

# DEMAND ANALYSIS WORKING GROUP (DAWG) **2021 Efficiency Potential & Goals Study**



**November 5, 2020**

# Remote-Only Format

*In compliance with Governor Newsom's Executive Orders N-25-20 and N-29-20, and the recommendations from California Department of Public Health, we are utilizing a remote-only format today.*

Timeslot	Agenda Item	Presenter
9:00 – 9:15	Introduction	Coby Rudolph
9:15 – 9:40	Calibration	Vania Fong
9:40 – 9:50	Scenario Approach	Karen Maoz
	5 min break	
9:55 – 10:20	Scenario Variables	Tyler Capps
10:20 – 10:50	Relating Scenarios to IRP	Amul Sathe
10:50 – 11:00	Discussion	Travis Holtby

Materials can be found on the

[CPUC 2021 Potential & Goals webpage](#)



# Webex Participant Guide

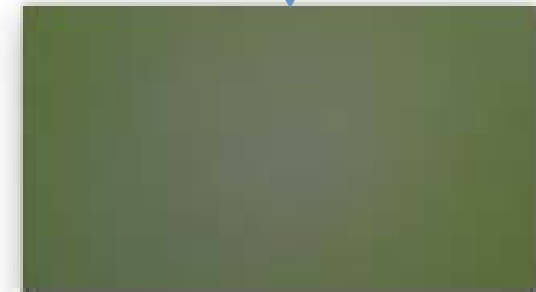
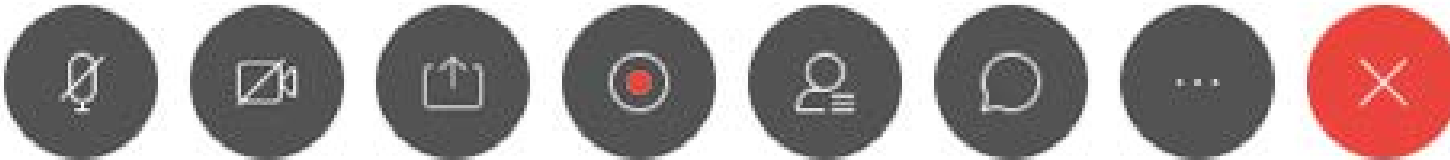
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Click to see the  
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and enter questions

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Link to: [Cisco Webex Participant Guide](#)

# Conference Call Etiquette During Q&A Sessions

- We know everyone is working from home, background noise if you are speaking is inevitable.
- BUT please mute yourself when you aren't speaking.
- Please do not place the line on hold.
- We are actively monitoring the chat window; consider submitting questions/comments via chat.

# CPUC EE Potential & Goals Study Team

- Coby Rudolph, Project Lead
- Genesis Tang
- Lisa Paulo
- Jessica Allison
- Peter Franzese
- Travis Holtby
- Paula Gruending, Project Supervisor

# Two EE Potential & Goals Tracks

## 1. Goals-adoption Policymaking Track (Policy Track):

Formal comments via EE rulemaking proceeding. Topics have included:

- Energy efficiency portfolio objectives and Goals metrics
- Energy efficiency / IRP Integration Opportunities
- Cost-effectiveness questions, treatment of non-resource programs and budget approval
- Prioritization & other issues

## 2. Potential and Goals Study Track (Study Track):

Informal work on the EE Potential & Goals Study.

- CPUC Energy Division staff (along with Guidehouse) is soliciting ongoing, informal feedback from stakeholders on methodological and technical issues related to the Study.
- As in previous studies, stakeholder engagement on technical will take place in coordination with the CEC's Demand Analysis Working Group (DAWG).

# EE Potential & Goals Background

Potential and Goals Study serves multiple purposes:

1. PG Study informs the CPUC Decision adopting IOU Energy Efficiency Goals.
2. EE Goals inform the statewide Demand Forecast (& IRP), SB 350 forecast.

# Potential & Goals Next steps (Subject to Change)

Activity	Track / Venue	When
ALJ Kao Ruling Questions (from 3/12/20)	Policy / formal comment	Completed
Study launch Workshop & Workplan	Study / informal comment	Completed
Measure characterization, data inputs	Study / informal comment	June 2020 DAWG mtg
Modeling	Study / informal comment	July 2020 DAWG mtg
Market studies, BROs, Low Income analysis	Study / informal comment	Oct 2020 DAWG mtg
Scenarios (PG study and IRP) and calibration	Study / informal comment	Today
Locational post-processing, Draft results	Study / informal comment	Q1 2021
Proposed Decision on Goals Adoption for 2022 and Beyond	Policy / formal comment	Q2 /Q3 2021
Decision on Goals Adoption for 2022 & Beyond	Policy / formal comment	Q3 2021
Additional Policy Activities TBD	Policy / formal comment	TBD

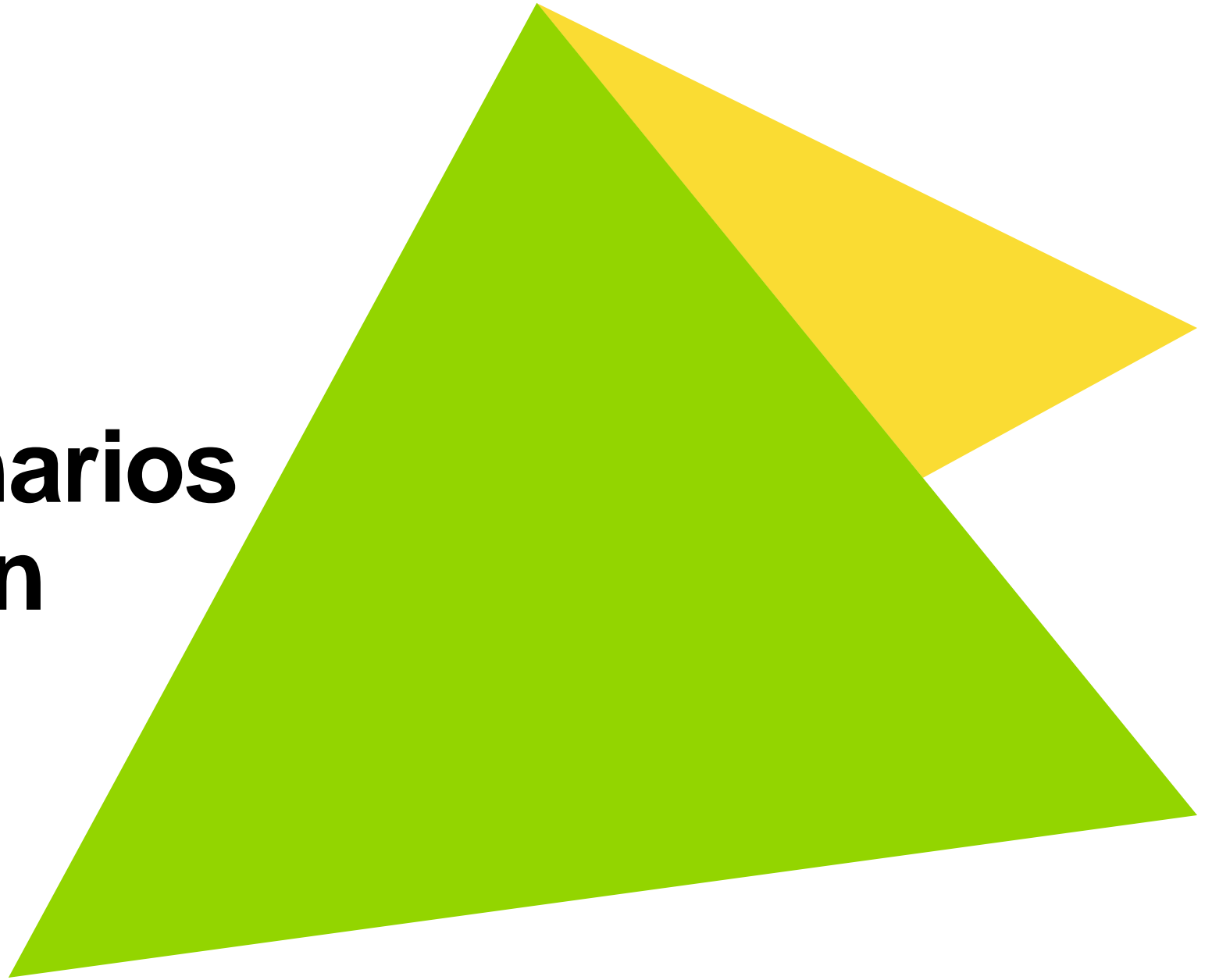
Completed Stakeholder Engagement



# Achievable Potential Scenarios and Calibration

2021 Potential and Goals

November 5, 2020



# Speakers Today



**Amul Sathe**  
Project Director  
Guidehouse



**Karen Maoz**  
Project Manager  
Guidehouse

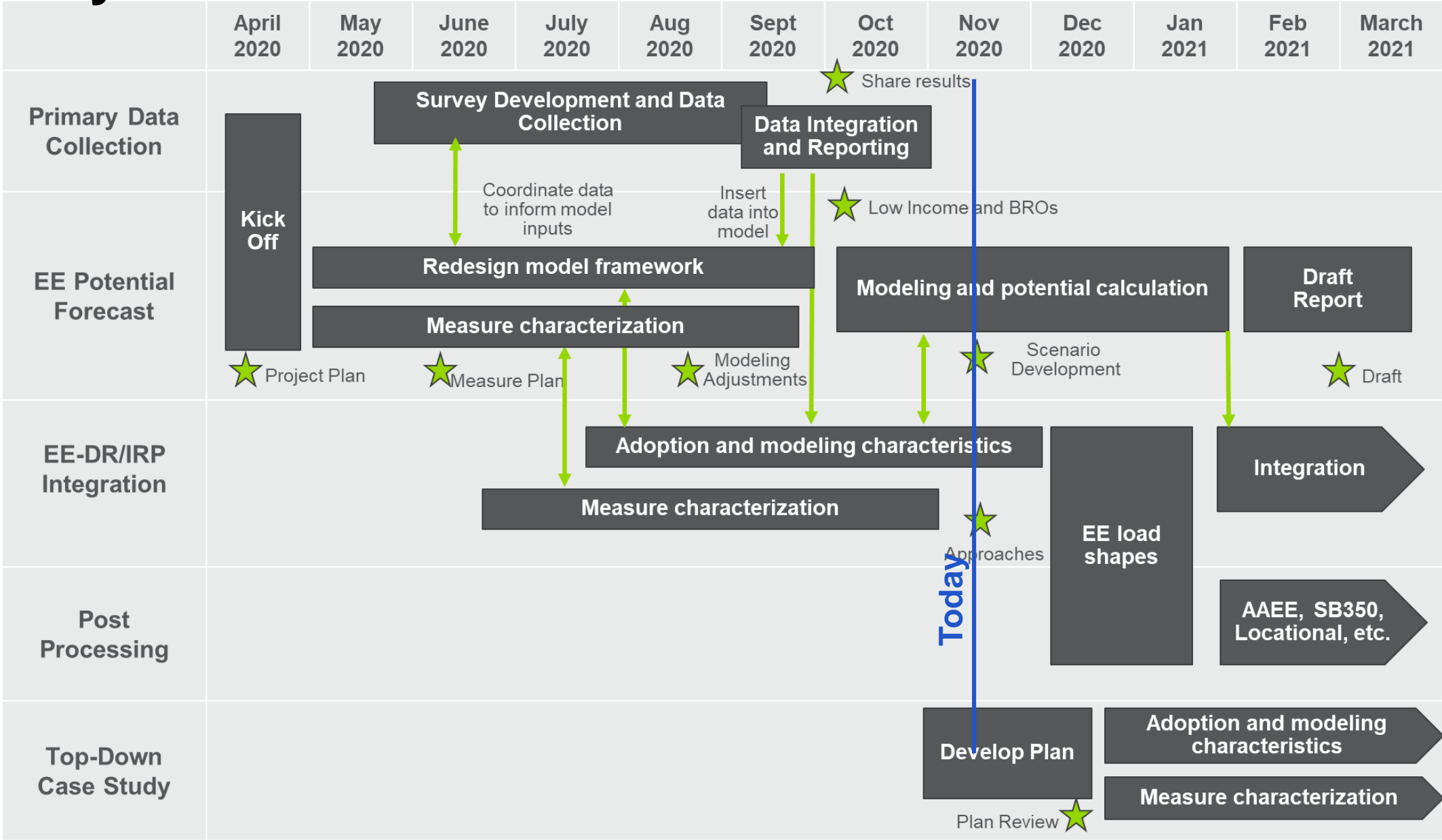


**Tyler Capps**  
Modeling Lead  
Guidehouse

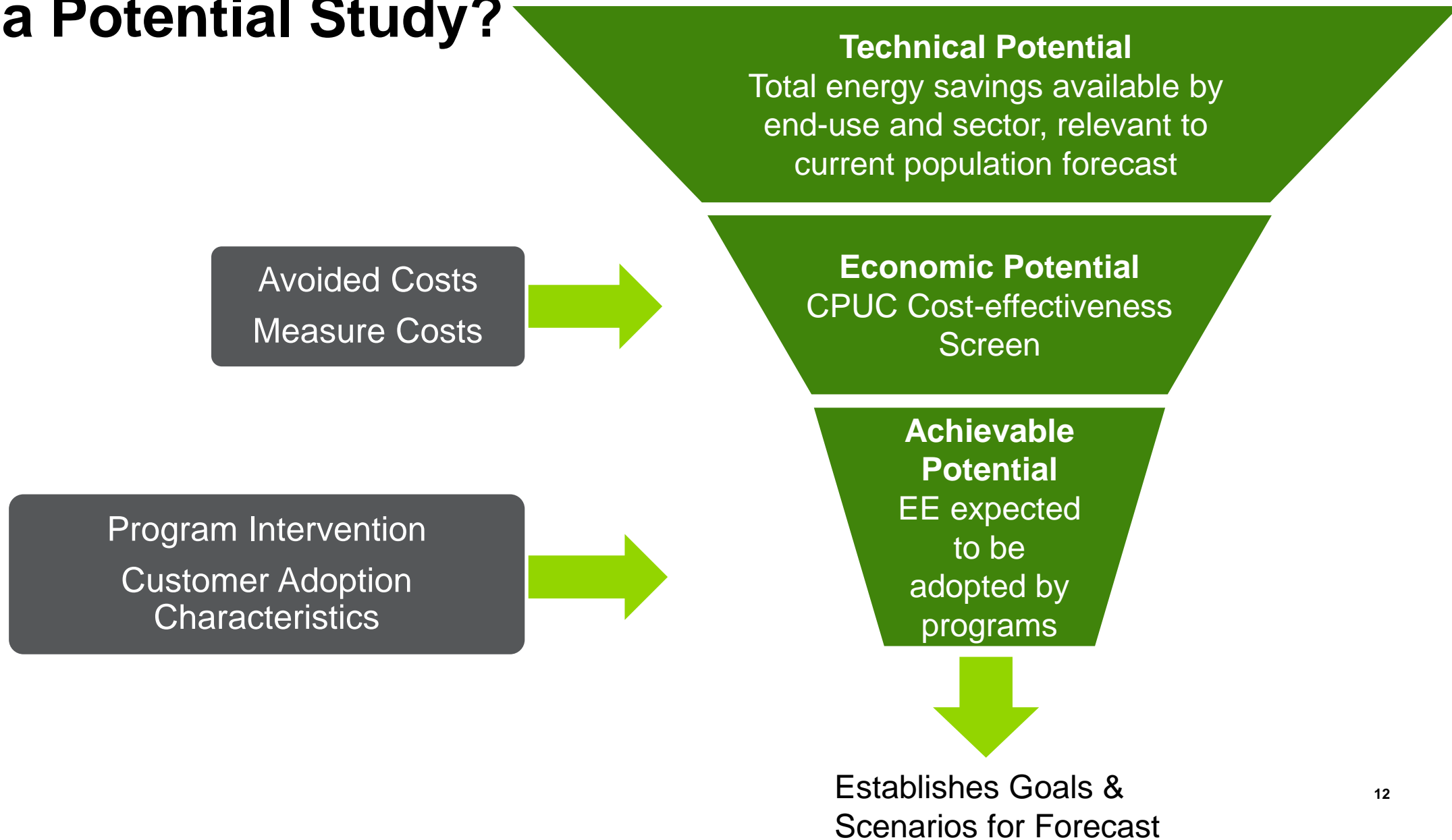


**Vania Fong**  
Modeling Support  
Guidehouse

# PG Study Workflow



# What is a Potential Study?



# Calibration

# Calibration 101: Why?

- Calibration - a standard process of adjusting parameters such that the starting point of the model aligns with actual program achievements
- Calibration **is not drawing a future trend line of savings** based on past program accomplishments
- **Calibration tunes parameters that describe the customer decision making process and the rate of adoption**
- Once we have these parameters, we use them as a starting point for the forecast of achievable potential
- This applies to rebate programs only (BROs, LI, and C&S are modeled differently)

# Calibration 101: How?

Lever	Drivers and Impact on Model results
Awareness	<ul style="list-style-type: none"><li>Increasing initial awareness shortens the time required for a measure to reach 100% consumer awareness and accelerates adoption.</li><li>Increasing marketing strength increases adoption rate of technologies in the nascent stage (i.e., having low initial consumer awareness).</li></ul>
Willingness	<ul style="list-style-type: none"><li>Adjusting incentive levels increase adoption, increase budget, and increase savings</li></ul>
Stock Turnover	<ul style="list-style-type: none"><li>Adjusting turnover rates allows the model to better reflect real world market dynamics. Even though the model assumes technologies turn over based on the end of life (defined by the EUL), the real velocity of the market turnover isn't this exact.</li></ul>



# Calibration 101: To What?

*“In assessing the feasibility and cost-effectiveness of energy efficiency savings ... the Public Utilities Commission shall consider the results of energy efficiency potential studies that are **not restricted by previous levels of utility energy efficiency savings.**”*

– SB350

- The P&G Study operates under this directive from SB350 by doing two things:
  - Calibrating consumer decision and market parameters (not a trendline of savings)
  - Developing alternate future scenarios (for CPUC to consider in goal setting process)



# Calibration 101: To What?

- The calibration process needs historic market data to inform our calibration process as we set these market/customer parameters
- We plan on using 2016-2019 program data (net and gross savings and program spending)
- Remember, calibration tunes parameters that describe the customer decision making process and the rate of adoption

# Market Adoption Study vs. Calibration

## Key Distinctions

	Market Adoption Study	Calibration
<b>Goal</b>	Capture multiple value factors that influence customer decision-making within competition groups	Tune parameters that describe the customer decision-making process and the rate of adoption
<b>Parameters Influenced</b>	<ul style="list-style-type: none"><li>• Willingness</li></ul>	<ul style="list-style-type: none"><li>• Initial Awareness, Word of Mouth, and Marketing Effectiveness</li><li>• Willingness</li><li>• Stock Turnover</li></ul>
<b>Modeling Step</b>	Input market study results for multi-attribute willingness calculations <i>before</i> running model	Calibrate parameters <i>after</i> running model and comparing with historical program targets

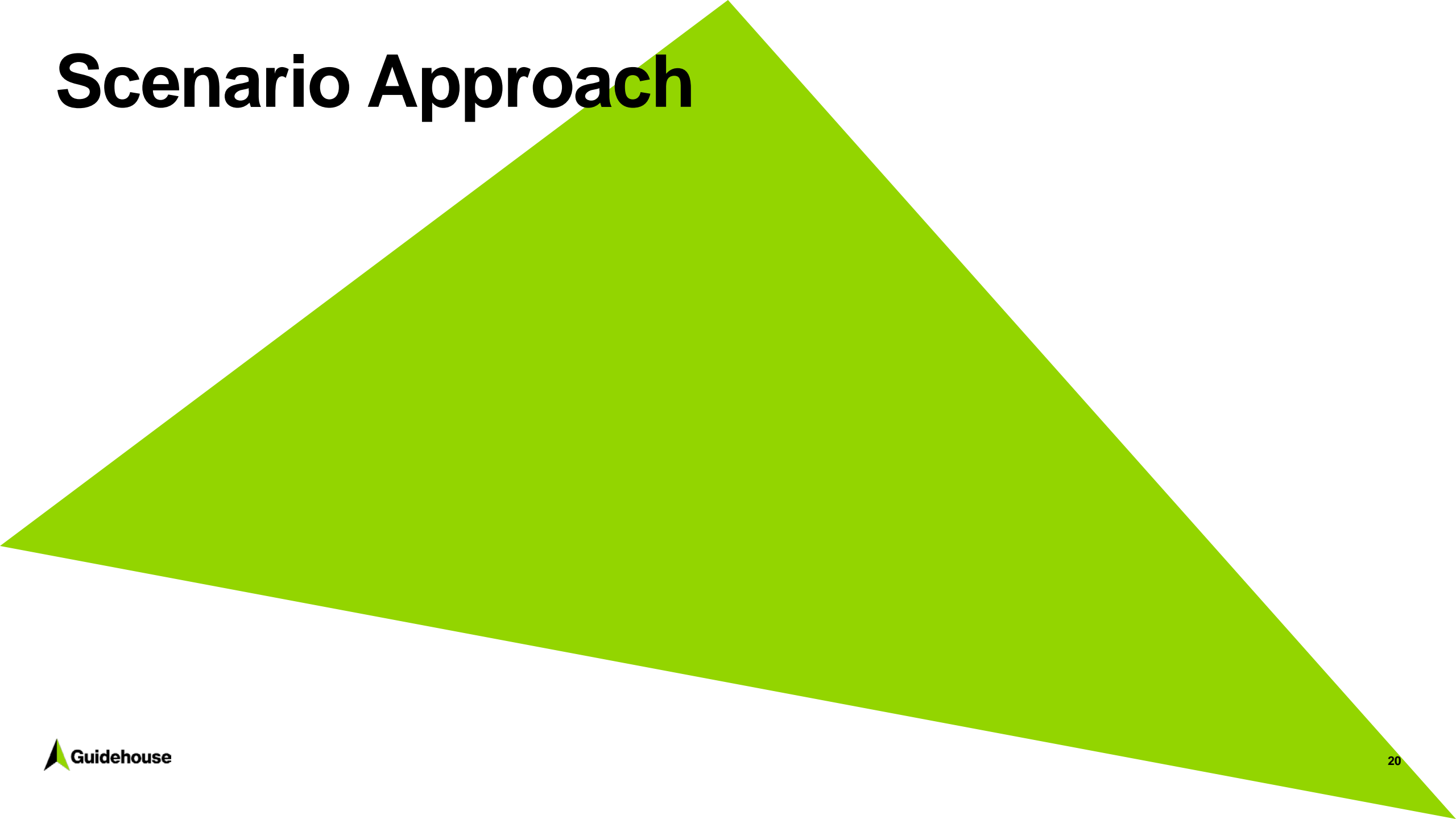
***Market study results support more accurate adoption modeling, leading to fewer adjustments during calibration***

# Stakeholder Input

- What program years should be considered for the calibration of the program model?



# Scenario Approach



# P&G Scenarios Scope

- The 2021 P&G study will develop several scenarios that inform the CPUC’s goal setting process. We refer to these as the **P&G Scenarios**:
  - One “reference” scenario that stems directly from the calibration process
  - Additional alternate scenarios (determined in conjunction with CPUC staff)
- **Additional** scenario analysis will be conducted as part of the Additional Achievable Energy Efficiency (AAEE) analysis after the P&G study is finalized. **AAEE Scenarios**:
  - Feed into the California Energy Commission’s Integrated Energy Policy Report (IEPR)
  - Are built around the adopted IOU goals and informed by P&G Scenarios
  - Consider additional variables and policy context
  - Do not impact IOU goals

Today’s discussion focuses on **P&G Scenarios**, not **AAEE Scenarios**

# What's a Scenario?

- Key variables in the P&G model can fall within a range of possibilities, grouped into two categories:
  - **Internally Influenced** - CPUC and IOUs collectively have control over these **policy** and **program** decisions
  - **Externally Influenced** - CPUC and IOUs do not have control over these factors

<i>Example Internally Influenced</i>	<i>Example Externally Influenced</i>
<ul style="list-style-type: none"><li>• <b>Cost-effectiveness (C-E) test</b></li><li>• <b>C-E threshold</b></li><li>• Incentive levels</li><li>• Marketing &amp; outreach level of effort</li><li>• Behavior, retro commissioning &amp; operational (BROs) customer enrollment over time</li><li>• IOU financing programs</li></ul>	<ul style="list-style-type: none"><li>• Building stock forecast</li><li>• Retail energy price forecast</li><li>• Measure-level input uncertainties (unit energy savings, unit costs, densities)</li><li>• Non-IOU financing programs</li><li>• Enacting of future Codes and Standards</li></ul>

- Scenarios allow us to explore different futures based on a combination of assumed policy interventions, program design decisions, and exogenous factors

# Approach to P&G Scenarios

- Reference Scenario is primarily informed by current program design and policy. The reference scenario should best represent “current and known future policy”
- Additional scenarios will be defined in coordination with the CPUC
- Alternate scenarios help identify the range of results and inform policy decision making.
  - P&G scenarios should focus on internally influenced variables
  - P&G scenarios will fix externally influenced variables to a single setting across all scenarios:
    - CEC Mid-case forecast for retail rates, population, building stock
    - Use DEER and workpaper values as is
    - One set of assumptions about future C&S

# Scenario Variables



# Candidate Scenario Levers - Descriptions

Lever	Description	Applicability	
		Economic	Market
Cost-Effectiveness (C-E) Test	Different C-E screening tests and/or thresholds yield different amounts of economic potential and cause the market potential model to incentivize different sets of measures. These only apply to rebate programs (excluding the LI and BROs programs)	✓	✓
C-E Measure Screening Threshold		✓	✓
Incentive Levels	Varying incentive levels will change both the C-E of measures and upfront and lifetime costs to customers	✓	✓
Marketing & Outreach	Varying marketing and outreach levels impacts customer awareness and the rate of technology adoption		✓
BROs Program Assumptions	Enrollment in BROs programs is an input vector by assuming a conservative or aggressive roll-out of BROs programs		✓
Financing Programs	IOU financing programs help reduce the cost burden associated with efficient measure adoption		✓

# Candidate Scenario Levers – 2019 Ranges

Lever	Range/Bounds	
	Lower	Upper
Cost-Effectiveness (C-E) Test	TRC, PAC, RIM, Societal*	
C-E Measure Screening Threshold	0.85 for all measures	1.25 for all measures
Incentive Levels	Capped at 50% of incremental cost or existing program levels	Capped at 75% of incremental cost
Marketing & Outreach	<u>Reference</u> : Default calibrated value	<u>Aggressive</u> : Increased marketing strength
BROs Program Assumptions	<u>Reference</u> : Continued offering of existing BROs interventions and planned new interventions based on policy directions	<u>Aggressive</u> : Intervention penetration grows faster than the Reference Case and additional BROs not currently in CA utility plans are included
Financing Programs	No savings claimed from financing programs**	IOU financing programs broadly available to Residential and Commercial customers

\*Not fully defined by CPUC

\*\* Consistent with 2017 P&G Study

# Scenarios from the 2019 Study

- 2019 P&G Study scenarios primarily varied the cost effectiveness screening thresholds
- Program engagement was either set to a reference case or an aggressive case

Scenario → Levers ↓	Reference	Alternative 1	Alternative 2	Alternative 3	Alternative 4
<b>C-E test</b>	TRC	TRC	TRC	TRC	TRC
<b>C-E measure screening threshold</b>	1.0 for all measures	0.85 for all measures	1.25 for all measures	1.0 for all measures	0.85 for all measures
<b>Incentive levels</b>	Capped at 50%	Capped at 50%	Capped at 50%	Capped at 50%	Capped at 75%
<b>Program Engagement*</b>	Reference	Reference	Reference	Aggressive	Aggressive
<b>Financing</b>	No	No	No	No	Yes

\*Includes Marketing and Outreach and BROs Program Assumptions

# Stakeholder Input

- What key variables should be the focus of scenario design?
- What are the most uncertain levers and their range we should consider testing?



# Relating Scenarios to IRP

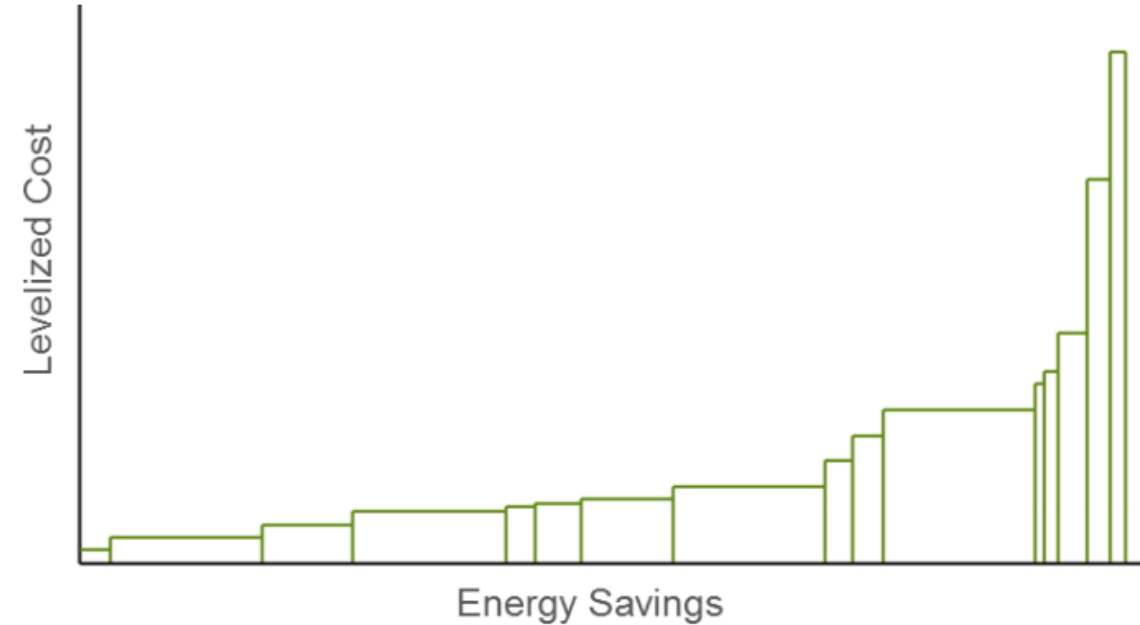
# Overview

- The IRP is a roadmap to meet forecasted annual peak and energy demand, with consideration of an established reserve margin, through a combination of supply-side and demand-side resources
- CPUC staff would like to consider the results of IRP modeling in the goal setting process
- Previously: PG study ran all scenarios on its own, these scenarios informed goals
- New PG Study will:
  - Run a set of scenarios on its own
  - Simultaneously provide EE supply curves to the IRP model for optimization
  - Publish both sets of results side by side

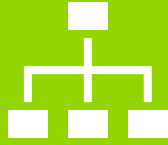
This certainly brings up policy questions. Guidehouse is here to discuss technical topics today.

# Incorporating EE Into the IRP

- Supply curves offer a useful way to illustrate the amount of energy savings available per dollar spent.
  - This is the type of information required for an IRP model as it optimizes based on cost (among other parameters)
  - Supply curves are made up of bundles of EE measures.
  - The concepts were described in a previous [technical analysis](#)
- 
- What is not optimized in the IRP model:
    - Natural gas energy efficiency
    - Fuel substitution
    - Low Income and Codes and Standards Programs
    - BROs Programs



# Technical Issues



## Bundling Measures

- Bundling allows highly C-E measures to subsidize low C-E measures
- Past analysis bundled measures based primarily on sector and end-use
- Other alternatives: bundle measures purely based on cost, programs, or other method



## Natural Gas Savings

- Only electric resources are optimized in an IRP; gas would not be optimized
- Historic basis for goals was the PG study (models both gas and electric)
- Measures that save both gas and electric need to reside within one or the other model (IRP or PG study) so that forecasts are consistent and not double counted

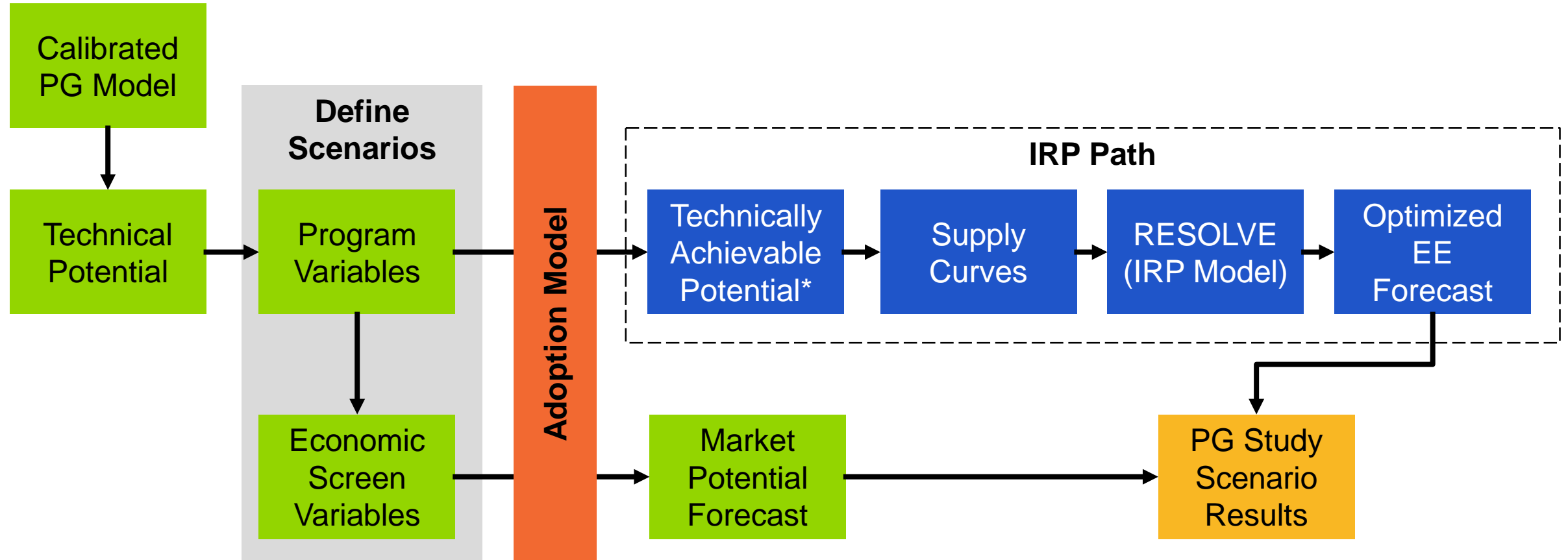


## Alignment of Resource Costs

- Analysis should ensure costs of EE resources are accounted appropriately compared to other DERs and supply side resources in the IRP
- Past analysis included all cost components used in the TRC test
- Non-resource program costs were added to the bundles



# Scenarios and the EE/IRP Process Flow



\* Technically achievable potential is the model's adoption forecast for ALL measures (with no cost-effectiveness screening)

# IRP Scenarios Plan

- Plan to develop more than one “scenario” of supply curve to feed into the IRP for optimization.
- Scenario levers are only those related to program intervention (incentives, marketing effect, etc.)
- RESOLVE itself also runs multiple scenarios targeting varying levels of GHG reduction in its optimization.
  - We will need to settle on one RESOLVE scenario, or we will produce far too many scenario results.

# Stakeholder Input

- Do stakeholders agree that BROs (like C&S and LI) should not be optimized?
- What cost components should be included in supply curves?
- Where should we model EE measures that save both gas and electric? Remove them from the IRP all together?
- The CPUC's IRP process doesn't run individual IOUs but rather at a "statewide" level. Does this high level of granularity of results cause any concerns for informing the goal setting process?
- What RESOLVE scenario should be used to inform goal setting?



# 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 the topics covered today are due **November 19** via e-mail to: [coby.rudolph@cpuc.ca.gov](mailto:coby.rudolph@cpuc.ca.gov) & [travis.holtby@cpuc.ca.gov](mailto:travis.holtby@cpuc.ca.gov).
- We suggest comments be focused on the questions posed throughout this slide deck
- For topics with no explicitly posed questions, open comment is welcome.

# Stay Informed

CPUC's 2021 Energy Efficiency Potential & Goals Webpage:

- <https://www.cpuc.ca.gov/General.aspx?id=6442464362>


CEC's Demand Analysis Working Group (DAWG):

- This meeting and future meetings are being noticed to the DAWG listserv (not the EE proceeding listserv)
- Sign up for the DAWG listserv to get future notices here: <https://www.energy.ca.gov/programs-and-topics/topics/energy-assessment/demand-analysis-working-group-dawg>

DAWG-LIST: DAWG Meeting October 8, 2020 from 2:00pm-5...

California Energy Commission <listenergia@listserv.cec.ca.gov>  
To: DAWG@LISTSERVER.ENERGY.CA.GOV Thu 4:04 PM

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CALIFORNIA ENERGY COMMISSION

October 01, 2020

To interested parties:

Please join us for an upcoming Demand Analysis Working Group (DAWG) meeting: "2021 CPUC Energy Efficiency Potential and Goals Study" on October 8, 2020 from 2:00pm-5:00pm.

Stakeholders will be invited to make comments or ask questions during the meeting, and there will be an opportunity for informal written comment submission after the workshop as well. During the meeting, CPUC Energy Division Staff and consultants will discuss and solicit feedback on the following:

- Ind/Ag measure characterization data collection study
- Market adoption data collection study
- Description of PG study integration of data collection study results
- BROs approach and stakeholder questions
- Low Income forecasting activities

# Contact

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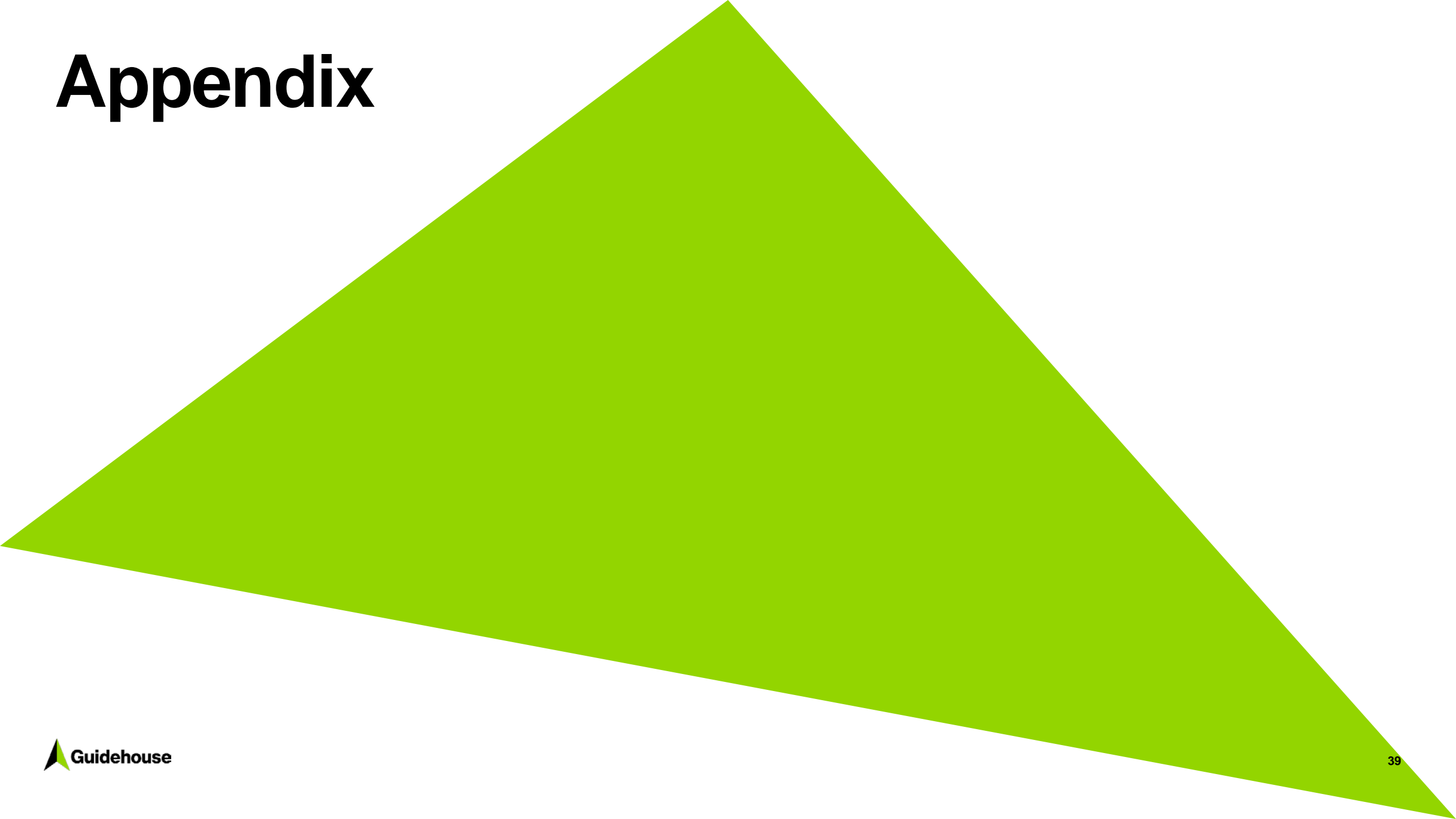
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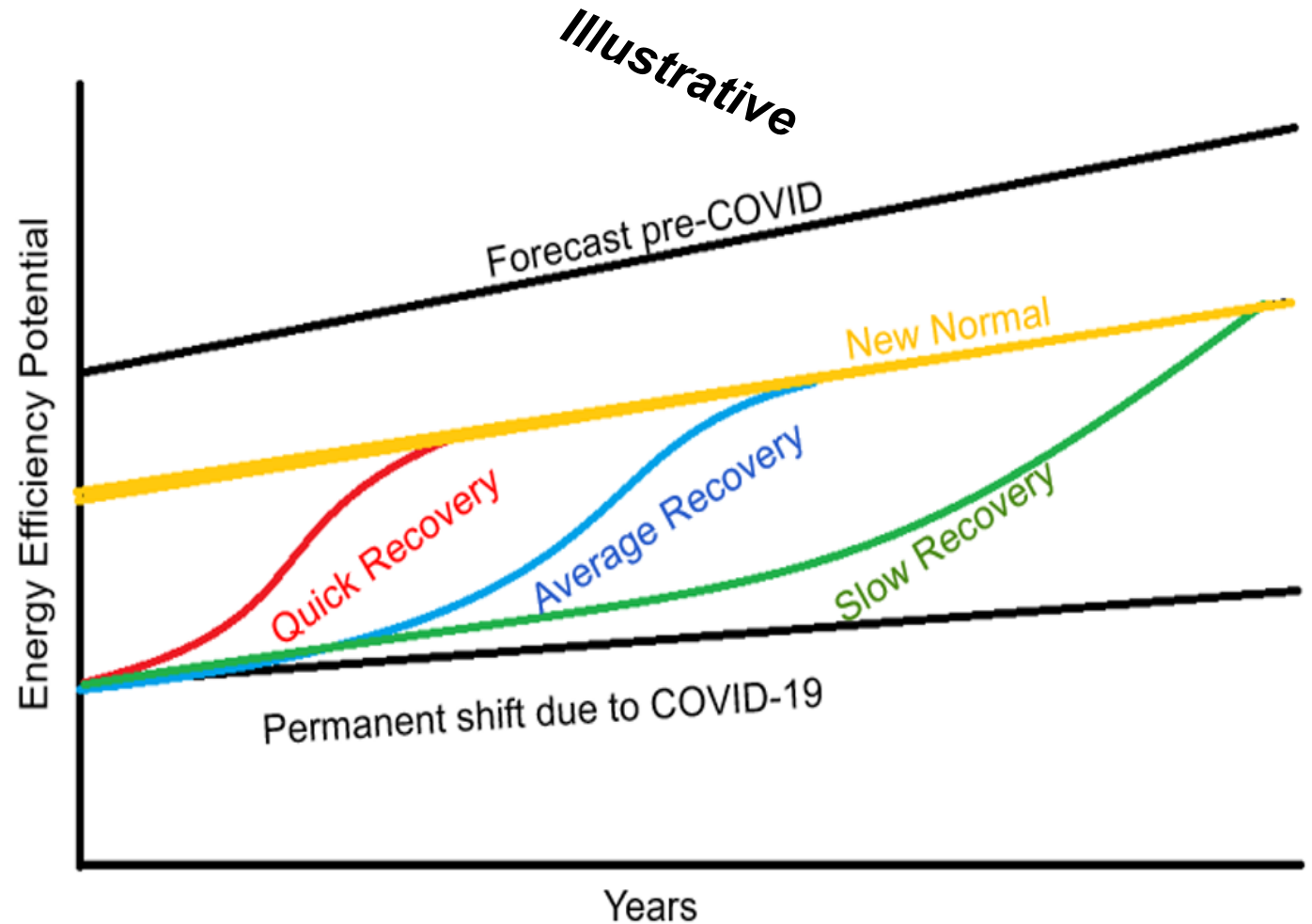


# Appendix



# Dealing with COVID Uncertainty

- Energy consumption and peak demand loads are shifting
- Most spending and investment is down in almost all sectors
- Future economic recovery and consumption is uncertain
- Proposal is to bound the forecast, the actual forecast falls somewhere between these two bounds:
  - Permanent shift due to COVID-19
  - Pre-COVID-19 assumptions



**Key Takeaway: Data is limited; assumptions will be necessary**



# Layering COVID Uncertainty on top of Scenarios

**Key Takeaway: Wait until Q1 of 2021 to select a recovery trajectory (or trajectories) and adjust based on COVID-19 impacts**

## Reasoning for planned approach

- The economy and shifts in energy consumption are volatile: neither show signs of predictable recovery rates as of now

## Different Value Factor Versions

- *Calibration*: Use Pre-COVID values to align with historic program achievements
- *Forecasting*: Use values capturing current consumer sentiments
- *Uncertainty*: Project a transition from “COVID” values to the “new normal”

		Stage of Analysis		
		Calibration	Forecasting	Uncertainty
Value Factor Versions	Pre-COVID	✓		✓
	COVID		✓	✓