

2025 EE Potential and Goals Study: Draft Work Plan Workshop

April 17, 2024

CPUC Leads:

Study lead: Hanna Navarro Goldberg

Income Qualified: Kapil Kulkarni

Contractor: Guidehouse, Inc.



California Public
Utilities Commission

Conference Call Etiquette

- If you have a question or comment -
- We are actively monitoring the chat window; feel free to submit questions/comments via chat at any time.
- **Use the "raise hand" feature to request to be unmuted.**
- Once unmuted, please hold your question for the end of each section.
- Webinar is being recorded

Background and Webinar Objectives

Today's Focus:

Present Draft Workplan for Stakeholder Feedback

Objectives

- Communicate overview 2025 P&G Study workplan
- Present 2025 Study timeline and Stakeholder engagement milestones
- Gather Stakeholder input on proposed approaches

Stakeholder Asks

- Comment about the schedule and proposed approaches
- Ask questions about approaches that are unclear
- Provide responses to our questions and proposed plans

Income-Qualified to be addressed at a separate timeline.

Stakeholder Engagement Opportunities

- Study-related comments are informal.
 - Comments on today's presentation are due **May 1** via e-mail to:
 - Hanna.NavarroGoldberg@cpuc.ca.gov
 - Ali.choukeir@cpuc.ca.gov
 - Npodkowsky@guidehouse.com
 - Upcoming stakeholder engagement opportunities:
 - Draft workplan development for the Income-Qualified PGS, likely in May.
 - Measure List to be distributed for stakeholder review & comment, likely in May.
 - To stay informed, look for notifications to the service list, and for updates to our webpage: [2025 Potential and Goals Study \(ca.gov\)](https://www.cpuc.ca.gov/2025-Potential-and-Goals-Study)

Primary Uses for the EE Potential and Goals Study

- Develops estimates of total system benefit, energy savings, and peak demand reduction potential in the service territories of California's major investor-owned utilities (IOUs)
- Forecast from 2026-2037, reporting net impacts. Results have multiple uses:
 - Informs the CPUC goal setting process
 - Informs Program Administrators' EE program portfolio planning, budget setting, and procurement efforts
 - Supports planning efforts of the CPUC, CEC, CAISO
 - Informs strategic contributions to Demand Forecast, IRP, SB350 targets
 - Identifies new energy efficiency and fuel substitution savings opportunities
- **The PG Study itself does not set goals; Guidehouse does not make recommendations to CPUC regarding goal setting.**

EE Potential and Goals Legal Basis

- Public Utilities Code 454.55-56
 - (a)(1) The commission, in consultation with the Energy Commission, shall identify all potentially achievable cost-effective electricity efficiency savings and establish efficiency targets for an electrical corporation to achieve
 - (a) The commission, in consultation with the Energy Commission, shall identify all potentially achievable cost-effective natural gas efficiency savings and establish efficiency targets for the gas corporation to achieve

Schedule for this cycle

Activity	Estimated Starting Date
Study Launch Workshop & Workplan	April 2024
Measure Characterization	May 2024
Scenarios	August 2024
Draft Results	January 2025
Draft Results Comment Period	January 2025
Proposed Decision Mailed	TBD
Decision on Goals Adoption for 2026 & Beyond	TBD

Email informal comments on draft workplan to Hanna, Ali and Neil:

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2025 Potential and Goals Study Work Plan

Stakeholder Webinar

April 17, 2024



Guidehouse Team



Neil Podkowsky
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Agenda

- 1. Group E Overview**
- 2. 2025 EE and FS Potential Forecast Introduction**
- 3. Study Approach**
- 4. Post Potential & Goals Study Support**
- 5. Summary & Final Questions**



Group E Introduction & Overview

2025 Contract Elements

Primary focus of today's webinar:

EE Potential Forecast - Core effort includes model development and producing scenario results.

Market and Measure Characterization; Technical, Economic, Achievable Potential; Low Income; Fuel Substitution; Codes & Standards

Planned and Potential activities for 2025 cycle beyond Core study:

Post Processing - Post process the EE potential forecast to meet needs beyond the goal setting process

Primary Research – Additional research to support refinement of future planning and recommendations

Potential and Goals Study Overview

- The 2025 Potential and Goals (PG) study builds upon refinements and improvements of past study cycles to inform the goals related policy questions CPUC staff are considering
- Preliminary stakeholder feedback provided during and in response to the 2025 PG Study Updates Webinar (held in January 2024) informed the development of the Draft 2025 PG Study Workplan
- **Multiple activities** make up the 2025 PG study:
 - Developing core forecasts to inform the IOU energy efficiency (EE) and fuel substitution (FS) goal setting process managed by the CPUC
 - Providing forecasts in a format that can be useful for other state planning processes (e.g. the CEC's IEPR), program administrators, and program implementers
 - Supporting as needed other forecasting, planning, and policy related efforts at the CPUC

What is new in the 2025 Study

Refine and improve on past study cycles to inform the goals related CPUC staff policy questions

- **Earlier project timeline** with continued commitment to stakeholder engagement
- **Application of Total System Benefit as a model driver** to better align with TSB as the statewide goal setting metric
- **Fuel substitution** measure characterization and achievable potential calculation refinements
- **Industrial & Agricultural Sector** measure re-categorization
- Right-sizing the model and analysis granularity to balance scope and budget:
 - Emphasis on characterization & analysis of **high priority/high impact measures**
 - **Continuing using past methodologies** in other areas (Residential/Commercial, C&S, BROs)

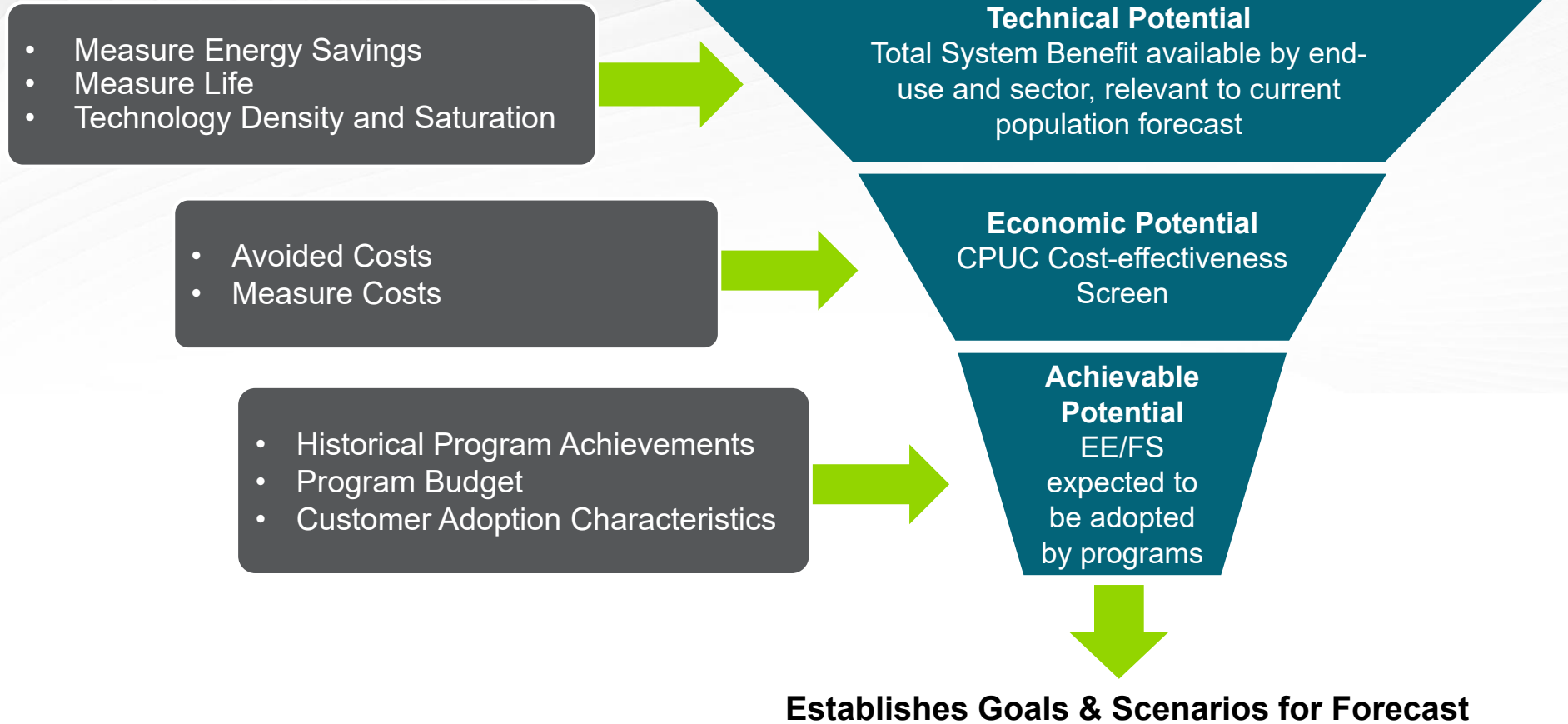


2025 EE and FS Potential Forecast

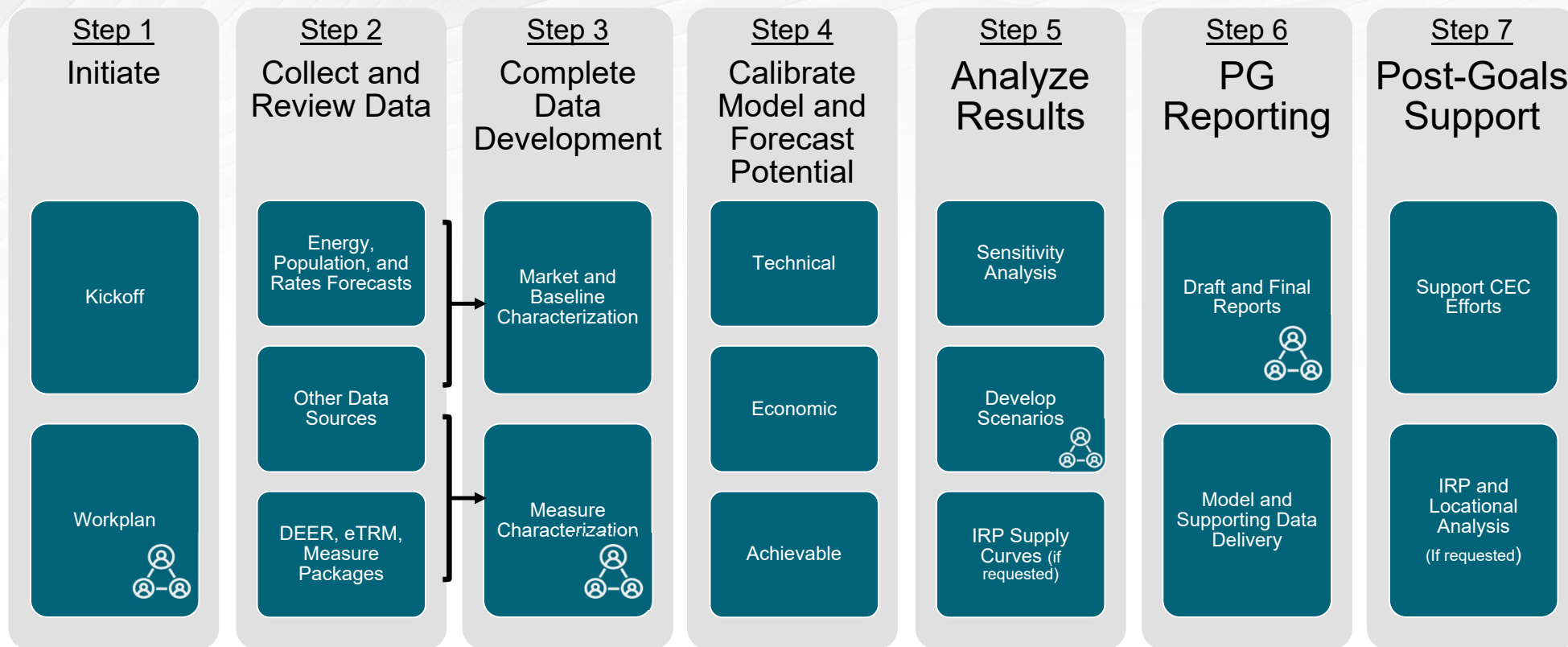
Potential Forecast Overview


- **This section covers:**
 - What a potential study is and the major steps to conducting a study
 - An introduction to scenarios
 - High level project schedule and stakeholder engagement plan
- **Critical things that are different than previous study:**
 - Modified timeline to permit CPUC Decision process earlier in 2025 versus prior Study cycles
 - Broader incorporation of TSB in the modeling process, emphasis on lifetime measure benefits
 - Incorporate broader data sets for Fuel Substitution analysis
 - Refinement of Industrial & Agricultural Sector analysis
- **During Q&A please consider:**
 - Are the priorities in line with your needs and expectations
 - Where else stakeholders can/should be involved in the process
 - Questions about other materials presented so far in this workshop

What is a Potential Study?



Potentials & Goals Study Process



 - Stakeholder touchpoint or engagement opportunity

Scenarios

- Up to four scenarios to inform the goal setting processes
- Scenarios address differences based on internally influenced variables – policy and program decisions under control of the CPUC and IOUs.
- Scenarios will adjust multiple variables and test combined effects
- Specific scenarios will be defined with consideration of Stakeholder input (planned engagement in Q3 of 2024)

Variables Analyzed in 2023 PGS	Potential Considerations for 2025 PGS
<ul style="list-style-type: none">• Incentive levels• Program engagement• Inflation Reduction Act tax credits	<ul style="list-style-type: none">• CARB Zero Emission Appliance Standards• IRA and statewide non-IOU program influences• Total System Benefit optimization

2023 vs. 2025 Timeline

Timeline changes:

Milestone	2023 Study	2025 Study
Launch	Late summer 2022	Early spring 2024
Measure review	Fall 2022	Summer 2024
Draft results	Spring 2023	January 2025
Decision	August 2023	TBD

Allows for more time of downstream PG study use cases to incorporate the study results

- Portfolio planning
- Resource procurement
- IEPR

Study dependencies:

- Measure related data must be available by **July 1, 2024**
 - eTRM/DEER – Unclear if will have sufficient updates to the DEER database
 - CEUS – Study results have been released
 - Any other data – from evaluation or other sources
- Model inputs must be available by **July 31, 2024**
 - Avoided costs – expected no later than **July 31, 2024**
 - CEDARs (2023 accomplishments) – typically by July 1, 2024
 - IEPR data (retail rates, consumption, stock) – Feb 2024



Market and Measure Characterization

Market and Measure Characterization

- **This section covers:**

- Characterizing technologies that have the potential to save electricity and/or natural gas, or represent electrification of natural gas consuming equipment
- Market and measure data needed for the study

- **Critical things that are different than previous study:**

- Total System Benefit employed to model measures within competition groups
- Additional attention to characterizing Fuel Substitution measure behind the meter infrastructure costs
- Addition of Commercial sector Custom
- Realignment of Industrial & Agricultural sector measure structure
- Prioritization of measures with larger achievable TSB

Measure list to be delivered in May 2024 to stakeholders in supplemental Memo

Market Data & Global Inputs

Market data consists of non-measure-specific inputs to the model

Key types of market data, and their sources, include the following:

Market Data Input	Source
Customer retail rates forecast (\$/kWh, \$/therm)	CEC Integrated Energy Policy Report (IEPR)
Energy sales forecasts (GWh, MW, and therm)	California Energy Consumption Database (ECDMS)
Forecast of building and consumption growth	Request from California Energy Commission
Avoided energy and capacity costs	CPUC Cost-Effectiveness Tool (2024 ACC vintage – <u>draft</u>)
Historic program savings and spending	CEDARS
Inflation rate	Federal Reserve Bank forecasts
Discount rate	Utility WACC (as used in the ACC)

Residential and Commercial Market Sectors

Measure Characterization

Process will remain overall consistent with recent Study cycles, leveraging the eTRM

Changes in 2025

- Targeted assessment of measure list to **identify high TSB measures** and simplify or remove low impact measures
- Special attention to **fuel substitution measures**, particularly incorporating broader measure cost data and incentive sources
- Earlier study timeline may result in draft Measure Package updates being utilized
- Updated 2023 Commercial End Use Survey (CEUS)
- Incorporate IRA program rebates, if program design information available

Commercial Custom (and SEM)

Moving to a top-down analysis

- Past potential analysis had no separate “measure” for non-deemed commercial savings
- Model is a bottom up by technology and end-use
- Any custom savings previously allocated to characterized measures
- 2025 study changes the bottom-up calculation model:
 - Custom program delivery (traditional and NMEC-based) have different adoption, program costs, measure costs, etc.
 - Shifting to NMEC brings in savings not appropriately captured with the per unit of technology-based analysis

Commercial Custom Analysis

New Custom Category

CEDARS
Data

Custom

Deemed

SEM/BROs

2023 Study
Approach

Deemed +
Characterized
Custom

BROs

2025 Study
Approach

Custom

Deemed

SEM/BROs

Non-residential Custom and SEM

Focused Analysis

- Past potential analysis rooted in historical savings, costs, and trajectory in a top-down type of analysis
- Need to explore new options as a large amount of TSB comes from a limited number of measures

2023 PG Study Results

Measure	% of Total TSB in 2024
Res HERs	12.3%
Ind & Ag Generic Custom	11.7%
Ind & Ag SEM	6.5%
177 other measures	69.5%

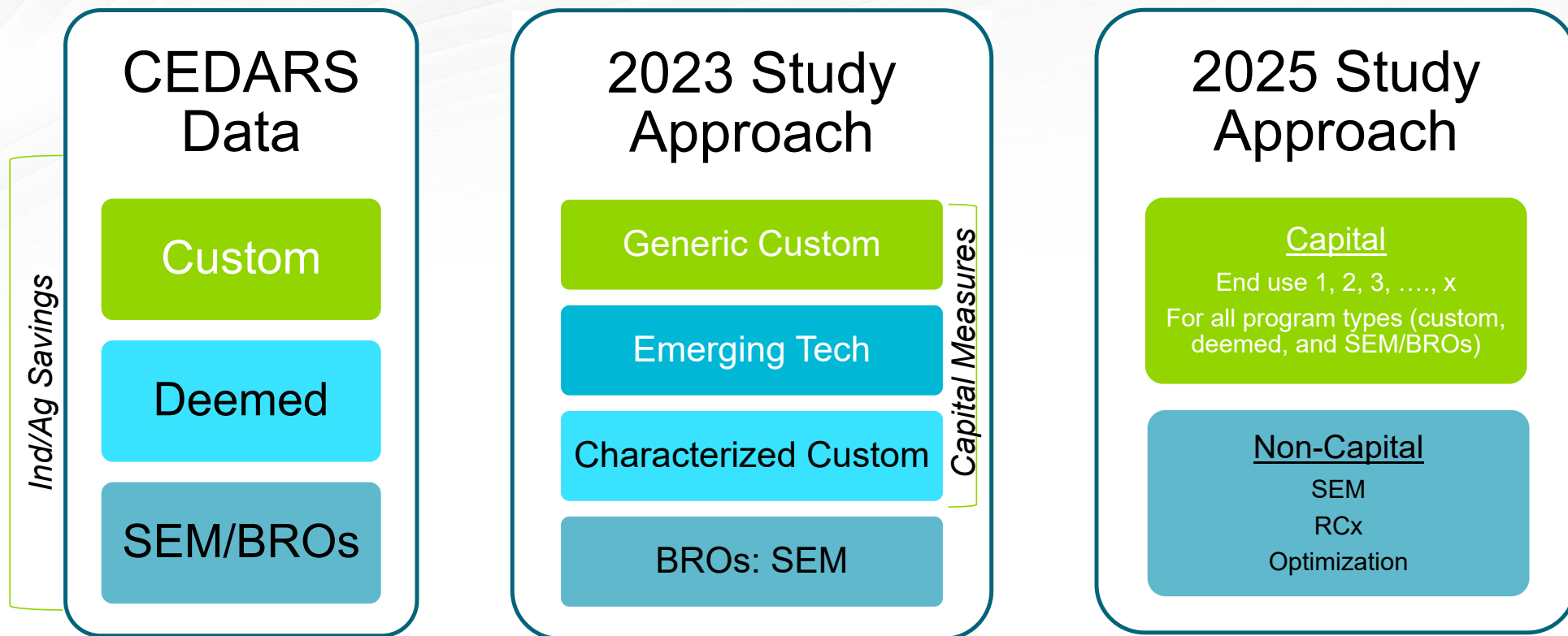
} ~18%

2023 Study Ind/Ag Measure Types and Approach

Measure Type	Approach
Characterized Custom	Bottom-up - Deemed measure characterization process using CEDARS, 2021 primary data collection, and secondary source data
Generic Custom Emerging Technologies	Top-down analysis leveraging historical program trends and consumption forecasts
Strategic Energy Management (Including Retrocommissioning and Optimization)	Top-down - BROs approach

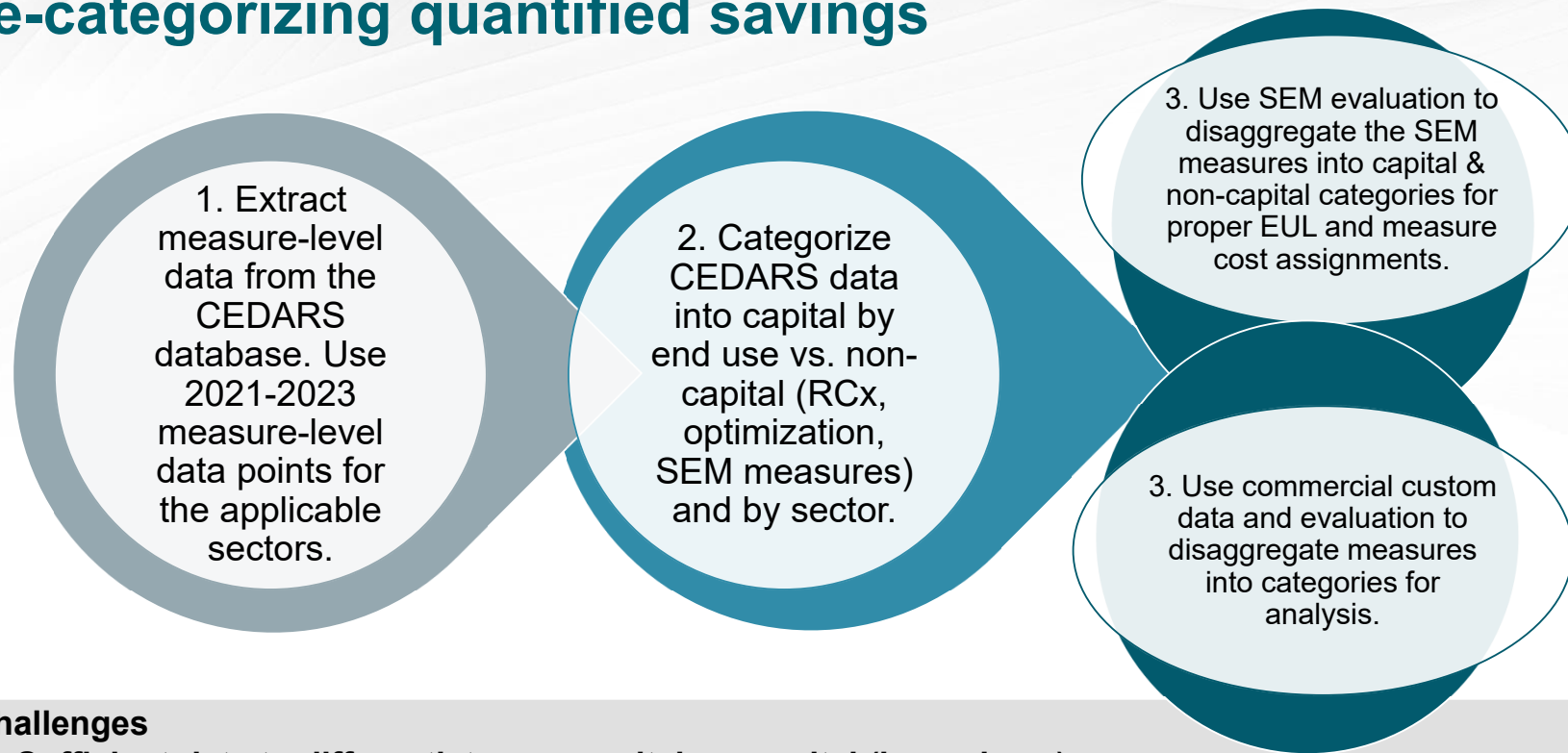
Recategorizing Industrial & Agricultural Sector

2025 analysis only using top-down



Redefining Industrial and Agricultural and Commercial Custom Measures

Re-categorizing quantified savings



Challenges

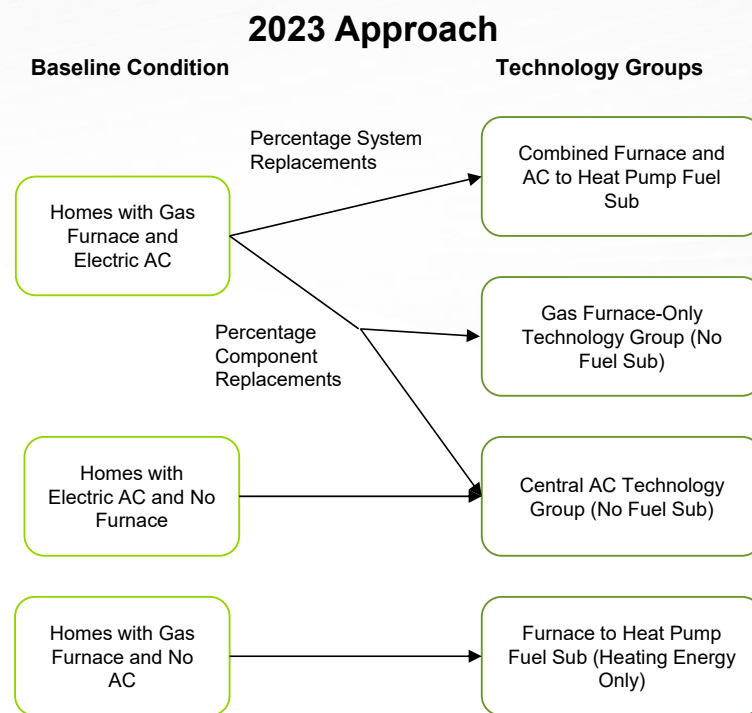
- Sufficient data to differentiate non-capital vs. capital (by end use) measures
- Forward looking adoption analysis grounded in data under new program paradigm

Fuel Substitution – Measure Characterization

No change to overall approach

Enhance the FS measure and market characterization:

- Update with any DEER/eTRM/evaluation results
 - Review to ensure alignment with [updated fuel substitution test](#). PG study may need to conduct analysis as the full DEER/eTRM update will not be ready in time
 - Coordinate with the DEER/eTRM to facilitate transfers of measure packages for real time contribution
- Incorporate 2023 FS measure infrastructure costs Market Study
 - 2023 study considered only electric panel upgrades.
 - Provides specific electrification costs using survey results analysis for BTM infrastructure (wiring new appliance only, panel optimization, or panel upgrade).

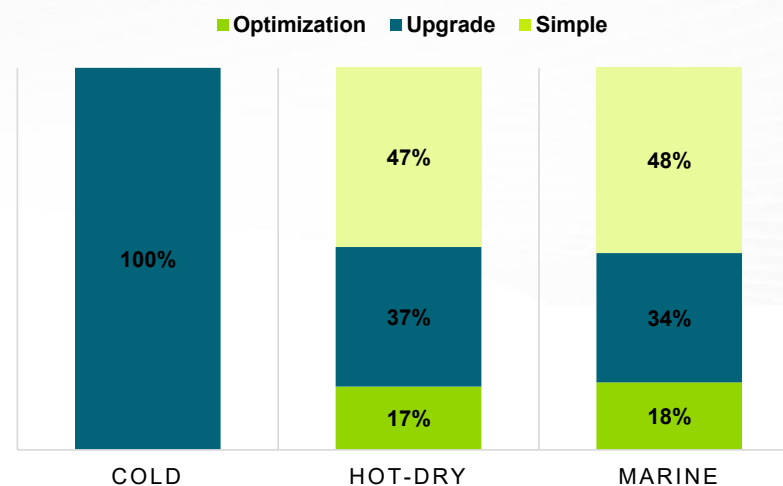


Fuel Substitution Characterization

By Climate Region and Technology

- Market study provides a weighted average cost based on the following parameters:
 - Building type
 - Building vintage
 - Climate region
 - Existing panel conditions
 - Technology electrified (FS Scenario)
- Simplify the diversity of weighted average values to address the variability in sample sizes within each permutation of characteristics:
 - Building type
 - Statewide
 - FS Scenario?
- Weighted average costs across the three categories:
 - Simple: wiring and connecting new appliance
 - Optimization: anything less than a panel upgrade (no need for more rated amps)
 - Upgrade: require increased amperage via new panel.

Gas Cooking to Electric



Market and Measure Characterization Questions

- Is the recategorization/realignment of Ind/Ag and Custom Commercial beneficial?
- Do you have program and measure data to share that's not available via eTRM/Workpapers or CEDARS?
- Are there any specific Fuel Substitution programs that should/should not inform inputs for these measures?
- Are there any specific industrial and agricultural segments or technologies of interest to study (e.g. technologies with cross-cutting potential)?
- **Upon delivery of proposed measure list, please consider:**
 - Which measures are highest priority?
 - Are there additional measures or technologies that should be included in the study?



Five-minute stretch break...





Modeling Methodology Overview

Modeling Methodology Discussion

- **This section covers:**
 - Modeling platform overview
 - Key Technical, Economic and Achievable potential analysis elements
 - Specific approach details for Fuel Substitution, BROs, Codes & Standards potential modeling
- **Key 2025 Study Updates:**
 - High-level methodology and analysis tool consistent with 2023 PG Study
 - Technical and Economic potential modeled based on Total System Benefit (\$)

Modeling Platform

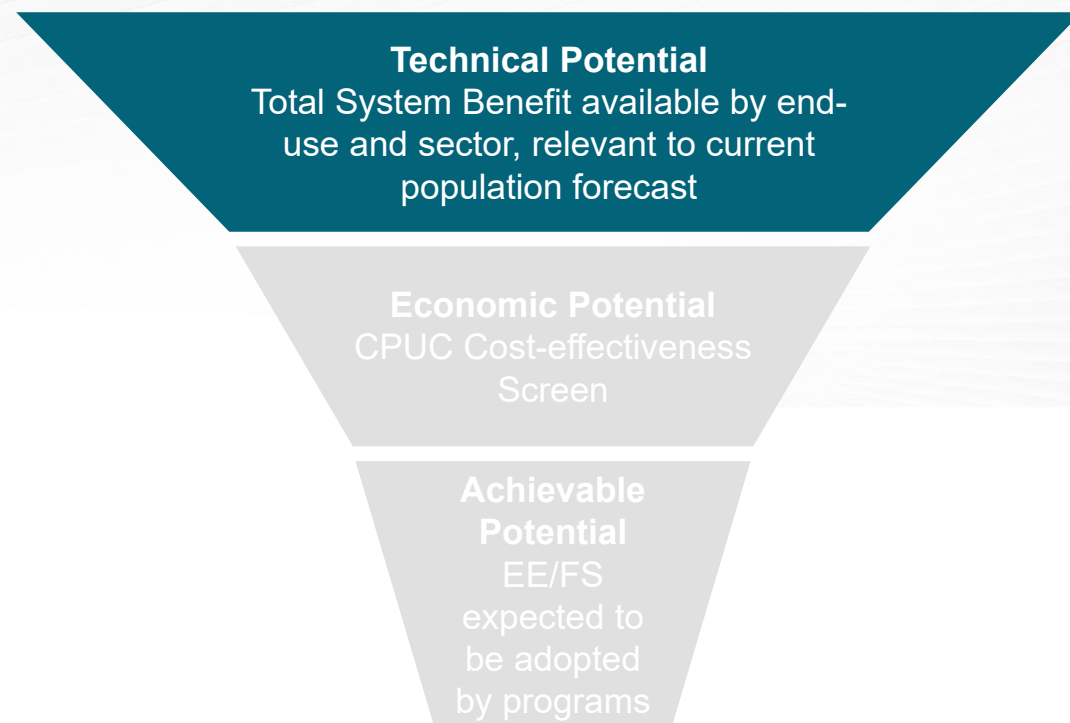
- Continue to use the model last used in the 2023 PG study with necessary revisions. This is largely bottom-up model already capable of:
 - Estimating Technical, Economic and Market Potential
 - Providing results with measure-level granularity
 - Explicitly modeling fuel substitution
 - Assessing cost effectiveness of individual measures and report portfolio cost effectiveness
 - Distinguishing between rebate program savings, codes and standards savings, and low-income program savings
 - Outputting annual and cumulative savings, including the total system benefits (TSB) metric
- Results details outputs spreadsheets and results viewers will be made available to stakeholders as have been in the past.
- The typical stakeholder should not have to download and run the model.

The screenshot displays the 'Full Model' interface for the '2022 & Beyond California Energy Efficiency Potential & Goals Study'. The interface is organized into several functional areas:

- Header:** Includes logos for the California Public Utilities Commission and Guidehouse, along with the study title and navigation buttons like 'READ ME' and 'Model Details'.
- Filter Settings:** Features a funnel icon and a 'Filters' button.
- Scenario Settings:** Divided into 'Pre-programmed' and 'Custom' sections. The 'Pre-programmed' section includes dropdowns for 'Select Scenario' (set to 'Also: Scenario 1'), 'Scenario Assignments' (with a 'Calc' button), and 'Potential to Evaluate' (set to 'Tech, Econ & Achievable'). The 'Custom' section includes 'Screening Cost Test' (set to 'Total Resource Cost Test'), 'Incentive Level Multiplier' (set to 1.5), 'Marketing Effect Multiplier' (set to 1), 'Simulate Financing' (set to 'No'), 'Benefit-Cost Threshold (ratio)' (set to 'Table'), 'BROs Scenario' (set to 0), and 'Include DR Benefits?' (set to 'No'). A 'Multiplier Impacts' callout is present next to the multiplier inputs.
- Other Settings:** Includes 'Accumulation Start Year' (2023), 'Apply COVID Adjustment?' (No), and 'Include BROs in Portfolio CF?' (No).
- Key Outputs:**
 - Equipment Results by End Use:** Lists metrics such as 'Technical Potential by End Use', 'Economic Potential by End Use', 'Incremental Market Potential by End Use', 'Cumulative Market Potential by End Use', 'Total Spending', 'Total System Benefits by End Use', and 'Portfolio Cost-Effectiveness (ratio)'. Each metric has a 'Calc' button and a 'mid' indicator.
 - BROs Results:** Lists 'BROs Incremental Market Potential', 'BROs Cumulative Market Potential', and 'BROs Spending', each with a 'Calc' button and a 'mid' indicator.
 - Codes and Standards Savings:** Lists 'Incremental C&S Savings' and 'Cumulative C&S Savings', each with a 'Calc' button and a 'mid' indicator.

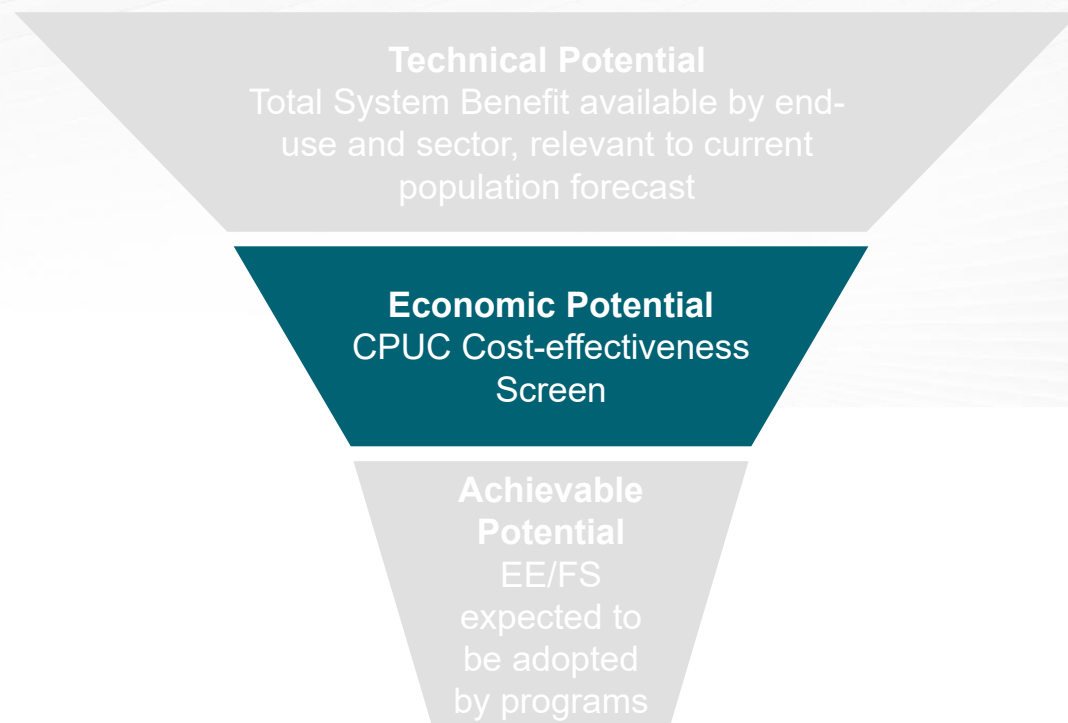
Technical Potential for Rebate Programs

- Assumes **ALL** eligible customers adopt **ALL** of the highest level of efficiency available within a technology group, regardless of cost effectiveness.
- Estimated by:
 - Sizing the total population for each individual measure in specific sectors and territories using building stock and appliance saturation data.
 - Estimating the number of annual installation decisions is based on replacement type, using either a measure's burnout rate, number of retrofittable measures, or new building stock.
 - Assuming all annual installations have the largest TSB.
 - Multiply number of installations by unit energy savings to establish energy impact.



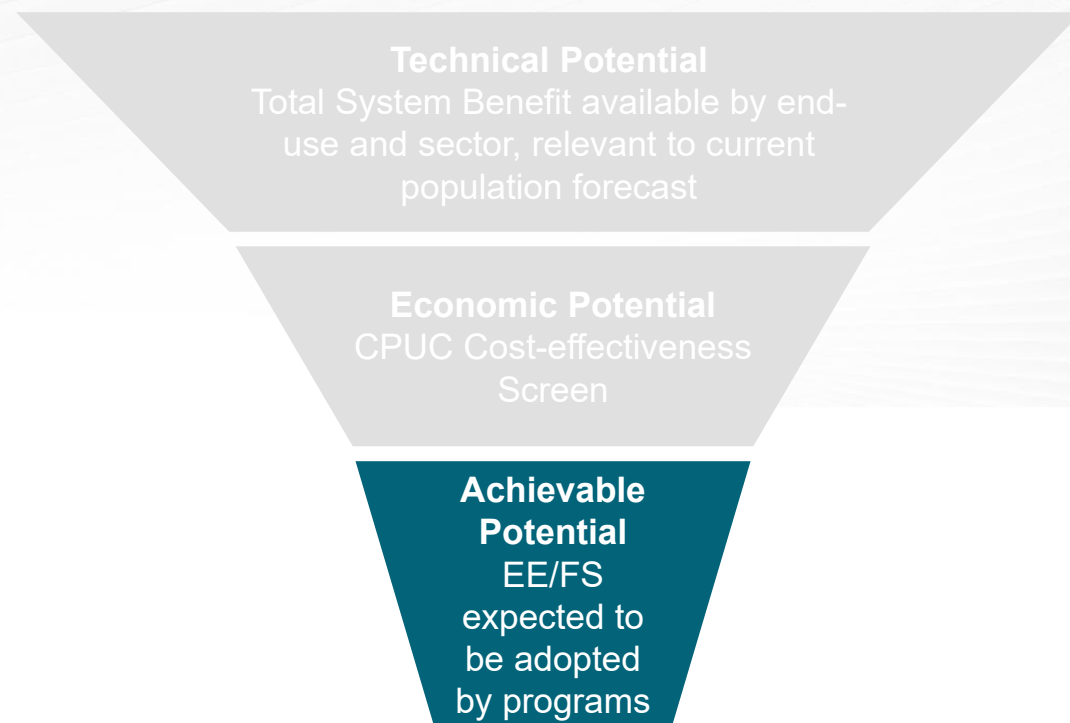
Economic Potential for Rebate Programs

- Calculated as the total potential available when limited to only cost-effective measures. All components of economic potential are a subset of technical potential.
- Estimated by:
 - Applying a cost effectiveness test to each measure (the 2023 PG study used the TRC test only).
 - Set a threshold definition of “economic” across scenarios, below which a measure is deemed not cost effective.
 - Remove all non cost-effective measures from the analysis and recalculate potential.



Achievable Potential for Rebate Programs

- The Total System Benefit (\$) that could be expected in response to specific levels of program incentives and assumptions about existing CPUC policies, market influences, and barriers.
- Estimated by:
 - Calculating the market share, or penetration of measures based on customer awareness of the measure and customer willingness to adopt the measure. Willingness is determined in one of two ways:
 - Multi-attribute-based: Predicts consumer behavior by weighting multiple value factors that customers use to decide whether to adopt a more efficient measure.
 - Payback-based: Compares payback time associated with efficient measure against competing measures.
 - Calibrating forecast using historic program data.



Total System Benefit

Better align 2025 study with TSB as the statewide Goal Setting metric



Modify existing potential modeling approach to develop Technical, Economic and Achievable potential using TSB as the key output instead of first year energy impacts, including calibration by TSB.

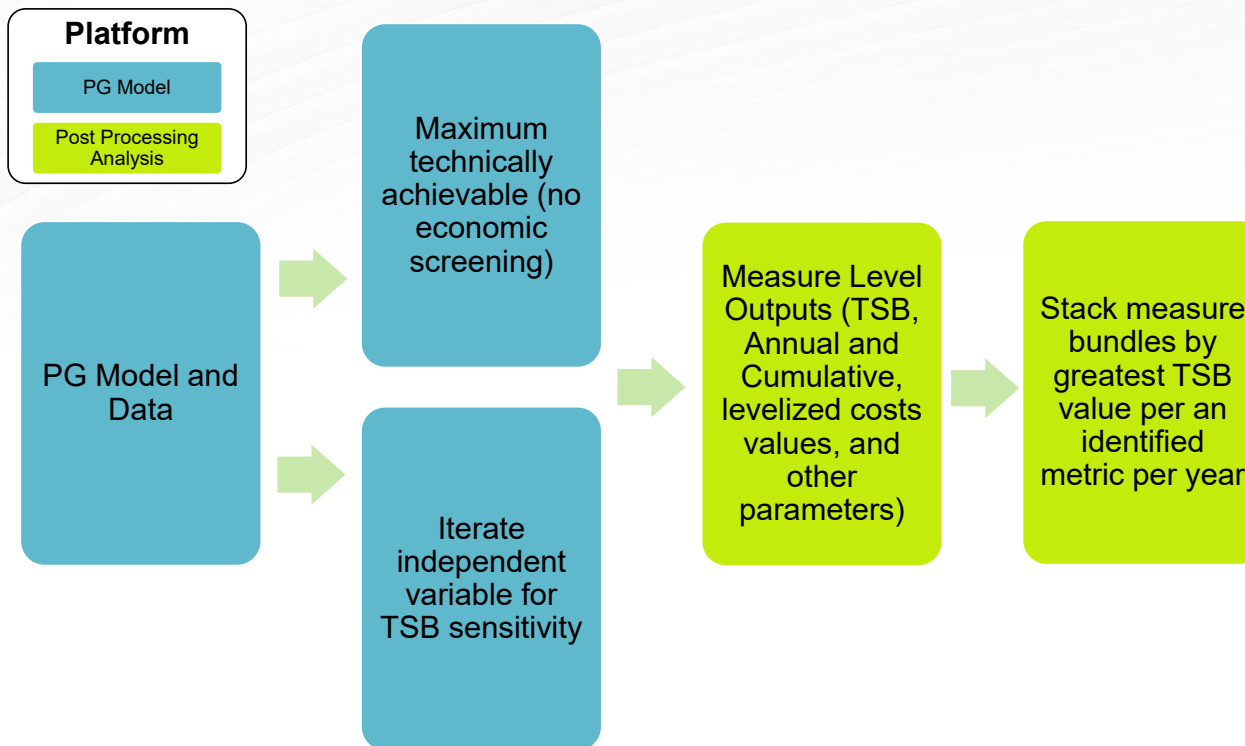


Consider a post processing “pseudo-optimization” analysis using existing model and secondary regression analysis to derive supply curves*

*See next slide for description.

Post processing TSB “pseudo-optimization” analysis

Process



Must define the parameter to stack TSB values against:

- Program cost
- Measure incentives
- Measure first year savings
- Other

Fuel Substitution

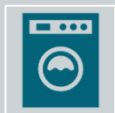
Modeling Updates planned for 2025 study



Incorporate broader program data in the **calibration process** e.g., POU, TECH, and other programmatic impacts, including the CalMTA, Equitable Building Decarbonization, and IRA programs and tax incentives



Assess **alternative FS incentive structure** by researching and analyzing all funding streams and impacts to customers/programs. Consider stacking/layering incentives or other financial parameters into FS analysis



Improve **approach for modeling CARB SIP Zero Emission Appliance Standard**, including:

- Shift in baseline to IOU programs
- Anticipated impact on adoption, growth of secondary market, supply uncertainty, out of state purchases
- Change in avoided costs and retail rates for natural gas

Fuel Substitution

Discussion

- Does the modeling approach proposed meet stakeholder needs?
- How should the study treat non-IOU program impacts on FS?
- What are stakeholders' other priorities/concerns regarding the new considerations for fuel substitution analysis?



BROs

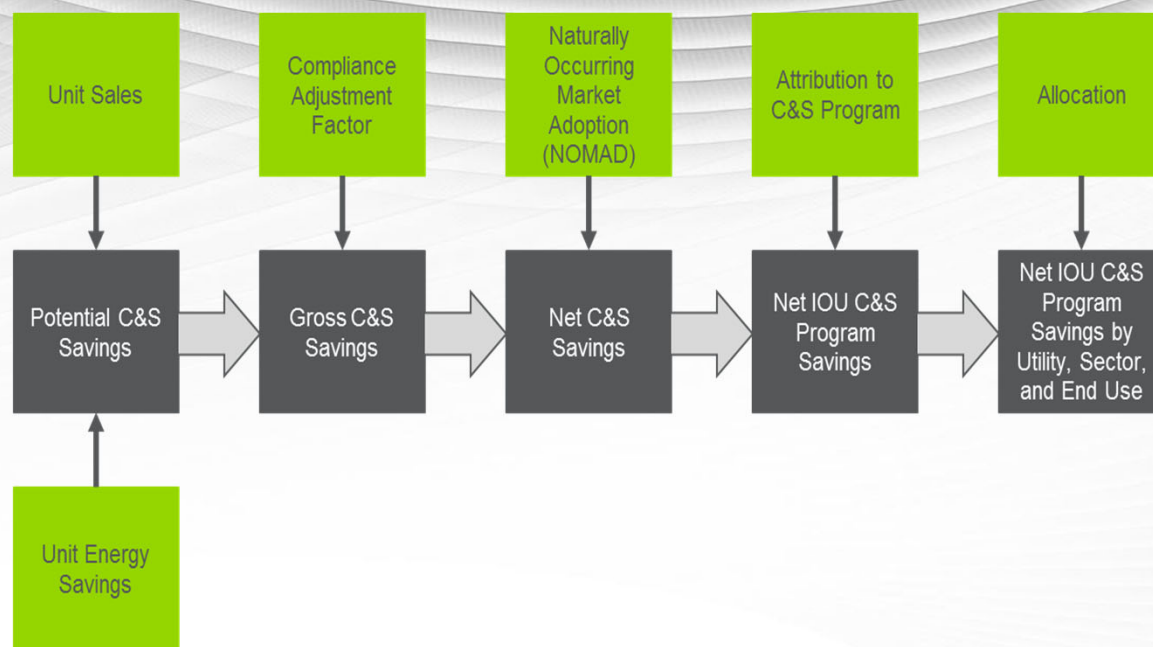
BROs

- Measure list largely consistent with 2023 PGS, but data will be updated as available.
- Primary focus:
 - Home Energy Reports
 - Strategic Energy Management
 - Retrocommissioning
- Additional measures to consider include Residential and Commercial Competitions, Universal Audit Tool, BEIMS, Benchmarking
- Non-Residential program types that have not been brought to market over multiple PG Study Cycles may be deemphasized or removed from analysis
- Key assumptions are based on existing programs and planned program rollouts and targets

Codes & Standards

- Calculations

- Adjust code baseline for rebated measures
- Calculate net C&S Savings – subtracts naturally occurring market adoption of code-compliant technologies
- Calculate net IOU C&S Savings – portion attributed to advocacy work



- Where gaps exist (mostly for pending new C&S), research or estimate:
 - **Market size estimates:** Market sale projections, construction projections, and trends
 - **Compliance factors:** For building codes, use historical data at the building level by building type based on the proportion of projected energy savings achieved. For the appliance standards, review historical compliance rates for similar standards.
 - **NOMAD factors:** From prior evaluations with adjustments to shift the start year, as appropriate.

Income-Qualified

Modeling Approach

- 2025 PGS methodology consistent with 2023 Income-Qualified Potential analysis, and will include:
 - Market Characterization
 - Measure Selection and Characterization – includes EE and Fuel Substitution
 - Assessment of Technical and Market Potential
 - Apply Income Qualified-specific Enrollment and Adoption inputs
 - Application ESA Cost Effectiveness Tool (ESACET) pre-screen
 - Incorporates modeled quantification of Non-Energy Benefits
 - Measures with Health, Comfort and Safety emphasis are included (will *not* be screened out)

New Considerations for 2025 Study

- Explore opportunities to refine Adoption Curves and better define Customer Willingness inputs

Methodology Questions

- What time period of historic program data is reasonable for use in calibrating the rebate program model?
- Should alternative cost effectiveness (TRC) thresholds or other B/C tests be considered for Economic or Achievable Potential determination
- Are there any specific BROs program types that should be considered for exclusion?

Income Qualified

- Should Guidehouse retain its ESACET measure screen for Income-Qualified sector measures?
- What opportunities or gaps exist in better defining Income Qualified customer adoption inputs?



Preliminary Planned Stakeholder Engagement Topics

Q2 2024

Work Plan (today's meeting)

Input on measure priorities and characterization (service list e-mail)

Q3 2024

Presentation of Income-Qualified approach and data needs (webinar)

Input on scenarios (webinar)

Q1 2025


Draft results (webinar)

Draft results formal comment

Study Overview Questions

- Are there questions/concerns with the project timeline?
- Any specific stakeholder engagement topics we should consider that aren't planned?
- Are the Industrial/Agricultural Sector and Fuel Substitution and focus areas appropriately positioned? Are there other areas of focus that should be added?
- Questions about other materials presented so far in this workshop?





Post Potential & Goals Study Support

Post Potential & Goals Study Support

Planned Tasks

- Additional Achievable Energy Efficiency (AAEE) and Fuel Substitution (AAFS) Scenarios
- SB350 IOU Territories Updates

Other Tasks (under consideration)

- Feasibility Study on Setting Locational Energy Efficiency Targets
- Development of IRP Supply Curves
- Impact of Zonal Electrification Efforts
- 2045 CA Statewide Net Zero Goal analysis



Summary & Final Questions

Q&A and Open Discussion

What additional questions/comments do you have that haven't already been covered today?



Reminders and Next Steps

Stakeholder engagement is critical and CPUC and the Potential and Goals Study team values the input and direction provided.

- Study-related comments are informal.
- Study-related comments on Workplan are due **May 1, 2024** via e-mail to: hanna.navarrogoldberg@cpuc.ca.gov, ali.choukeir@cpuc.ca.gov, and npodkowsky@guidehouse.com



Stay informed

CPUC's 2025 Energy Efficiency Potential & Goals Webpage:

<https://www.cpuc.ca.gov/industries-and-topics/electrical-energy/demand-side-management/energy-efficiency/energy-efficiency-potential-and-goals-studies/2025-potential-and-goals-study>



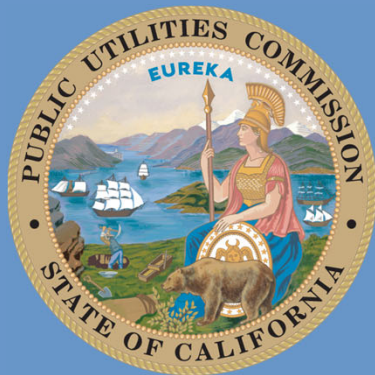
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Thank You

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