



Pacific Grove Unified School District

**Finance Workshop & Measurement & Verification**

Presented by:  
ABM Building Solutions, LLC

CSLB #976012

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15  
2023



The background features a large, faint, circular graphic of a group of people standing in a circle, rendered in a dark blue color. The people are stylized with simple shapes for heads and bodies. The text "Finance Workshop" is centered over this graphic.

# Finance Workshop

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A faint, dark blue background graphic depicting a group of stylized human figures arranged in a circle, suggesting a workshop or meeting. The figures are composed of simple geometric shapes like circles and triangles.

# Measurement & Verification Workshop

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The background features a large, faint, circular arrangement of stylized human figures. Each figure is composed of a dark blue circle for the head and a geometric, faceted shape for the torso, all rendered in a slightly lighter shade of blue than the background. The figures are positioned as if they are standing in a circle, facing outwards.

# ABM Process Overview

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# Thank You

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GET IN TOUCH WITH US

ABM BUILDING SOLUTIONS, LLC  
Email: [Christina.Sherriff@abm.com](mailto:Christina.Sherriff@abm.com)



# M&V Workshop

- Customers should understand and be comfortable with M&V
- Customer should be included in the M&V Methodology Selection Process
- We are VERY early in the process, will circle back when scope is clear

This is YOUR meeting! Help me define the desired outcomes.

- What questions and concerns do you have coming into this discussion?
- What do you want to make sure I cover today?

# What is M&V?

Measurement and Verification (M&V)

- ***Process to Reliably determine project's savings***

Savings

- ***Comparing before and after retrofit***

Tools for Best Practices

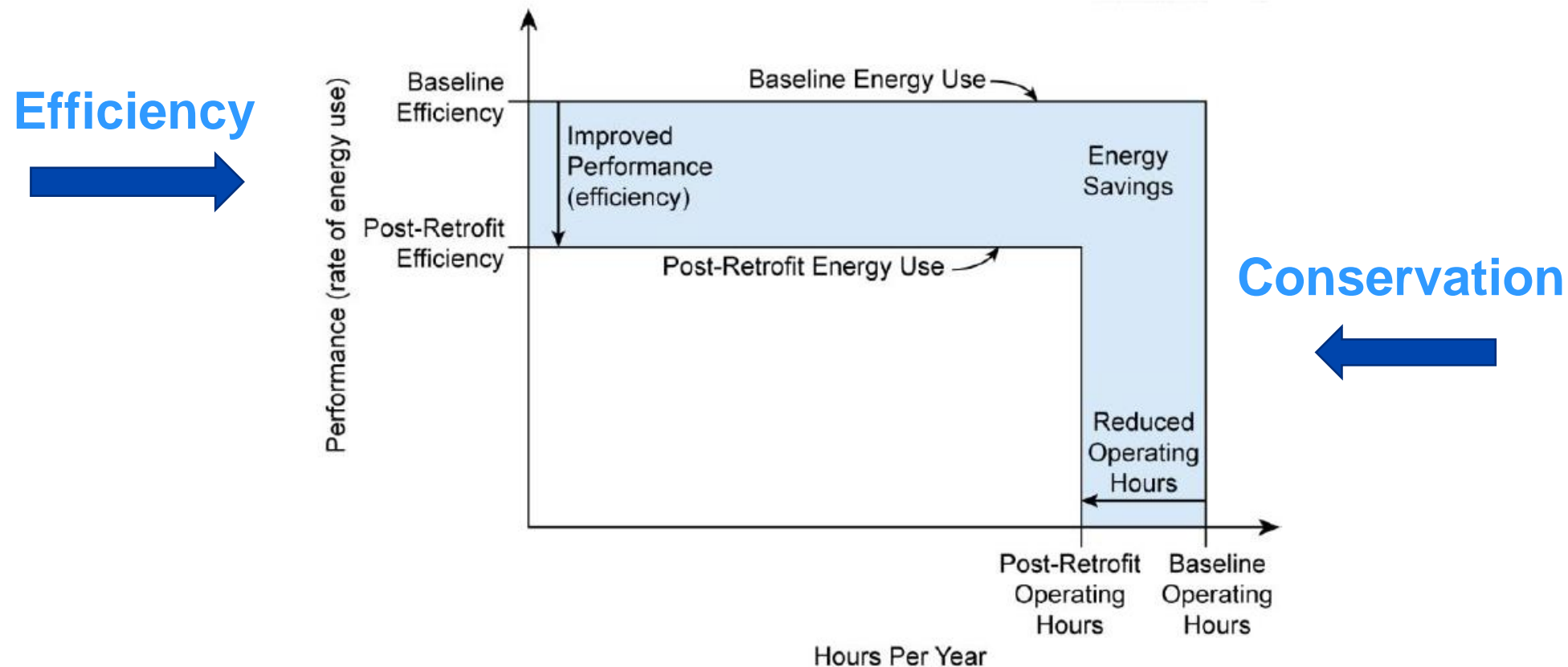
- ***Regular site inspections***
- ***Trend & utility reviews***
- ***Annual reporting***

# The Basis of an ESPC Project

## ECM: Energy Conservation Measure

**Efficiency** = Reduce the energy/water used when it's on.

**Conservation** = Turn it off.





# Options A & B- Retrofit Isolation

**Visual Inspections** – Insulation, window film

**Sample spot measurements** – Lighting, water

**Short-term performance testing** – Chillers

**Data trending** – Building Automation Systems

***Savings is known almost immediately***

# Option C - Utility Bill Analysis

Includes all the work for Options A & B plus...

Utility bill comparison that includes adjustments

- Weather – mild winter vs polar vortex
- “Student-days” – length of winter & spring break, summer school
- Other variables – building additions, Covid
- Building savings greater than 25%

**Several month lag in determining savings**

# M&V Process Steps

## Plan

- Benchmarking (EUI)
- Utility Rate Analysis
- Customer M&V Workshop
- Baseline Conditions
- ECM Development
- Savings Calculation Review
- Co-Authored M&V Plan
- Balance of Cost vs. Rigor

## Install

- Project Kickoff
- Pre/Post Data from Subs
- Trend Data Setup
- Verify Potential to Perform
- Verify Scope Completion
- Calculate Install Savings
- Estimate Year 1 Savings
- Post-Install Report (PIR)

## Maintain

- ECM Visual Verification
- Operational Review
- Trend Data Analysis
- Site Observations / Recommendations
- Annual Savings Reports
- Continuous Planning / Continuous Improvement

# “Potential to Perform” = Install Period Goal

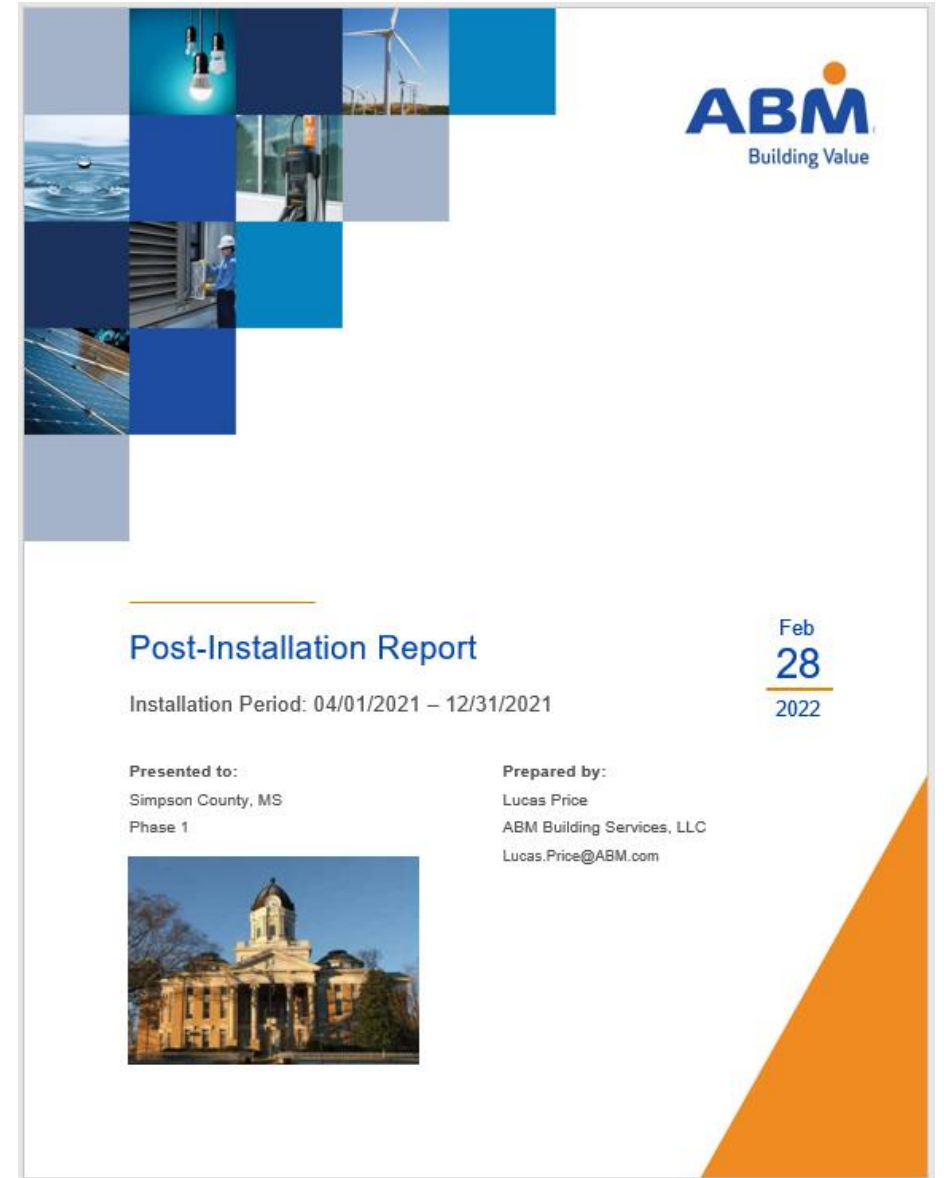
- Pre-retrofit measurements (before demo)
- Set points, schedules, as-built's, pictures
- Post-retrofit measurements (after retrofit)
- Change Order documentation
- Control drawings, sequence of operations
- Equipment Startup and Functional Performance Testing
- Signed and Dated Customer ECM Acceptance
- Punchlist updates and follow up

## Install

- Pre / post measurements
- Change Order Review / Savings Impact
- Functional Performance Testing
- Post-Install Report
- **“Potential to Perform”**

# Post-Install Report

- ~ 60 days after Total Project Acceptance
- **Detailed documentation**
- Installed Quantities and Specs vs Design
- Document Sampling Plan Results
- Quantify the Installation Savings
- Projection of Year 1 Savings
- List the Year 1 Activities



# “Persistence of Savings” = Ongoing Goal

- Ongoing M&V for 1 to 15 Years
- Review ECM Operation and Condition
- Two ways to validate proper operations
  - BAS Trend Data and Remote Login
  - Seasonal site visits and customer staff meetings
- Client has a role in “Persistence of Savings”
  - Drive Awareness / Compliance with Standards of Comfort
  - Address temperature set point & schedule overrides

## Maintain

- Calculate Savings
- Site inspection
- Trend data and remote BAS analysis
- Timely feedback on identified energy creep
- **“Persistence of Savings”**

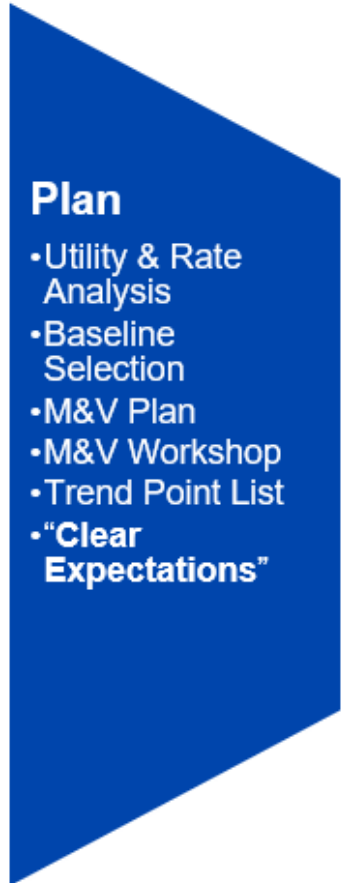
# Annual Report

- Provides annual results
- Contains site visit observations
- May or may not contain BAS trend data or measurements, depending on M&V Plan
- Documents submission of contract deliverable
- We ask for Report Delivery Receipt signature

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# “Plan”: Establish Clear Expectations

- Buildings are surveyed, Developer / Engineer defines ECM’s / savings
- Builds a Preliminary M&V Plan through:
  - Review of Baseline usage and rates
  - Review of ECM details, Savings as % of Baseline
  - Proper application of M&V Protocol
- **M&V Workshop with Customer (Likely two in this case)**
  - **Discuss suggested M&V Approach & Risk / Cost Balance**
  - Discuss access potential for remote investigation of BAS
- **Based on Customer Feedback:**
  - **Finalize the M&V plan**
  - Build Sampling Plans and Trend Point List
  - Ensure all hardware, software, measurements, trending, & other data acquisition tasks are included in scope from ABM Branch or Contractor scope



**Plan**

- Utility & Rate Analysis
- Baseline Selection
- M&V Plan
- M&V Workshop
- Trend Point List
- “Clear Expectations”



# Budget-friendly M&V Pricing Option

**Example:** Traditionally, M&V Services are invoiced annually.

- Year 1 Price = \$10k (*purely hypothetical*)
- 15-Year Total = \$186k (3% escalation)

**Up-front Option:** Three (3) Years of M&V Services built into the Project.

- Year 1 invoice = \$0 (No ongoing M&V invoices to pay)
- Contract Cost Savings of \$155k over the term

## Reasons / Benefits:

- Year 1 = shakedown year (see how things perform)
- Year 2 = address anything learned during Year 1
- Year 3 = create a culture, set customer up to be self-sustaining
- Less total-term M&V Costs = More Project Scope

# Conclusion

- M&V Selection is part of the Co-Authored process
- Goal is Your Satisfaction with Balance of M&V Cost and Value
- Consistent Site Visits & Operational Data Review
- There are Budget-friendly M&V Pricing options

# Feedback

Did we address your concerns?

# Executive Summary

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- Improve Physical Living Environment
- Leverage Savings
- Firm Fixed Price – No Change Orders
- Co-Authored Process
- Expedited Implementation Schedule
- Fiscal Stewardship & Provides Long Term Strategic Asset Management Plan
- Guaranteed Results!

