

# Executive Summary

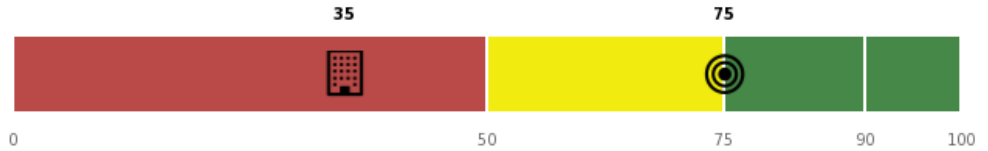
## Your Building's Energy Performance Benchmarks



### Energy Use

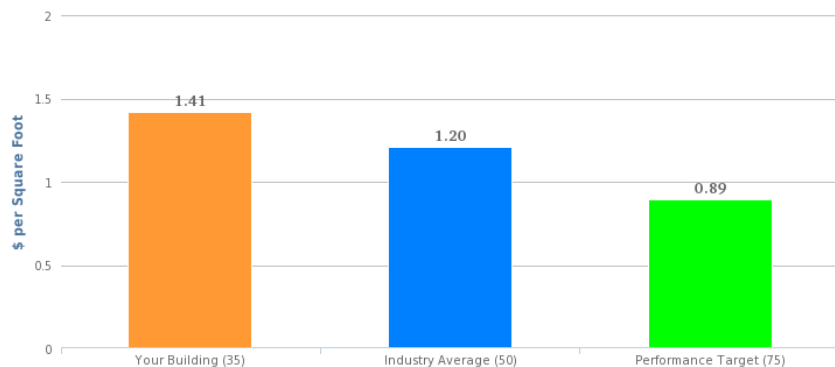
Your building's ENERGY STAR® Energy Performance Rating is **35**. Its Energy Use Index is **103 kbtu per sq. ft.**

Your building's ENERGY STAR score of **35** ranks you below average versus your peers and falls well below the minimum rating of 75 that is required for ENERGY STAR certification.



### Cost

Your building's annual cost per square foot is **\$1.41 per sq. ft.** overall.

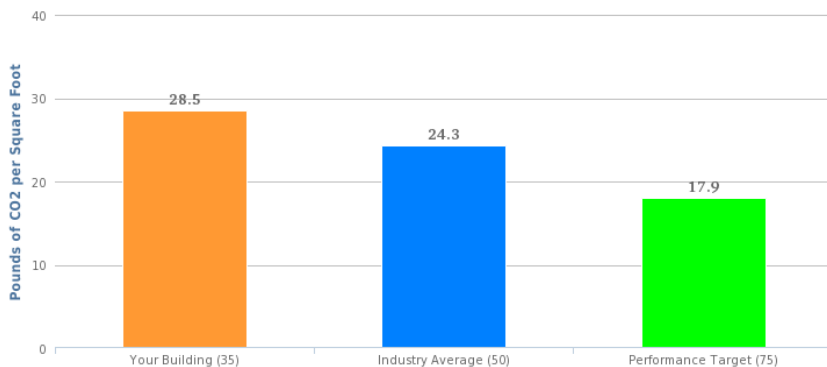


Your building's cost per square foot is **\$0.52 more** than the ENERGY STAR certification level. Your annual cost can be reduced by **\$9,221** by achieving an ENERGY STAR score of 75.



### Carbon Footprint

Your building's annual carbon footprint is **228 metric tons of CO<sub>2</sub>** or **28.5 lbs per sq. ft.**



Your building's carbon emissions are **14.8%** more than the industry average, and can be reduced by **10.6 lbs per sq. ft.** by achieving an ENERGY STAR score of 75.

You could save up to **\$9,221** annually or **\$46,105** over 5 years by raising your ENERGY STAR score to the level of **75**.

While a more detailed energy audit is required to quantify actual savings, the savings potential can be estimated by comparing the performance of your building to the ENERGY STAR database.

# How Does Your Building Use Electricity Today?

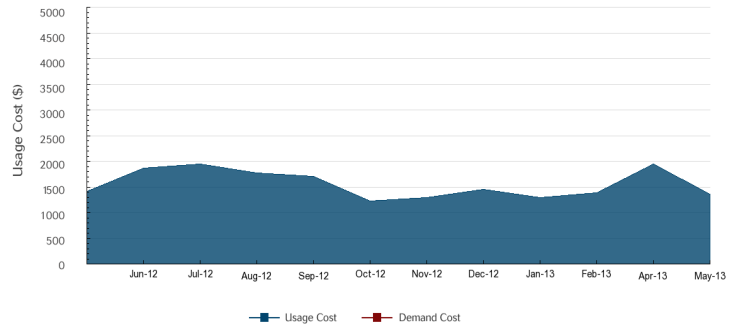
This page shows how electricity use in your building compares to outside weather and helps identify performance issues in the building. Typically your consumption should track the weather pattern for the type of heating or cooling equipment operating in your building. Overall flat consumption can be indicative of 1) simultaneous heating and cooling, 2) extended fan operation, 3) extensive reheat, and 4) an inefficient lighting system. Be aware, some variation can be caused by estimated meter readings which are “fixed” the next time the meter is actually read.

## Monthly Electricity Costs

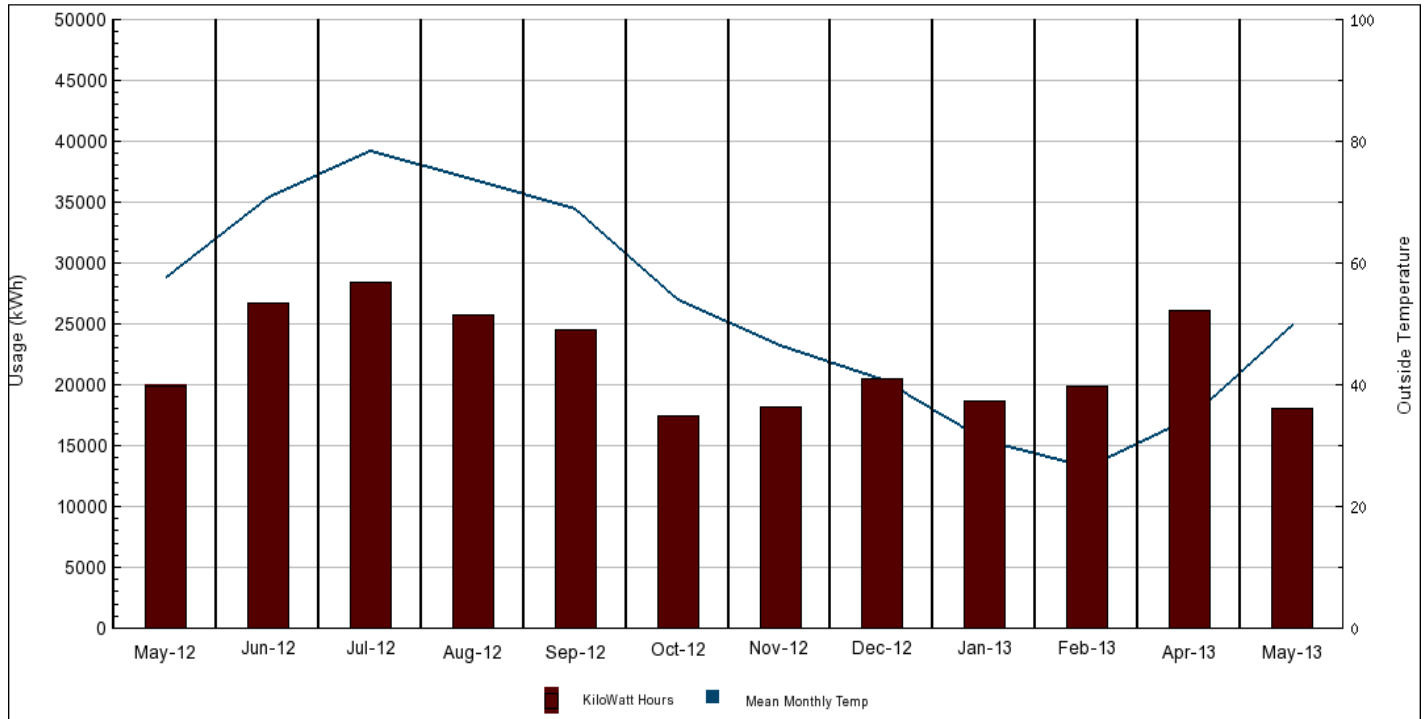
### Utility Bill Analysis

#### Electricity Consumption

- Electricity comprises 73% of your total utility cost, and 49% of your total utility consumption.
- Your Total Spend on Electricity is \$18,666.67, so when considering savings opportunities, remember you can only save some percentage of that total.
- We did not analyze the demand costs for this building.



## Electricity Consumption and Outside Air Temperature



# How Does Your Building Use Natural Gas Today?

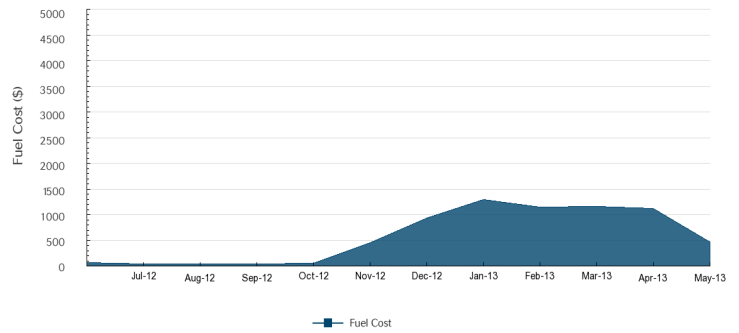
This page shows how Fuel is used in your building relative to outside weather and helps identify performance issues in the building. Typically your consumption should track the weather pattern for the type of heating equipment operating in your building. Overall excessive consumption can be indicative of 1) simultaneous heating and cooling, 2) extensive reheat, and 3) heating in warmer months. Be aware, some variation can be caused by estimated meter readings which are "fixed" the next time the meter is actually read

## Monthly Natural Gas Costs

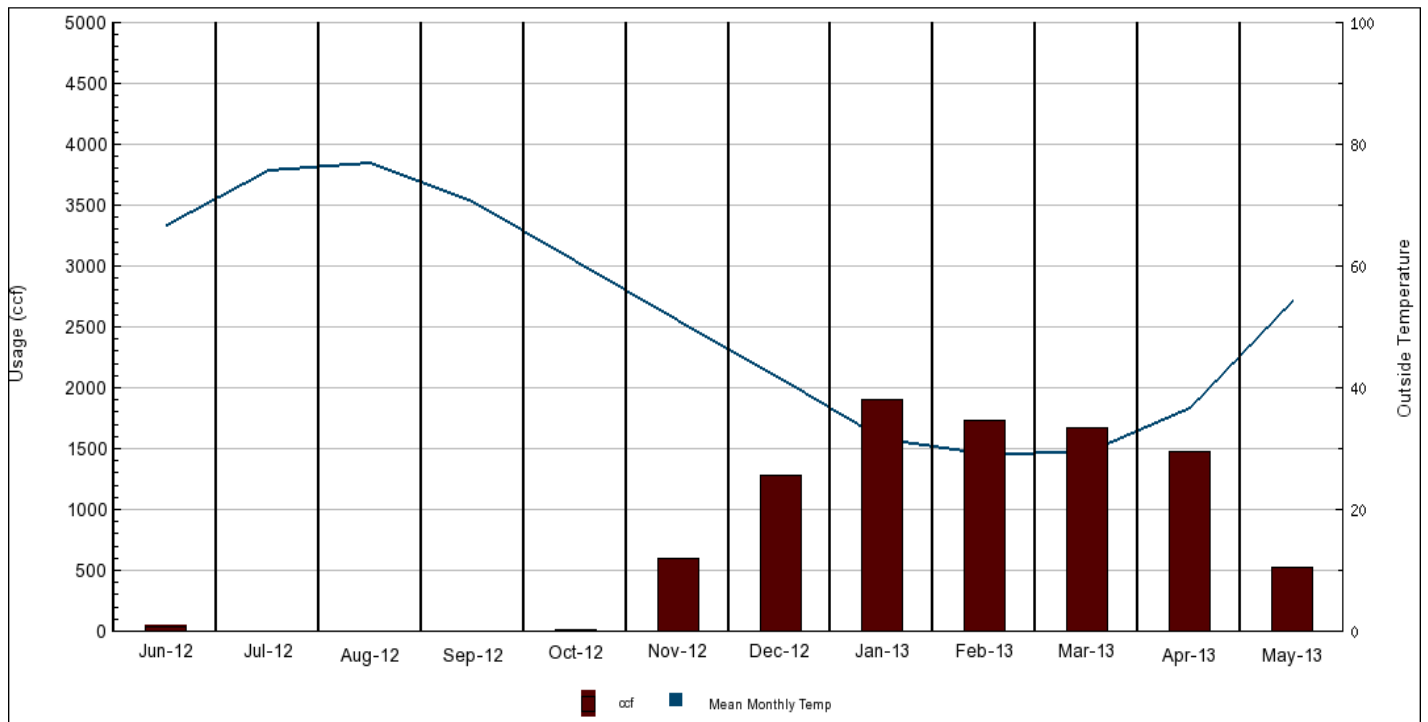
### Utility Bill Analysis

#### Natural Gas Consumption

- Fuel comprises 27% of your total utility cost, and 51% of your total utility consumption.
- Your Total Spend on Natural Gas is \$6,818.64, so when considering savings opportunities, remember you can only save some percentage of that total.



## Natural Gas Consumption and Outside Air Temperature



# Building Comfort and Ventilation Analysis

This page shows the min/max range of temperature, humidity, and carbon dioxide levels measured during occupied periods. Reducing the range is critical to achieving a building under control that is properly ventilated which allows tenants to be comfortable and productive. The action ratings are based on the worst case found when comparing measured data during occupied hours against established industry guidelines (ENERGY STAR, BOMA, ASHRAE, DOE).

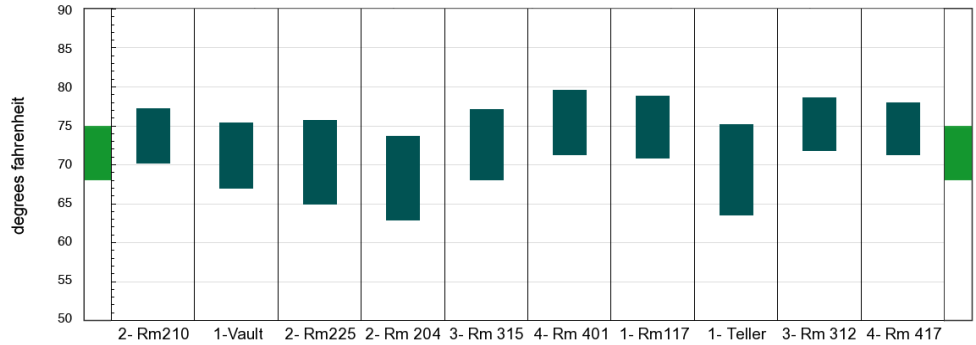
## Temperature Findings



Action Recommended

Your building has some control issues in specific sections.

- 6 space(s) were too warm at times
- 4 space(s) were too cool at times
- 7 space(s) had excessive temperature variation

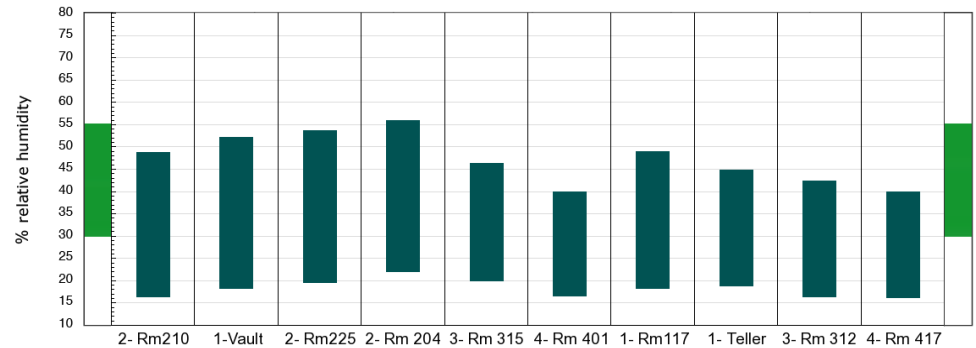


## Relative Humidity Findings



Action Necessary

- 0 space(s) had high relative humidity at times
- 10 space(s) had low relative humidity at times



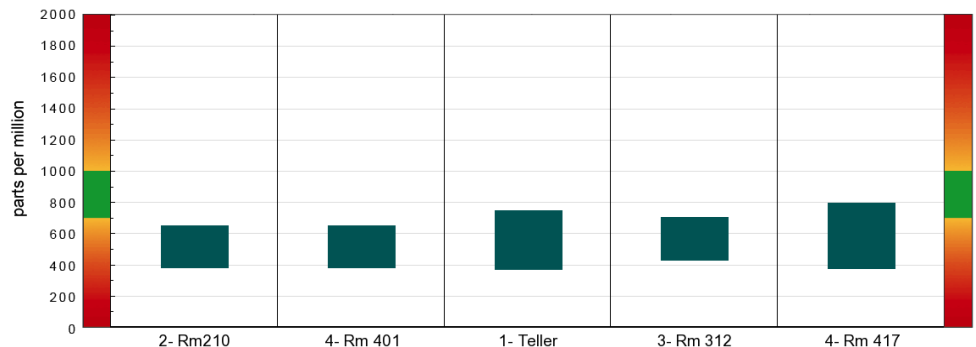
## Carbon Dioxide Findings



Action Necessary

Your building is over-ventilated and can save energy by reducing the overall amount of outside air ventilation

- 1 space(s) had elevated carbon dioxide levels
- 5 space(s) had low carbon dioxide levels



# Temperature

[Sensor Range: 32 to 100 °F; Resolution: 0.1 °F; Calibration Accuracy: ± 1 °F]



The ideal temperature is between 68 °F and 75 °F during the heating season and 72 °F and 78 °F during the cooling season, with variation of less than 3 °F. Lowering the heating setpoint and raising the cooling setpoint can save significant energy while maintaining a comfortable and productive working environment.

Sources: ASHRAE Standard 55 – 1992, BOMA, ENERGY STAR, DOE

Alert Lvl	
	Occupied/Unoccupied Heating Setpoint is 70 / 65
	Occupied/Unoccupied Cooling Setpoint is 74 / 80

## Monitor Statistics

Monitor	Alert Lvl	Min °F	Max °F	Avg °F	%ToR*	SV†
2- Room 210		70	77	74	24%	4
1-Vault		67	75	70	4%	6
2- Room 225		65	76	71	16%	9
2- Room 204		63	74	68	54%	5
3- Room 315		68	77	73	19%	5
4- Room 401		71	80	74	26%	6
1- Room117		71	79	75	53%	6
1- Teller		64	75	70	21%	5
3- Room 312		72	79	75	41%	2
4- Room 417		71	78	74	41%	3

These statistics are for occupied times only based on 10 minute averages.  
 \* % Time out of Range † Spread Value is based on rolling 4hour per ASHRAE

## Energy Savings Opportunities

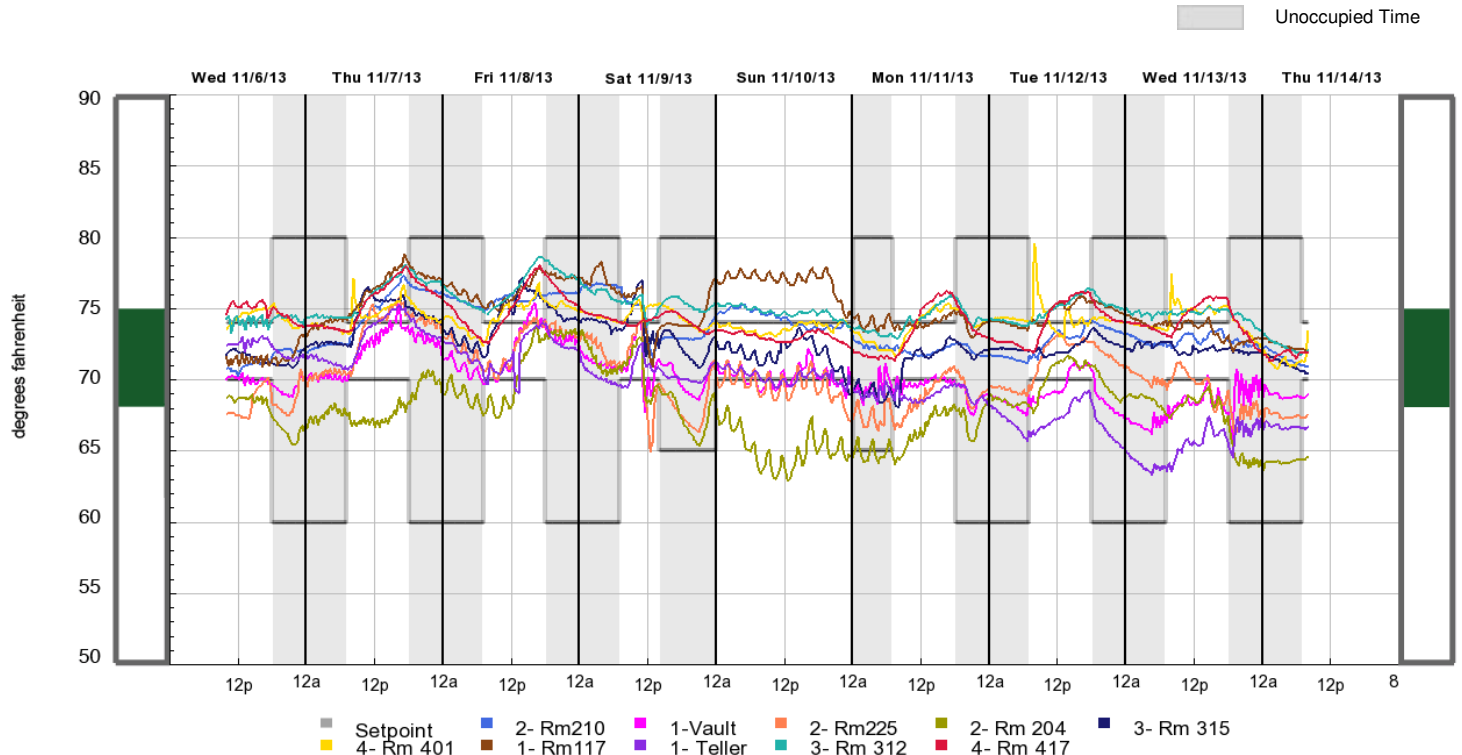
Our findings indicate there are several ways to save money by operating your building differently:

### Energy Recommendations Based on Measurements

- Calibrate thermostat(s) to reduce temperature variation
- Verify the controls system is shutting the heating & cooling equipment off
- Move thermostat(s) to reduce temperature variation
- Balance air flow within duct system to reduce temperature variation

### Further Comfort & Energy Recommendations

- Install zone level heating controls



# Relative Humidity

[Sensor Range: 10 to 95 %; Resolution: 1%; Calibration Accuracy: ± 5%]



Optimum comfort and health is achieved when relative humidity is maintained between 30% and 55%. Readings outside these boundaries may indicate ventilation issues which contribute to an increase of energy used to condition the space.

Sources: ASHRAE Standard 55 – 1992, American Lung Association, Indoor Air Quality Association, BOMA, ENERGY STAR, DOE

## Analysis and Recommendations

Our findings indicate areas in your building that may have issues worth investigating for possible energy savings, and especially if there are comfort complaints.

### Possible Causes

- No humidification system present
- Excessive ventilation during some periods

### Recommended Actions

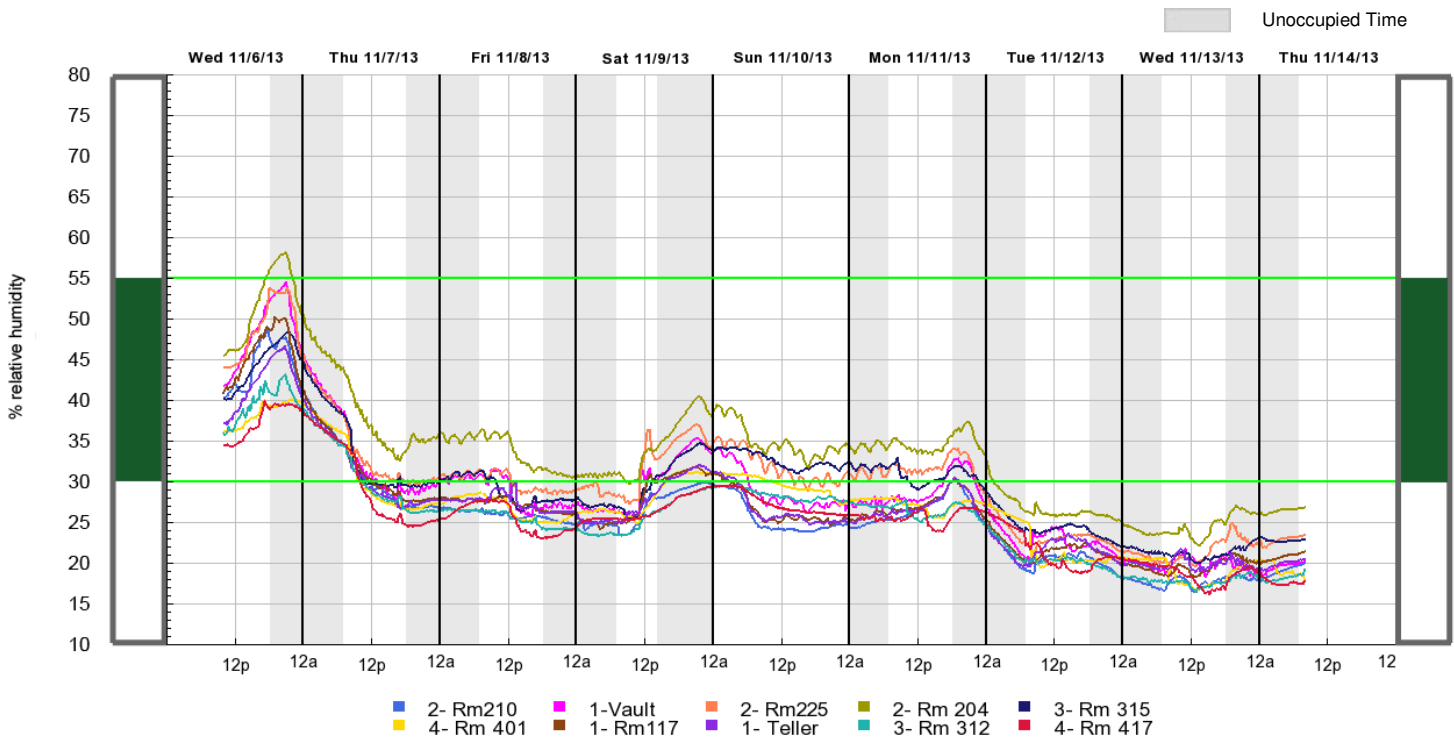
- Add humidification system
- Improve ventilation control

## Monitor Statistics

Monitor	Alert Lvl	Min	Max	Avg	% ToR*
2- Rm210		16	49	26	87%
1-Vault		18	52	29	70%
2- Rm225		20	54	30	40%
2- Rm 204		22	56	34	26%
3- Rm 315		20	46	30	52%
4- Rm 401		17	40	27	78%
1- Rm117		18	49	27	82%
1- Teller		19	45	27	83%
3- Rm 312		16	42	26	88%
4- Rm 417		16	40	26	88%

These statistics are for occupied times only.

\* % Time out of Range



# Carbon Dioxide

[Sensor Range: 0 to 2000 ppm; Resolution: 10 ppm; Calibration Accuracy: ± 100 ppm]



Monitoring carbon dioxide levels is an important aspect of ensuring a comfortable, healthy and energy efficient indoor environment. At levels above 1000 ppm, air becomes stale and less comfortable to breathe. Levels well below 1000 ppm may indicate excessive outside air, resulting in higher than necessary energy costs due to the need for conditioning of this additional outside air.

Sources: ASHRAE Standard 62-2001, U.S. Green Building Council, Indoor Air Quality Association, Health Canada, BOMA, ENERGY STAR, DOE

## Energy Savings Opportunities

Our findings indicate there are several ways to save money by operating your building differently:

### Energy Recommendations Based on Measurements

- Verify dampers are not stuck open or leaky
- Reduce the amount of outside air ventilation
- Install demand control ventilation

### Comfort & Health Recommendations

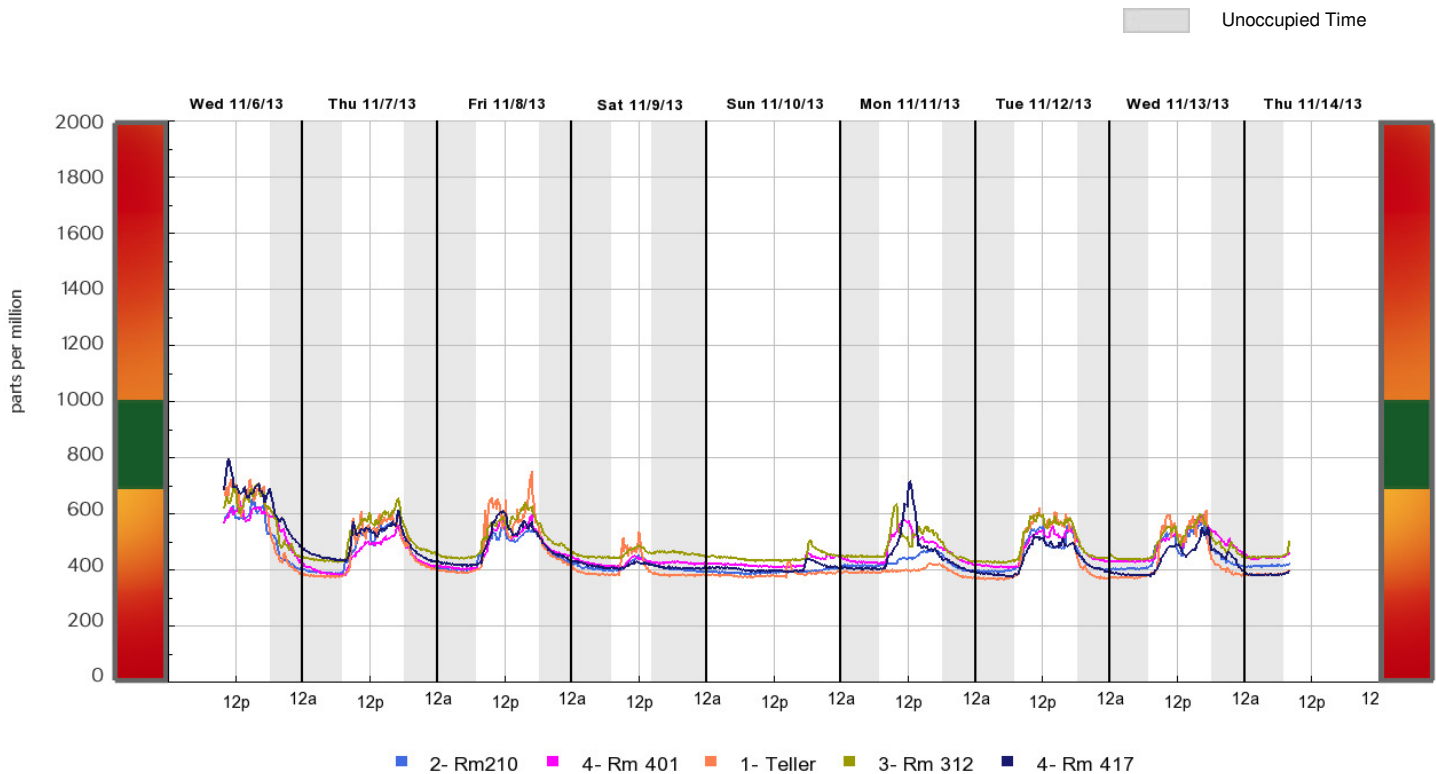
- Increase the amount of ventilation into the building.

## Monitor Statistics

Monitor	Alert Lvl	Min	Max	Avg	% ToR*
2- Rm210		383	651	471	99%
4- Rm 401		381	653	488	100%
1- Teller		371	750	487	98%
3- Rm 312		428	703	523	99%
4- Rm 417		377	797	486	98%

These statistics are for occupied times only.

\* % Time out of Range



# Lighting



Lighting controls and scheduling are some of the easiest low and no cost investments in energy efficiency. Controlling the artificial lights with occupancy or daylight controls and replacing inefficient bulbs can significantly reduce your electrical energy spend. In the graph below, artificial lights are represented by the sharp on/off of the curve, natural daylight by a gradual increase, and direct sunlight by the large spikes.

Sources: BOMA, ENERGY STAR, DOE

## Energy Savings Opportunities

Our findings indicate there are several ways to save money by operating your building differently:

### Energy Recommendations Based on Measurements

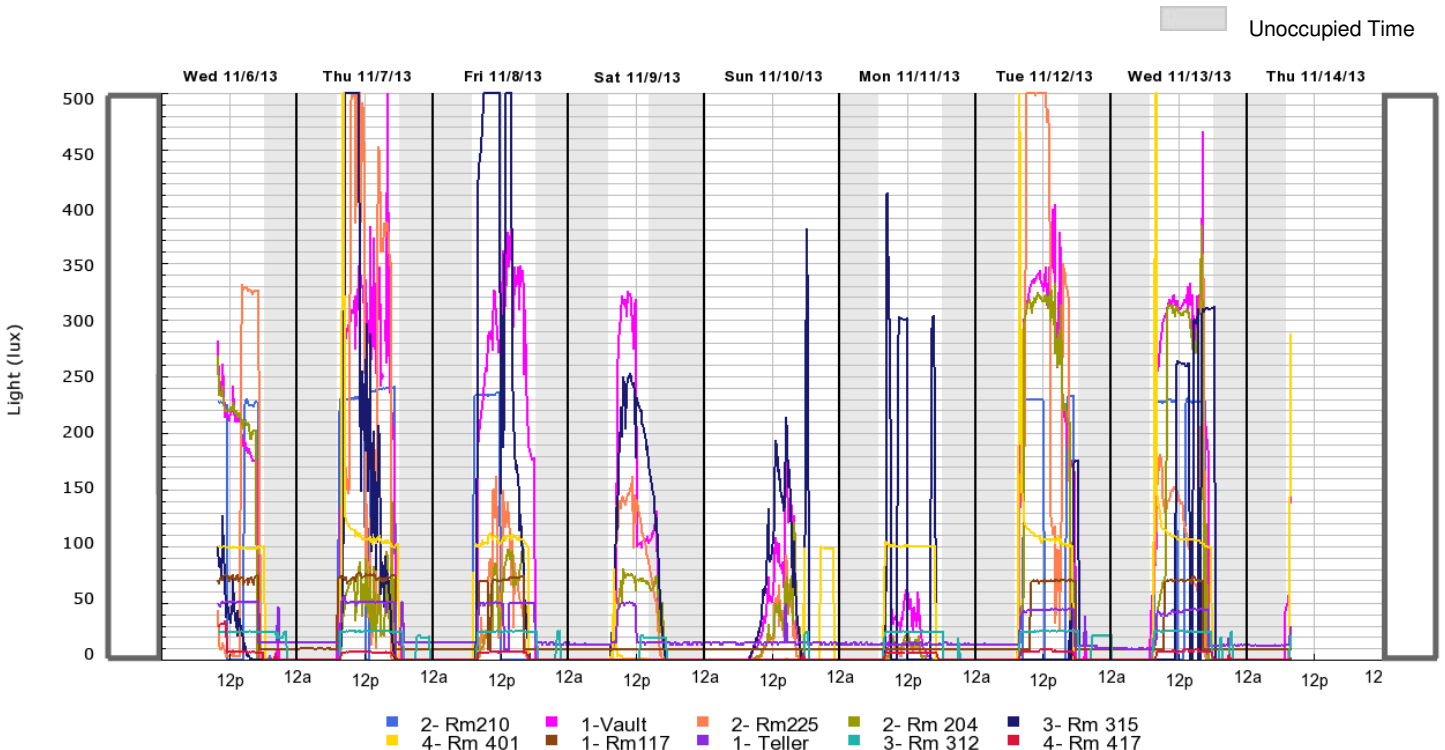
- Verify the light schedule & reduce unoccupied hours operation

### Further Energy Recommendations

- Replace inefficient lamps with new high efficiency lamps
- Install occupancy sensors for individual zones
- Install daylight controls on the perimeter
- Reduce after hours use through coordination with the cleaning crews

Stated Schedule: 12.3 average occupied hours

Monitor	Alert Lvl	Measured On-Time
2- Rm210		3.82 hrs
1-Vault		6.04 hrs
2- Rm225		3.13 hrs
2- Rm 204		2.38 hrs
3- Rm 315		4.24 hrs
4- Rm 401		4.79 hrs
1- Rm117		14.93 hrs
1- Teller		12.81 hrs
3- Rm 312		9.57 hrs
4- Rm 417		6.93 hrs





# Outdoor Conditions

Outdoor conditions recorded during the test period are included as part of this report.

The outdoor data included in this report was recorded at: Findlay, OH 45840

## Outdoor Temperature

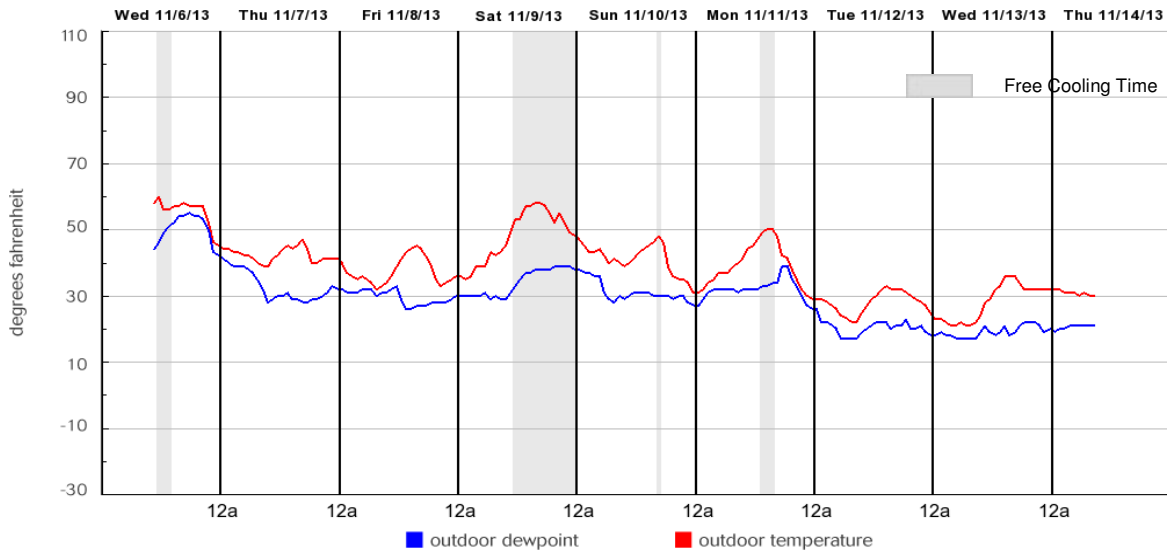
Test Period Avg: 11/6/13 – 11/14/13	Heating Degree Days	Cooling Degree Days
39 °F	26	0

## Outdoor Temperature and Dewpoint

A major factor in the total cost of heating and cooling a building is the heat lost (during heating season) or gained (during cooling season) due to the difference between indoor and outdoor temperatures. The amount of energy consumed to compensate for the difference between outdoor temperature and the desired indoor temperature is driven by three primary factors:

- Heat lost or gained due to conduction through walls, ceilings, and windows.
- Energy required to heat, cool, and dehumidify outside air entering the building, either through infiltration or mechanical ventilation.
- Heat gain due to solar load.

This chart shows the outdoor temperature and dewpoint during the test period at the test location.



More aggressive temperature setbacks during unoccupied periods may provide energy savings with no impact on occupant comfort. Proper ventilation control and use of an economizer for free cooling may also contribute significantly to energy savings.