



Energy Efficiency Evaluation Measurement and Verification

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Kentucky Public Service Commission

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Topics

- **Definitions and Evaluation Basics**
 - Types of evaluations
 - Why
 - When
- **Impact Evaluations and Measurement and Verification**
 - 'Gross' Savings
 - Net Savings
 - Cost-Effectiveness
 - Avoided Emissions
- **Market Level and Process Evaluations**
- **EM&V Planning and EM&V Issues**
- **EM&V Resources**
 - National Action Plan for Energy Efficiency Impact Evaluation Guide
 - Other Resources on the Web
- **Getting Started**



Workshop EM&V Objectives

- Provide stakeholders with a common background of EM&V approaches and issues in order to facilitate discussion about EM&V policy decisions and implementation

- Enable decision-makers to define a Kentucky approach to efficiency EM&V

+ LBNL Technical Assistance to States on Energy Efficiency

- LBNL (and team of consultants) funded by DOE EERE and OE
- Working with 9 states (mainly PUCs, but also Energy Offices): Ohio, Kansas Pennsylvania, Illinois, Maryland, Massachusetts, Hawaii, Kentucky, Wyoming
- Scope of activities varies by state depending on their priorities & needs:
 - Workshops on decoupling, shareholder incentives and cost recovery (Kansas)
 - Workshop on Benefit/Cost analysis (Kansas); EM&V issues (IL), Alternative models for EE Administration (Hawaii)
 - Technical assistance on Solicitations for Program Administrators (Hawaii); help negotiate Contract and Performance Incentives for 3rd Party administrator
 - Assistance on solicitations for statewide EM&V contractors (MD, PA, OH)
 - Input on EE Program plan filing template (PA and Ohio)
 - Strategies to oversee and manage Evaluation, Measurement & Verification (EM&V) planning and studies (MA, OH, PA, MD)
 - Assistance on Benefit/Cost analysis methods (PA)



+ Evaluation Basics and
Definitions

+ Two Primary Types of Program Strategies

The focus of this presentation is on EM&V for RA, but will cover some MT issues as well

Resource
Acquisition

Market
Transformation



Target:
Individual
participants
“Direct”

Target:
Market
“Indirect”

Rebates &
Incentives

Sales force
training

Education/
information

Demand
Response

Marketing/
outreach

Energy
audits

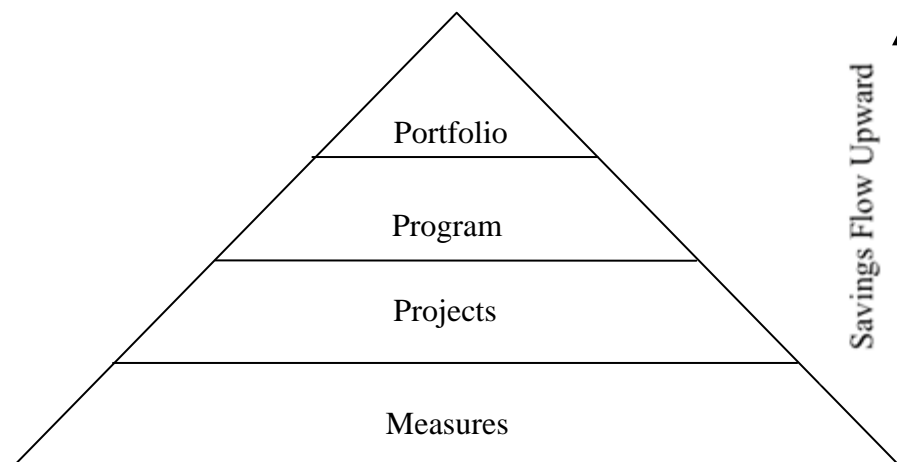
Labeling

RA & MT/direct & indirect, are two ends
of a continuum. They are not mutually exclusive.

Source:
CEE

+ Definitions: The Savings Hierarchy for Resource Acquisition Programs

- Fundamental savings unit is the measure, equipment or strategy that reduces energy use while maintaining or improving service
- Projects are coordinated activities to install one or more measures at a facility
- Programs are collections of similar projects that are intended to motivate customers in a specific market (a describable group of customers) to implement more energy efficiency
- Portfolios are multiple program initiatives in specific market sectors





What is Evaluation

A rigorous ***scientific process*** of examining programs as designed and as delivered, examining impacts as the difference between ***what happened*** and ***what could have happened***, assessing some ***return on investment (ROI)***, and providing ***feedback*** for program ***improvement***.

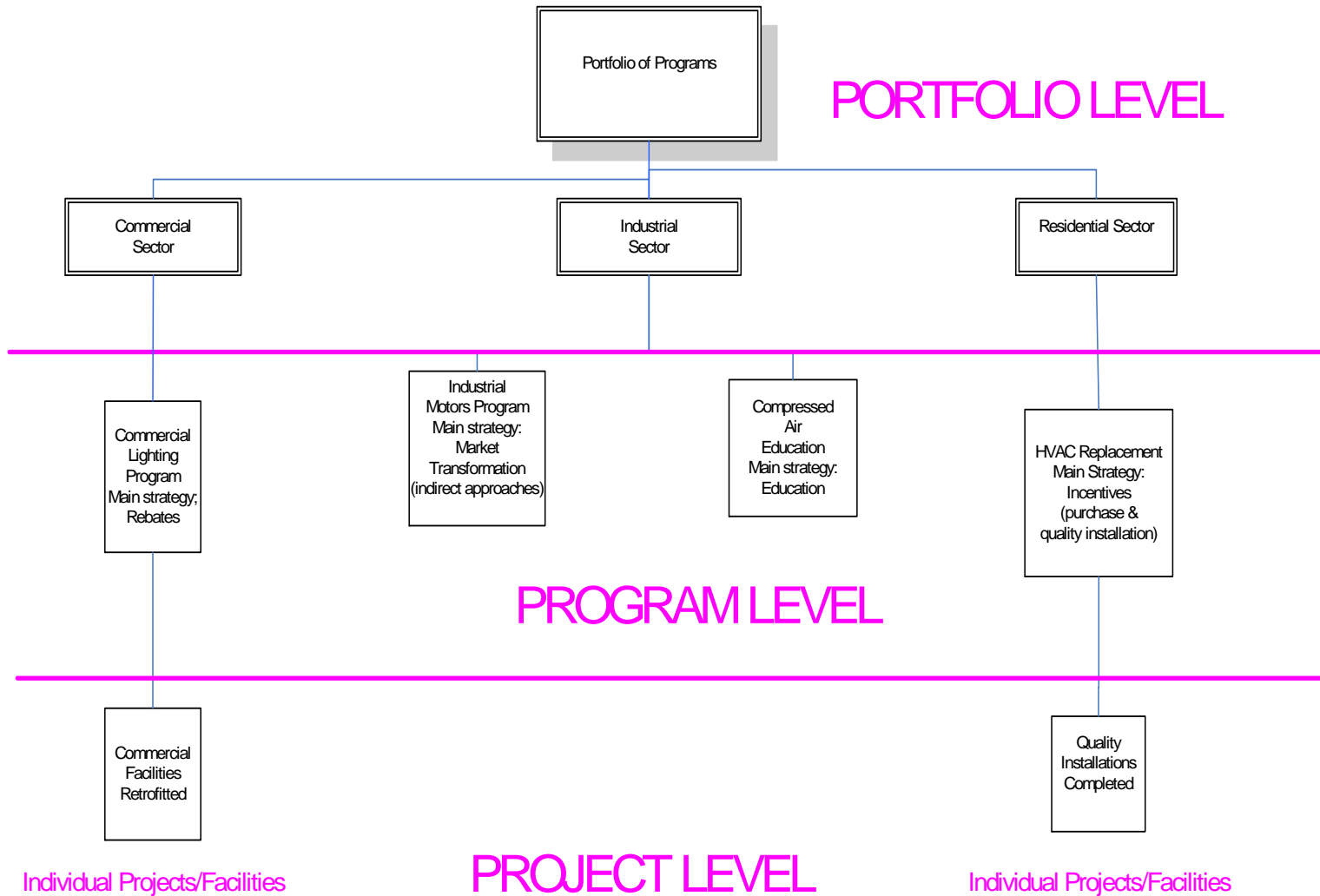
+ Definitions – EM&V

- **Evaluation** - The performance of studies and activities aimed at determining the effects of a **program**
- **Measurement and Verification** – Data collection, monitoring, and analysis associated with the calculation of gross energy and demand savings from **individual sites or projects**. M&V can be a subset of program evaluation.
- **EM&V** - The term “evaluation, measurement, and verification” is frequently seen in efficiency evaluation literature. EM&V is a catchall acronym for determining both program and project impacts.

+ Two Overarching Categories of Evaluation

- **Formative and Outcomes Evaluation**
 - **Formative:** Helping program design
 - **Outcomes:** Determining program results
- Often, the two categories are blended for maximum use of information and cost efficiency

+ Three Levels of Evaluation



Source:
CEE

+ Six Types of Evaluations

Evaluation Category	Phase at Which Implemented	Evaluation Type	Assessment Level
Formative	Pre-program Planning Phase	Market Assessment (includes characterization, baseline)	Market, Portfolio, Program
		Potential or feasibility	Portfolio, Program, Project
	Implementation Phase - ongoing	Process	Portfolio, Program
Outcomes	Implementation Phase – ongoing and/or ex-post	Impact	Program, Project, Measure
		Market Effects Evaluation	Market, Portfolio
		Cost Effectiveness	Portfolio, Program, Project

+ Why Evaluate

- **Quantify Results:** Document and measure the energy savings of a program in order to determine how well it has met its goals; has there been a good use of ratepayer money?
- Understand why program effects occurred and identify ways to improve current and future programs as well as select future programs

Other reasons:

- To verify impacts for capacity and avoided emissions (e.g., GHG)
- To compare EE investments against alternative investments for meeting demand (integrated resources planning)
- “Things that are measured tend to improve.”

New Versus Old Evaluation Paradigms

- **Real time (new paradigm).** The evaluator is in on the project from the beginning. The evaluation and the implementation team work together. Great advantages:
 - The evaluator is no longer just the “auditor”
 - Great for collecting the right data at the right time
 - Course corrections in real time
- **Retrospective assessments (old paradigm).** The evaluator comes in on the tail end of the project. Looks back. Often looks for things that were not done right. Often data needed were never collected.

When to Evaluate – concurrently with implementation

