SONOMA COUNTY ENERGY FINANCE (SCEF) PROGRAM

EDUCATION DAY

Presentation to

Potential Participants & Pre-Qualified ESCOs

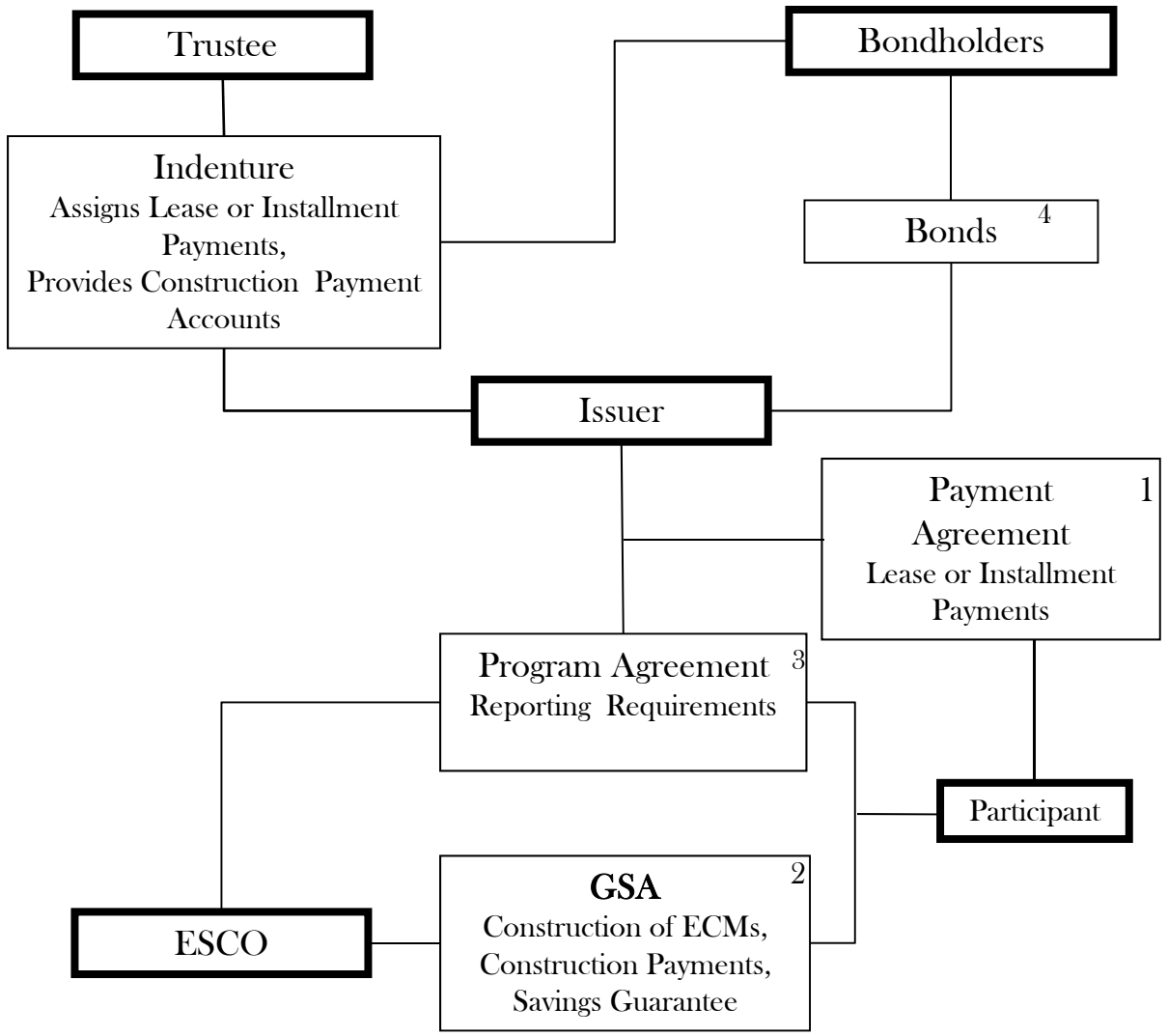
October 19, 2012

AGENDA

9:00 am	Overview of SCEF by Sonoma County Water Agency
9:10 am	Overview of the Sustainable Energy Bond Model by FREE (Dr. John Byrne)
9:30 am	Introductions
9:50 am	Financing Strategy – Ken Becker, President, Becker Capital
10:30 am	Review of Common Documents – Baird Brown, Drinker Biddle
11:10 am	Monitoring & Verification Strategy – John Byrne, FREE
11:40 am	Discussion
12:30 pm	Lunch and ESCO Presentations
1:45 pm	Exhibit Tour & One-on-One Meetings
3:00 pm	Education Day concludes

FINANCING MECHANICS

1. Participant enters into Lease or Installment Payment Agreement with the Issuer in which the participant agrees to make annual payments for installation of energy conservation measures ("ECMs").
2. Energy Service Company ("ESCO") enters into Guaranteed Savings Agreement ("GSA") with the Participant, guaranteeing annual savings for the term of the agreement. Participant approves construction draws.
3. Issuer, ESCO and Participant enter into Program Agreement in which ESCO and Participant agree to report to Issuer on performance of the ECMs and job creation.
4. Issuer issues tax-exempt bonds secured by the payments under the Lease or Installment Payment Agreement.



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BENEFITS OF SCEF PROGRAM

- Pre-Contract Audit Provided at No Cost to Participants with 90% or Higher Accuracy to IGEA
- All Program Costs are Paid Within Bond Issue
- Project Pool Means Economies of Scale for Document and Rating Costs
- No Cross Collateralization or Risk Associated with Participation by Other Participants
- Customized and Serialized Financing Optimization
- Larger Size of Pool Means Access to Capital Markets and Lowest Interest Rates

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GOVERNING DOCUMENTS

- Guaranteed Savings Agreement (GSA)
- Installment Payment Agreement (IPA)
- Program Agreement
- Indenture

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GUARANTEED SAVINGS AGREEMENT

- Purpose:
  -Agreement between ESCO and the Participant to undertake the implementation of one or more energy conservation measures on the host's facility.

- Mechanism:
  -ESCO agrees to design, construct and install certain energy conservation measures

  -ESCO guarantees that the amount of energy savings (after payment of operation and maintenance costs will exceed the payments due under the Lease or Installment Payment Agreement.

  -The Participant assumes operating responsibility, starting at the project's time of completion.

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LEASE OR INSTALLMENT PAYMENTS AGREEMENT (IPA)

- Purpose:

  -Provides payments from the Participant to Trustee in order to pay debt service on the project.

- Mechanism:

  -The Participant promises payments outlined in the Indenture to pay debt service on the portion of the bonds used to fund its project and it's pro rata share of costs.

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PROGRAM AGREEMENT

- Purpose:

  -Provides for certain responsibilities of the ESCO and the Participant with respect to the program

- Mechanism:

  -ESCO and Participant regularly report to SCWA-FREE on monitoring and verification, energy savings, job creation, etc.

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INDENTURE

Purpose:

-A legal contract between the issuer and the trustee, who acts on behalf of the bondholders, in which the various obligations of each party, as well as the nature of the bonds, are described.

Mechanism:

-Trustee holds the proceeds of the bonds in separate construction accounts for each participant's project, and disburses them to the ESCO when the participant approves draws made under the GSA

-Trustee repays the bonds with proceeds from the lease or installment payments from the Participants

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MONITORING & VERIFICATION

FROM

DISPUTE RESOLUTION M&V

TO

DIAGNOSTIC, COLLABORATIVE M&V

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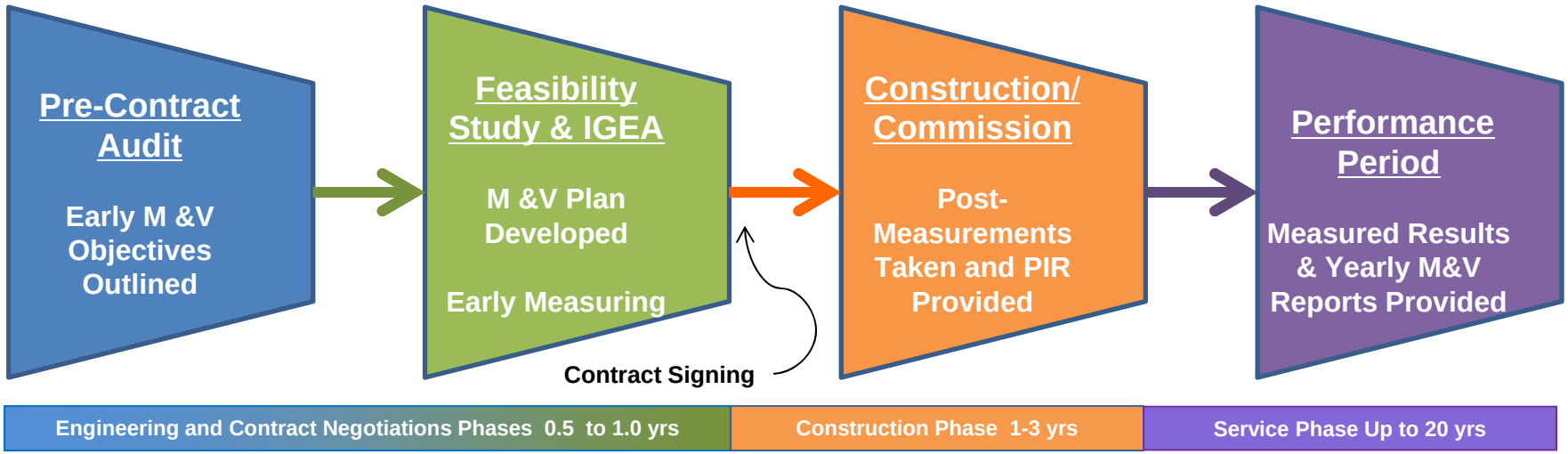
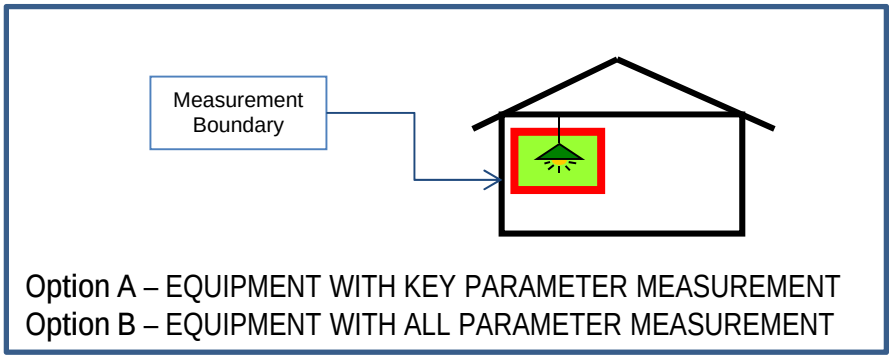
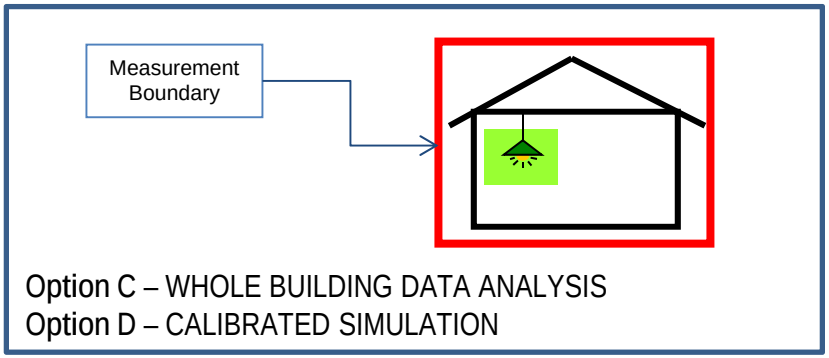
M&V OVERVIEW



- DOE SPONSORED PROTOCOLS (IPMVP)





- ✓ Remote monitoring, automated data collection.
- ✓ Early identification, isolation and resolution of issues with Post-Installation Reporting.
- ✓ Regular spot checks and communication of performance.

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M&V OVERVIEW

International Performance Measurement and Verification Protocol (IPMVP):

- Four (4) main options (two geared toward ECMs; two geared toward whole building):

Option A – Retrofit Isolation: Key Parameter Measurement

Option A	Customer Assurance	M&V Investment
	↑	↑

- Field Measurement on a selected sample of locations of the significant parameter.
- Rigorous sampling using 80% Confidence and 20% Precision as a minimum.
- Example – **Lighting fixture retrofit**.

Option B – Retrofit Isolation: All Parameter Measurement

Option B	Customer Assurance	M&V Investment
	↑↑	↑↑

- Field Measurement on a selected sample of locations of all parameters related to the equipment energy use.
- Similar sampling criteria as Option A.
- Example – **Lighting fixture upgrade with Occupancy Controls**.

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M&V OVERVIEW

Option C – Whole Building Utility Analysis

Option C	Customer Assurance	M&V Investment
	↑↑↑	↑↑↑

- Affected utilities are metered continuously.
- Baseline consumption and demand are analyzed to determine the impact of various known variables such as weather and occupancy.
- Actual performance period readings are compared to Baseline energy usage adjusted for the same operating variables.
- Typically used when numerous ECMs impact a building and accurate tracking of required variables is available
- Example – Multiple ECMs (complex HVAC Replacements) with reliable baseline utility data.

Option D	Customer Assurance	M&V Investment
	↑↑↑	↑↑↑↑

Option D – Calibrated Building Model

- A virtual model of the facility is created using geographic orientation, building equipment, construction type and materials, and operating habits.
- Typically used when there are several interactive ECMs, reliable information on operating variables are not available, or in cases lacking building sub-metering.
- Example – Multiple ECMs (i.e. HVAC & BMS), buildings w/out reliable baseline utility data or with complex ECMs that cannot traditionally be measured under Options A , B or C.

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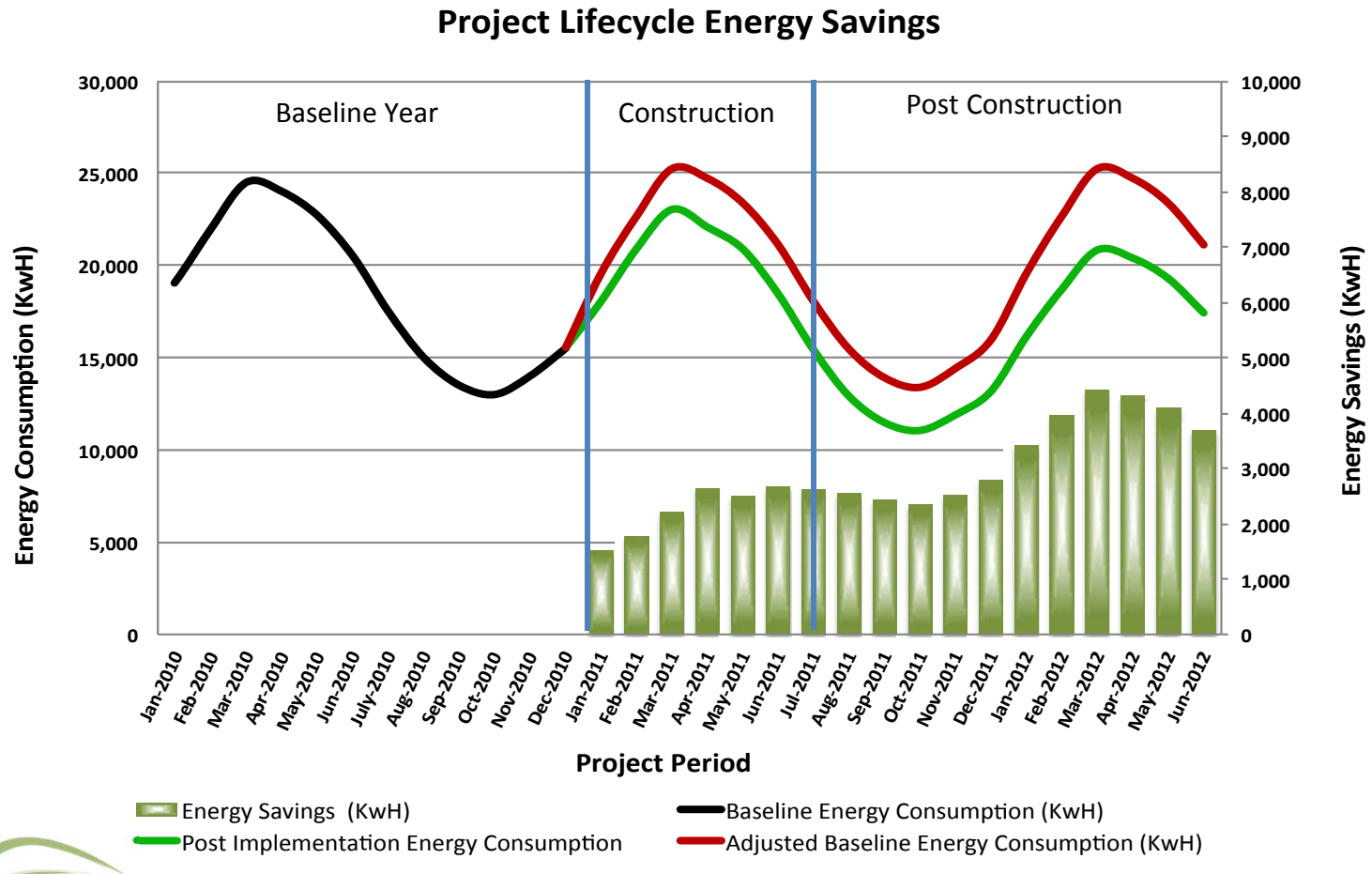
SAVINGS DEMONSTRATION

Energy savings = Difference between the Post-Implementation and Adjusted Baseline Energy Consumption that would have occurred in the absence of any implemented ECMs.



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CONVENTIONAL M&V APPROCAH

1) What do ESCOs typically guarantee?
   - Energy Savings Guarantee for projected savings of energy units (kWh, Btu, kgal)

2) What will ESCOs do to ensure energy savings actually occur over the entire term of Energy Savings contract (20 years)?
   - Pre-agreed regular site visits for periodic re-measurement of retrofits, site inspections, monitoring of utility consumption and interviews with maintenance personnel about operation & maintenance of equipment
   - Provide Annual Energy Report to verify that savings expectations are being met

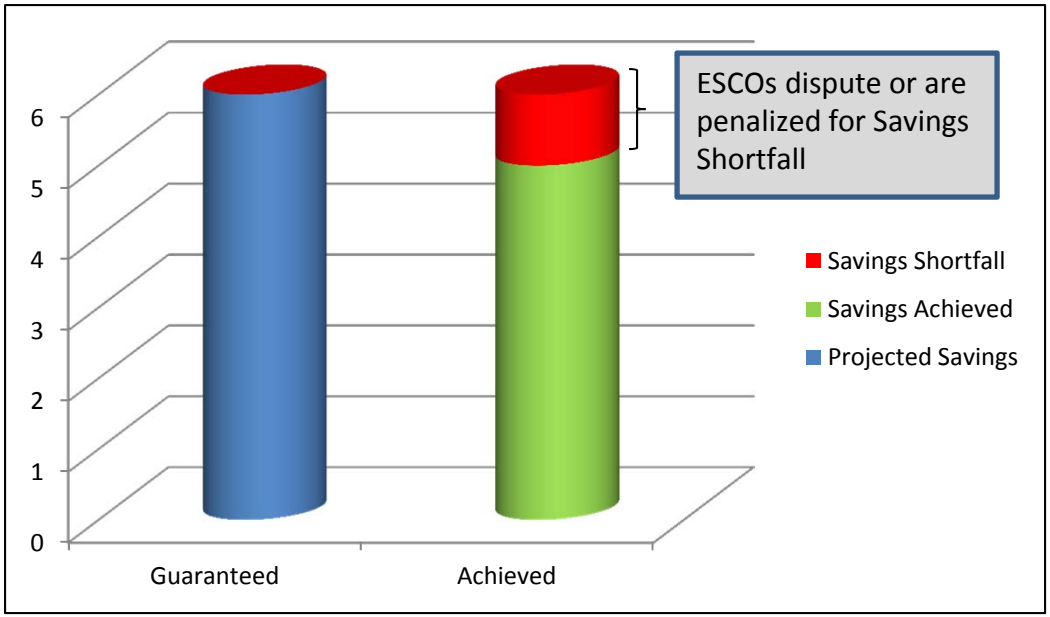
3) What actions would ESCOs typically take if the guaranteed level of savings are not met?
   - ESCOs may use M&V to consider if assumptions were appropriate and/or if Participant behavior or Facility use may have changed
   - ESCOs will write a check to cover the shortfall in guaranteed annual energy savings if assumptions are found to be appropriate and/or behavior or other facility changes cannot explain the savings shortfall
   - Or dispute resolution processes spelled out in the contract may be invoked to resolve concerns

4) What supports an ESCO's savings guarantee?
   - Among other things, the balance sheet of the Company or its Parent Company as the means to backstop savings guarantees.

CONVENTIONAL M&V APPROACH – SUMMARY

CONVENTIONAL M&V APPROACH: Dispute Resolution Model

- ✓ DOE Sponsored IPMVP (2009)
- ✓ FEMP Guidelines: Measurement and Verification for Federal Energy Projects Version 3.0
  - **Option A** – RETROFIT ISOLATION WITH KEY PARAMETER MEASUREMENT
  - **Option B** – RETROFIT ISOLATION WITH ALL PARAMETER MEASUREMENT
  - **Option C** – WHOLE BUILDING DATA ANALYSIS
  - **Option D** – CALIBRATED SIMULATION



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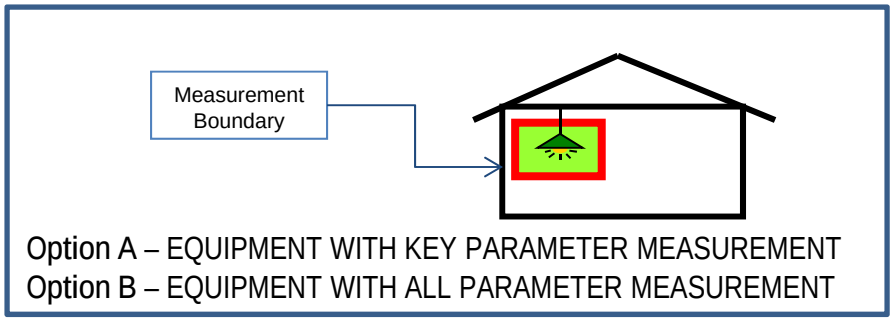
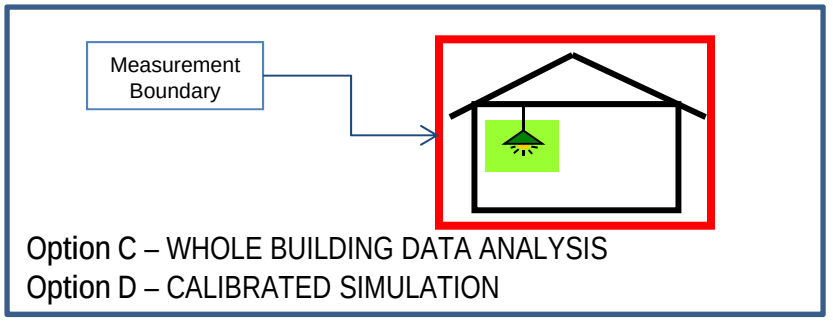
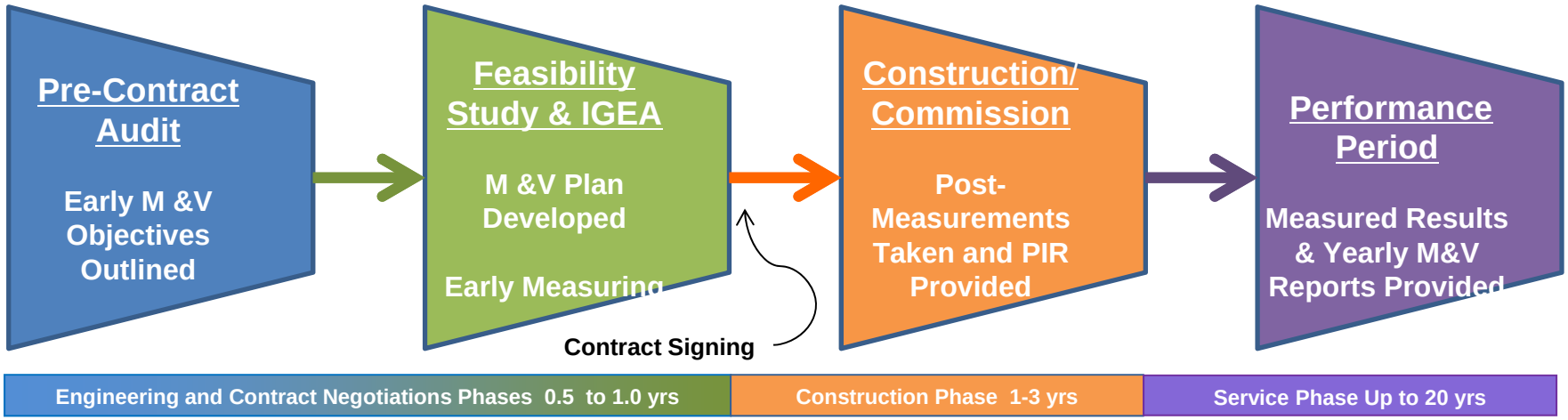
SCEF'S UNIQUE M&V APPROACH

- BASED ON THE SAME DOE SPONSORED PROTOCOLS (IPMVP)





- ✓ Remote monitoring, automated data collection.
- ✓ Early identification, isolation and resolution of issues with Post-Installation Reporting.
- ✓ Regular spot checks and communication of performance.



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SCEF'S IMPROVED M&V

1) What do ESCOs guarantee in the SCEF Program?

- **Annual Dollar Savings ($$)** by implementing the energy project which is greater than the annual debt service associated with the new investments
- Annual Dollar Savings that are **always** greater than associated debt service

2) What will the ESCOs do to ensure Dollar Savings greater than associated debt service actually occur over the entire term of Energy Savings contract (20 years)?

- Throughout the year, ESCOs use M&V to assess their ability to meet the DOLLAR SAVINGS GUARANTEE without penalty
- ESCOs fine-tune installed ECMs throughout the year, based on regular monitoring, to increase savings as needed
- Where a shortfall is imminent, ESCOs implement additional ECMs to cover the savings shortfall and/or discuss with Participants any management improvements that might be mutually acceptable
- ESCOs write a check if a shortfall remains

4) What supports an ESCO's savings guarantee in the SCEF Program?

- Balance sheet of the Company or its Parent Company as the means to backstop savings guarantees

AND

- Diagnostic M&V to avert shortfalls

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SCEF'S IMPROVED M&V - SUMMARY

SCEF's M&V APPROACH: Collaborative Approach, Non Dispute Model

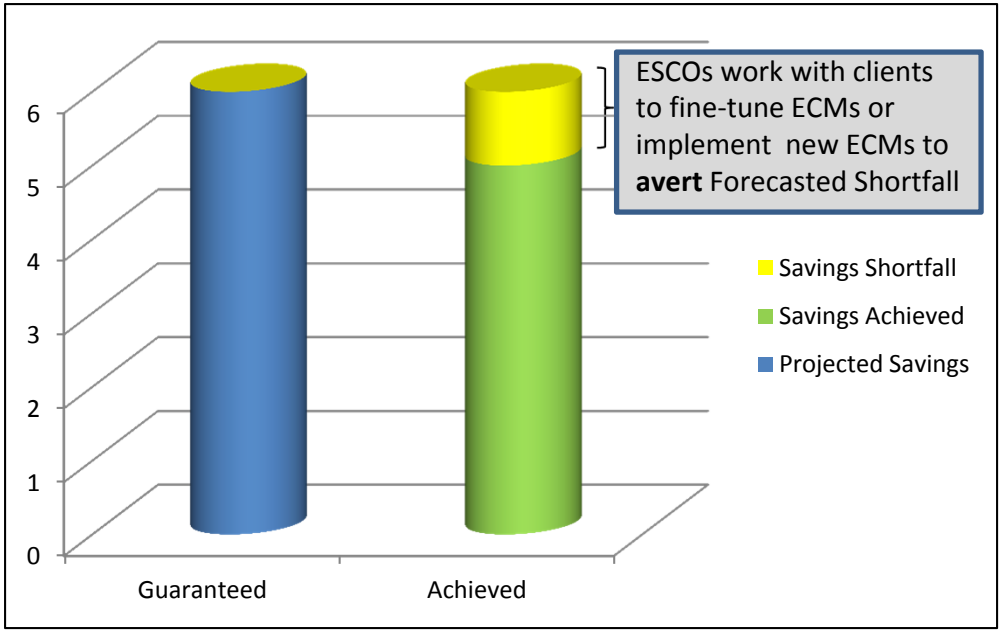
- ✓ Uses the same DOE Sponsored IPMVP (2009)
- ✓ Based on FEMP Guidelines: Measurement and Verification for Federal Energy Projects Version 3.0

Option A – RETROFIT ISOLATION WITH KEY PARAMETER MEASUREMENT

Option B – RETROFIT ISOLATION WITH ALL PARAMETER MEASUREMENT

Option C – WHOLE BUILDING DATA ANALYSIS

Option D – CALIBRATED SIMULATION



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APPENDIX

MEASUREMENT AND VERIFICATION
Terms, Options & Calculations

The M&V Design and Reporting Process

- Gather relevant energy, water and operating data to form the baseline and reporting periods.
- Identify special measurement equipment that is needed under the M&V Plan.
- Inspect the installed equipment and revise operating procedures and through the end.
- Compute savings in energy and monetary units in accordance with the M&V Plan.
- Report savings in accordance with the M&V Plan.

Definition of Key Concepts

- **Baseline Period:** The period chosen to represent operation of the facility or system before implementation of a CM.
- **Reporting Period:** The period following implementation of a CM when savings reports adhere to IPMVP.
- **Energy/Water Conservation Measure (CM):** A set of activities designed to increase energy/water efficiency of a facility, system or equipment.
- **Measurement and Verification (M&V):** The process to reliably determine actual savings within a facility, system or equipment by comparing resource use before and after implementation of a project.

Measurement Boundary

- Measurement boundary depends upon the purposes of reporting.

Purposes of Reporting	**Measurement Boundary**
To help manage only the equipment affected by the savings program,	boundary should be drawn around that equipment.
To help manage total facility energy performance,	boundary should encompass the whole facility.
To take place of missing data by using energy estimates from calibrated simulation program for either part of all of the facility,	boundary can be drawn accordingly.

Measurement Period Selection

- Baseline Period
  - Usually includes 2 years of utility billing data.
- Reporting Period
  - Should encompass at least one normal operating cycle of the equipment or facility.
  - Metering may be left in place to provide real-time feedback of operations.
- Adjacent Measurement Periods
  - Should be long enough to represent stable operation and cover the range of normal facility operations.
  - On/Off test needs to be repeated under different operating modes.

Adjustment

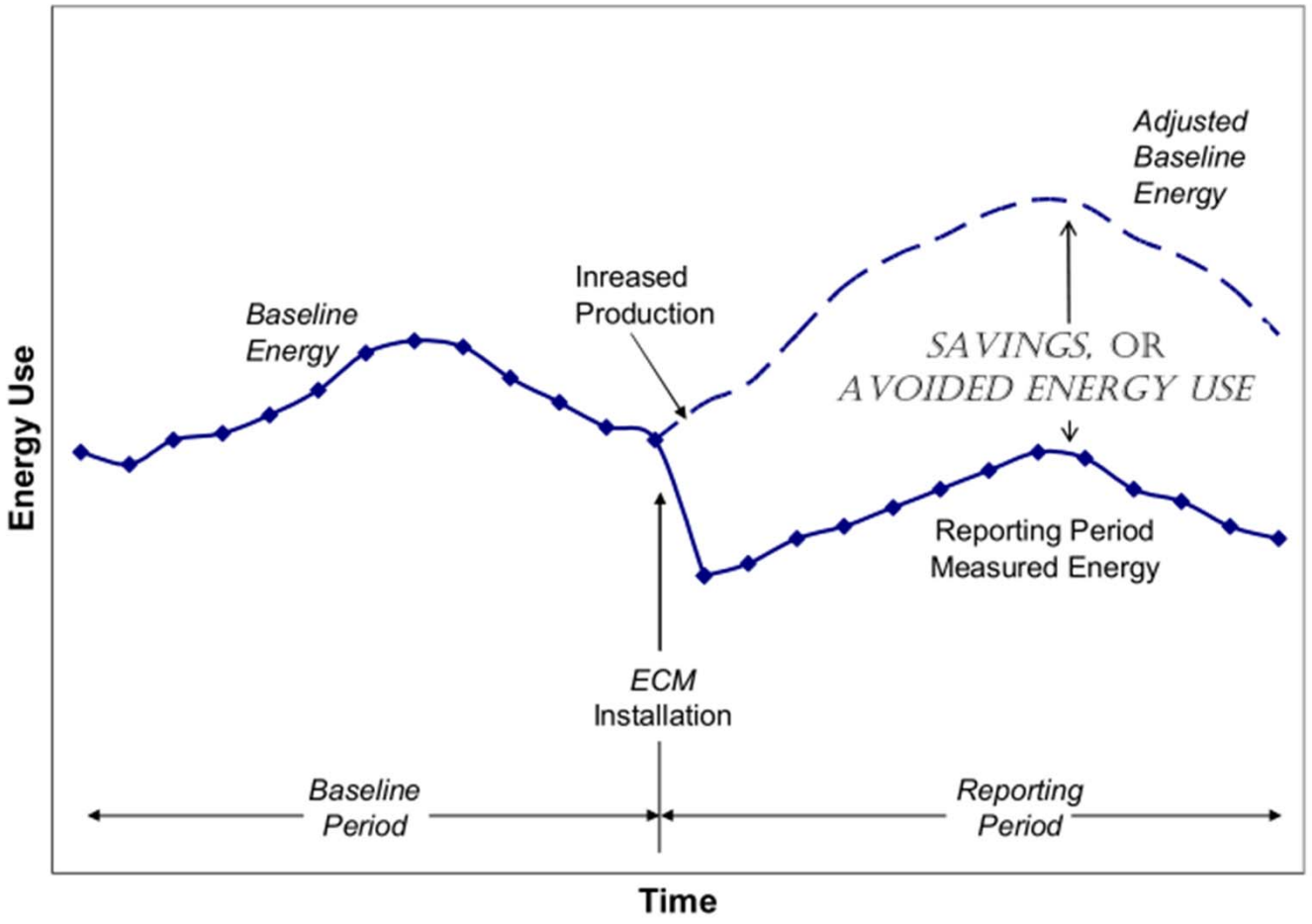
- Routine Adjustments
  - For energy-governing factors that might change routinely during reporting period such as weather and production volume.
- Non-routine Adjustments
  - For static factors not usually expected to change such as facility size and design and operation of installed equipment.
- Savings Equation

$$\textit{Savings} = (\textit{Baseline Energy} - \textit{Reporting-Period Energy}) \pm \textit{Routine Adjustments} \pm \textit{Non-Routine Adjustments}$$

Two Types of Saving

- Avoided Energy/Water Use
  - The reduction in energy/water use occurring in the reporting period, relative to what would have occurred if the facility had been equiped and operated as it was in the baseline period. Cost avoidance is the monetary equivalent of avoided energy/water use.
- Normalized Savings
  - The reduction in energy/water use or cost occuring in the reporting period, relative to what would have occurred if the facility had been equiped and operated under a normal set of conditions that may be defined as a long term average. Normal conditions may also be set as those prevailing during the baseline period, especially if they were used as the basis for predicting savings.

Example Energy History



Overview of IPMVP Options

IPMVP Option	How Savings Calculated	Typical Applications
A. Retrofit Isolation: Key Parameter Measurement	Measurements of key operating parameters of baseline and reporting period; routine and non-routine adjs can be made.	A lighting retrofit
B. Retrofit Isolation: All Parameter Measurement	Same as above, plus engineering computations or proxies of energy use.	A variable-speed drive and controls to motor to adjust pump flow
C. Whole Facility	Analysis of whole facility baseline and reporting period meter data; routine and non-routine adjs can be made.	A facility where multifaceted energy management programs affect many systems.
D. Calibrated Simulation	Energy use simulation and calibration with hourly or monthly utility billing data.	A facility with many systems affected by multifaceted energy program but no meter in baseline period.

Calculation of Savings

Option A: Retrofit Isolation

- Based on a measurement of only one key parameter.
- Equation:

  Savings = Stipulated Value × [Lifetime in years of the installed measure]

- Cost of Option A is usually less than other options.
- Common Applications: Lighting

Calculation of Savings (cont'd)

Option B: Retrofit Isolation

- Use additional meters to measure all parameters.
- Equation:

  Savings = [Baseline Period Energy/Water Use]
  – [Reporting Period Energy/Water Use]

- Option B is typically more costly than Option A.
- Common Applications: Boilers or other devices whose resource use can be isolated from other devices or activities contributing to a site's or all resource use.

Calculation of Savings (cont'd)

Option C: Whole Facility

- Involve use of utility meters, whole-facility meters or sub-meters.
- Equation:

  Savings = [Baseline Period Energy/Water Use]
  – [Reporting Period Energy/Water Use]
  ± f (weather, production volume, occupancy, etc.)

- Cost of Option C depends on the source of the energy data, and the difficulty of tracking static factors.
- Common Applications: Where energy performance of the whole facility will be assessed, not only the ECMs.

Calculation of Savings (cont'd)

Option D: Calibrated Simulation

- Estimate facility energy use based on computer simulation and comparing to calibration data.
- Equation:

  Savings = [Baseline energy/water from the calibrated model without CMs]

  – [Reporting-period energy/water from the calibrated model with CMs]

  If actual energy data are available for either baseline or reporting period,

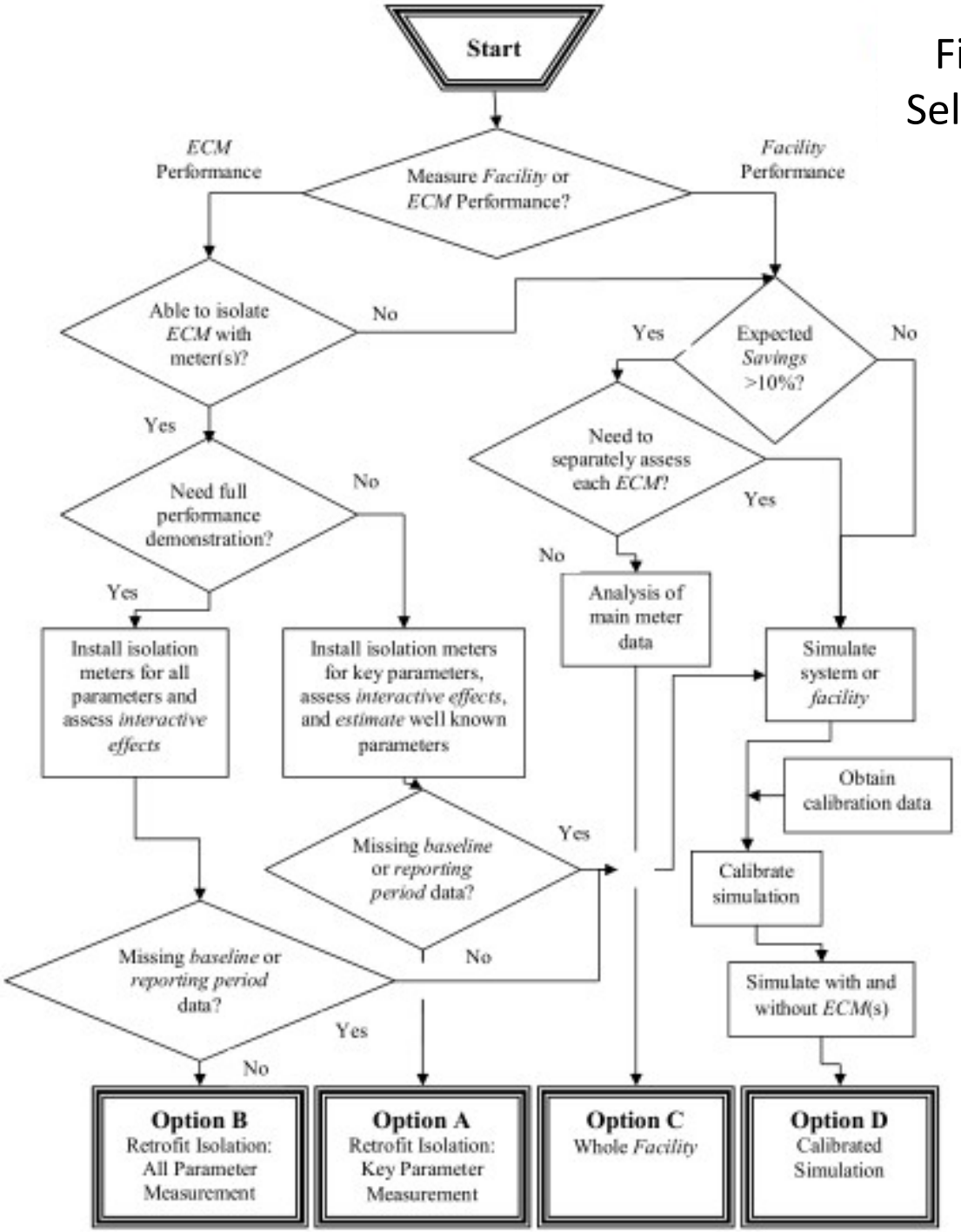
  Savings = [Baseline energy/water from the calibrated model without CMs]

  – [Actual calibration-period energy/water (with CMs)]

  ± [Calibration error in the corresponding calibration reading]

- Option D is costly due to challenges of accurate computer modeling and calibration.
- Common Applications: Where energy data of either baseline or reporting period, but not both, are unavailable or unreliable, such as a new facility.

Figure: Option Selection Process



Key Elements of M&V Costs

Option A	Fewer measurement points; simpler method of estimation; lower cost and higher uncertainty than B.
Option B	Length of the reporting period longer than A.
Option C	Less costly for long reporting periods and when multiple CMs are installed at one site.
Option D	Time-consuming and costly; but provides highly accurate estimates and is appropriate when designing complex retrofits.

Guidelines for Balancing Uncertainty and Costs

1. Low Energy Variation & Low-Value CM.
   - *Option A is preferred especially if reporting period is short.*
2. High Energy Variation & Low-Value CM.
   - *Option B is preferred due to relatively low cost of M&V especially when uncertainty level is low.*
3. Low Energy Variation & High-Value CM.
   - *Option A is suitable due to low level of uncertainty; Option C is also favored since it can keep M&V cost low while expecting high savings.*
4. High Energy Variation & High-Value CM.
   - *Options A and B can be used but may not be sufficiently accurate. Options C and D may be preferred on accuracy and uncertainty grounds.*