LEARN MORE AT
energystar.gov

ENERGY STAR®
Higher Education Benchmarking Initiative (HEBI)

SUMMARY SCORECARD

NOVEMBER 2021

TABLE OF CONTENTS

ABOUT THE HEBI

The Higher Education Benchmarking Initiative (HEBI) was launched with the goal of providing institutions a sense of how their campus energy and water performance compare with that of peer institutions, moving beyond sector challenges—such as incomplete building level metering, perceived incomparability, and partial coverage of 1-100 ENERGY STAR Scores—to deliver actionable insights, all at no cost.

This summary scorecard looks across the nearly 200 participating campuses, representing nearly 100 institutions, that participated in the first round of the HEBI. Institutions that did not participate can use this resource to approximate their relative performance, while industry associations and other stakeholders can use it to understand broader performance trends.

ENERGY STAR DEFINITIONS

Source Energy Use Intensity (EUI):

The total raw fuel required per year to operate the property, including losses that take place during generation, transmission, and distribution of the energy, divided by the property square foot.

In this summary scorecard, source EUI is displayed in the units of kBtu/ft^2, or thousands of Btu per square foot.

Source EUI is an energy performance metric that creates a fair point of comparison between properties (or campuses) with different mixes of fuel sources, showing energy use over a year.

Water Use Intensity (WUI):

The total amount of water used from all water sources per year divided by the building square foot (not including parking or irrigated area).

In this summary scorecard, WUI is displayed in the units of gallons of water per square foot of the property (or campus). WUI shows water performance used by the property over a year.

METHODOLOGY AND LIMITATIONS

Participants self-reported campus-wide energy and (optionally) water consumption data for calendar year 2019 via ENERGY STAR® Portfolio Manager® and completed a separate questionnaire to provide additional campus characteristics for analysis. Metrics submitted by participants were analyzed to create peer groups based on participation distribution, industry interests, and trends in median energy and water use intensities.

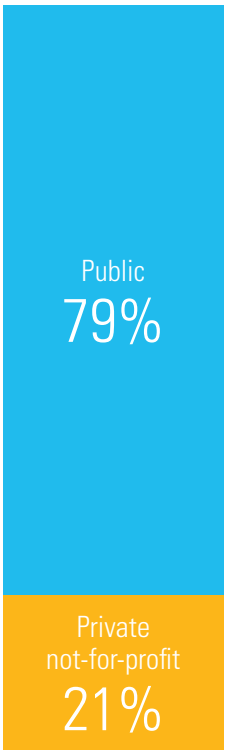
To avoid substantially skewed results, campuses with source EUI values below 30 kBtu/ft^2 and above 600 kBtu/ft^2 were classified as outliers for energy charts, and campuses with WUI values below 3 gal/ft^2 and above 175 gal/ft^2 were classified as outliers for water charts. Outliers were excluded when determining median values for peer groups.

"This was a wonderful first effort towards engaging the higher education community."

— HEBI participant

PARTICIPATION OVERVIEW

TYPE OF CAMPUS

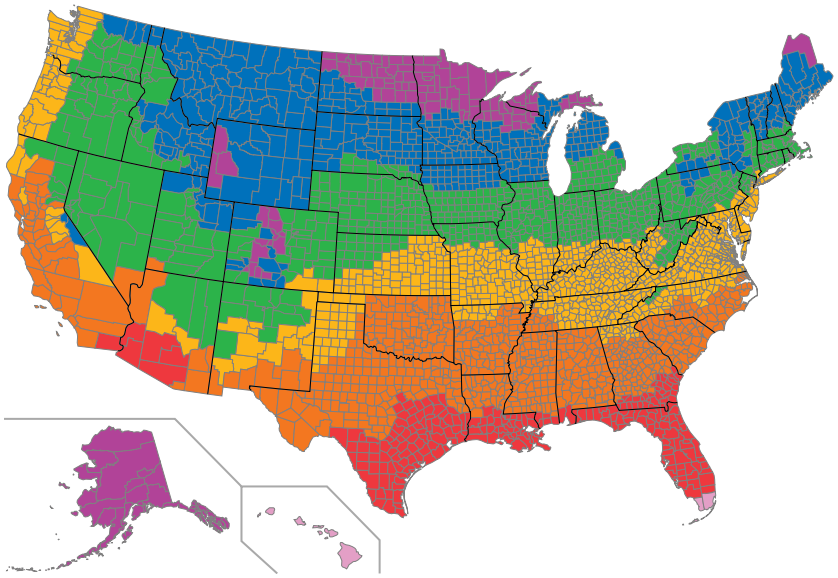


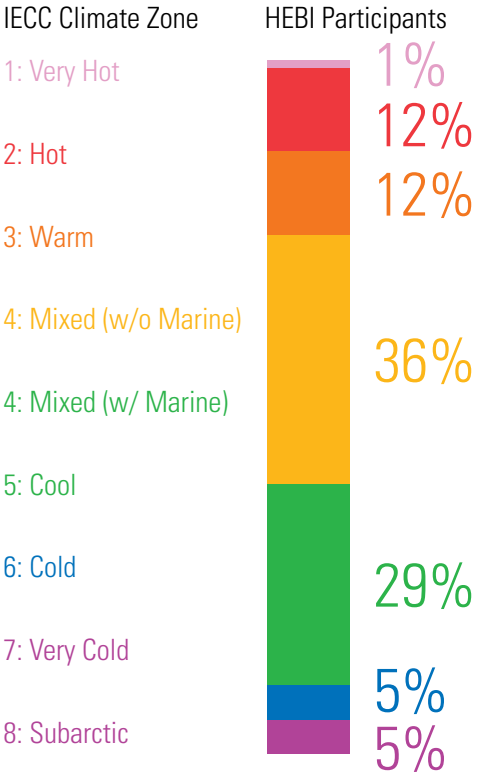
CARNEGIE CLASSIFICATION

Carnegie Classification[1]	Subcategory	Campus Count	Campus Percent
Doctoral University	R1: Doctoral Universities – Very high research activity	22	25%
	R2: Doctoral Universities – High research activity	21	
	D/PU: Doctoral/Professional Universities	4	
Master's College or University	M1: Master's Colleges and Universities – Larger programs	21	14%
	Master's Colleges or Universities	6	
Baccalaureate College	Baccalaureate College	14	8%
Baccalaureate / Associate's College	Associate's Dominant Institutions	16	9%
Associate's College / Special Focus Institution	High Transfer – High Nontraditional Institutions	8	44%
	Mixed Transfer/Career & Technical – Mixed Traditional/Nontraditional	55	
	Mixed Transfer/Career & Technical – High Nontraditional	4	
	High Career & Technical – Mixed Traditional/Nontraditional Institutions	5	
	Associate's College/Special Focus Institutions	11	

1. To learn more about the Carnegie Classification framework for classifying colleges and universities, visit carnegieclassifications.iu.edu.

INTERNATIONAL ENERGY CONSERVATION CODE (IECC) CLIMATE ZONE[2]





2. Canadian climate zones were not referenced in this image but were extrapolated from IECC data.

PERFORMANCE RESULTS

The tables below display the source EUI and WUI performance values of participating HEBI campuses based on calendar year 2019 data. There are tables for four different characteristics: Carnegie Classification, IECC Climate Zone, Percent of 2019 Fall Residents Living On-Campus, and Percent Energy Intensive Floor Area. Each table has rows that represent individual peer groups based on those variables and columns with the performance of campuses in the given peer group at the 10th, 25th, 50th (median), 75th, and 90th percentiles, excluding outliers.

KEY *The color gradient from lower to higher EUI and WUI is weighted for each table.*

Lower EUI — Higher EUI

Lower WUI — Higher WUI

CARNEGIE CLASSIFICATION

Category	Peer Group	Source EUI (kBtu/ft²)						WUI (gal/ft²)					
		Count (excludes outliers)	Percentile					Count (excludes outliers)	Percentile				
			10th	25th	50th (median)	75th	90th		10th	25th	50th (median)	75th	90th
Carnegie Classification	Associate's College / Special Focus Institution	79	80.8	106.3	136.5	181.9	199.3	9	5.0	5.7	10.7	13.2	14.1
	Baccalaureate / Associate's College	7	111.2	135.7	160.4	237.0	412.6	3	14.1	16.0	19.3	25.4	29.0
	Baccalaureate College	13	139.3	150.3	165.4	206.3	223.9	8	10.4	13.2	16.4	20.4	30.5
	Master's College or University	23	60.4	101.8	147.4	206.0	264.9	14	16.6	18.4	20.7	27.8	48.2
	Doctoral University	46	141.5	182.9	222.2	252.9	285.7	27	16.9	18.8	24.6	29.3	36.8

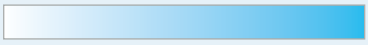
TAKEAWAY: EUI and WUI increase with Carnegie Classification as Doctoral Universities have significantly higher EUI and WUI than all other types of institutions.

IECC CLIMATE ZONE

Category	Peer Group	Source EUI (kBtu/ft²)						WUI (gal/ft²)					
		Count (excludes outliers)	Percentile					Count (excludes outliers)	Percentile				
			10th	25th	50th (median)	75th	90th		10th	25th	50th (median)	75th	90th
IECC Climate Zone	1: Very Hot & 2: Hot	20	67.7	95.0	117.2	171.3	210.6	6	15.9	19.1	31.2	47.0	50.6
	3: Warm	20	121.6	139.8	177.4	191.4	253.8	5	8.7	13.8	32.7	34.2	46.9
	4: Mixed	60	72.4	101.6	139.3	193.6	220.0	13	16.2	17.7	23.1	29.1	31.1
	4: Mixed Marine & 5: Cool	50	132.6	144.2	182.9	231.6	266.1	27	8.4	12.6	18.4	24.1	29.9
	6: Cold	9	146.4	153.6	199.2	253.4	279.9	7	15.2	18.3	21.2	24.5	25.0
	7: Very Cold & 8: Subarctic	9	138.7	189.7	202.1	222.3	312.8	3	9.8	14.4	22.1	23.3	24.0

TAKEAWAY: EUI is higher in colder regions while WUI is higher in hot regions.

KEY *The color gradient from lower to higher EUI and WUI is weighted for each table.*



PERCENT OF 2019 FALL RESIDENTS LIVING ON-CAMPUS

Category	Peer Group	Source EUI (kBtu/ft²)						WUI (gal/ft²)					
		Count (excludes outliers)	Percentile					Count (excludes outliers)	Percentile				
			10th	25th	50th (median)	75th	90th		10th	25th	50th (median)	75th	90th
2019 Fall Term Headcount of On-Campus Residents	None	95	79.3	106.3	136.5	182.5	204.6	12	5.3	7.5	11.4	14.1	18.7
	1% to 19%	21	118.1	142.6	188.5	222.3	260.3	15	18.7	19.6	24.5	28.8	46.2
	20 to 29%	18	150.5	195.9	232.8	262.6	307.9	9	17.0	17.4	27.4	31.5	36.7
	30 to 49%	18	150.4	187.0	217.5	246.4	284.5	14	9.6	16.9	22.2	27.8	32.8
	50 to 100%	16	136.3	150.7	177.5	206.4	233.3	11	13.6	15.5	18.3	26.1	32.7

TAKEAWAY: EUI and WUI are lowest when no residents are on campus and peak at a given threshold of percent residential, after which EUI and WUI decline.

PERCENT ENERGY INTENSIVE FLOOR AREA

Percent energy intensive floor area is a self-reported variable showing floor area associated with uses that are more energy intensive than colleges/universities overall, such as labs and hospitals.

Category	Peer Group	Source EUI (kBtu/ft²)					
		Count (excludes outliers)	Percentile				
			10th	25th	50th (median)	75th	90th
Percent Energy Intensive	None	12	93.5	133.0	156.5	219.1	288.4
	0.1% to 4.9%	27	100.1	120.4	160.4	202.5	232.9
	5% to 7.4%	23	113.0	148.9	200.9	225.8	246.2
	7.5% to 11.9%	23	130.3	148.4	183.3	216.4	243.3
	12% to 17.4%	24	103.5	139.0	163.2	243.1	265.4
	17.5% to 24.9%	21	111.6	126.0	166.4	199.1	230.4
	25% to 39.9%	26	81.0	97.9	117.9	181.4	204.5
	40% or more	12	34.4	88.6	161.2	240.3	299.3

TAKEAWAY: While unexpected, there were not clear performance trends with energy-intensive floor area, perhaps due to a lack of standardization in how institutions define such space and/or data quality issues in how it gets reported.

"The HEBI improved our benchmarking process by providing relevant comparisons and establishing previously unknown industry averages. It's good to see how our institution compares to similar colleges. The HEBI scorecard provided a good opportunity to review comparisons and identify data discrepancies. Our HEBI scorecard was a pleasant surprise and a terrific validation of the great work our Facilities group has done to increase building energy system efficiency. [We] see this as a possible launch for more involvement in the ENERGY STAR and Portfolio Manager programs."

— HEBI participant

NEXT STEPS

EPA thanks the inaugural participants of the HEBI for their efforts to collect and report their energy, water, and campus characteristics data. The overwhelming response to this new initiative exceeded expectations and allowed for a robust analysis with the potential to inform improvement in energy and water performance and reduction in GHG emissions. EPA hopes that this information might help colleges and universities adopt and invest in greater levels of energy and water efficiency, overcoming challenges such as backlogs of deferred maintenance, competing sustainability priorities, and limited budgets and staff time.

In the coming months ENERGY STAR will begin considering a second round of the HEBI in order to grow the ranks of participating institutions and add more value to the scorecards. EPA also plans to engage with higher education industry associations to explore the possibility of conducting a survey of energy and water use information which might allow for the development of a 1-100 ENERGY STAR score for higher education campuses.

Please don't hesitate to contact Brendan Hall, Higher Education Program manager, ENERGY STAR Commercial Buildings at hall.brendan@epa.gov.

"I use a variety of items to track our progress for consumption reduction. So it is great being able to know where I am in comparison to other institutions. I will be adding the information into an annual report."

— HEBI participant

"The HEBI reinforced the need to benchmark against peers when considering performance. We are doing a great job but comparing ourselves to other institutions helped us realize that we still have savings opportunities."

— HEBI participant

INAUGURAL HEBI PARTICIPANT LIST

American University
Arizona State University
Arkansas Tech University
Ashland Community & Technical College
Auraria Higher Education Center
Bellevue College
Big Sandy Community & Technical College
Bluegrass Community & Technical College
Boise State University
Boston University
Brandeis University
Bucknell University
California State University
Case Western Reserve University
Central Carolina Technical College
Central Washington University
Cleveland State University
College of Charleston
Colorado Mountain College
Colorado State University
Community College of Allegheny County
Concordia University
Cuyahoga Community College
Dalhousie University
Dominican University
Dallas College
Duquesne University
Elizabethtown Community & Technical College
Endicott College
Franklin W. Olin College of Engineering
Gallaudet University
Gateway Community & Technical College
Georgetown University
Hawai'i Pacific University
Henderson Community College
Hopkinsville Community College
Houston Community College
Husson University
Illinois Institute of Technology
Jefferson Community & Technical College
Lehigh University
Lenoir-Rhyne University
Macalester College
Madisonville College
Manhattan College
Maysville Community & Technical College
Milwaukee Area Technical College
Montclair State University
Montgomery College
Morehouse College
North Seattle College
Oakton Community College
Ohio University
Owensboro Community & Technical College
Portland Community College
Portland State University
Raritan Valley Community College
Red River College
Saint Peter's University
Salisbury University
Seattle Central College
Seminole State College of Florida
Saint Peter's University
Salisbury University
Seattle Central College
Seminole State College of Florida
Somerset Community College
South Seattle College
Southcentral KY Community & Technical College
Southeast KY Community & Technical College
Stanford University
State University of New York at Albany
The Catholic University of America
The College of New Jersey
The College of Saint Scholastica
The University of Chicago
The University of Cincinnati
The University of Tennessee
Towson University
University of Alberta
University of Arizona
University of California San Francisco
University of Connecticut
University of Kansas
University of Michigan
University of Minnesota
University of New Brunswick
University of North Carolina at Charlotte
University of Pittsburgh
University of Southern California
University of St. Thomas
University of the South
University of Utah
University of Virginia
Valencia College
The University of Texas at San Antonio
Washington and Lee University
Washington State University
Wells College
Wentworth Institute of Technology
West Kentucky Community & Technical College
Whitman College
Williams College
Yale University

Some institutions participated with multiple campuses.

To explore ENERGY STAR tools, resources, and support to reduce building energy use at colleges and universities, please visit:

ENERGYSTAR.GOV/HIGHERED