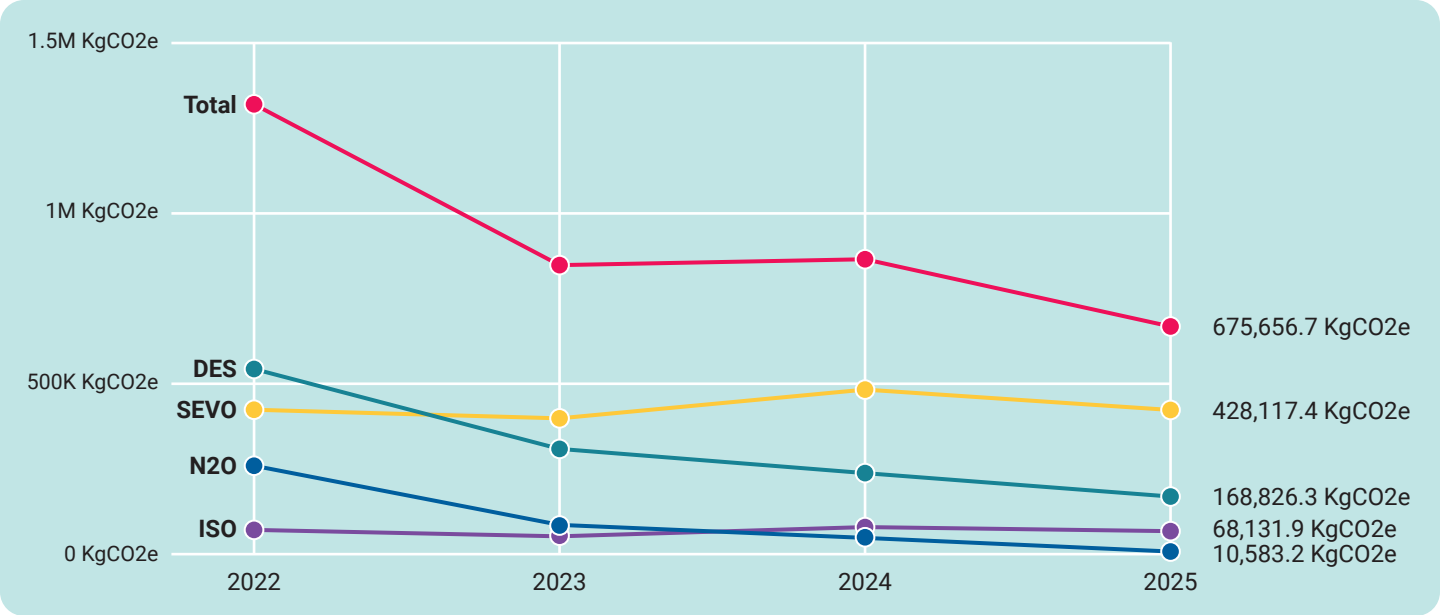
$7.0 million
in utility costs

41.0 million pounds
of CO_2e emissions

Anesthetic Gas Use at MGH:

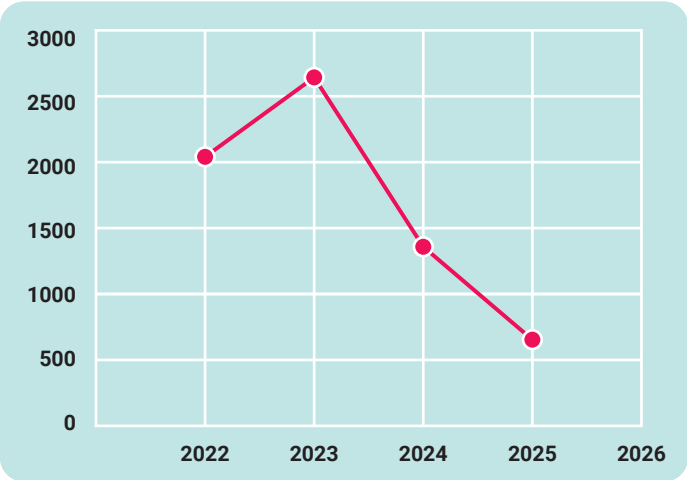
The data show total anesthetic emissions over time, from 2022 to 2025. Total estimated emissions declined sharply over the reporting period, reflecting the impact of targeted sustainability actions across anesthesia practices to reduce the environmental footprint of anesthetic gas use while maintaining safe, high-quality patient care. These results were made possible by:

- Educating anesthesiologists about the climate impact of anesthetic gases like desflurane and nitrous oxide
- Providing real-time feedback about excessive fresh gas flow rates, which contribute to gas waste without added benefit to patient care
- Incorporating the carbon footprint of gases and the amounts used into monthly performance reports for anesthesia providers



MGH's sharp drop in nitrous oxide purchases over the past four years resulted in a 67% decrease from 2022, driving a significant reduction in associated emissions and meaningfully lowering overall emissions (see table below):

Nitrous Oxide GHG Emissions at MGH [MT CO2e]



	lbs	kg	kg CO2e	MTCO2e
2025	4985	2260.771	673709.8	673.7098
2024	9870	4476.190	1333905.0	1333.9050
2023	19533	8858.503	2639834.0	2639.8340
2022	15142	6867.120	2046402.0	2046.4020

Decarbonization Master Plan and Emissions:

The Mass General Brigham decarbonization master plan study is now complete, providing a comprehensive understanding of systemwide energy-related emissions and a clear set of recommendations to guide long-term climate action. Early progress—most notably the transition to cleaner energy sources and continued efficiency improvements—has already reduced emissions and is expected to keep compliance costs low through 2030. As the organization moves into the next phase, the work will involve more substantial upgrades such as electrifying buildings and equipment which will require careful planning, strategic investment, and a more unified approach across facilities. This phase will also encourage greater alignment in how energy-related decisions are made, helping ensure that local operational choices collectively support systemwide goals while still recognizing the distinct needs of individual sites. Implementation efforts will focus on integrating decarbonization into routine decision-making, formally adopting the systemwide plan, and developing detailed, site-specific roadmaps that guide each facility through the transition.

Advocacy Efforts:

Mass General Brigham has continued to advocate for climate solutions at the federal, state, and local levels, recognizing the role that the expertise and leadership of our researchers, clinicians, and professionals across the system can play in advancing climate action and strengthening our communities. Below are some of our efforts over the past two years, in addition to endorsing several state bills.

Federal Advocacy:

- Letter to OSHA on Heat Related Illness, January 2025
- Letter to EPA in Support of Energy Star Program, June 2025
- Letter to National Governors Association on Preparedness Policies for Extreme Heat, July 2025
- Letter to EPA to Preserve Endangerment Finding, September 2025

State Advocacy:

- Sign-on letter in support of climatetech investments in Mass Leads Act, May 2024
- Letter to MA Legislature urging investments in modernizing and decarbonizing our transportation system, April 2025
- Testimony in support of *An Act to protect Massachusetts public health from PFAS*, Joint Committee on Public Health, November 2025

Research:

As the single largest hospital system-based research enterprise in the U.S., Mass General Brigham brings its research expertise to bear on advancing understanding of the impacts of climate change on physical and mental health, as well as how the healthcare system contributes to—and can more effectively respond to—the climate crisis. Between 2024 and 2026, Mass General Brigham researchers published in top-impact journals including *New England Journal of Medicine*, *Journal of the American Medical Association*, *British Medical Journal*, and *Nature Reviews Cancer,* advancing global evidence on climate, sustainability, and health system transformation. Here are just a few of these examples:

1. **Climate change is redefining health-care delivery and preparedness**, Lancet Planetary Health (2025): https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(25)00111-1/fulltext

2. **Environmental sustainability of research and innovation**, *BMJ* (2024): https://pubmed.ncbi.nlm.nih.gov/39142798/
3. **Inhaler-Related Greenhouse Gas Emissions in the US: A Serial Cross-Sectional Analysis**, *JAMA* (2025): https://jamanetwork.com/journals/jama/article-abstract/2839471
4. **The Moral Injury of Inhaler Prescribing**, *New England Journal of Medicine* (2025): https://www.nejm.org/doi/abs/10.1056/NEJMp2412383
5. **Overview of Heat-Related Illnesses**, *New England Journal of Medicine* (2024): https://www.nejm.org/doi/full/10.1056/NEJMp2310182
6. **No climate havens: the expanding threat of climate change to cancer care**, *Nature Reviews Cancer* (2026): https://www.nature.com/articles/s41568-025-00867-y
7. **Assessing the Environmental and Downstream Human Health Impacts of Decentralizing Cancer Care**, *JAMA Oncology* (2024): https://pubmed.ncbi.nlm.nih.gov/38829310/
8. **Measuring environmentally sustainable health care: a scoping review**, *Lancet Planetary Health* (2024): https://www.thelancet.com/journals/lanplh/article/PIIS2542-5196(24)00162-1/fulltext
9. **Environmental impact, cost, and acceptability of a laboratory sustainability certification program for biomedical research**, *Journal of Climate Change and Health* (2025): https://www.sciencedirect.com/science/article/pii/S2667278224000804
10. **Air Pollution and Particulate Matter: Implications in Upper Airway Disease**, *International Forum of Allergy & Rhinology* (2026): Air Pollution and Particulate Matter: Implications in Upper Airway Disease - Bergmark - International Forum of Allergy & Rhinology - Wiley Online Library

Education-focused updates:

Mass General Brigham held the first Continuing Education course, Pathways to Net Zero, meant to equip clinicians, administrators, and healthcare staff with the knowledge, skills, and resources needed to improve their operations and work toward net zero emissions. By providing education on the environmental impact of healthcare and practical strategies for mitigation, the goal of the course is to empower participants to implement sustainable practices in their healthcare work environments and through their respective roles.

Looking Ahead: Our Goals

As Mass General Brigham reflects on these accomplishments, the system remains committed to transparency and continuous improvement. Some of the priorities for the months and years ahead include:

- In 2025, Mass General Brigham conducted a community health survey as part of the Community Health Needs Assessment across its hospitals. This survey aimed to understand how climate change affects our communities and to incorporate climate considerations into community health needs, ensuring that Mass General Brigham addresses the health pressing impacts identified by the community. As the work moves into the next phase—developing Community Health Improvement Plan (CHIP)—Mass General Brigham is committed to working together with local residents and organizations to turn these findings into measurable, sustainable change.
- Continuing efforts to lower overall emissions through its Decarbonization Master Plan, which will provide a roadmap for reducing and ultimately eliminating emissions from Mass General Brigham's energy consumption. Additionally, the system will maintain its commitment to transparency by reporting its greenhouse gas emissions through CDP.
- Actively participating in the US Healthcare Climate Council, collaborating with other progressive health systems to develop actionable strategies for decarbonizing healthcare delivery.

"We are proud of the progress we have made in our sustainability journey," said Niyum Gandhi, Chief Financial Officer and Treasurer and Chairman of the Climate and Sustainability Leadership Council of Mass General Brigham. "Our achievements over the past year demonstrate our commitment to enhancing our operations and contributing positively to the environment and our communities. However, there is still much work ahead. Though it will take time adn effort to overcome the challenges posed by climate change, we resolve to face this problem head-on so that those we serve can live their best, healthiest lives."