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<th>21-IEPR-03</th>
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<td><strong>Project Title:</strong></td>
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<td><strong>Document Title:</strong></td>
<td>Presentation - CEC Demand Scenarios Project</td>
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<tr>
<td><strong>Description:</strong></td>
<td>By: Michael R. Jaske, Ph.D., Project Principal, and Anitha R. Rednam, P.E., Project Technical Lead</td>
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<td><strong>Filer:</strong></td>
<td>Raquel Kravitz</td>
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<td><strong>Organization:</strong></td>
<td>California Energy Commission</td>
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<td><strong>Submitter Role:</strong></td>
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CEC Demand Scenarios Project

Michael R. Jaske, Ph.D., Project Principal
Anitha R. Rednam, P.E., Project Technical Lead
December 2, 2021
History

• CEC Assessments Division has periodically undertaken projects using a scenario approach rather than a forecasting approach.

• Like most such projects, these efforts have addressed a speculative topic striving to achieve insights rather than being the basis for resource procurement decision-making.

• Not infrequently, these efforts have also utilized a consultant to perform much of the analysis rather than developing CEC staff skills and capabilities.
What is Different Now?

• California policymakers are generally in agreement that massive reductions in GHG emissions are needed by mid-century.

• Since GHG emissions are largely a result of burning carbon-based fuels, a major reduction in GHG emissions means a large shift from high carbon fuels to low- or no-carbon energy forms.

• Although GHG emission inventories reveal that most GHG emissions result from final end-user energy consumption, substantial energy is used extracting, transforming, transmitting, and distributing energy to end-users.

• Understanding energy demand and the pattern of change from one energy form to another is critical to assuring reliability for each energy form.
Demand Scenarios Project

- CEC management has directed EAD staff to develop an ongoing demand scenarios assessment capability within EAD.

- The scope includes:
  - Developing demand scenarios
  - Assessing these in both final demand and supply-side dimensions
  - Developing key insights
  - Communicating results to sister agencies and stakeholders
  - Adapting methods through time in response to sister agency needs

- This capability will develop a product each biennial IEPR cycle, and may become adopted similar to demand forecasts.
Focus for 2021 IEPR

• Develop and assess scenarios stressing a high electrification theme

• Adapt/create modeling capabilities that can assess scenario consequences:
  • Through time out to 2050
  • Annual time interval, but hourly 8760 load impacts needed for electric generation sector assessments
  • Geographically disaggregated to planning area and/or major utility
  • Address all significant energy fuel types
  • Compute GHG consequences

• Build off of existing demand forecasting models, ancillary projections tools developed for AAEE and AB 3232 fuel substitution assessments and rely on E3’s PATHWAYS model for other sectors/fuels
Our Aspiration

• Develop and assess scenarios explicitly quantifying impacts of programs, standards, and policies impacting energy demand by, and GHG emissions from, selected customer sectors

• Understand what existing programs, standards, and policies are expected to achieve, and compare these results to our goals

• Contribute to thoughtful development of additional policy initiatives to “close the gap”
Forecasts

- Forecasting attempts to predict a likely future.
- Forecast includes factors such as economic/demographic projections, impacts of market policies, and trends.

Scenarios

- Scenarios look at a range of potential and possible futures.
- Scenarios help to understand the deviations and divergence between each possible future.

Different Strategies like Efficiency, Electrification etc.
CEC Demand Scenarios Overview

• **Purpose:** Scenarios enable more comprehensive examination of demand-side fuel shifts, supply-side consequences of demand changes.

• **Time Horizon:** Our Scenarios will extend to 2050.

• **Scope:** Our Scenarios will reflect a full set of fuel types.

• **Number:** Three primary Scenarios which enable a more complete assessment of uncertainties.

• **Methods:** Using managed mid demand forecast and load modifier projection tools for this analysis.
CEC Demand Scenario Process

• Demand Scenarios Process will focus on the high degrees of electrification.

• We produce alternative demand projections using combinations of energy efficiency and fuel substitution programs to modify baseline demand forecast.

• The outputs of this process is modified energy consumption projections and corresponding GHG emissions by sector.
Why are Demand Scenario Assessments Needed?

• Clear need for objective, independent information that convey a range of solution sets that can achieve California’s energy and GHG emission reduction goals.

• Provides a sense of how easy or difficult it may be for each sector to achieve those goals.

• Provides insights into where incentives or programs need to be targeted.
Proposed Scenario Types

• Reference Scenario by IEPR Vintage
  ➢ This is a business-as-usual scenario using the same core assumptions as the CEC adopted, managed Mid-Mid demand forecast through 2035.
  ➢ Beyond 2035, this Scenario assumes continuation of the same set of standards, programs, and policies reflected in the CEC adopted managed demand forecast with the same degree of compliance.

• Policy/Compliance Scenario
  ➢ Serve as sensitivities to Reference Scenario by testing varying degrees of compliance with the same set of standards, programs, and policies, or aspirational policies not yet enacted.

• Mitigation Scenario
  ➢ Adds additional standards, programs, policies and what-if assumptions with impacts beyond those already included in the Policy/Compliance Scenario.
  ➢ Reflects incremental impacts (e.g., cost and GHG emissions) relative to the previous Scenarios.
# Scenario Framework For 2021 IEPR

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<th>Sectors</th>
<th>Inputs</th>
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<th>Natural Gas</th>
<th>Traditional Fuels In Transportation</th>
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### Preliminary Reference Scenario Design

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## Preliminary High Electrification Mitigation Scenario Design

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IEPR Timeline (Demand Scenarios)

• September 15th: Demand Scenarios Project Overview & Framework DAWG

• December 2nd: IEPR Commissioner workshop on Demand Scenarios Project Overview & Framework

• March 2022: IEPR Commissioner workshop on Demand Scenarios Inputs, Assumptions & Results
Questions?