

Energy & Store  
Development Conference

E+Sd

2015



# **Retro-Commissioning: Unlocking Lost Profit**

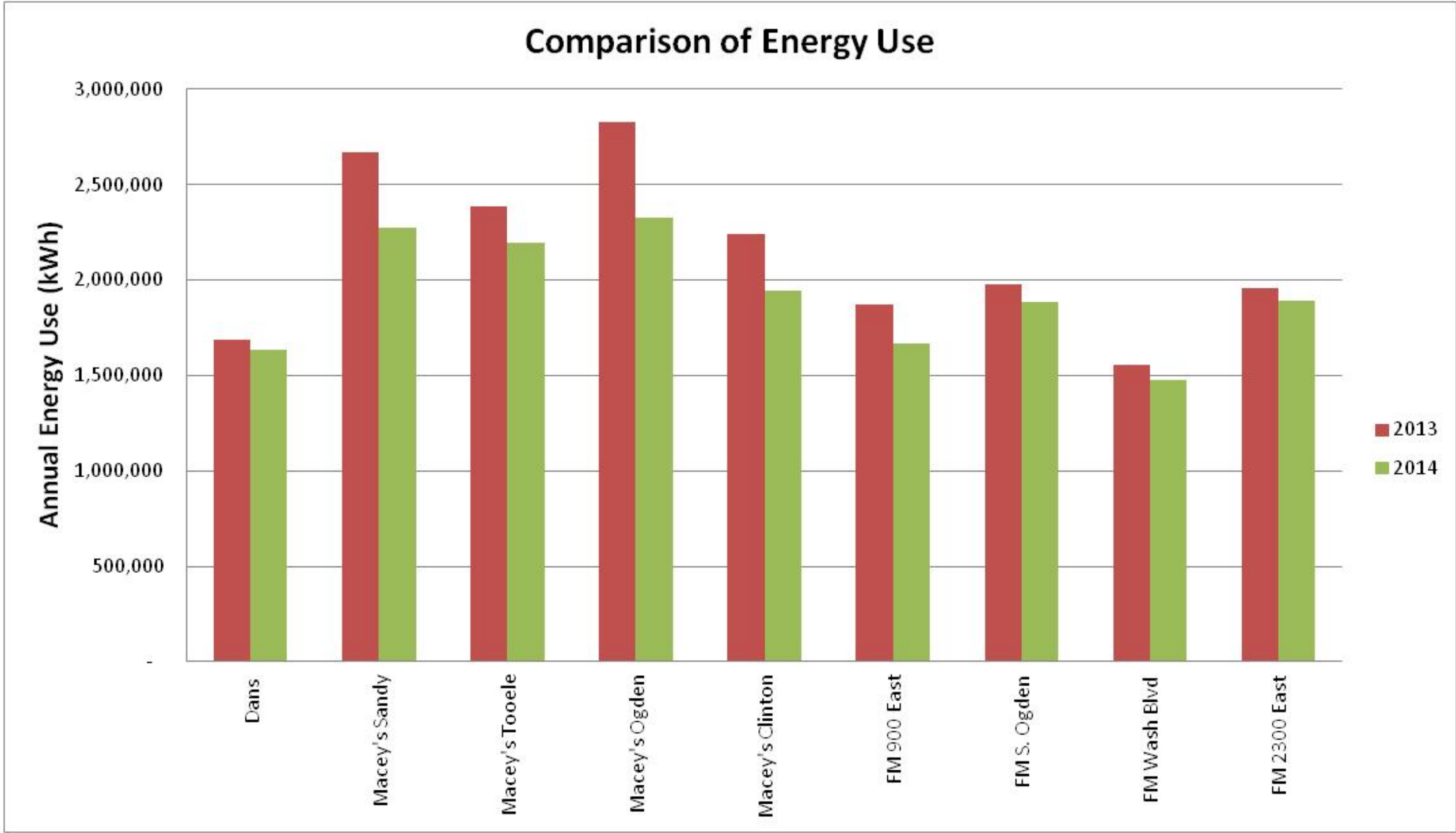
Sanjiv “Sunny” Devnani – kW Engineering  
Bill Walley – Associated Food Stores, Inc.

# Associated Food Stores Summary

- Reduced Operating Cost by \$118,960
- At 2% margins
- \$5,948,000 in offset sales on the register

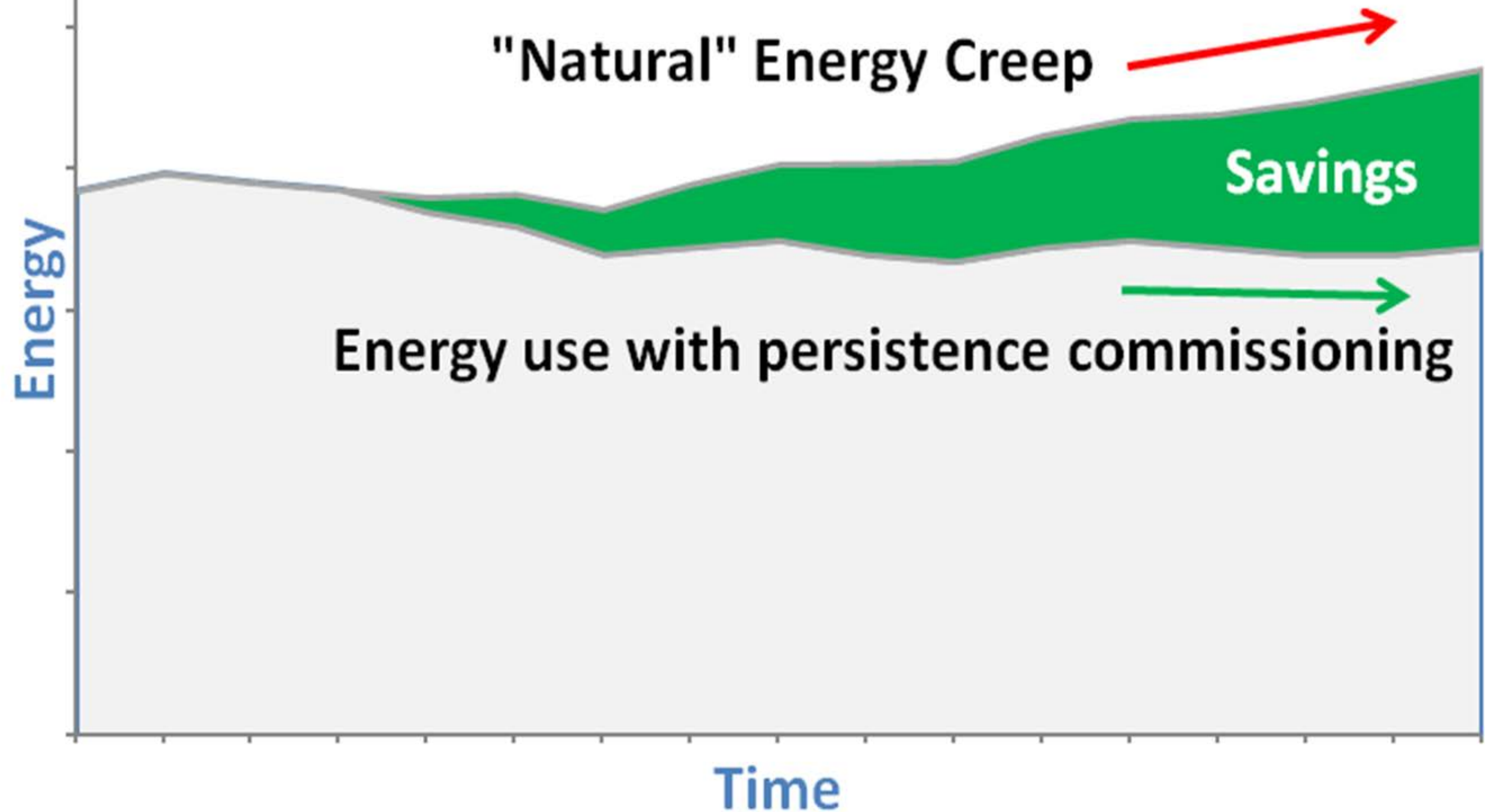


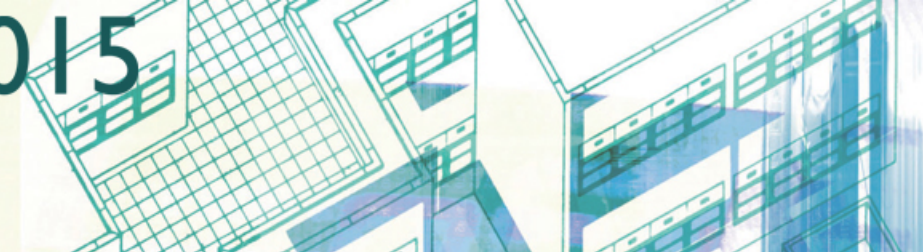
Comparison of Energy Use





# The Need for RCx





# Stories we've told ourselves

- Buildings meet codes (equipment, operations and sequences)
- We know how long equipment lasts and we replace it when it's at the end of its life
- No degradation of control sequences (ever)
- Building operators know when things fail and they fix them.

In theory there is no difference  
between theory and practice.  
In practice there is.

Yogi Berra



# Macey's Sandy

- Neighborhood store
  - 60,000 ft<sup>2</sup> traditional “Big Box” grocery store
  - 24 hours/ 6 Days
  - Sunday closed to sales, but occupied with stocking/cleaning
- Store was upgraded in 2008  
(Store lighting, E2 Controls, VFDs etc)
- Recommissioned in November 2013

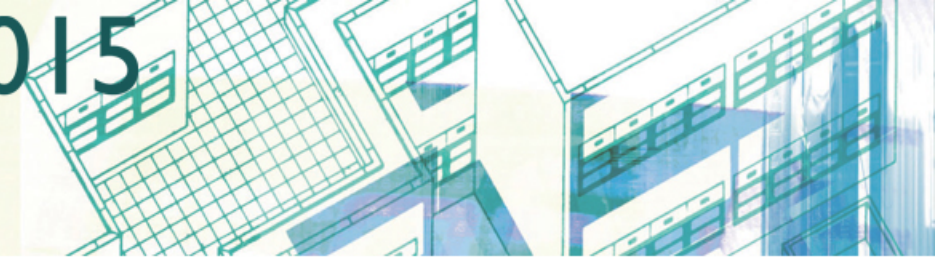




# Macey's Sandy

	Annual Energy Use (kWh/yr)	Annual Electric Cost (\$/yr)	Average Cost/ kWh (\$/kWh)
2007	3,743,040	\$212,845	\$0.057
2012	2,648,560	\$194,980	\$0.074
2013	2,670,560	\$208,690	\$0.078
2014	...		



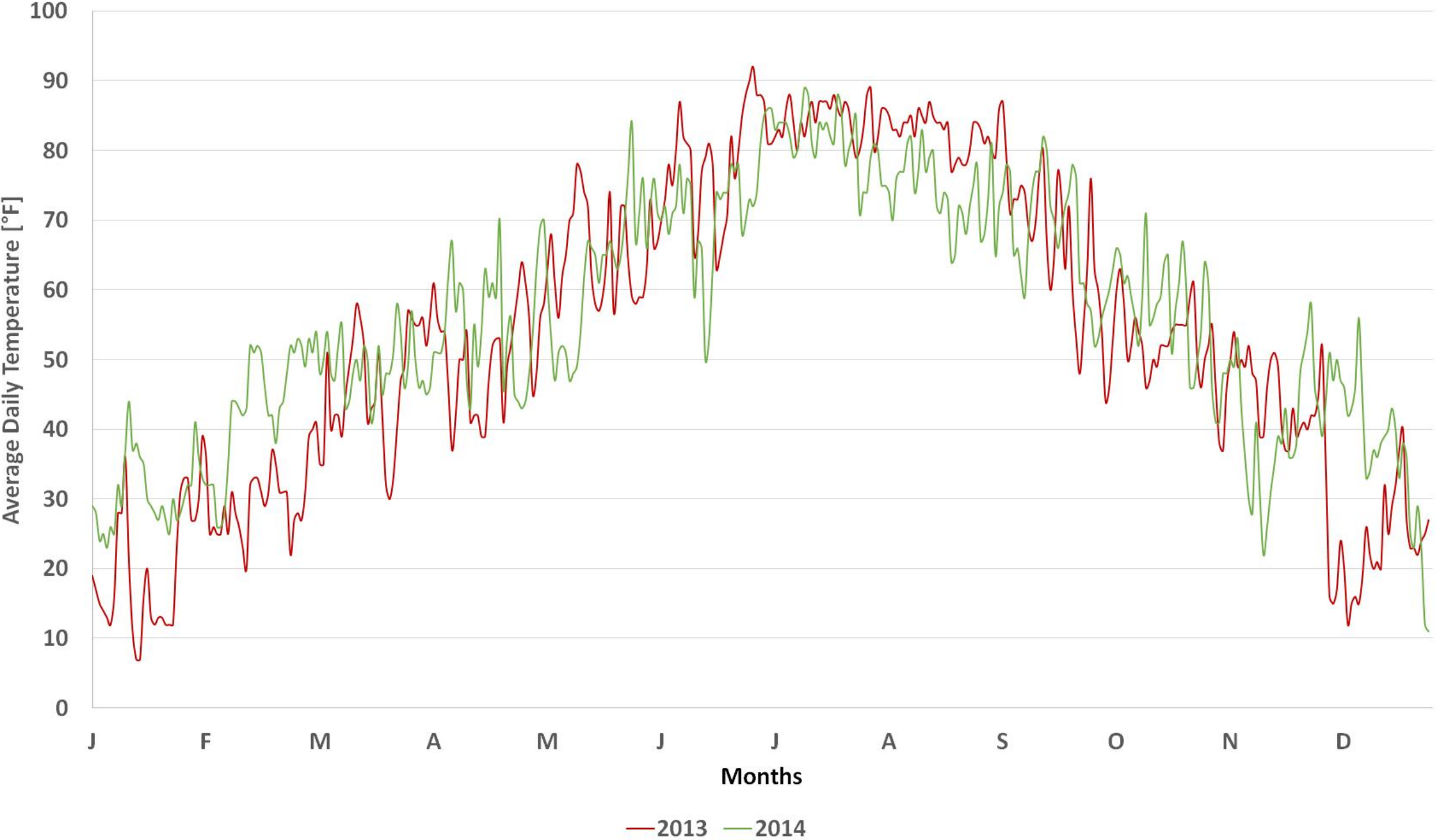


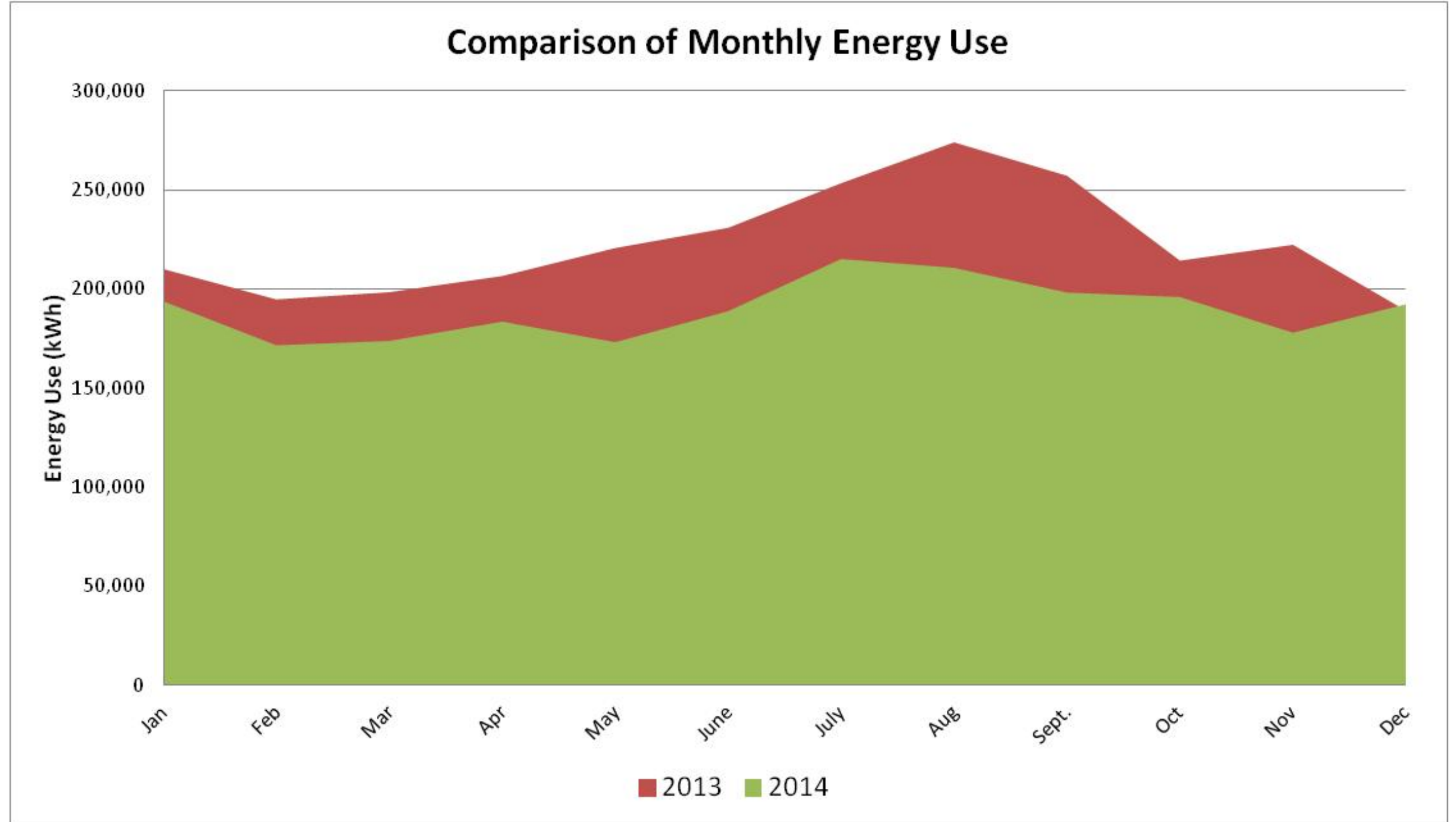
# What did we do?

- Overhead Lighting to 50% between 12-6 am
- Case Lighting Scheduling- Off 2 additional hours
- Suction Pressure Setpoints
- Head Pressure Setpoints
- HVAC Setpoints



# Salt Lake City Mean Ambient Temperature





# Energy Reduction

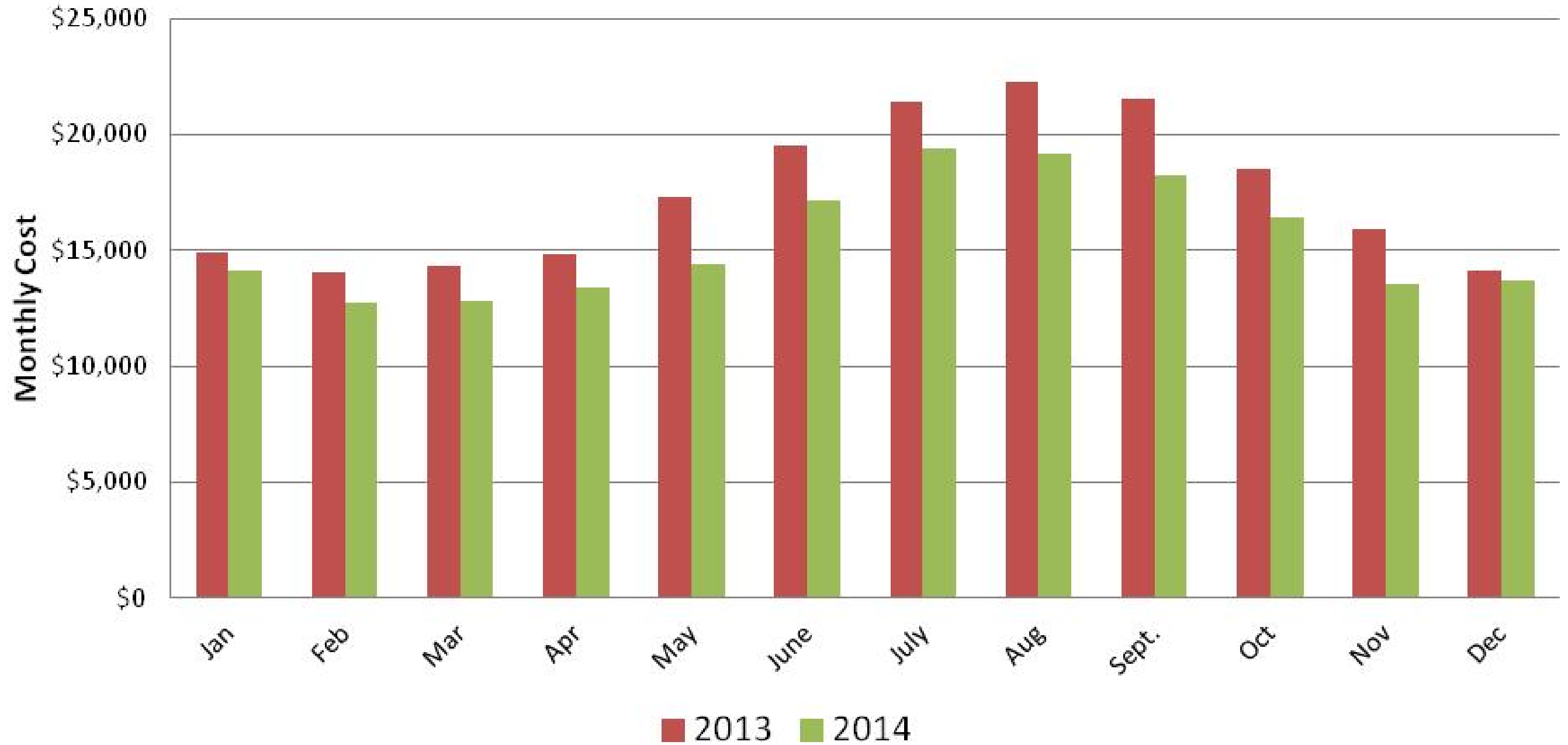
## Comparison of Monthly Peak Demand



# Demand Reduction



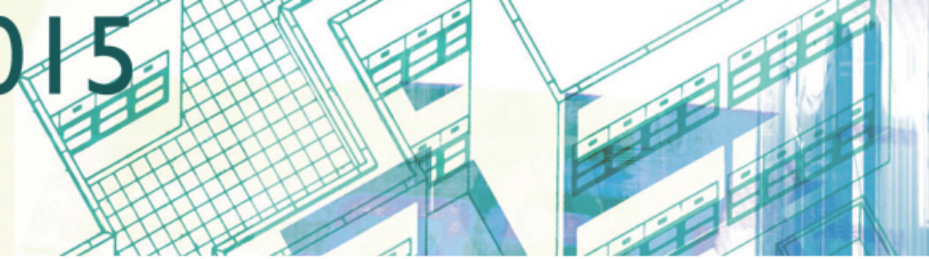
## Comparison of Monthly Costs



# Monthly Cost Savings

# Macey's Sandy

	Annual Energy Use (kWh/yr)	Annual Electric Cost (\$/yr)	Average Cost/ kWh (\$/kWh)	% Rate Hike	% Reduction in Operating Cost net Hike
2007	3,743,040	\$212,845	\$0.057		
2012	2,648,560	\$194,980	\$0.074		
2013	2,670,560	\$208,690	\$0.078		
2014	2,276,560	\$184,952	\$0.081	4%	-11%

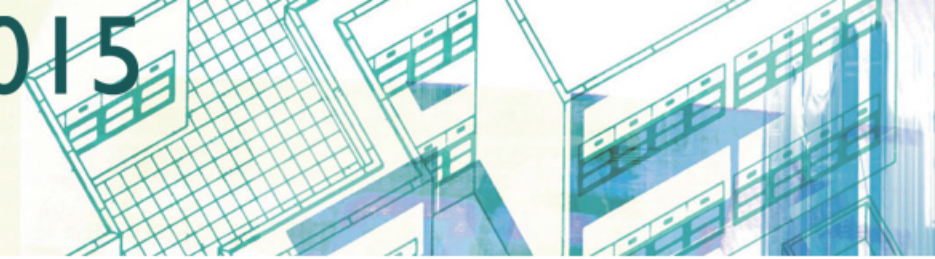


# What is Retro-Commissioning?

Retro-commissioning is defined as “a systematic process for identifying less-than-optimal building performance.”



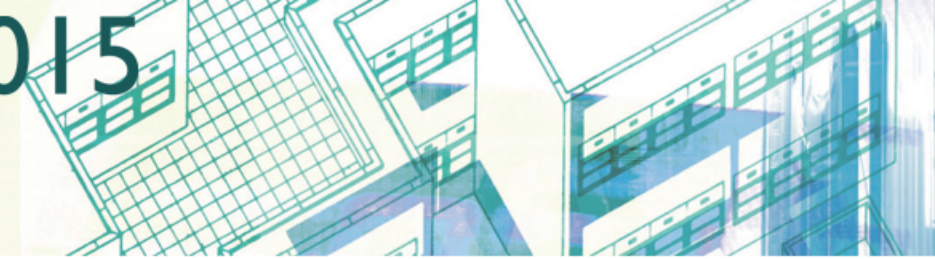




# Selecting Stores

- 3 to 5 years since last upgrade
- Benchmarking
- Digital Controls (E2/Danfoss etc)
- No major mechanical upgrades for next 2 to 3 years
- Some funding, generally less than \$5,000



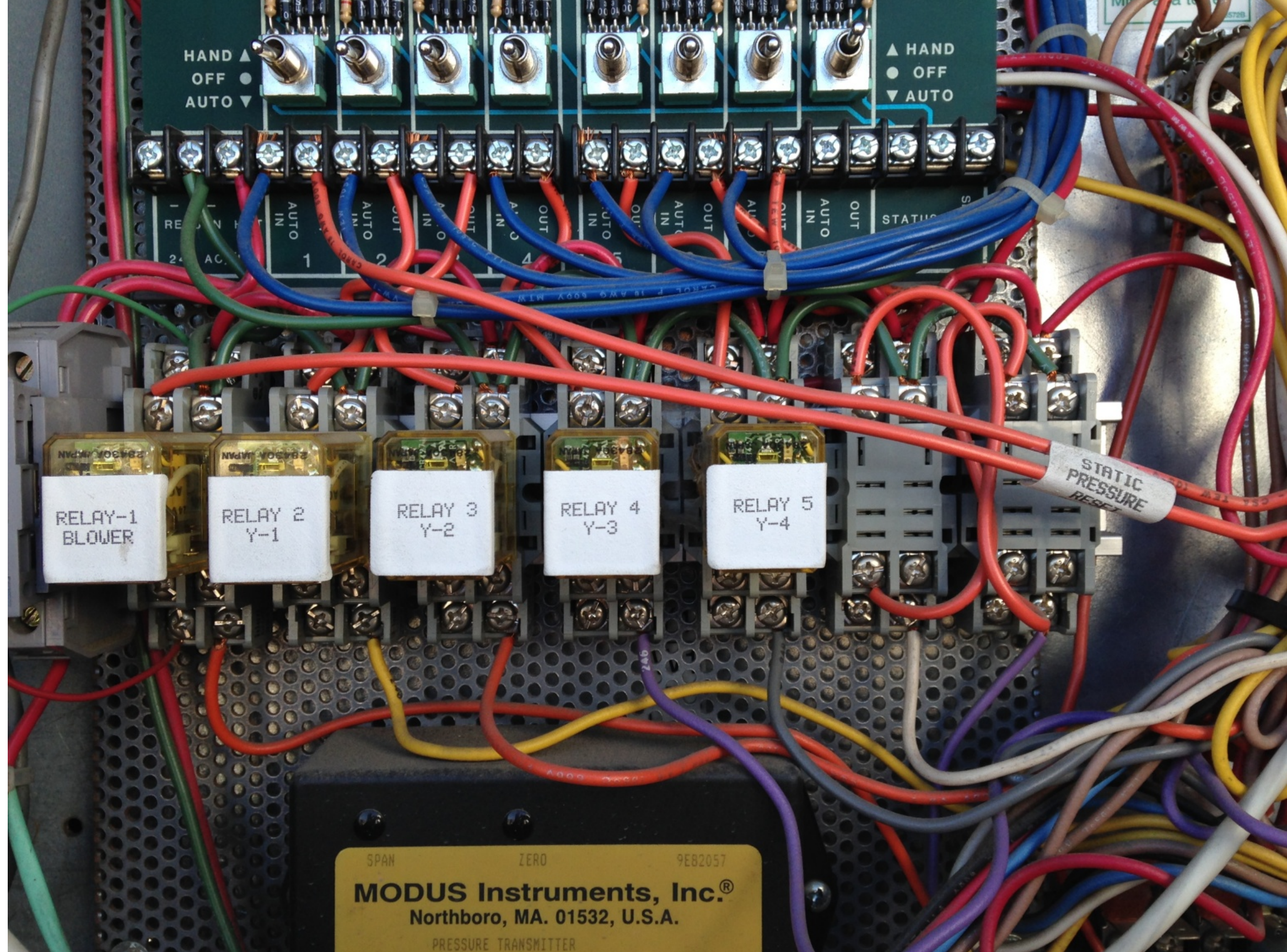


# Typical Opportunities

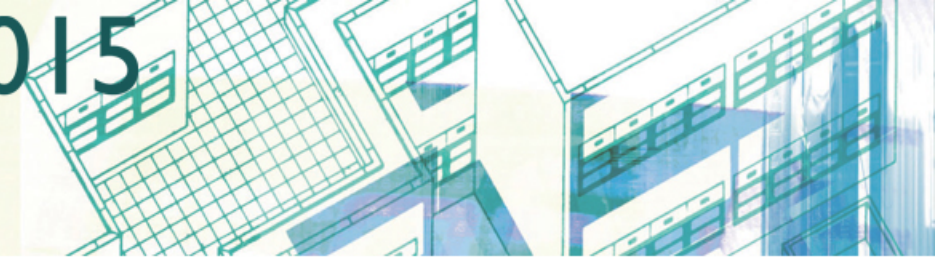
- Scheduling... Scheduling...Scheduling
- Calibration or sensor offsets
- Adjust Setpoints
- Sequence optimization
- Mechanical tuning of valves/actuators etc



# Example Site

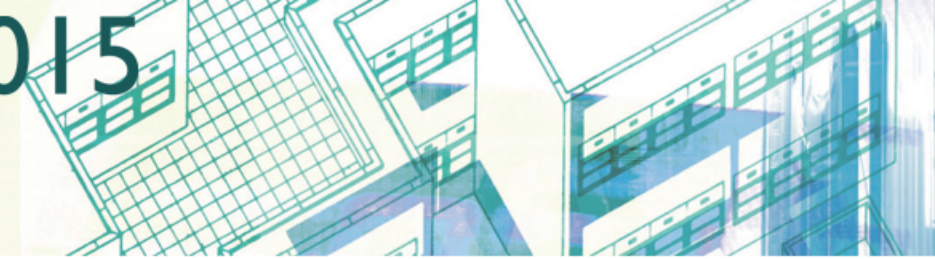






# Typical Measures

- HVAC schedule and set point adjustment
- Overhead lighting schedule adjustments
- Daylighting controls optimization
- Case lighting schedule adjustments
- Anti-sweat heater (ASH) control optimization
- Defrost control optimization
- Sensor calibration (OAT and RH are worst culprits)
- Suction and head pressure adjustment
- Expansion valve tuning



# Monitoring-based Commissioning (MBCx)

- Access to real-time interval data from Utilities makes this easy
- Powerful analytical and fault detection techniques are now available
- Remote access allows energy managers to be more cost effective
- Faults are detected sooner and much prior to catastrophic failure
- Utilities and the energy efficiency industry is moving in this direction
- Pay for performance model



# Contractors and Service Contracts

- Contractors will circumvent to minimize
  - Service calls
  - Material costs embedded in their contracts
- Service Contracts should be written with efficiency in mind
  - Bonus/Penalty for performance







ComEd Energy Efficiency Program

## Retro-Commissioning Can Raise the Performance of Your Building

EXPAND ALL | COLLAPSE ALL

### Program Summary

#### Optimize your Building's Performance with Retro-Commissioning

Retro-Commissioning (RCx) provides an expert engineering study that helps buildings identify low-cost energy-saving operational improvements that can also enhance occupant comfort and productivity.

The ComEd Smart Ideas® Energy Efficiency Program offers four options for retro-commissioning your facility, tailored to its size and unique characteristics. In addition to the RCx study, you will receive a summary of opportunities for energy-saving equipment retrofits, along with details of available incentives.

RCx is also effective in identifying opportunities to lower your natural gas usage. ComEd works with your gas utility to seek gas as well as electric savings where feasible.

#### Want more information?

- Call 855-433-2700 during normal business hours to speak with a Smart Ideas representative.  
Or send an email to: [SmartIdeasBiz@ComEd.com](mailto:SmartIdeasBiz@ComEd.com)

*Funds are limited and will be provided on a first-come, first-served basis.*

### Applications

[Retro-Commissioning Application \(pdf\)](#)

[RCxpress Application \(pdf\)](#)

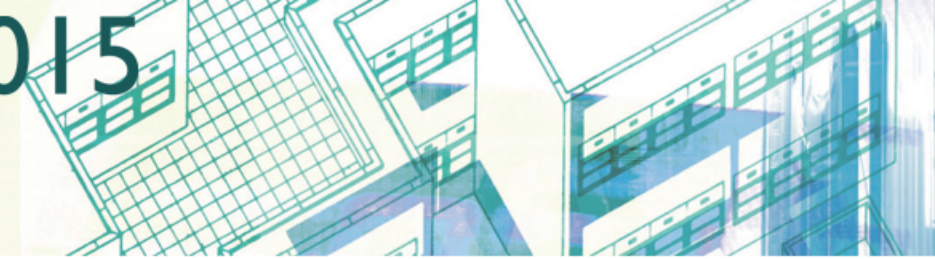
[Monitoring-based Commissioning Application \(pdf\)](#)

[RCx Service Providers \(pdf\)](#)

[MBCx Service Providers \(pdf\)](#)

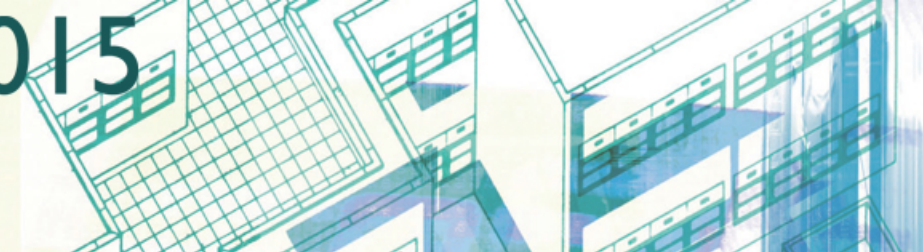
[Retro-Commissioning Options \(pdf\)](#)





# Utility Incentives

- Almost all utilities offer incentives for reduced energy consumption
  - As a customer you pay into the program. It is your money
  - Incentives are substantial and can impact project economics significantly
  - Technical guidance and support is often provided by 3<sup>rd</sup> party consultants



# Utility Incentives

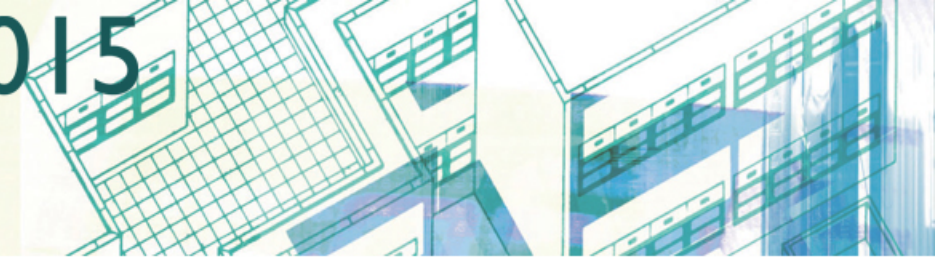
- Most have programs to pay for RCx or Tune-up
- Some have co-funding opportunities to hire dedicated energy managers
  - Call your Customer Account Manager
  - Ask if there is co-funding
  - Ask if you or a cohort of you can collectively get incentivized for such a person



# Macey's Sandy RCx Project Summary

Annual Energy Savings (kWh/yr)	Annual Cost Savings (\$/yr)	Implementation Cost (\$)	Utility Incentive (\$)	Payback After Incentive (Months)	GHG Emissions Reduction (CO <sub>2</sub> tons)
394,000	\$23,738	\$2,715	\$2,203	<1 month	299 tons

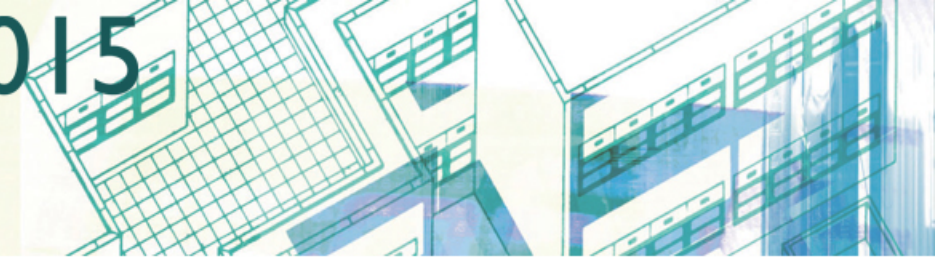




# Barriers to RCx



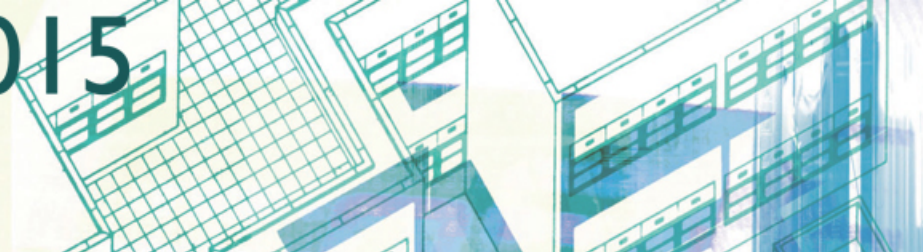
- Personnel / Resources
- Technical understanding
- Agreements and Corporate Policy
- Lack of integrated controls infrastructure
- Contractors and Service Contracts



# Take Home Points

- Reduced operating costs = Increased profits
- RCx is your lowest cost resource
- RCx is quick and immediate
- Utilities have programs to offset expenses
- RCx should be your first step towards improving operations





# Questions / Comments

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