Reducing Measure Permutations

CALIFORNIA
TECHNICAL FORUM

TIM MELLOCH

APRIL 2019

Measure Permutations

- A permutation is a combination of measure parameters for which savings values are derived:
  - Measure application type
  - Fuel
  - Delivery type
  - Building type
  - Building vintage
  - Building location, climate zone, program administrator
  - Equipment size
  - Efficiency level or tier
- CA has about 20 million measure permutations in CEDARs
- Only 5% of them are actually used in the portfolio
- For any given measure, the energy savings difference between different measure permutations may vary by only a few percent

Goal & Benefits

- To develop criteria & consistent approach/framework to reducing the number of measure permutations:
  - Eliminate permutations that are not significantly different from one another
- Fewer permutations will be easier & lower cost to understand, work with & manage:
  - Easier for customers to understand & evaluate
  - More straightforward for implementation contractors to promote
  - Program planners will find it easier to work with fewer measure permutations
  - Lower administrative costs to maintain and ensure quality of a smaller data set

Considerations

- Method must be transparent, clear, and able to be consistently applied to avoid “gaming” through the process:
  - “gaming” refers to using the measure permutation reduction process to create higher deemed saving values
- Must be presented to the CPUC staff & ex ante team for review, comment & ultimately approval

Threshold Issues

Key threshold issues that must be decided are:

- *How* the number of measure permutations should be reduced
- What are the acceptable uses for the reduced measure permutations (planning, program implementation, claims reporting, evaluation, etc.)
- Whether reduced permutations should be filed with the WP, or merely viewable as a report in the eTRM
- What range (%) should be used to determine whether the difference between measure permutations can be “collapsed” and represented by a single value

Option 1

Eliminate Parameters that Don't Impact Savings

- If a parameter does not impact energy savings or cost effectiveness, remove it from the permutation process.
  - **Example**: Depending on the measure and the specific input parameter could include: Measure application type, building type, IOU, delivery type

Option 2

Reduce Permutations Created Where Savings Values Are Minimally Affected

- If a parameter does not cause permutation savings values to vary by more than 10%, determine an appropriate single value that can be used statewide.
  - **Example**: If savings across all sixteen climate zones do not vary by more than 10%, utilize an approved method (e.g. mean, median, weighted average) to arrive at a single value that can be applied for all measure permutations.

Option 3

Only Reduce Permutation Options within a Parameter that Don't Impact Savings

- Similar to option 2 but recognizes that there may be instances where collapsing is appropriate across a certain subset for a particular input parameter (e.g. climate zones), but not all.
  - **Example:** collapsing across fourteen climate zones may show little impact in ex ante estimates for a measure, but is not appropriate for two of the climate zones based on their impact to the ex ante values.
  - Such an approach would not currently be possible as CEDARS/CET either requires all climate zones or a single value to be provided, such a "hybrid approach" could not be processed.

Option 4

Upfront Engineering Assessment to Reduce Permutations

- Evaluate inputs during measure development to reduce number of permutations that would need to be created and analyzed
- Will require more work and acceptance up front but can simply deemed measure development in the eTRM

Other Considerations

Perform Parametric Analysis

- Some unnecessary measure complexity can be controlled with the high-speed, high-volume parametric analysis capabilities
- NREL's OpenStudio platform can run high volumes of energy simulations to identify how much small variations in single inputs affect final energy savings estimates
- Allows the modeler to quantify the added value and/or uncertainty of creating additional measure combinations
- The approach to parametric analysis is described further in TPP 5; Reducing Measure Complexity

Discussion/Feedback

- Other options
- Cal TF feedback
- Next steps