

Measure Cost Analysis: Fundamentals & Proposed Guidance



CALIFORNIA

TECHNICAL FORUM

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Agenda

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- Objectives & Timeline
- Recap
- Fundamentals
- Challenges
- Proposed Guidelines
- Next Steps

Objectives and Timeline

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- Goal

- Create guiding principles for measure developers (utility and 3Ps)

- Value

- Create broad understanding of measure cost requirements and “fundamentals”
- Facilitate the consistency of data sources and methods
- Provide greater transparency into measure development
- Provide measure developers with trade-offs associated with data sources & analytical methods to ensure accuracy, transparency, and cost-efficiency

- Timeline



Recap: Current Practices

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- Approach
 - Reviewed cost analysis documentation of 116 statewide measures
- Data Sources
 - Material cost data largely from primary data sources
 - Trend to use list prices, small sample sizes
 - Labor cost data primarily from secondary sources (RSMMeans)
- Data Vintage
 - Average vintage (weighted by 2019 claims) is 2015 / 2016
 - Adjustments for inflation were inconsistent within same measure
- Analytical Methods
 - Increasing use of simple average calculation (66% of measures)
 - Inconsistencies within end uses
 - Shifting occurring now that WO017 (DEER) values outdated

Cost Analysis Fundamentals

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1. Comply with regulatory requirements.
2. Represent average prices paid by customers.
3. Represent current market conditions.
4. Represent an “apples-to-apples” comparison between base and measure case costs (data sources, vintage, method).
5. Represent costs associated with change in energy performance (for IMC cost basis).
6. Investment in measure cost analysis should be commensurate with the measure contribution of impacts to the portfolio.
7. Be transparent and well documented to foster consistency and reproducibility.

Recommended Guidelines

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Proposed Guideline	Fundamental(s)
Costs align with TRC and claims requirements	#1
Costs needed for TRC calculation	#1
\$ Data sources and analytical methods	#2, #3, #4, #5, #6
Separate estimates for material and installation labor costs	#4
Costs align with base/measure definitions, same data sources and vintage, same methods	#4
Reflect California market	#3
\$ Represent average of costs paid	#2
Independently validated	#6, #7
Document all data sources, values, and analytic methods	#7
\$ Establish triggers for measure cost review	#3
Define data to be collected during implementation	#2, #6, #7
Document infrastructure costs during implementation (fuel sub)	#2, #5

Guideline 1:

Develop costs that align with TRC and claims requirements

Measure Application Type	Description	1st Baseline Cost	2 nd Baseline Cost
Accelerated Replacement (AR)	Measure is installed when the existing equipment is still operational. This type includes Repair Eligible and Repair Indefinitely measures.	FMC (realized when measure is installed)	IMC over code/standard equipment (realized after the RUL period)
Normal Replacement (NR)	Measure is installed when the existing equipment fails, or maintenance requires replacement.	IMC over code/standard equipment	N/A
New Construction (NC)	Measure is installed during construction instead of code/standard equipment.	IMC over code/standard equipment	N/A
Add-on Equipment (AOE)	Measure is installed to pre-existing “host” equipment that is still operational.	FMC	N/A
Building Weatherization (BW)	Measure includes improvements to nonmechanical building structures or existing equipment that is essential to building function without maintenance.	FMC	N/A
Behavioral (BRO-Bhv)	Measure includes informational or educational programs that influence energy-related practices.	FMC	N/A
Retrocommissioning (BRO-RCx)	Measure is installed/applied as part of retro-commissioning.	FMC	N/A
Operational (BRO-Op)	Measures that improve the efficient operation of installed equipment.	Full measure cost	N/A

Source: Ex Ante Measure Cost Specification (12/22/2015) and Statewide Deemed Workpaper Rulebook (version 3.0, 1/1/2020)

Guideline 2:

Costs needed for TRC calculation

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- Material Costs
 - Equipment
 - Non-equipment
 - Removal (less salvage value)
- Labor Cost
 - Installation
 - O&M
- NR / NC
 - Costs that are the same between base and measure will cancel each other out in IMC calc
 - If so, installation, O&M, and/or non-equipment \$ not estimated
- All Other MATs
 - All costs included in FMC

Guideline 3:

Data Sources and Analytical Methods

- Goals of this guideline are to:
 - Provide key considerations for developing data collection & analysis approach
 - Define common cost analysis methods
 - Provide guidance on “best available data” and analytic methods for most end use categories/sub-categories
- There is not one single best or correct approach!
- Want to reflect expertise for each end use category/sub-category

Guideline 3:

Data Sources and Analytical Methods

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Use Category	Data Sources	Analytical Method	Pros & Cons
Service HVAC Maintenance	Contractors – invoices	Simple Average	<ul style="list-style-type: none"> Can include installation costs Limited sample
	Contractors – artificial bids	Lower quartile	<ul style="list-style-type: none"> Can include installation costs Reflects competitive bid pricing Limited sample

Use Category	Data Sources	Analytical Method	Pros & Cons
Food Service	AutoQuotes	Simple Average or Median	<ul style="list-style-type: none"> Cost efficient Industry accepted quote service List prices do not reflect prices charged to customers, unless estimate of discount developed No sales volume

Guideline 4:

Develop separate estimate for material costs and installation labor costs

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- Ensure symmetry between estimated costs for the baseline and measure case equipment.
- Supports transparency
- Better inform future updates

Guideline 5:

Develop Costs that Align with Base and Measure Case Definitions, Using Same Data Sources, Vintage, and Analytical Methods

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- Ensure symmetry between estimated costs for the baseline and measure case equipment for IMC
- Ensure symmetry of inputs for FMC

Guideline 6:

Estimates should reflect the CALIFORNIA market

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- Data representing region outside of California should be adjusted
 - Data collected in another state for another state
 - National averages
 - RSMeans price indices
- Locational adjustments within CA no longer applied for statewide measures

Guideline 7:

Estimated costs should represent average of prices actually paid

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- (In practice, this one is tough)
- Requires knowledge of buyer/seller transactions
 - Discounts
 - Mark-ups
 - Competitive bid pricing
- Depending on cost data sample, need weighting factors
 - Quantity of units sold/installed
 - Market share data
 - Claims data (measure case)
- Data limitations and availability challenges

Guideline 8:

Independently validate cost estimates

- “Reality check” estimate against other sources
 - Artificial bids
 - Invoices
 - List prices
 - RSMeans other secondary sources
 - Market actor interviews, panel/Delphi approach
- Best practice for high-impact measures

Guideline 9:

Document all data values, sources, and analytic methods

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- Ensure transparency, reproducibility
- Knowledge transfer
 - Document costs, rationale for including/excluding in calc
 - Rationale for data collection/analysis strategy
- 4 Measure Characterization fields:
 - Base Case Material Cost
 - Measure Case Material Cost
 - Base Case Labor Cost
 - Measure Case Labor Cost
- *Statewide Measure Development and QA/QC Guidelines*

Guideline 10:

Establish trigger(s) for measure cost review

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- Rate of market evolution varies across measures
- Cost changes at different pace than other parameters

- Trigger: Set cost review date
 - Based upon understanding of market, rate of evolution
- Trigger: Data vintage = 2+ years (?)
 - Review costs to determine if update needed
 - If not, adjust for inflation
- Trigger: Other measure updates

Guideline 11:

Define data that should be collected during implementation

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- To support future updates
- To understand all costs and buyer/seller transactions
 - Discounts, mark-ups, installation costs, etc.
- To validate cost estimates
- To develop time series database of equipment incentivized through program
- Examples
 - Installation costs
 - Make/model, nameplate
 - Non-equipment costs
 - Infrastructure costs (fuel sub)
- “Data Requirements” field in Measure Characterization

Guideline 12:

Document infrastructure costs during implementation (*fuel sub only*)

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- Not required for CET
- Help to better understand all costs of fuel sub measures

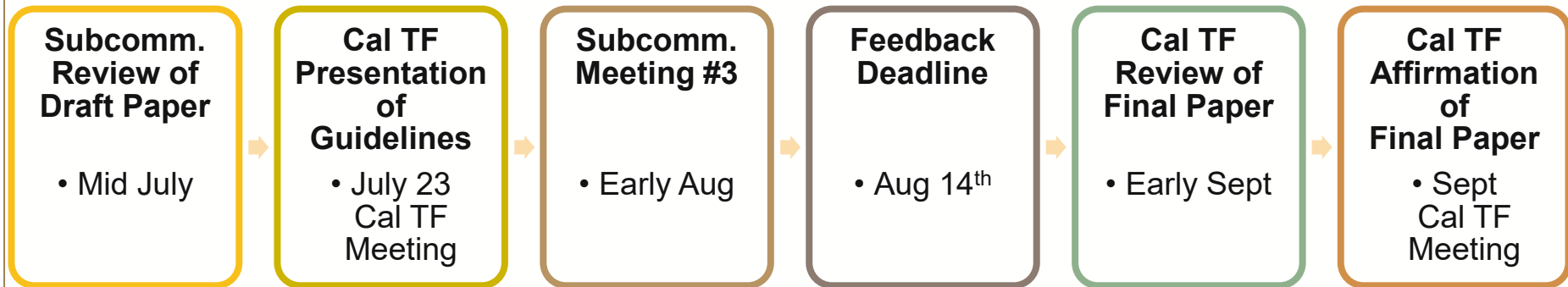
Other Recommendations

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- Targeted market assessments
 - Key drivers
 - Product mix/availability
 - Market entry
 - Historical trends, pace of evolution
 - Market share data
- Synchronize Cost Reviews
 - Leverage economies of scale
 - Encourage consistency within end use categories/sub-categories
 - Levelize workload
- Integrate Data Needs into eTRM / Leverage eTRM to Support Measure Update Planning / EM&V

Next Steps

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- If you can provide your feedback early (within July), we can work it into the presentation for the 3rd Subcommittee Meeting