



Workshop: 2021 Energy Efficiency Potential & Goals Study Kick-off

Thursday, April 16th, 2020
9am-12:30pm

Via Webinar





Before We Get Started

- **Muting:** All participants are muted by default. Participants may unmute themselves during Q&A:
 - On the Webex Meeting interface
 - On your phone: *6
- **Questions / discussion:**
 - Four opportunities during today's workshop for Q&A / discussion / comments ... 10min at the end of each sub-session, 35 min at the end.
 - During Q&A times: Either unmute yourself to speak live, or type your question/comment and we'll read it.





Webex Participant Guide

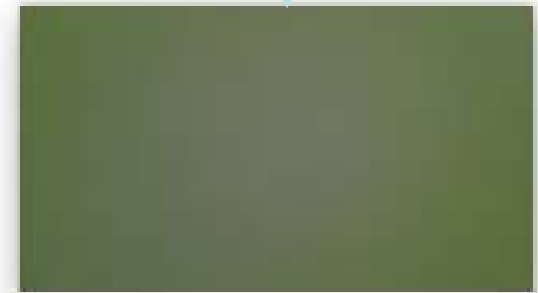
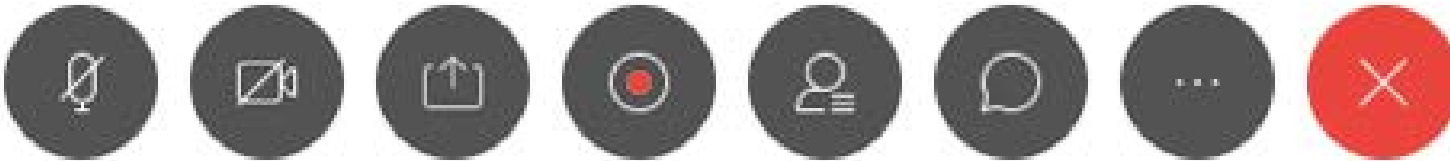
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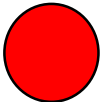
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participants

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-  Gray means "on" (Not Muted, Sharing Video)
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Link to: [Cisco Webex Participant Guide](#)





WebEx Conference Call Etiquette During Q&A Sessions

- We know everyone is working from home; don't feel bad about noise from kids, dogs, etc. if you are actively asking a question or making a comment

...BUT, after you speak please re-mute your microphone.

- Please do not place the line on hold
- We are actively monitoring the WebEx chat window; consider submitting questions/comments via chat





Today's Workshop

Kick-off for the 2021 Energy Efficiency Potential and Goals Study





Let's get started - Agenda

Time Slot	Length	Topic	Presenter(s)
9:00-10:00*	60 min	Introductions and Overview of Group E Scope	CPUC and Guidehouse
		Parallel tracks of policy and study development	Coby (CPUC)
		Overview of planned studies	Amul (Guidehouse)
		EE Potential Forecast Overview	Karen (Guidehouse)
		Study approach	
		Study schedule	
10:00-10:05	5 min	Break	
10:05-10:45*	40 min	Market and Measure Characterization	Rebecca (Guidehouse)
		Market and measure data inputs	
		Measure characterization approach for market sectors	
		Other: NMEC, fuel substitution, EE-DR	
10:45-10:50	5 min	Break	
10:50-11:30*	40 min	Modeling Methodology Discussion	Tyler (Guidehouse)
		Potential analysis steps	
		Planned modeling updates	
		Achievable potential	
11:30 -11:45	15 min	Potential and Goals Study Additional Analysis	Karen (Guidehouse)
		Low-income, BROs, Codes & Standards	
		Post-Processing: Load shapes, location-based impacts, and CEC forecast	
11:45-11:55	10 min	EE-DR and IRP Integration	Amul (Guidehouse)
11:50-11:55	5 min	Reminders and Next Steps	Coby (CPUC)
11:55-12:30	35 min	Q&A and Open Discussion	CPUC and Guidehouse

*At minimum, the last 10 minutes of the time slot is allocated to Q&A and open discussion.





CPUC EE Potential & Goals Study Team

- **Coby Rudolph**, Senior Regulatory Analyst
- **Genesis Tang**, Regulatory Analyst
- **Paula Gruending**, Program and Project Supervisor





Two EE Potential & Goals Tracks

- 1. Goals-adoption Policymaking Track (Policy Track):** seeking stakeholder input on existing policies
 - Energy efficiency portfolio objectives
 - Energy efficiency Goals
 - Energy efficiency / IRP Integration Opportunities
 - Portfolio assessment of cost-effectiveness and budget approval
 - Prioritization & other issues
- 2. Potential and Goals Study Track (Study Track):** covers the update to the Potential and Goals
 - Updates to traditional data and methods
 - New methods and data development this round
 - Staff will informally collaborate on methods and data development via the DAWG
 - Engagement schedule still TBD





Potential & Goals Next steps (Subject to Change)

Activity	Track / Venue	When
ALJ Kao Ruling Questions (from 3/12/20)	Policy / formal comment	Comments by 5/22, Replies by 6/5
Study launch Workshop & Workplan	Study / informal comment	Today / Informal comments by 4/27
Measure characterization, data inputs	Study / informal comment	Q2 2020
Modeling, Data collection findings	Study / informal comment	Q3 2020
Scenarios, Top-down scoping, Low income modeling	Study / informal comment	Q4 2020
EE/DR/IRP Integration, 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





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:

<https://www.energy.ca.gov/programs-and-topics/topics/energy-assessment/demand-analysis-working-group-dawg>





EE Potential & Goals Study

Why do we do the Potential & Goals Study?





EE Potential & Goals Background

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





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.





2021 EE Potential and Goals Study

What to expect in this cycle's Study Workplan





2021 Potential & Goals Updates

The 2021 Study makes improvements & additions based on stakeholder feedback, and lays groundwork for potential further changes down the road.

- Energy efficiency / demand response integration activities
- Fuel substitution measure characterization & IOU
- IRP: Options for scenarios that include IRP optimization analysis.
- Industrial/ag market studies
- Consumer adoption drivers studies
- Some measures targeted by climate zone
- Additional locational forecasts to help CCAs and RENs plan their activities.





Groundwork for the Future

- IRP: Work to support continuous integration.
- Top-down Study Exploration: A parallel activity to explore “top-down” approaches
 - Based on consumption data / defining existing & target end use intensities to quantify potential.





Study Workplan Comments

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 Study Workplan are due **April 27, 2020** via e-mail to: coby.Rudolph@cpuc.ca.gov & genesis.tang@cpuc.ca.gov.

We suggest comments be focused on the questions posed throughout this slide deck

Please respond separately to policy-related questions by May 22 for the topics posed in: *Administrative Law Judge's Ruling Inviting Responses to Potential and Goals Policy Questions*.





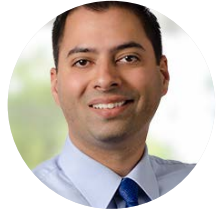
2021 Potential and Goals Work Plan

Workshop

April 16, 2020

Guidehouse Speakers Today

And the Subcontractors



Amul Sathe
Project Director
Guidehouse



Karen Maoz
Project Manager
Guidehouse



Rebecca Legett
Measure Lead
Guidehouse



Tyler Capps
Modeling Lead
Guidehouse



**Tierra Resource
Consultants**



**John Jai Mitchell
Analytics**



**Opinion Dynamics
Corporation**
Market Adoption
Characteristics Study



DNV GL
Industrial and
Agricultural Measure
Study

Overview of Planned Studies

Potential and Goals Study Overview

- The 2021 PG study is more multi-faceted and complex relative to its predecessors to better inform the questions CPUC staff are considering
- Stakeholder feedback from the October 2019 PG workshops informed the new scope
- **Multiple activities** make up the 2021 PG study:
 - Developing core forecasts to inform the IOU energy efficiency (EE) goal setting process managed by the CPUC and the CEC IEPR process
 - Collecting primary data that informs forecasts **(new)**
 - Coordinating with other forecasting related efforts at the CPUC such as demand response and integrated resource planning **(enhanced)**
 - Exploring alternate methods of forecasting beyond those that have been historically used **(new)**
 - Providing forecasts in a format that can be useful for other state planning processes, program administrators, and program implementors **(enhanced)**

What to expect for the 2021 Study?

- Longer project timeline
- Increased stakeholder engagement
- Coverage of new topics beyond what past EE potential studies covered
- Evolving modeling methods in some areas (rebate programs)
- Continuing past methodologies in other areas (C&S, BROs, Low Income)
- Right-sizing the model and analysis granularity

Potential and Goals Study Deliverables

EE Potential Forecast

Core effort also includes model development and producing scenario results.

Primary Data Collection

Two new sets of data to feed as inputs into the EE potential forecast (as identified by stakeholders in the October workshops)

EE-DR/IRP Integration

Better coordinate the EE with DR forecast; possible optimization of EE or coordinated EE/DR data integration into the CPUC's Integrated Resource Plan (IRP) process.

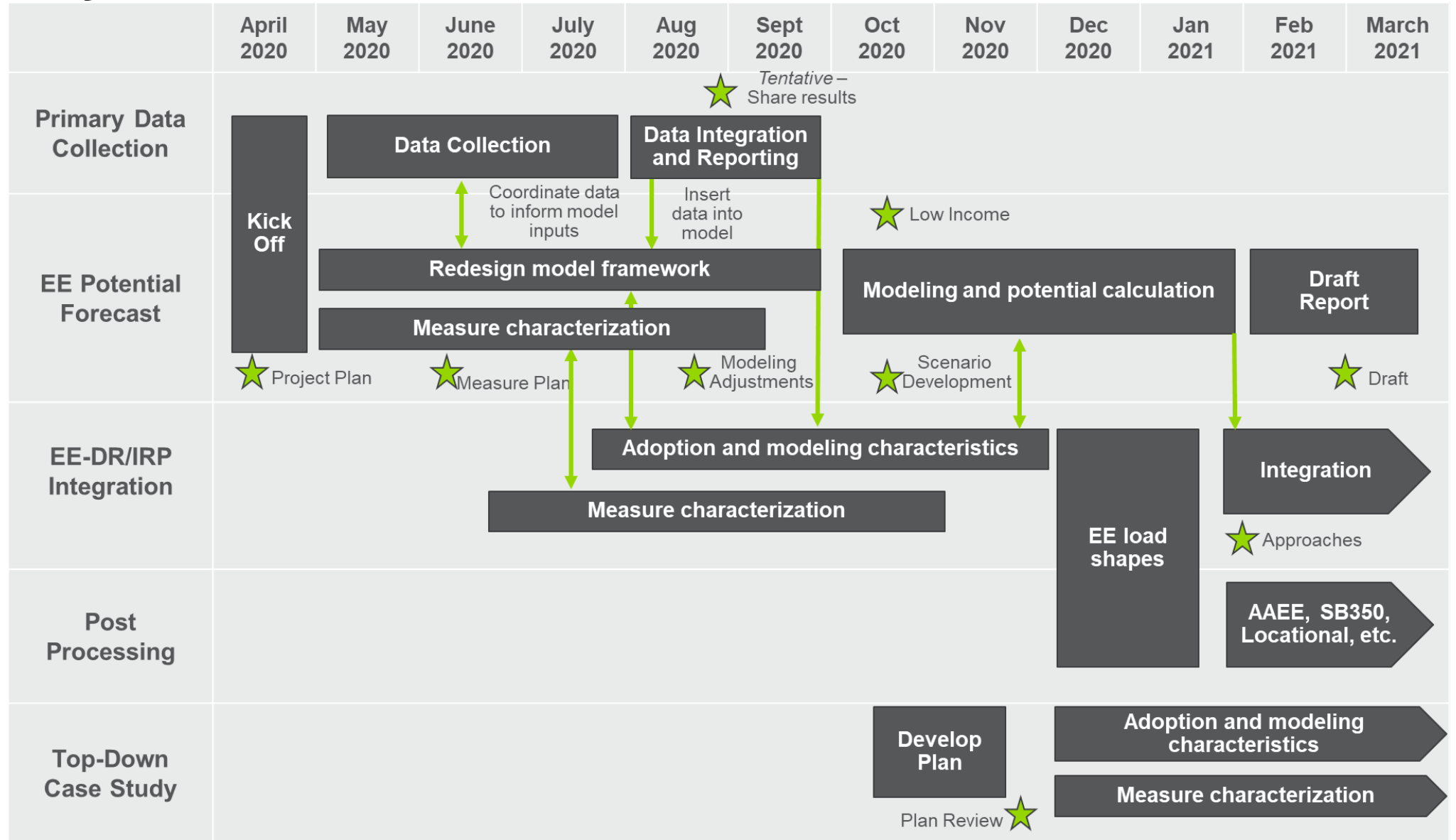
Post Processing

Post process the EE potential forecast to meet needs beyond the goal setting process: hourly impact estimates, supporting CEC, and locational disaggregation.

Top-Down Forecasting Pilot

Explore forecasting EE potential using an alternate modelling approach.

PG Study Workflow

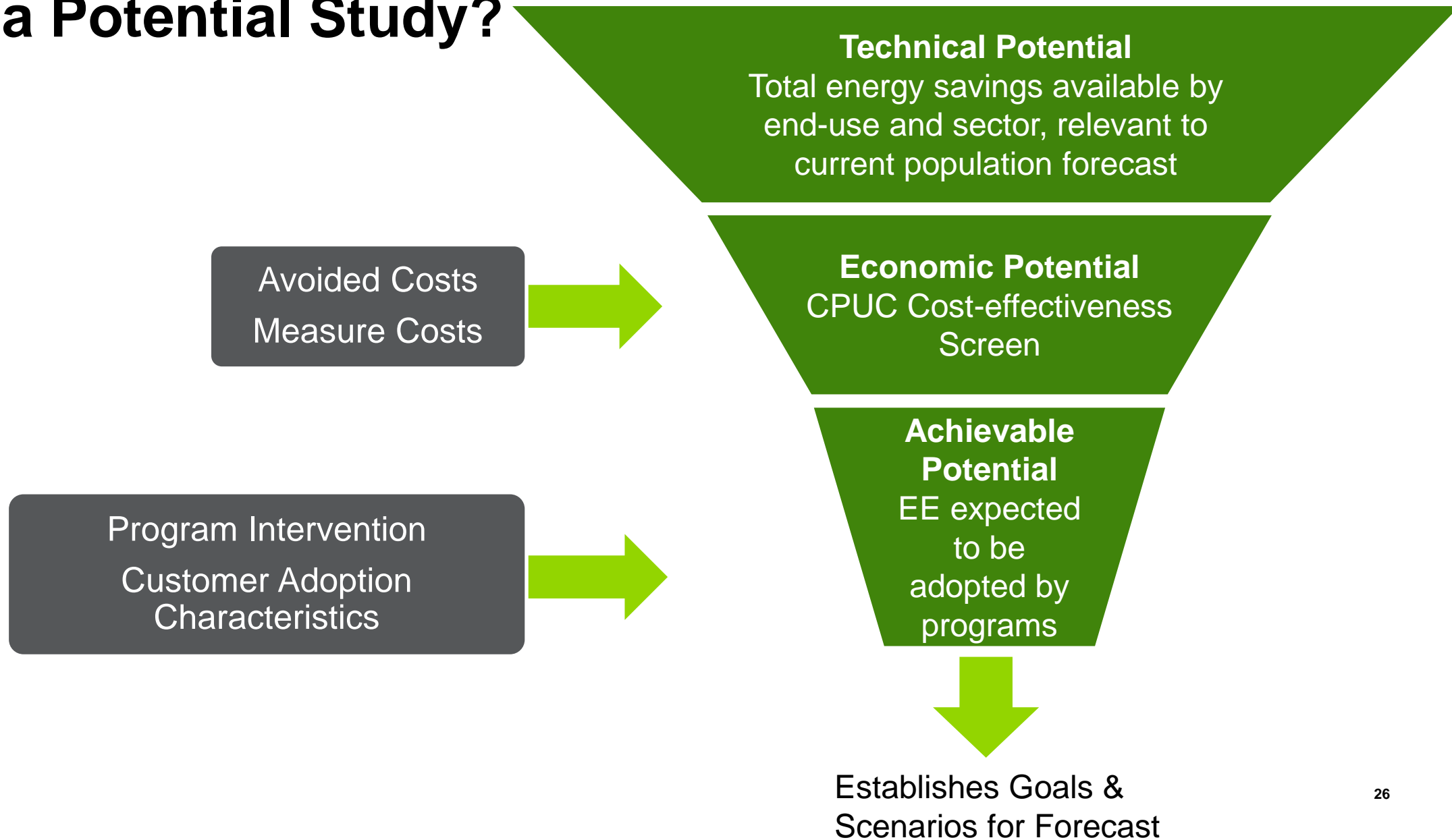


EE Potential Forecast Overview

EE Potential Forecast Overview

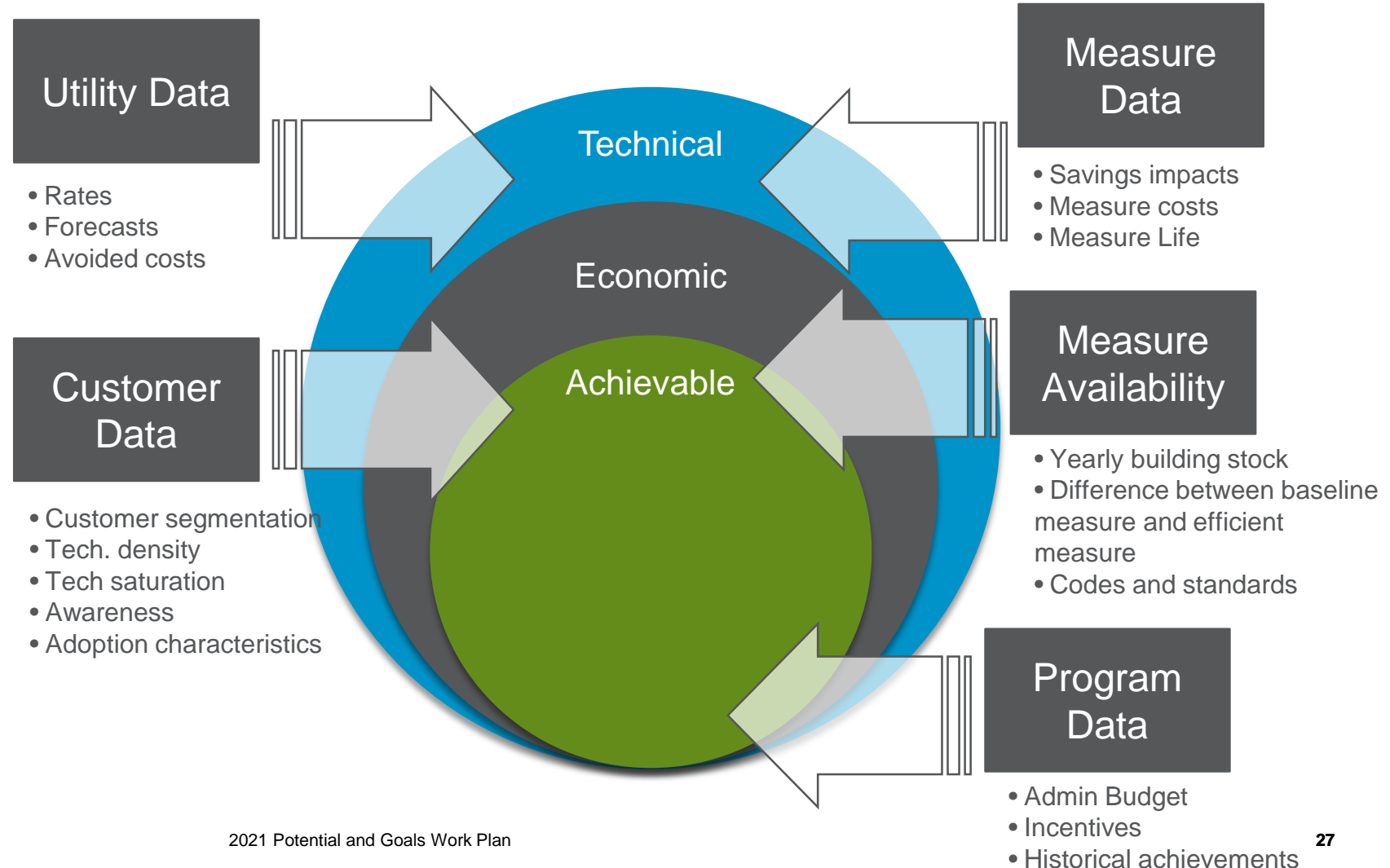
- **This section covers:**
 - What a potential study is and the major steps to conducting a study
 - An introduction to scenarios
 - High level project schedule and stakeholder engagement plan
- **Critical things that are different than previous study:**
 - Longer timeline and more planned stakeholder engagement
- **During Q&A please consider:**
 - Thoughts/questions/concerns about the schedule
 - 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?

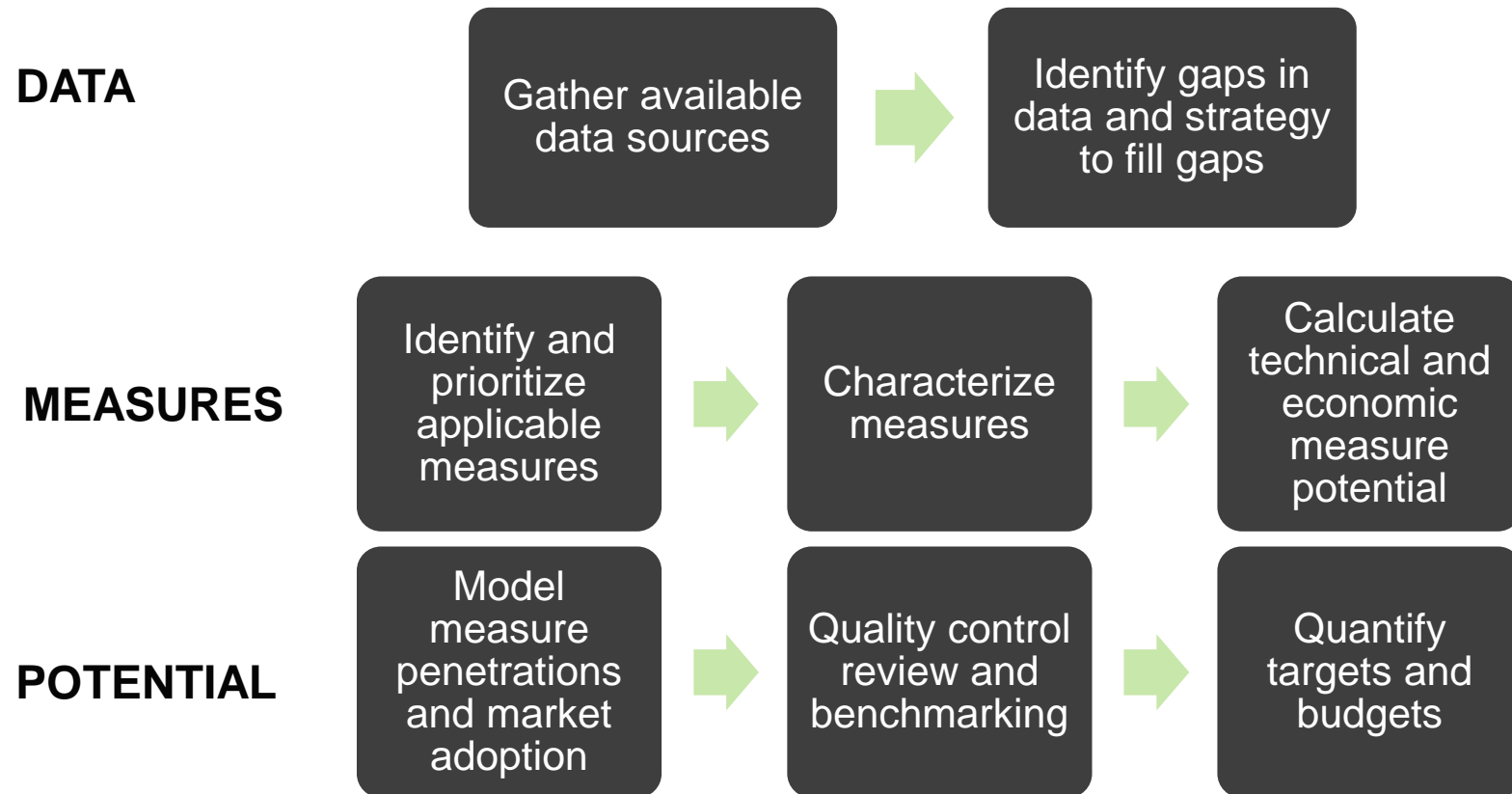


Potential Analysis Data Overview

- Data rich study
 - A lot of data, but need to sift through the noise
 - Identify the good data
 - Identify the data gaps
 - Fill the data needs
 - Leverage past PG study, as appropriate
- Calculate the technical, economic, and achievable potential



Data and analysis structure



EE Potential Forecast Tasks

- Task 1 – Model Infrastructure Redesign
- Task 2 – Market and Baseline Characterization
- Task 3 – Measure Characterization
- Task 4 – Technical Potential
- Task 5 – Economic Potential
- Task 6 – Achievable Potential
- Task 7 – Codes & Standards Potential
- Task 8 – Low Income Potential
- Task 9 – Reporting & Model Delivery

Scenarios

- Up to six scenarios
- Scenarios only address differences based on internally influenced variables
 - Internally influenced variables: policy and program decisions under control of the CPUC and IOUs
 - Externally influenced, such as economic and demographic conditions
- COVID-19 impacts may need to be considered

Internally Influenced

- Cost-effectiveness (C-E) test & screening threshold
- Incentive levels
- Program budgets
- BROs customer enrollment
- Financing programs

Externally Influenced

- Building stock forecast
- Avoided costs
- Retail energy price forecast
- Measure-level input uncertainties (unit energy savings, unit costs, densities)

Schedule for EE Potential Forecast

Task	Milestone/Deliverable	Start Date	Completion Date
0	Scope Development	2/10/2020	4/15/2020
1	Develop Model Infrastructure	4/13/2020	7/1/2020
2	Collect Global Inputs/ Market Baseline	5/1/2020	9/1/2020
3	Characterize Measures	5/1/2020	9/15/2020
4	Develop Technical Potential	9/15/2020	10/15/2020
5	Develop Economic Potential	10/15/2020	11/1/2020
6	Develop Achievable Potential	10/15/2020	12/15/2020
7	C&S Potential	9/15/2020	11/15/2020
8	Low Income Potential	9/15/2020	12/15/2020
9	Reporting	9/1/2020	4/1/2021

Planned Stakeholder Engagement Topics

	Work Plan (today's meeting)
Q2 2020	Input on measure priorities and characterization including fuel substitution & EE/DR
Q3 2020	Input on modeling: fuel substitution EE/DR, and EE adoption Draft findings from primary data collection studies
Q4 2020	Input on scenarios Input on scoping top-down study Presentation of Low-Income approach and data needs
Q1 2021	Discussion of EE/DR/IRP integration approaches Input on locational post processing Draft results

Study Overview Questions

- Are there questions/concerns with the project timeline?
- Any specific stakeholder engagement topics we should consider that aren't planned?
- Questions about other materials presented so far in this workshop?





Five Minute Break

Market and Measure Characterization

Market and Measure Characterization

- **This section covers:**
 - Task 2 and 3 in our workplan
 - Characterizing technologies that have the potential to save electricity and/or natural gas
 - Market and measure data needed for the study
- **Critical things that are different than previous study:**
 - Change in emphasis on certain technologies: for example, de-prioritizing LED lighting technologies
 - New data sources and data collection methods: for example, primary data collection for industrial and agricultural sectors; use of normalized meter data
 - Including fuel substitution measures
- **During Q&A please consider:**
 - Measures or technologies to include in the study
 - Sources of data

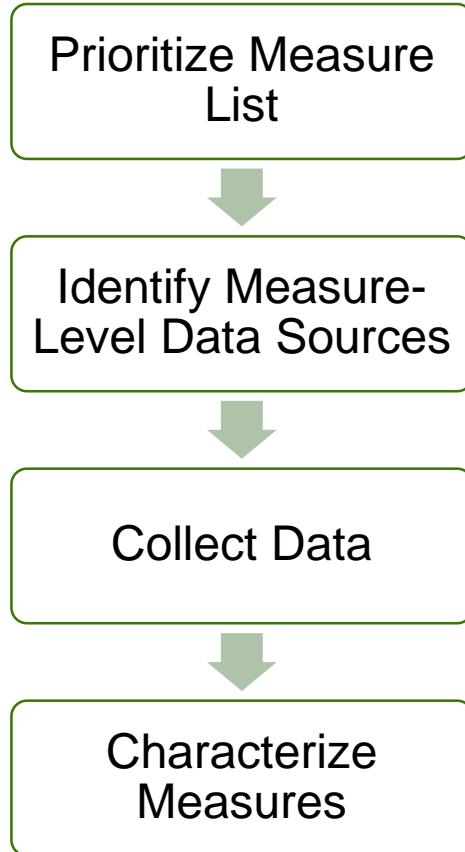
Market Data

- 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
Historic program savings and spending	CEDARS; CPUC Interviews
Inflation rate	Federal Reserve Bank forecasts
Discount rate	Utility WACC and Social Discount Rate
Emissions data	Avoided Cost Calculator

Measure Characterization Process and Data Needs

Measure Characterization Steps



Key Measure Data Required for Characterization

- Electric energy, demand, and/or gas savings
- Measure cost
- Replacement type (replace-on-burnout, retrofit add-on, etc.)
- Density (e.g. products per household)
- Saturation (percentage of market that is already efficient)
- Technical suitability of measure for each building type (expressed as percentage)
- Measure lifetime
- Net-to-gross ratio
- Greenhouse gas emissions

Market Sectors and End Uses

- Forecast savings potential for each market segment
- Within each market segment, define the appropriate building types and end uses
- End use characterization will consider load shapes aggregated from the 2019 CEC load shape study

Mining is a low priority due to size, so no changes proposed from last study.

Proposed Market Sectors

- Residential
- Commercial
- Industrial
- Agricultural
- *Mining*
- *Street Lighting*

The street lighting sector has limited remaining potential and may be removed from this study.

Residential and Commercial Market Sectors

Data Collection

Sources of Measure Characterization Data

Name of Source	Data in Source	Author
DEER	Energy use and coincident peak demand for deemed measures	CPUC
eTRM	Statewide database for deemed measures (similar to DEER)	California Technical Forum
Workpapers (approved and pending)	Technologies not included in DEER	IOUs and CPUC
2025 California Demand Response Potential Study	DR co-benefits for EE technologies enabling DR	LBNL
EM&V Reports	Evaluated measure data	Evaluators; CA IOUs
CA IOU Emerging Technology Reports	Data on emerging technologies	ETCC; IOUs
IOU Program Data	Measure data in EEStats and CEDARS	CPUC; IOUs
Regional Technical Forum Database	Measure data from Pacific Northwest	NPCC
Guidehouse Potential Study Database	Measure data from other utilities	Guidehouse

Residential and Commercial Market Sectors

Measure Characterization

Changes to Include

- Refresh measure list to **capture the high impact measures** and simplify or eliminate low impact measures
 - For example, **de-prioritize LED lighting measures** as many have become standard practice baseline
- Consider **bundling or categorization of measures**:
 - Aggregate efficiency levels where additional granularity does not provide high value
 - Bundle low-savings or niche measures into a single representative measure
 - Characterize typical groupings of measures in implementation
- Consider **targeting measures** to fully capture high potential impact; e.g., by climate zone

Industrial and Agricultural Market Sectors

Data Collection

- Conduct a primary data collection study to gather California-specific data on market penetration, saturation and adoption characteristics within the industrial and agricultural sectors.
- Target up to six of the segments within the industrial and agricultural sectors to be selected/prioritized soon
- Deep dive on top technologies by segment

Separate detailed workplan will be published

Industrial and Agricultural Market Sectors

Measure Characterization

Two Methods Used for Characterization

Diffusion Model

- Description: Typical measure characterization process using CEDARS and secondary source data
- Used for: Deemed measures

Top-Down Analysis

- Description: Leverage historical program trends and consumption forecasts
- Used for:
 - Generic custom
 - Emerging technologies
 - Strategic Energy Management (SEM)

Changes to include:

- **Primary data collection** on measures, existing saturation, and forecast of adoption
- **Revisit calibration process** to address changes in programs, markets, and opportunities
- Potentially **no change to top-down analysis** (except for adoption assumptions)

Normalized Meter Energy Consumption (NMEC)

- NMEC-based programs calculate project savings from normalized meter data instead of using deemed values for energy savings
- Normalized meter data most commonly used to claim savings for:
 - Residential whole home programs
 - Commercial multi-end use retrofits
 - Industrial Strategic Energy Management
- California is transitioning towards a higher penetration of NMEC-based programs and portfolios
- Analysis will incorporate how NMEC-based programs may affect measure characterization and potential

Fuel Substitution

- Identify and characterize candidate fuel substitution measures
 - Focus on measures that displace existing natural gas with added electricity consumption
 - Meet the fuel substitution test requirements: eligible measures do "not increase source energy or CO2 emissions compared to the baseline technology"¹
- Characterize data to enable modelling of these measures
- Consider increases in hydrofluorocarbons (refrigerants) and reductions in natural gas leakage

¹ Per the CPUC fuel substitution test: <https://www.cpuc.ca.gov/General.aspx?id=6442463306>

Market and Measure Characterization Data Questions

- Do you have program and measure data to share that's not available via DEER/Workpapers or CEDARS?
- Do you have any comments about the data sources we plan to use?
- What do you believe are measures not in current deemed data sources that we should consider in our potential study?
- Is there sufficient program data available to inform NMEC characterization: population-based and site-specific?
- Are there any pilot fuel substitution programs that can inform data inputs?
- What are pending workpapers not yet submitted or approved that can be leveraged for the study?
- Are there any specific industrial and agricultural segments of interest to study?
 - Where do you see the growth potential?
 - Where is there stranded savings or gaps, not yet captured?
- Are there any particular technologies for industrial and agricultural segments that have cross cutting potential?





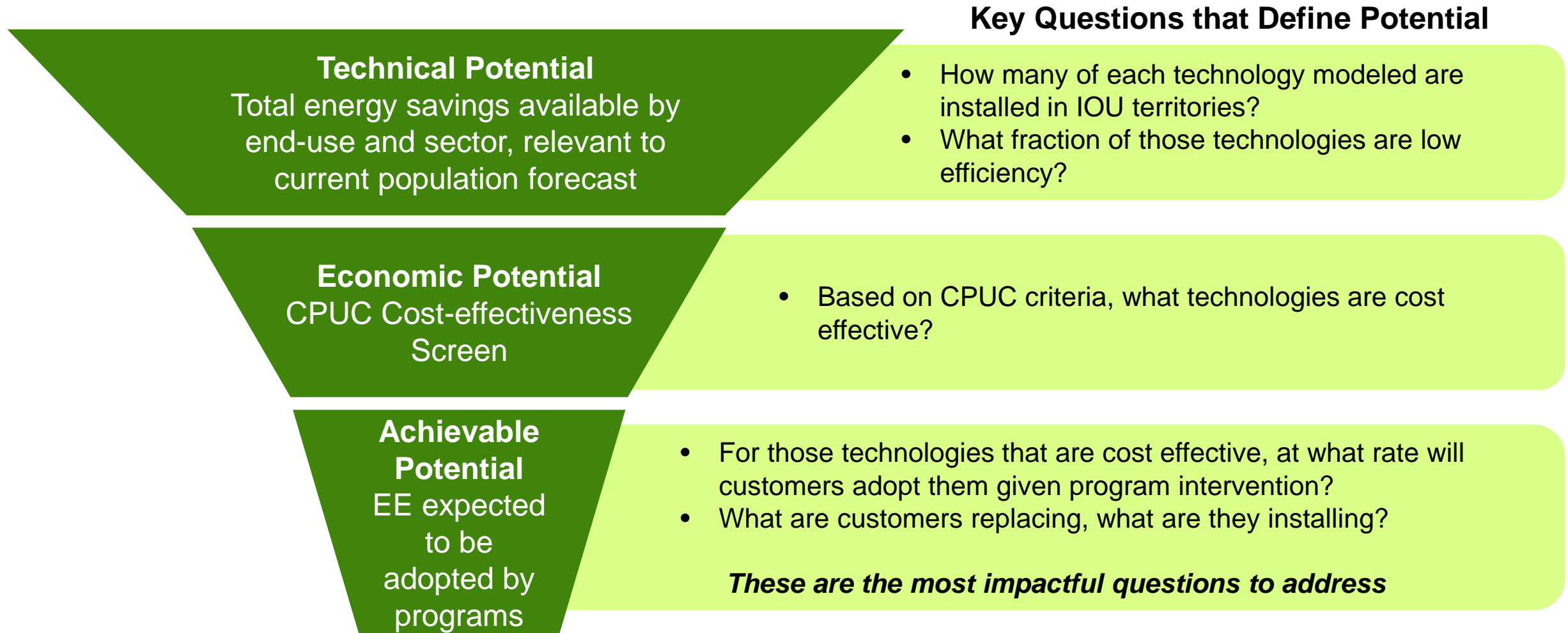
Five Minute Break

Modeling Methodology Discussion

Modeling Methodology Discussion

- **This section covers:**
 - Core modeling methods that are used to carry out Task 4, 5 and 6 (technical, economic, and achievable potential)
 - What different types of potential mean
 - Process flow of updating the modeling methodology
 - Scope of analyses to be performed
- **Critical things that are different than previous study:**
 - Revamping the adoption model algorithms which calculate achievable potential
- **During Q&A please consider:**
 - Calibration comments not mentioned during the October 2019 workshops
 - How DR co-benefits are considered
 - Useful fuel substitution results

What Different Types of Potential Mean



Potential Analysis Steps

Develop Model Inputs

- Market study to collect customer adoption characteristics
- Market and measure characterization ongoing QC

Redesign Model Framework

- Update adoption algorithms to consider non-energy and non-financial impacts that influence adoption
- Include impact of DR co-benefits on EE adoption
- Create fuel substitution logic

Calculate Potential Savings

- Calculate Technical and Economic Potential
 - Use the existing PG model framework
 - Determine appropriate cost effectiveness tests and threshold
- Calculate Achievable Potential
 - Use updated model framework to calculate market adoption

Develop Model Inputs

Market Adoption Research

- Gather data on adoption characteristics and customer segmentation in order to inform adoption mechanisms
- Covers three segments: residential, small commercial, and large commercial. This will provide data that can be used to revise and inform the core adoption algorithms and allow us to rely less on previous program achievements for calibration

Separate detailed workplan will be published

Redesign Model Framework

Adoption Algorithms and Dimensionality

Update adoption algorithms

- Planned Updates
 - Develop logic to consider non-energy and non-financial impacts that influence adoption
 - Impacts of "hassle factor," comfort, program delivery methods, etc.
 - Translate market study results into model inputs
 - Reassess use of Bass Diffusion and payback acceptance as being core to adoption logic
- Goals of Updates
 - Improve logic to more accurately reflect drivers of consumer choice

Right-size the model

- Planned Updates
 - Reduce unnecessary complexity and add detail where valuable
 - Differentiation between certain customer segments and climate zones may not add value
 - Include uncertainty bounds on inputs
- Goals of Updates
 - Improve ease of understanding results while maintaining accuracy
 - Provide confidence around forecasted potential results

Redesign Model Framework

Fuel Substitution and EE/DR Integration

Introduce Fuel Substitution Logic

- Planned Updates
 - Consideration of *increased* consumption of the fuel being substituted, and associated costs
 - Do fuel substitution technologies compete with same fuel technologies?
- Goals of Updates
 - Enable potential forecasting of fuel substitution

Include Impact of DR Programs on EE Adoption

- Planned Updates
 - Consideration of how combining EE and DR benefits influence adoption of technologies with co-benefits
 - Integrate adoption logic from both the DR and EE models
- Goals of Updates
 - Capture the influence of DR programs and benefits on the adoption of EE technologies

Calculate Potential Savings – Economic Potential

- While technical potential is fixed, economic potential can vary by scenario
- **Previous potential study:**
 - Used the TRC test only
 - Varied the threshold definition of “economic” across scenarios (from 0.85 to 1.25).
- **This study:**
 - Cost effectiveness thresholds will be determined as part of scenario development
 - Will implement CPUC guidance on fuel substitution measures in regard to economic potential
 - Will consider if demand response co-benefits are a factor

Calculate Potential Savings – Achievable Potential

1

- Use PG model framework to calculate achievable potential
 - Apply adoption characteristics using the economic potential based on market study triggers
 - Use data obtained from the primary data collection as much as possible

2

- Calibrate base achievable potential using a combination of historic program activity and information obtained from the primary data collection studies

3

- Work with CPUC staff to develop up to 6 scenarios

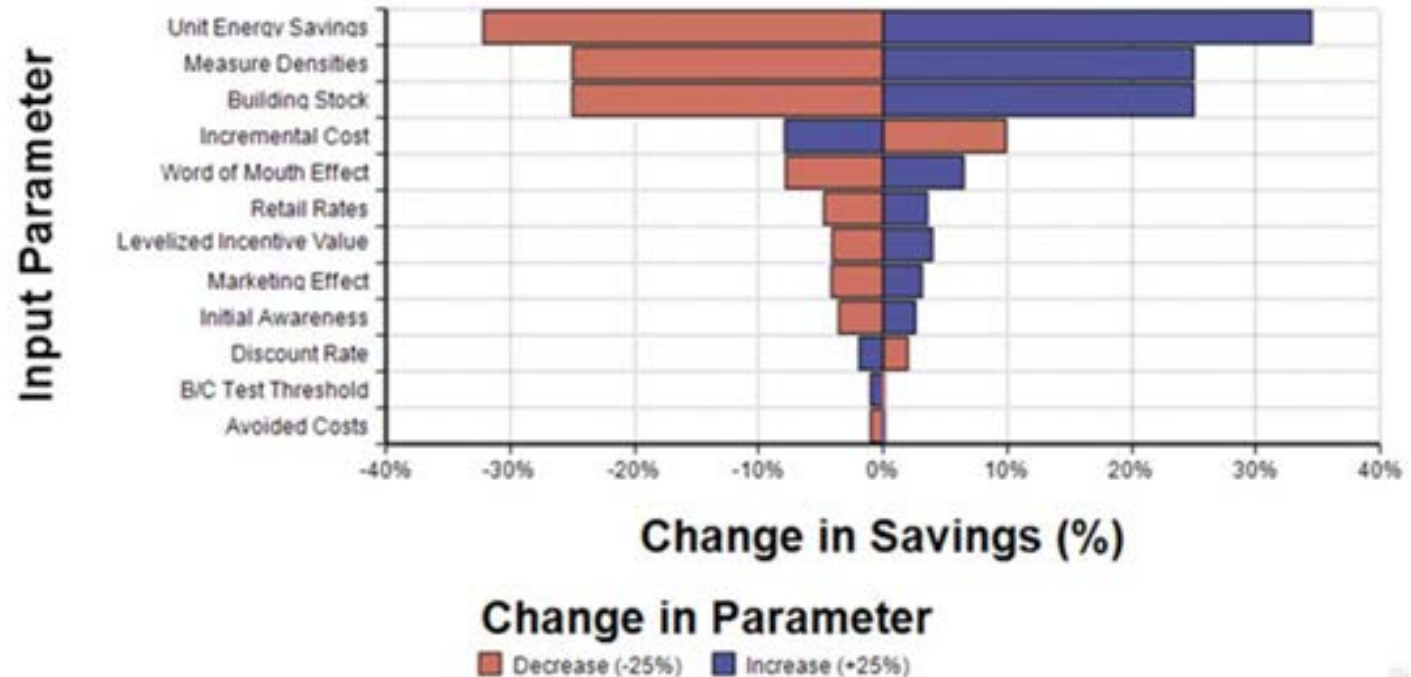
Uncertainty Analysis

Why

- Typical uncertainty plus added complexity of gathering data and forecasting during the COVID-19 pandemic necessitate additional uncertainty considerations

How

- Add uncertainty bounds to select inputs
- Perform sensitivity analysis
- Engage stakeholders for feedback and possibly update uncertain values
 - Guidehouse will work with CPUC staff to explore ways to accommodate this with uncertainty analysis around key variables believed to be most impacted by the pandemic



Modeling Methodology Questions

- What additional thoughts do stakeholder have on calibration that weren't already discussed during the October 2019 workshops?
- Do DR co-benefits get factored into the TRC (or other tests) as benefits?
- What types of outputs from a fuel substitution potential forecast will be most useful?
- What sectors or sub-sectors are of most interest to revisit adoption metrics. Our current study is looking into single family, small commercial, and large commercial. Is there interest in multi-family or other sub sectors?
- Any specific technology category of interest to understand participant adoption propensity?



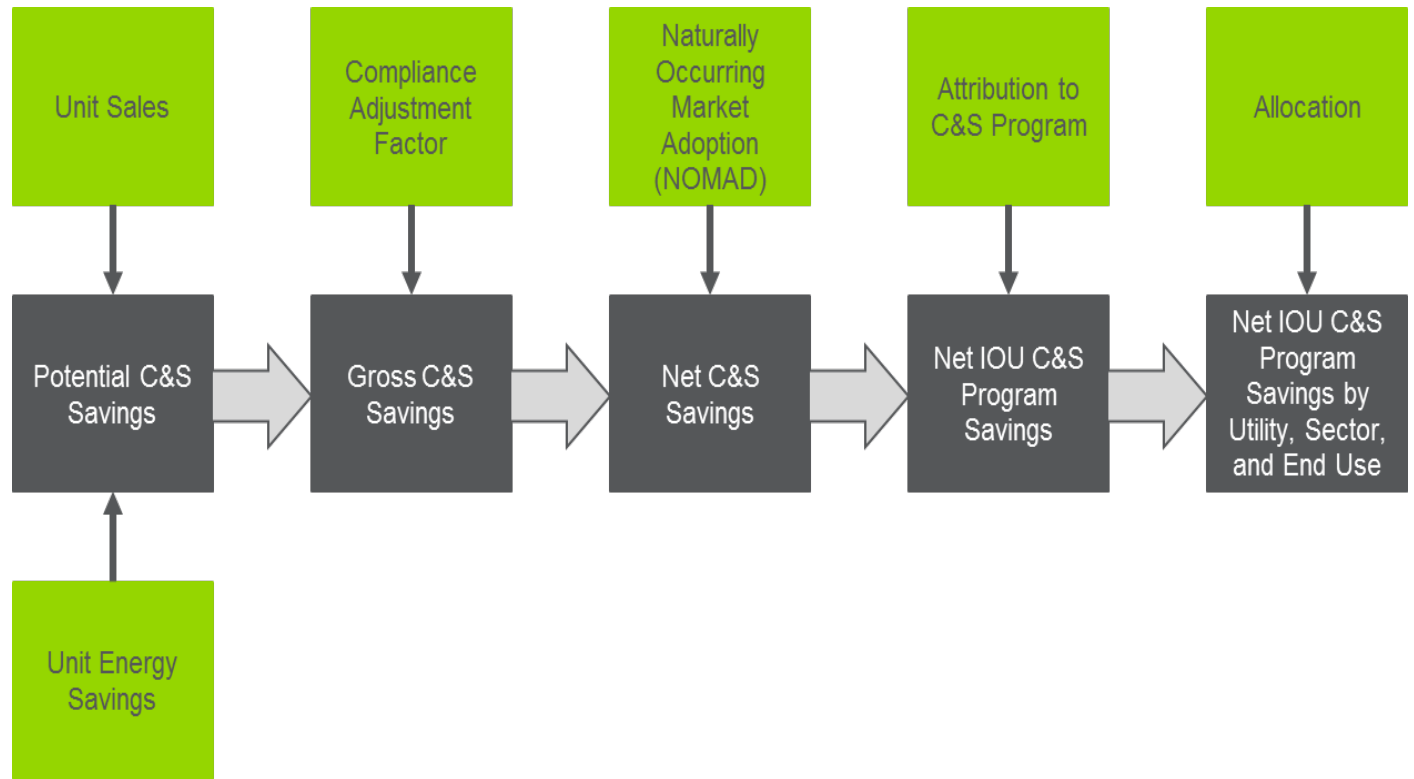
Additional Analysis

Additional Analysis

- **This section covers:**
 - Approach to C&S, Low Income, BROs and post-processing (hourly, locational, etc.)
- **Critical things that are different than previous study:**
 - We plan to revert back to the 2018 PG study approach to low income (shelving the methodology updates we made in the 2019 PG study)
- **During Q&A please consider:**
 - What better data is available to inform BROs forecasts?
 - Thoughts about the change to low income approach
 - “Locational” potential needs

Codes & Standards

- Calculations
 - Adjust code baseline for rebated measures
 - Calculate net C&S Savings – 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.

BROs and Low Income

BROs

- No changes to list of programs, but update data, as needed
- Primary focus:
 - Home Energy Reports
 - Strategic Energy Management
 - Retrocommissioning
- Key assumptions are based on planned rollout

Low Income

- 2019 PG study developed a new forecasting method relative to the 2018 PG study which was more complex and granular
- This study will consider whether to revert back to the method utilized by the 2018 PG study.
 - CPUC will engage stakeholders for low income proceedings
 - Desire to ensure PG study method is complementary to the direction of ESA 2021 and beyond

Post Processing

Hourly Impacts

- Informs multiple deliverables
- Data sourced mostly from CECs 2019 study and EM&V Group A. Older sources to fill the gap.
- Load shape data can be applied to end use forecast of electricity savings

Locational Forecasts

- Climate zone market potential
 - Disaggregate results to 16 BCZs
- CCAs and RENs
 - CCAs: county level or other geographic boundary
 - RENs: granular data for program planning/targeting needs
 - Will require population, customer counts, and historic program activity for analysis

Support CEC Forecasts

- Additional achievable energy efficiency based on multiple scenarios to inform CEC's forecast
- Develop scenario framework
- Produce scenario results
- Provide guidance on hourly and locational impacts

Additional Analysis Questions

- Are there any new BROs programs we should consider?
- What better data on existing BROs programs should we leverage?
- In reverting back to previous low income forecasting methods, are there any concerns?
- Are there new load shape data to inform forecasts and IRP inputs?
- Are there energy efficiency load shapes?
- What are your locational potential needs?



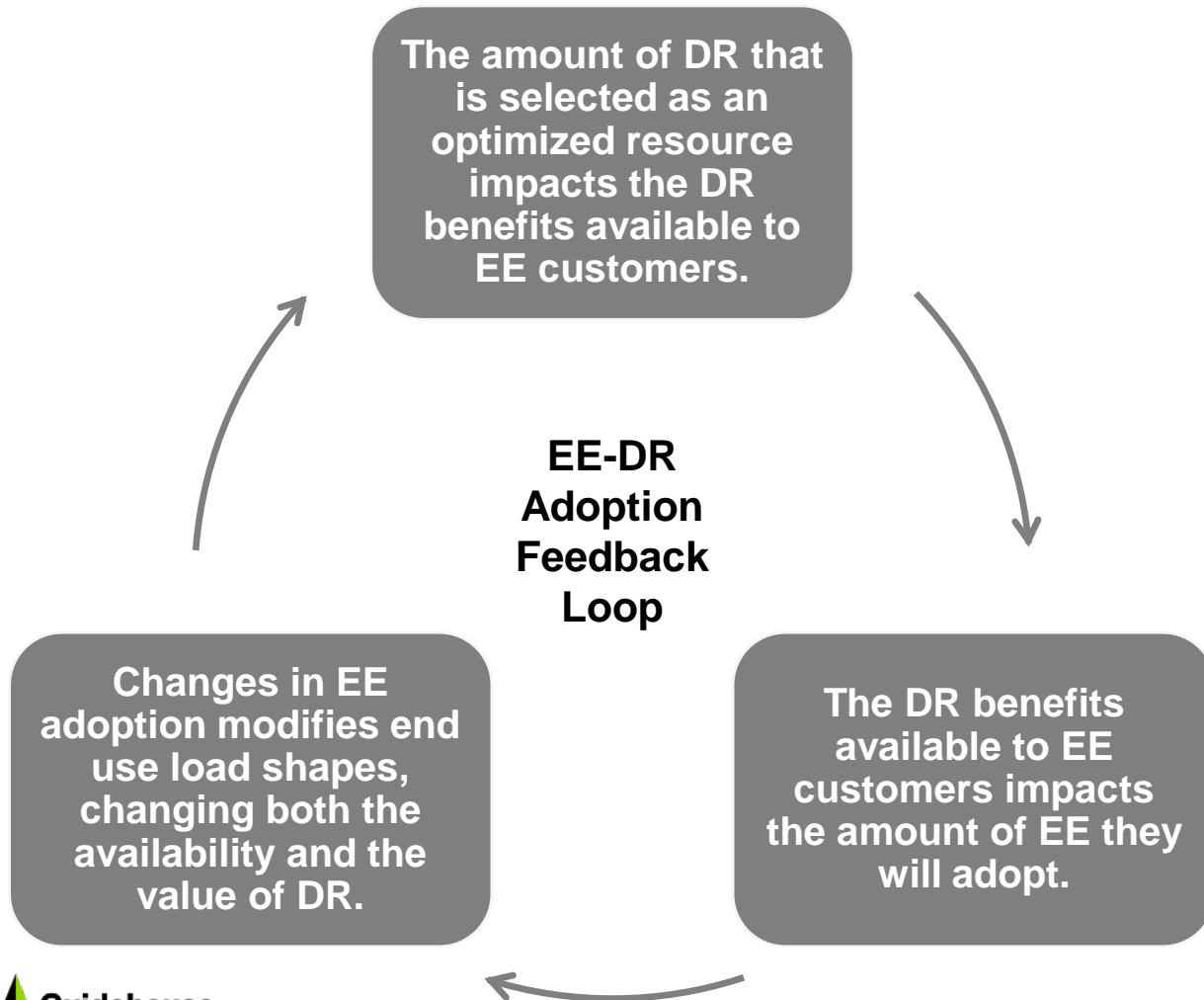
EE-DR and IRP Integration

EE-DER and IRP Integration Discussion

- **This section covers:**
 - Added considerations to accommodate EE/DR integration
 - How EE/DR can relate to the IRP
- **Critical things that are different than previous study:**
 - Pretty much everything in this section!
 - IRP integration can build upon previous technical studies
- **During Q&A please consider:**
 - Technical (not policy) questions related to EE/DR and IRP

EE-DR Integration

Goal: capture complementary impacts of DR on EE adoption and vice versa



- Update market adoption algorithms
 - EE PG study used customer decision logit coupled with Bass diffusion
 - DR PG study used econometric customer propensity
- Characterize co-benefits of DR when EE technologies have built in controls and communication capabilities or retrofitted with the capability
- Estimate load impacts of EE on DR via the hourly load shape

EE Measures with DR Co-Benefits

- The scope of this study is **not** to forecast both EE and DR potential, but rather capture the complementary impacts of DR programs on EE adoption and vice versa.
- Input impacting the EE study are quantified during measure characterization:
 - Identify EE measures that have joint EE and DR benefits.
 - Develop data to characterize the costs and co-benefits

What are technologies with DR co-benefits?

- Higher efficiency technologies with controls that enable demand response
- This includes:
 - Technologies with controls and communication capabilities built in
 - Aftermarket controls and communication devices that can be added to existing energy efficient equipment

IRP Integration

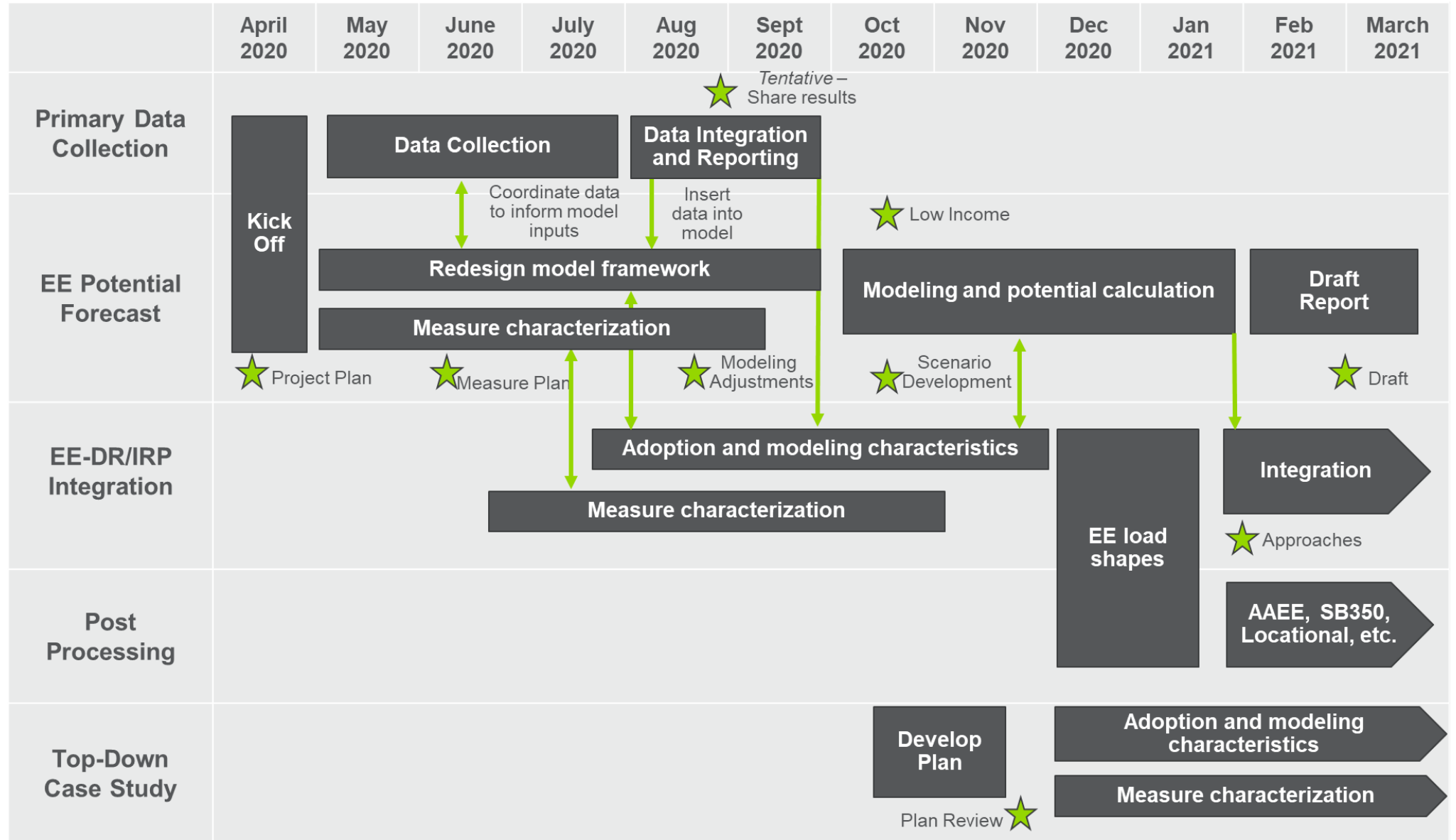
- In the past, the IRP did not treat EE as an optimizable resource
- In 2017 CPUC conducted a technical analysis exploring the integration of EE as a supply curve into IRP
- DR is already modeled as a optimizable resource, integrated EE/DR forecasts would have to be fed into the IRP in some form
- Guidehouse is prepared to support CPUC on integrating EE into the IRP as appropriate

CPUC is seeking stakeholder input on the IRP's optimization role in the EE goals setting process through a separate ALJ ruling. Please provide formal comments on policy issues through that venue.

We appreciate technical questions/comments today.

Reminders and Next Steps

Overall Schedule Reminder





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 **April 27, 2020** via e-mail to: coby.Rudolph@cpuc.ca.gov & genesis.tang@cpuc.ca.gov.

We suggest comments be focused on the questions posed throughout this slide deck

Please respond separately to policy-related questions by May 22 for the topics posed in: *Administrative Law Judge's Ruling Inviting Responses to Potential and Goals Policy Questions*.





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:

<https://www.energy.ca.gov/programs-and-topics/topics/energy-assessment/demand-analysis-working-group-dawg>



Q&A and Open Discussion

Near term study focus areas

- 2021 Energy Efficiency Potential & Goals Study Schedule
- Overall stakeholder engagement plan
- Measure characterization and prioritization

There will be more opportunity in the future to comment on:

- Modeling fuel substitution
- EE/DR/IRP
- Low income
- Post processing steps



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