

CY20 SUSTAINABILITY REPORT

Harvard Medical School



HARVARD
UNIVERSITY

Sustainability



HARVARD
MEDICAL SCHOOL



HARVARD UNIVERSITY SUSTAINABILITY PLAN

- Water Conservation Measures
- Green Lab Certification
- Healthier Building Materials - Countway
- Waste Management

- Healthy and Sustainable Meeting Guide



- Strategic Energy Plan updates
- Energy Conservation Measures
- NRB Solar Array
- BERDO & GHG reporting Analysis



- Countway Community Garden



- Lighting Fairs
- Student Outreach

HARVARD'S CLIMATE ACTION PLAN:

FOSSIL FUEL-FREE BY 2050

FOSSIL FUEL-NEUTRAL BY 2026

green.harvard.edu/climate

Roadmap to fossil fuel-free

30% net emissions
reduction from 2006-2016



Energy-efficient buildings
and rooftop solar



Fossil fuel-neutral by 2026



100% renewable
regional electric grid



Fossil fuel-free district
energy system



Emissions-free
transportation



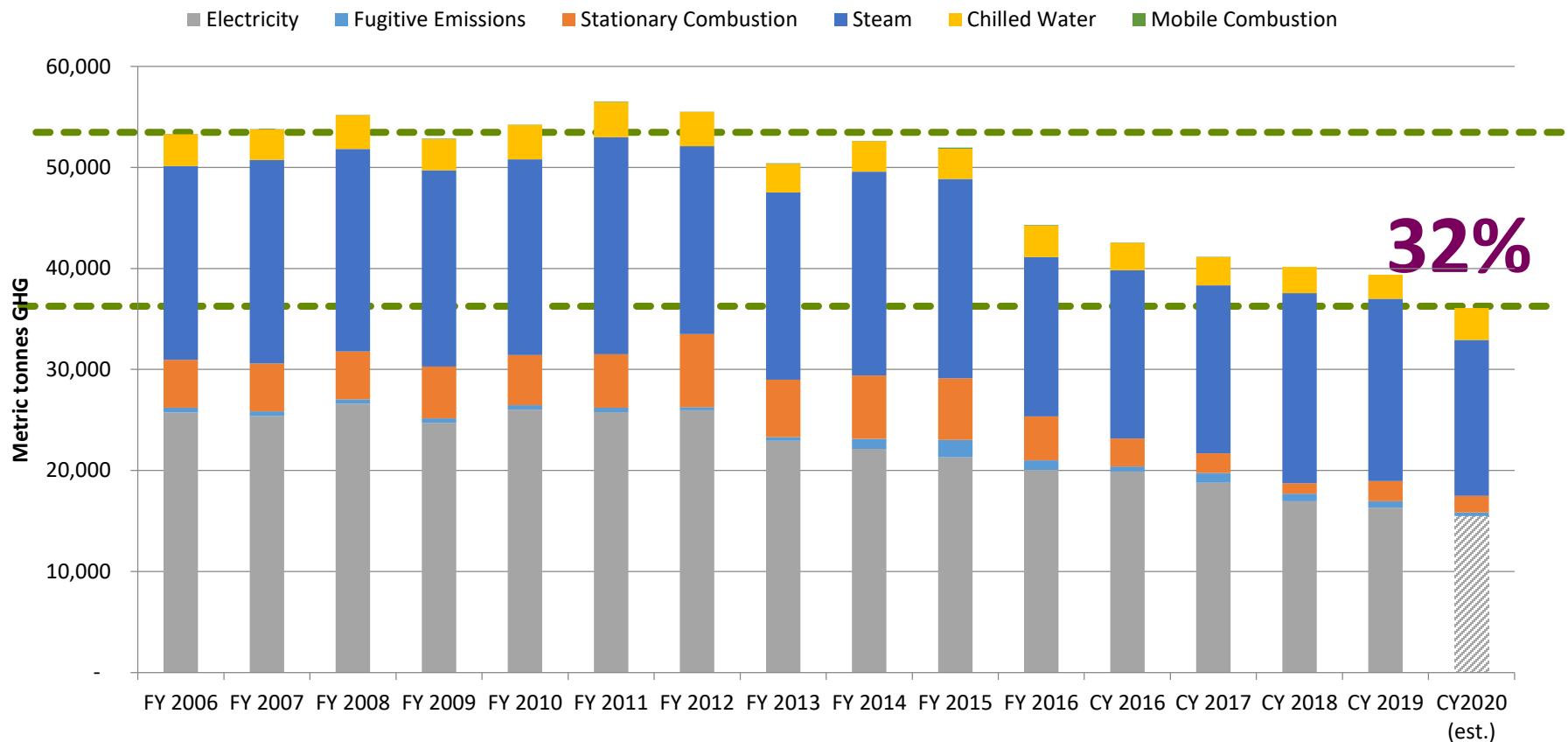
**FOSSIL
FUEL-FREE
BY 2050**

EMISSIONS AND ENERGY



HMS GHG EMISSIONS REDUCTION PROGRESS

HMS GHG Emissions by Category



CY2020 emissions data has not be finalized as of this report's publishing, but estimates suggest approximately a 32% reduction from the 2006 baseline in CY2020.

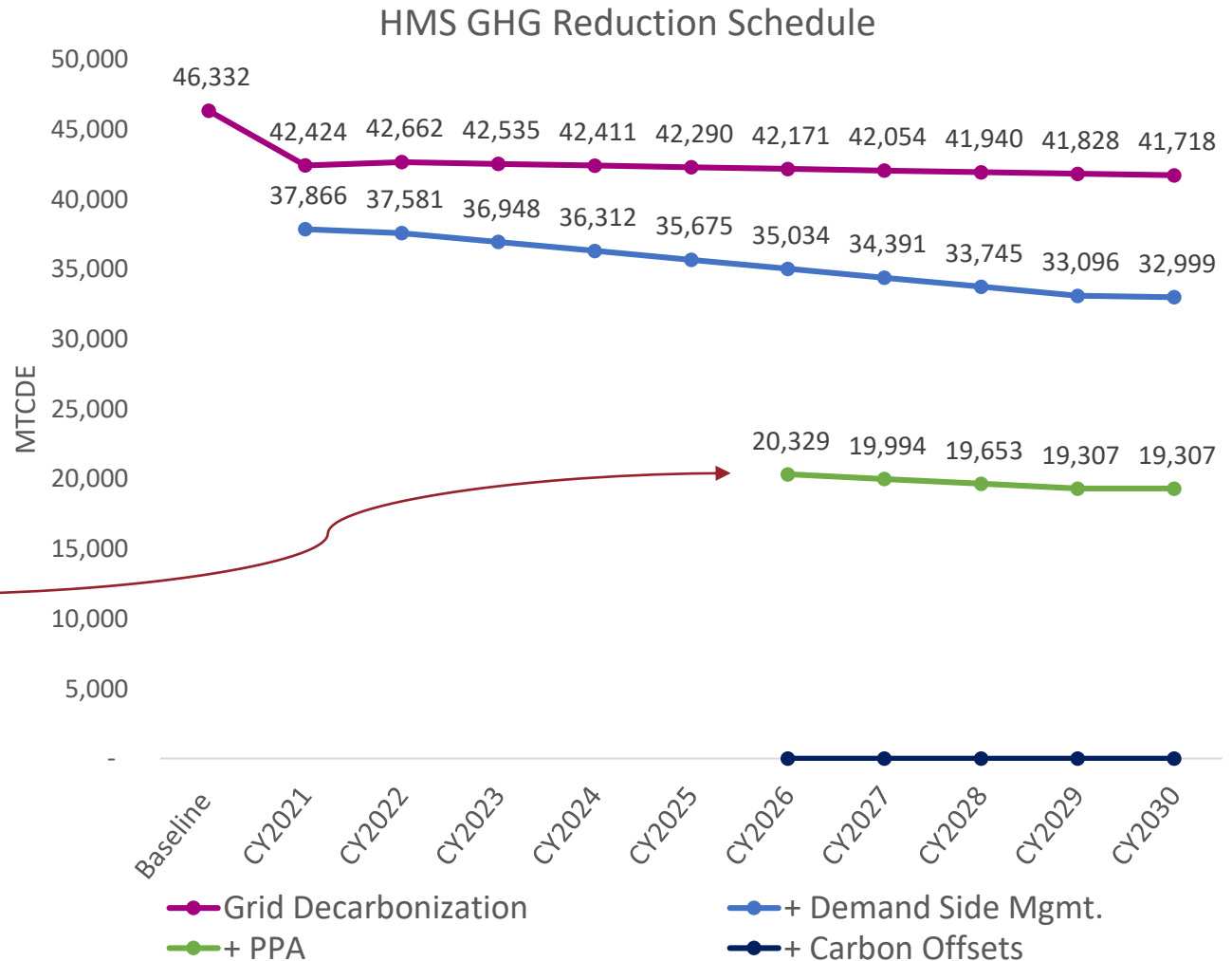
EMISSIONS AND ENERGY



HMS GHG EMISSIONS REDUCTION SCHEDULE

In alignment with Harvard University's 2026 and 2050 goals, HMS projects the following greenhouse gas reduction schedule.

In 2026, the school offsets all electric emissions with RECs, and all of its steam and natural gas emissions with carbon offsets.



EMISSIONS AND ENERGY

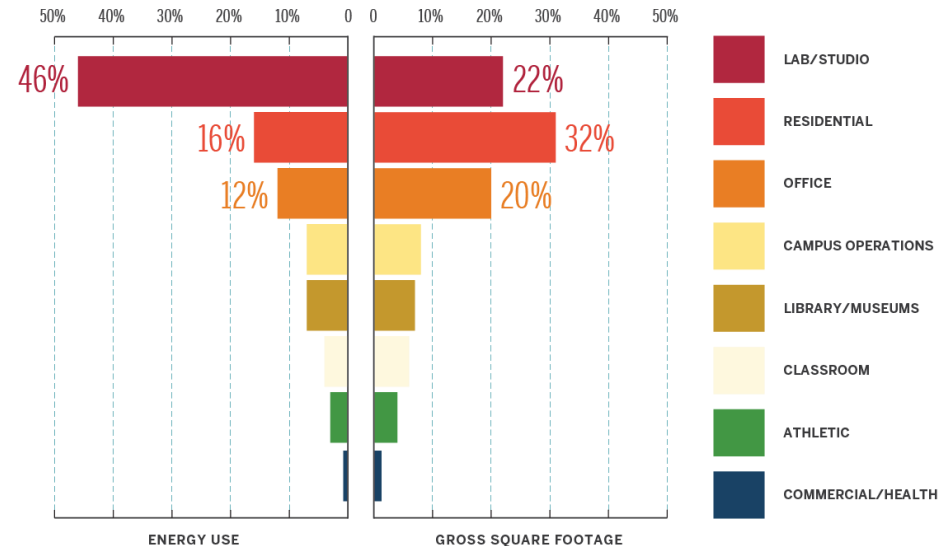
ENERGY CONSERVATION MEASURES AND STRATEGIC ENERGY PROJECTS FOCUS ON LABORATORY ENVIRONMENTS

Harvard-wide Lab Impact:



Laboratories at Harvard University consume **46%** of energy on campus but represent only **22%** of the total square footage, illustrating the unique challenge that research-focused organizations face as they seek to reduce their emissions footprint.

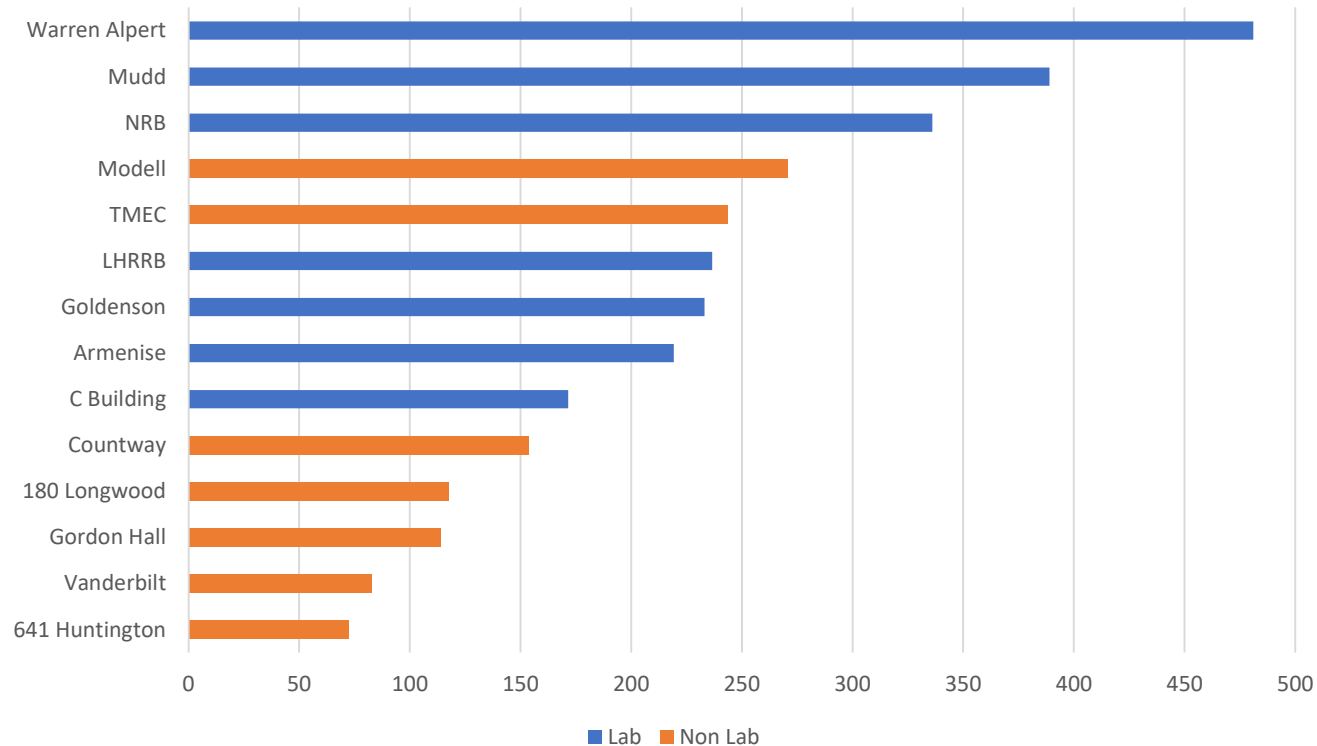
This challenge is especially evident at HMS, where **70%** of space belongs to labs. Sustainability and efficiency achievements on campus must keep up with growing research, increased building population density, and the introduction of more delicate, energy intensive equipment.



EMISSIONS AND ENERGY

ENERGY CONSERVATION MEASURES AND STRATEGIC ENERGY PROJECTS FOCUS ON LABORATORY ENVIRONMENTS

HMS 2020 EUIs

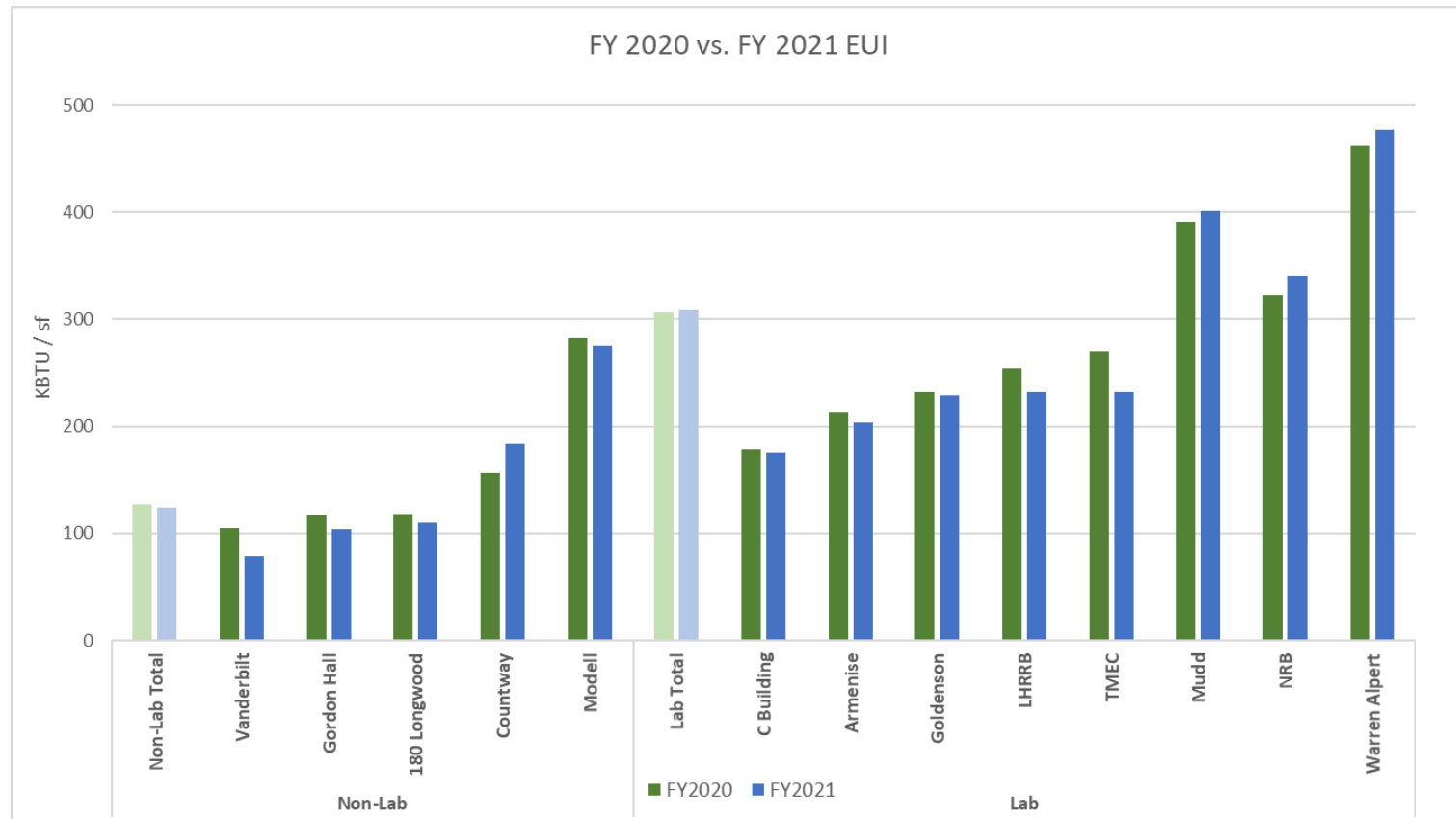


This shows HMS's buildings, split between lab buildings and non-labs, and their Energy Use Intensities (EUI), in CY2020. EUI is a measurement of a building's annual energy consumption relative to its square footage, and allows for comparison between buildings.

EMISSIONS AND ENERGY



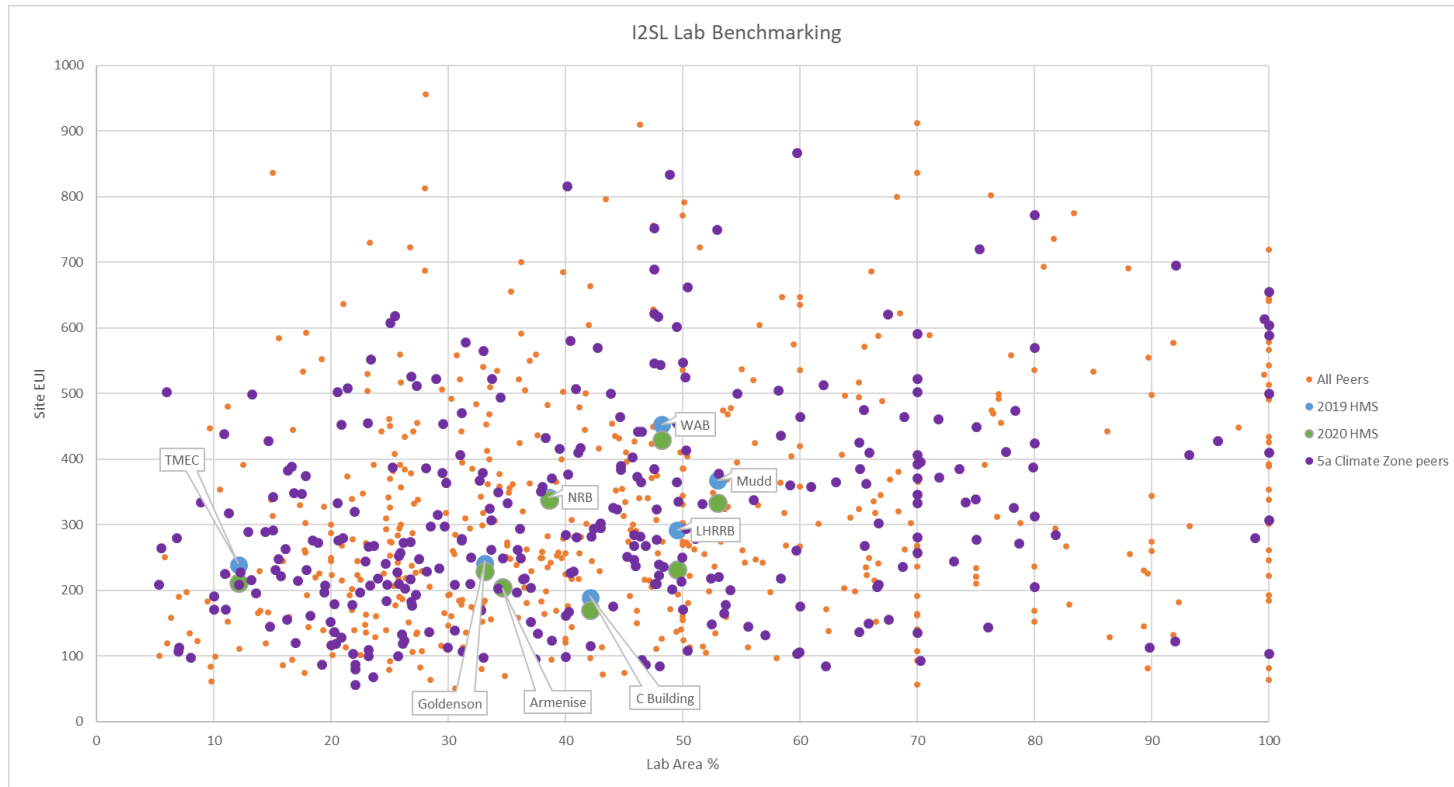
ENERGY CONSERVATION MEASURES AND STRATEGIC ENERGY PROJECTS FOCUS ON LABORATORY ENVIRONMENTS



This shows HMS's buildings, split between lab buildings and non-labs, between FY20 and FY21. The lighter bars, for "Non-Lab Total" and "Lab Total" represent the EUI for the building category as a whole, using total energy consumption and total area.

EMISSIONS AND ENERGY

ENERGY CONSERVATION MEASURES AND STRATEGIC ENERGY PROJECTS FOCUS ON LABORATORY ENVIRONMENTS



This chart shows HMS's lab buildings within a data set from the International Institute for Sustainable Laboratories, where buildings are ranked by the percentage of the building's lab area versus their EUI. HMS is well aligned with its peers in this respect.

EMISSIONS AND ENERGY

A decorative header illustration featuring a green background with white silhouettes of trees, a factory with smoke, a person on a ladder, a person walking a dog, and a building with solar panels.

HMS FACILITIES COMMITMENT TO SUSTAINABILITY

HMS facilities is committed to providing a safe and healthy campus to support daily operations of critical research and to the wider community. Simultaneously, facilities focuses on reducing operating costs and shrinking the impacts of operations on the environment.

To better align with HU's overarching sustainability goals, HMS Campus Planning and Facilities has updated its Strategic Energy Plan, building on 2016-2020 plan.

EMISSIONS AND ENERGY

HMS FACILITIES IS FINALIZING ITS UPDATED STRATEGIC ENERGY PLAN

The new Energy Plan's focus areas include:

- Ensuring Competitive Procurement of Energy Resources
 - Reduction of Energy Consumption
 - Improvement of Energy Data Sourcing and Analytics
 - Championing Energy and Sustainability Outreach
 - Ensuring Continuity of Utility Service
 - Ensuring Carbon Emission Performance
- Compliance and Reporting with:
- Boston BERDO regulation
 - Harvard University goals



EMISSIONS AND ENERGY

ECMs AND STRATEGIC ENERGY PROJECTS

- NRB Solar PV System
- Clockworks Analytics Fault Detection Software
- Energy Retrofits and Retro-commissioning Projects
- GreenerU Investment Grade Audits (IGAs)
- WAB LED Lighting & Controls Upgrades
- NRB Tower & Parking Garage LED Lighting & Controls Upgrades
- Campus Wide Heat Recovery Coil Cleaning
- C Building Heat Recovery System Recommissioning
- Goldenson Ventilation Optimization Study
- NRB CoolTrol Installations Round 2



EMISSIONS AND ENERGY

ECMs AND STRATEGIC ENERGY PROJECTS

NRB SOLAR PV SYSTEM

Building Use: Research Lab

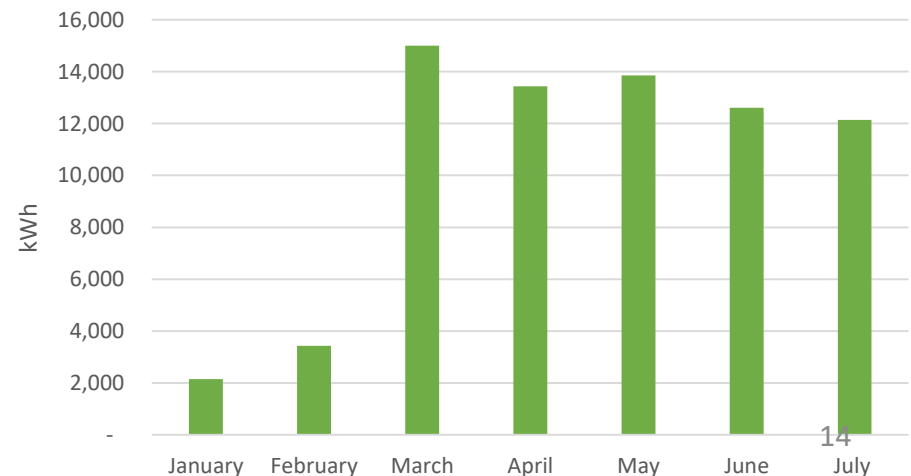
380 solar panels interconnect January 2021 on two adjacent sections of the roof in New Research Building. The power output from the system is directed to the building's main switchgear and supplements the power provided by Eversource.



Production January 2021-July 2021:

- ~73.6 MWh generated
- ~115,712 lbs avoided CO₂ Emissions

Monthly Production



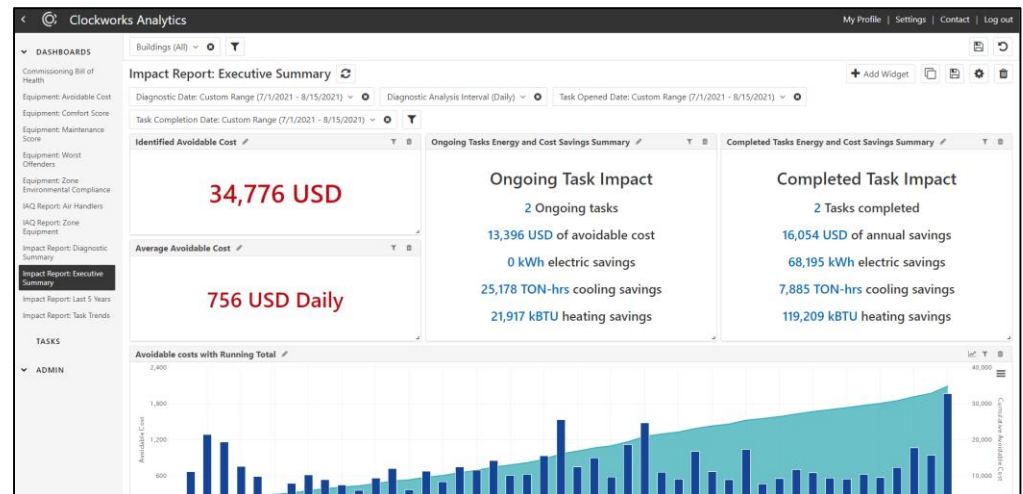
EMISSIONS AND ENERGY

ECMs AND STRATEGIC ENERGY PROJECTS

CLOCKWORK ANALYTICS FAULT DETECTION SOFTWARE

Clockworks Analytics software is designed to perform continuous fault detection on all mechanical/HVAC equipment by pulling trends from points found on the Building Automation System (BAS). The platform has been fully deployed and is currently used to check operation of major and critical equipment such as air handling units, chillers, boilers, pumps, fan coil units, exhaust fans, terminal units, etc.

- In 2020, HMS resolved 14 major issues identified by Clockworks, including simultaneous heating and cooling, sensor failures, fixing pneumatic controls and other issues which realized \$68,119 of savings.



EMISSIONS AND ENERGY



ECMs AND STRATEGIC ENERGY PROJECTS

ENERGY RETROFITS AND RETRO-COMMISSIONING PROJECTS

Implementing energy retrofit projects not only results in the reduction of energy cost and emissions, but also helps Facilities to improve the longevity of mechanical and electrical equipment, lowering operational expenses. The following projects were implemented in CY 20:

- Repair and replacement of inoperable and leaking valves, dampers, and actuators
- Compressed air leak detection survey & repairs
- Programming optimization for mechanical heating, ventilation, and air conditioning equipment
- Commissioning of compressed air system in NRB



GREENER U

INVESTMENT GRADE AUDITS (IGA)

In 2020, HMS Facilities contracted with GreenerU, an energy consulting firm, to develop a comprehensive energy conservation program for the campus. Three investment grade audits (IGA) targeting lighting and mechanical systems were initiated, scheduled to be completed in 2020/2021. Projects will include:

- IGA 1 – Campus Lighting Audits
 - WAB and NRB Tower & Garage in bid
- IGA 2 – Ventilation Optimization & Heat Recovery Systems
 - Heat recovery from an exhaust fan in Goldenson basement
 - Heat recovery from a cage wash fan in WAB
- IGA 3 – Variable Frequency Drives (VFDs) for Hydronic Systems
 - Pumps and fans over 5 horsepower for potential VFD installation



EMISSIONS AND ENERGY

ECMs AND STRATEGIC ENERGY PROJECTS

WARREN ALPERT LED LIGHTING & CONTROLS UPGRADES

Building Use: Research, Lecture Room, Office

Purpose – LED lighting fixtures and controls consume far less energy per unit of light, allowing for enhanced lighting and reduced electricity consumption.

Outcome – Proposal to upgrade 755 lighting fixtures, reducing the building's electricity consumption by **approximately 160,000 kWh/yr or ~\$39,000/yr.**

This is equivalent to about **113 metric tons of CO₂.**

The project is in the final phases of approval and construction will start in FY22.



EMISSIONS AND ENERGY

ECMs AND STRATEGIC ENERGY PROJECTS

NRB TOWER & PARKING GARAGE LED LIGHTING & CONTROLS UPGRADES

Building Use: Research, Lecture Room, Office, & Parking Garage

Purpose – LED lighting fixtures and controls consume far less energy per unit of light, allowing for enhanced lighting and reduced electricity consumption.

Outcome – Proposal to upgrade 2,715 lighting fixtures, reducing the building's electricity consumption by **approximately 608,000 kWh/yr or ~\$153,000/yr.**

This is equivalent to about **431 metric tons of CO₂.**

The project is in the final phases of approval and construction will start in FY22.



ECMs AND STRATEGIC ENERGY PROJECTS

CAMPUS WIDE HEAT RECOVERY COIL CLEANING

This project included a deep cleaning of 44 coils on air handling units, makeup air units, and exhaust fans across the campus.

Resulted in:

- A decrease in pressure drop across coils, helping to conserve fan energy.
- Increased heat transfer efficiency, helping to conserve energy of steam
- Installation of access doors for future maintenance.

This project will save approximately \$78,000/yr in avoided energy costs.



EMISSIONS AND ENERGY

ECMs AND STRATEGIC ENERGY PROJECTS

C BUILDING HEAT RECOVERY SYSTEM RECOMMISSIONING AUDIT

Building Use: Research Lab

This audit evaluated C Building's heat recovery system, including piping, insulation, connected coils, and pumps.

The resulting scope of work will replace insulation, upgrade controls and monitoring, and re-balance the system.

This project is slated for construction in FY22 as part of a larger air handling unit replacement project in C Building.



EMISSIONS AND ENERGY

ECMS AND STRATEGIC ENERGY PROJECTS

GOLDENSON VENTILATION OPTIMIZATION STUDY

Building Use: Research, Lecture Room, Office

Purpose – This study evaluated the building's ventilation system on the subject of ventilation optimization.

Outcome – The building's ventilation levels were found to be in compliance with the standards and some energy conservation opportunities were identified including the installation of air-side heat recovery system.

These opportunities will be further investigated in FY22.



EMISSIONS AND ENERGY

ECMS AND STRATEGIC ENERGY PROJECTS

NRB COOLTROL INSTALLATIONS ROUND 2

Six cold rooms in NRB were retrofitted with the CoolTrol temperature and evaporator fan control technology. In addition, 29 shaded-pole evaporator motors were replaced with high-efficiency EC motors and dewpoint-based pulse controls were installed for anti-sweat cooler/freezer door heaters.

This project is estimated to save approximately 145,000 kWh/yr or \$23,000/yr.



CAMPUS OPERATIONS

WATER CONSERVATION

Quench Valve Project

Location: Campus-wide

Purpose – Quench valves are used in sterilization and cage washing machines to reduce the temperature of hot effluent water and condensate.

Outcome – 31 quench valves on 75 units of sterilization equipment found to be leaking and in need of repair have been replaced or repaired. HMS Facilities expects substantial water and steam savings due to the project completion.





WATER CONSERVATION

Water Savers Project

Location: NRB

Purpose – To reduce the consumption of potable water by sterilization equipment. Each sterilizer uses about 111,750 gallons/week per sterilizer.

Projected Outcome - Getinge proposed adding water saver kits to 22 autoclaves in NRB. With a water saver kit installed, water consumption is expected to drop ~92%, to 8,550 gallons/per week per sterilizer.

With water costs at ~\$21/kGal, cost savings are expected to be ~\$112,695 per year.

Installation of the kits is planned to start in FY22.



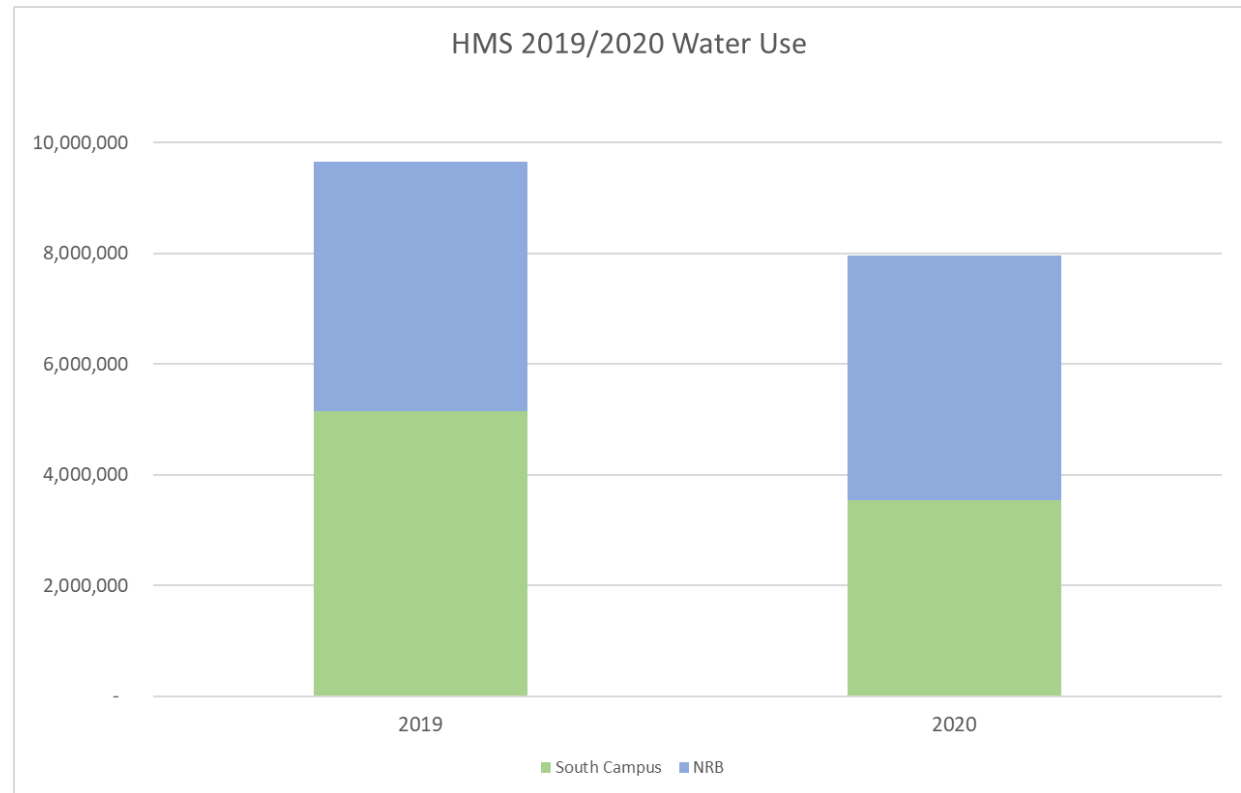
CAMPUS OPERATIONS

WATER CONSERVATION

Pandemic Impacts on Water Use

HMS saw a ~18% reduction in total water usage between CY2019 and CY2020.

Some reductions are expected to continue into CY2021. Maintaining the decreases will greatly depend on campus re-occupancy.



CAMPUS OPERATIONS



WATER CONSERVATION

IRRIGATION

- Irrigation controllers updated to Rain Bird IQ4 modular multi-site controllers for improved control and increased water savings
- HMS is exploring installation of moisture meters to better understand moisture content and to only irrigate zones based on specific demand



CAMPUS OPERATIONS

Green Lab Certification Program

Labs are the most energy intensive spaces at HMS, so conserving resources and efficient consumption habits are of key importance in these areas.

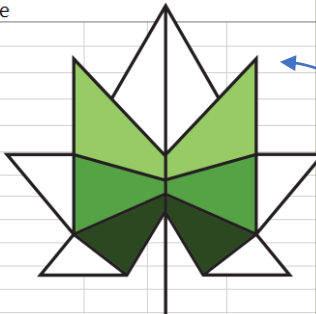
To further these practices, the HMS Green Lab Certification Program recognizes and encourages labs engaging in sustainable practice.

Lab	Certification Level	Points Achieved / Points Available
ICCB-L	Leaf 4	89/97
Zhang Lab	Leaf 4	70/101
HiTS LSP	Leaf 3	79/103

Three labs completed certifications in CY2020 prior to the pandemic. Post-pandemic, HMS is working to bolster the program and encourage these practices in a wider array of labs.

Green Lab Program - Progress Dashboard

Lab Name	Yor Lab Name
Current Level	76
Available Points	100
N/A Points	0
Total Points	100
Leaf Level	Points
Leaf One	55
Leaf Two	65
Leaf Three	75
Leaf Four	85



What categories are you strongest/weakest in?

Category	Total Points Achieved	Points Available	N/A Points	Total Points	Progress
Universal Practices	18	27	0	27	67%
Save Energy	24	29	0	29	83%
Reduce Energy Consumption	10	13	0	13	77%
Maximize Efficiency	14	16	0	16	88%
Conserve Resources	34	44	0	44	77%
Operate Efficiently	13	16	0	16	81%
Purchase Sustainably	6	10	0	10	60%
Reduce Waste	15	18	0	18	83%
Total	76	100	0	100	76%

Example summary of a lab's certification process.

Lab members complete the program's self-assessment guide, and earn points to achieve one of four levels of certification. They may track their progress, earn points for improving in certain areas, and attempt certification at a higher level.

green.harvard.edu/greenlabcert



CAMPUS OPERATIONS

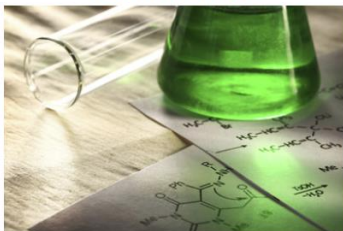
Lab Product Sustainability and Transparency

HMS continues to collaborate across Harvard and lead a Longwood-based group to advance lab product transparency and reporting related to sustainability and health, such as the ACT Label from MyGreenLabs.

CONSUMABLES



CHEMICALS & REAGENTS



EQUIPMENT



ACT.

Accountability, Consistency, Transparency.

The Environmental Impact Factor Label

Product Name

Manufacturing Location

Manufacturing

Manufacturing Impact Reduction	6
Renewable Energy Use	No
Responsible Chemical Management	10
Shipping Impact	7
Product Content	5.3
Packaging Content	5.4

User Impact

Energy Consumption	5
Water Consumption	N/A
Lifetime Rating	2

End of Life

Packaging	5.2
Product	8

Environmental Impact Factor 53.9

Label Valid Through September 2019

My Green Lab  mygreenlab.org

**Energy and water consumption reported as daily values, all other values on a scale of 1-10. 1 indicates the least environmental impact and 10 indicates the greatest.

CAMPUS OPERATIONS

HEALTHIER BUILDING MATERIALS ACADEMY PILOT: HMS COUNTWAY LIBRARY

Using an integrated design process with an initial sustainability kick-off and goal setting, the project accomplished:

- Healthy materials used for renovation with focus on carpet, furniture, window shades, wall base
- Designed to LEED Gold CI-V4 standards
- Designed to Harvard Green Building Standards, including enhanced systems commissioning
- Reduction in emissions through LED lighting, lighting controls, daylight optimization, automated shades throughout



- Prioritizes high levels of Occupant comfort
- Water reductions through low-flow fixtures and water efficient planting

CAMPUS OPERATIONS

WASTE DISPOSAL

Regular Waste

- Composting
 - Collected throughout campus including directly from cafeteria
- Single Stream Recycling
- Municipal Solid Waste

Campus Regular Waste	Compost (Ton)	Single Stream Recycling (Ton)	Municipal Solid Waste (Ton)
CY2020	70.5	251.5	767.1
FY19	157.5	312.1	983.1

HMS disposed of ~20% less recycling and municipal waste, and ~55% less compost in CY20 than in FY19. Closures in TMEC and in the cafeterias due to the pandemic are the largest contributors to these changes.

Bio-waste

- Cannot be disposed of through regular channels
- Regulated Medical Waste

CY2020 Bio-Waste	Regulated Medical Waste (lb)	Sharps
TMEC	57,406	-
WAB	58,936	499
NRB	133,654	85

CAMPUS OPERATIONS

WASTE REDUCTION & DIVERSION: COMPOST EXPANSION & TIP-BOX RECYCLING PILOT



HMS Custodial expanded the campus composting program to include bathrooms.



A pilot program to collect clean tip-boxes from labs began in Genetics. It was expanded to the full campus in August 2020.



CAMPUS OPERATIONS



TIP-BOX RECYCLING PILOT

- Polypropylene plastic
- Boxes are granulated and re-used at local manufacturers
- A pilot program to collect clean tip-boxes from labs began December 2019 in NRB
- Pilot expanded to full campus in August 2020



Performance in FY21:

South Campus	6,419 lbs
NRB	10,017 lbs
Total Collected	16,436 lbs



HMS collected a total of about 7.5 metric tons of tip boxes in FY21.

CAMPUS OPERATIONS

A blue silhouette illustration of a campus scene. On the left, a dump truck is shown. In the center, there are recycling bins, a person on a bicycle, and a person walking. To the right, a bus is parked. Further right, a person is on a ladder painting a building. In the top right corner, there is a white icon of a wrench and a pencil crossed.

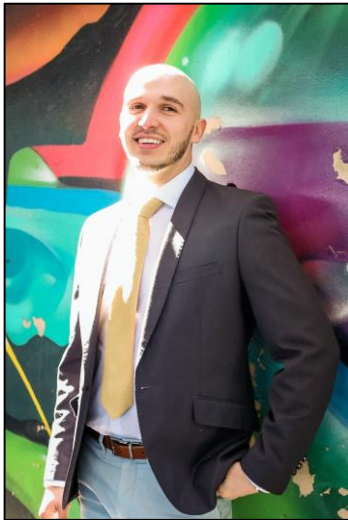
LANDSCAPING: FERTILIZER

- Facilities collaboration with Harvard Office for Sustainability on developing site maintenance standards regarding landscaping needs
 - Recycling all mow clippings using “X Blade Adapters” to reduce the amount of granular fertilizer applied seasonally
 - Soil testing to determine each year’s site maintenance plan
 - Operate as Zone 2: eliminating turf products detrimental to bee and aquatic invertebrates

STRENGTHENING ENERGY MANAGEMENT TEAM

HMS Facilities hired two full time employees for the energy office in July 2020.

Stan Karachev
Energy Performance Analyst



Stan is a BMET Wentworth graduate with 8 years of experience in energy consulting, project management and commissioning.

Outside of work, Stan is involved in Boston's art communities, specifically in dance. As a street style dancer, he's an active supporter, contributor and leader through performances, teaching classes, battles, and organizing events.

Colette Baker
Energy Billing Analyst



Colette comes to HMS with years of experience in energy data analysis from both utility and governmental perspectives. She graduated from the economics and environmental analysis and policy programs at Boston University.

In her spare time, Colette enjoys hiking, kayaking, and biking her way through New England.

NATURE AND ECOSYSTEMS



COUNTWAY COMMUNITY GARDEN



The garden was closed for the 2020 growing season due to COVID-19 precautions, but reopened for the 2021 growing season and now has a full team of gardeners using the available raised beds.

Harvard Longwood Campus members can now host events in the garden. To submit an event request visit countway.info/garden or contact countwaycommunitygarden@hms.harvard.edu.

HEALTH AND WELL-BEING

HARVARD SUSTAINABLE MEETING AND EVENT GUIDE

TOP 10 TIPS FOR BETTER MEETINGS

FROM THE HARVARD SUSTAINABLE MEETING AND EVENT GUIDE

The Harvard Sustainable Meeting and Event Guide was created to support a culture of health and wellness in meetings and conferences across the University. Start with these 10 tips to help employees, students, and visitors eat well and be active while reducing their environmental impact.

FOOD AND BEVERAGES

Always ask caterers to label common allergens, such as nuts and shellfish.

- Make pitchers of tap water the featured beverage. Add fruit to some pitchers for a flavor-infused option.
- Opt for plant-based proteins for the main dish, like beans, lentils, or tofu.
- Offer fruits and/or vegetables every time food is served.
- Always serve whole grains instead of refined grains (like brown rice in place of white rice).
- When offering snacks, serve whole or cut fruit, vegetables and hummus, or unsalted nuts.
- Coffee and tea make for a satisfying end to a meal. If dessert is necessary, opt for a combination of dark chocolate, fresh fruit, and unsalted nuts.

WASTE REDUCTION

- Ask your caterer to use reusable, recyclable, or compostable serving items.
- Make sure your meeting room has a "waste station" with clearly-marked recycling, compost, and trash bins.

MOVEMENT

- Periodically break up sitting time with standing, walking, or light stretching.
- Inform attendees of which stairwells, elevators, and restrooms they may use, including any on other floors.

CHECK OUT THE FULL GUIDE AT [GREEN.HARVARD.EDU/EVENTGUIDE](https://green.harvard.edu/campaign/sustainable-meeting-and-event-guide)

This guide was developed as a quick reference resource for event and meeting planners to improve the sustainability of their events



<https://green.harvard.edu/campaign/sustainable-meeting-and-event-guide>

CULTURE AND LEARNING



LONGWOOD LIGHTING FAIRS

HMS: 11 attendees
HSDM: 5
HSPH: 6

Total 22 attendees
292 LEDs purchased

If all the bulbs are installed at home, the expected annual electricity cost savings are ~\$3,192. The emissions equivalent is removing approximately 2.4 cars from the road.

EVERSOURCE



Sustainability

LED Lighting Sale

May 10th - 24th

We have partnered with Eversource to offer the Harvard community exclusive discounts on energy-efficient ENERGY STAR LEDs. LED bulbs are up to 90% more efficient than standard bulbs and last at least 15x longer!

Restrictions may apply

Lunch and Learn

Date: May 12th Time: 12:00pm

[Add our webinar to your calendar](#) and speak with lighting experts to learn more!

Eversource is a proud sponsor of



LED A19 12-pack - **\$5**

9W usage = 60W output



LED A19 12-pack - **\$7.50**

11.5W usage = 75W output



LED A19 12-pack - **\$10**

15W usage = 100W output



Globe 12-pack - **\$5**

5W usage = 60W output



Candle 12-pack - **\$5**

4W usage = 40W output



Honeywell Room Air Cleaner - **\$25**



LED Shop Light - **\$20**



Outdoor Fixture - **\$10**



Ceiling Fixture - **\$15**



40/60/100W 3-Way 2-pack - **\$5**
4/8/16W usage

Bulbs available in warm white and daylight tones. Product selection is subject to change. Offer good while supplies last.

techniartpopup.com/eversource_ma_harvard



CULTURE AND LEARNING



STUDENT OUTREACH

- Collaboration and discussion with Students for Environmental Awareness in Medicine (SEAM)
- Quarterly meeting and forum for staff and students to discuss daily operations, energy sourcing, sustainability projects, waste disposal, and Boston's regulatory requirements.

City of Boston Emission Performance Standard Updates

- Building Energy Use Disclosure Ordinance new provisions
 - Building Performance Standard
 - Target buildings as main source of emissions
 - Long term reductions
- Multiple pathways to compliance
 - Threshold method
 - Self-improvement pathway
- Means to reach emissions targets
- Harvard is currently evaluating which pathway to be most appropriate
- The City will convene a District Energy Working Group to address the LMEC's unique profile



Means to reach emissions targets

1. Reduction in usage and improvement in efficiency
2. Grid efficiency improvements
3. Electricity: Purchase Electric Renewable Credits (RECs)
 - \$44/MWh abated
4. Chilled Water: Purchase CHW
 - ~\$44/MWh abated
5. Steam: Alternative Compliance
 - If emissions target is missed, payments to ACP can close the gap
 - Initial estimates of cost: \$234 per metric ton of CO₂e



Update: Other Conservation Programs

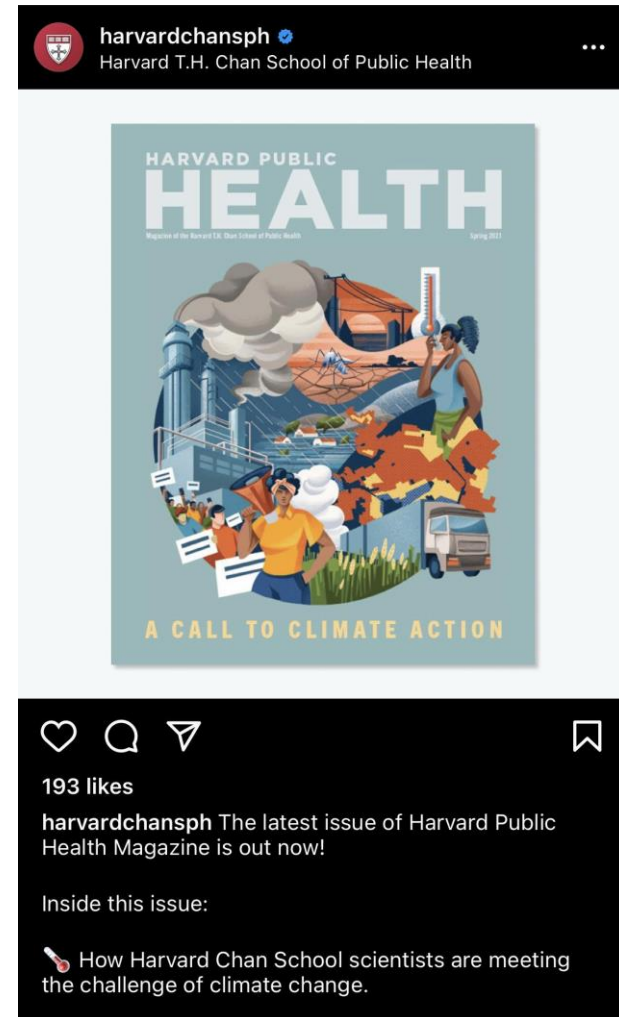
- TMEC Air Handling Unit Commissioning & Heat Recovery Improvements
- WAB Heat Recovery
- NRB Heat Recovery
- NRB 6 Cold Room
- Winter Season Load
- Campus-wide Water
- Campus-wide 27
- Clockworks and



Harvard University Office of Sustainability introduction & overview



ORIGINAL CONTENT and SOCIAL ENGAGEMENT @HARVARDCHANSPH





Connect & Learn More

Ruben Avagyan

Energy Manager

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- Utility Supply/Delivery Contracts
- Energy & Water Reduction Targets and Load Growth Planning
- Demand Response and Load Shed Program
- GHG Reduction Strategy
- Budgeting and Forecasting
- Energy Prediction Modeling
- Continuity of Utility Service
- Critical Equipment PMs
- Utility Infrastructure Resiliency

Stan Karachev

Energy Performance Analyst

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- Asset Management
- Critical Equipment PMs
- Proactive PM of Building Assets
- ECM implementation
- Mechanical equipment retrofits
- Retro & Continuous Commissioning
- Fault Identification and Diagnoses via Clockworks Analytics Software
- Data Analysis

Colette Baker

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- Utility Supply/Delivery Billing and Energy Data Analysis
- Metering Issues and Upgrades
- Energy Budgeting and Forecasting
- Energy Benchmarking, Dashboards, and KPIs
- Green Labs
- GHG Emissions Analysis
- HU Energy/GHG Emission Data Compliance
- City of Boston BERDO Data Compliance