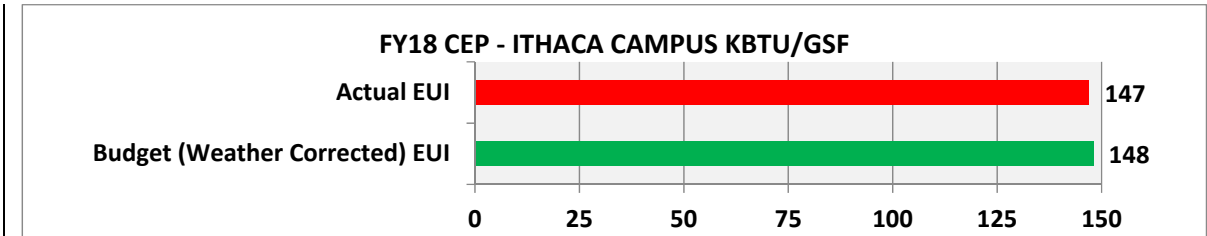




Ithaca Campus - Central Energy Plant (CEP) Summary:

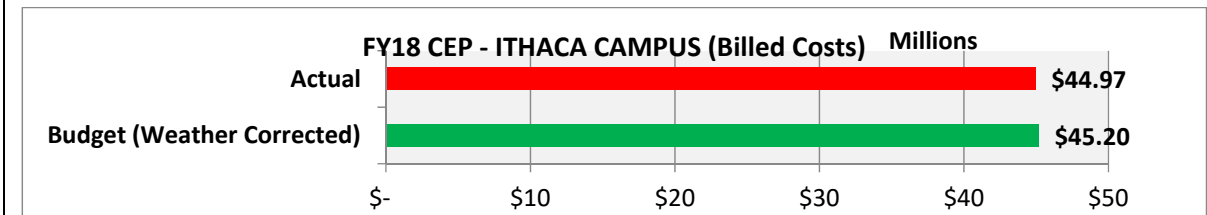
Starting in the 2011/2012 fiscal year, a quarterly energy metrics analysis is being performed. This analysis supports creating Facilities Metrics and evaluation of building and overall campus energy usage vs the budget for each fiscal year. The purposes of the analysis are:

- Document/Measure building performance and conservation savings on a campus wide basis. The “projected” usage bar for a building is the FY18 budget weather corrected predicted usage of energy per square foot and is shown together with the “actual” bar for comparison. The projected usage is created based on a “baseline” equation that relates past usage to past weather using regression analysis factoring in expected changes from renovation, new construction, and conservation.
- Identify central energy plant connected facilities where energy use intensity (EUI) is trending unexpectedly higher compared with projected values. EUI turns all energy into one common unit “Btu” divided by the gross square feet. Buildings are targeted for follow up action to determine why the usage is higher than predicted. Note: the projected values are based on best behavior baseline and are dynamic (adjusted based on major building changes) and feed into each year’s budget forecast values.



For FY18 Actual EUI is approximately <1% below projected values.

Note: Energy Use Intensity (EUI) is expressed in kBtu’s (1,000 British Thermal Units) per Gross Square Foot. Energy use represents the delivered energy for electric, steam and chilled water.



Actual billed energy costs are about \$ 0.25 million lower than weather corrected budget.

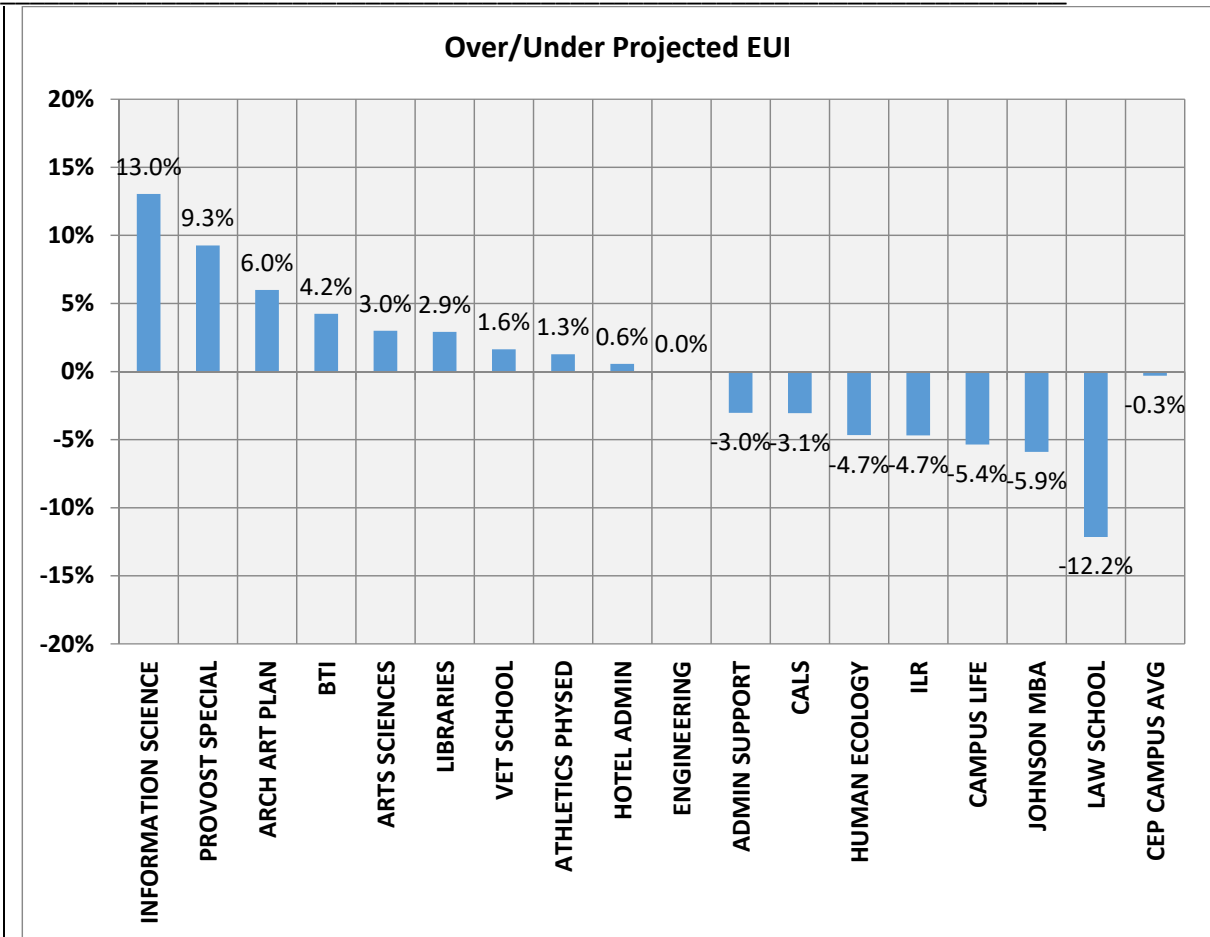


College/Unit Summary

The charts on the following pages provide the following:

- 1) EUI information by commodity (steam, chilled water and electric) by College/Unit. The analysis at the commodity level uses the gross square footage assigned for each commodity. For example, not as many buildings are connected to the district cooling system compared with those connected to the district steam system. Building space may be occupied by multiple colleges; however, the analysis assigns the energy consumption and dollars to the **majority** space user for each building.
- 2) Sales information by College/Unit. Facilities are billed based on metered consumption. There are separate rates for steam, chilled water (cooling) and electric.
- 3) CO2 emissions information by College/Unit. Charts are provided for CO2 intensity (annual CO2 emissions per GSF) and total CO2 emissions.

Research/lab buildings have the higher EUI and associated CO2 intensity. These buildings use more energy due to higher airflow requirements.

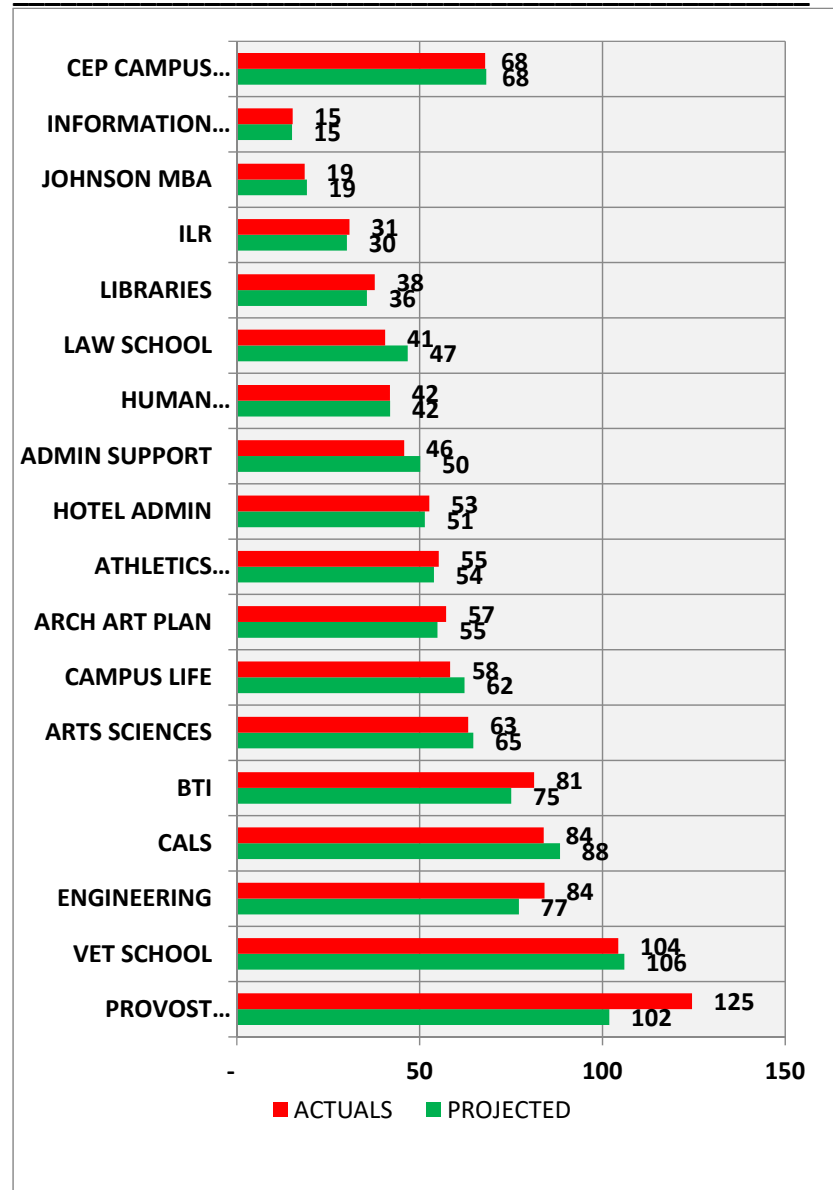


Actual EUI is approximately 0.3% below projected weather adjusted values.

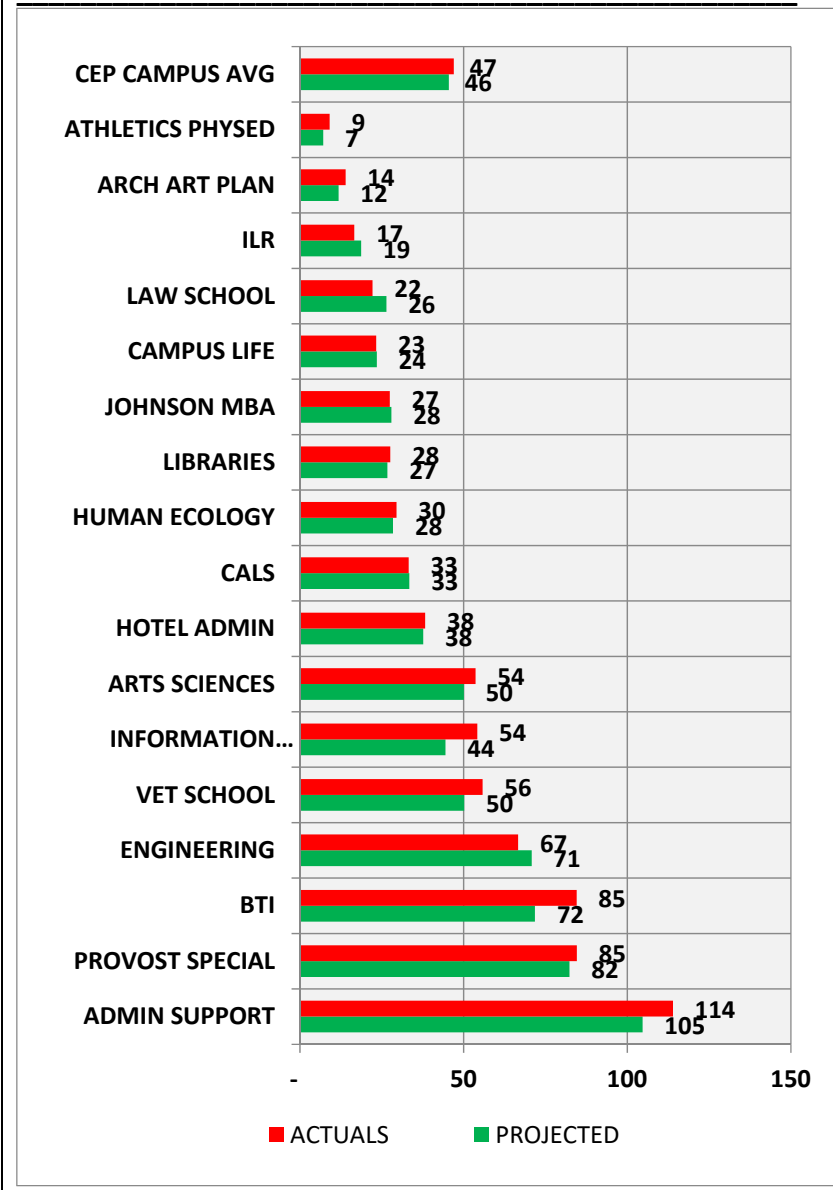
**Cornell University Energy and Sustainability:
Ithaca Campus Energy Metrics Fiscal Year 2018 Annual Analysis
College/Unit Energy Use Intensity (EUI)**



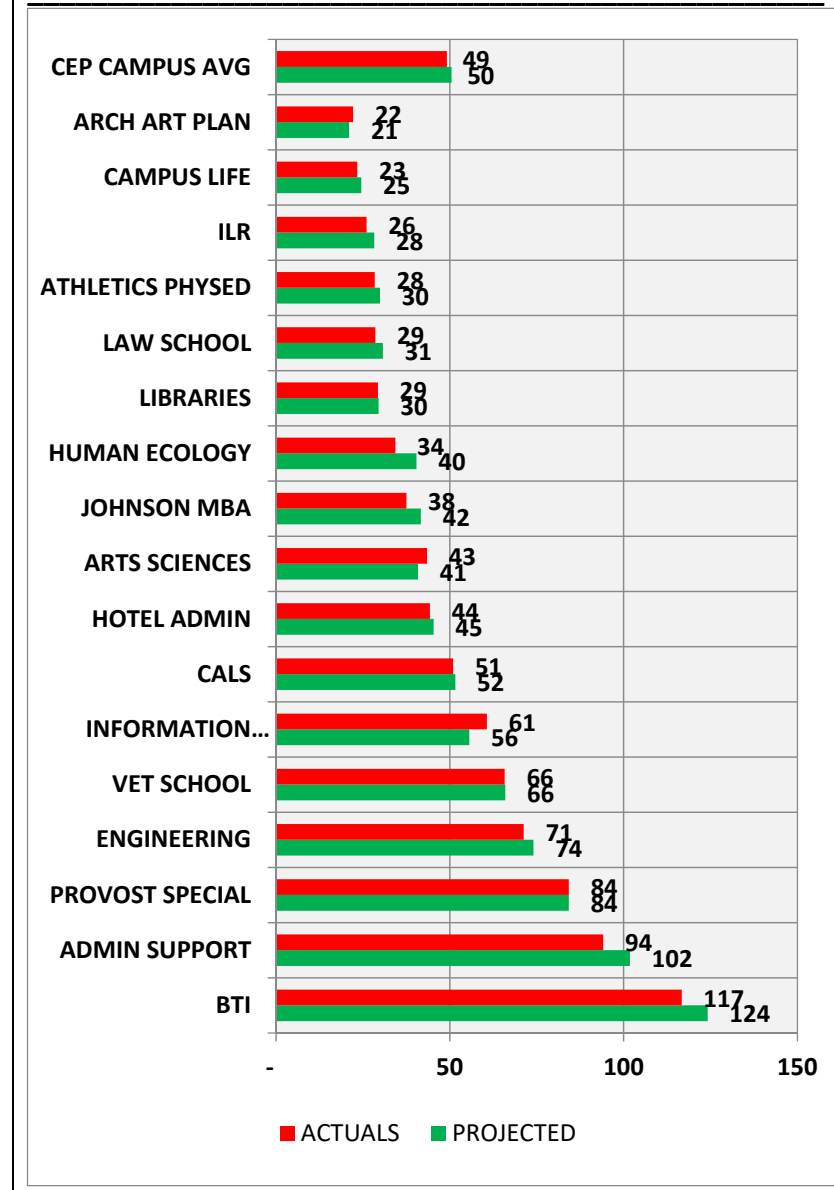
STEAM EUI (kBtu/gsf): 12.8 million GSF



CHILLED WATER EUI (kBtu/gsf): 10.8 million GSF



ELECTRIC EUI (kBtu/gsf): 14.1 million GSF

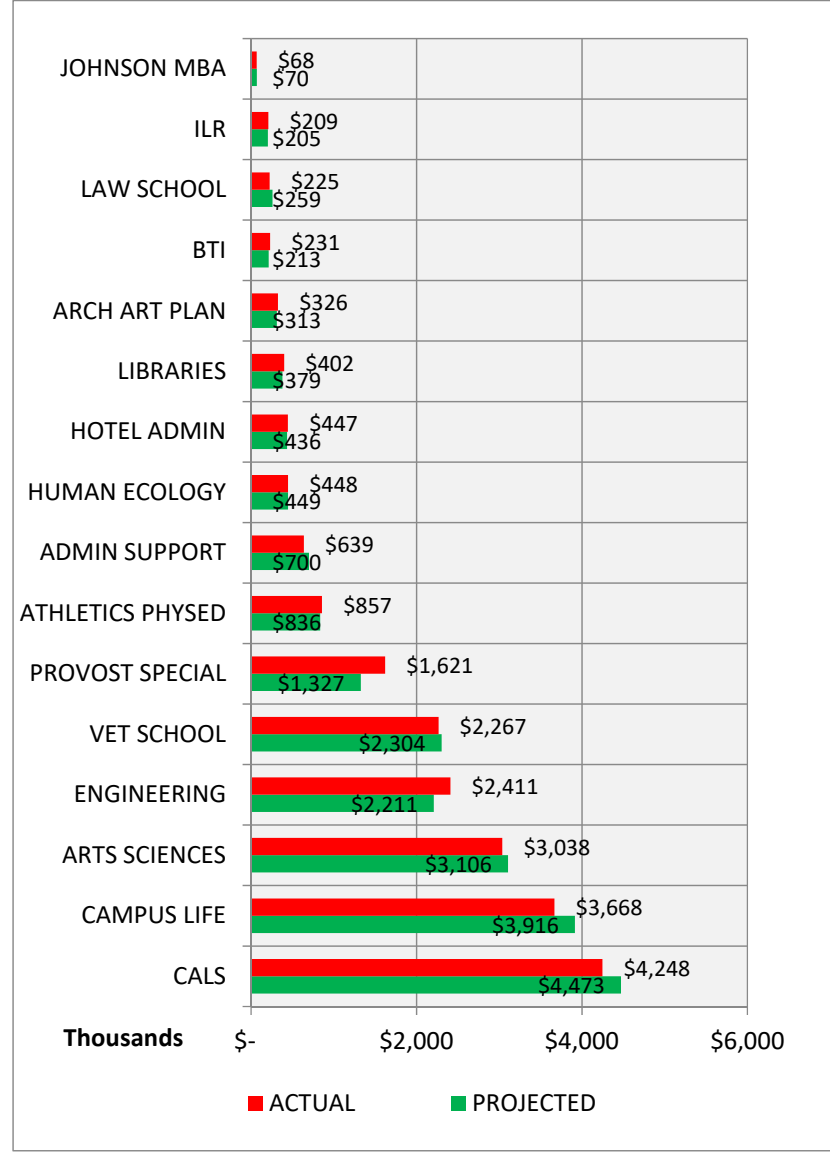


**Cornell University Energy and Sustainability:
Ithaca Campus Energy Metrics Fiscal Year 2018 Annual Analysis
College/Unit Energy Sales**



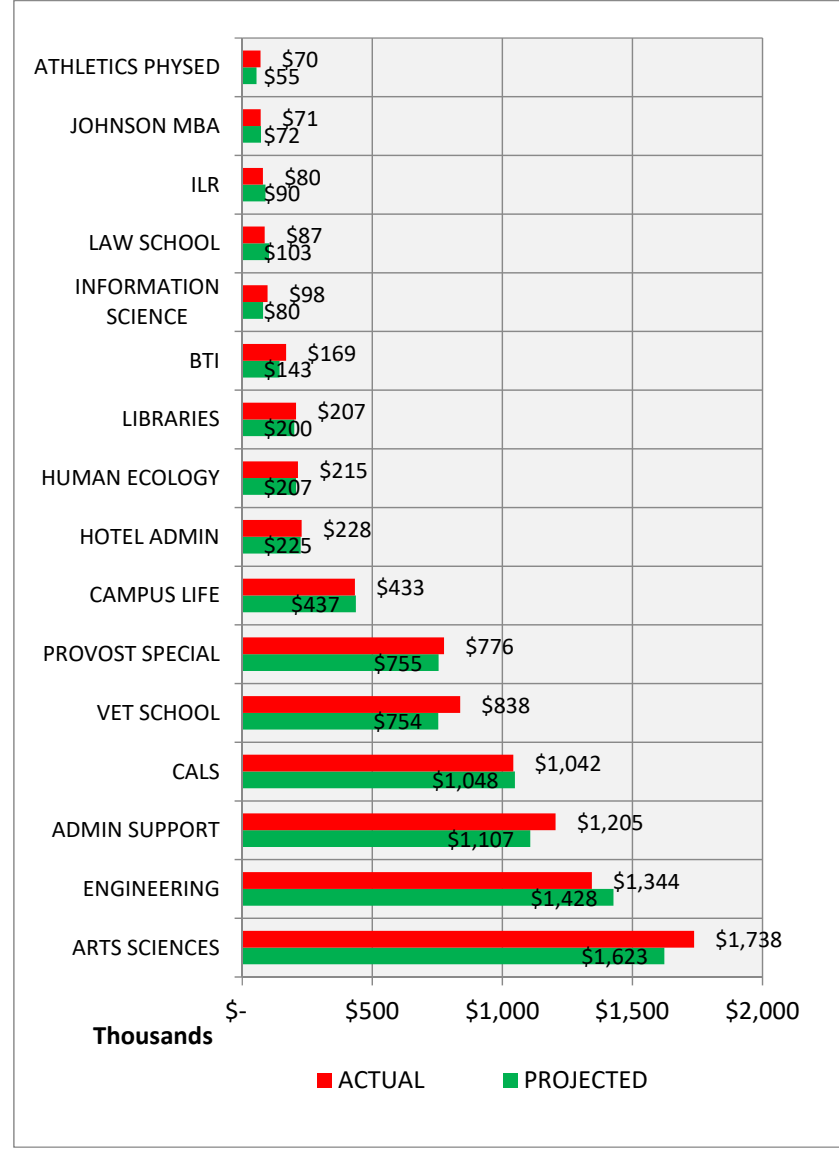
STEAM SALES

TOTAL ACTUAL BILLED COST: \$ 21,144,000
TOTAL PROJECTED BILLED COST: \$ 21,236,000



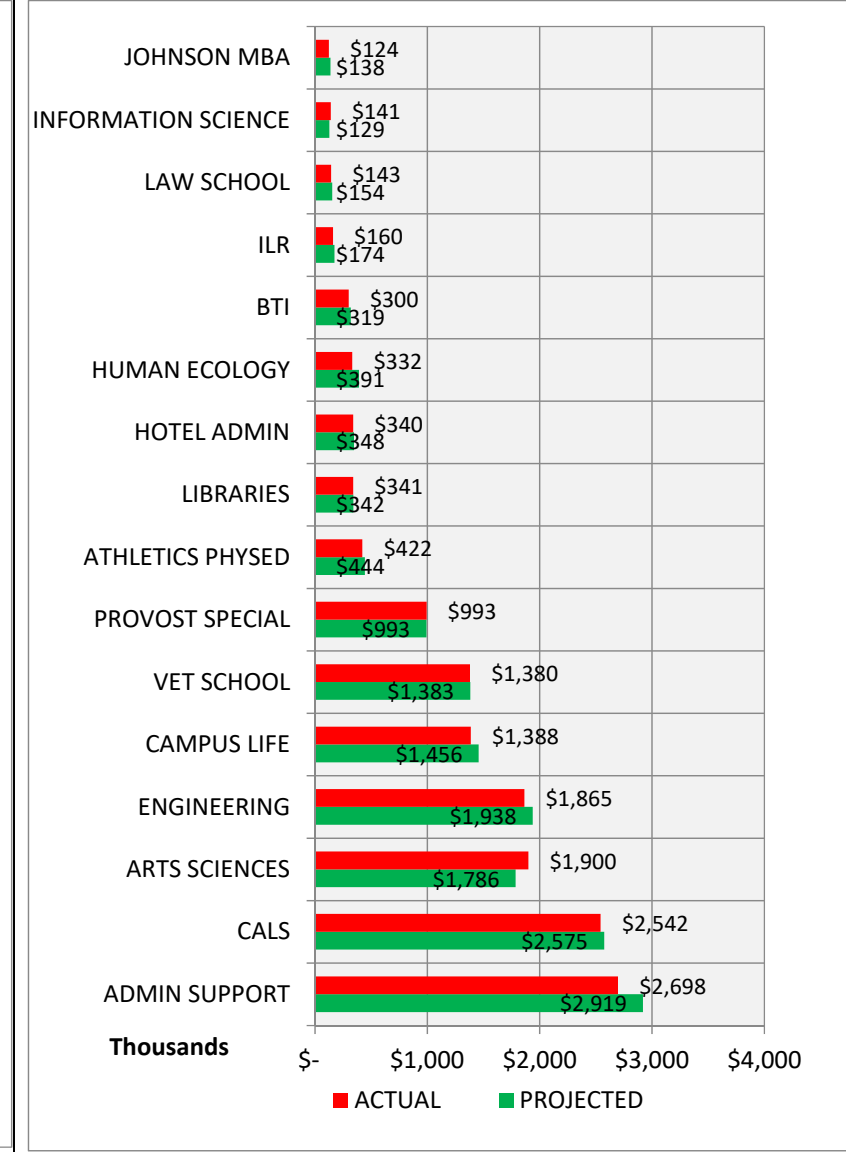
CHILLED WATER SALES

TOTAL ACTUAL BILLED COST: \$ 8,640,000
TOTAL PROJECTED BILLED COST: \$ 8,363,000



ELECTRIC SALES

TOTAL ACTUAL BILLED COST: \$ 13,804,000
TOTAL PROJECTED BILLED COST: \$ 14,216,000



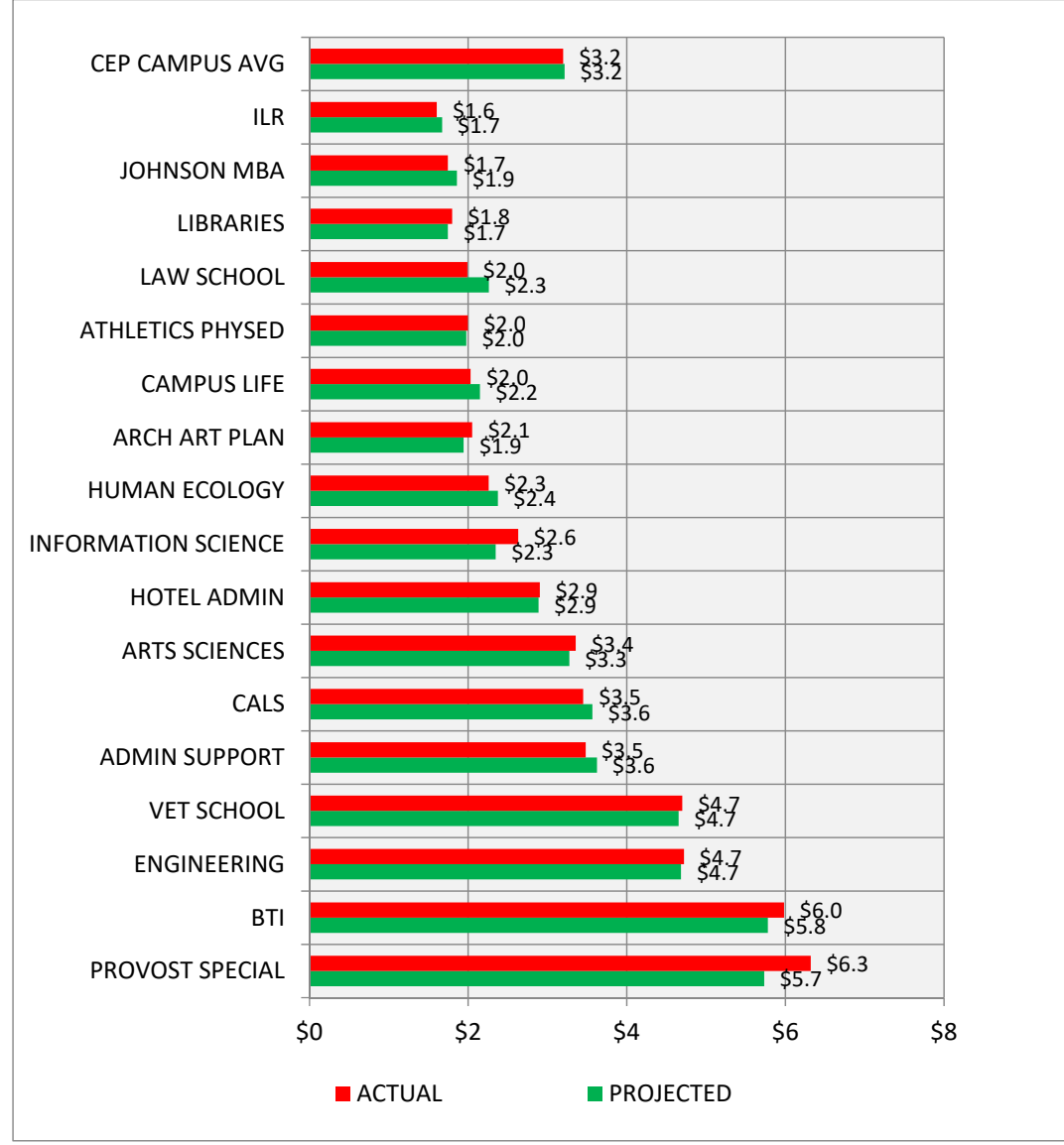
**Cornell University Energy and Sustainability:
Ithaca Campus Energy Metrics Fiscal Year 2018 Annual Analysis
College/Unit Energy Sales**



ALL COMMODITIES COST INTENSITY (Billed \$ per GSF)

Actual Campus Average: \$3.2

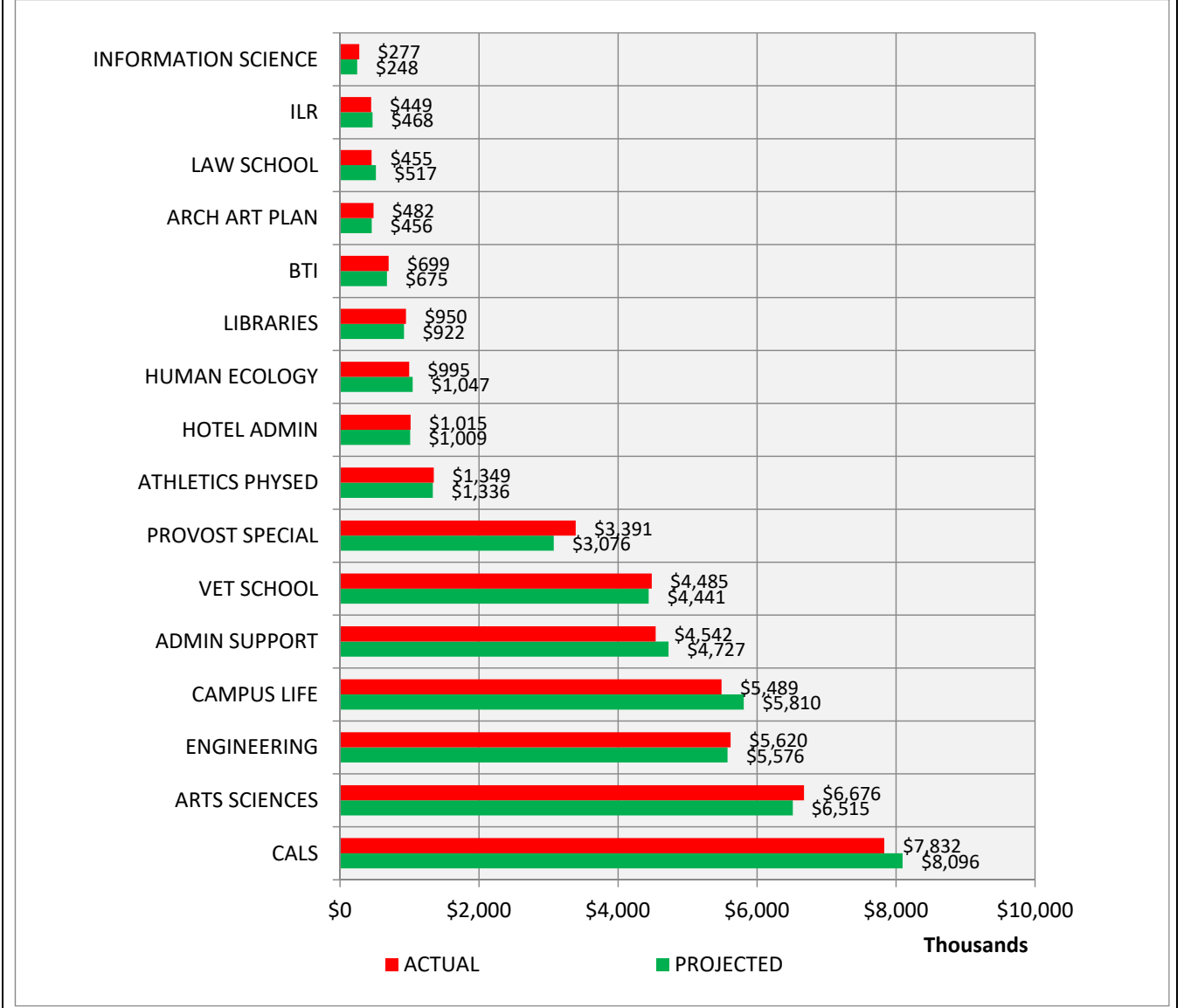
Projected Campus Average: \$3.3



ALL COMMODITIES SALES

TOTAL ACTUAL BILLED COST: \$ 44,968,000

TOTAL PROJECTED BILLED COST: \$ 45,198,000



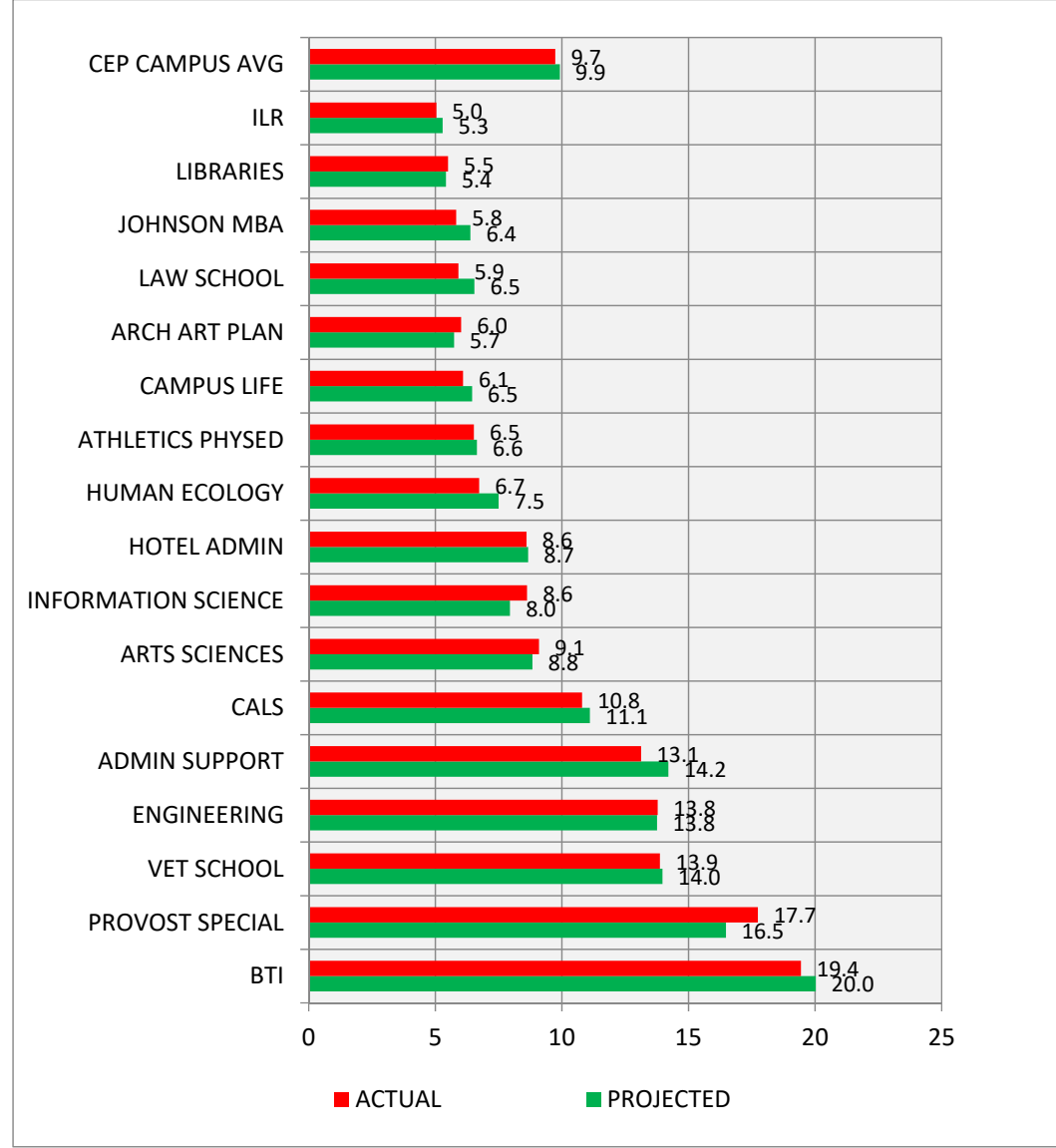
**Cornell University Energy and Sustainability:
Ithaca Campus Energy Metrics Fiscal Year 2018 Annual Analysis
College/Unit Energy Sales**



ALL COMMODITIES CO₂ INTENSITY (kg of CO₂ per GSF)

Actual Campus Average: 9.7

Projected Campus Average: 9.9



ALL COMMODITIES CO₂ EMISSIONS (METRIC TONS)

TOTAL CAMPUS ACTUAL: 137,000

TOTAL CAMPUS PROJECTED: 139,000

