Harvard University Water Auditing

Using Water Audits to Identify Water Efficiency Opportunities

HARVARD
Office for Sustainability

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HARVARD UNIVERSITY SUSTAINABILITY PLAN

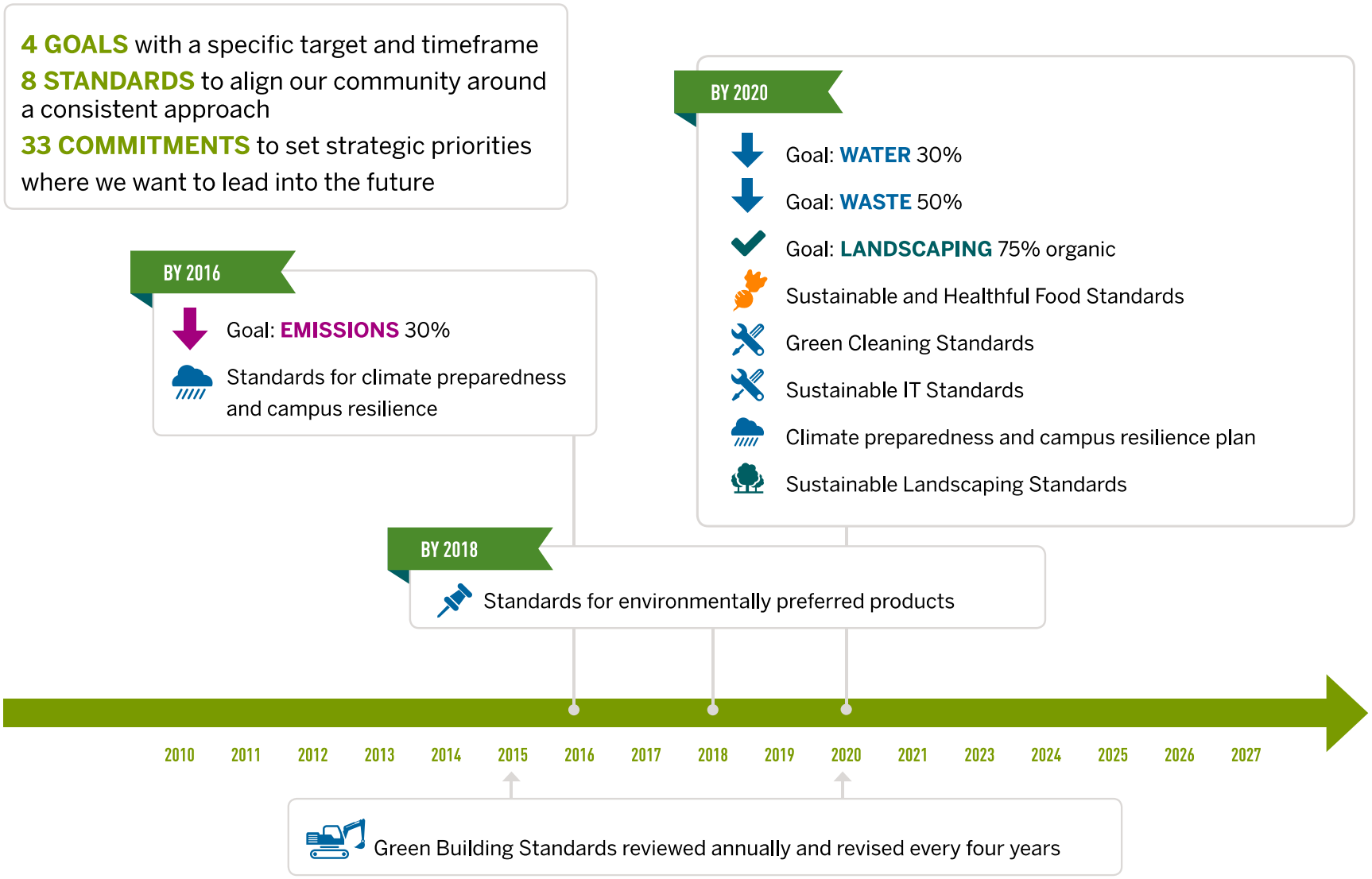
EMISSIONS AND ENERGY

CAMPUS OPERATIONS

NATURE AND ECOSYSTEMS

HEALTH AND WELL-BEING

CULTURE AND LEARNING


4 GOALS with a specific target and timeframe
8 STANDARDS to align our community around a consistent approach
33 COMMITMENTS to set strategic priorities where we want to lead into the future
BY 2016
Goal: EMISSIONS 30%
Standards for climate preparedness and campus resilience
BY 2020
Goal: WATER 30%
Goal: WASTE 50%
Goal: LANDSCAPING 75% organic
Sustainable and Healthful Food Standards
Green Cleaning Standards
Sustainable IT Standards
Climate preparedness and campus resilience plan
Sustainable Landscaping Standards
BY 2018
Standards for environmentally preferred products
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2023
2024
2025
2026
2027
Green Building Standards reviewed annually and revised every four years

Current Effort

Goal: Reduce University-wide water use 30% by 2020, from a 2006 baseline.

- Faculty Arts and Sciences
- Harvard Business School
- Harvard Medical School
- Harvard University Housing

HARVARD MEDICAL SCHOOL

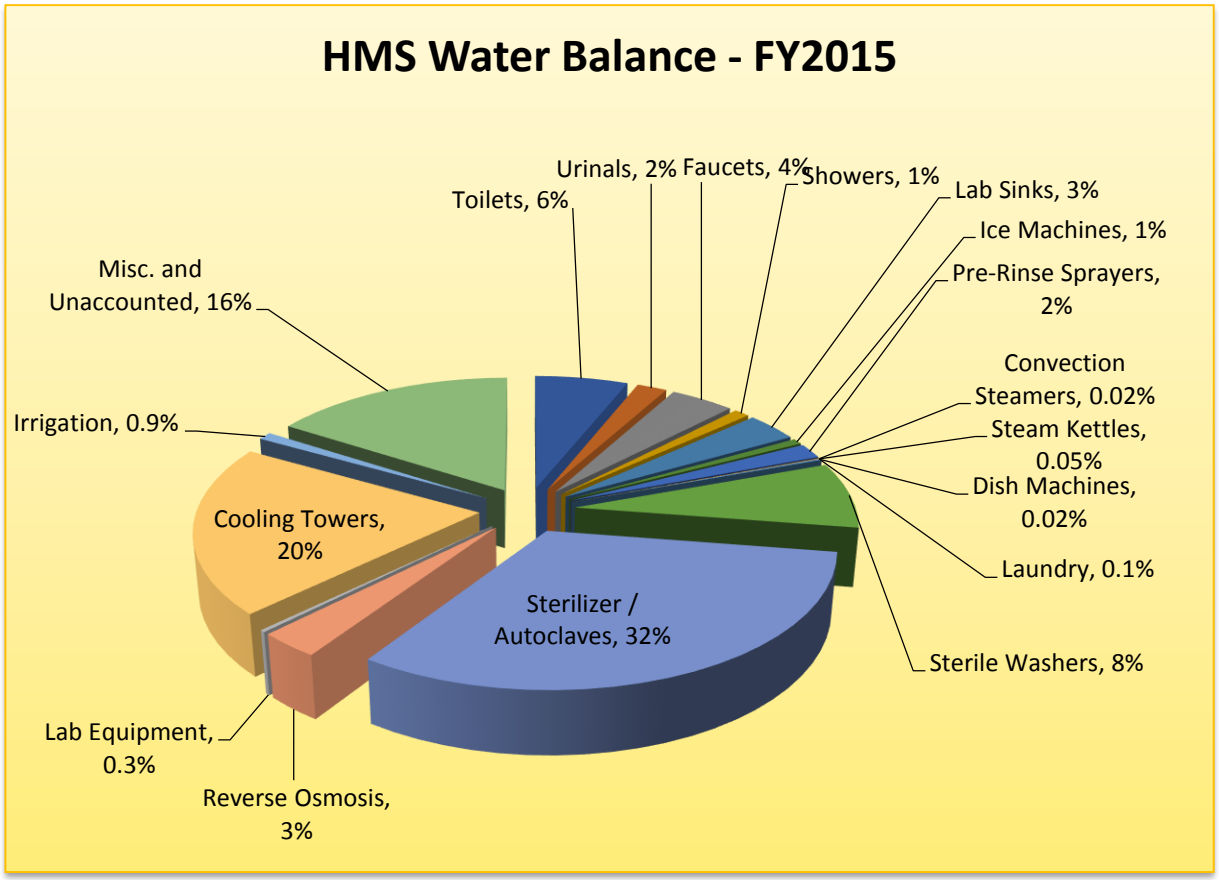
WATER USE EVALUATION

CAMPUS-WIDE WATER AUDIT COMPLETED

Completed in June 2016.

18 buildings, 3.05 million sq ft

Recommendations under consideration for implementation in future years.



Water conservation efforts completed to date and next steps

FY16 14,935,617 CF - FY17 14,012,291 CF usage
6% reduction (HMS numbers)

Faucet retrofits:
644 non-lab faucet aerators
144 shower heads

- ½ year payback
- Estimated Savings: 3 million gallons

2017: initiated monthly tracking of WUI by building

Aspirational Next Step: Water consumption reduction from HMS's 3,100 lab sinks

HARVARD MEDICAL SCHOOL

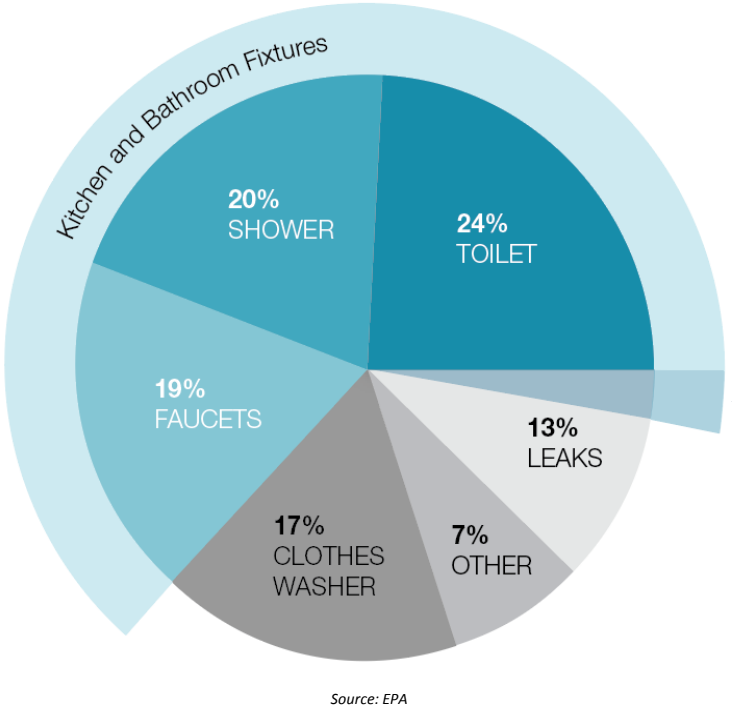
Water Savers
Energy Solutions

Harvard University Housing
Water Use Evaluation:

- Utility Analysis
- On-Site Audits
- Pilot and Survey

- Equipment and Mechanical
- Irrigation
- **Indoor Plumbing Fixtures**

  Phase 1: 300 residential units



6% of leaks come from toilets

Source: EPA

Audit Process:

Toilets	Aerators	Showerheads
GPI Flow Meter T5 Flushmeter Blue Dye Leak Test	GPI Flow Meter Flow Bag	GPI Flow Meter Flow Bag

GPI
Device is ideal for short term measuring on a fixture by fixture basis of its overall water consumption

METERING CLAMP
Device is ideal for long term measuring for the overall property's water consumption and allows for isolation of particular fixtures

RECAP OF OVERALL RESULTS

PROPERTY	AERATOR (B)	AERATOR (K)	SHOWERHEADS	TOILETS
MT. AUBURN	1.72 GPM	1.93 GPM	2.42 GPM	2.30 GPF
BANKS	1.81 GPM	1.45 GPM	2.04 GPM	2.55 GPF
BECKWITH	1.74 GPM	1.39 GPM	1.70 GPM	2.30 GPF
MELLEN	0.95 GPM	1.85 GPM	2.21 GPM	2.51 GPF
TERRY TERRACE	1.53 GPM	1.98 GPM	1.73 GPM	2.27 GPF
SHALER	0.83 GPM	2.48 GPM	1.53 GPM	1.37 GPF
SUMNER	1.53 GPM	2.06 GPM	1.88 GPM	2.62 GPF
BROADWAY	1.18 GPM	4.63 GPM	2.33 GPM	3.43 GPF
TOTAL AVERAGE	**1.46 GPM**	**1.85 GPM**	**2.00 GPM**	**2.31 GPF**

NIAGARA CONSERVATION

Fixture:	New Rate:	Projected Reduction:
Bathroom Aerators	0.5 GPM	65%
Kitchen Aerators	1.5 GPM	20%
Showerheads	1.5 GPM	25%
Toilets	0.95/0.5 GPF	70%

Estimated Annual Savings: 7,126,115 gallons
Projected ROI: 6 Months
Utility Rebate: Eversource

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