

# I've Benchmarked, Now What? A Building Energy Performance Workshop

---

## Contractor Insights

Next Step After Benchmarking – Looking at the Data and  
Identifying Needs

Keith Derrington – Recurrent Innovative Solutions

Leveraging Building Tune-Up and Monitor-Based  
Commissioning to plan for your improvements

- Mike Cain – ERA Building Solutions

How to make an idea into an energy project and  
maximize resources and returns

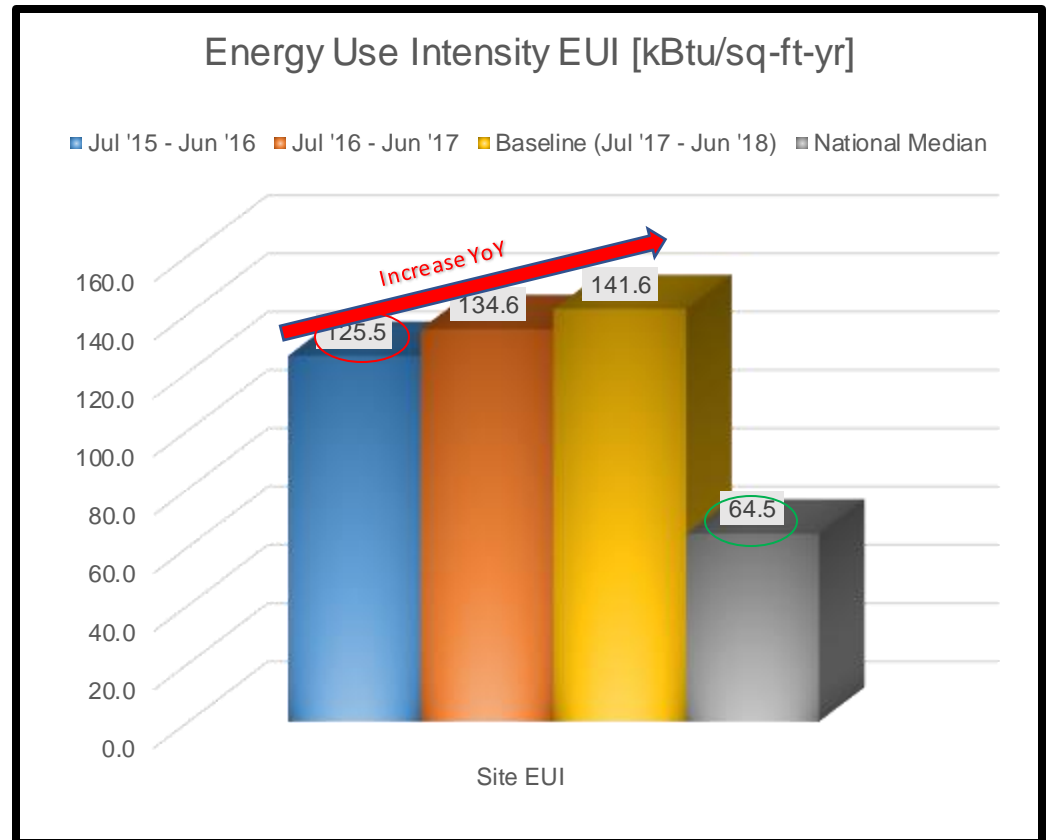
- Ric Sandoval – Green Generation



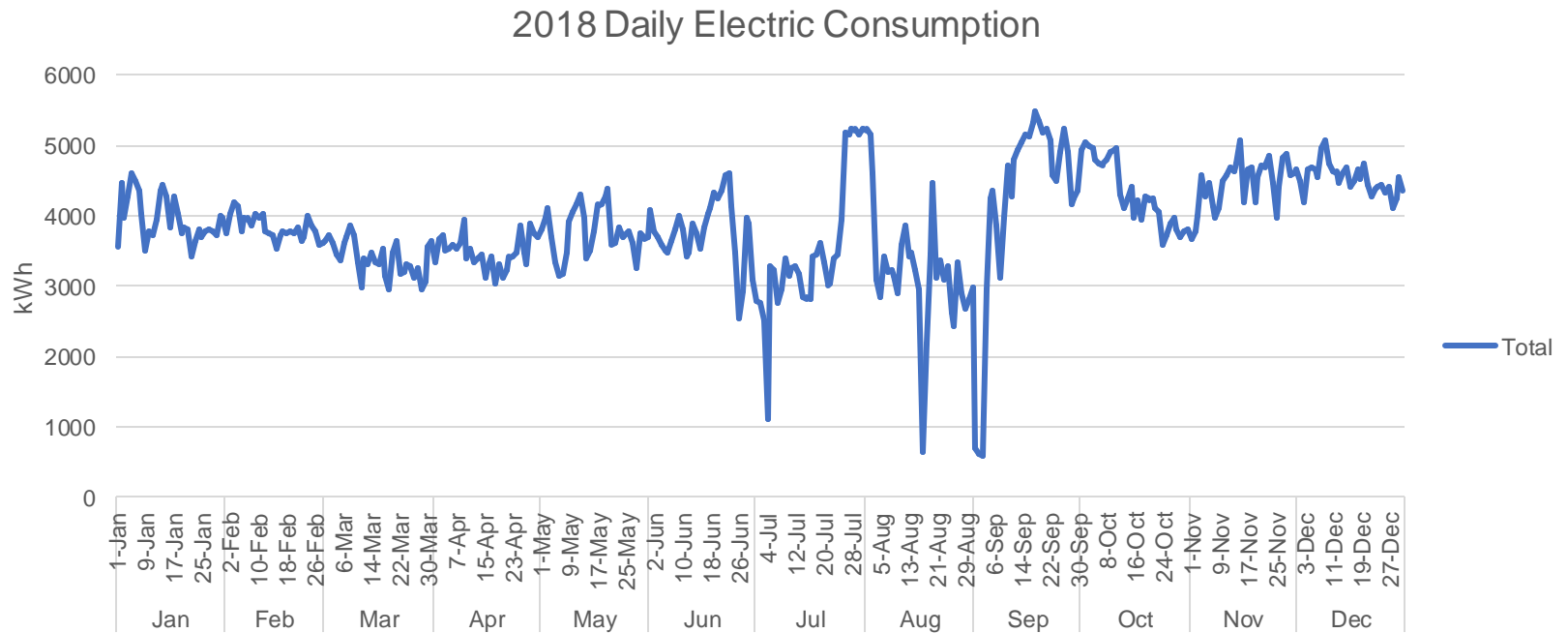
# Next Steps After Benchmarking – Looking at the Data and Identifying Needs

**Annual Building  
Energy Use**

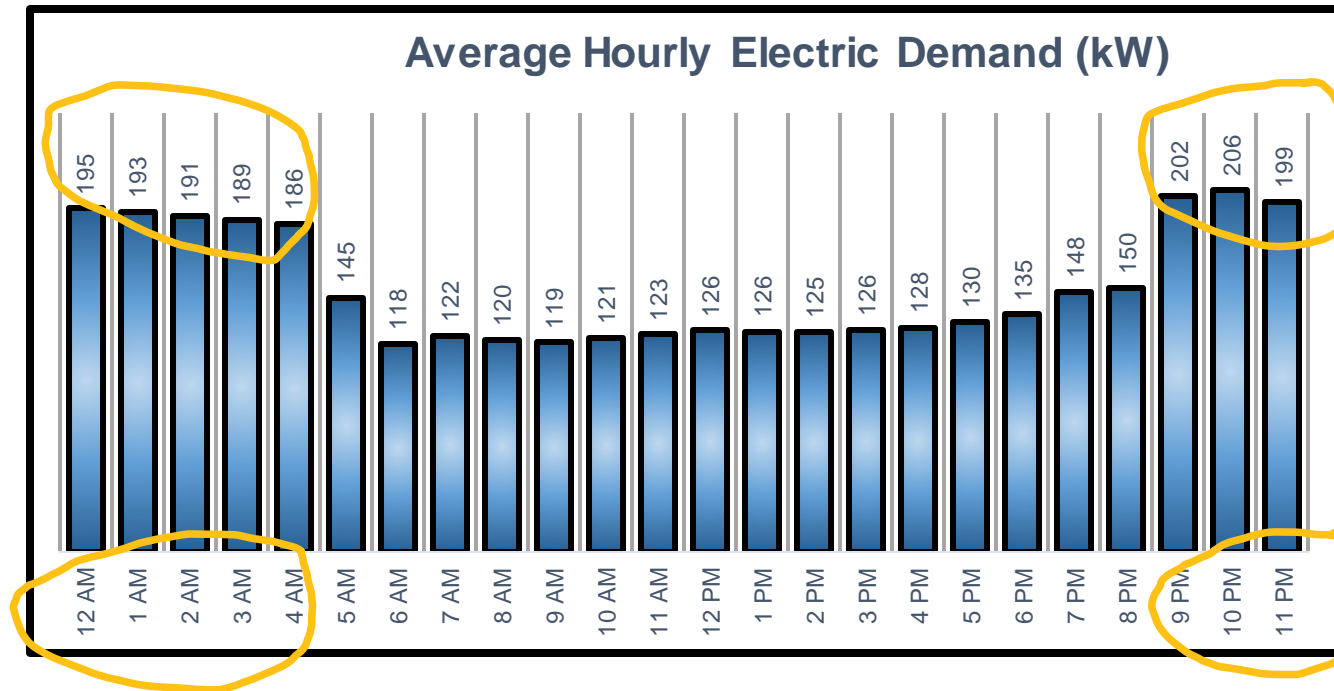
**Last 3 Years  
VS  
Median of the  
CBECS Peer Group**



# Electric Interval Data



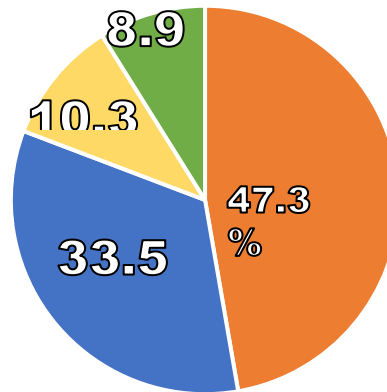
# Analyze Interval Data





# Existing Building Electrical Energy End Uses

## Electrical Energy End Uses

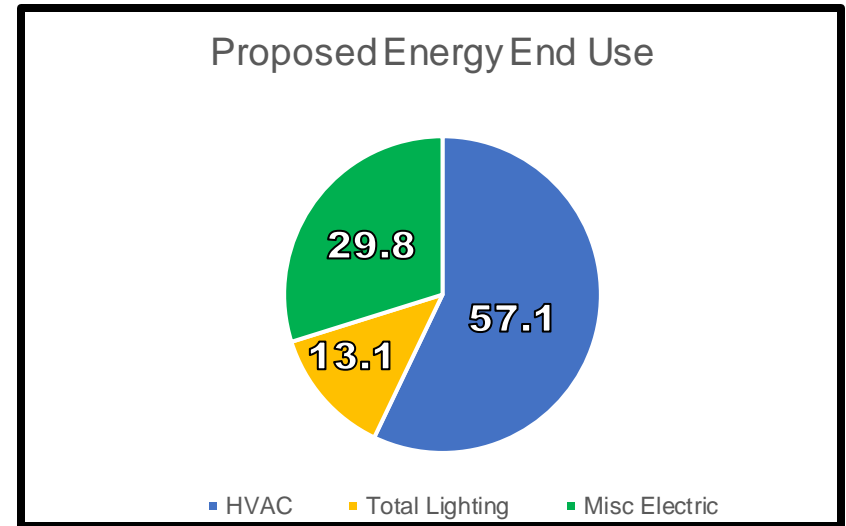
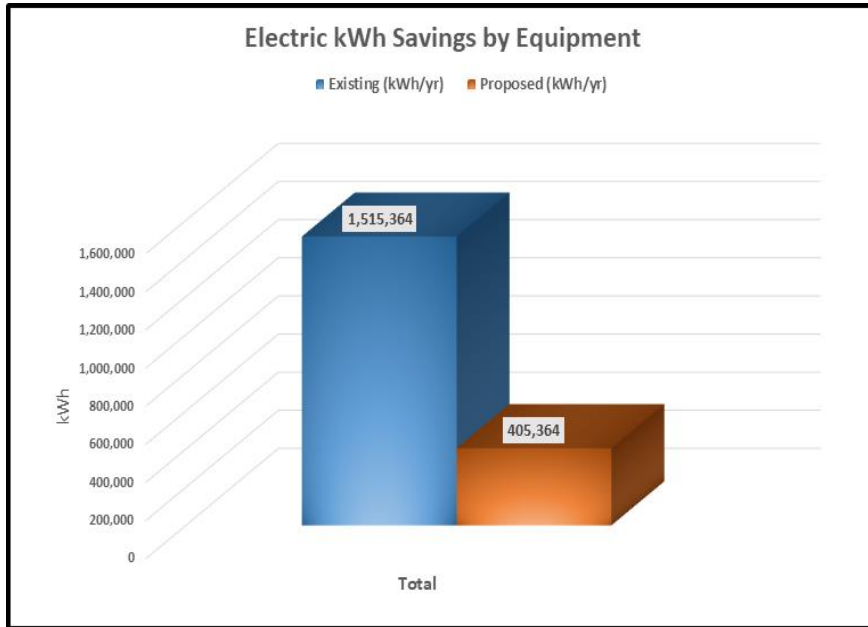


HVAC energy use share is > 80.  
Double the amount it should be!

■ Heating ■ Cooling ■ Lighting ■ Misc Electrical

Recurrent submetering results

# Energy Savings from Proposed Lighting, Controls, and HVAC Upgrades



Deep Energy Retrofit financed 100% Yielding \$40,000 in annual net positive cash flow after amortization costs.



# I've Benchmarked, Now What? A Building Energy Performance Workshop

## Contractor Insights

Next Step After Benchmarking – Looking at the Data  
and Identifying Needs

Keith Derrington – Recurrent Innovative Solutions

Leveraging Building Tune-Up and Monitor-Based  
Commissioning to plan for your improvements

- Mike Cain – ERA Building Solutions
- How to make an idea into an energy project and maximize resources and returns
  - Ric Sandoval – Green Generation

1260  
Multifamily



2017 Class A





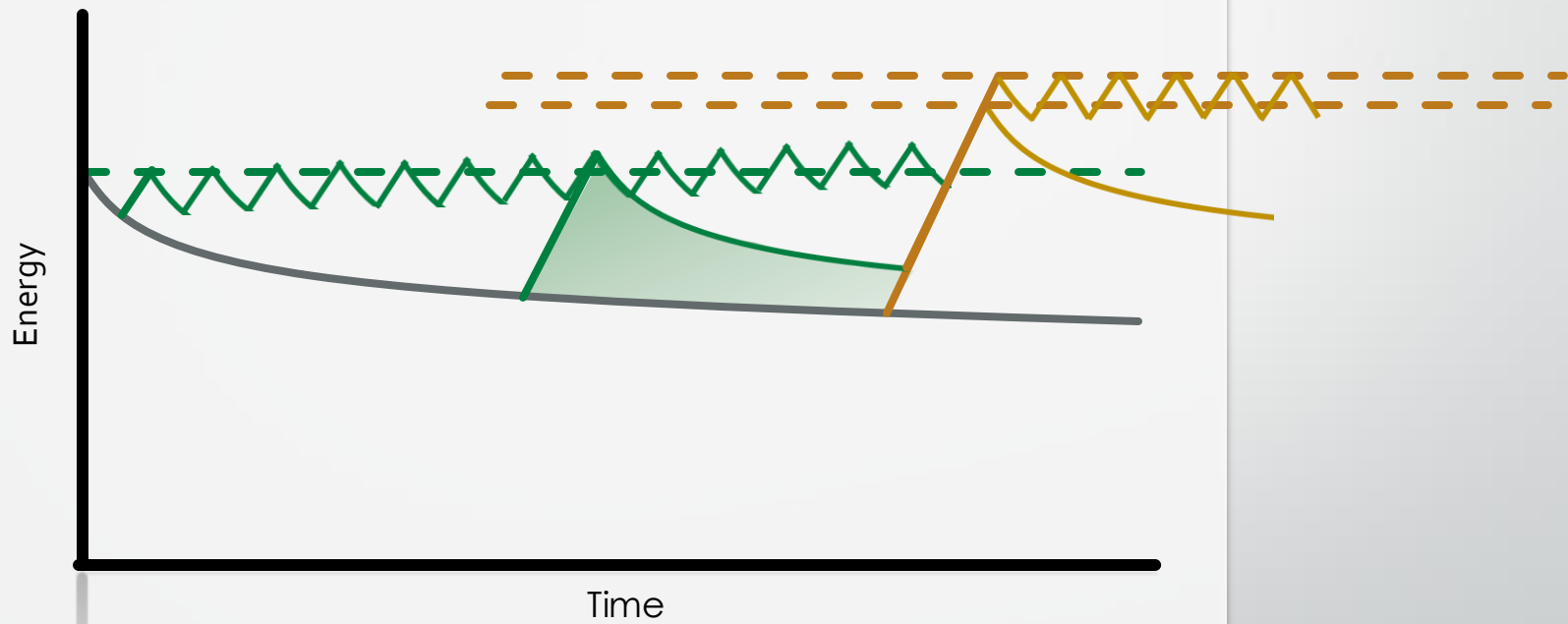
1970 Class B



# Civic Center



# The Cost of Time



# retrocommissioning

“Building Tune-Up”



Optimize the Existing Building Systems  
Identify Energy Saving Opportunities  
Determine Energy Usage

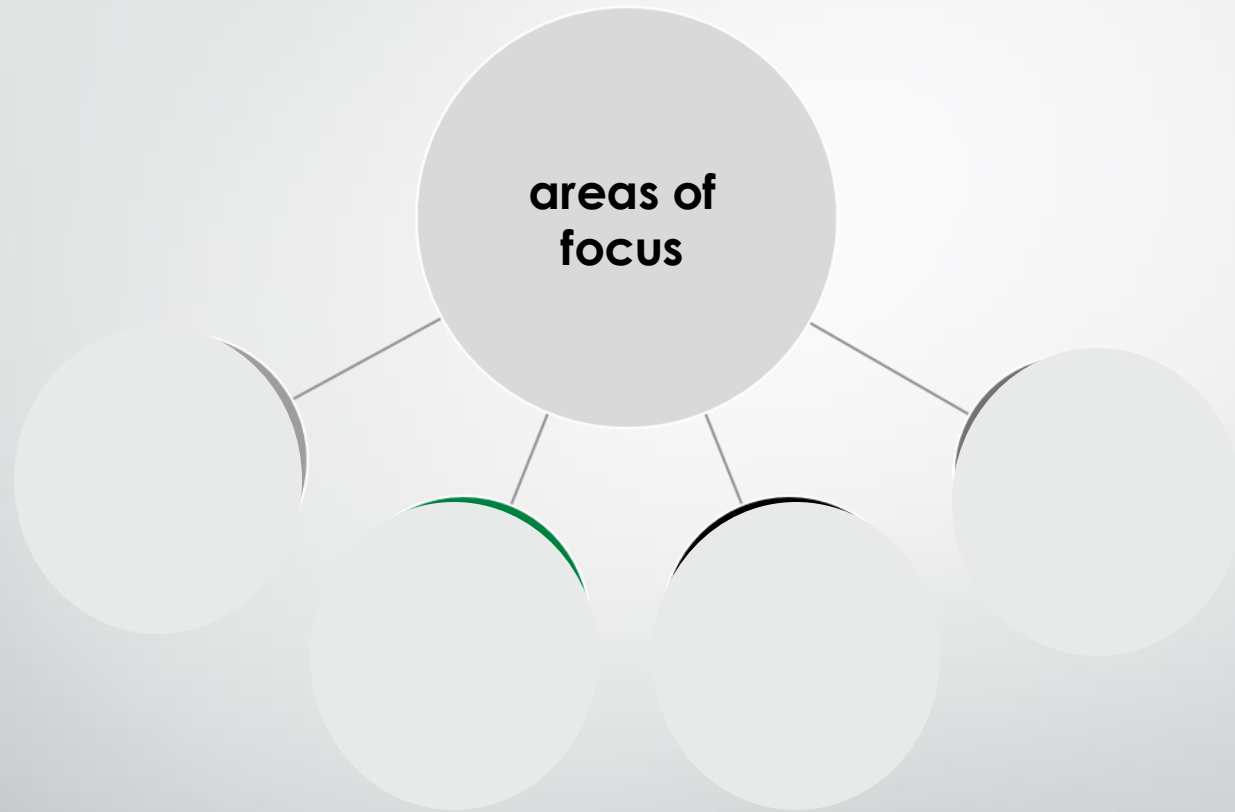


# monitoring based commissioning “MBCx”

Optimize the Existing Building Systems  
Identify Energy Saving Opportunities  
Determine Energy Usage



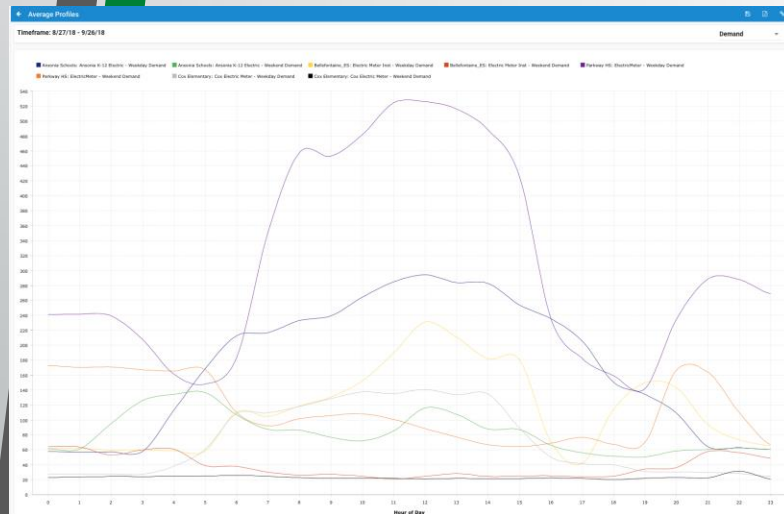




# Full Building Tune-Up

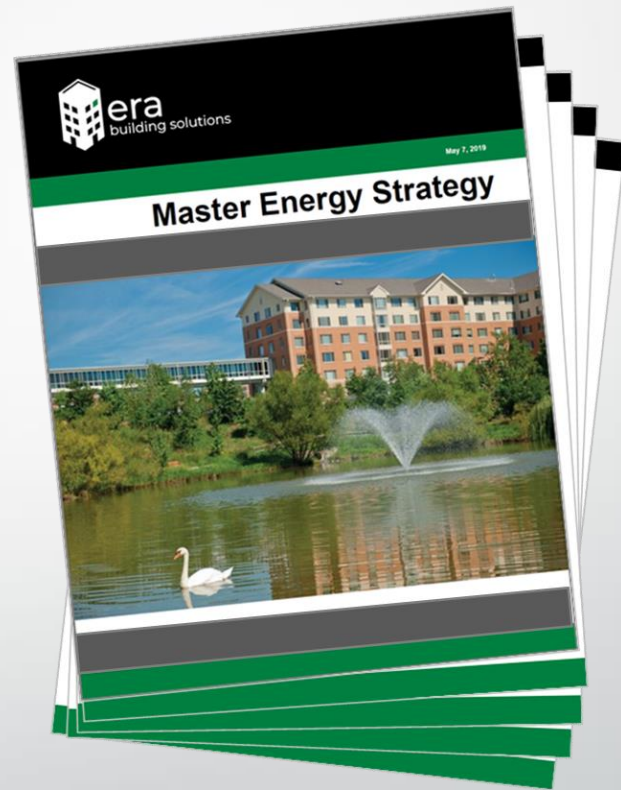


# Monitoring-Based Commissioning





5 to 10+%



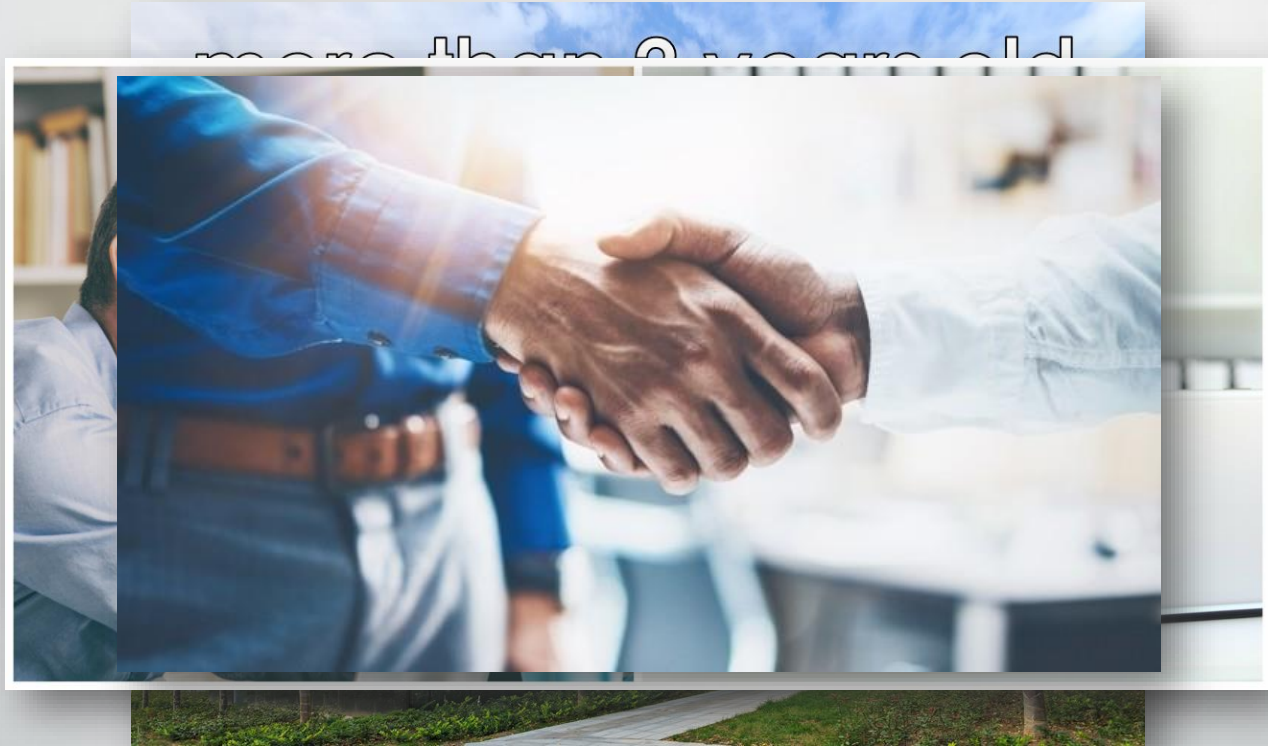


Building Tune-Ups can be so impactful that local **utility incentive programs will cover up to 75% of the cost** of implementation for qualified properties.

**PotomacEdison™**  
*A FirstEnergy Company*



If your building...



...you might be a candidate.



# I've Benchmarked, Now What? A Building Energy Performance Workshop

## Contractor Insights

Next Step After Benchmarking – Looking at the Data  
and Identifying Needs

Keith Derrington – Recurrent Innovative Solutions

Leveraging Building Tune-Up and Monitor-Based  
Commissioning to plan for your improvements

- Mike Cain – ERA Building Solutions

How to make an idea into an energy project and  
maximize resources and returns

- Ric Sandoval – Green Generation

# How to Make an Idea into an Energy Project

- Establish objectives
- Assess the property
- Engineer solutions
- Project financing
- Implementation
- Perform Measurement and Verification (M&V)



# Establish objectives

- What are your goals?
- Who are your key stakeholders?
- What is the time horizon?

# Assess the property

- Top to bottom onsite review
- Leverage benchmarking and building monitoring initiatives
- Consumption vs. Demand
- ECMs vs. CapEx

# Engineer the Solutions

- Energy modeling
- Develop ROI
- Iterative process with onsite team
- Rebate and incentives
- Develop final scopes of work

# Project Funding

- Direct Capital Investment
  - Operating Budget
  - Capital Budget
- Reserves
  - Building
  - Mortgage
- Rebates and incentives
  - Pepco
  - MEA
- Loans
  - Green Bank
  - Lawton Loan Program
  - PACE
- Lease
  - Operating
  - Capital

# Implementation thru Measurement & Verification

- **Implementation**

- RFP process
- Project management - Onsite vs. Remote
- Quality assurance and quality control

- **Measurement and Verification**

- Confirm you received the savings you “bought”
- Ongoing M&V to maintain/increase savings

# Senior Living Facility, Maryland

- This resident-owned cooperative community located in Bethesda, Maryland is a distinctive full-service retirement community that included assisted living and skilled nursing services
- Solution focused on a combination of strategic energy conservation measures as well as end of useful-life capital projects
- GreenGen completed cost benefit analyses to compare “like-kind” replacements to “high efficiency” alternatives
- The project was awarded Maryland Energy Administration’s EmPower Maryland grant funding of \$500,000



Project Summary	Gross Investment	Simple Payback	Utility Rebates	Net Investment	Annual Savings	Net Payback	% Cost Reduction	kWh Reduction	% kWh Reduction
<b>Total Solutions</b>	<b>\$ 1,434,798</b>	<b>9.48</b>	<b>\$ 510,866</b>	<b>\$ 923,932</b>	<b>\$ 151,415</b>	<b>6.10</b>	<b>15.8%</b>	<b>1,181,712</b>	<b>20.2%</b>
<b>Total Conservation Measures</b>									
Lighting	\$ 501,666	7.68	\$ 196,657	\$ 305,009	\$ 65,353	4.67	7.0%	532,383	9.1%
VFD Fans	\$ 26,795	1.13	\$ 15,602	\$ 11,193	\$ 23,637	0.47	2.4%	189,690	3.2%
VFD Pumps	\$ 51,937	2.30	\$ 23,119	\$ 28,818	\$ 22,558	1.28	2.3%	181,033	3.1%
Data Visualization	\$ 24,666	3.42	\$ 7,216	\$ 17,450	\$ 7,218	2.42	0.7%	37,961	0.7%
Low Flow Faucets	\$ 10,192	2.75	\$ -	\$ 10,192	\$ 3,710	2.75	0.4%	n/a	n/a
<b>Total CapEx Measures</b>									-
RTU/HP Replacement	\$ 557,995	30.42	\$ 189,647	\$ 368,348	\$ 18,343	20.08	1.9%	147,202	2.5%
Cooling Tower Replacement	\$ 261,547	24.68	\$ 78,625	\$ 182,922	\$ 10,596	17.26	1.1%	93,443	1.6%

# I've Benchmarked, Now What? A Building Energy Performance Workshop

---

## Financing Resources – When Your Cash is not Enough

- Lindsey Shaw – Dept of Environmental Protection
- Tom Deyo – Montgomery County Green Bank

# Montgomery County Commercial PACE Program

## Innovative Financing for Building Upgrades

Presented by the Department of Environmental  
Protection

**October 23, 2019**





# Commercial PACE Basics

- Allows property owners to make EE and RE upgrades to their property
- Secured by the property, repaid via the property tax bill
- Can finance up to 100% of the project hard and soft costs upfront with terms up to 20 years
- Project cost minimum \$5K, but makes the most financial sense starting at \$250K+
- Offers “off-balance sheet” financing for building owners
- To date, the County’s program accepted **12 C-PACE projects** totaling more than **\$8.4M** in private capital into our building stock.

# What is C-PACE Eligible?



## Eligible Measures

- Lighting fixtures
- HVAC and automated controls
- Solar PV/thermal, geothermal, biomass
- Insulations
- Energy-efficient windows
- EV charging stations
- Water efficiency measures
- Any other upgrade of equipment, device, or other material intended to reduce energy use or expand renewable energy use
- \*Includes hard and soft costs

## Eligible Properties

- A commercial property located in Montgomery County either not designated for human habitation OR multi-family dwelling used for human habitation with more than 4 rental units.
- Includes: Commercial, Multi-family, Agricultural, Industrial, and Non-Profits
- Excludes: Condominiums
- Property must be current and in good standing on property tax payments
- Applicant must be the legal owner of property

# How much can I finance?

- **For Existing Buildings:**

- 20% maximum C-PACE loan amount vs. value of building
- 90% maximum debt vs. value of building

- **For New Construction:**

- 15% maximum C-PACE loan amount if designed building energy performance exceeds code by no more than 5%
- 20% maximum C-PACE loan amount if designed building energy performance exceeds code by 5% or more
- 90% maximum debt vs. value of building

- For all C-PACE Loans, mortgage holder(s) must consent to C-PACE

# MC-PACE Case Study

## ***Shady Grove Professional Building & Comfort Inn Shady Grove***

**Project Need & Solution:** Commercial office building and hotel implementing cost-saving energy efficiency upgrades.

**Energy:** Building envelope, HVAC replacement, LED Lighting

**Total Project Cost:** ~ \$1,400,000

**Money Down:** \$0.00

**C-PACE Financing:** ~ \$1,400,000 **Term:** 20 years

**Annual PACE Surcharge:** ~\$125,000

**Annual Cost Savings:** ~\$155,000

**Annual Energy Savings:** 1,600 MMBtu

**Net Annual Cash Flow:** ~\$30,000

**Lifetime Cost Savings:** ~\$3,000,000

**PACE to Value <10%**

**DTV< 80%**



# Supporting Commercial Properties

Presentation by:  
Tom Deyo, Montgomery County Green Bank



Montgomery County  
**GreenBank**

Your partner for clean energy <sup>TM</sup>

# Who We Are

## *Montgomery County Green Bank*

- The nation's FIRST County-level green bank, designated in July 2016, chartered by the County in 2015. Independent, 501(c)3 non-profit corporation.
- Purpose to accelerate investment in energy efficiency and renewable energy in the County
- Not a Bank, **an Investment Fund.**
- Capital opportunity of over \$20 million from County settlement from Pepco-Exelon merger.
- Look for market gaps in energy efficiency and renewable financing markets
- Co-invest with lenders to reduce perceived risk and bring their private capital to market



# What We Offer.

## Multiple Approaches to Support Commercial Properties

- **Commercial Loan for Energy Efficiency and Renewables (CLEER)**
  - ❖ 100% Financing
  - ❖ No lien on property
  - ❖ Offered through Revere Bank, Latino Economic Development Center, Ascentium Capital
- **Open solicitation of financing needs to learn about market**
  - ❖ Specific needs of effort underway
  - ❖ Provide information on situation and financial need of project
- **Outreach to Increase Awareness and Introduce Concepts for Specialty Markets**
  - ❖ Common Ownership Communities
  - ❖ Faith-Based Institutions
- **Technical Assistance – Affordable Housing Pilot as a Test**
  - ❖ Start with assessment; define scope, budget and financing; support implementation
- **Community Solar – Opportunities to leverage unused rooftops for LMI program**
- **Commercial Solar PPA – Small solar array strategy**



# When Cash Is Not An Option. Using CLEER to Finance a Project.

Simple Payback Model – Customer Cash

Category	Project - HVAC
Cost of Project	\$198,000
Less: Pepco Utility Incentives	<u>\$48,000</u>
Balance to be Funded	\$150,000
Customer Cash	\$150,000
Projected Energy Savings Per Year (179,500 Kwh @14 Cents per Kwh; assumed an all-in rate)	\$25,130
Number of Years to Recover Cash Outlay	6

CLEER Financing Alternative – No Customer Cash

Category	Project - HVAC
Cost of Project	\$198,000
Less: Pepco Utility Incentives	<u>\$48,000</u>
Balance to be Funded	\$150,000
Loan Amount	
100% of balance	\$150,000
CLEER fees	<u>\$5,250</u>
Total Loan Amount	\$155,250
Term and Rate	10 yr / 6.375%
Annual Debt Service	\$21,036
Projected Energy Savings Per Year (179,500 Kwh @14 Cents per Kwh; assumed an all-in rate)	\$25,130
Annual Customer Cash Flow After Debt Service	\$4,094





# I've Benchmarked, Now What? A Building Energy Performance Workshop

---

Audience Q&A