

CY19 SUSTAINABILITY REPORT

Harvard Medical School



HARVARD
UNIVERSITY

Sustainability



HARVARD
MEDICAL SCHOOL



HARVARD UNIVERSITY SUSTAINABILITY PLAN

- Water Conservation Measures
- Green Lab Certification
- Healthier Building Materials Academy
- Longwood Reuse Room

- Healthy and Sustainable Meeting Guide

EMISSIONS AND ENERGY

CAMPUS OPERATIONS

NATURE AND ECOSYSTEMS

HEALTH AND WELL-BEING

CULTURE AND LEARNING

- Strategic Energy Plan
- Energy Conservation Measures
- ULT Freezer PM program

- Countway Community Garden

- Eco Opportunity Sustainable Student Event Fund
- MATEP Health Impact Assessment
- Lighting Fairs

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



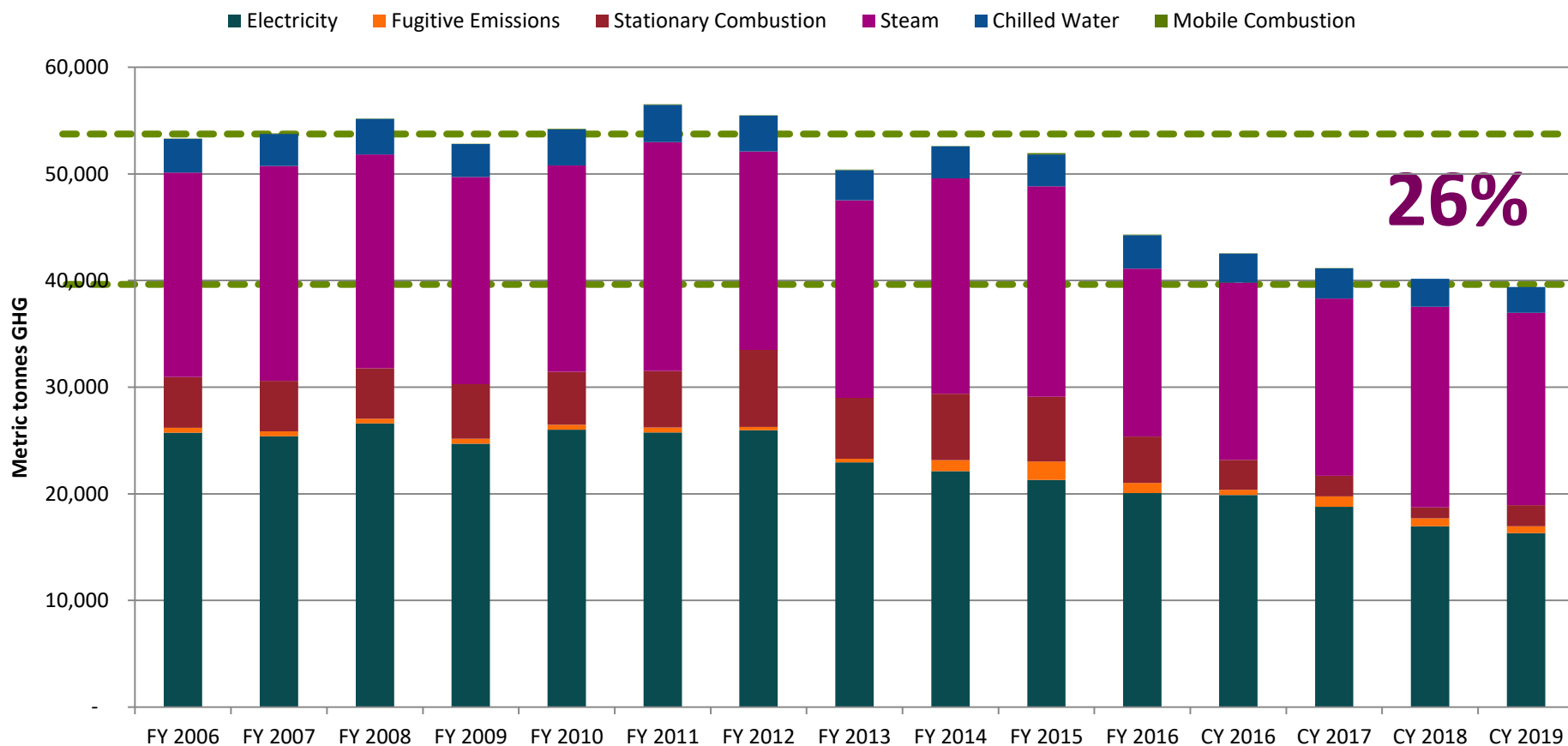
**FOSSIL
FUEL-FREE
BY 2050**

EMISSIONS AND ENERGY



HMS GHG EMISSIONS REDUCTION PROGRESS

HMS GHG Emissions by Category



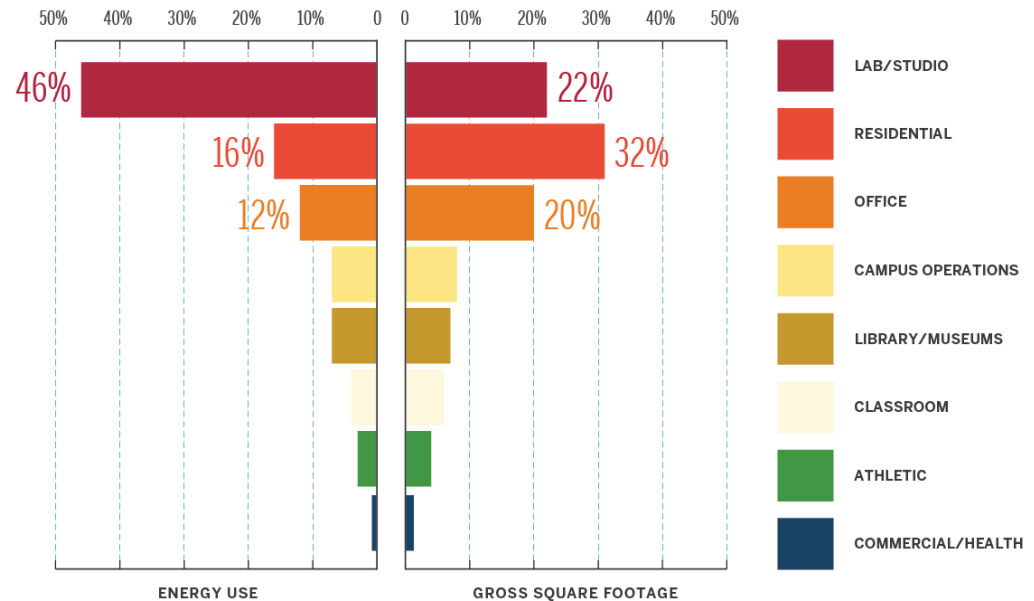
EMISSIONS AND ENERGY

ENERGY CONSERVATION MEASURES AND STRATEGIC ENERGY PROJECTS FOCUS ON LABORATORY ENVIRONMENTS

Harvard-wide Lab Impact:



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



EMISSIONS AND ENERGY



HARVARD MEDICAL SCHOOL AND HMS AFFILIATES ANNOUNCED DECARBONIZATION COMMITMENT

The Boston Globe

OPINION | GEORGE Q. DALEY, ASHISH JHA, AND AARON BERNSTEIN

Climate change threatens public health and doctors' ability to provide care

“Our commitment to decarbonize health care is also about our responsibility to our patients’ health and the communities we serve. Burning less fossil fuel in power plants, buildings, and cars means less air pollution, and less air pollution means fewer heart attacks and strokes, fewer asthma attacks, less lung cancer, and better pregnancy outcomes.”

EMISSIONS AND ENERGY



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.

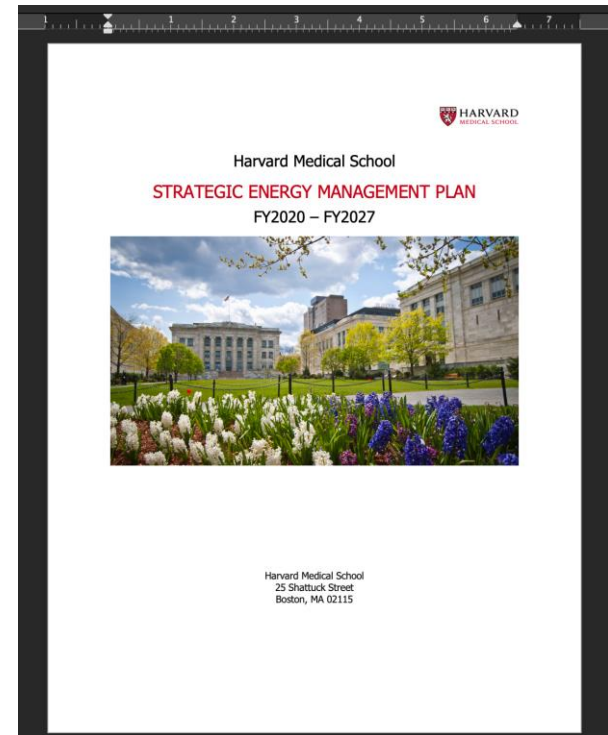
To better align with HU's overarching sustainability goals, HMS Campus Planning and Facilities has updated its Strategic Energy Plan, building on 2016-2020 plan.

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 Compliance and Reporting



EMISSIONS AND ENERGY

HMS ECMs AND STRATEGIC ENERGY PROJECTS

- NRB solar PV system
- Energy audits
- Ventilation optimization/reduction programs
- Enforcement of space temperature policies
- Lighting LED upgrades
- Transition from pneumatic to DDC controls
- Establishment of energy metrics tracking system, energy dashboards, analytics and automated fault detection
- Energy retrofits and retro-commissioning projects



EMISSIONS AND ENERGY



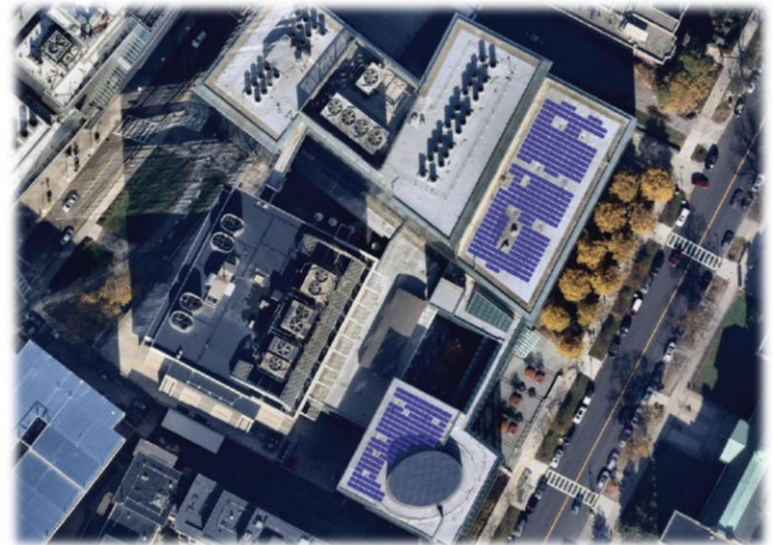
HMS ECMs AND STRATEGIC ENERGY PROJECTS

NRB SOLAR PV SYSTEM

Building Use: Research Lab

380 solar panels have been installed on two adjacent sections of the roof in New Research Building. The power output from the system will be directed to the building's main switchgear to supplement the power provided by Eversource.

The first-year energy production from the system is estimated to be around 152,960 kWh equivalent to approximately \$23,400 in electric energy cost savings.



EMISSIONS AND ENERGY



HMS ECMs AND STRATEGIC ENERGY PROJECTS

C BUILDING – BUILDING HEAT RECOVERY SYSTEM RECOMMISSIONING AUDIT

Building Use: Research Lab

This audit investigated the status of C-Building's energy saving heat recovery system through evaluating existing piping, insulation, connected coils, and air handling systems.

A resulting scope of work suggested to replace insulation, upgrade controls, monitoring, and recommission the heat recovery system



EMISSIONS AND ENERGY



HMS ECMs AND STRATEGIC ENERGY PROJECTS

GOLDENSON – VENTILATION OPTIMIZATION STUDY

Building Use: Research, Lecture Room, Office

Purpose – This study investigated the potential optimization of the building's ventilation system

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



EMISSIONS AND ENERGY



HMS ECMs AND STRATEGIC ENERGY PROJECTS

GOLDENSON – LED LIGHTING & CONTROLS AUDIT

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 1,245 lighting fixtures, reducing the building's electricity consumption by **60% (est.)**, or **approximately 245k kWh**

This is equivalent to about **170 metric tons of CO2** equivalent, or **19k gallons of gas**



EMISSIONS AND ENERGY



HMS ECMs AND STRATEGIC ENERGY PROJECTS

WARREN ALPERT – LED LIGHTING & CONTROLS AUDIT

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 2,348 lighting fixtures, reducing the building's electricity consumption by **>40%** (est.), or **approximately 290k kWh**

This is equivalent to about **215 metric tons of CO₂** equivalent, or **24k gallons of gas**



EMISSIONS AND ENERGY



HMS ECMs AND STRATEGIC ENERGY PROJECTS

NRB PARKING GARAGE – LED LIGHTING & CONTROLS AUDIT

Building Use: Parking

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 462 lighting fixtures, reducing the building's electricity consumption by **60%** (est.), or **approximately 90k kWh**

This is equivalent to about **67 metric tons of CO2** equivalent, or **7.5k gallons of gas**



EMISSIONS AND ENERGY



HMS ECMs AND STRATEGIC ENERGY PROJECTS

CONTINUOUS COMMISSIONING: CLOCKWORKS INVESTIGATION

Location: Entire Campus

Purpose – continuous commissioning is a process of evaluating building systems well after initial building occupancy to ensure system functionality and optimization. KGS Clockworks is a building analytics platform used to identify HVAC system deficiencies. From there, HMS verifies the identified faults and takes corrective actions.

Outcome – 8 building systems were recalibrated to operate within desired parameters, saving electricity, steam, and chilled water.



EMISSIONS AND ENERGY

ULT FREEZER PREVENTATIVE MAINTENANCE BI-ANNUAL PROGRAM

HMS Facilities continued a preventative maintenance program on Harvard-owned

- ✓ Ultra Low Temperature freezers, which includes freezers operating below -65.

This year's program included 262 freezers, covering issues such as connecting to Central Alarm, repairing gaskets/seals, and defrosting.

- ✓ Energy savings are associated with keeping freezer coils and filters free of dust, allowing for proper heat exchange.

- ✓ The PM program saves energy while providing a more secure environment for research samples—a win-win situation for research labs and facilities teams alike.



CAMPUS OPERATIONS

WATER CONSERVATION

Quench Valve Project

Location: Entire Campus

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.



CAMPUS OPERATIONS

Green Lab Certification

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%



CAMPUS OPERATIONS

4 Labs Received Green Lab Certification

Lab	Certification Level (Leaf 1-4)	Universal Practices Pts Avail: 27	Energy Savings Pts Avail: 29	Resource Conservation Pts Avail: 44	Total Points Achieved / Points Avail. To Specific Lab
ICCB-L	Leaf 4	19	26	44	89/97
Genetics - Media Prep and Glass Washing	Leaf 4	20	16	36	72/82
Cell-Bio - Harper Lab	Leaf 3	17	20	41	78/100
HiTS LSP	Leaf 3	16	22	41	79/103
Genetics - Church Lab	In Progress				
Microbiology - Bernhardt Lab	In Progress				



green.harvard.edu/greenlabcert

CAMPUS OPERATIONS

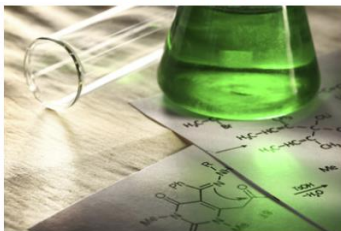
Lab Product Sustainability and Transparency

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

HMS's Countway Library renovations will feature building materials across 8 product categories that have been manufactured to eliminate 6 classes of chemicals of concern.

HMS's Engineering and Construction and the project's external vendors collaborated with Harvard's Office for Sustainability to ensure the project's schedule and financial goals were met in the process.



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. If successful, the program will roll out across HMS



LEARN IT.
LIVE IT.



WE'VE GOT A GOAL to reduce waste per capita 50% by 2020 from a 2006 baseline, with the aspirational goal of becoming a **zero-waste campus**

NATURE AND ECOSYSTEMS



COUNTWAY COMMUNITY GARDEN



Reorganization of Community Garden
Management team – volunteer leadership successfully advocated for a part-time staff member to support the Garden's development!



WATER! A spigot was installed within the Garden's limits, eliminating the need to connect to BWH's spigot.



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



ECOOPPORTUNITY'S SUSTAINABLE STUDENT EVENT FUND

EcoOpportunity launched its Sustainable Student Event Fund, which provides supplemental funding to support events organized by Harvard Longwood Campus student organizations.

Events must comply with Harvard's Sustainable Meeting and Event Guide.

The fund supported:

- T.H. Chan's Environmental Justice Student Organization's annual conference
- Health Equity and Leadership (HEAL) annual conference



CULTURE AND LEARNING



LONGWOOD LIGHTING FAIRS

Chan: 42 attendees participated, that purchased 646 products. In addition, we also raised \$215 for the Mass Fallen Hero Campaign. Medical: 50 attendees participated, that purchased 708 products. In addition, also raised \$215 for the Mass Fallen Hero Campaign.

Harvard Chan
HSPH FXB Atrium

Harvard Medical
HMS Courtyard Café

Dec., 11th & 12th, 2018

11:30 a.m. - 2:00 p.m.

ENERGY-SAVING LIGHTING FAIR

Hosted By:

ecoopportunity

HARVARD
LONGWOOD CAMPUS

Made Possible By:

nationalgrid

EVERSOURCE
ENERGY

Unitil
energy for life

mass save

LED Starter Kit Includes

limit 4 kits per customer

(1) 5W LED DESK LAMP
(40W OUTPUT)
available in a variety of colors

(4) 9W LED A19s
(60W OUTPUT)

(4) 11W LED A19s
(75W OUTPUT)

(4) 16W LED A21s
(100W OUTPUT)

(2) 5/9/16W LED
3-WAY A21
(40/60/100W OUTPUT)

\$10

LED Indoor Flood Lights

BR20
8W usage = 50W output
110° beam spread
\$2

BR40
12W usage = 65W output
110° beam spread
\$4

PAR38
13W usage = 90W output
40 degree angle
\$6

All 8-Packs just \$10

8-PACK BR30
8W usage = 65W output
\$10

8-PACK CANDLE
4W usage = 40W output
\$10

8-PACK GLOBE
7W usage = 60W output
\$10

Advanced Power Strips

TRICKLESTRIP TIER 1 APS
1 - control outlet
2 - always on outlets
4 - switched outlets
\$10

TRICKLESTRIP TIER 2 APS
1 - control outlet
1 - always on outlets
4 - switched outlets
1 - multi-sensor
\$20

Gadget Corner

DIRECTIONAL NL 2-PACK
(a variety of nightlights are available starting at \$3.00)
\$5

MULTI-COLOR LED
STRANDS OF LIGHT
• 70 LED indoor / outdoor
• connect up to 43 sets
• weather resistant
• connects end-to-end
\$12

Bulbs available in warm white and daylight tones in some cases. See event attendant for details. Product selection is subject to change. Offer good while supplies last. Sales tax is not included in pricing. Cash, check and charge accepted.

ORIGINAL CONTENT and SOCIAL ENGAGEMENT

Maintaining a Healthy Community

By ADAM MEIER | April 2, 2019 | [HMS Community](#)



<https://hms.harvard.edu/news/maintaining-healthy-community>

ORIGINAL CONTENT and SOCIAL ENGAGEMENT

Powering Change

Ruben Avagyan joins HMS to reduce energy costs, bolster sustainability

By MIKE CAMPBELL | September 19, 2019 | [HMS Community](#)



Ruben Avagyan loves the outdoors. On a recent trip to the White Mountains, Harvard Medical School's new energy manager, who studied geophysics as an undergraduate, was impressed by the Flume, a 90-foot gorge carved into granite by geological processes over the course of hundreds of millions of years.

Avagyan's fascination with the earth guides his work as energy manager.

[Get more HMS news here](#)

"I am an environmentalist," said Avagyan. "I'd like to preserve Mother Nature for future generations. I want to be part of the solution."

<https://hms.harvard.edu/news/powering-change>

ORIGINAL CONTENT and SOCIAL ENGAGEMENT



greenharvard • Following ...



greenharvard "I'm very proud of the Harvard Sustainable Meeting and Event Guide, which I had the opportunity to work on with members of the Office for Sustainability and Harvard students and staff. It's nice to know that a resource now exists to help everyone across all Harvard schools design campus meetings and events that help employees and students eat well and stay active while reducing their environmental impact.", Aviva Musicus, @harvardchansph '20 and Council of Student Sustainability Leaders Member. -- We asked our graduating team members from the #Harvard20 class to share their best @Harvard experiences, favorite memories, future plans, and advice for incoming students. #SustainableHarvard



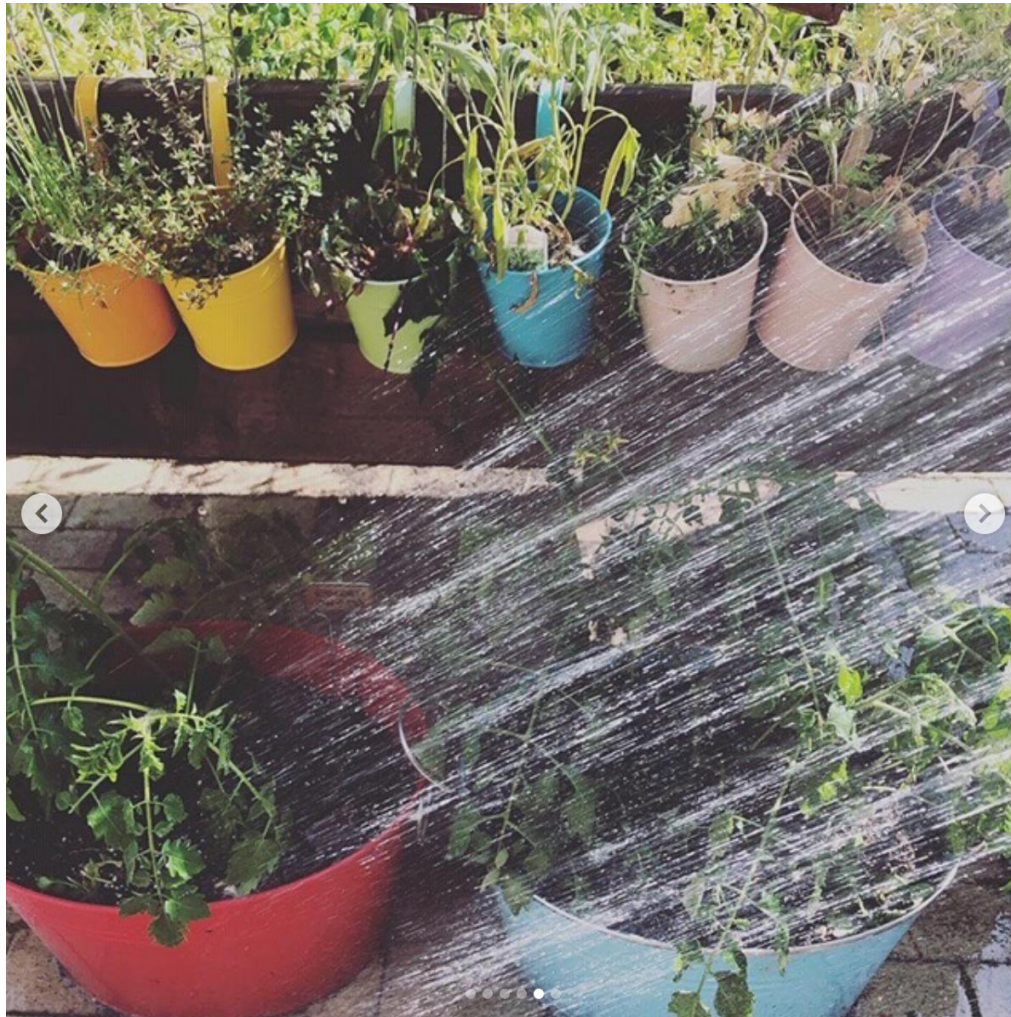
Liked by bretttootis and others

MAY 21

Add a comment...

Post

ORIGINAL CONTENT and SOCIAL ENGAGEMENT



harvardchansph • Following ...



harvardchansph The Countway Community Garden was founded in 2012 by a group of staff, students, and faculty from our School and [@harvardmed](#) to provide the Longwood campus with opportunities for education and hands-on experience relating to urban agriculture, sustainability, and health. The plots are green, vibrant, and in full bloom at this time of year. 🌱: 2019 plot holders of the garden
[#HarvardChan](#) [#sustainability](#) [#urbanagriculture](#)

52w



ame.monte ❤️❤️❤️



52w Reply



Liked by **brettootis** and **others**

JULY 25, 2019

Add a comment...

Post

ORIGINAL CONTENT and SOCIAL ENGAGEMENT



greenharvard • Following

greenharvard Thanks to the @arnold_arboretum for hosting our team's strategic planning meeting yesterday. Here's a snapshot of the group who biked there from Cambridge along the Emerald Necklace and through the Arboretum to their #LEED Gold Weld Hill Research Bldg.



flavia_cristna Que maravilha!



campusessentials We like your photos!



rainforestivory Great!



Liked by jtoweh and 228 others

AUGUST 16, 2018

Add a comment...



ORIGINAL CONTENT and SOCIAL ENGAGEMENT



Luncheon with HMS Class Day Speaker, Dr. Mona Hanna-Attisha, Prof. Ronnie Levin, and students from HMS, HSDM, and HSPH





HARVARD
MEDICAL SCHOOL



HARVARD
Office for Sustainability

Connect

green.harvard.edu

@GreenHarvard

EcoOpportunity: goo.gl/ke8u1m

Learn more

Sustainability Plan

www.green.harvard.edu/plan

Sustainability Report

www.green.harvard.edu/report

Living lab

www.green.harvard.edu/livinglab