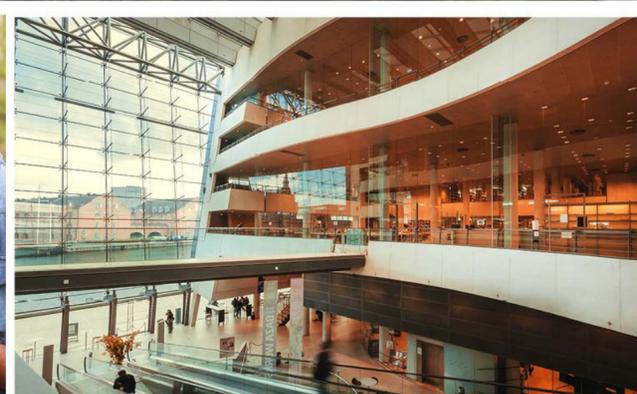
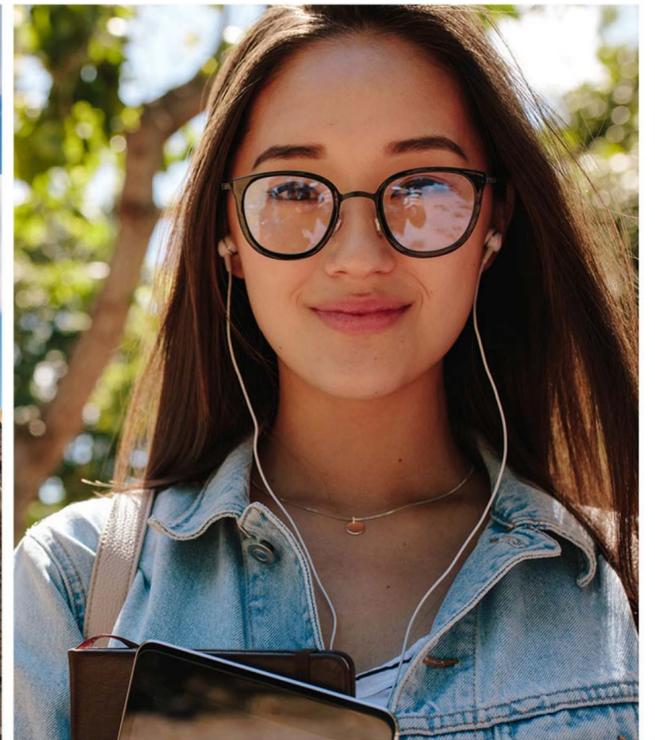




# ENERGY STAR® Higher Education Benchmarking Initiative (HEBI)

Montclair State University



## ABOUT HEBI

*ENERGY STAR Higher Education Benchmarking Initiative (HEBI) provides institutions with information on how their campus energy and water performance compares to peer institutions. This initiative moves beyond sector challenges such as incomplete building level metering, perceived incomparability, and partial coverage of 1-100 ENERGY STAR Scores, to deliver actionable insights for participants.*

## WHAT'S NEW THIS YEAR

*The second round of HEBI delivers comparisons on site energy use intensity, in addition to source energy and water use intensity. The scorecard also provides information on the energy and water performance of residential buildings (where submitted in addition to campus data), and information on the impacts of COVID-19 on campus operations.*



## 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 energy generation, transmission, and distribution, divided by the square feet of the property.

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

Source EUI is the most appropriate metric for equitably comparing institutions with different fuel sources.

### SITE ENERGY USE INTENSITY (EUI):

The total amount of energy consumed on-site per year, regardless of the source, divided by the square feet of the property.

In this scorecard, site EUI is displayed in the units of kBtu/ft<sup>2</sup>, or thousands of Btu per square foot.

Site EUI is the most appropriate metric for measuring improvement over time for an individual campus or institution.

### WATER USE INTENSITY (WUI):

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

In this 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

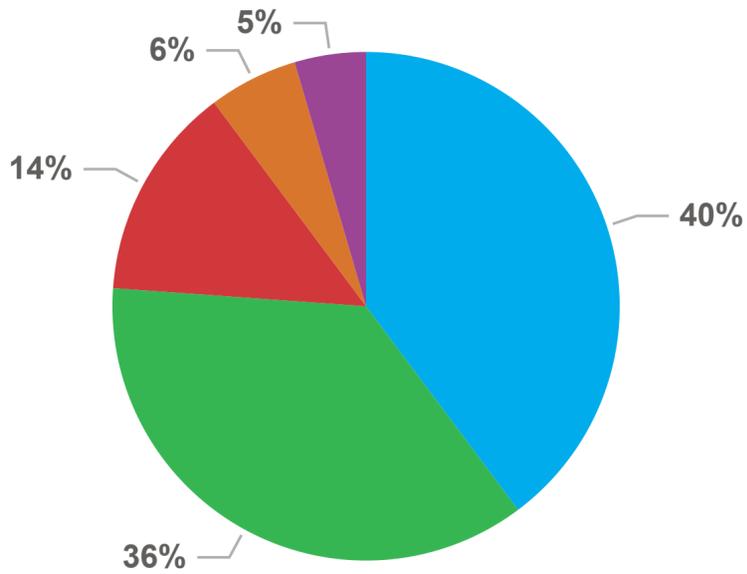
Participants self-reported campus-wide energy and (optionally) water consumption data for calendar year 2021 via ENERGY STAR® Portfolio Manager®. Participants also completed a separate questionnaire to provide additional campus characteristics for analysis.

Participant data was analyzed to create peer groups based on institution/campus characteristics considered across the sector to be key factors influencing energy performance.

To avoid substantially skewed results, campuses with source EUI values above 794.6kBtu/ft<sup>2</sup> were classified as outliers and excluded from the analysis. Campuses with WUI values above 133.8 gal/ft<sup>2</sup> were classified as outliers and excluded. Outliers were also excluded when determining median values for peer groups.

## Participant Overview\*

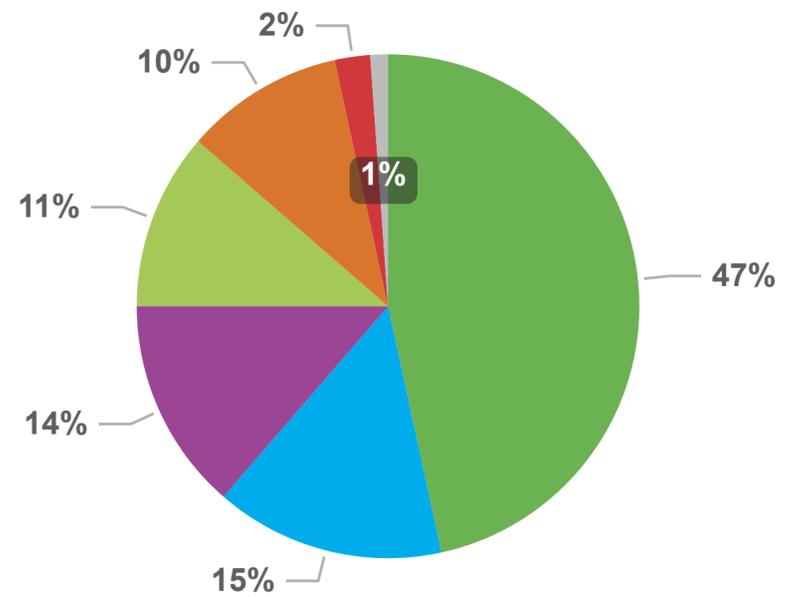
### Carnegie Classification<sup>1</sup>



88 reporting campuses

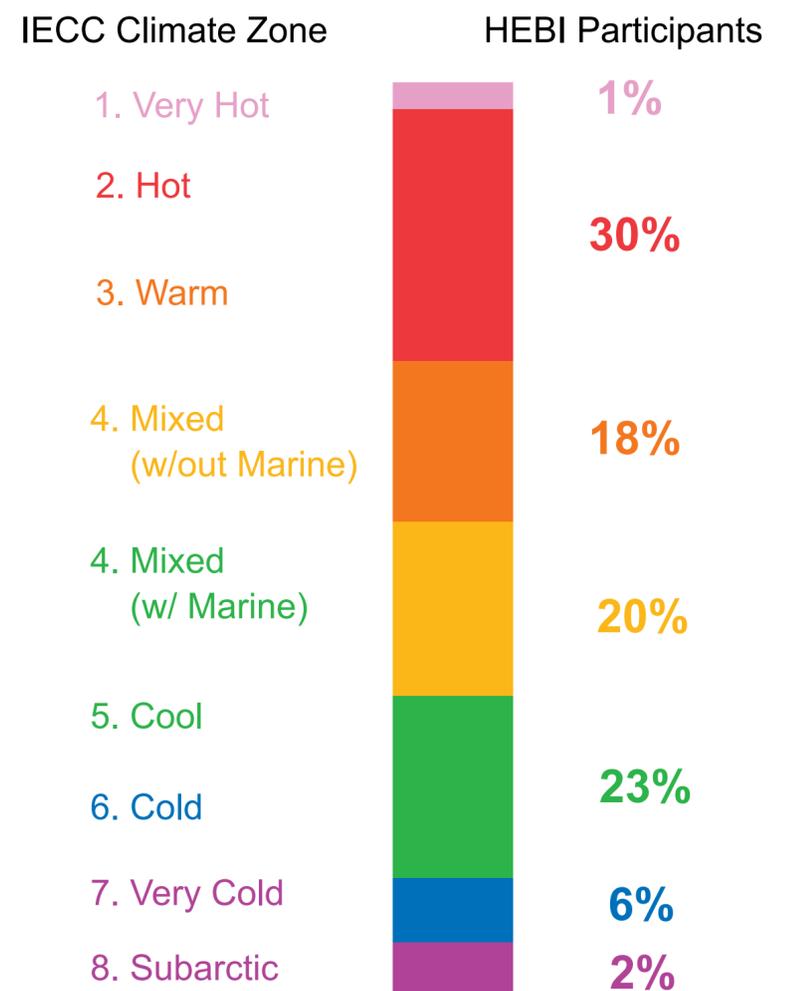
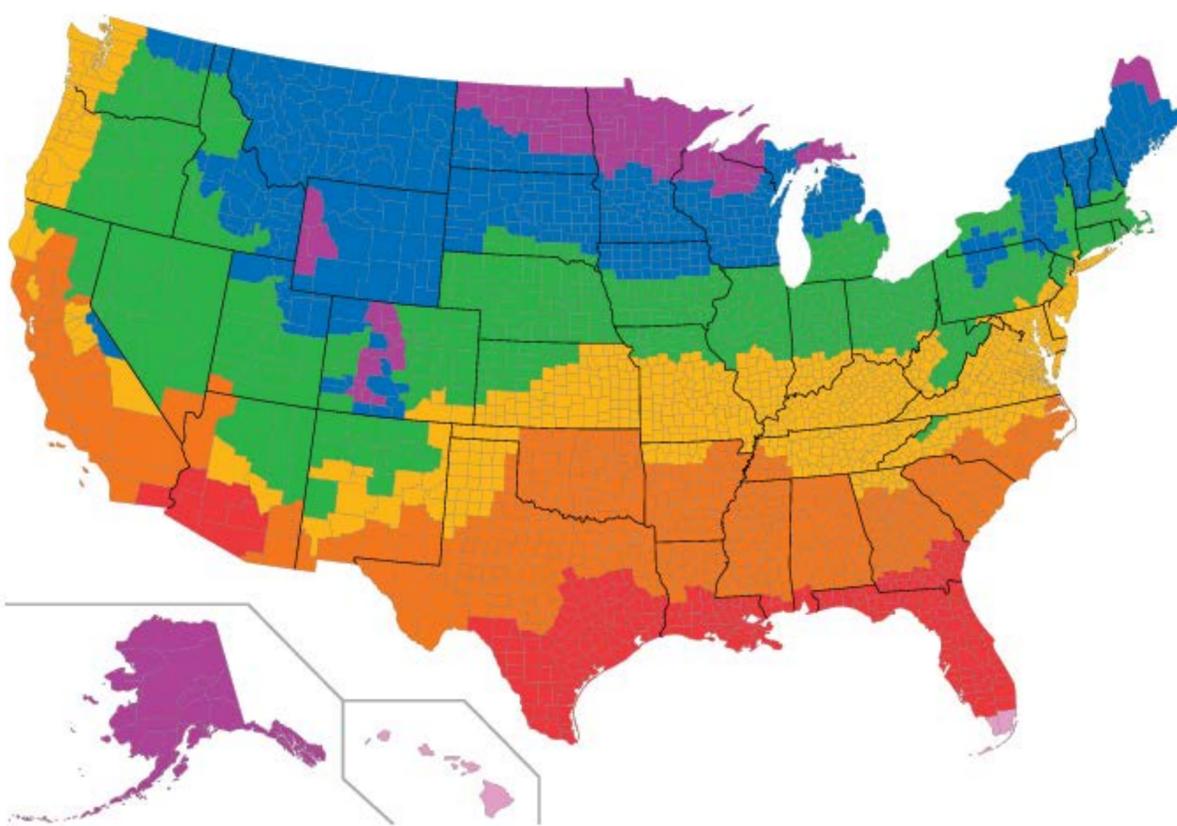
1. To learn more about the Carnegie Classification framework for classifying colleges and universities, visit [carnegieclassifications.iu.edu](http://carnegieclassifications.iu.edu).

### 2021 Residential Fall Term Headcount %



88 reporting campuses

### International Energy Conservation Code (IECC) Climate Zone<sup>2</sup>



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

\*A total of 88 campus submissions, representing 51 unique institutions.

88 reporting campuses

## COVID-19 Impacts

Survey respondents had the option of reporting the impacts of COVID-19 on campus operations in 2021, including building occupancy, food service, and hours of operation. In March 2020, many higher education institutions closed campus buildings and adopted virtual learning to prevent the spread of COVID-19. A year later, COVID-19 continued to impact campus operations, as many institutions remained wholly or partially closed to in-person learning, adopted hybrid learning models, and invested in air filtration to minimize community spread of the virus.

Below is a summary of responses to the question “*Looking across CY 2021, on average, what operational impacts did your HEBI campus experience due to the COVID-19 pandemic?*” Respondents were able to select more than one response.

### Operational Impacts from COVID-19

Percentage of Respondents	Operational Impacts Experienced Due to the COVID-19 Pandemic
82%	Classes were virtual for some of or all the year
82%	Substantial decrease in number of hours of faculty and staff working in campus buildings compared to pre-pandemic
72%	Substantial increase in outside air ventilation and/or filtration compared to pre-pandemic
50%	Substantial decrease in hours that some or all buildings were “open” and operating compared to pre-pandemic
45%	Substantial decrease in food service offerings (hours of operation, outlets open, etc.) for students and staff
44%	Campus housing occupancy was substantially lower than pre-pandemic
6%	No impact or N/A

88 reporting campuses

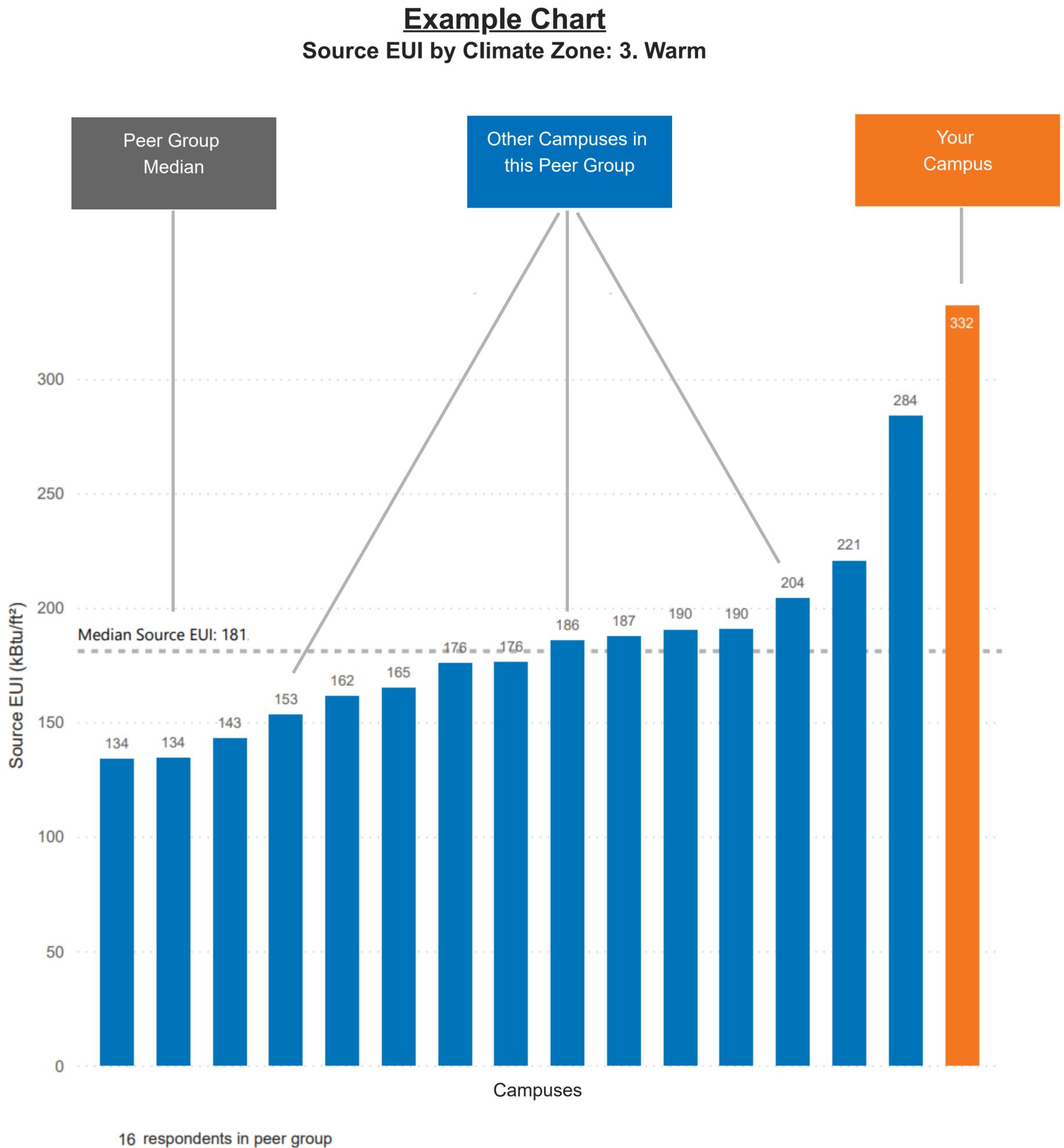
### Residential Occupancy Impacts from COVID-19

Percentage of Respondents	Residential Occupancy Impacts due to COVID-19 Pandemic
38%	Decreased 1-25%
25%	Decreased 26-50%
13%	Decreased 51% or more
25%	No change

8 reporting campuses

## How to Read Your Scorecard - Campus Peer Group Chart

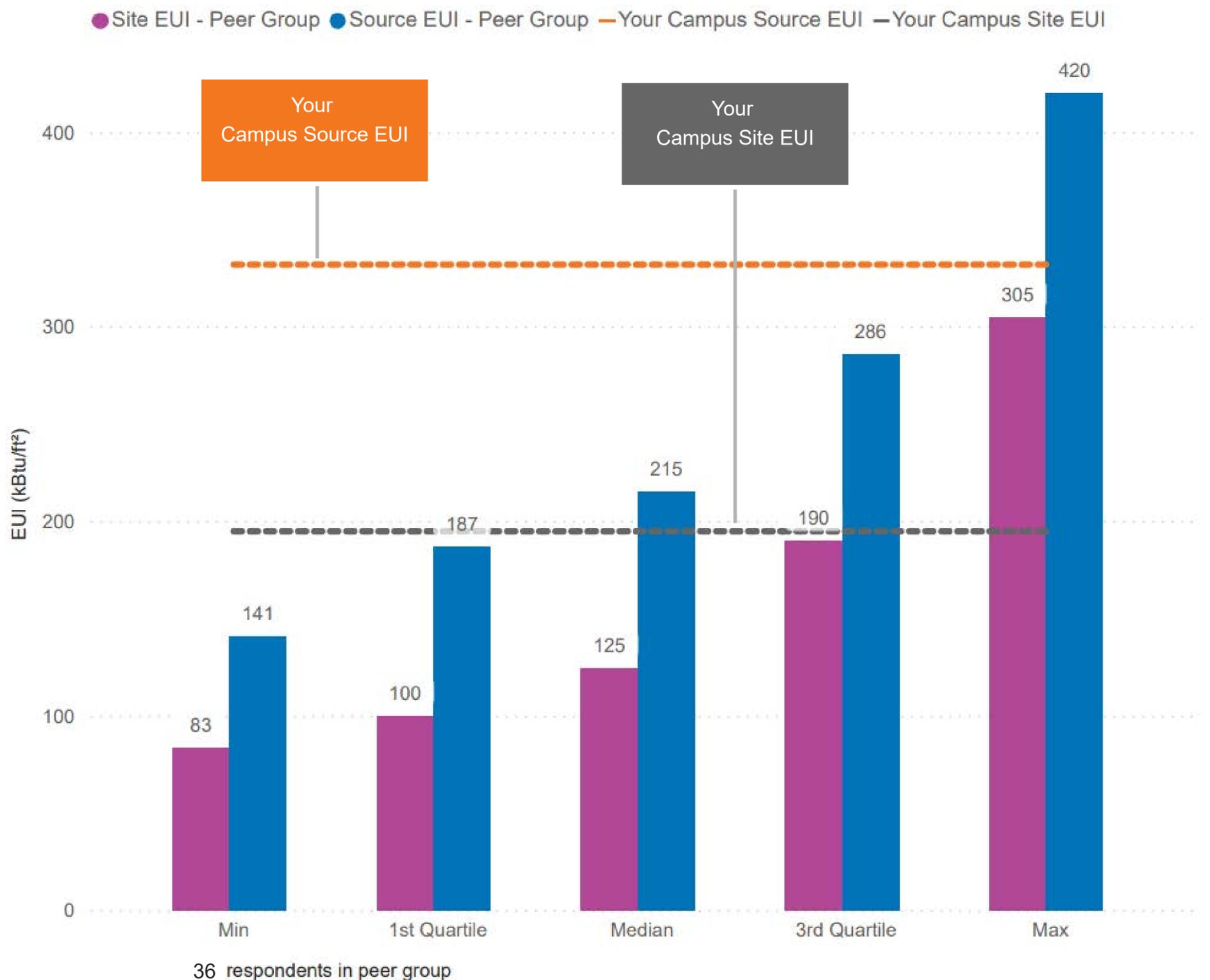
Individual campus source and site EUI will be represented by a bar graph for peer groups with fewer than 34 (<34) reporting campuses.



## How to Read Your Scorecard - Quartile Chart

Source and site EUI will be aggregated and presented as quartiles, dividing the datapoints into equally sized quarters, in peer groups with 34 or more reporting campuses. Individual campus source and site EUI will be indicated by a horizontal line.

**Example Chart**  
EUI Quartiles by Climate Zone: 6A Cold Humid



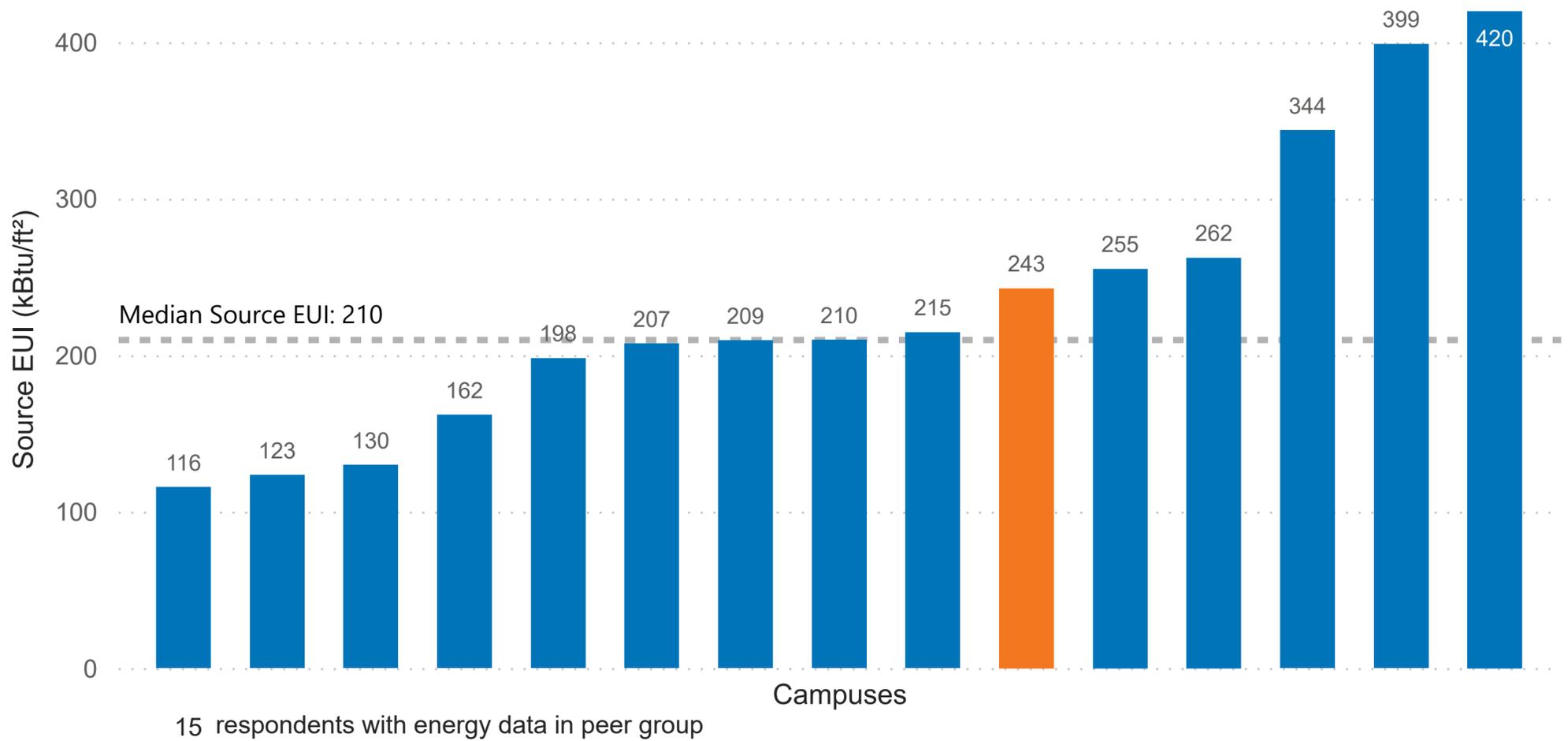
## Your Campus Snapshot: Montclair State University

Carnegie Classification	Doctoral University
IECC Climate Zone	5. Cool
Campus Source Energy Use Intensity (kBtu/ft <sup>2</sup> )	243
Campus Site Energy Use Intensity (kBtu/ft <sup>2</sup> )	212
Campus Water Use Intensity (gal/ft <sup>2</sup> )	15

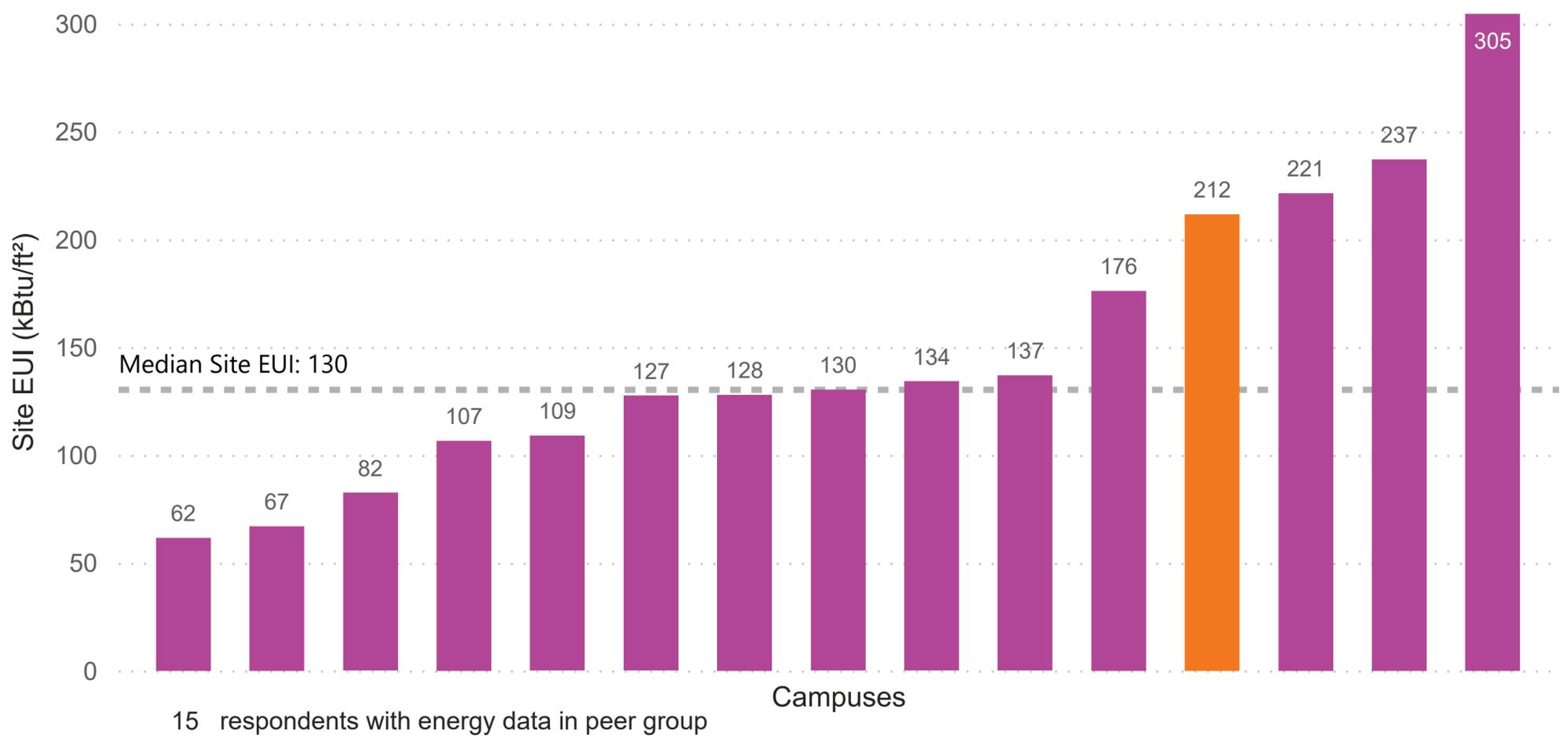


## Energy Use Intensity by Climate Zone

### Source EUI by Climate Zone: 5. Cool

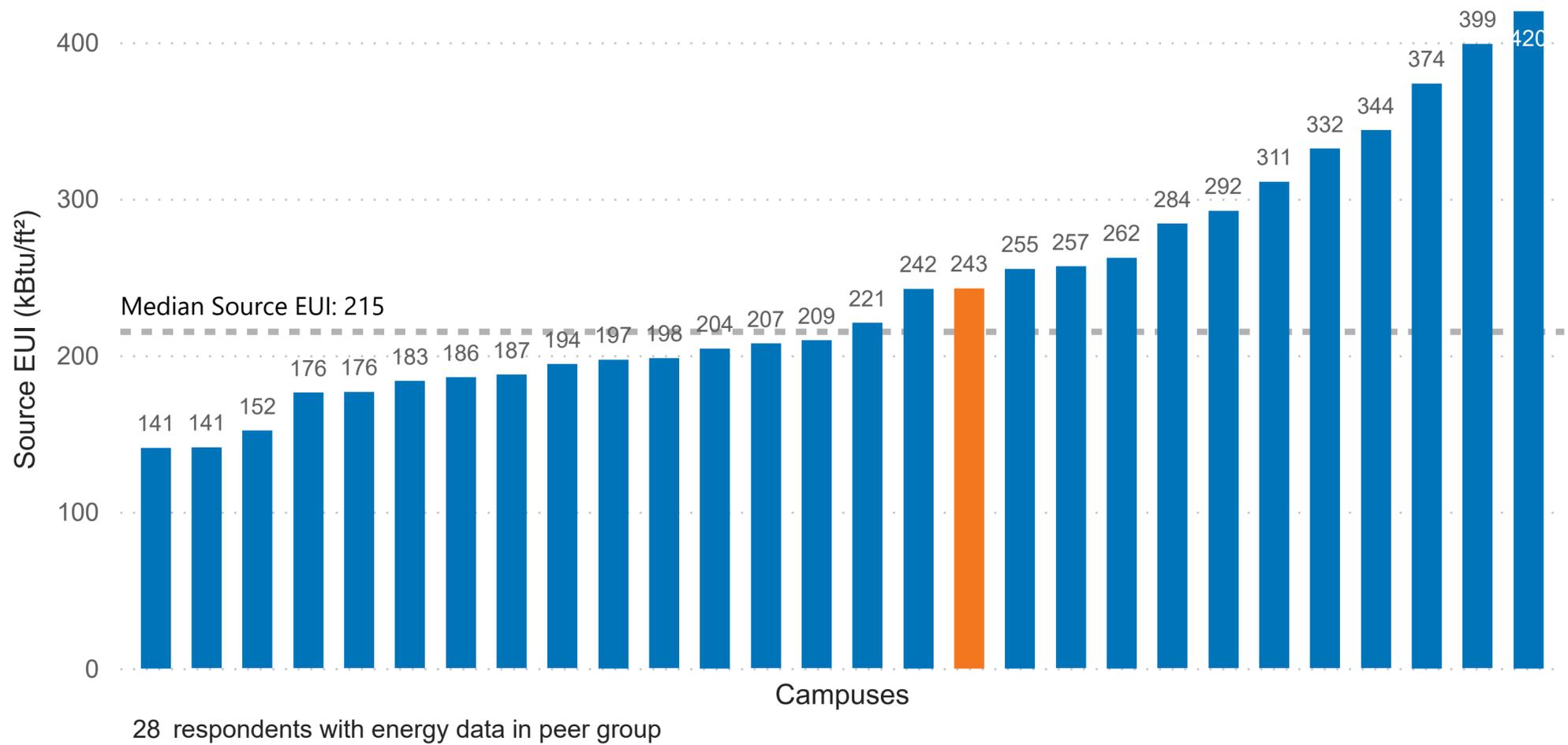


### Site EUI by Climate Zone: 5. Cool

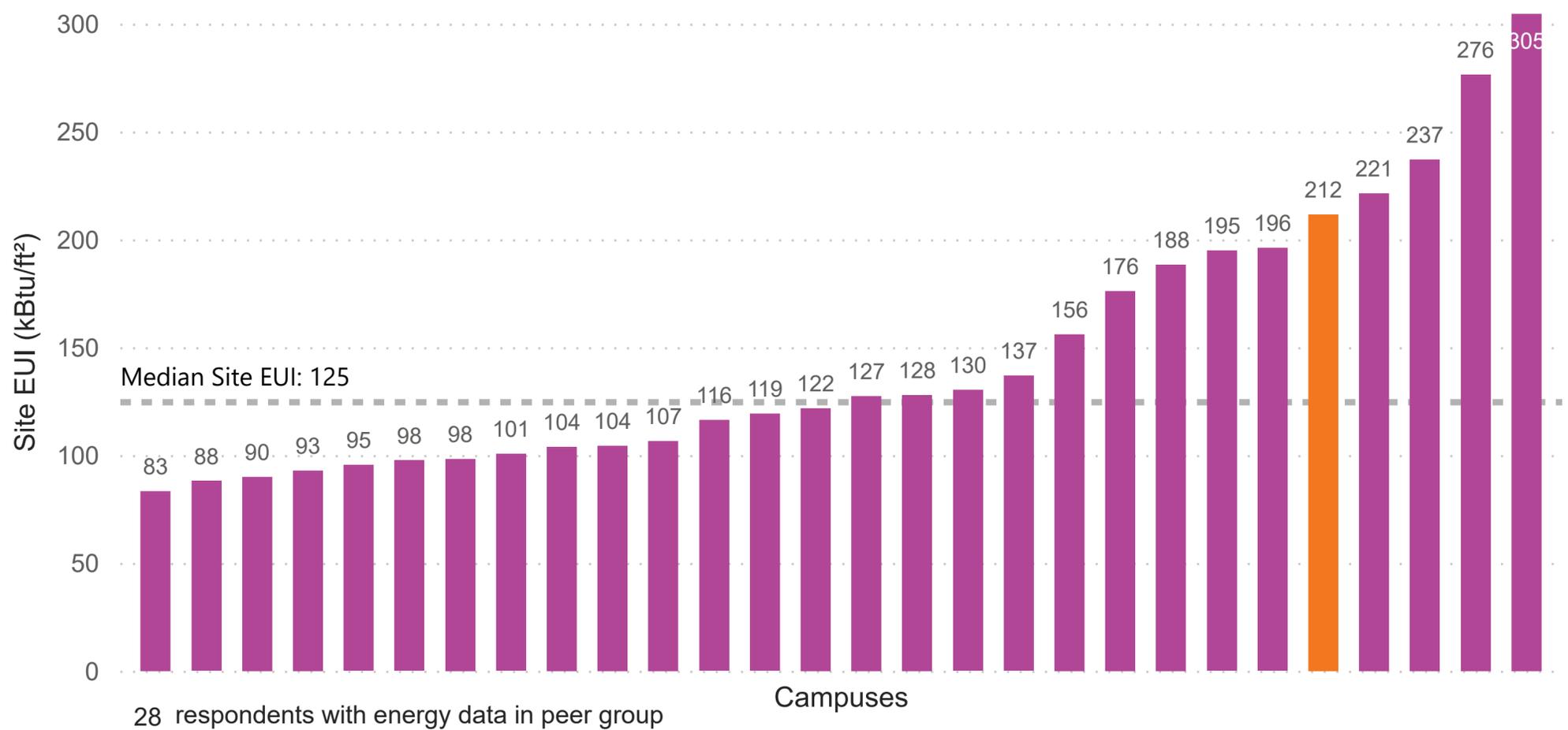


## Energy Use Intensity by Carnegie Classification

### Source EUI by Carnegie Classification: Doctoral University



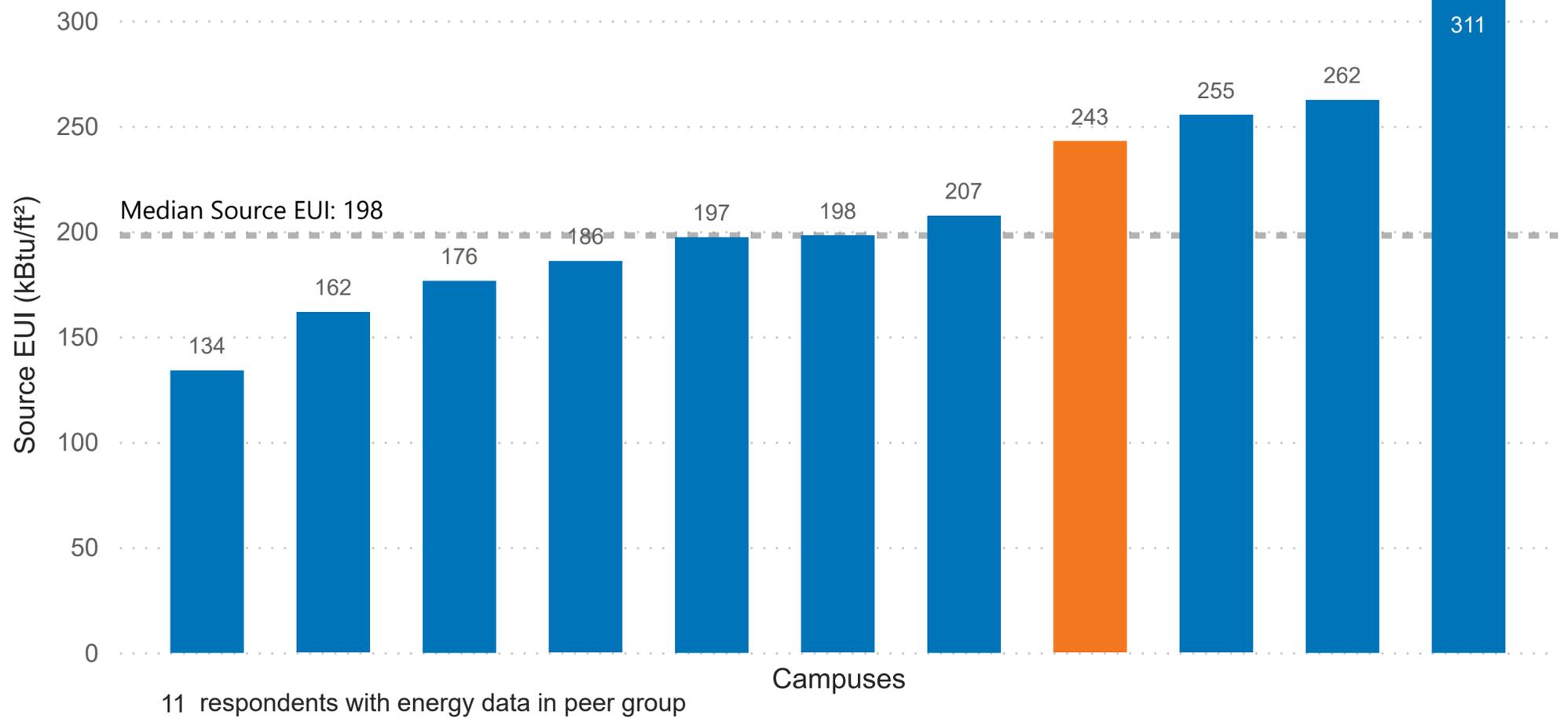
### Site EUI by Carnegie Classification: Doctoral University



## Energy Use Intensity by Fall Term Residential Headcount

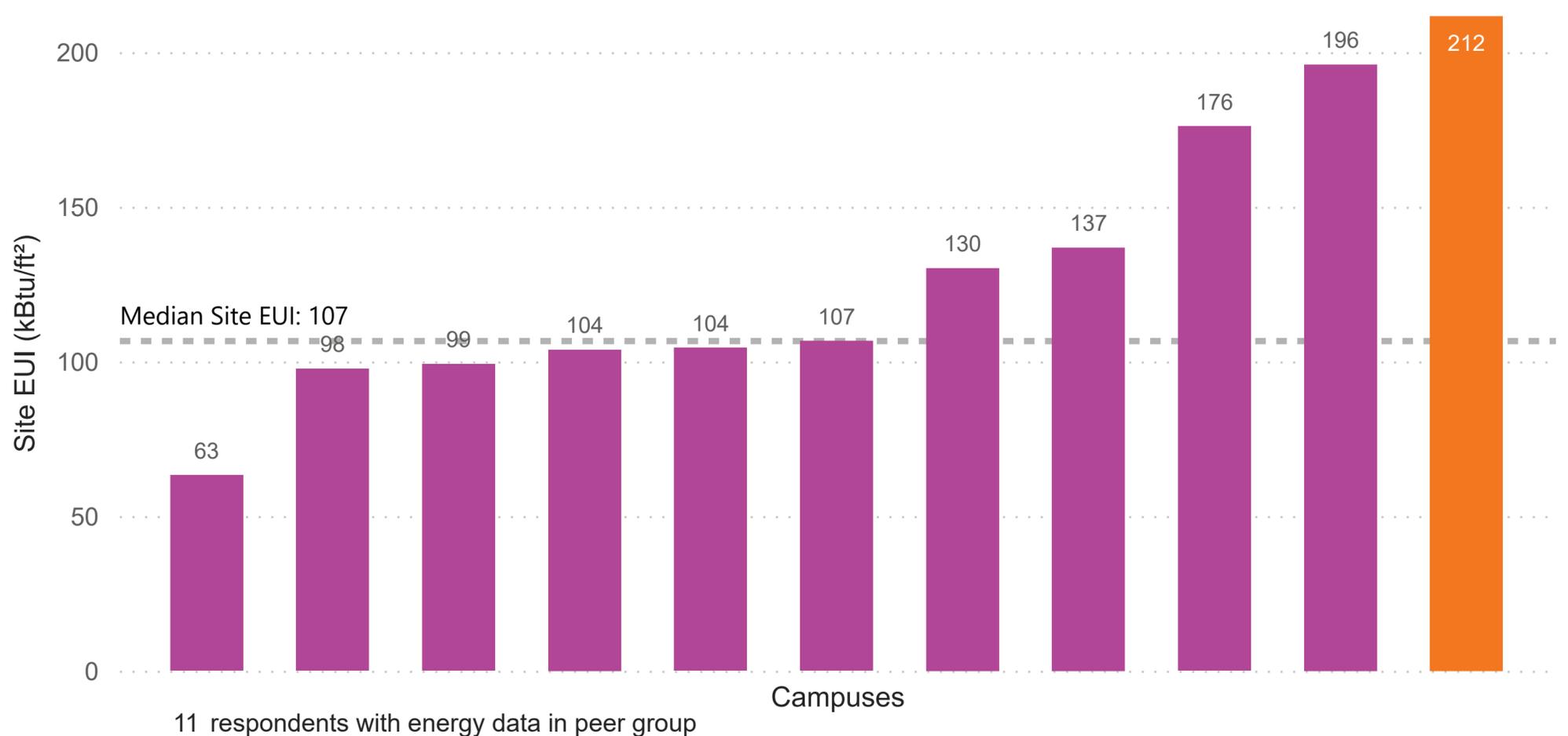
### Source EUI by Fall Term Headcount:

20%-29%



### Site EUI by Fall Term Headcount:

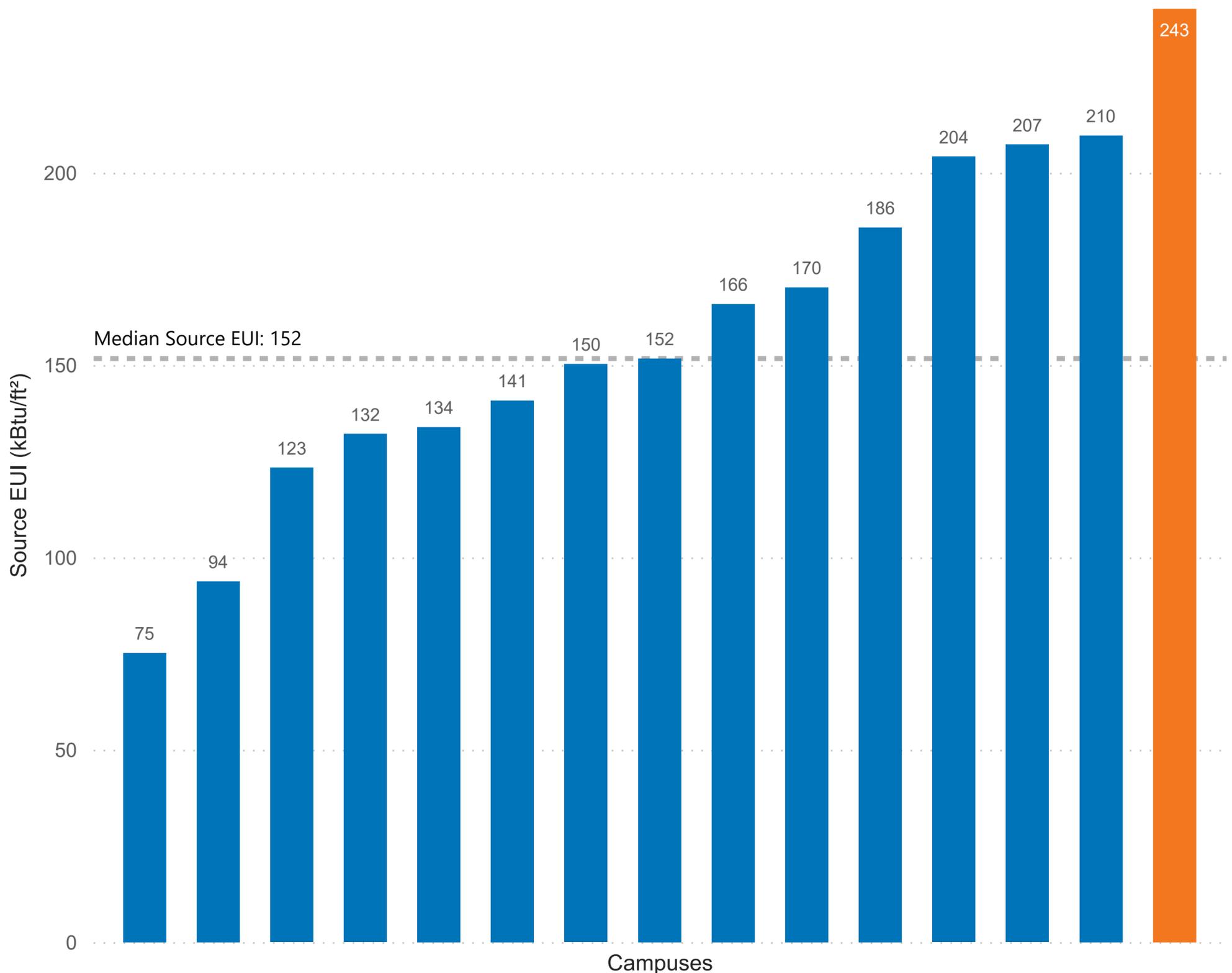
20%-29%



## Actual Source EUI by Expected Energy Use

This peer group includes campuses with a similar range of expected energy use. Each campus's expected energy use was calculated by assigning [US national median EUI values](#) to the property types (Laboratory, Food Service, Hospital, Lifestyle Center, etc.) that were reported for that campus. If a respondent reported two or more property types for a campus, the calculation to derive expected energy use was weighted according to the reported gross floor area of each property type. Expected energy use was binned to create peer groups: 160 to 182 kBtu/ft<sup>2</sup>, 182 to 200 kBtu/ft<sup>2</sup>, 200 to 225 kBtu/ft<sup>2</sup>, and over 225 kBtu/ft<sup>2</sup>. This graph therefore provides a sense of how well each campus in the group is performing against expectations, taking into account the mix of different property types on each campus and their typical energy intensity.

### Actual Source EUI by Expected Energy Use: Campuses with Expected EUI of 182 to 200 kbtu/ft<sup>2</sup>

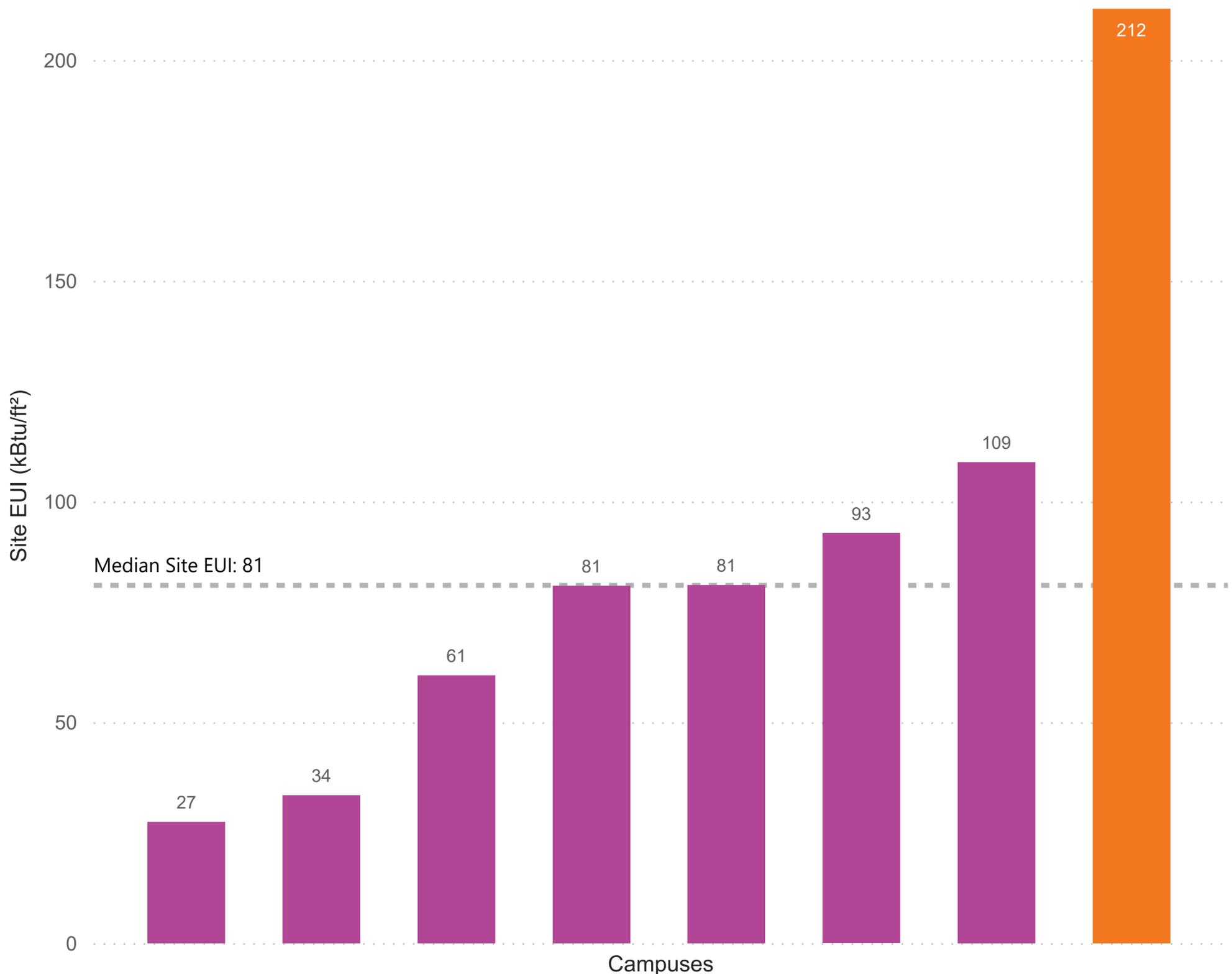


15 respondents with energy data in peer group

## Actual Site EUI by Expected Energy Use

This peer group includes campuses with a similar range of expected energy use. Each campus's expected energy use was calculated by assigning [US national median EUI values](#) to the property types (Laboratory, Food Service, Hospital, Lifestyle Center, etc.) that were reported for that campus. If a respondent reported two or more property types for a campus, the calculation to derive expected energy use was weighted according to the reported gross floor area of each property type. Expected energy use was binned to create peer groups: 80 to 85 kBtu/ft<sup>2</sup>, 85 to 90 kBtu/ft<sup>2</sup>, 90 to 95 kBtu/ft<sup>2</sup>, and over 95 kBtu/ft<sup>2</sup>. This graph therefore provides a sense of how well each campus in the group is performing against expectations, taking into account the mix of different property types on each campus and their typical energy intensity.

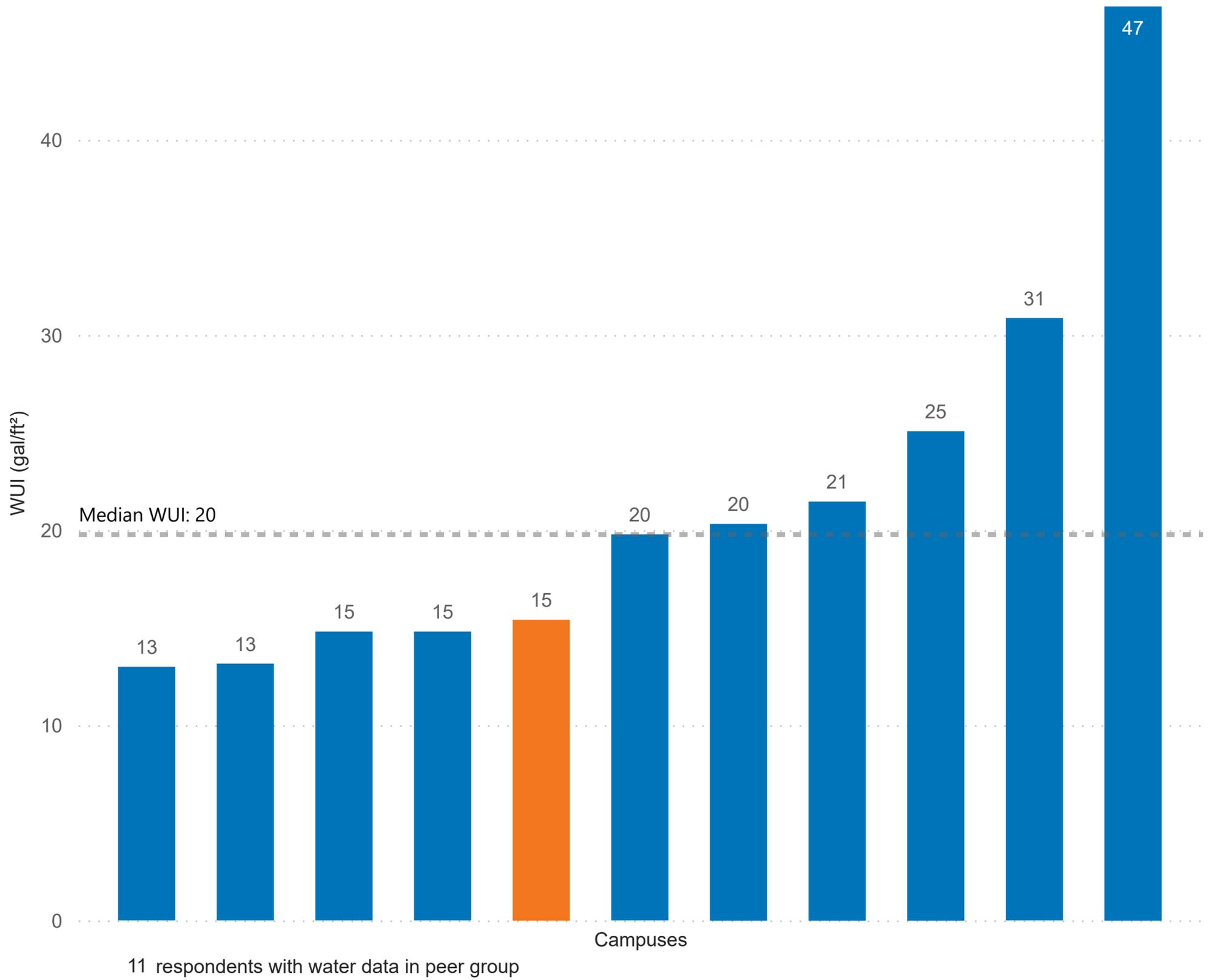
### Actual Site EUI by Expected Energy Use: Campuses with Expected EUI of 85 to 90 kbtu/ft<sup>2</sup>



8 respondents with energy data in peer group

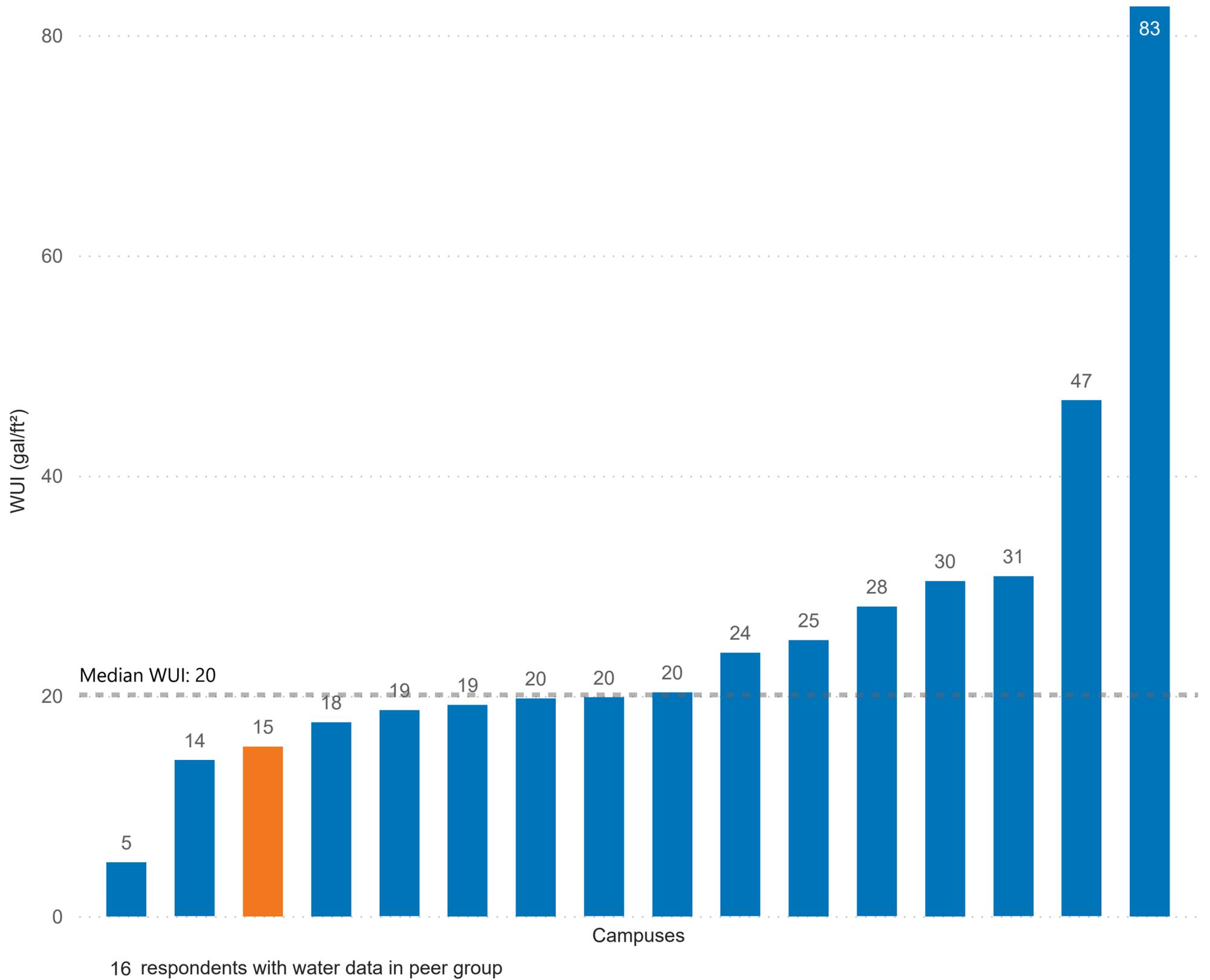
## Water Use Intensity by Climate Zone

WUI by Climate Zone:  
5. Cool



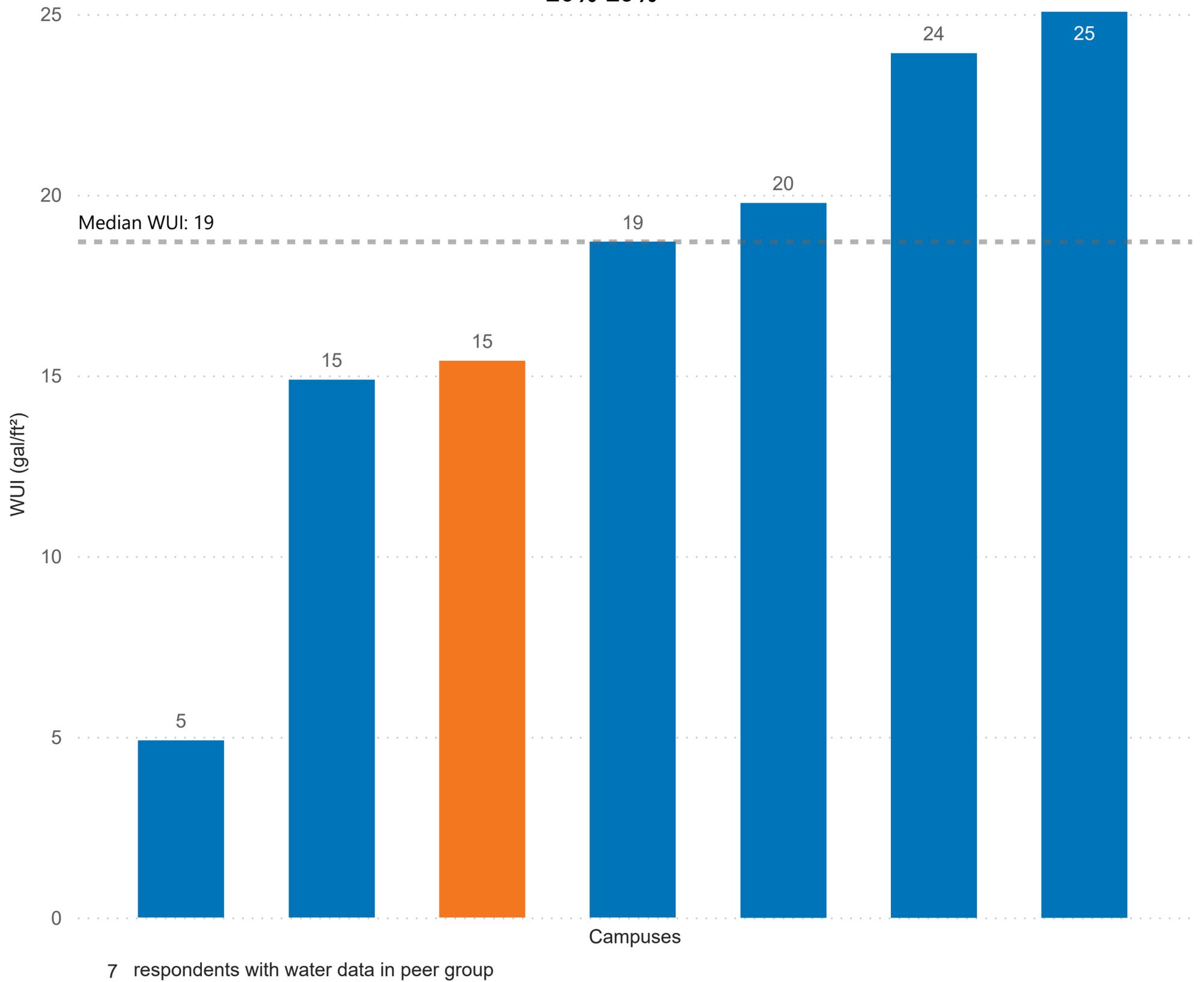
## Water Use Intensity by Carnegie Classification

### WUI by Carnegie Classification: Doctoral University



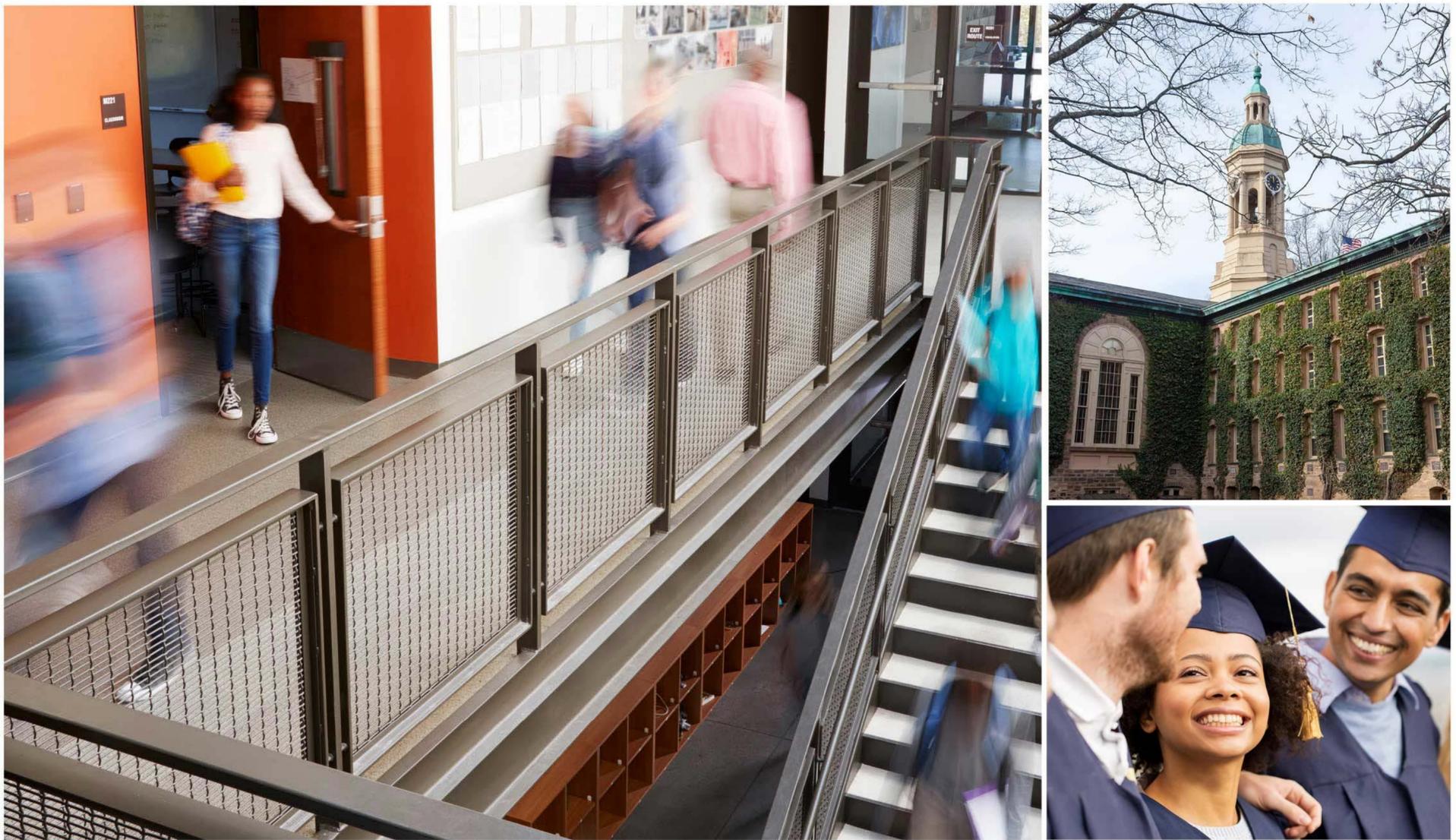
## Water Use Intensity by Fall Term Residential Headcount

WUI by Fall Term Headcount:  
20%-29%



## Contact Information

**Brendan Hall, Higher Education Program Manager**  
**ENERGY STAR for Buildings, US Environmental Protection Agency**  
**Hall.Brendan@epa.gov**



To explore ENERGY STAR tools and resources for higher education institutions, please visit:

[ENERGYSTAR.GOV/HIGHERED](https://ENERGYSTAR.GOV/HIGHERED)

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