California Commissioning Collaborative

California Commissioning Collaborative Advisory Council Meeting

March 25, 2010

SMUD

Agenda

9:30 a.m.	Welcome, Introductions and Announcements	Don Frey, CCC Advisory Council Chair
9:50 a.m.	Report on Monitoring Systems Survey	Misti Bruceri, Misti Bruceri & Associates and Don Frey, CCC Advisory Council Chair
10:30 a.m.	BREAK	
10:45 a.m.	PIER PAC Meeting	Eliot Crowe, CCC Program Manager Beth Chambers, CEC Contract Manager
11:00 a.m.	PIER Project Highlight: Energy Performance Tracking Best Practices	Hannah Friedman, PECI
11:30 a.m.	PIER Project Highlight: Verification of Savings Guideline	David Jump, QuEST
12:00 p.m.	Lunch (Provided)	
1:00 p.m.	California's Benchmarking / Asset Rating Initiative	Martha Brook, CEC
1:30 p.m.	CCC Policy Initiative: Tactical Update	Brenda Hopewell, PECI
2:00 p.m.	2010 Projects Planning – Working Session	Don Frey, CCC Advisory Council Chair
3:15 p.m.	Advisory Council Meeting Adjourns	

Introductions & Announcements

ARRA Stimulus funding update (Martha Brook)

Board / Advisory Committee membership

Title 24 training for building departments (Tav Commins)

California Commissioning Collaborative

Commissioning Provider Survey Results: Including Monitoring Requirements in Title 24

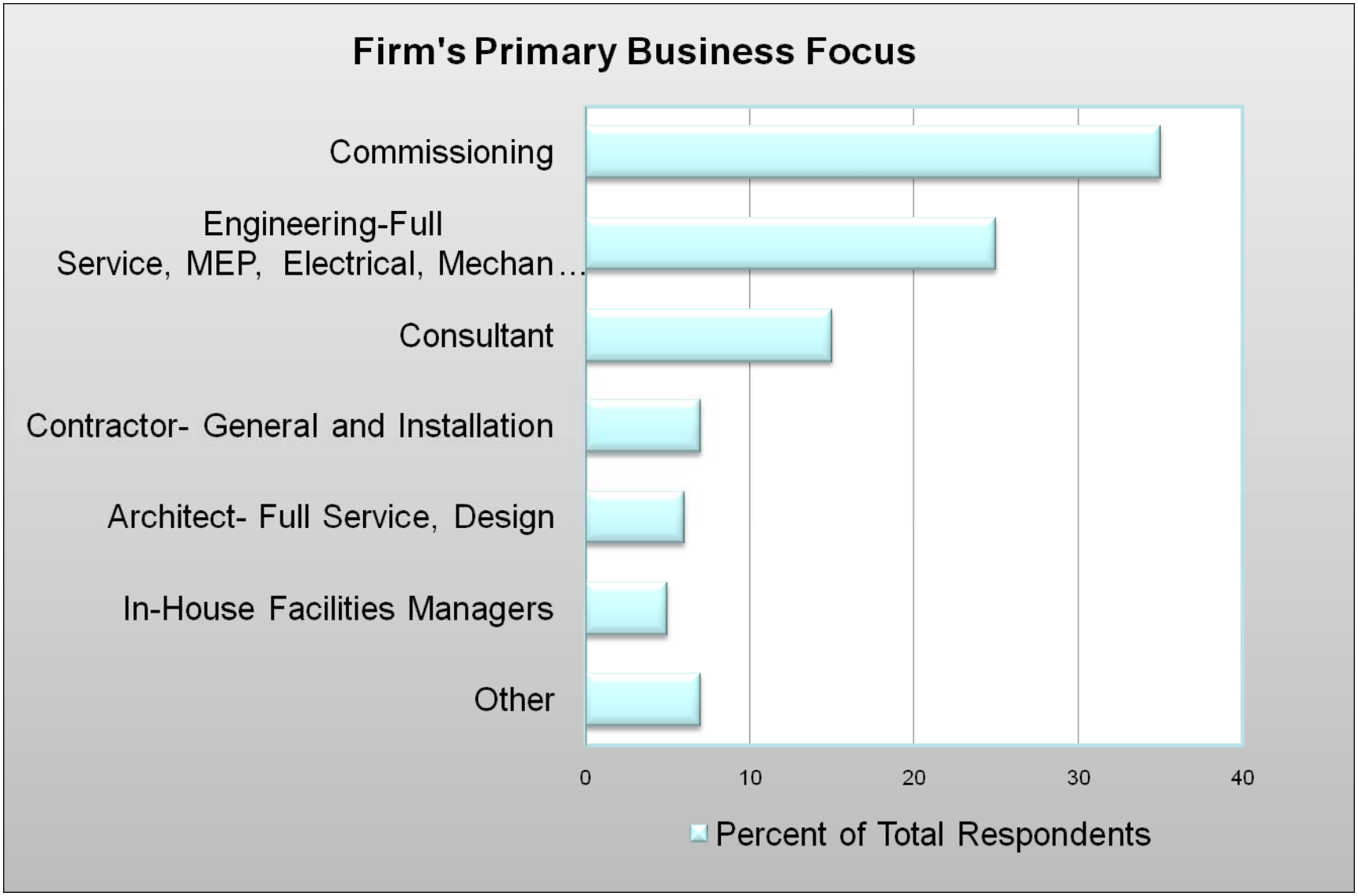
Presented by:
Misti Bruceri

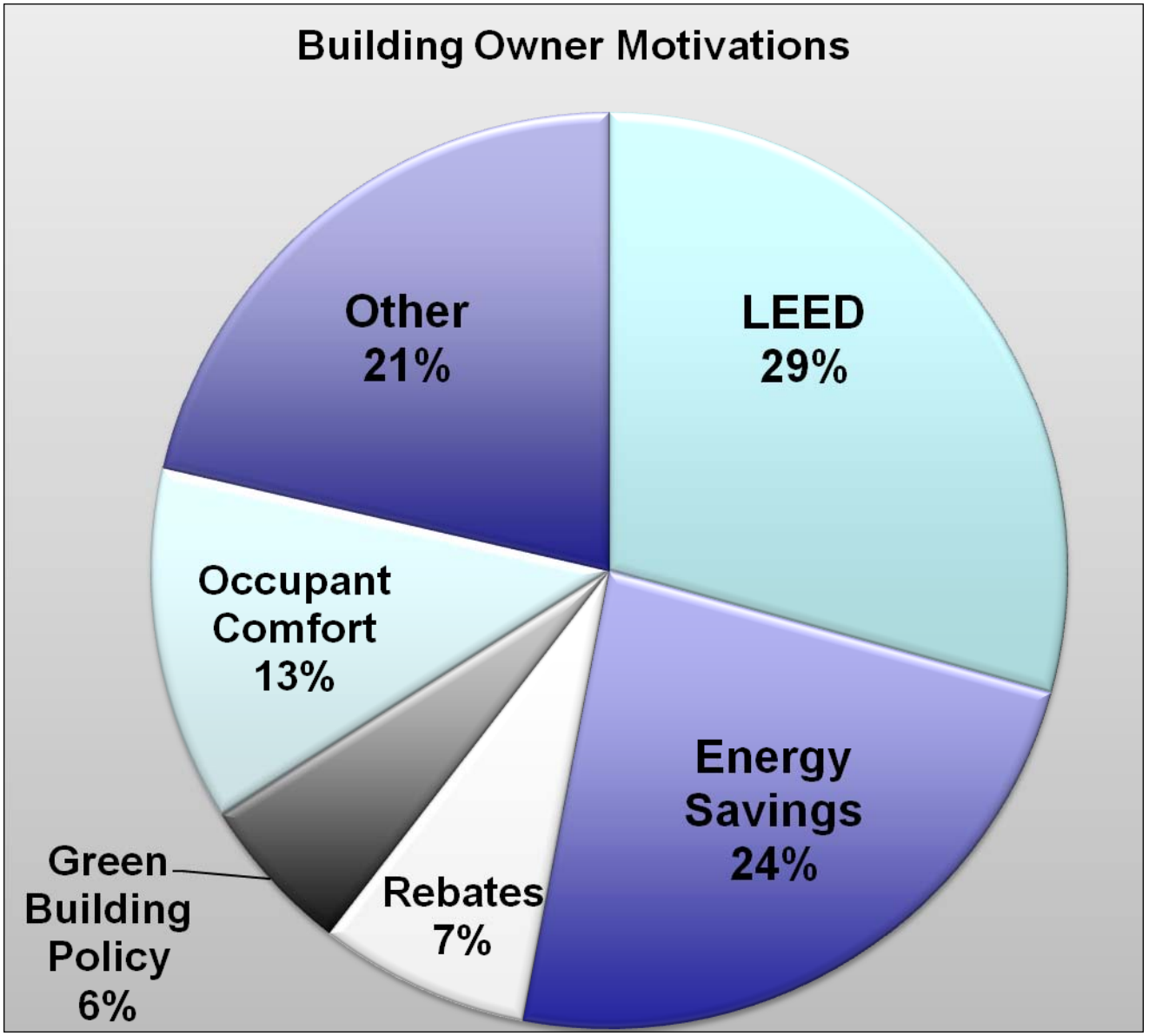
March 25, 2010

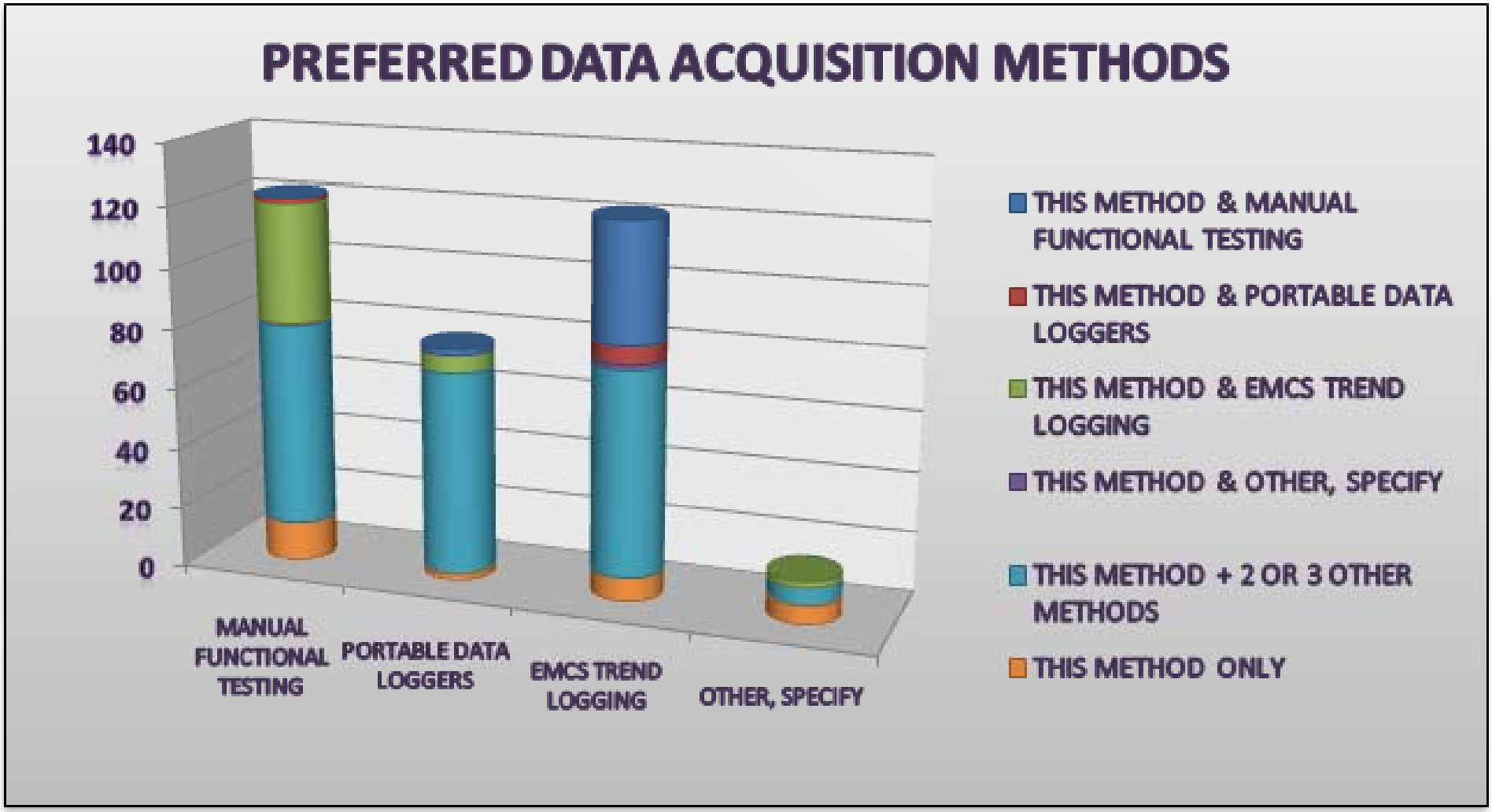
Commissioning Provider Survey

- Phase 1: Obtain information about existing practices, expertise, and challenges.
  - How do Providers typically use data?

- Phase 2: Identify specific code features
  - Triggers
  - Data collection
  - Data storage and accessibility.







Potential Impact of Data Collection Tools on Commissioning					
	1 (Little Effect)	**2**	**3**	**4**	**5 (Greatest Effect)**
Smart Meters	6	18	49	40	23
EMCS	2	3	17	56	**60**
Web-based EMCS	4	5	23	45	**61**
End-use meters	3	16	59	35	19
Interval metering	7	28	54	33	11
FDD w/ EMCS	8	17	43	35	29
Advanced Meters/Systems	6	14	40	44	26
Other	0	1	2	1	5

EMCS Systems

- Frequently a Problem
  - Inadequate Number of Points (39%)
  - Sensors Out of Calibration (34%)
- Never A Problem
  - Lost Data Caused by Erased Trends (25%)
  - Inconsistent Time Intervals or Inadequate Collection Frequency (23% each)

Additional Insights

- Data Points
- Web-based Systems
- Monitoring Duration and Intervals
- Integration
- Facility Characteristics
- Dashboard Displays

Phase 2: Code Requirements

- Triggers
  - New Buildings, Alterations
- Data Collection Intervals
  - Whole Building or Major System
- Data Storage and Accessibility
  - Duration
  - External
  - Web-based
  - Open Protocol

Potential Code Triggers

- New Buildings and Additions
  - Size
  - Fuel Usage (connected load)
  - System / Equipment Types
- Alterations
  - System / major equipment replacement
  - Upgrade or replacement of EMCS system
- Renewable Systems
  - Size or percent of load

Data Collection Intervals

- Whole Building and By System, Majority stated
  - 15 minutes adequate for most purposes
  - 1-minute or 5-minutes required for fault detection

Data Storage

- Duration
  - Same for all data
    - Two weeks to three years
- External Storage and/or Processing
  - Three support, two did not support

Data Accessibility

- Web-Based
  - Two support
  - One supports, but thought not code-ready
  - One undecided
  - One indicated potential logistical difficulties (some don't permit outside access to systems)
- Open Protocol
  - Three do NOT support
  - Two support, though not code-ready

Challenges and Options

- Challenge Quantifying Direct Benefits.
  - Savings requires human intervention
- Initial Options for Code Inclusion:
  - Require only for projects with EMCS systems
  - Include in Design-Phase Cx project
  - Partial inclusion through Acceptance Tests
  - Compliance credit

Next Steps / Recommendations

- Research cost implications of various options
- Identify potential opportunities to combine with other proposals
- Identify applicable Acceptance Tests (existing and proposed for 2011).
- Finalize recommendations for code features (triggers, data, etc.)

Draft Code Features

- Trigger
  - New construction and additions only?
  - Building size, type?
- Data Collection Intervals
  - 1, 5, or 15-minutes?
- Data Storage and Duration
  - External Storage?
  - 30 days to 36 months?
- Data Accessibility
  - Web-based?

For Reference Only

Expertise with Data Collection Technologies			
	Familiar but do not use regularly	**Competent expertise**	**High expertise**
EMCS	12	32	**90**
Portable Data Loggers	21	52	63
Energy Information Systems	44	51	36
FDD w/ EMCS	**59**	52	20
Advanced Meters / Systems	46	55	32
Interval Meters	**57**	44	30
Supervisory Control and Data Acq. (SCADA) System	**57**	49	25
Handheld Meters	10	37	**89**
Other	7	8	10

ASHRAE 189.1 Requirements

Table 7.3.3-1 Energy Source Meter Thresholds	Main Metering Threshold
Electrical service	> 200 kVA
On-site renewable energy power	All systems > 1 kVA (peak)
Gas and district services	> 300 kW (1,000,000 Btu/h)
Geothermal energy	> 300 kW (1,000,000 Btu/h) heating
On site renewable thermal energy	> 30 kW (100,000 Btu/h)

HVAC system	Connected electric load > 100 kVA
HVAC System	Connected gas or district services load > 500,000Btu/h (150 kW)
People moving	Sum of all feeders > 50 kVA
Lighting	Connected load > 50 kVA
Process and Plug	Connected load > 50 kVA
	Process connected gas or district services load > 250,000 Btu/h (75 kW)

Automatically communicate to data acquisition system.
Minimum hourly.
36 months storage, with reporting for hourly, daily, monthly and annual.

CALGreen Prescriptive Approach

504.2 Energy monitoring. Provide submetering or equivalent combinations of sensor measurements and thermodynamic calculations, if appropriate, to record energy use data for each major energy system in the building, including chillers, heat pumps, packaged AC systems, fans, pumps, cooling towers, boilers and other heating systems, lighting systems and process loads. This energy use data, once collected, shall be stored within a data management system.

504.2.1 Data storage. The data management system must be capable of electronically storing energy data and creating user reports showing hourly, daily, monthly and annual energy consumption for each major energy system. Hourly data shall be retained a minimum of 30 days, daily data shall be retained a minimum of 6 months and monthly data shall be retained a minimum of 2 years.

504.2.2 Data access. Hourly energy use data shall be accessible through a central data management system and must be available daily

Break

10:30 – 10:45 a.m.

California Commissioning Collaborative

CCC PIER Research Program:

"Building Commissioning: Strategies and Technologies for Energy Efficiency"

Program Advisory Committee (PAC) Meeting

March 25, 2010, SMUD

Commissioning CA Cx Collaborative

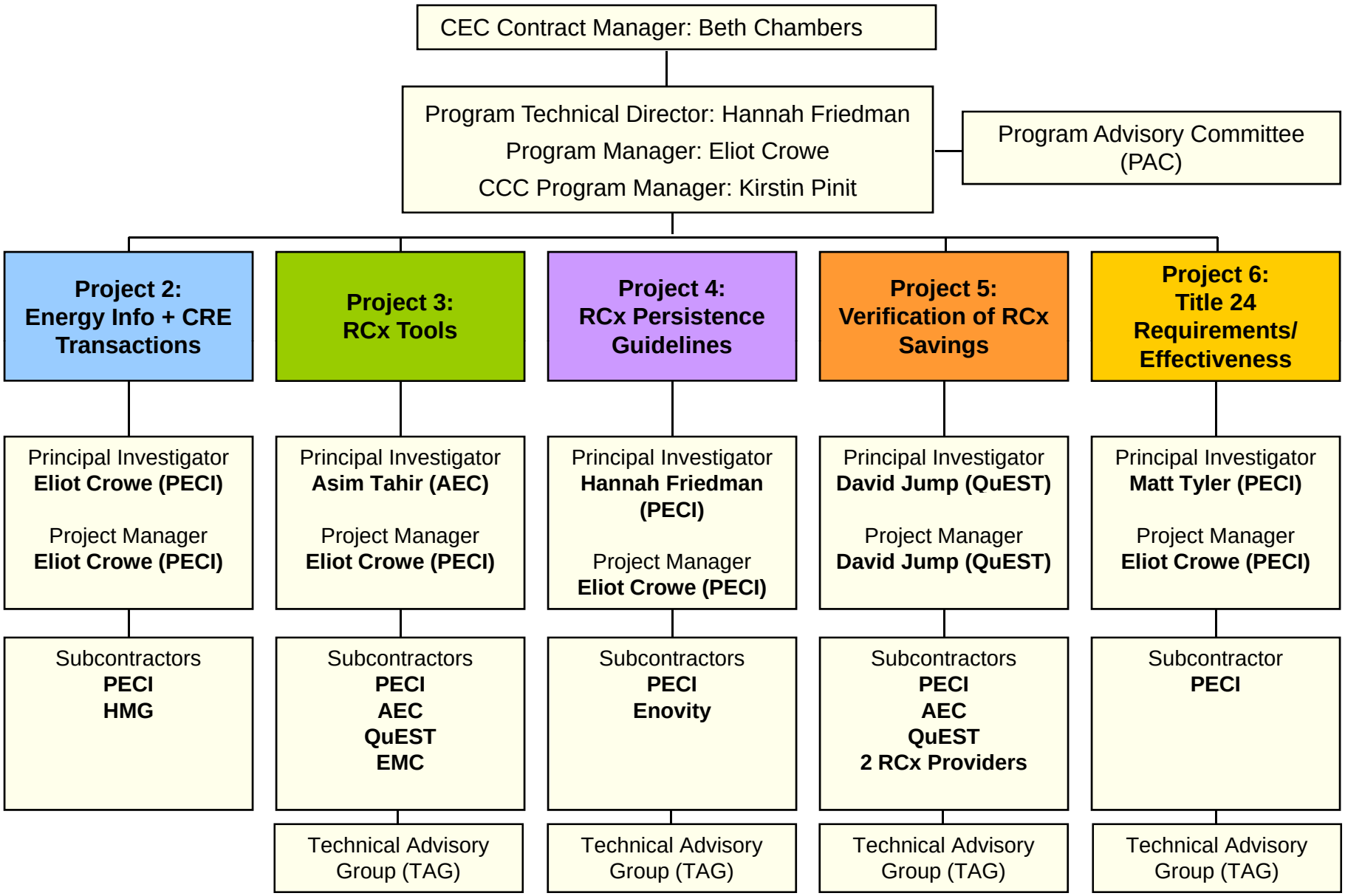
CA.GOV The California ENERGY COMMISSION

AGENDA

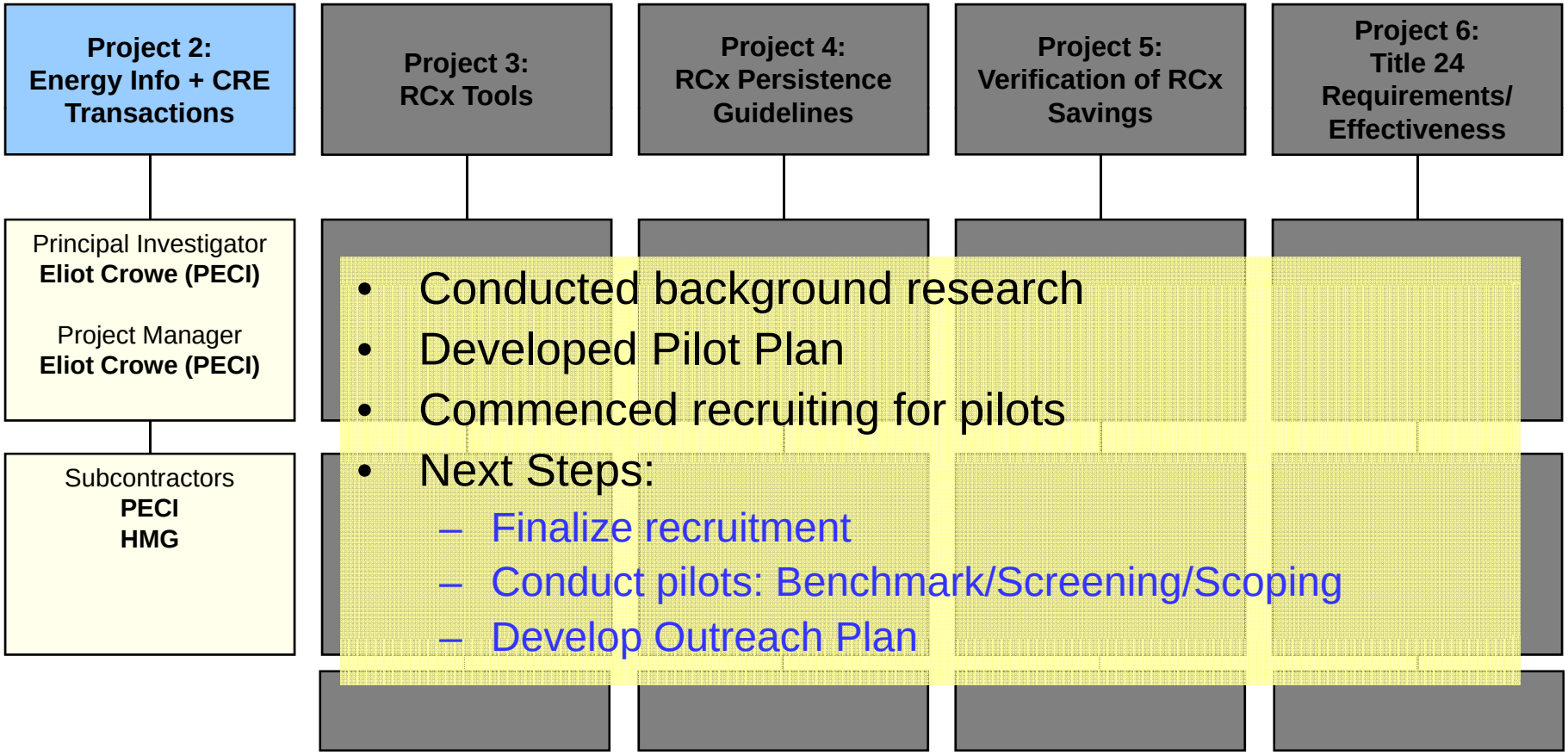
- General update from the Energy Commission
- Program refresher
- Brief progress update
- Project highlight: Project 4: *Improving Persistence of RCx Benefits (Hannah Friedman)*
- Project highlight: Project 5: *Guidelines for Verifying Existing Building Commissioning Savings (David Jump)*

CALIFORNIA ENERGY COMMISSION UPDATE

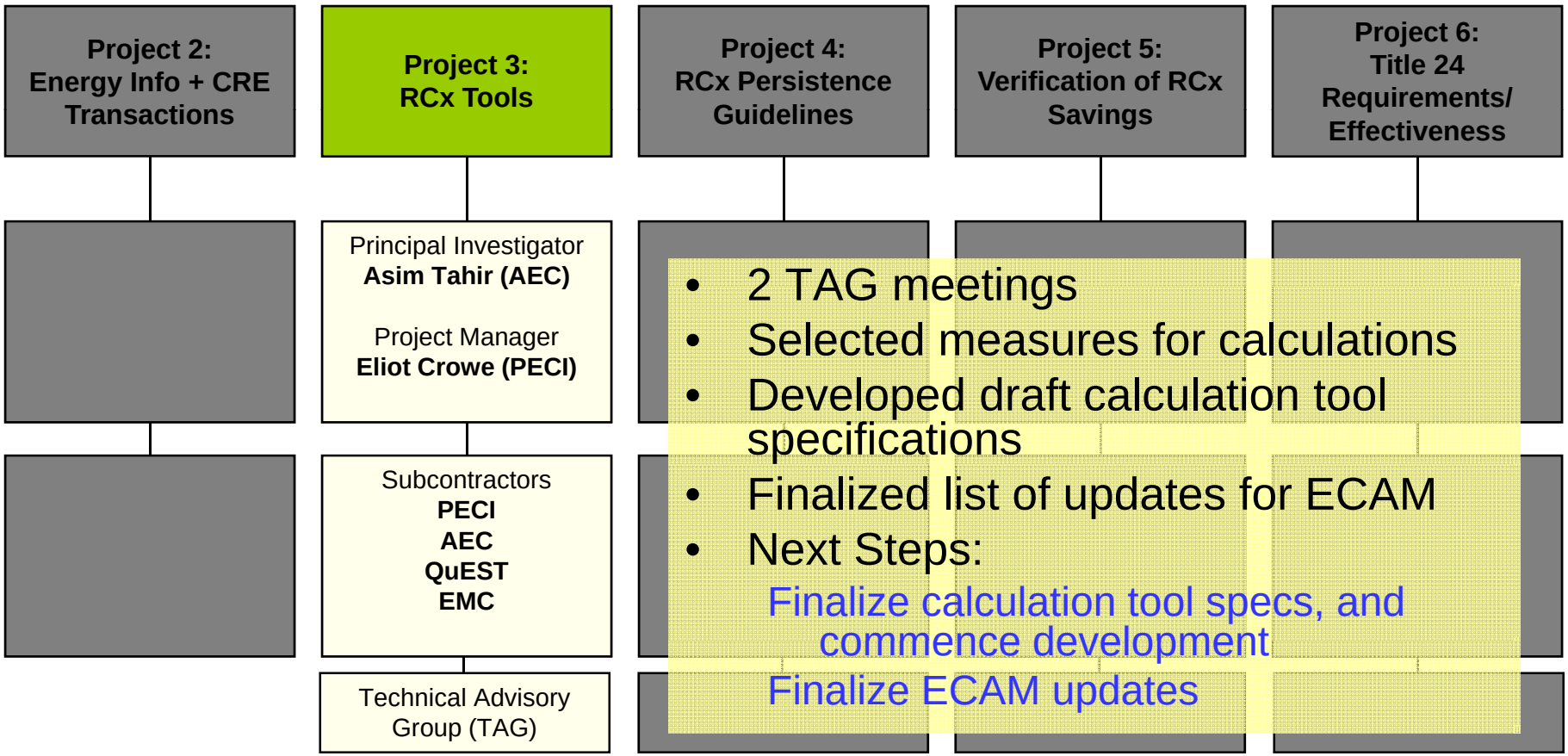
- Budget Update
- Technology Innovations in Buildings and Communities (TIBC#2) solicitation update
- PIER team leadership changes



Progress Update: Project 2: "*Integrating Energy Information into Commercial Real Estate Transactions*"

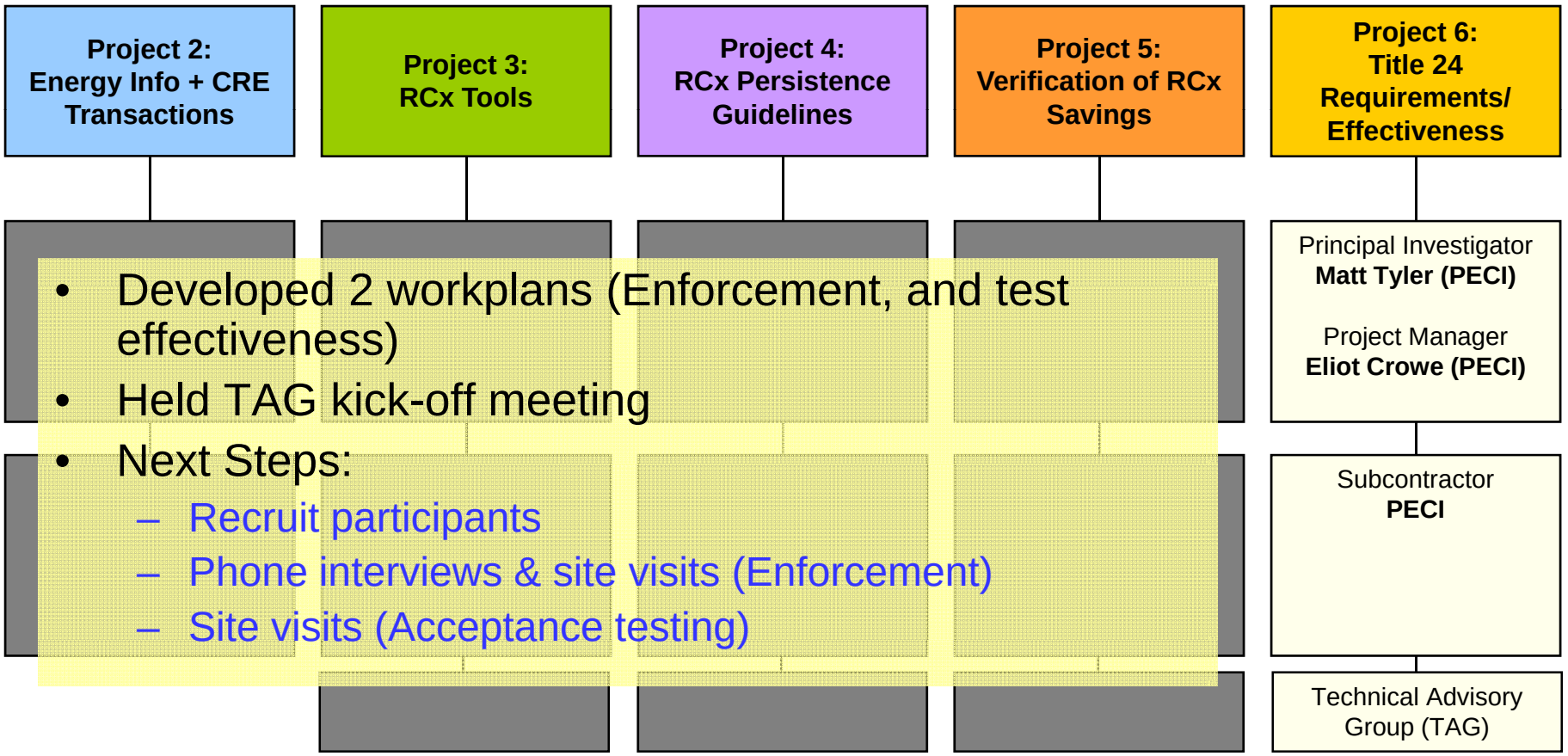


Progress Update: Project 3: "*EBCx Tools Development*"



- 2 TAG meetings
- Selected measures for calculations
- Developed draft calculation tool specifications
- Finalized list of updates for ECAM
- Next Steps:
  - Finalize calculation tool specs, and commence development
  - Finalize ECAM updates

Progress Update: Project 6: "*Evaluation of Title 24 enforcement, and effectiveness of acceptance tests*"



- Developed 2 workplans (Enforcement, and test effectiveness)
- Held TAG kick-off meeting
- Next Steps:
  - Recruit participants
  - Phone interviews & site visits (Enforcement)
  - Site visits (Acceptance testing)

PAC Co-Chairs

Beth Chambers
California Energy Commission
bhchambe@energy.state.ca.us
(916) 654 4070

Eliot Crowe
Portland Energy Conservation, Inc
ecrowe@peci.org
(503) 961 6123

ANY QUESTIONS?

California Commissioning Collaborative

CCC PIER Research Program:
"Building Commissioning: Strategies and Technologies for Energy Efficiency"

Project 4: Improving Persistence of Retrocommissioning Benefits

CCC Advisory Council Meeting

March 25, 2010

AGENDA

- Refresher
- Definitions
- Literature Review Results
- Phone Interview Results
- Update on FDD Tools Research
- Next Steps

PROJECT TEAM

PECI

- Hannah Friedman (Principal Investigator)
- Eliot Crowe (Project Manager)
- Tudi Haasl
- Dave Moser
- Mark Effinger
- Emilia Sibley
- Erik Greensfelder

Enovity

- Jonathan Soper
- Tim Fackler
- Joy Ulickey
- Eric Koeppel

Performance Tracking Research Objectives:

- Broader view than persistence of RCx measures
  - Whole building performance
- Gather information on performance tracking systems
  - Types and features
  - Relative benefits (energy savings/persistence) and costs
  - Both packaged tools and build-your-own solutions
  - What metrics are actually used?
- Develop case studies
- Develop guide on performance tracking system options
  - Describe minimum level of performance tracking
  - Describe best practices in performance tracking for different situations
  - Make early leader's actions accessible to others

Project Connections to Utility Programs

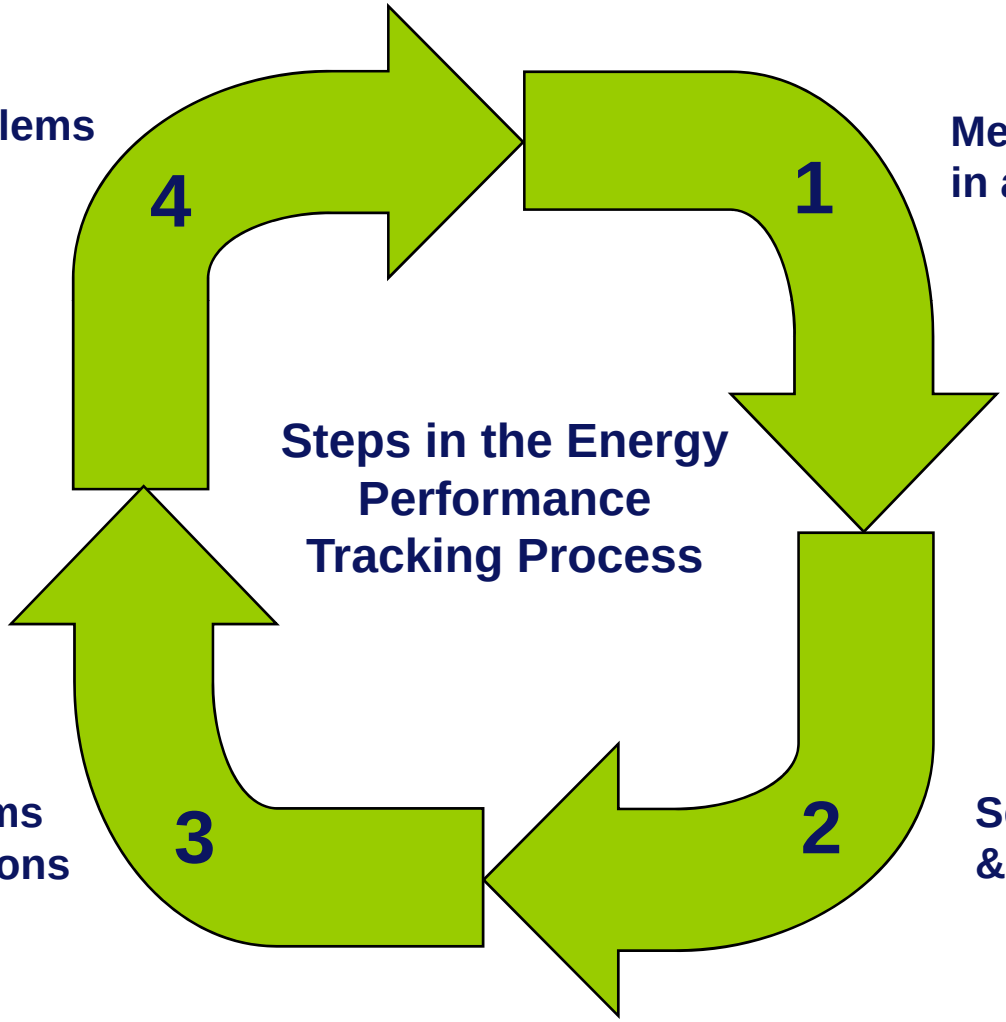
- Utilities may begin to offer EIS or FDD to customers as energy savings measure
  - Using performance tracking tools to elevate energy performance visibility can lead to behavior changes
- Utilities use of performance tracking systems to help ensure persistence of savings
  - Mechanism for ensuring persistence in EBCx/MBCx programs
- Key considerations in selecting the right system for the customer

PROJECT TASKS OVERVIEW

TASK	DESCRIPTION	START	END	TAG MEETING
4.2	Investigate Energy Performance Tracking Strategies (Market Research)	Sep 2009	May 2010	March 2010
4.3	Characterize FDD Tools (Enovity)	Sep 2009	May 2010	May 2010*
4.4	Gather and Define Performance Metrics	Jan 2010	Jul 2010	June 2010*
4.5	Develop Performance Tracking Guide	Sep 2009	Dec 2010	Oct 2010*
4.6	Perform Outreach	Jun 2010	Jul 2011	N/A

* Provisional

PERFORMANCE TRACKING PROCESS



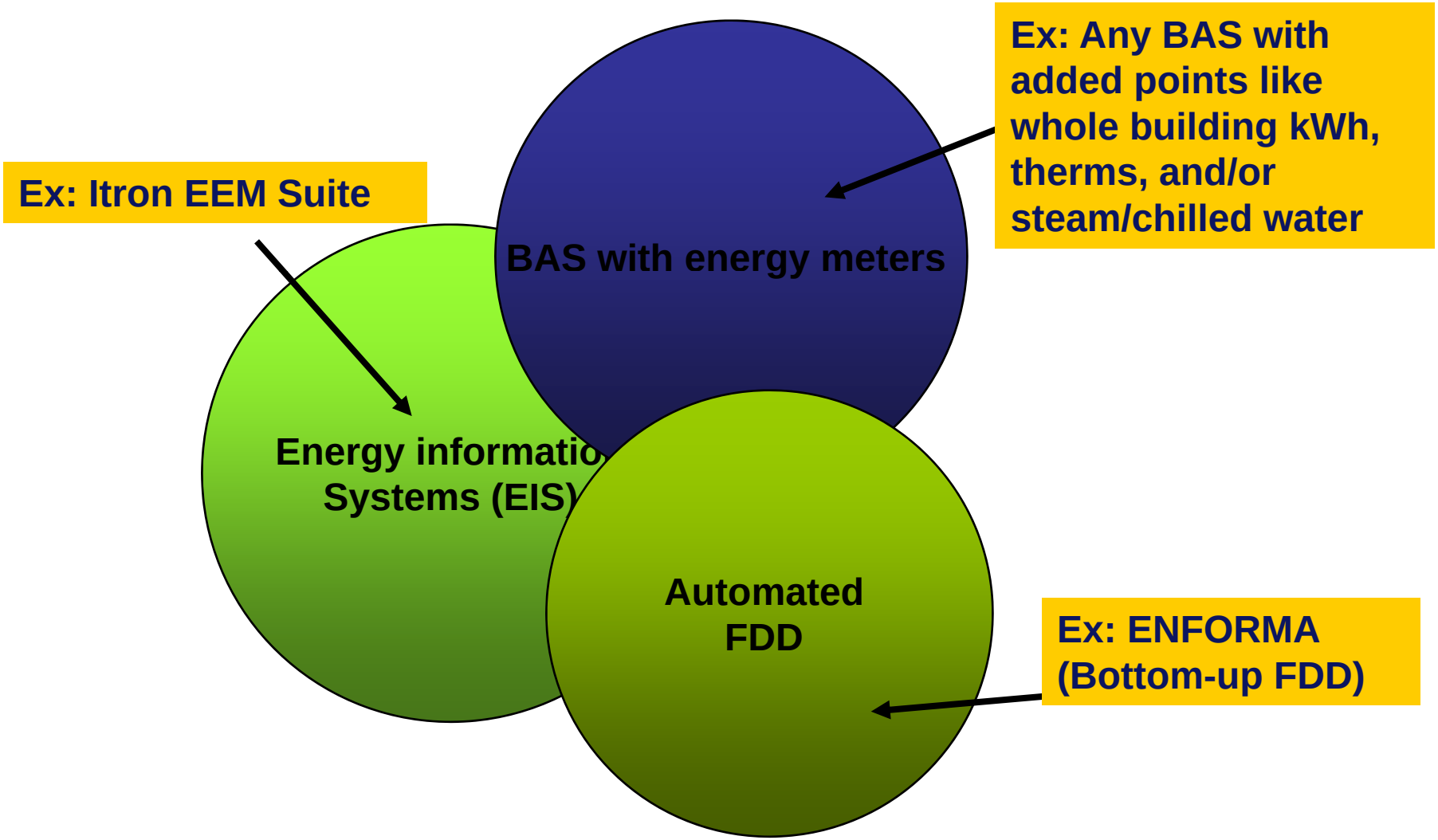
Basic Definitions: Performance Tracking Tool Categories

- Benchmarking
  - energy consumption comparison with itself or other similar buildings
- EIS (Energy Information Systems)
  - records, monitors, processes and displays energy data
- BAS with energy monitoring
  - existing control system connected to energy meters
- Automated Fault detection and diagnostics (FDD)

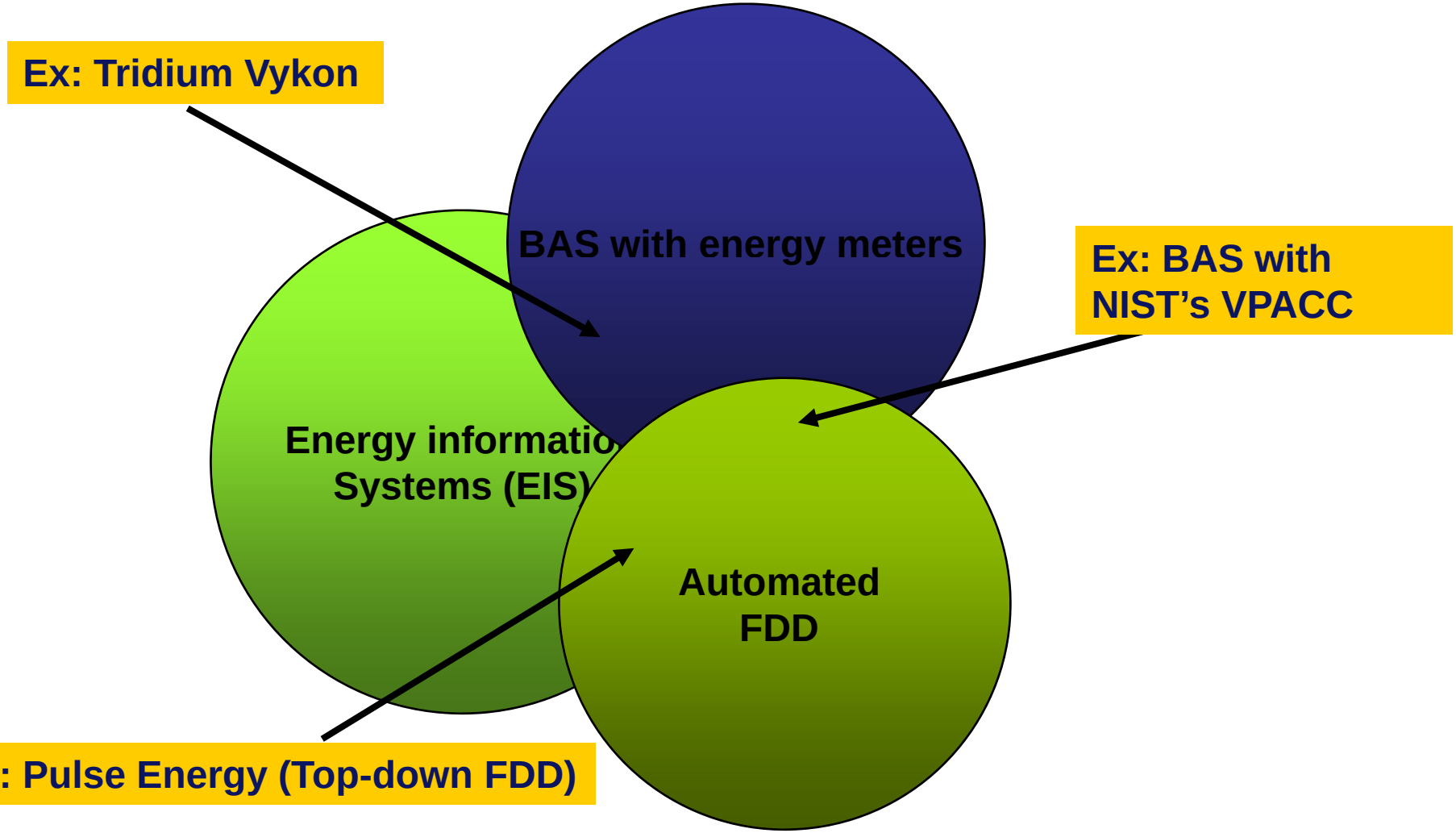
Automated FDD Approaches

- Top-down approach: whole building level
  - Uses meter data to create models
  - Detects deviation from expected consumption
  - Detection only
- Bottom-up approach: equipment level
  - Uses BAS data & expert rules
  - Detection and help with fault diagnosis (determining cause of the problem)

Relationship among strategies



Relationship among strategies



LITERATURE REVIEW FOCUS

- Types of documents reviewed
  - Information on PT strategies: Benchmarking, EIS, FDD, MBCx-like
  - Persistence studies (SMUD, Texas A&M, SBW)
  - Energy mgmt guides/training (BOMA, ESTAR, NEEA)
- Costs and benefits (qualitative and quantitative)
- Successes, challenges, and barriers
- Lessons learned and recommendations

LITERATURE REVIEW RESULTS

Themes

- Tracking energy performance a missing component of most efficiency programs
- Limited details regarding how to act on monitored data
- Lack of cost/benefit data
- Lack of operator time, training, information were common challenges

- No performance tracking guides for owners available
  - A few paragraphs within most Cx guides

PHONE INTERVIEWS

- 16 interviews conducted to date (goal 10-15)
- Interview candidates
  - property or energy managers, national energy directors, building operators
- Building types were generally office (a few campus style arrangements)
  - Currently recruiting MBCx participants and more sites with BAS + energy metering

PHONE INTERVIEWS

- Major tracking strategies reported
  - Monthly Benchmarking (Portfolio Manager, in-house spreadsheets)
  - Whole building monitoring with fault detection (Northwrite, Pulse Energy, Stonewater)
  - Service contracts (MACH Energy, EnergyCAP, Constellation)
  - BAS with energy tracking (Tridium Vykon)

PHONE INTERVIEWS: FINDINGS

- Predominant tracking inputs = monthly utility bill data
- Simple benchmarking successful where supported by management and defined policies
- Connection to work orders a motivator
- Difficulty identifying users of ‘bottom-up’ tools
- Cases identified of sophisticated tools that are no longer used or highly underutilized
  - No time to use/learn
  - No trained staff
  - No knowledge of the previous installation (aligns with a finding from the literature review – lack of information transfer)

PHONE INTERVIEWS: BEST PRACTICES INITIALLY IDENTIFIED

- Information transfer to all levels
  - tenant to corporate
- Defined procedures and responsibilities
  - who is accountable to react, when, and how
- Selecting tools that meet multiple needs and are easy to use
  - Billing payment services, DR capability
- Energy manager turnover is key!

FAULT DETECTION & DIAGNOSTIC (FDD) TOOLS RESEARCH – ENOVITY

- Summary of tools to be researched in depth
- Themes and highlights from initial research

FDD TOOLS SELECTED FOR INVESTIGATION

- Multiple Systems Bottom-up/Expert Rules
  - PACRAT (Facility Dynamics)
  - ENFORMA (AEC)
  - APAR/VPACC publically available toolsets (NIST)
  - Infometrics (Cimetrics)
  - SCIwatch (Scientific Conservation) – also includes top-down
  - Metasys Sustainability Manager (JCI)
  - Envision for BACtalk (Alerton)
- System-specific Bottom-up
  - Efftrack (Efftec) – chilled water systems
  - Service Assistant (FDSI) – Packaged RTU
- Top-down/Whole building models
  - Pulse (Pulse Energy)
  - Energy Expert (Northwrite)

FDD TOOLS RESEARCH: THEMES

1. Large variety in depth and complexity.
2. Fewer of these toolsets deployed than anticipated.
3. No vendors gave any cost information on their product.
4. Slower evolution of these tools since 2001 than expected.

Next Steps

- 4-6 Site Interviews
- Complete FDD research
- Research on key performance metrics
  - Literature review
  - Mapping out recommended metrics by system type
- Write Energy Performance Tracking Guide and case studies
- Outreach

More Research is Needed

- Study persistence of savings from RCx projects
  - Have gathered the persistence studies
  - SBW's RCx evaluation persistence study was limited in scope
- Study energy savings related to the performance tracking systems themselves
  - Have gathered reported savings; anecdotal
  - No protocol for attribution of savings to performance tracking/energy information system

QUESTIONS….?

ENERGY PERFORMANCE TRACKING GUIDE

- User-friendly format for different audiences
  - Building Owners/Investment decision-makers, Energy Managers, Building Operators
- Checklists
  - Based on current/intended management structure, systems complexity, and cost:
    - Choosing an approach
    - Selecting a tool (or making your own)
    - Integrating the tool into everyday practice
- Guide will include
  - Business Case
  - Foundations for Performance Tracking (Process, mgmt systems)
  - Overview of Approaches / Choosing approach
  - Details on the Approaches
  - Case Studies

California Commissioning Collaborative

California Commissioning Collaborative
CEC Project 5
Guidelines for Verifying Existing Building Commissioning Project Savings

March 25, 2010

David Jump, QuEST

Project Purpose

Develop "***Guidelines for Verifying Existing Building Commissioning Project Savings.***"

Provide guidance for EBCx projects on:

- Verification methods
- Selecting and implementing appropriate methodologies

Establish higher levels of confidence in the benefits of existing building commissioning

Objectives of Project

- Develop additional verification methodologies
- Refine the CCC's existing verification guidelines
  - Use feedback from two demonstration projects improve the existing B/C methodology.
- Develop criteria and guidance on selecting appropriate verification methods
- Compile the verification guidelines and selection criteria as chapters in a book format

Purpose and Stakeholders

- Provide standardized methods to verify savings specifically for EBCx projects
  - Support CA programs
  - Increase confidence in EBCx savings
- Stakeholders:
  - service providers
  - program managers, building owners
  - technical reviewers
  - program evaluators

Project Team

Quantum Energy Services & Technologies, Inc. (QuEST)

- David Jump (Lead)
- Amelia Schmale
- Bill Koran

Portland Energy Conservation, Inc. (PECI)

- Lia Webster
- Mark Effinger
- Emilia Sibley

Coming soon:

Architectural Energy Corporation (AEC)

Main Tasks

Convene a Technical Advisory Group

Pilot the Option B/C (Interval Data) Verification Methodology

Develop Methods Matrix and Evaluation Framework

Apply the Evaluation Framework to evaluate ten verification methods

Develop method selection procedure

Complete Final “Guideline for Verifying Existing Building Commissioning Project Savings”

Conduct Industry Outreach Activities

Project Background/History

Verification of Savings project 2008

Phase I

- ID stakeholder needs
- Research existing methods
- Method categorization framework

Project Background/History

Verification of Savings project 2008

Phase II

Developed: "Guideline for Verifying Existing Building Commissioning Project Savings – Using Interval Data Energy Models: IPMVP Options B and C"

- www.cacx.org, link in recent documents box

Verification Methods Matrix

Rigor (Least to Most)	Method	Description	RCx project requirements	Pros	Cons
1	Benchmarking	• Whole building energy use per square foot is calculated and often weather-normalized for both the baseline and post-ECM implementation periods, and savings is determined as the difference between the two benchmarks.	• 12 months of utility data (usually monthly utility data) for both baseline and post-ECM periods	• Minimal effort required: • websites provide good user interfaces and weather-normalization engines • Can obtain LEED-EB credits for good benchmark scores (i.e. Energy Star) • No special monitoring, only customer's monthly billing records for 24 months needed	• Does not take into account important driving factors (e.g. schedule changes, weather effects, occupancy changes, etc.) • Combines electric and heating energy sources, cannot determine savings per energy source • Cannot determine savings separatly for end-uses (HVAC, lighting, etc.) or infdividual measures • 12 months are required after implementation to determine the new benchmark, project schedules often preclude this option
3	Engineering Calculation & Visual Verification	• These are ex-ante calculations based on data collected before the ECMs are installed • Calculations require an estimate of baseline energy use as well as an estimate of post-ECM energy use. These usages are determined from operational data, engineering models, and assumptions, and not on direct measurements of system energy use. • The engineering methods can vary widely (e.g. bin analysis, engineering models based on equipment performance characteristics, etc.) • Implementation of ECMs is verified with visual inspection • Ex-ante savings estimates are not updated with post-ECM performance data	• System configurations, equipment capacities and performance characteristics, operation schedules, etc. • Time-series data over a majority of equipment or building operation ranges using independently installed loggers or trends from building energy management systems • Spreadsheets, building simulation programs, equipment operation simulation programs	• Reduced cost by eliminating/reducing post-ECM measurement requirements and calculations • Savings are determined on a measure level - fits efficiency program paradigm	• Accuracy of energy use/predictions are not assured • Deviations from original assumptions are not captured in the savings estimate • Actual performance of ECM may not be verified

Evaluation Framework

- What are important criteria?
- How should criteria be applied (to select a VoS method)?

Main category	Key Metrics
Stakeholder Objectives	Accuracy
	Quantification of uncertainty
	Granularity of Savings
	Overall savings captured
	Continuous diagnostics
	Formal method
Constraints	Required baseline data (type)
	Required baseline data (quantity)
	Required post-ECM data (type)
	Required post-ECM data (quantity)
	Tools required
	Labor (expertise required)
	Labor (level of effort)
	Requires consistent building operation?
	Requires high level of savings (>5-10% of whole building)

Evaluation Framework Scorecard

Chapter Title	Method	Objectives						Constraints								
		Relative Accuracy (1-5)	Quantified Uncertainty (yes/no)	Granularity of Savings (whole building, system, measure)	Savings Interactions Captured (yes/no)	Persistence (repeat, continuous, no)	Formal method (IPMVP, ASHRAE)	Required Baseline Data (Type)	Required Baseline Monitoring Time (Quantity)	Required Post-ECM Data (type)	Required Post-ECM Monitoring Time (Quantity)	Basic tools required (type)	Labor - Expertise required (type)	Labor - Level of effort (1-5)	Consistent building operation (Yes/No)	High level of savings (Yes/No)
N/A	Benchmarking	1	No	Whole building	Yes	Continuous	No	Monthly data	12 months	Monthly data	12 months	Spreadsheet	Data entry	1	Yes	Yes
N/A	Deemed Savings	1	No	Measure	No	No	No	Physical inputs	0	Photos	0	Spreadsheet	Data entry	1	No	No
Method 1: Enginering Calcs with Field Verification	**Engineering Calcs & Visual Verification**	1-3	No	System Measure	No	Repeat	No	Nameplate, Physical inputs and/or Performance data	spot measurement or up to 1-4 weeks	Photos	0	Logging tools Spreadsheet or Simulation software	Engineer	2-3	No	No
	Engineering Calcs & Performance Verification	2-4	No	System Measure	No	Repeat	No	Nameplate, Physical inputs and/or Performance data	spot measurement or up to 1-4 weeks	Performance data	spot measurement or up to 1-4 weeks	Logging tools Spreadsheet or Simulation software	Engineer	3	No	No
Method 2: Equipment or End-use Energy Measurement	**Option A: Key Parameter Measurement**	2-4	No	System Measure	No	Repeat	IPMVP	Measured physical inputs and Energy performance data	spot measurement or up to 1-4 weeks	Energy performance data	spot measurement or up to 1-4 weeks	Equipment performance curves Spreadsheet	Engineer	3	No	No
	Option B: All Parameter Measurement	4	Yes	System Measure	No	Repeat	IPMVP ASHRAE GL-14	Measured physical inputs and Energy performance data	1-4 weeks	Energy performance data	1-4 weeks	Logging tools Spreadsheet or Simulation software	Engineer	4	No	No

Selected Methods

1. Engineering Calculations with Field Verification
2. Equipment or End Use Energy Measurement
3. Energy Models Using Interval Data
4. Calibrated Simulation

- Methods 2, 3, and 4 adhere to IPMVP

Detailed Outline

- Introduction
- Background
- Selecting a Method
- Engineering Calculations with Field Verification
- Equipment or End Use Energy Measurement
- Energy Models Using Interval Data
- Calibrated Simulation

Detailed Outline

- ***Method 1. Engineering Calculations with Field Verification (5-10 pages)***

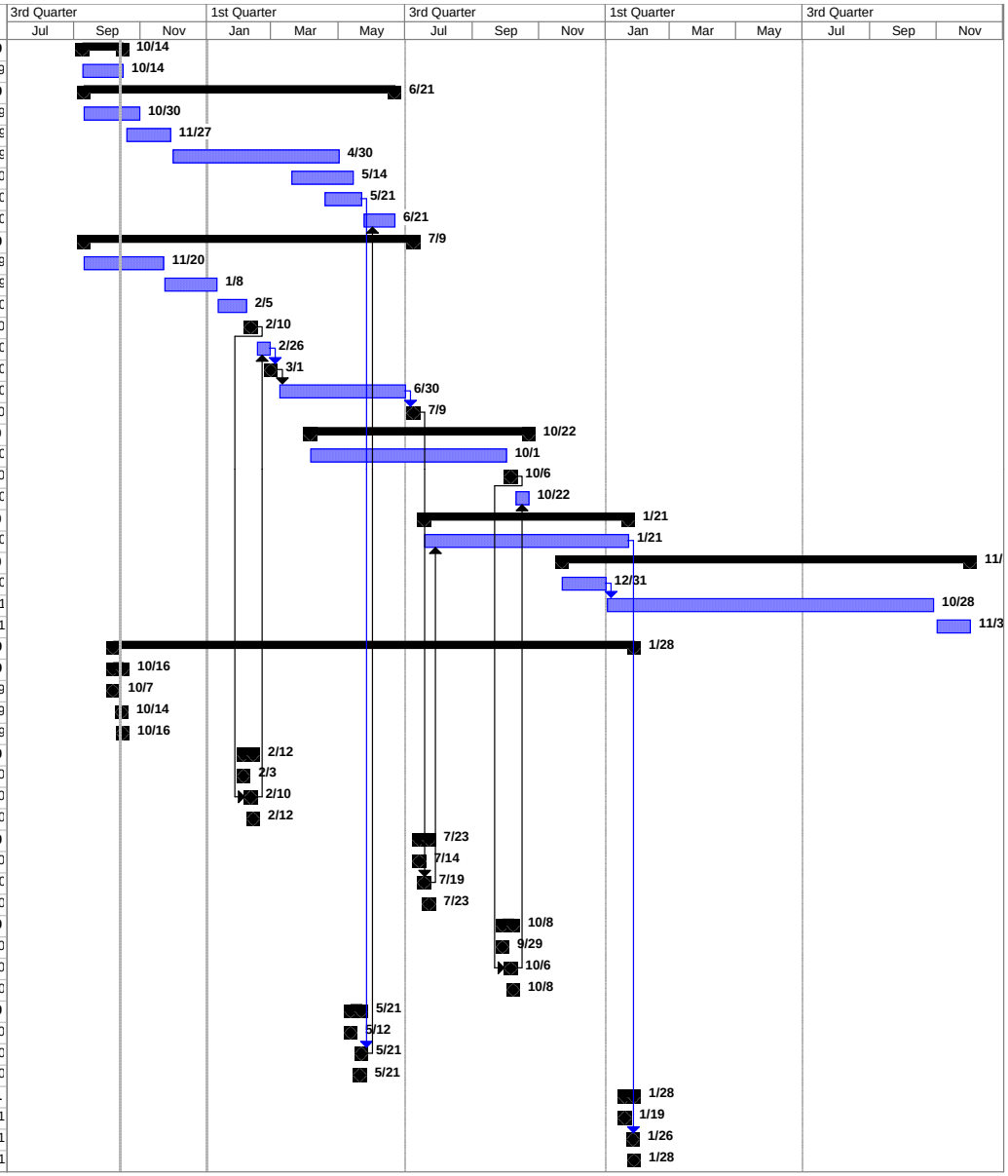
- Overview of Approach
  - Relationship to formal guidelines
- How Key Risks Addressed
  - Savings aren't realized
  - Savings less than expected
  - Savings don't last
- Verification Process
  - Graphic representation / flow chart
- Required Resources & Costs
  - Data requirements
  - Labor expertise
  - Other required project conditions
- Analysis Methods
  - General discussion of common industry practice
    - Bin methods
    - Engineering models
    - Etc.
- Applications and Other Considerations

Status: Pilot Implementation Projects

- Two experienced EBCx firms to read existing B/C Guideline and implement strategies
  - EMC Engineers
  - EnerNOC
- Use data from completed projects
  - Compare to predicted savings
- Understand costs of M&V strategy
- Provide feedback to update B/C Guideline
- Develop two case studies

Schedule

ID	Task Name	Duration	Start
1	**Task 5.1 Convene TAG and Hold TAG Meeti**	**26 days**	**Wed 9/9/09**
2	Task 5.1.1 Invite Stakeholders for TAG	26 days	Wed 9/9/09
3	**Task 5.2 Pilot the Option B/C Verification M**	**203 days?**	**Thu 9/10/09**
4	5.2.1 ID and select projects	37 days	Thu 9/10/09
5	5.2.2 Develop Pilot Implementation Plan	30 days	Mon 10/19/09
6	5.2.5 Conduct the Pilots	110 days	Mon 11/30/09
7	5.2.6 Interview Participants	41 days	Fri 3/19/10
8	5.2.7 Develop Pilot Summary Report	25 days?	Mon 4/19/10
9	5.2.8 Develop Two Case Studies from Pilc	21 days?	Mon 5/24/10
10	**Task 5.3 Plan and Develop Methodologies**	**216 days?**	**Thu 9/10/09**
11	5.3.1 Evaluation Framework	52 days?	Thu 9/10/09
12	5.3.2 Evaluate EBCx methods	35 days?	Mon 11/23/09
13	5.3.3 Detailed Outline of Final Guideline	20 days?	Mon 1/11/10
14	5.3.4 Methods Matrix- TAG Meeting #2 Pr	0 days	Wed 2/10/10
15	5.3.5 Critical Project Review report	10 days?	Mon 2/15/10
16	5.3.6 Critical Project Review- finalize selec	0 days	Mon 3/1/10
17	5.3.7 Develop Selected Methods	83 days?	Mon 3/8/10
18	5.3.8 Present Draft Guidelines TAG Meeti	0 days	Fri 7/9/10
19	**Task 5.5 Develop Procedure for Selecting V**	**145 days?**	**Mon 4/5/10**
20	5.5.1 Draft Method Selection Procedure	130 days?	Mon 4/5/10
21	5.5.2 Review Draft at TAG Meeting #4	0 days	Wed 10/6/10
22	5.5.3 Updated Goals and Resources of Me	10 days?	Mon 10/11/10
23	**Task 5.6 Finalize Guidelines**	**135 days?**	**Mon 7/19/10**
24	5.6.1 Final Guidelines for Verifying Existin	135 days?	Mon 7/19/10
25	**Task 5.4 Conduct Industry Outreach Activiti**	**268 days?**	**Mon 11/22/10**
26	5.4.1 Develop Outreach Plan	30 days?	Mon 11/22/10
27	5.4.2 Implement Outreach Plan	215 days?	Mon 1/3/11
28	5.4.3 Write Outreach Summary Report	22 days?	Tue 11/1/11
29	**Task 5.1.2 Convene TAG 6 times**	**342 days**	**Wed 10/7/09**
30	**Meeting 1**	**7 days**	**Wed 10/7/09**
31	Distribute Agenda	0 days	Wed 10/7/09
32	Hold Meeting	0 days	Wed 10/14/09
33	Meeting Minutes	0 days	Fri 10/16/09
34	**Meeting 2**	**7 days**	**Wed 2/3/10**
35	Distribute Agenda and materials (ref	0 days	Wed 2/3/10
36	Hold Meeting	0 days	Wed 2/10/10
37	Meeting Minutes	0 days	Fri 2/12/10
38	**Meeting 3**	**7 days**	**Wed 7/14/10**
39	Distribute Agenda and materials (ref	0 days	Wed 7/14/10
40	Hold Meeting	0 days	Mon 7/19/10
41	Meeting Minutes	0 days	Fri 7/23/10
42	**Meeting 4**	**7 days**	**Wed 9/29/10**
43	Distribute Agenda and materials (ref	0 days	Wed 9/29/10
44	Hold Meeting	0 days	Wed 10/6/10
45	Meeting Minutes	0 days	Fri 10/8/10
46	**Meeting 5**	**8 days**	**Wed 5/12/10**
47	Distribute Agenda and materials (ref	0 days	Wed 5/12/10
48	Hold Meeting	0 days	Fri 5/21/10
49	Meeting Minutes	0 days	Fri 5/21/10
50	**Meeting 6**	**7 days**	**Wed 1/19/11**
51	Distribute Agenda and materials (ref	0 days	Wed 1/19/11
52	Hold Meeting	0 days	Wed 1/26/11
53	Meeting Minutes	0 days	Fri 1/28/11



Progress and Next Steps

Completed

- Evaluation Framework
- Detailed Outline
- Tag Meetings
  - 2 of 5 completed
  - Methods & Detailed Outline approved
- Pilot firms selected

Next

- Feedback from pilots
- Draft Methodology Chapters

Later

- Method selection
- Industry outreach

- Questions? Comments?

Thank you!

Lunch

12:00 – 1:00 PM

California's Benchmarking / Asset Rating Initiative

Martha Brook

California Commissioning Collaborative

California Commissioning Collaborative 2010 Policy Initiative

Brenda Hopewell, PECI

March 25, 2010

CCC Policy Point of View

April 2009: POV Document

- Building standards
- Short-term CPUC policy opportunities
- Long-term CPUC policy opportunities
- Expanding commissioning provider and market capacity
- Overarching topics

Go to www.cacx.org to download the paper from homepage

CCC Policy Point of View

February 2010: Conversations With Advisory Council Members

- EM&V: standardized calculations and commonly accepted practices/protocols
- Whole building performance and incentives for demonstrated savings
- Training/qualifications issues

What we're following…

CPUC

- Long Term Energy Efficiency Strategic Plan
- Rulemaking #09-11-014: the forum for implementation and adjustments to the strategic plan

CEC

- AB 758: Comprehensive Energy Efficiency Program for Existing Buildings
- Federal Building Star program

ARB

- AB 32 Scoping Plan

Our goals for participation…

CPUC

CCC goals:

- Become a party to rulemaking #09-11-014
- Participate in workshops
- Participate in a working group
- Contribute POV and recommendations at a staff level

CEC

CCC goals:

- AB 758: Track progress and participate as work begins on this later in the year
- Provide recommendations on Federal Building Star program legislation

ARB

CCC goals:

- AB 32 Scoping Plan: track progress and participate via CPUC and CEC activities

Brenda Hopewell
415-420-9909
bhopewell@peci.org

2010 Project Planning – Working Session

Don Frey

Wrap Up

Next Meeting: Thursday, June 10

Location: Irwindale

Host: SCE

Agenda Topics

- TBD

2010 Meeting Schedule

Date	Host
June 10	SCE
Sept. 16	PG&E
Dec. 2	Sempra (SoCal Gas)

Adjourn

Thanks to SMUD

for hosting the meeting today!