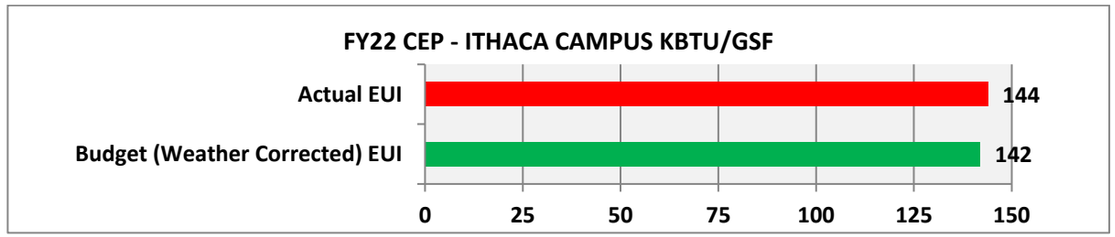
Ithaca Campus - Central Energy Plant (CEP) Summary:

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:

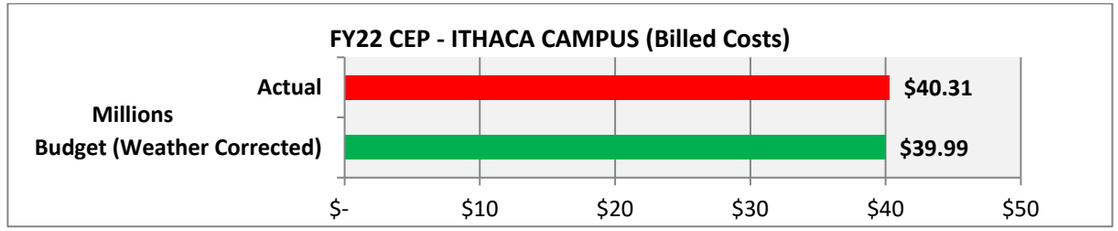
- Document/Measure building performance and conservation savings on a campus wide basis. The "projected" usage bar for a building is the FY22 budget weather corrected predicted usage of energy per square foot and is shown together with the "actual" bar for comparison. The projected usage is created based 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 FY22 Actual EUI is approximately 1% above 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 $ 300 thousand above weather corrected budget. The delta is immaterial and within model "noise". Remote/hybrid work can be considered the new normal. Please note the North Campus Residential Expansion (NCRE) is not included for the FY22 analysis because the site was not fully operational and actively metered. NCRE will be included in the FY23 analysis.

College/Unit Summary

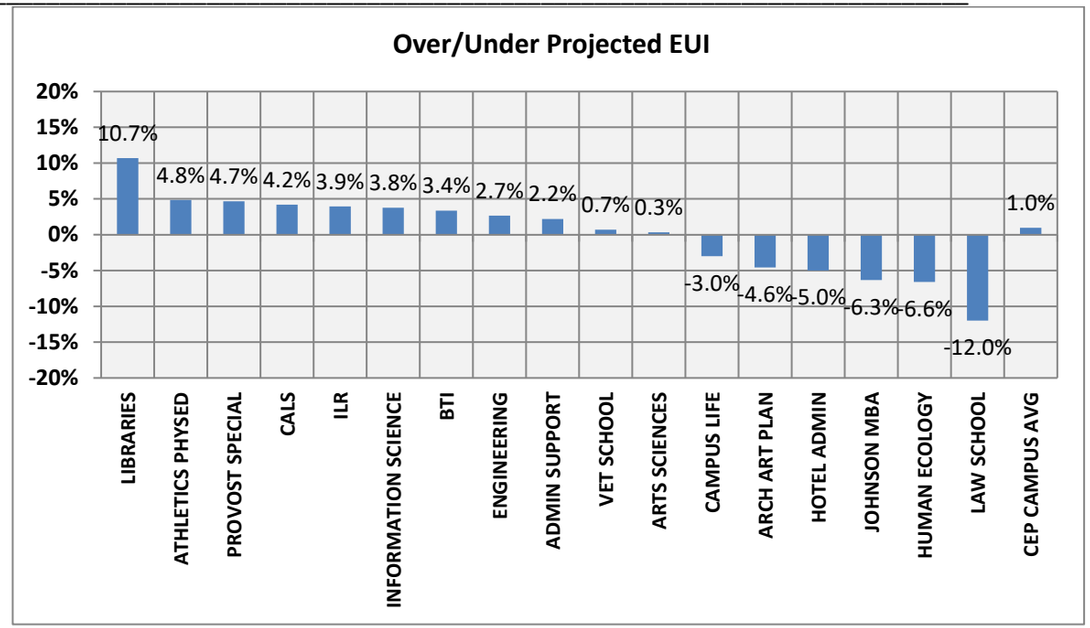
The charts on the following pages provide the following:

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. The “Utilities” unit has a high EUI due to significant electrical equipment loads and chilled water usage for equipment and air inlet cooling.

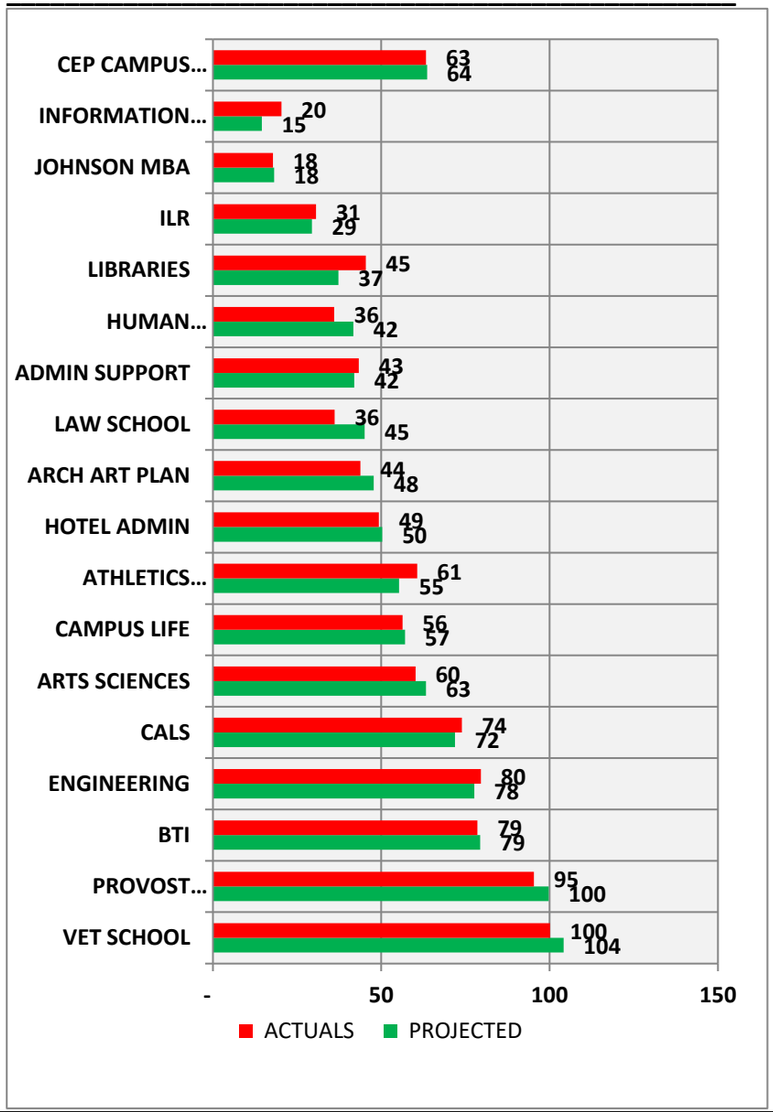


Actual EUI is approximately 1% above projected weather adjusted values.

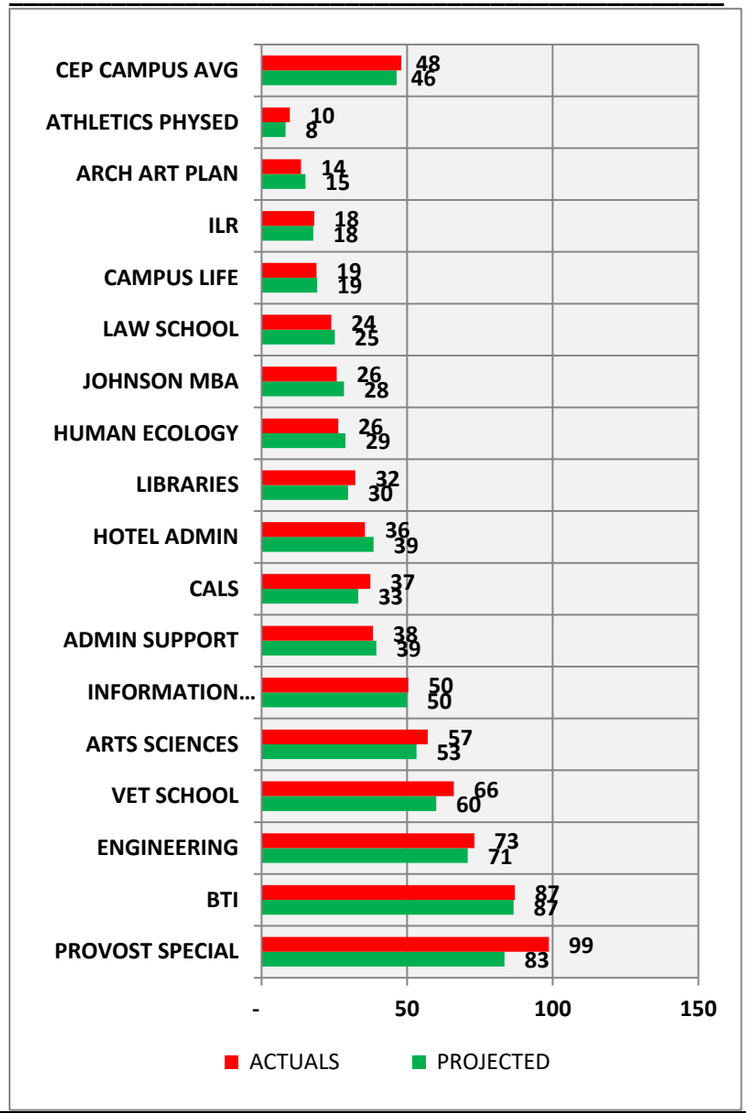
The differences between the Over/Under is largely due to impact associated with remote/hybrid work and as a whole are within the “noise”; especially when needing to develop building energy/weather models in a post-Covid environment.

Cornell University Energy and Sustainability:
Ithaca Campus Energy Metrics Fiscal Year 2022 Annual Analysis
College/Unit Energy Sales

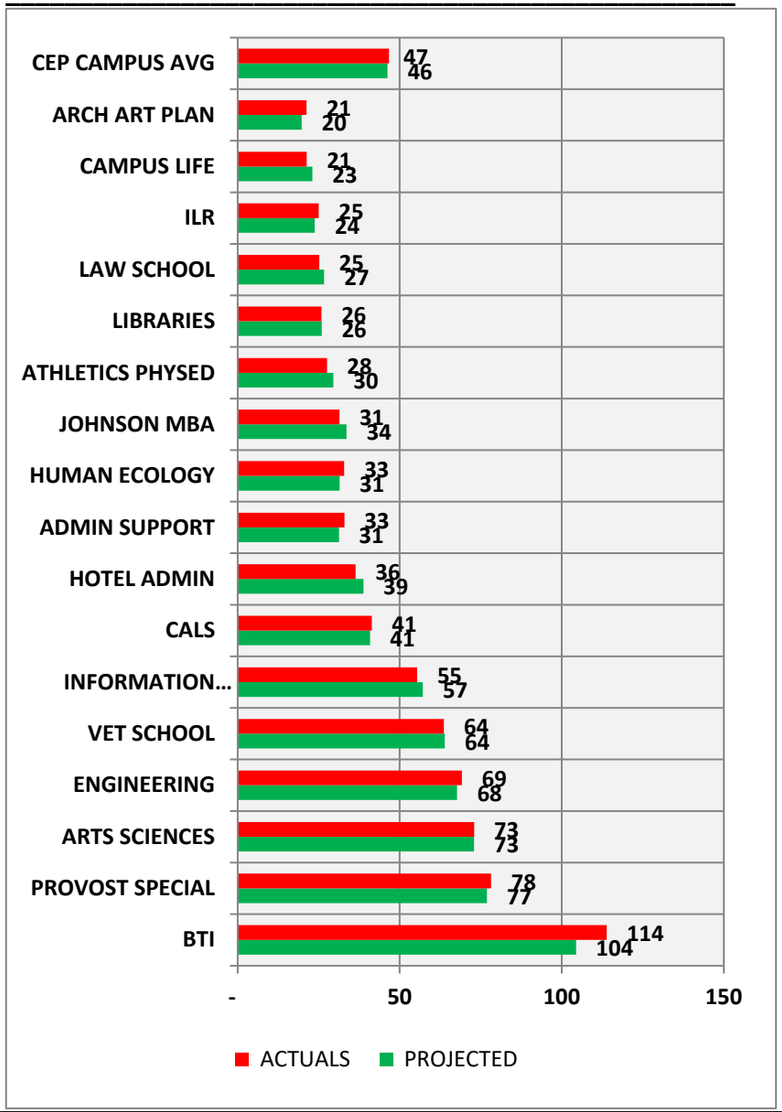
STEAM EUI (kBtu/gsf): 13.0 million GSF



CHILLED WATER EUI (kBtu/gsf): 11.0 million GSF



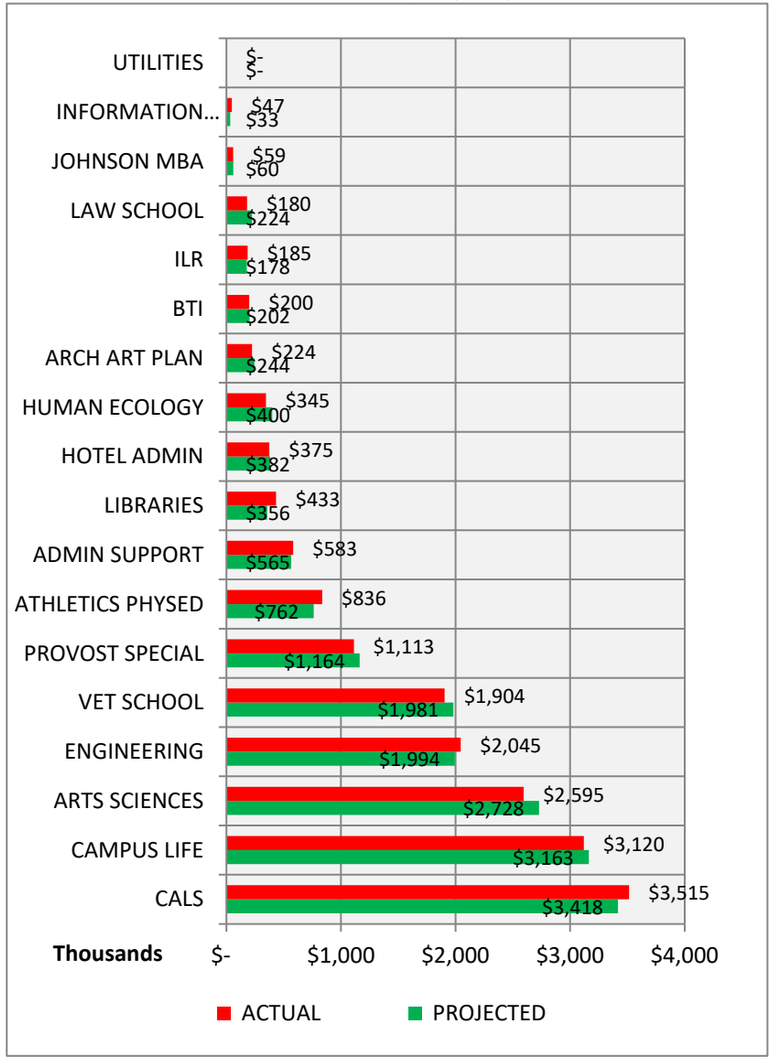
ELECTRIC EUI (kBtu/gsf): 13.9 million GSF



Cornell University Energy and Sustainability:
Ithaca Campus Energy Metrics Fiscal Year 2022 Annual Analysis
College/Unit Energy Sales

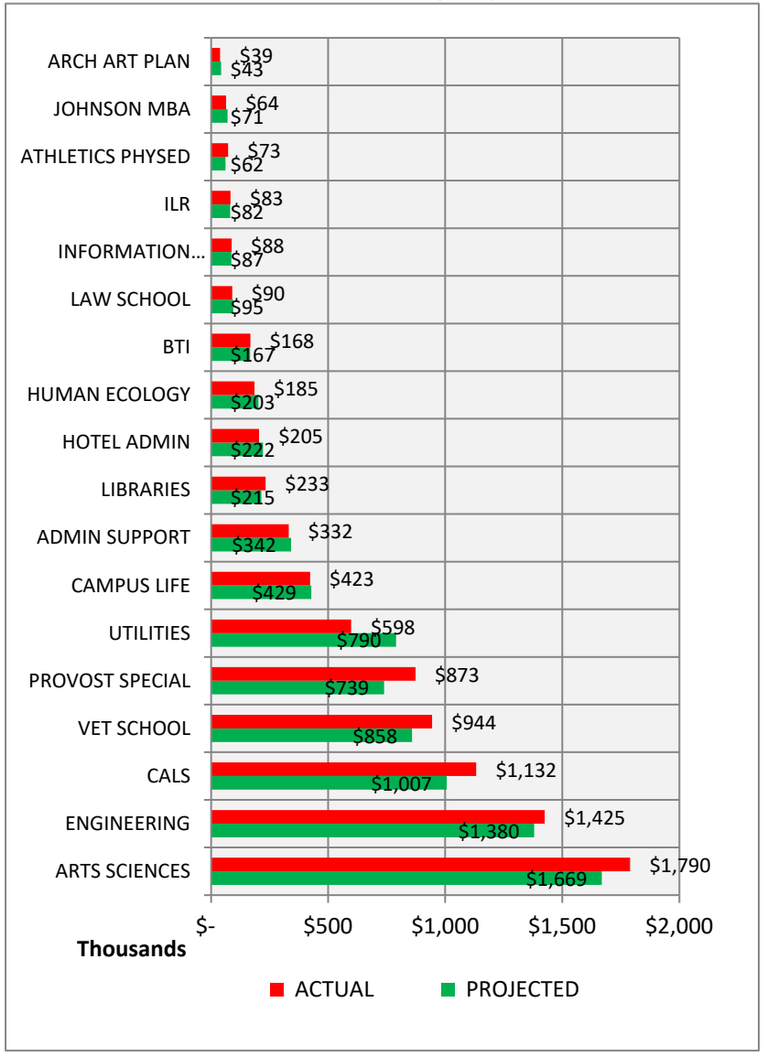
STEAM SALES

TOTAL ACTUAL BILLED COST: $ 17,800,000
TOTAL PROJECTED BILLED COST: $ 17,900,000



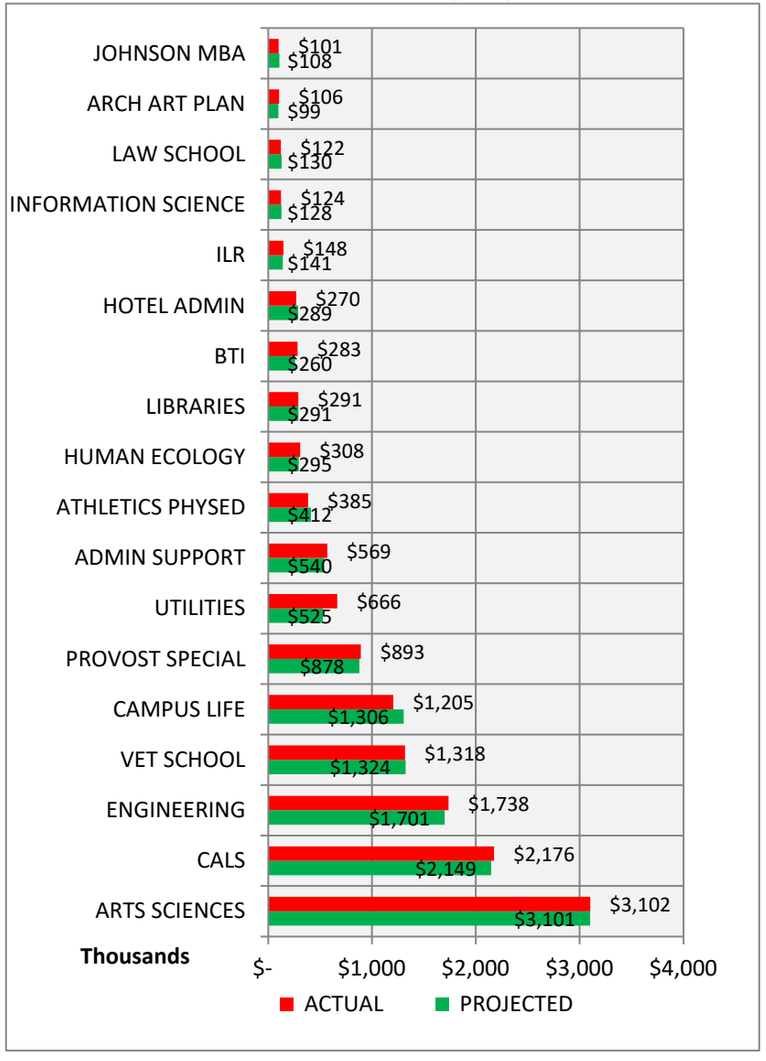
CHILLED WATER SALES

TOTAL ACTUAL BILLED COST: $ 8,700,000
TOTAL PROJECTED BILLED COST: $ 8,500,000



ELECTRIC SALES

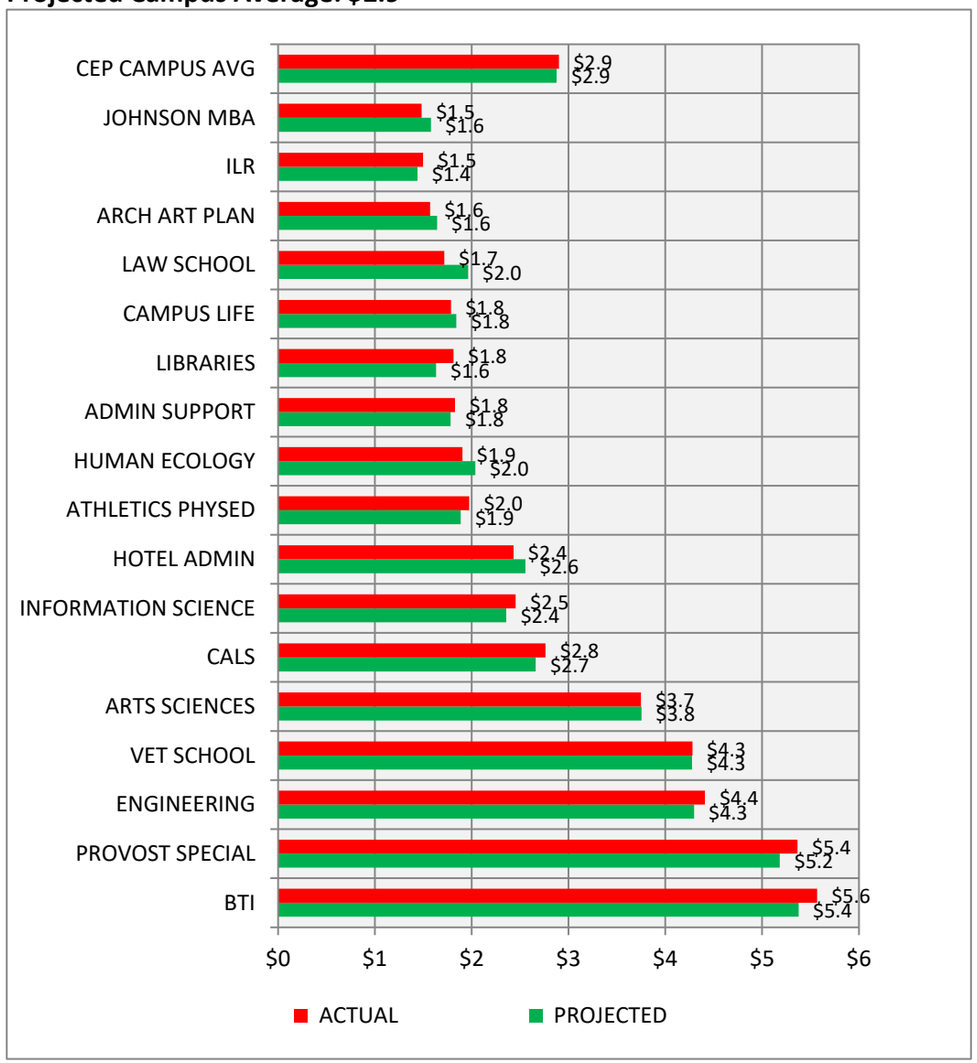
TOTAL ACTUAL BILLED COST: $ 13,800,000
TOTAL PROJECTED BILLED COST: $ 13,700,000



Cornell University Energy and Sustainability:
Ithaca Campus Energy Metrics Fiscal Year 2022 Annual Analysis
College/Unit Energy Sales

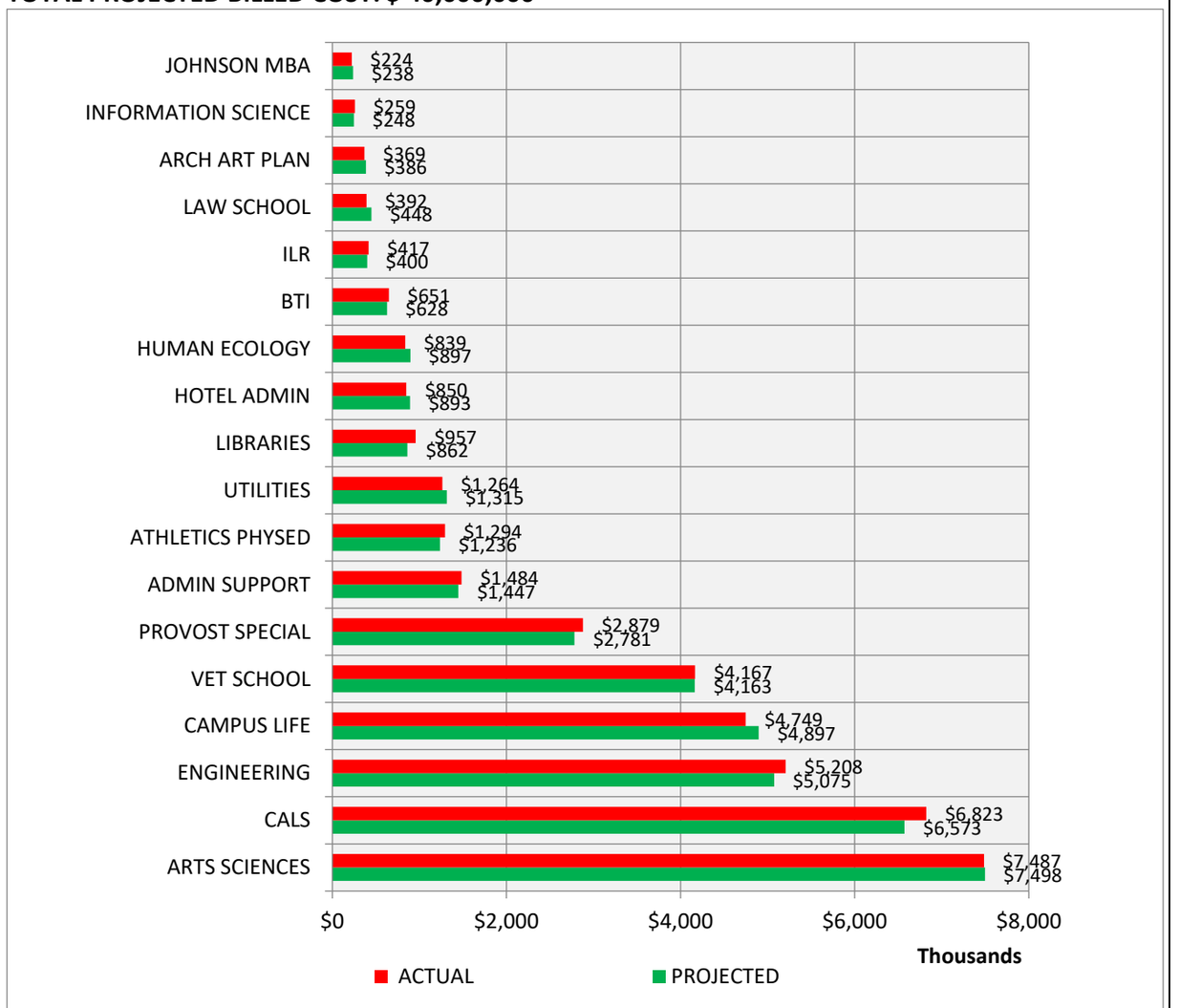
ALL COMMODITIES COST INTENSITY (Billed $ per GSF)

Actual Campus Average: $2.9
Projected Campus Average: $2.9



ALL COMMODITIES SALES

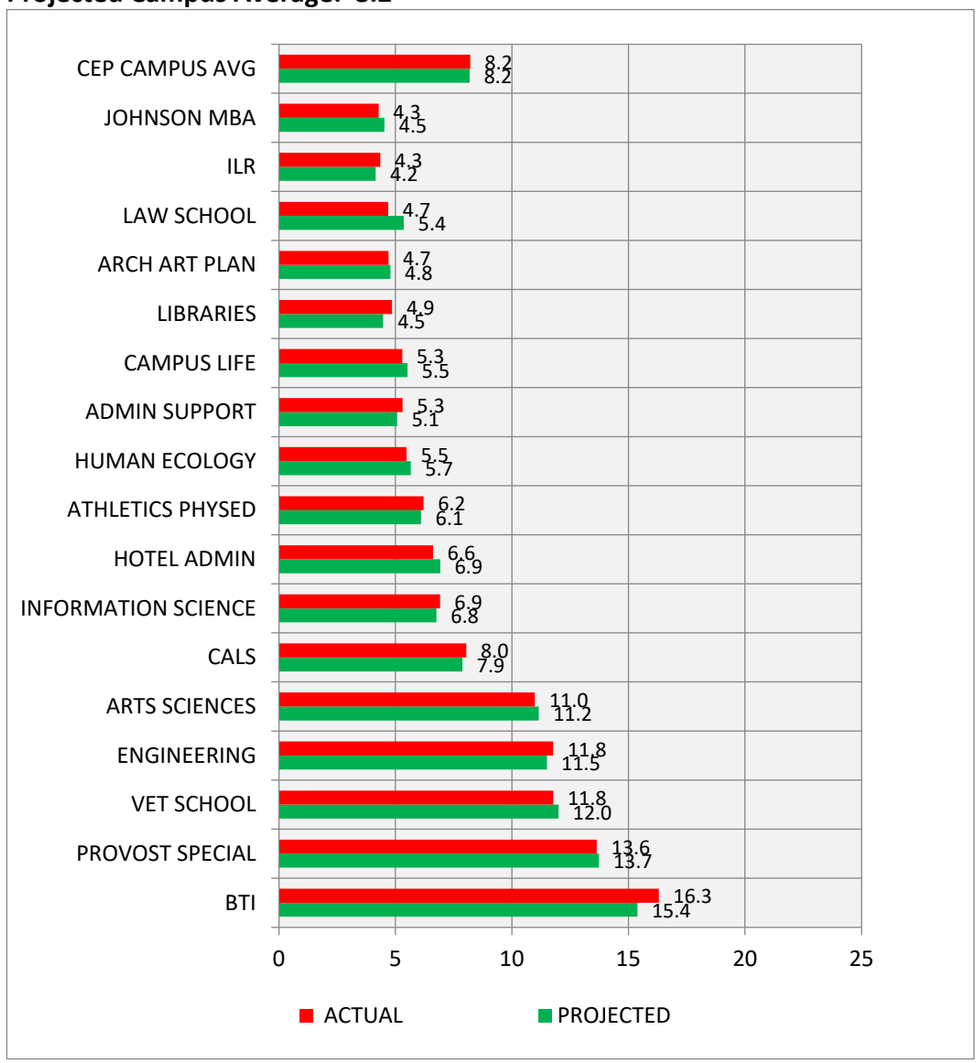
TOTAL ACTUAL BILLED COST: $ 40,300,000
TOTAL PROJECTED BILLED COST: $ 40,000,000



Cornell University Energy and Sustainability:
Ithaca Campus Energy Metrics Fiscal Year 2022 Annual Analysis
College/Unit Energy Sales

ALL COMMODITIES CO_2 INTENSITY (annual kg of CO_2 per GSF)

Actual Campus Average: 8.2
Projected Campus Average: 8.2



ALL COMMODITIES CO_2 EMISSIONS (METRIC TONS)

TOTAL CAMPUS ACTUAL: 114,000
TOTAL CAMPUS PROJECTED: 114,000