2023 Annual Sustainability Report

Harvard Medical School

Campus Planning & Facilities

HMS sustainability

October 2024

Campus Planning & Facilities: Our Sustainability Mission

Harvard Medical School Campus Planning & Facilities (CP&F) is committed to building a sustainable campus while supporting its vital research and education mission. This sustainability report summarizes our department's efforts to further sustainability and conservation in 2023.

Our efforts align with Harvard University's Sustainability Action Plan and primarily focus on emissions reduction, energy optimization, and campus decarbonization. In 2023, CP&F completed multiple energy conservation projects that have improved campus efficiency, and has maintained its progress in waste reduction and water conservation.

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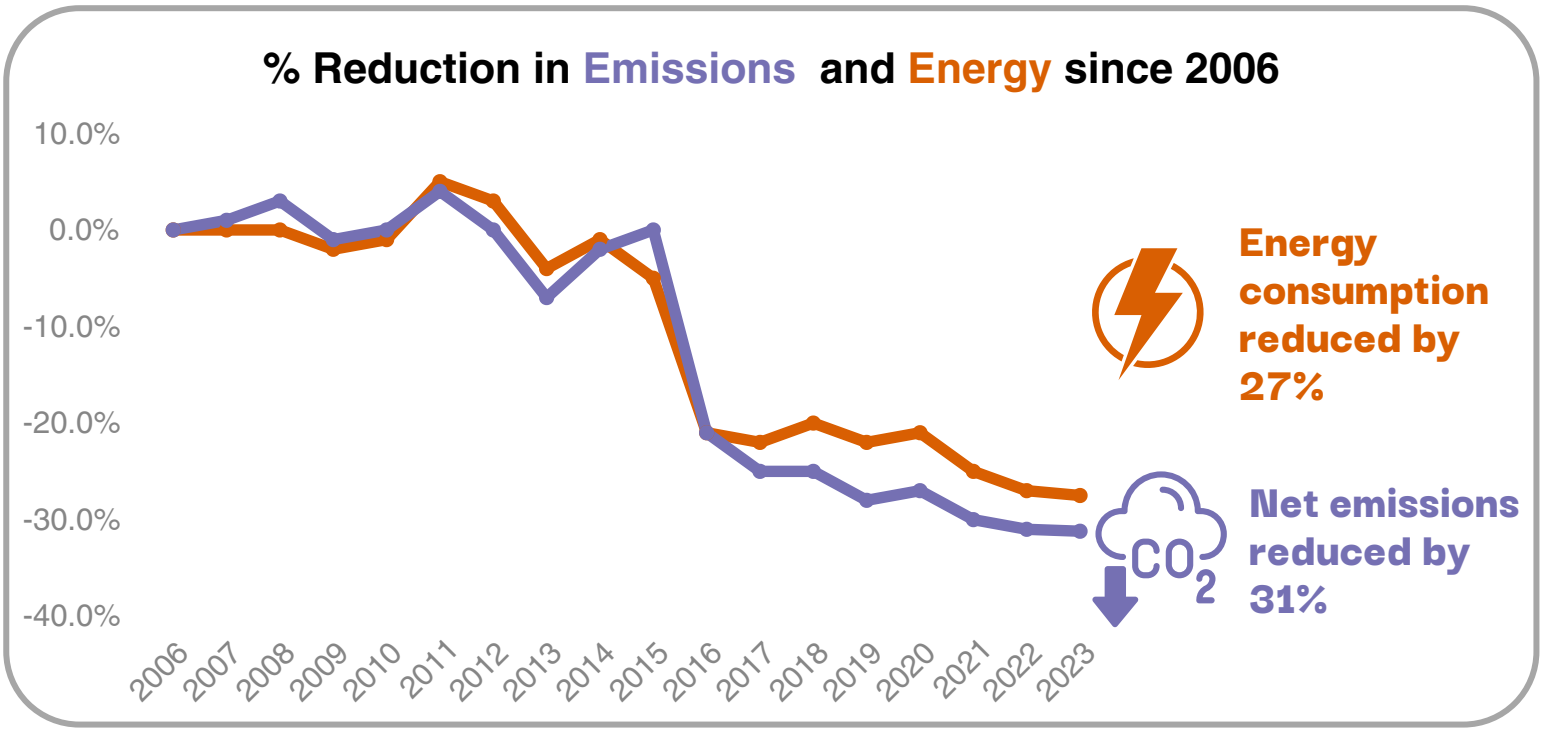
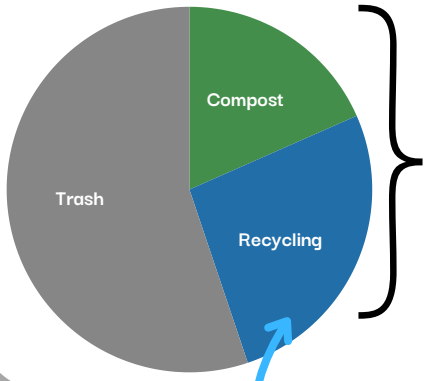
2023 sustainability impact at a glance





44% of waste diverted from the landfill

22% increase in pipette tip box recycling from 22 to 23!

6	energy conservation measures
57	corrected mechanical faults
126	repaired/replaced steam traps
2,150	Metric tons CO2e saved annually

These annual savings are equivalent to:

241,500	gallons of gasoline not consumed
300	homes' energy use for one year
35,550	tree seedlings grown for 10 years
0.5	wind turbines running for a year

Reduced road salt by **65%, ~58,000 pounds** from 2022 to 2023

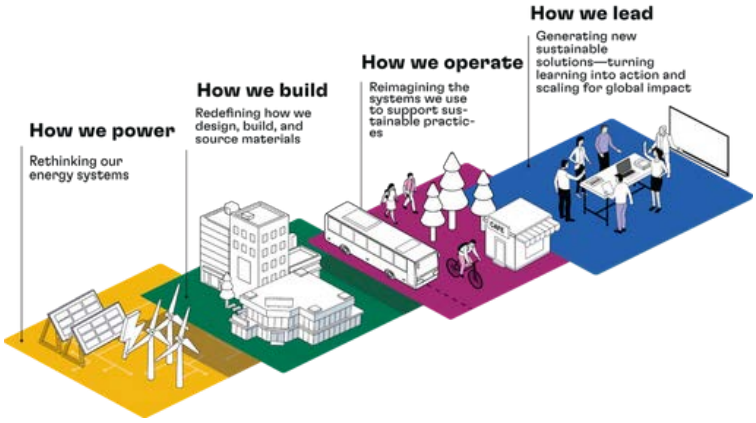
906 meals donated by Restaurant Associates

Electric vehicle charging increased by **49%** from 2022 to 2023

127 MWh produced with solar on campus

HU Sustainability Action Plan

In 2023, the Office for Sustainability updated the Harvard University Sustainability Action Plan, first adopted in 2014. The updated plan uses a new framework for sustainability, where all actions and priorities are centered holistically around three pillars: climate, equity, and health. Harvard's vision of sustainability strategies and solutions, focused on intergenerational wellbeing and equity, are divided into four critical areas: **how we power**, **how we build**, **how we operate**, and **how we lead**.



The plan's major objective remains "Goal Zero", which was established in 2018, aiming to completely phase out reliance on fossil fuels for heating, cooling, and powering buildings and vehicles campus-wide by 2050. This entails zero fossil fuel usage across campus, including both direct and indirect emissions, without any offsets. As an interim milestone towards this goal, Harvard has also committed to achieving fossil fuel neutrality by 2026. Meeting fossil fuel-neutral by 2026 will involve reducing fossil fuel consumption as much as possible and using renewable energy purchases and projects to completely eliminate remaining Scope 1 and Scope 2 emissions. These initiatives will consider not only the emissions, but also the health impacts associated with pollution resulting from fossil fuel usage.

The first step in this effort, especially in meeting the CY26 fossil fuel neutral goal, is to procure 100% fossil fuel-free electricity. Harvard University is contracting for renewable energy projects locally and elsewhere in the United States to reduce emissions and air pollution. The focus on power is supplemented by its Sustainable Building Standards, the use of environmentally friendly materials in construction, evaluating the broader impacts of goods and services purchased by the University, and integrating equity and well-being throughout.

While Goal Zero is only one aspect of the Sustainability Action Plan, it is one of the most substantial in confronting climate change and in reducing local impacts on greenhouse gases. Meeting these goals will require a complete transition away from onsite fossil fuel consumption, including emissions from district energy systems, such as the one supporting HMS. Using this high-level framework, including its standards, objectives, and strategies presents a valuable opportunity for HMS Facilities to prioritize and strategize for embracing sustainability across all aspects of operations.

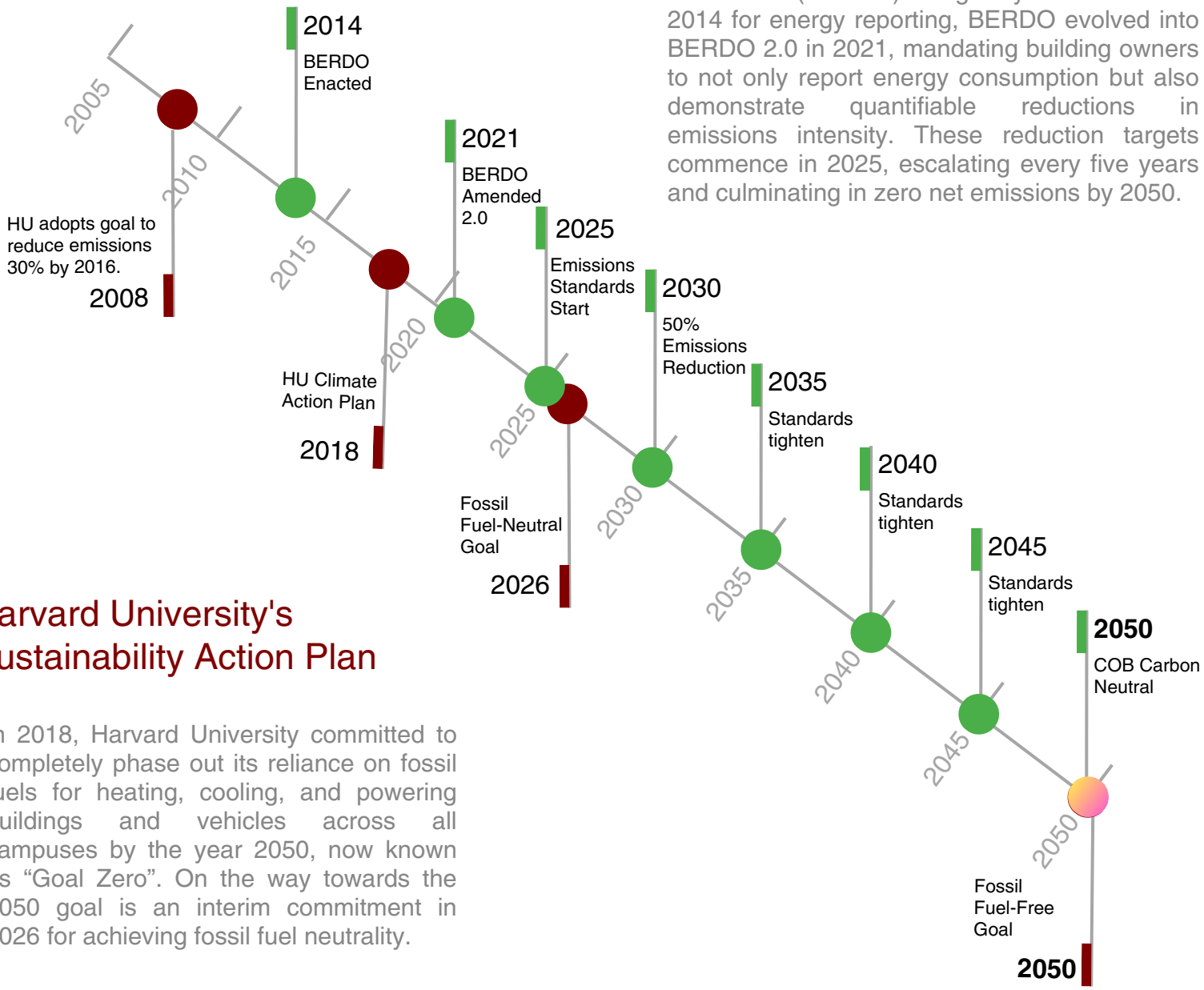
Read the plan here: https://sustainable.harvard.edu/our-plan/

Carbon Commitments and Regulations

HMS is dedicated to meeting Harvard University's Sustainability and Climate Action Plan commitments while adhering to the City of Boston's carbon reduction requirements.

City of Boston

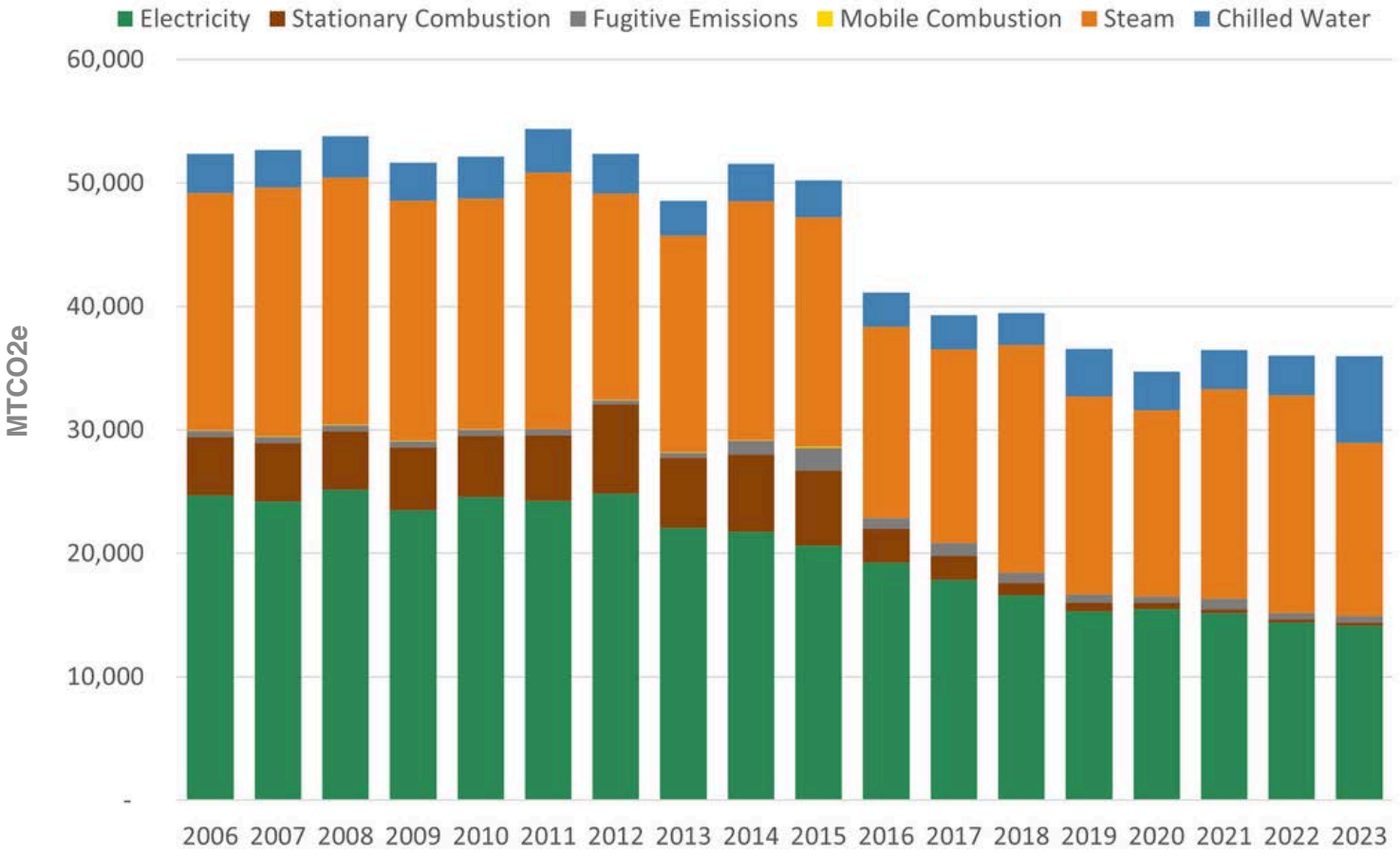
The City of Boston's Climate Action Plan pledges to achieve a 50% reduction in emissions by 2030 and carbon neutrality by 2050. A pivotal tool in this endeavor is the Building Energy and Reporting Disclosure Ordinance (BERDO). Originally established in 2014 for energy reporting, BERDO evolved into BERDO 2.0 in 2021, mandating building owners to not only report energy consumption but also demonstrate quantifiable reductions in emissions intensity. These reduction targets commence in 2025, escalating every five years and culminating in zero net emissions by 2050.



Harvard University's Sustainability Action Plan

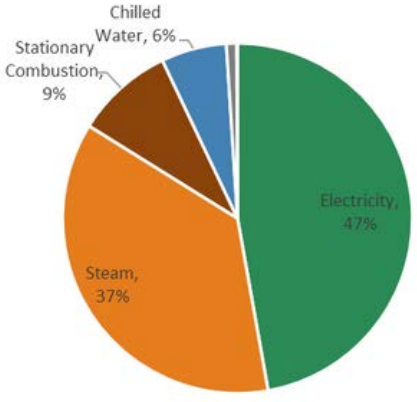
In 2018, Harvard University committed to completely phase out its reliance on fossil fuels for heating, cooling, and powering buildings and vehicles across all campuses by the year 2050, now known as "Goal Zero". On the way towards the 2050 goal is an interim commitment in 2026 for achieving fossil fuel neutrality.

Annual HMS-HSDM Emissions by Source

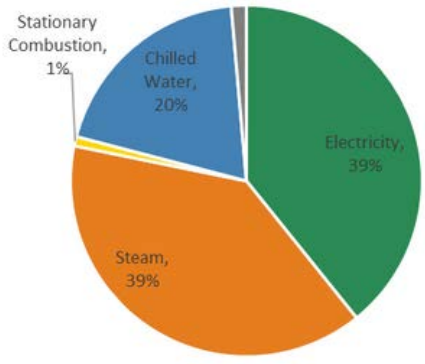


**Note: 2023 greenhouse gas emissions data is preliminary and may undergo revisions as finalized figures become available.*

2006 Emissions:



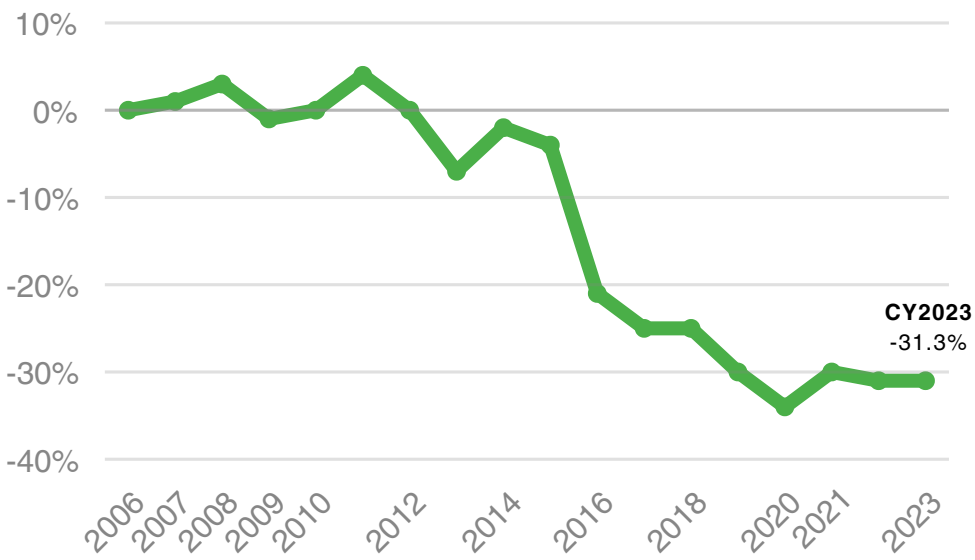
2023 Emissions:



Helpful definitions:

- MTCO2e: metric tons of carbon dioxide equivalent. Equivalent carbon dioxide is a metric that accounts for various greenhouse gases' respective capacities to heat the Earth's atmosphere.
- Fugitive Emissions: Pollutant released into air from leaks in equipment, pipe lines, seals, valves, etc.
- Stationary Combustion: A fixed-site producer of GHG, at HMS, these are mainly facilities using natural gas boilers.

Annual% Reduction from 2006 Baseline



As of 2023, HMS has achieved a 31% reduction in emissions from the 2006 baseline year.

**Note: CY2023 greenhouse gas emissions data is based on preliminary values and may undergo revisions as finalized figures become available.*

As of 2023, HMS and HSDM have achieved a 31.3% reduction in emissions from the 2006 baseline year. Due to the critical research and essential facility operations on campus, the Schools' emissions during the COVID-19 pandemic decreased to 34% below baseline levels in 2020 - a moderate reduction compared to organizations that ceased operations entirely. While GHG emissions increased slightly as administrative and teaching operations began to normalize in 2021 and returned to full campus operations in 2022, they have not returned to pre-pandemic levels. The numerous energy conservation measures completed in 2021, 2022, and in 2023 have sustained this reduction.

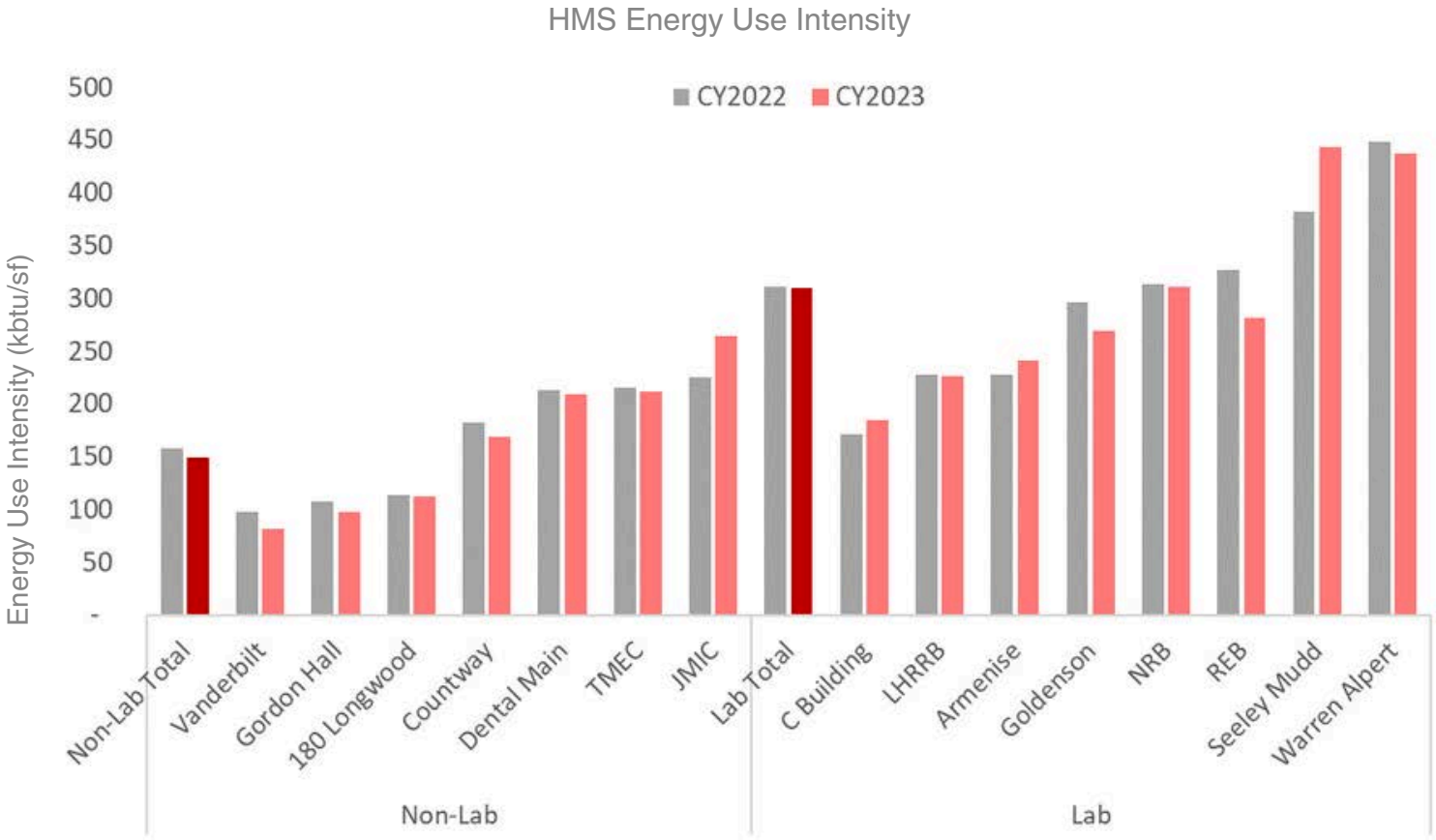
Looking ahead, the School has scheduled several major energy conservation projects for completion through 2024 that will achieve additional reductions These projects advance HMS and HSDM's emissions reduction strategy in support of HU's 2026 Fossil Fuel Neutrality and 2050 Fossil Fuel Free goals, while improving local air quality and increasing building resiliency against climate change impacts. Through the continued implementation of a campus-wide energy conservation program initiated in early 2021, and the execution of projects identified through a variety of energy audits (some of which are detailed on page 19), HMS Facilities projects an additional 9% reduction in building energy consumption through 2030.

Focus on Laboratory Environments

The challenge of meeting emissions goals is much higher for research-focused organizations face as they seek to reduce their emissions footprint in such energy intensive spaces. A large proportion of campus space is wet labs (43%). Labs are responsible for the vast majority of total annual energy consumption and are therefore the focus of energy conservation measures and strategic energy projects at HMS. Sustainability and efficiency achievements on campus must keep up with the expansion of research, increased building population density, and the continued introduction of delicate, energy intensive equipment.

Focus on Laboratory Environments

Which buildings are most intensive on the HMS Campus?

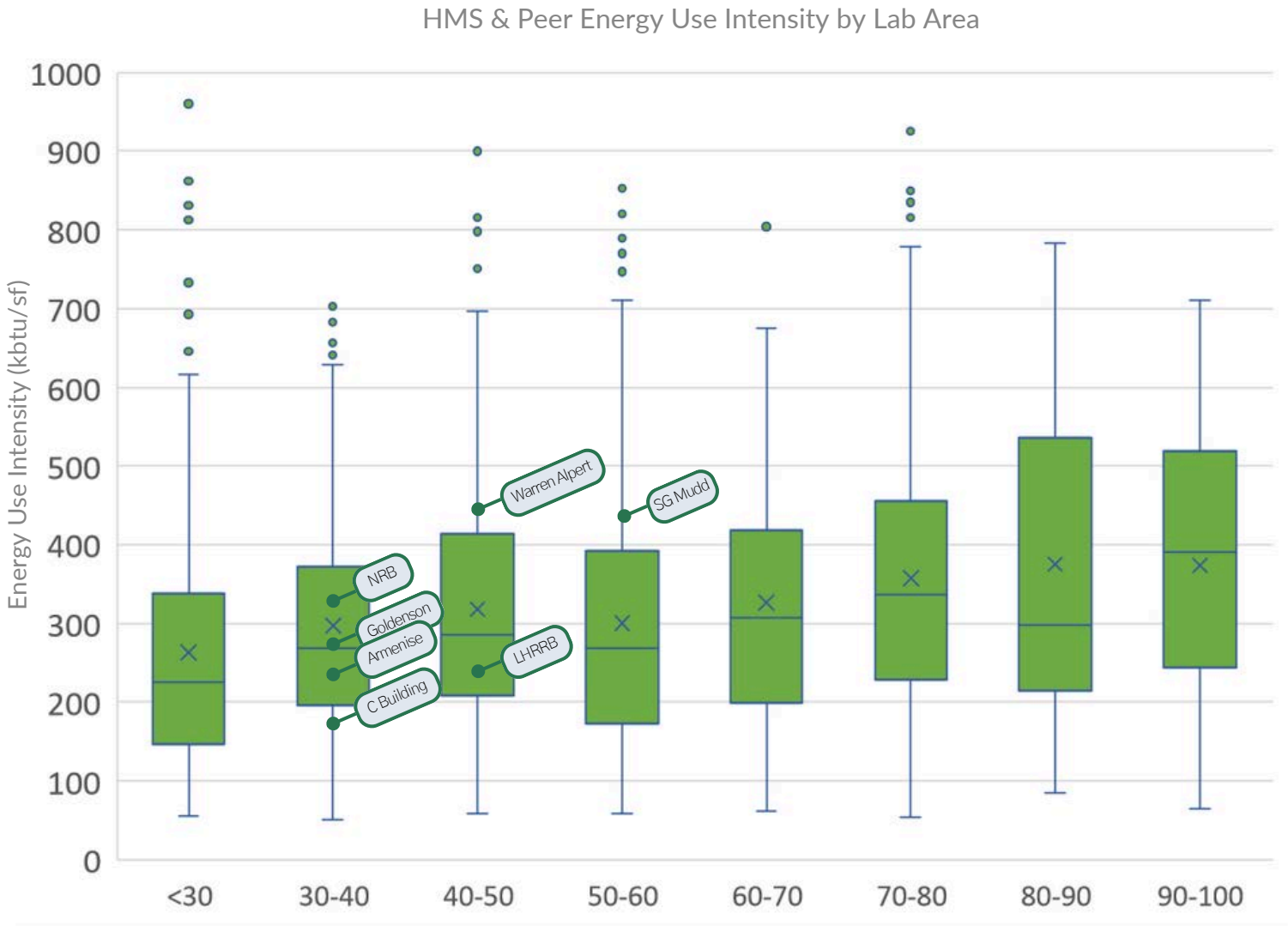


The chart above highlights the performance of HMS's buildings in calendar year 2023 compared to 2022 using a metric titled **Energy Use Intensity** (EUI). EUI is calculated by dividing a building's total annual energy consumption by its area (gross square feet). This statistic is useful for normalizing and directly comparing the energy consumption of buildings, despite their potential size differences. Both lab buildings and non-lab buildings experienced decreased EUIs in 2023 compared to 2022.

Across all buildings on campus, HMS experienced an overall decrease in EUI (257 in 2022 and 254 in 2023).

Focus on Laboratory Environments

How does HMS compare to its peers?



Above is a boxplot showing the relationship between lab space (as % of total building area) and Energy Use Intensity (EUI) in lab buildings. Each bin represents a range for the proportion of square footage in each building dedicated to lab research, with labels denoting the placement of HMS 2023 EUIs. The comparative data is sourced from the International Institute for Sustainable Laboratories' (I2SL) Lab Benchmarking Tool (LBT) - a database containing energy, emissions, and operational metrics from 1000+ peer facilities. Notably, the HMS labels predominantly align with its peers, within the Q1 and Q3 of each boxplot, which illustrate the distribution of EUIs. Two buildings, Warren Alpert Building and Seeley G Mudd, exceed the Q3 of their ranges, higher than most buildings in the dataset with similar lab areas. Methodology differences in quantifying square footage may skew this data - some building owners may be quantifying "lab areas" differently or less granularly than HMS.

Getting to Goal Zero

HMS Facilities is employing and planning the following efforts to continue the reduction of Scope 1 and Scope 2 greenhouse gas emissions:

- Strategic energy management
  - Continue seeking opportunities for efficiency
  - Energy conservation measures and strategic energy projects with focus on lab environments
  - Operational/maintenance efficiency
  - Focus on energy efficient design and resiliency measures

- Utility Master Plan
  - Improvements of utility distribution and supply system
  - Implementation of technological advances and alternative energy sources
  - Electrification of heating hot water and steam utility systems

Learn more about the Utility Master Plan on the next page.

- Decarbonization Compliance Plan
  - Ensure continued compliance with commitments and regulations

- Reduction of carbon intensity of utilities

- Procurement of Renewable Energy Certificates (RECs) to meaningfully invest in renewable electricity and reduce electricity emissions

- Purchase of carbon offsets

Utility Master Plan

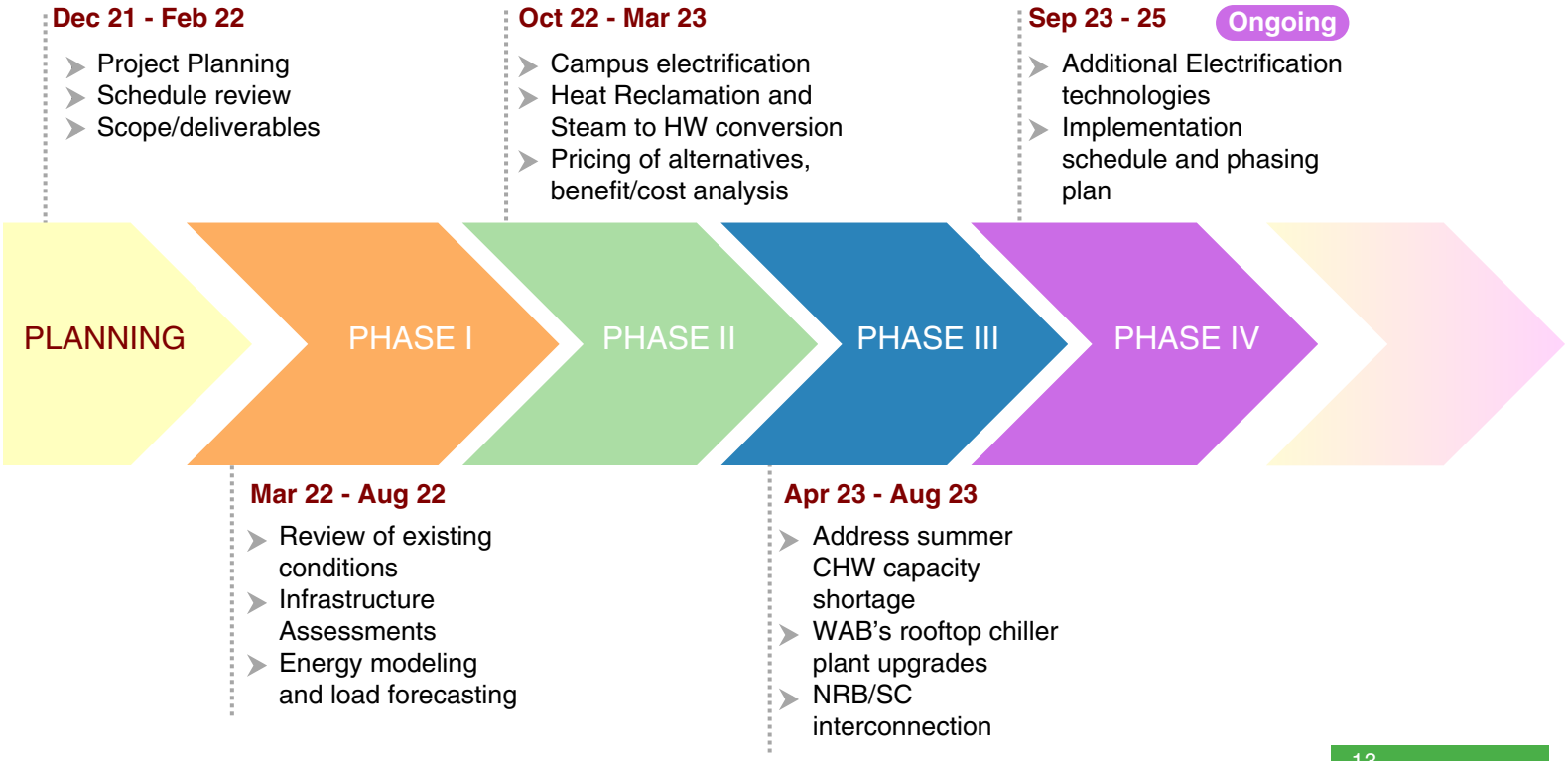
To meet sustainability and carbon reduction commitments, HMS Facilities is advancing its energy conservation programs while exploring decarbonization solutions. In 2022, HMS initiated a comprehensive Utility Master Plan (UMP) study to address energy consumption and sourcing on campus. The goal of this four-phase study is to enhance the resilience of HMS's utility infrastructure and reduce energy consumption through large-scale efficiency projects and conversions to alternative energy technologies.

Phase 1 assessed existing campus infrastructure and developed energy models to forecast future demands. Key findings revealed that chilled water deficiencies on campus are primarily due to lack of pressure at the cooling source, rather than distribution piping issues. This results in difficulty meeting space temperature and humidity setpoints on hot days. The study also identified year-round opportunities for heat reclamation and conversion to hot water heating, supporting business continuity, climate resilience, and campus expansion plans.

Phase 2 evaluated the feasibility of switching to low-temperature hot water heating and explored electrification opportunities. The study found that converting from steam to hot water heating would significantly reduce greenhouse gas emissions from steam, albeit requiring substantial infrastructure changes and increased electricity consumption. A phased, grouped approach was recommended for implementation.

Phase 3 addressed cooling capacity and efficiency, developing recommendations to mitigate anticipated cooling shortages due to climate change. The considered chilled water options include supplementing the power plant's chilled water production in the summer as well as interconnection of chilled water between NRB and South Campus.

Phase 4, currently in progress, is exploring additional energy and decarbonization technologies. This phase will analyze capital and operating costs, expected greenhouse gas emissions, and resiliency outcomes for various scenarios. The final report, expected in early 2025, will compare these scenarios and provide recommendations for HMS's transition towards net-zero emissions and decarbonization.



Energy

This section showcases the essential energy projects and initiatives from 2023, divided into four sections:

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Tracking Energy Projects

This year, HMS Facilities began using the Green Revolving Investment Tracking System (GRITS) to monitor and analyze and track Energy Conservation Measures (ECMs) completed on campus.

- Inputting historical data from past ECMs, creating a comprehensive record of sustainability efforts
- Analyzing the financial and environmental impacts of projects, including metrics such as Unit Cost per Metric Ton of CO2 equivalent (MTCO2e) abated
- Benchmarking initiatives against peer institutions to identify areas for improvement and innovation
- GRITS is helping to streamline data management and reporting processes, supporting more informed decision-making for future sustainability initiatives across campus.

For a running summary of projects, please visit the HMS Sustainability website, https://campusplanning.hms.harvard.edu/sustainability

CY23

Heat Recovery

Heat recovery systems capture and reuse heat from various sources, minimizing the need for additional heating energy and improving overall efficiency. These systems can significantly reduce energy consumption and carbon emissions and are central to modern energy conservation projects.

Heat Recovery System Cleaning

HMS Facilities performed its biannual deep cleaning of 46 heat recovery coils on air handling units, makeup air units, and exhaust fans across the campus. Heat recovery coils capture and reuse heat energy from exhaust air, transferring it to incoming air to improve overall energy efficiency in building heating and cooling systems. Clean coils decrease the pressure drop across the coils thus conserving the fans' electrical energy and also increase heat transfer efficiency resulting in a lower use of steam for heating.

This project yielded approximately 42,000 kWh in electric savings and 1,000 MMBtu in steam savings, cutting an estimated 82 metric tons of carbon emissions annually.

Coils before cleaning

Coils after cleaning

Removing dirt and debris to improve performance. Seeing the fins and lines more clearly indicates that the coils are cleaner.

CY23

Heat Recovery

In **air-side heat-recovery projects**, captured heat is reused to warm fresh incoming air, reducing the need for additional heating energy. By leveraging the heat "recycling" process, the system significantly reduces energy consumption and costs, a key component in HMS's overall energy strategy. Two of these projects were completed recently on campus:

Warren Alpert Building
The building had an existing glycol heat recovery system that served several main air-handling units and their exhaust fans, but the system was not operating efficiently and needed upgrades. The upgrade project involved installing new control valves, switching to two-way valves, adding pump speed controls, and installing balancing valves. **The improvements enhanced system efficiency and temperature control, reducing annual carbon emissions by about 215 metric tons - equivalent to taking 51 gas-powered cars off the road every year.**

New Research Building
This project focused on the building's process cooling loop, which is critical for environmental rooms and imaging equipment. This system was reconfigured to capture and reuse waste heat. During cold weather, the excess heat from process cooling is now redirected to the building's heat-recovery loop instead of being discarded. **This upgrade reduces the need for additional heating from steam, cutting an estimated 330 metric tons of carbon emissions annually - equivalent to removing 79 gas-powered cars from the road for a year.**

Through these combined heat recovery initiatives, HMS has achieved a total annual carbon emission reduction of approximately 627 metric tons, equivalent to removing 150 gas-powered cars from the road each year.

CY23

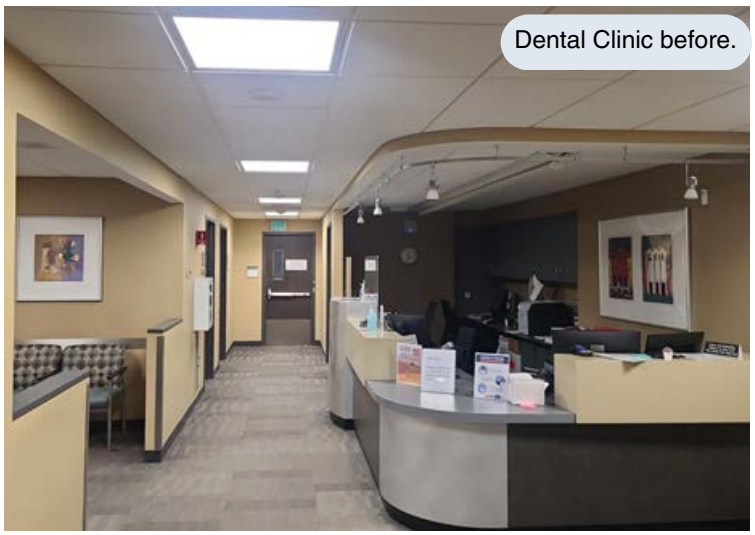
Lighting Upgrades

REB and Dental

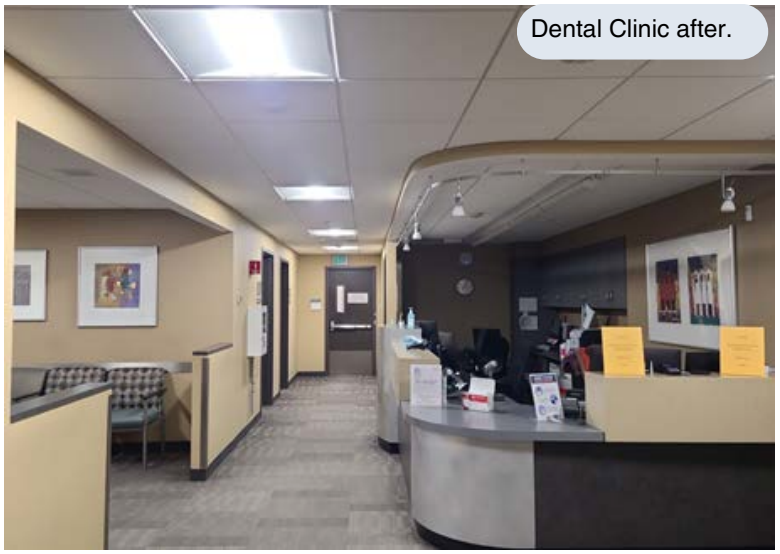
Facilities performed lighting upgrades in HSDM's two buildings, the Dental Administration Building (which also houses the Dental Clinic) and the Research Educational Building (REB).

This project will save over **325,000 kWh** annually, approximately **80 metric tons of carbon dioxide** per year. This is equivalent to the carbon sequestered by more than **93 acres of US forests** in one year!

Building	# of Fixtures	Electric Savings (kWh)
Admin	924	156,660
REB	1,415	168,625
Total HSDM	**2,339**	**325,285**



Dental Clinic before.



Dental Clinic after.

LED's use significantly less electricity than traditional incandescent bulbs, up to 80%. The lifespan of LED's also significantly longer than traditional bulbs, reducing maintenance requirements, as well as the physical waste generated by replacements.

CY23

Lighting Upgrades

Biosafety cabinet light replacements

This project replaced fluorescent lighting in 132 biosafety cabinets in several buildings across campus with LEDs, including Armenise, C Building, Goldenson, REB, LHRRB, Mudd and WAB. The project saved about 5,142 kWh. The unit on the left has the original lighting while the unit on the right is new.

Original Lighting

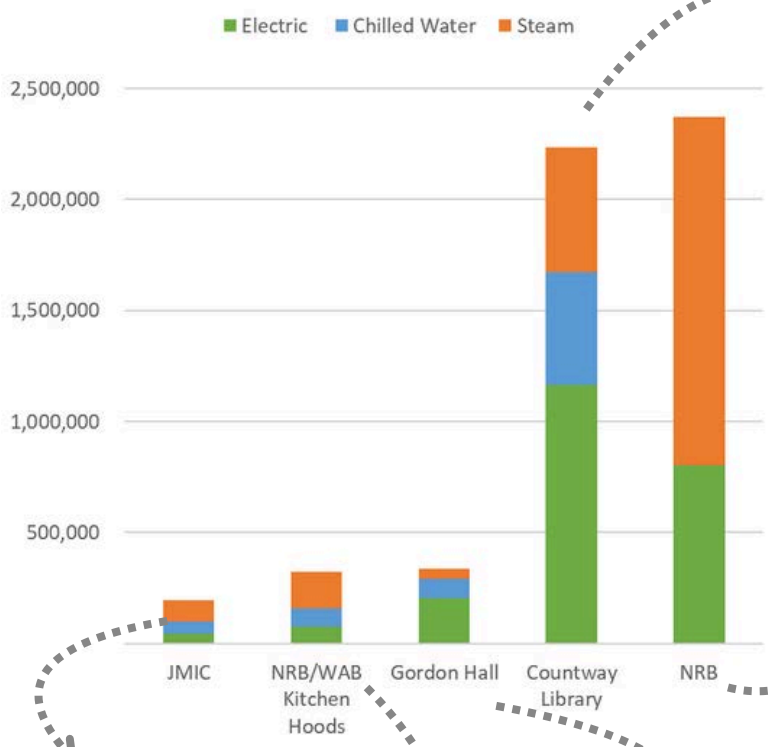
New Lighting

The driver and new lamps inside the BSC.

CY23

Energy Audits

As part of efforts to improve energy efficiency and reduce environmental impact, HMS Facilities completed several detailed energy audits in 2023, looking for energy savings opportunities across campus. The first audit was ventilation focused, and recommended the multiple ECMs described below, which are scheduled for implementation in fiscal year 2025. These projects focus on retro-commissioning efforts, equipment scheduling, and system optimization.



Countway Library: RCx and Scheduling of 2 AHUs, addition of VAV Boxes

Retro-commissioning of multiple air handling units, improved scheduling, and the addition of variable air volume (VAV) boxes to optimize airflow in administrative areas.

NRB: Ventilation Optimization

Adjustments to air flow rates, pressurization, and control strategy in NRB.

JMIC: AHU-8 and Controls Improvements

Retro-commissioning (RCx) of air handling units and associated control systems to enhance efficiency.

Gordon Hall: Schedule AHU-10

Improved scheduling to reduce unnecessary operation during unoccupied periods.

Kitchen Hood Controls: NRB and WAB Kitchen Hoods

Adjustments to reduce energy consumption while maintaining proper air quality and safety standards.

Based on the energy audit's findings, implementing these projects will save 200 metric tons of CO_2e. Next year's report in '24 will provide updates on actualized savings.

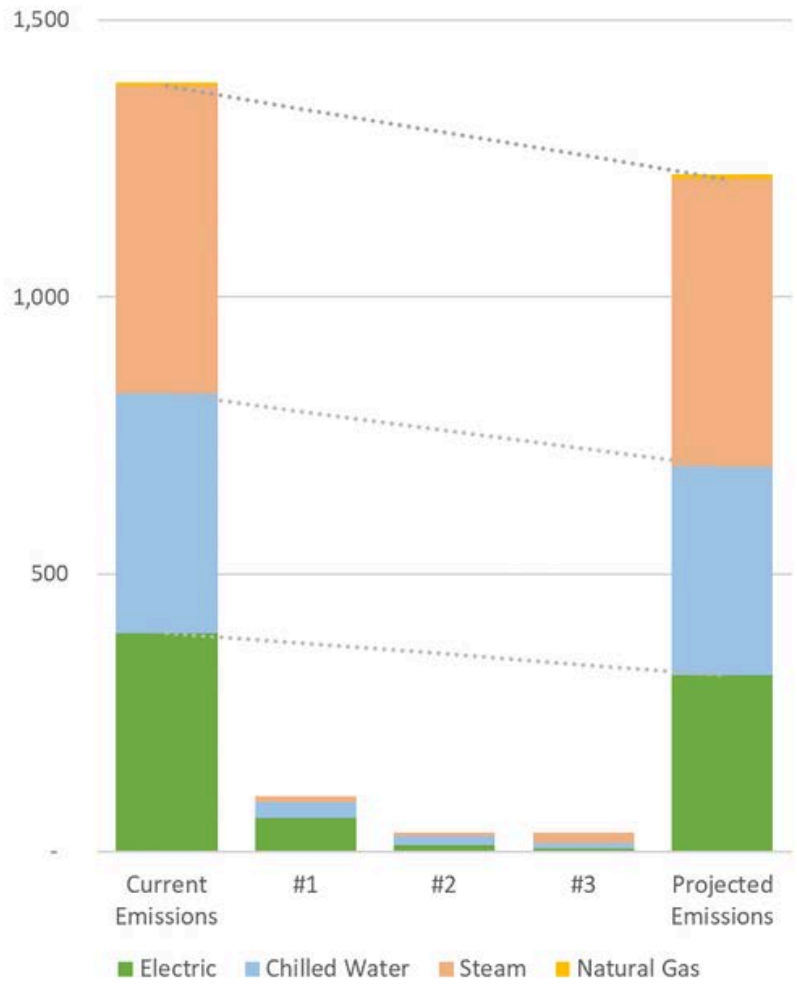
CY23

Energy Audits

A second audit completed in 2023 focused on the Dental Research and Education Building. The project identified multiple key opportunities for improving energy efficiency in the building. As a result of this audit, three energy conservation measures have been approved for implementation in fiscal year 2025. They include:

1. **AHU Scheduling and Resets:** optimize air handling unit operations by improving scheduling for non-laboratory spaces and automating supply temperature and static pressure resets.
2. **Lab Ventilation Controls Optimization:** strategically reducing airflow during unoccupied periods for specific air handling units. It will result in reductions in energy use across multiple systems.
3. **Heat Recovery Improvements:** upgrades to the building's heat recovery system, including new two-way valves for improved control, variable frequency drives (VFDs), and control components to monitor heat exchange.

Once completed, these improvements will boost the building's energy efficiency and lower operating costs. The energy-saving measures are expected to cut the building's carbon emissions by **150 metric tons per year - about 10% of REB's annual carbon footprint**.



Energy Audits

An audit of the New Research Building (NRB) and Warren Alpert Building (WAB) kitchen exhaust systems identified opportunities for reducing range exhaust during non-cooking times. Currently, the exhaust fans in these kitchen areas operate continuously, 24 hours a day, 7 days a week. The audit revealed potential for significant energy savings through installing a system to modulate fan speeds during periods of low or no cooking activity.

This optimization is expected to reduce electricity consumption and heating/cooling costs, equivalent to 50 metric tons of carbon dioxide equivalent per year. The project will be implemented in FY25, with progress and actual savings to be reported in the CY24 sustainability report

Additional Kitchen Audit: Water Conservation

HMS Facilities also engaged a contractor to conduct a site survey of the major kitchen equipment in use on campus, with a focus on their water consumption efficiency. This included the Elements Café kitchen at the New Research Building and the Courtyard Café kitchen at the Warren Alpert Building. Nearly all equipment was surveyed including ice machines, sprayers, ovens, steamers, refrigeration systems, dish machines, garbage disposals, and faucets.

Most equipment was found to be in Fair to Good condition but with the changing needs of Dining services, more expensive, new equipment would need to be installed to adhere to current requirements. The survey and feedback were shared with Campus Planning to ensure that Dining services incorporates these recommendations into future equipment replacement budgets.

Campus Steam Trap Replacements

A steam trap survey was conducted across campus, inspecting 1,113 traps for three common issues: blow-by (steam passing through when the trap should be closed), leaking, and blockages. These problems can significantly reduce system efficiency and waste energy.

The survey identified issues **in approximately 11% of the traps**. As a result, 126 traps were repaired or replaced over two project phases. This initiative saves approximately 9,030 mmbtu of energy annually, equivalent to about 650 metric tons of carbon dioxide - more than Gordon Hall's total annual emissions.

Air Supply Fan Repair & Calibration

A series of repairs and calibrations were performed on a Warren Alpert air supply fan which serves three air handling units in Goldenson. These improvements resolved airflow issues and significantly enhanced the air handling units' efficiency. As a result, the supply fan speeds of the three units were reduced by 10%, 15%, and 22% respectively, leading to substantial electrical energy savings downstream. **The net energy savings on this project are approximately 54,500 kWh - this is equivalent to the combined annual electricity use of about 8 homes.**

Guide vane, controls the speed of the fan.

The fan.

Quad Door Weatherization

Door weatherization was completed across various campus building entrances and exits to ensure proper sealing around main doors. Air sealing prevents untreated, unconditioned air from entering the buildings, significantly reducing heating and cooling energy loads while improving occupant comfort and creating a more stable indoor environment.

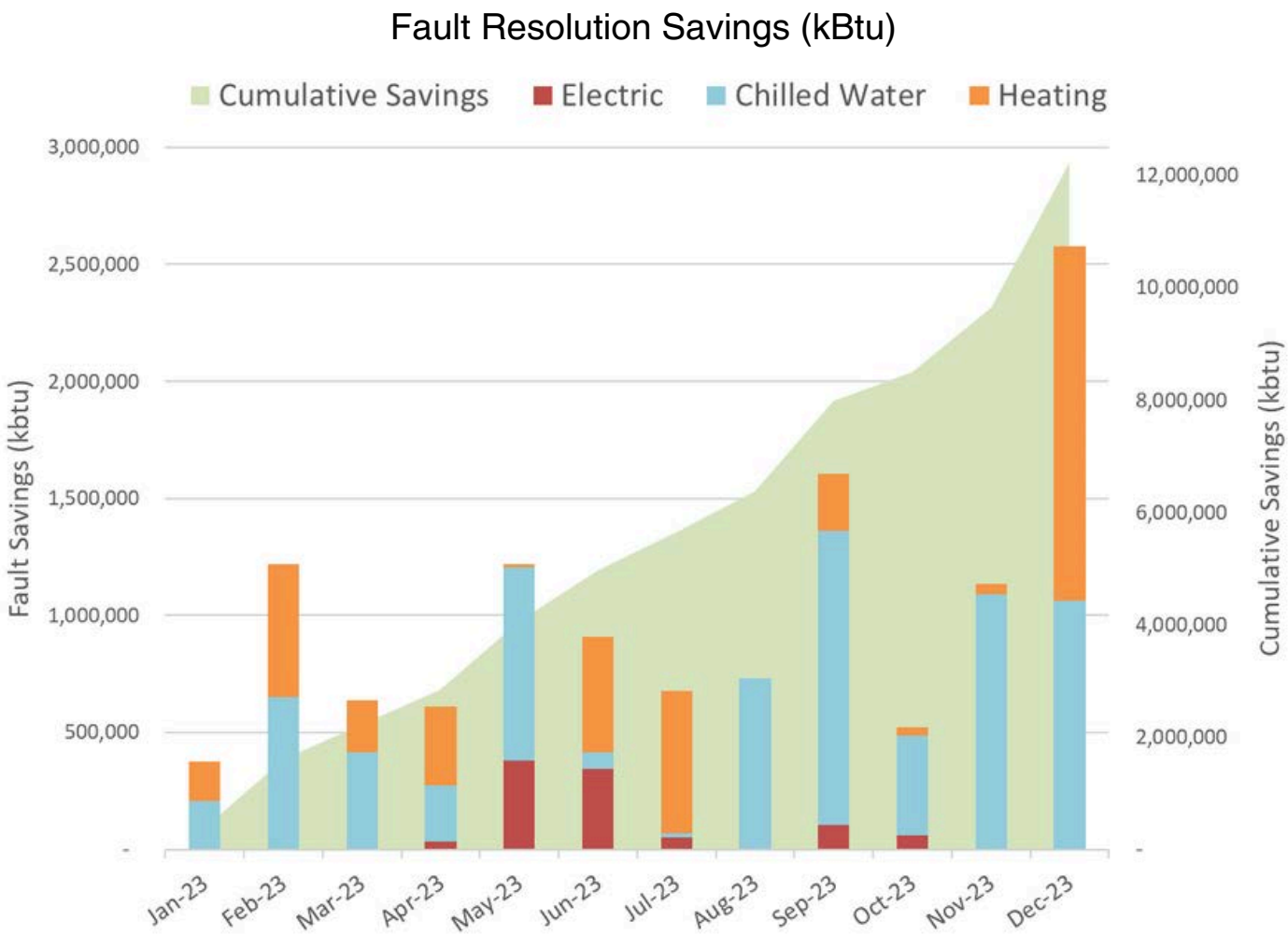
Drafty seal

Repaired seal

Fault Detection Software

HMS's fault detection software, Clockworks Analytics, plays a crucial role in furthering energy efficiency efforts of operations. The software functions by continuously monitoring all mechanical and HVAC equipment, by extracting and analyzing trends from the Building Automation System (BAS), the centralized hub for all buildings' essential systems. The Clockworks platform is implemented across the entirety of the campus, and is used to check performance of major and essential equipment, including air handling units, chillers, boilers, pumps, fan coil units, exhaust fans, and terminal units. By leveraging this software, the energy group is able to proactively identify and rectify any potential faults in the operation of these critical systems, ensuring their most efficient performance.

In 2023, Facilities **resolved 57 major issues** identified by Clockworks, encompassing simultaneous heating and cooling, sensor failures, pneumatic controls errors, and others. Beyond the benefits of extending the life of equipment requiring fault correction this approach resulted in energy savings equivalent to over **12 million kBTU, about $420,000 in energy costs**.



CY23

Green Labs

As a leader in research and innovation, we carry a responsibility to pioneer and champion sustainable laboratory practices. In Fall of 2023, Facilities launched two key initiatives to promote sustainability in laboratory settings: a Green Lab Certification Program and an Ultra-Low Temperature (ULT) Freezer Rebate Program.

Green Lab Certification

The Green Lab Certification program aims to reduce energy consumption, minimize waste, and promote sustainable practices in research environments.

- Assess the current sustainability level of participating labs
- Provide actionable recommendations for improving eco-friendly practices
- Acknowledge and celebrate labs already implementing sustainable measures

Scoring takes place using self-assessment checklist with which labs can evaluate their practices and progress. Upon achieving a certain number of points, certification is awarded on a three-tier basis: bronze, silver, and gold.

With over 260 labs across our campus, our collective efforts can make a substantial impact on our environmental footprint. In 2023, HMS Sustainability certified 4 labs.

Ultra-Low Temperature Freezer Rebate Program

At the close of 2023, HMS Facilities began offering rebates to labs purchasing highly energy efficient models of Ultra Low Temperature Freezers. Ultra-Low Temperature (ULT) freezers, -70 and -80 degree freezers, are significant energy consumers. Older models can consume up to 30 Kwh/ day—as much as some entire homes! The rebate Program incentivizes the replacement of older, energy-intensive freezers with more efficient models. which consume as little as 8 kWh/day.

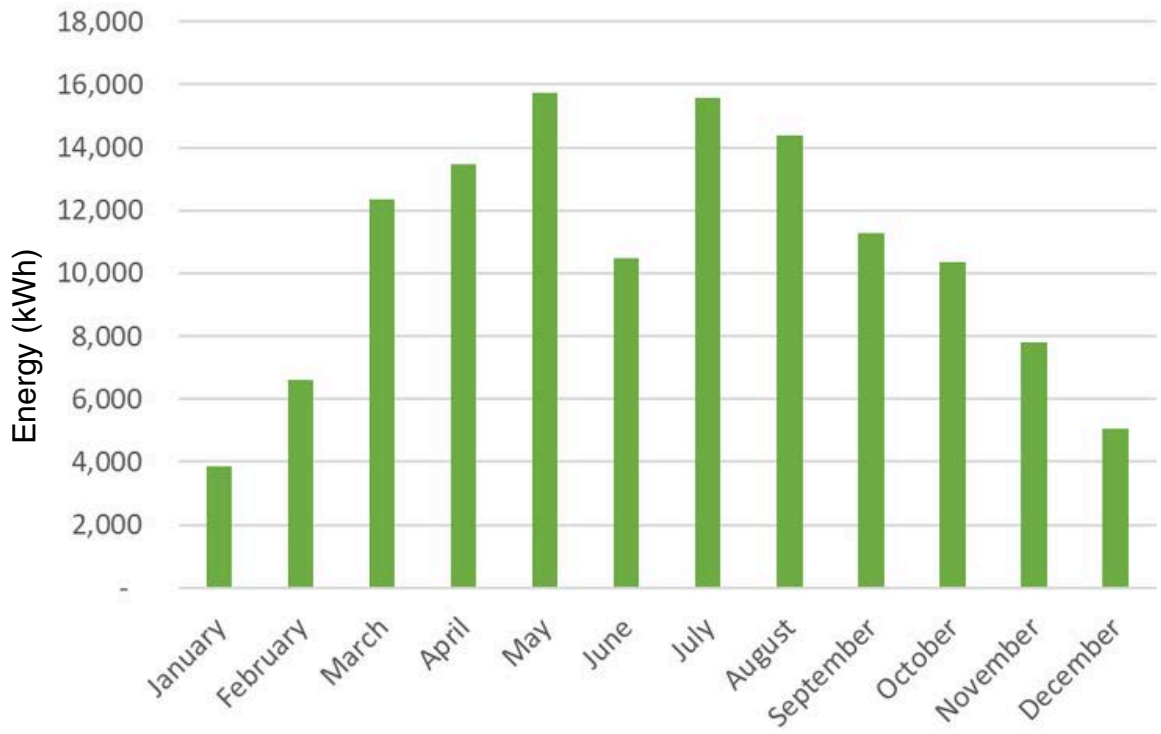
Facilities processed 3 rebates at the end of 2023, with interest in the program growing in 2024. On average, a **simple payback of 1.2 years,** meaning that the energy cost savings from the new efficient freezers cover the initial investment of providing labs with the rebate in just over a year, after which the campus continues to benefit from reduced energy costs and environmental impact.

NRB Solar Array

Below is the monthly production of electricity from the 380 solar panels on the roof of NRB in 2023. This electricity supplements power provided by Eversource. Every kWh generated by the solar panels contributes to the relative reduction of GHG emissions that would otherwise be generated by Eversource.

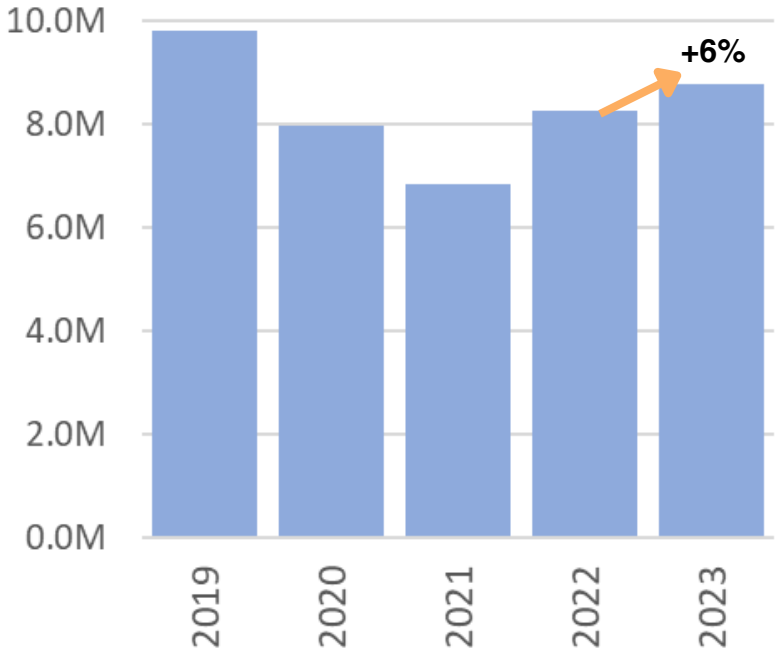
Production Stats CY2023:
~127 MWh generated (compared to ~137 MWh in CY2022)
~37 MT CO2e emissions avoided

2023 NRB Solar Production



Water Consumption

HMS Total Water Consumption (cubic feet)



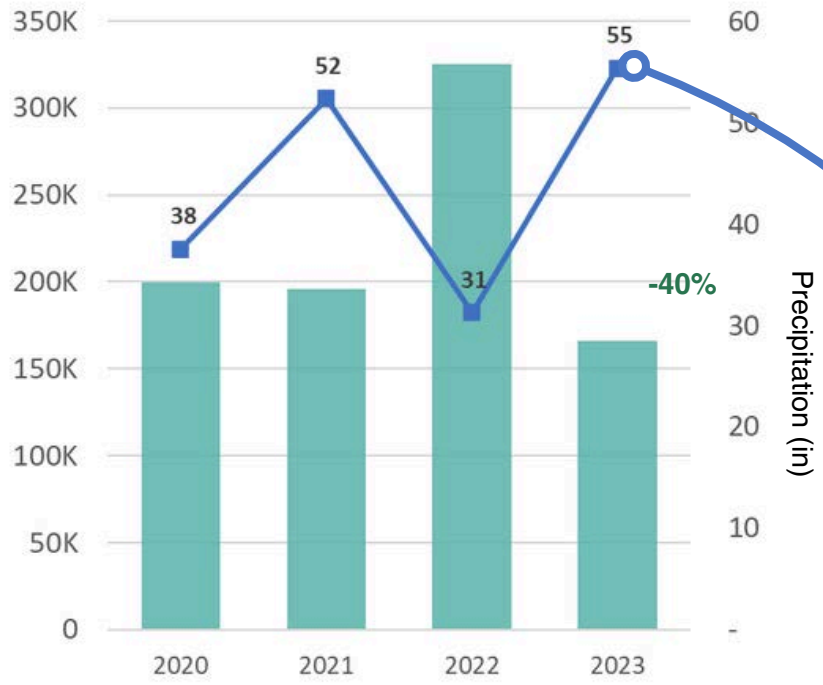
HMS experienced a slight increase in water consumption across campus when comparing 2022 to 2023, of about 6%.

Water consumption across campus consists of water use inside the building (lab sinks, bathrooms, etc.), for cooling some building on campus, and for irrigation.

As 2023 had a slightly milder summer than 2022, the increase in consumption is not attributable to cooling as the need was reduced.

In addition, there was also more precipitation in 2023 compared to 2022, reducing the need for irrigation on campus. **Altogether, the increase in consumption in 2023 is likely due to increased usage of water inside the building, for lab equipment that uses water, for sinks, toilets, and other everyday uses.**

HMS Irrigation (cubic feet)



2023 saw higher precipitation, significantly decreasing irrigation needs for the quad and green spaces on campus - by over 40%.

Water Savers

Sterilization equipment plays an important role in research facilities, destroying viruses, bacteria, and other pathogens from instruments and apparatus used in the lab. However, steam sterilizers and autoclaves are water-intensive in their operations, and are among the most intensive equipment on campus. As part of HMS' campus water conservation program, a total of sixteen (16) water saver devices were furnished and installed on sterilizers in the New Research Building in late 2022.

The water savers installed on the sterilizers use controlled recirculation to create the necessary vacuum for sterilization while significantly reducing water consumption

During the initial months of operation, the system required troubleshooting and technical adjustments which lasted through early 2023.

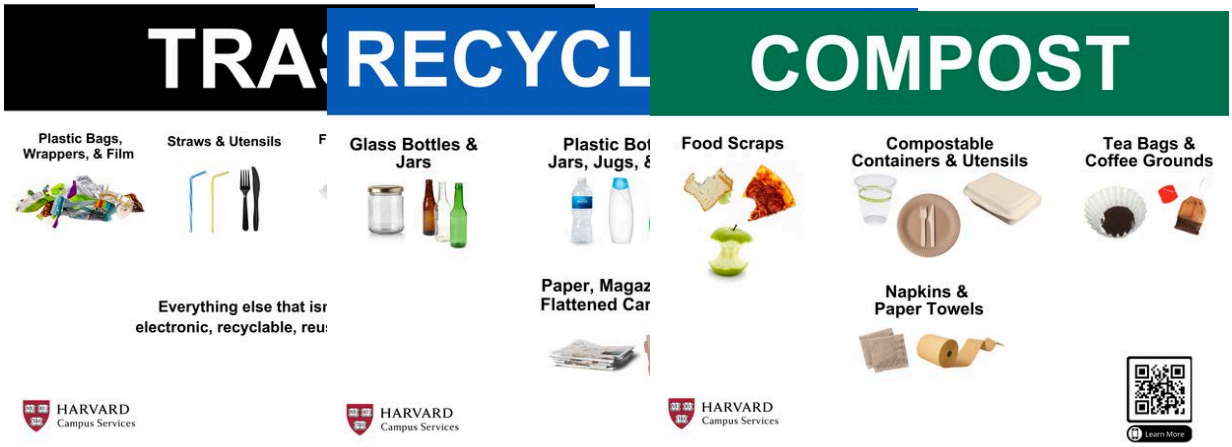
Now that the water savers are operational, preliminary savings data suggest that these improvements have reduced the building's total water consumption by about 8%!

Results and Impact

- **91%** reduction in water usage across all sixteen units
- Weekly water savings of over **47,000 gallons**
- Annual conservation of nearly **2.5 million gallons**

Waste Disposal

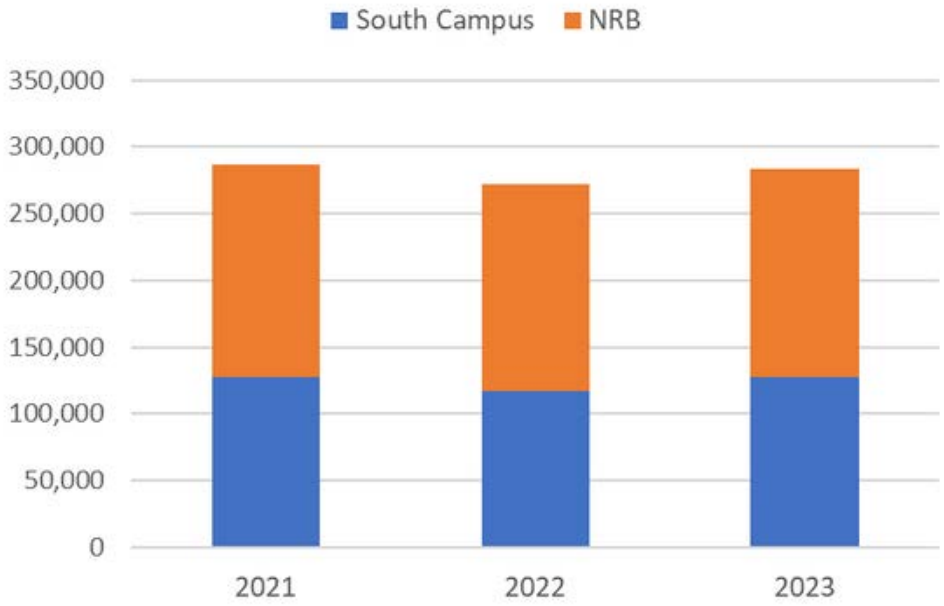
HMS waste patterns from 2020 to 2023 reflect the impact of the COVID-19 pandemic and the subsequent return to normal operations. Total waste generation, including Municipal Solid Waste (Trash), Single Stream Recycling, and Compost, was lowest in 2020 due to reduced campus occupancy. As campus activities resumed, waste levels have increased across all streams, reaching pre-pandemic volumes in 2023. This trend, returning to typical operational levels, aligns with broader patterns at the University level. Ongoing monitoring is critical for assessing and improving waste reduction initiatives on campus.



For detailed information on accepted materials, sorting guidelines, and to download these posters, please visit the the HMS Sustainability Website: https://campusplanning.hms.harvard.edu/sustainability

Biowaste Disposal

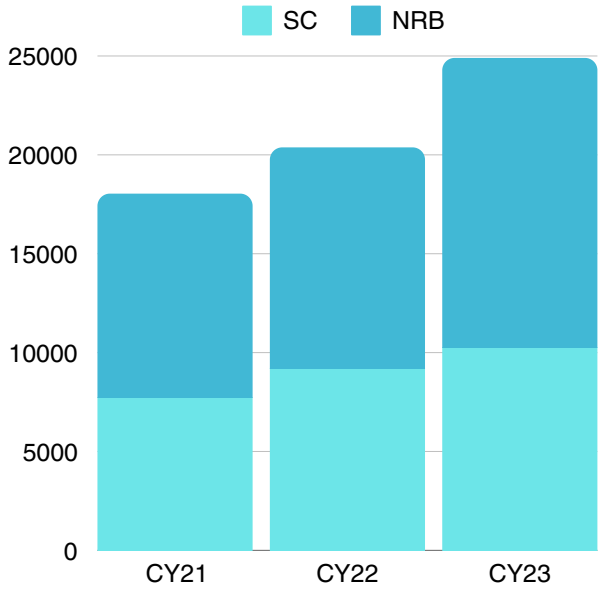
While regulated medical waste presents inherent challenges for sustainable resource recovery and eco-friendly disposal due to its hazardous nature, HMS Facilities prioritizes safety and environmental regulations in our management approach of bio-waste on campus.



Pipette Tip Box Recycling

Pipette tip box recycling has continued to expand on HMS's campus since its expansion from a pilot in 2019 to full campus availability in August 2020. **Pipette tip box recycling volumes grew 22% in 2023 from 2022, with nearly 25,000 lbs of tip boxes collected from the HMS campus (over 12 tons diverted from the landfill).**

The tip boxes, polypropylene plastic, are granulated and re-used by local manufacturers to make more laboratory supplies.



Total Weight of Tip Boxes (lbs)	CY21	CY23	CY23
NRB	10,301	11,204	14,648
South Campus	7,738	9,174	10,254
Total Diverted from Landfill	**18,039**	**20,378**	**24,902**

Grounds

Salt application is necessary for the safety of pedestrians on campus, but can also contribute to the degradation of water quality as it enters the sewer, and eventually waterways. In Fall of 2023, Facilities changed its snow and salt management strategy, establishing:

- Limited salt zones
- Non-chloride product zones
- Use of vegetable brine solution for pre-treatment

Ventrac with brine sprayer

Despite nearly equivalent snowfall, this new approach reduced road salt by 65%, ~58,000 pounds from 2022 to 2023

Clockwise: backpack blower, utility cart, mower, snowblower

Grounds is using electric-powered equipment wherever possible, cutting down noise and emissions. The fleet includes an electric utility cart, electric mowers, snow blowers, and backpack blowers. Facilities plans to expand the electric equipment fleet as technology advances, especially for high-capacity commercial models.

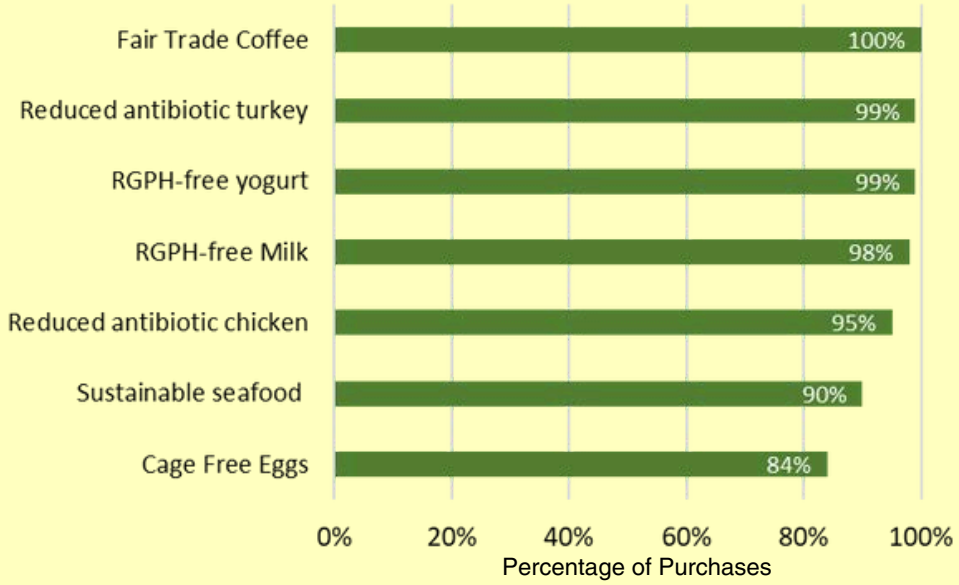
Dining

HMS partners with Restaurant Associates (RA), a member of Compass Group, USA, as its on-site dining management company. RA implements sustainable practices and promotes healthful food choices through various initiatives, including:

- Sourcing sustainable seafood according to Monterey Bay Aquarium Seafood Watch standards
- Maintaining a sustainability scorecard to track and monitor purchases
- Using compostable serviceware, including BPI-certified plates, utensils, cups, and containers, across all dining areas
- Offering Virtual Teaching Kitchen classes that focus on sustainable, plant-forward meals to promote food literacy and education

Sustainable Sourcing

With a target of 100% sustainable purchasing across all categories of food, in 2023 RA achieved:



When falling short of the 100% goal, it is often due to supplier substitutions. RA continues to work closely with suppliers to minimize these occurrences and maintain high standards.

Food Recovery

RA partners with Food For Free in Cambridge for food recovery in their Heat n Eats program. **In 2023, RA contributed 906 meals!** This initiative helps reduce food waste while supporting the local community.

Get in touch

For more information about sustainability initiatives and how you can get involved, please visit our website, scan the QR code below, or email us directly.

sustainability@hms.harvard.edu

https://campusplanning.hms.harvard.edu/sustainability