



Mass General Brigham

Sustainability Impact Report



From our Chief Financial Officer



At Mass General Brigham, our mission is to enhance and sustain the health of our community. From research and innovation to lifesaving clinical care, we strive to serve our patients by addressing health challenges great and small.

Though we often provide care within the walls of our hospitals and clinics, we know the issues affecting human health begin long before our patients walk through the door. Communities of color have long borne the brunt of public health crises and have traditionally been underserved by the health care system. As we approach these issues, we must do so with a clear-eyed understanding that members of our community do not experience these challenges equally.

Our dedicated clinicians expertly counsel patients, prescribe medicines and perform critical procedures, but we also know that there are factors affecting our community that require a broader and more holistic response. Just as access to food and housing is essential to our health, so are climate resiliency and environmental sustainability. Climate change is a public health crisis. And at Mass General Brigham, we believe it's critical that we all treat it as one.

We do not issue this report from a finish line, in celebration of some long-sought victory. Nor do we do so with our hands helplessly in the air, unsure of the path ahead. We report our progress here with a clear understanding that just as we have made strides toward achieving our sustainability and climate resiliency goals, there is much work ahead. And though we look outward at the challenges posed by climate change, we must also look inward, within our own institutions, to more clearly understand how we contribute to the problem and how we can help lead to a solution.

Most importantly, the change we seek must include and benefit those who are most impacted, and so our strategy must be driven by that reality if we hope to achieve meaningful results.

Historically at Mass General Brigham, sustainability has started from the ground up and been led by those who see how climate change affects our patients every day. As chair of our Climate and Sustainability Leadership Council, I have the opportunity and responsibility to scale these innovations and commitments across our hospitals, practices and research operations and ensure that we're working as one health care system, 80,000 strong.

As a mission-driven, integrated health care system, our commitment is to our patients and our community. Though we will not overcome the challenges posed by climate change in a day, or a year, we resolve to face the problem head-on, so that those we serve can live their best, healthiest lives.

Niyum Gandhi

Chairman of Climate and Sustainability Leadership Council
Chief Financial Officer and Treasurer of Mass General Brigham

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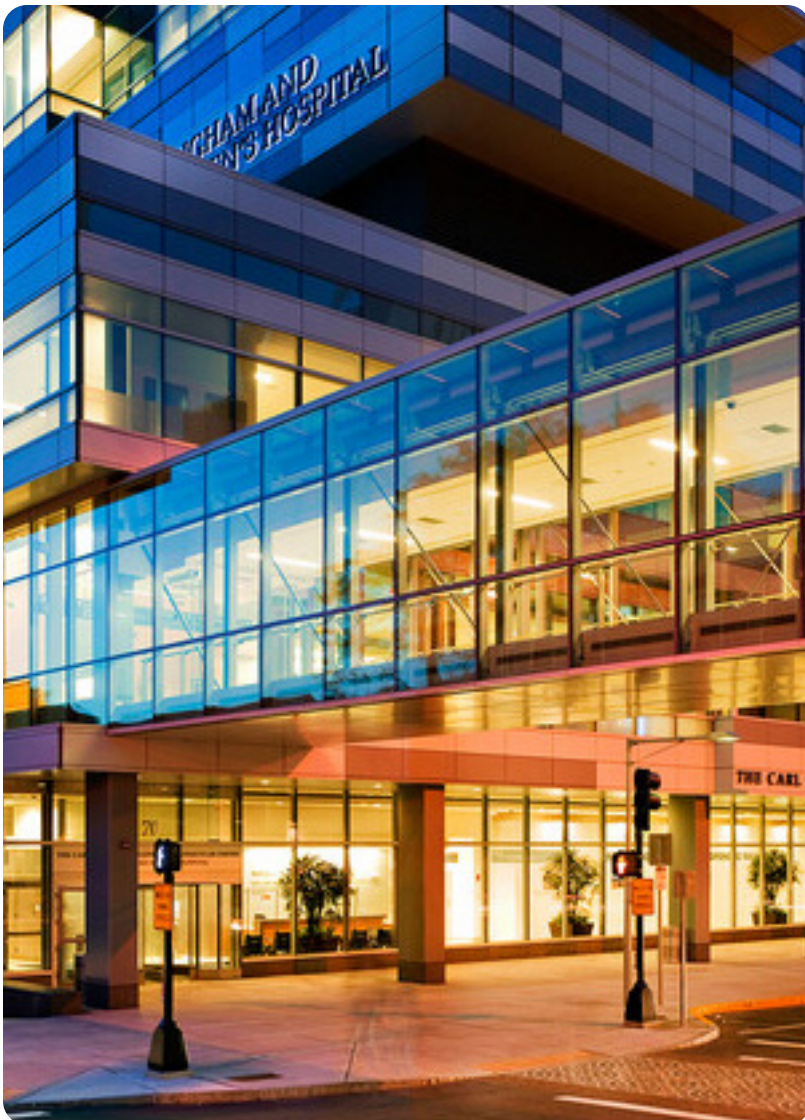
Who we are

Founded by some of the oldest and most prestigious hospitals in the world, today Mass General Brigham encompasses a range of health care organizations. With two of the world's best known academic medical centers—Massachusetts General Hospital and Brigham and Women's Hospital—our system features renowned specialty

hospitals, community hospitals, a leading rehabilitation network, health insurance plan and physician network, a teaching organization and numerous locations for urgent and community care and care at home.

With the most Harvard-trained doctors in the world, and as the United States' top health care

system for National Institutes of Health (NIH) funding, we offer millions of patients local access to large numbers of clinical trials and an unmatched network of specialists to diagnose, treat and cure diseases other clinicians may have never seen—from gene therapies to organ transplants to cutting-edge advanced cancer treatments.



Founding members

- Brigham and Women's Hospital
- Massachusetts General Hospital

Members

- Brigham and Women's Faulkner Hospital
- Community Physicians
- Cooley Dickinson Hospital
- Health Plan
- Healthcare at Home
- Martha's Vineyard Hospital
- Mass Eye and Ear
- McLean Hospital
- MGH Institute of Health Professions
- Nantucket Cottage Hospital
- Newton-Wellesley Hospital
- Salem Hospital
- Spaulding Rehabilitation
- Urgent Care
- Wentworth-Douglass Hospital

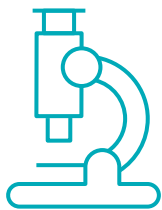


Mass General Brigham at a glance

Funding



\$250 Million commitment to community health



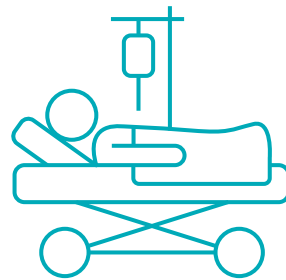
\$2 Billion annual research and academic funding

Mass General Brigham system



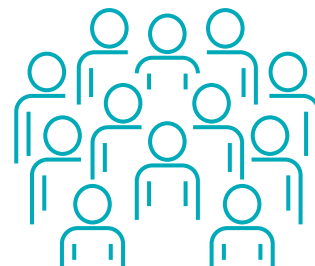
- 12 acute and specialty hospitals
- 4 ambulatory surgery centers
- 5 Harvard-affiliated teaching hospitals
- 22 urgent care centers
- 28 rehabilitation locations
- 5 community health centers

Our patients



- 2.6 Million patients
- 120 different countries

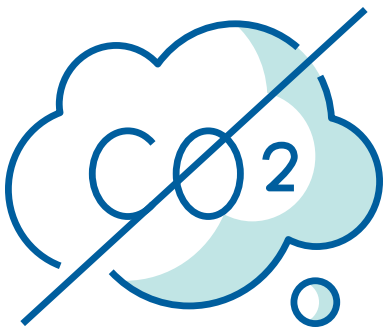
Largest private employer in Massachusetts



- 7,500 physicians
- 15,020 nurses
- 82,000 total employees

Reducing our energy usage, emissions and waste

The health care **sector is responsible for approximately 8.5 percent of carbon emissions** in the United States. For Mass General Brigham, we believe that contributing to a crisis that is taking a devastating toll on human health is at odds with our fundamental mission to promote health and well-being. As a health care and community leader, we have an obligation to lower our overall emissions, the amount of emissions-creating energy we use and consume and reduce our waste output.



Lowering our emissions

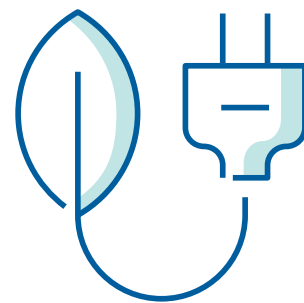
Greenhouse gas reductions. Mass General Brigham has reduced energy-associated greenhouse gas emissions by about 58 percent since 2008 (based on a baseline business-as-usual trendline).

- 20 percent is the result of energy conservation measures
- 37 percent results from the procurement of carbon-free electricity

Using fewer harmful anesthetic gases. Our hospitals are reducing the amount of anesthetic gases we use, which directly contribute to climate change. Our anesthesia clinical service is educating anesthesiologists about the greenhouse effects of anesthetic gases like desflurane and nitrous oxide. As a result, we have begun shifting to using less potent gases where possible. We are also incorporating the carbon footprint of gases and the amounts used into monthly performance reports for anesthesiologists and nurse anesthetists.

The goal is to provide the same quality care to patients while reducing the hospital's environmental impact by using more environmentally safe agents to shift towards more sustainable practices in the operating room.

Signatory of the Cool Food pledge. At a number of our hospitals, we have made a commitment with the World Resources Institute that helps hospitals reduce their greenhouse gas emissions from food purchasing. By committing to this evidence-based pledge, we're tracking the climate impact of the food we serve and developing plans to serve dishes with smaller carbon footprints, with the goal of reducing food-related greenhouse gas emissions 25 percent by 2030.



Using less carbon-emitting energy and more clean energy

Renewable energy. Currently 80 percent of the electricity used by the Mass General Brigham system comes from renewable sources and our system strives to achieve carbon neutrality for all electricity by 2025.



Conservation spotlight: HVAC. Over the last five years, we’ve enacted 122 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:

- 40.7 million kWh
- 52,420 MMBtu of natural gas
- 39.1 million pounds of CO2 emissions
- \$4.3 million in utility costs



Reducing waste and recycling

Caring for patients also creates waste byproducts. That is why we keep exploring new ways to

reduce that waste and, where possible, recycle materials. To that end, our hospitals have begun **increasing medical device reprocessing**—cleaning, refurbishing, sterilizing and inspecting devices to be good as new for reuse, reducing the environmental impact up to 80 percent in some cases. We are also using **blue wrap recycling**, transitioning to **rigid reusable sterilization containers and reducing supply delivery waste** by transitioning from cardboard to totes where possible.

Watching our waste. Led by members of our Departments of Surgery and Environmental Services, this program educates operating room staff about the importance of properly segregating waste. This helps to minimize the production of regulated medical waste (“red bag waste”) which generates more emissions during disposal than standard waste and costs five times as much as regular trash. Having successfully reduced the Brigham’s use of red bag waste in operating rooms by an estimated 30 percent, we are expanding these efforts to other operative and procedural areas and to other hospitals within the Mass General Brigham system, beginning with Salem Hospital.

Tracking our progress. Our largest two hospitals have created sustainability data dashboards that track information related to environmental impact and provide information about the latest efforts to reduce these impacts. While these dashboards currently track monthly regulated medical waste by site, anesthetic gas emissions

and organic recycling at each hospital, going forward we recognize we must also develop a dashboard that captures metrics across the Mass General Brigham system. Mass General Hospital’s sustainability dashboard can be viewed at: massgeneral.org/environment-and-health/sustainability-data-dashboard.



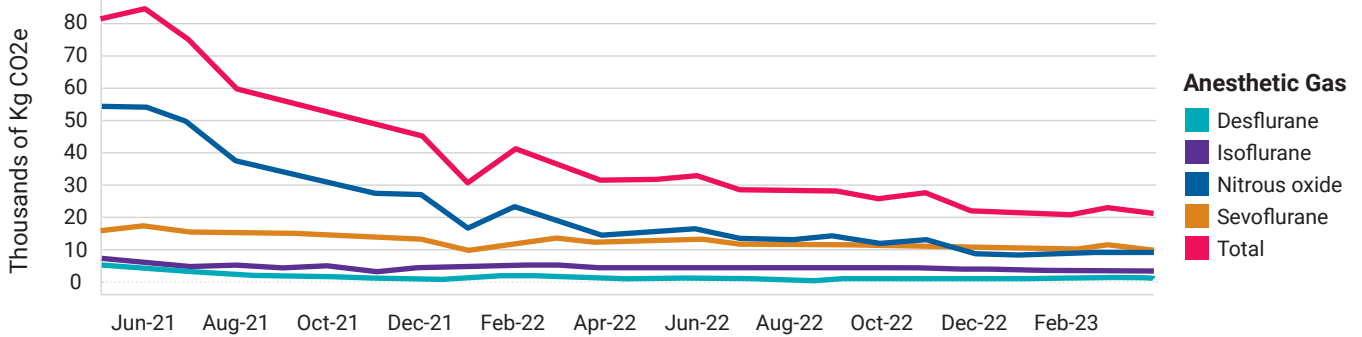
Massachusetts General Hospital
Founding Member, Mass General Brigham

Center for the Environment and Health
Created July 2023

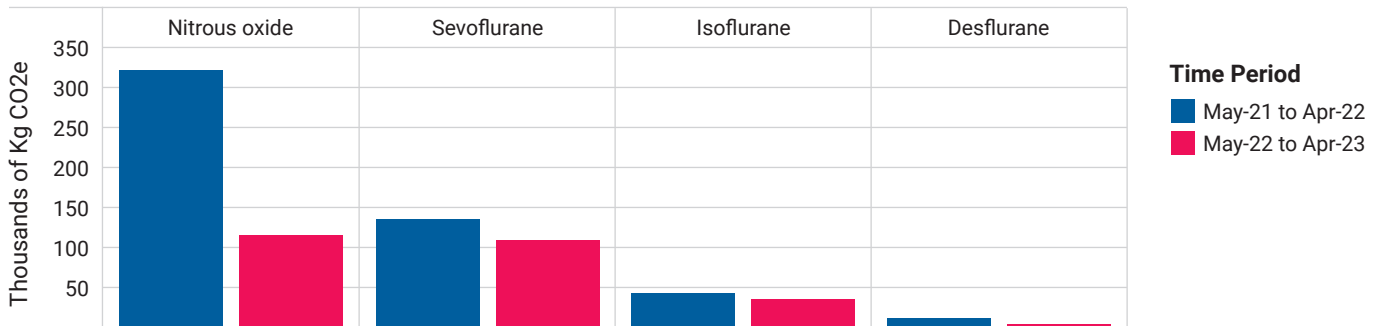
Anesthetic gas data at MGH



Kilograms of carbon dioxide equivalent from anesthetic gas use in the Department of Anesthesia, Critical Care & Pain Medicine by month*



Kilograms of carbon dioxide equivalent from anesthetic gas use in the Department of Anesthesia, Critical Care & Pain Medicine by 12-month period*



* Data shown are based on information on anesthetic gas use collected in medical software for the Department of Anesthesia, Critical Care & Pain Medicine. Other potentially important sources of environmental impacts from anesthetic gases including gases lost to leaks are not captured.

Integrating climate health and sustainability into research, clinical care and training

As recipients of more National Institutes of Health funding than any other hospital system in the nation, and with five Harvard-affiliated teaching hospitals, we are in a unique position to transform how climate is integrated into medical research, clinical care and training for the next generation of medical professionals.

Our climate research. Mass General Brigham represents the single largest hospital system-based research enterprise in the U.S. With an annual research budget exceeding \$2 billion, we have an opportunity and obligation to apply our expertise in investigation to furthering human understanding of the physical and mental health impacts of climate, as well as how our health care system contributes—and can better respond—to the climate crisis. Published papers include:

- I. [Mitigating the Twin Threats of Climate-Driven Atlantic Hurricanes and COVID-19 Transmission | Disaster Medicine and Public Health Preparedness | Cambridge Core](#)
- II. [An Examination of the Intersection of Climate Change, the Physician Specialty Workforce, and Graduate Medical Education in the U.S. | Taylor & Francis Online](#)
- III. [Dumpster Diving in the Emergency Department: Quantity and Characteristics of Waste at a Level I Trauma Center | eScholarship](#)
- IV. [Communication strategies targeting climate change action at a large academic medical center | ScienceDirect](#)
- V. [The plastic pandemic: Quantification of waste on an inpatient medicine unit | ScienceDirect](#)
- VI. [Perspectives on Climate Change and Pediatric Mental Health: a Qualitative Analysis of Interviews with Researchers in the Field | SpringerLink](#)
- VII. [The Climate-Smart Emergency Department: A Primer | Annals of Emergency Medicine](#)
- VIII. [Climatizing the internal medicine residency curriculum: A practical guide for integrating the topic of climate and health into resident education | ScienceDirect](#)
- IX. [Waste audits in healthcare: A systematic review and description of best practices | Sage Journals](#)
- X. [Sources of Variation in the Carbon Footprint of Hemodialysis Treatment | Journal of the American Society of Nephrology](#)
- XI. [Patient transport greenhouse gas emissions from outpatient care at an integrated health care system in the Northwestern United States, 2015–2020 | ScienceDirect](#)
- XII. [Reusable scrub caps are cost-effective and help reduce the climate footprint of surgery | SpringerLink](#)

Our commitment to climate clinical work and training. As an academic health system, we are formally integrating climate-health and health care sustainability into how we train the next generation of physicians. To ensure climate is a focus for our doctors and trainees, we will continue to integrate key topics into medical education including **monthly seminars** on intersections between environment, health and healthcare delivery as well as regular **climate-related conferences** for our clinical departments. In addition, we are supporting Harvard Medical School's efforts to expand its climate curriculum and integrating climate change and health into BWH and MGH internal medicine residency programs.

Climate training spotlight: With the leadership, input and assistance of residents, BWH and MGH recently collaborated to develop one of the first curricula in the United States that integrates climate change and health into the internal medicine residency program.

Elevating climate's role in our academic medical centers. We established the **Mass General Center for Environment and Health**, one of the first centers of its kind in the country dedicated to infusing environmental thinking into the full spectrum of a hospital's operations. The **Brigham Climate Action Council** was also formed to address the critical role the healthcare sector has to play in addressing the current and emerging health impacts from climate change while also reducing the environmental impacts of our clinical, research, and educational operations, and engaging the trusted voices of medical professionals to advocate for smart, evidence-based climate policy.

Sharing our knowledge and insights.

Incorporating sustainability can't just be changing how our own hospitals think and teach, but must help orient our whole profession toward net zero. That is why we are a founding partner of the [Climate Resources for Health Education program](#), a collaborative to develop and disseminate free resources for medical schools and resident training programs.

Using our voice to speed climate action and strengthen communities

We have a responsibility as citizens to leverage our reputation and the expertise of researchers, clinicians and professionals across our system to advance climate action at the local, state and federal levels.

Pushing for climate action. As the largest private employer in the state, Mass General Brigham is made up of more than **80,000 professionals** with unique insights into how climate impacts the communities we serve. That's one reason we're building a culture that encourages our experts to advocate and educate about the health impacts of climate change before policymakers—particularly those in vulnerable communities. Our doctors, nurses, residents and researchers have testified before state and federal lawmakers on topics

ranging from preparing the nation's healthcare infrastructure for climate change, to the impact of climate on child psychology, and how tightening standards on soot, carbon, and smog pollution can reduce illness.

Spotlight on climate advocacy and a just transition: Dr. Renee Salas. An emergency medicine physician at Mass General Hospital and Yerby Fellow to expand the diversity of those entering the academic public health field,

Dr. Salas has [testified before Congress](#) on how climate change is harming health. She recently co-authored the [2022 Lancet US Countdown Brief](#) which focuses on four ways in which climate change can harm health, including how:

1. Burning fossil fuels drives **poor air quality**, harms health and increases health inequities.
2. **Extreme heat** is becoming more severe and there are wide inequities in heat-related illness and death
3. Climate change is increasing the threat of **infectious diseases**
4. Climate change harms **mental health** and well-being, particularly in the children, young people, and rural and Indigenous communities who are at greater risk.

Recognizing that the health impacts of climate change are not experienced equally, the report offers a series of policy recommendations including 1) Achieving a zero-emission energy sector and prioritizing air quality improvements in the most impacted communities, 2) Accelerating the transition to a zero-emission transportation system that equitably benefits health, 3) Ending the development of all new fossil fuel infrastructure and phasing out fossil fuel subsidies as rapidly as possible, while ensuring a just transition, 4) Targeting investments in adaptation to build healthy, resilient, and equitable communities, and 5) Scaling up U.S. contributions to global climate change finance to support global health equity.

Advocating for global climate solutions. We also have called on Congress to accelerate America's transition to a clean economy. And, as a founding member of the [U.S. Healthcare Climate Council](#) (and its precursor, the Healthier Hospital Initiative), we are committed to advocating for policies that accelerate progress toward achieving climate-smart health care.

Champions for a net-zero Boston. Mass General Brigham was a vocal supporter for the development of Boston's [Building Emissions Reduction Ordinance \(BERDO\)](#), which sets



requirements for large buildings to reduce their energy use with the goal of gradually reducing emissions to “net zero” by 2050. To do our part implementing the city's Climate Action Plan, we are a leader within the [Green Ribbon Commission](#) with our CEO, Dr. Anne Klibanski, co-chairing its Health Care Working Group.

Promoting health equity through environmental justice. In 2020, Mass General Brigham called for the passage of the bill, [An Act Relative to Environmental Justice](#), addressing public health inequities among low-income and communities of color by protecting communities from air pollution, increasing equitable access to government and information and reducing public health inequities.

Building a more climate-resilient health care system

It is essential that health care systems can assure access to medical care for their patients and communities, both during and after emergencies. With climate change increasingly threatening the resiliency of health care institutions and the communities they serve around the country, Mass General Brigham has taken extensive steps to ensure our continued operations amid the climate crisis to ensure that none of the care we provide our patients or the greater Boston community is compromised.

Our progress. To ensure continuity of service in the face of increasingly frequent and severe extreme weather events, we have:

1. Engaged outside experts to rigorously analyze the predicted flooding, heat, wind and other climate hazards in our communities for the coming 50 years
2. Examined the specific consequences of each hazard scenario on all of our major hospital campuses and have developed climate resiliency plans for each site
3. Worked to ensure all new construction is maximally resistant against the consequences of climate change for the anticipated 50+ year lifespan of those buildings, generally designing buildings to be more resilient than the code requires
4. Made major upgrades to existing buildings to increase the resilience of our clinical and research sites, and we will continue to do so each year going forward

Resilience spotlight:

Spaulding Rehabilitation

Hospital: The first waterfront hospital designed to withstand the projected rise in sea levels, flooding and storms, Spaulding is built to endure for the next century. Nested where the Little Mystic Channel meets Boston's Inner Harbor, Spaulding's location allows its rehabilitation programs to incorporate water activities such as kayaking and other treatments to help patients regain balance and mobility.

Unique features include a first floor 30 inches above the 500-year flood level to safeguard against projected sea-level rise, rooftop- or penthouse-located boilers, chillers, air handlers for ventilation to ensure operation during flooding and an extensive drainage network. Spaulding has already demonstrated the value of resilience: its on-site cogeneration system for heat and power recouped its installation costs within its first decade of operation.



The MGH Ragon Building: Mass General Hospital has begun construction on a state-of-the-art new building, ushering in the next generation of exceptional health care while reinforcing our strong commitment to our workforce, neighbors and communities. Consisting of two inpatient towers with 482 single-bed inpatient rooms and more than 1.5 million square feet, the new facility includes six levels of underground parking, accommodating 864 vehicles for patients and families and will be capable of storing emergency medical supplies in climate disasters and increasing resilience. All of its rooms will be capable of becoming double occupancy



in a disaster, providing a safe “facility of refuge” for the rest of the hospital campus in the most severe events. Powered almost entirely by renewable electricity, the sustainable structure reflects Mass General Brigham’s continued commitment to significantly reducing its carbon

footprint. Built to withstand the projected major flooding and high wind risks for the next 70 years, Ragon will be MGH’s most resilient facility to date, capable of providing its own energy and functioning independently for up to 96 hours during natural or manmade disasters.

Building an environmentally sustainable health care system

While our work at our hospitals has resulted in first-of-their-kind innovations, we have a responsibility—as medical professionals and as citizens of the Commonwealth—to align our work as an integrated health care system.

Assessing and mitigating our climate impact. As medical professionals and scientists, we believe in following the data. We recently completed a comprehensive environmental assessment including system-wide greenhouse gas emissions (“carbon footprint”), as well as water use and particulate matter pollution. The results will inform a systemwide emissions reduction plan.

Building an integrated climate governance infrastructure

- In recent years, we have established a Mass General Hospital Executive Sustainability

Committee and formed the Brigham Climate Action Committee. We formed a sustainability office within our real estate and facilities function and are the only health care system in the country with four medical or clinical directors for sustainability.

- Now, we are taking important steps to bring this work together system-wide. In 2022, we launched the Mass General Brigham Climate and Sustainability Leadership Council to begin developing system-wide goals for emission-reductions, inform system-wide sustainability practices and initiatives and identify

opportunities for collaboration with other Mass General Brigham priorities.

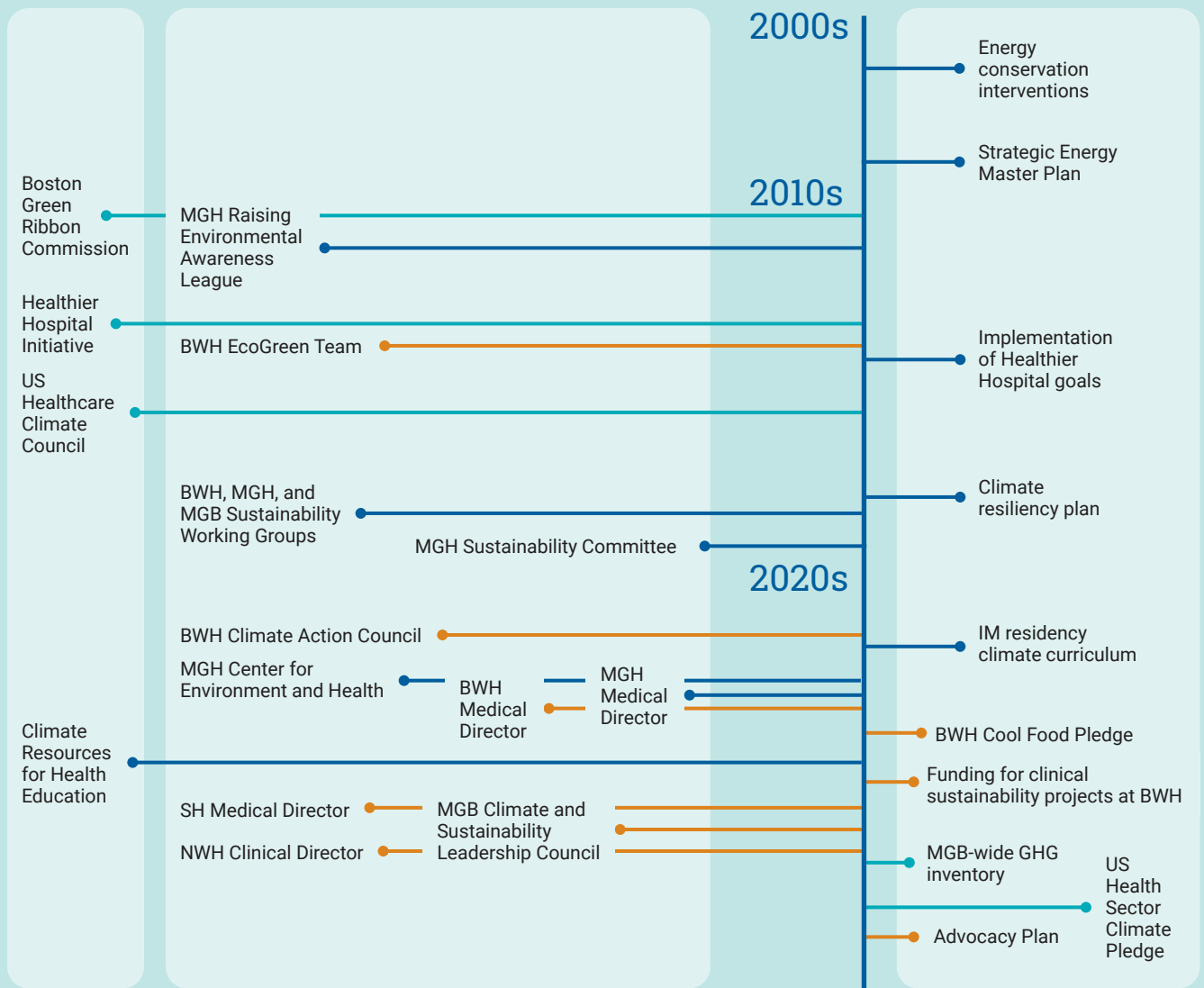
System leadership spotlight. In 2022, Mass General Brigham received the prestigious Commonwealth Environmental Leadership Award by the Environmental League of Massachusetts (ELM). It was awarded to our system for being “a leader in

integrating climate, equity and health into clinical practice and have been vocal advocates at every level of government about the intersectionality of those issues.” ELM also noted our work with key drivers of the state’s economy to advocate for strong environmental policy like environmental justice, offshore wind and clean transportation.

Mass General Brigham has been a leader in climate and health for decades, with increasing intensity

Partnerships Structure and leadership

Actions

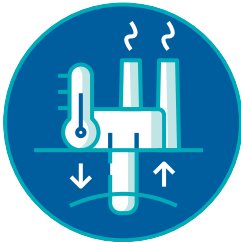


Pushing ahead for progress: our sustainability goals in the years ahead

While we have made important progress, when it comes to climate change and environmental sustainability at Mass General Brigham, we have much work ahead of us. In the coming decades, we pledge to:



1. Implement an enterprise-wide environmental assessment system that collects and reports greenhouse gas emissions data across Mass General Brigham. We are reporting to CDP, a recognized global disclosure system for environmental impacts, with a plan to continue to do so annually.



2. Set science-based targets for emissions reductions and register them with the Science Based Targets Initiative (SBTi).



3. Finalize and act on a comprehensive greenhouse gas reduction plan. This includes:

- Fulfilling the U.S. Health Sector Climate Pledge to reduce Scope 1 (such as heating and fuel) and 2 (such as purchased energy that generates emissions) emissions 50 percent by 2030 and 100 percent by 2050.
- Establishing ambitious but achievable Scope 3 emissions goals around purchased goods and services, capital development and employee and patient travel.



4. Form a dedicated and appropriately resourced sustainability enterprise team with administrative and clinical leadership.

- This would include overall system leadership and both a medical director and non-clinical sustainability director.
- This office would work to ensure vertical and horizontal integration across Mass General Brigham, assisting our institutions' local sustainability leaders to implement programs and initiatives to meet system goals.
- Supporting this team would be leaders from supply chain, food and nutrition, facilities engineering and clinical care realms.



5. Develop a comprehensive system-wide structure and approach to climate—analogous to how we address quality and safety in our clinical work or diversity, equity and inclusion in our business.

