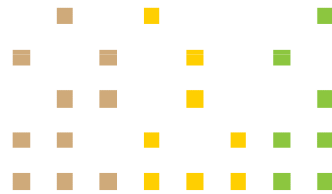


# Ex Ante Measure Development – Balancing complexity and accuracy



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# Overview

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- Policy need
  - How much measure complexity is needed to provide accurate ex ante estimates?
- Current status: complexity
- Does more complexity give greater accuracy?
- Challenges with measure complexity
- Principles for reducing complexity
- TF feedback
- Key components of policy
- Next steps

# Current Status: Complexity

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- Sources of complexity in California
  - Building modeling – weather sensitive measures
  - Number of measure combinations
- What does DEER cover?
  - Fraction of IOU deemed measures
  - Over 1 million measure combinations in DEER
  - Multiple measure combination parameters
    - ✦ 16 CEC climate zones
    - ✦ 23 commercial building types
    - ✦ 5 residential building types
    - ✦ 7 vintages
    - ✦ Multiple HVAC options

# Does more complexity give better accuracy?



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- Measure combinations should reflect the most impactful calculation parameters
  - Calculation parameters (duty cycle, climate zone, HVAC system type, etc.) that have little bearing on the outcome should not inform measure granularity
- Measure combination differences should be meaningful
  - Differences in values should be greater than the variance or uncertainty in the data used to derive the value
  - Output value can only be as precise as the weakest input value
- Majority of data in DEER is modeled, not empirical
  - DOE-2 has error band of +/- 10%, even in “model case”

# Challenges with Measure Complexity

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- In era of “big data,” does complexity matter?
- Challenges with complexity
  - Planning
    - ✦ When you have 200 lines for the same measure, how do you plan?
  - QA/QC
    - ✦ Is meaningful QA/QC possible with so many measures?
  - Updating Measures
    - ✦ New weather files – every DEER measure had to be updated
  - Transaction Side – Can programs collect information required to differentiate between measure combinations?
    - ✦ Customers don’t understand distinctions; contractors may not be willing to collect
- Complexity makes it harder to replicate the database

# Principles for Reducing Complexity

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- Consider using engineering calculations instead of building models
- Conduct sensitivity analysis
  - Identify the most impactful parameters
- Consider if the combination distinctions really matter
  - Take a close look at different building types/vintages, and see if they “make sense” for a particular measure
- Consider program implementation
  - If can't collect data in field to distinguish between different combinations, don't create distinct measure combinations.
- Only update measures when update will lead to statistically significant difference.
  - New value should be statistically different from old value.
  - Rule of Thumb: New values should differ from old by >10%

# TF Feedback

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- Need to define the end use of ex ante estimates – ratepayer protection, resource adequacy, etc.
- Need for regulatory guidance on acceptable “error band” of ex ante estimates
- Evaluate the acceptable error bands in other jurisdictions, and justifications for those bands
- Need for iterative updates to refine measures

# Key Components of Policy

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## Key components of a TF policy:

- Who is the end user/reviewer of estimates
- Resource adequacy vs. ratepayer protection
- What is an acceptable error band
- How to address bias towards conservatism or optimism
- What is “best available data”
- What is the impact of behavior
- Tools for evaluating precision (statistical tests, sensitivity analysis, etc.)
- Revising values through an iterative process

# Next Steps

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TF staff to draft an outline for further discussion at November meeting

- Statement of problem
- Key questions to answer
- Research from other jurisdictions
- Clarification of end uses for ex ante estimates (CPUC, CEC, CAISO)