

DOCKETED

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2025 Senate Bill (SB) 100: Non-Energy Impacts Workshop

April 16, 2024



Instructions

- Workshop is being conducted in person and remotely via Zoom
 - Workshop is being recorded
- Attendees may participate in the workshop by:
 - Making comments during public comment period
 - Submitting written comments due **April 30, 2024**
- Questions and Comments can be entered in the Q&A section of the Zoom application



Workshop Overview

- Overview of Non-Energy Impacts in SB 100 2025 Report
- SB 100 Joint Agencies: Progress in State Agency Planning Processes
 - CARB
 - CPUC
 - CEC
- Lunch Break
- Approach to Non-Energy Impacts in SB 100 2025 Report
- Panel Discussion



Opening Remarks from the Dais





2025 SB 100: Non-Energy Impacts Overview

April 16, 2024

Jacqueline Gilyard Jones

Zero Carbon Electricity Lead, Energy Assessments Division



SB 100 Report Requirements

California Energy Commission (CEC), California Public Utilities Commission (CPUC), and California Air Resource Board (CARB) required to issue a joint-agency report every four years that includes:

- 1. Policy review (technical, safety, affordability, reliability)**
- 2. Reliability benefits and impacts**
- 3. Financial costs/benefits**
- 4. Barriers/benefits of achieving the policy**
- 5. Alternative scenarios and costs/benefits of each**

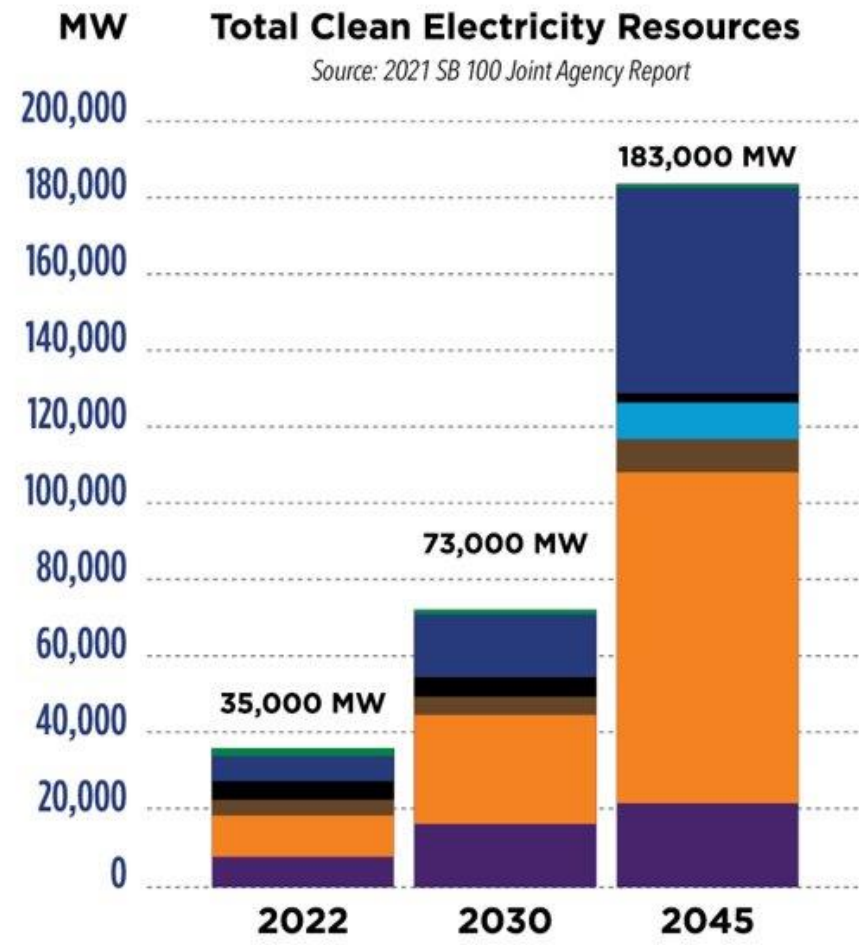
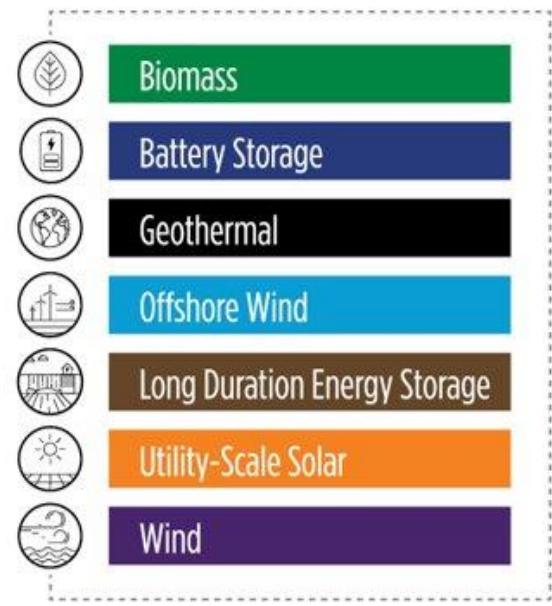


2021 Report Results

To provide 100% clean electricity by 2045,
California will build an unprecedented amount of new utility-scale clean energy resources

Totals represent new and existing resources. The 2021 SB 100 Joint Agency Report projects the need for 148,000 MW of new resources by 2045.

In addition, California also expects new capacity from energy efficiency, customer solar and demand response.





2021 Report Recommendations for Further Analysis

- 1) Verify that scenario results satisfy the state's grid reliability requirements.
- 2) Continue to evaluate the potential effects of emerging resources, such as offshore wind, long-duration energy storage, clean and renewable hydrogen technologies, and demand flexibility.
- 3) Assess environmental, social, and economic costs and benefits of the additional clean electricity generation capacity and storage needed to implement SB 100.
- 4) Hold annual workshops to support alignment among the joint agencies and continuity between SB 100 reports.

Social Costs and Non-Energy Benefits



In written comments to the 2021 report, submitting organizations recommended the joint agencies integrate at least the following into SB 100 planning:

- Land Use Impacts
- Public Health and Air Quality
- Water Supply and Quality
- Economic Impacts
- Resilience

CEC has contracted PSE Healthy Energy to support the SB 100 NEI analysis.



2025 SB 100 Report Opportunities:

- **Report on current statewide efforts** toward clean electricity progress and **identify opportunities** to enhance state efforts.
- **Study alternate scenarios** to understand the impact of uncertainty in cost, technology innovation, and project development on achieving SB 100.



2025 Report Timeline

Anticipated Timing	Workshop	Topics
Today	Non-Energy Impacts	Proposed approach for non-energy impact analysis of the scenarios
2024 Late Q2	Draft Modeling Results	Draft scenario modeling results
2024 Early Q3	Draft NEI and Land Use Results	NEI and land use impact results based on the draft scenario modeling results
2024 Late Q3	Final Analysis Workshop	Final scenario modeling and evaluation
2024 Q4	Report and Recommendations Workshop	Draft report recommendations



SB 100 Fits into a Large and Complex Energy Regulatory Framework

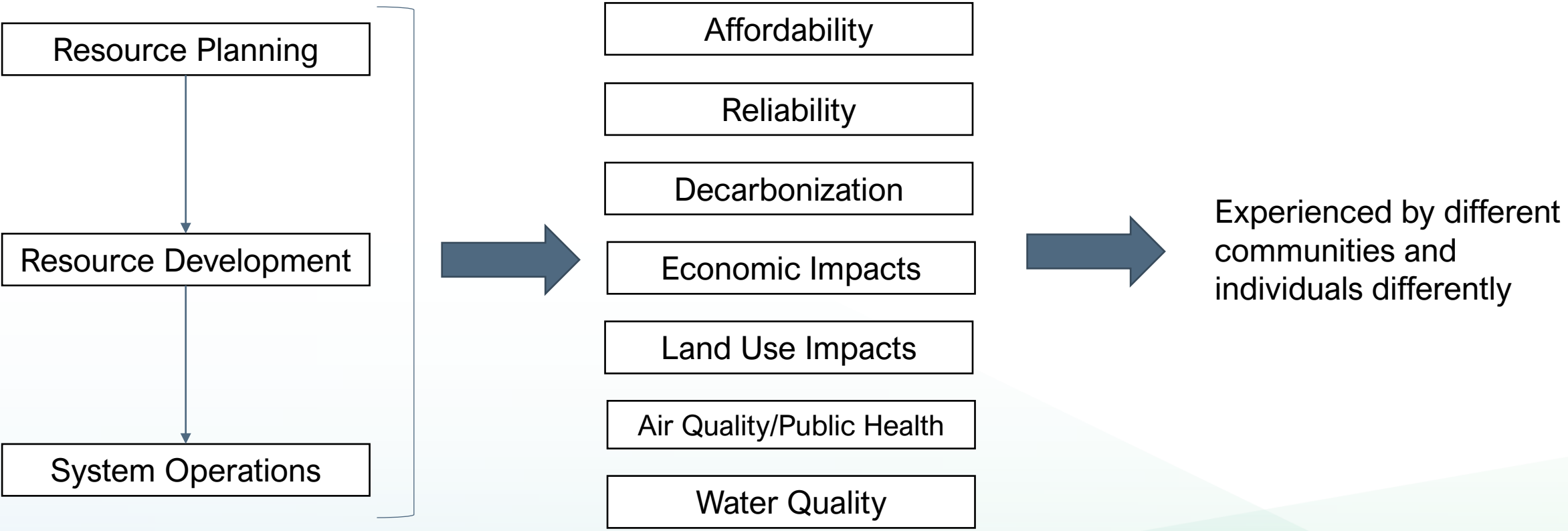
Primary Venues	Affordability	Reliability	Decarbonization
	Resource Planning Rate Cases (IOUs) Utility Investments	Resource Planning Resource Adequacy System Operations	Scoping Plan Resource Planning Cap and Trade
Primary Venues	Land Use/Environmental	Water	Air Quality
	Permitting (CEQA*)	CEQA Clean Water Act Regional Water Quality Control Plans	CEQA Clean Air Act State Implementation Plan Permitting (Air Permits)

SB 100: Understand implications for the alternate scenarios

* - California Environmental Quality Act

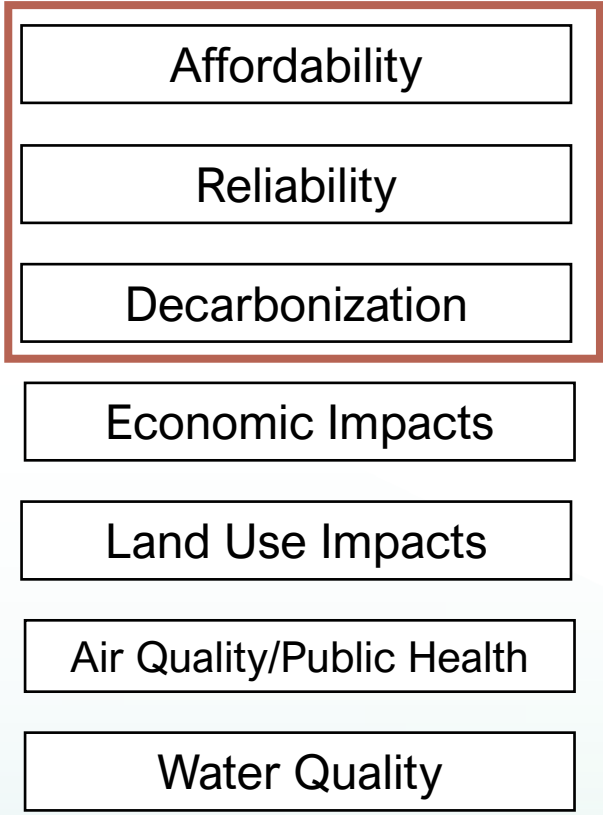
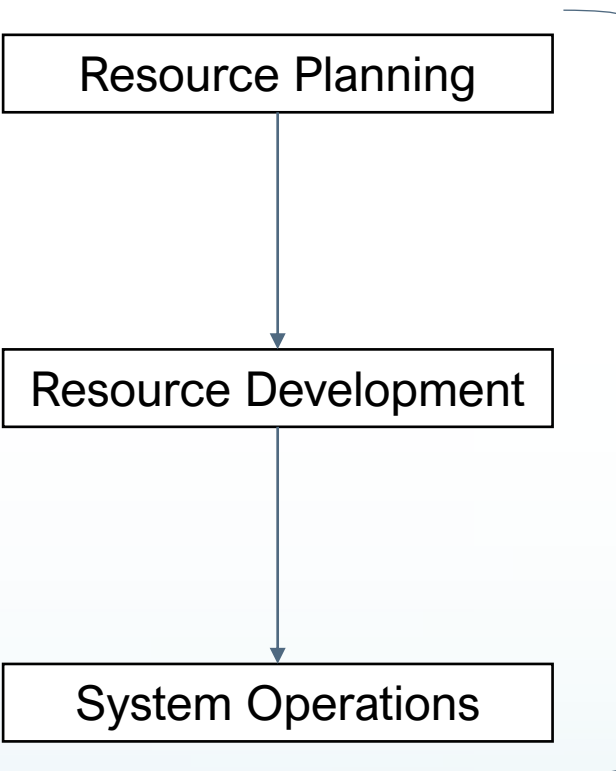


System Investments and Operations Have a Multitude of Impacts





Affordable, Reliable, & Safe Electricity

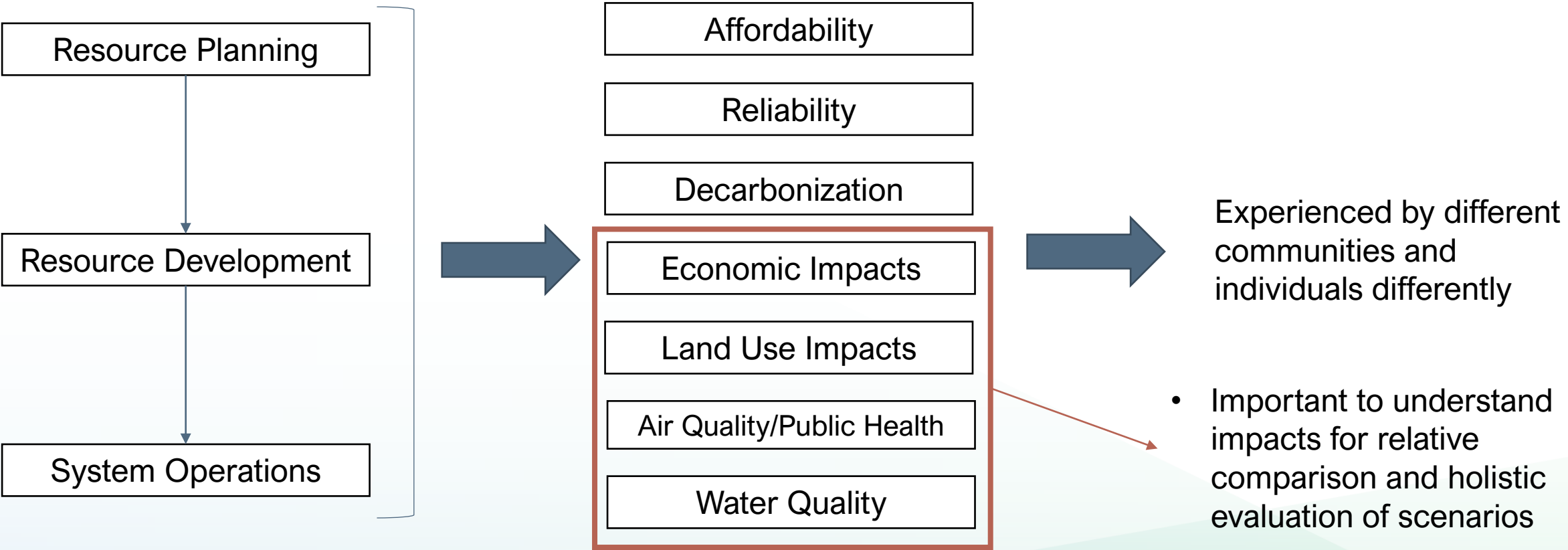


Primarily regulated by energy officials and informed by statewide planning efforts such as the 2022 Scoping Plan Update, to achieve the State's aggressive statutory mandates for climate and energy

Experienced by different communities and individuals differently

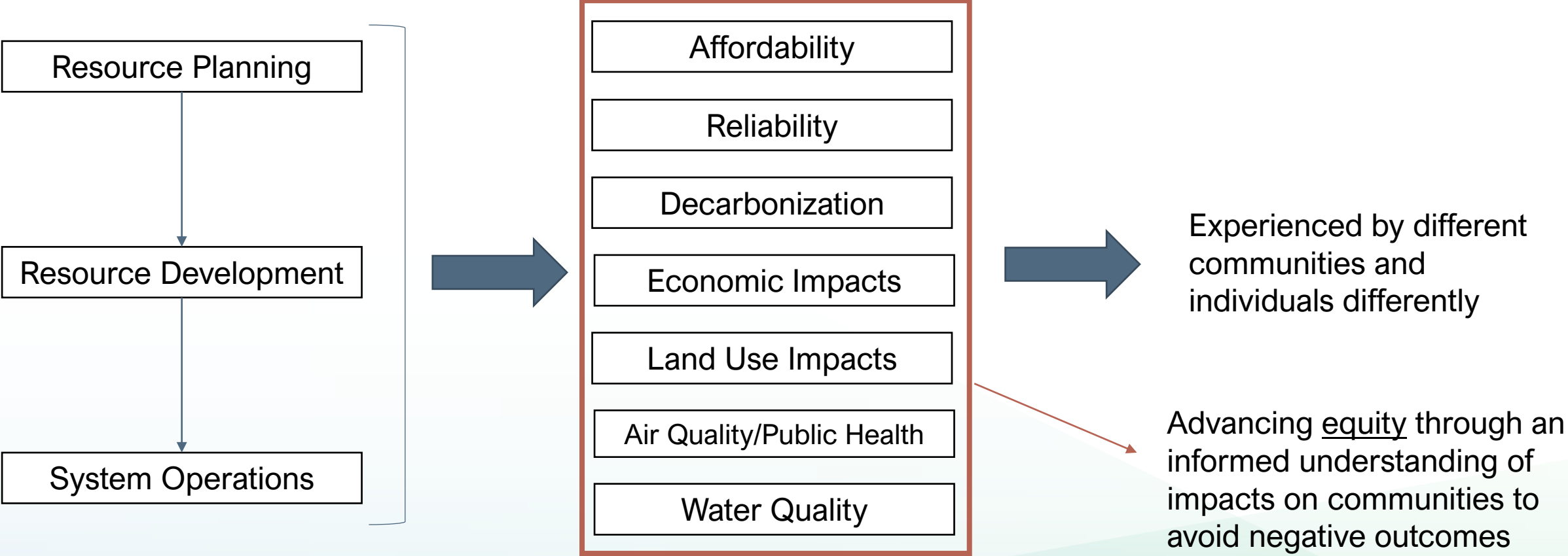


Non-Energy System Impacts





Advancing Equity Through Holistic Evaluation





Non-Energy Impacts Analysis in SB 100

- Provide information on impacts of energy system investments and operations outside of the primary regulated energy system impacts (affordability, reliability, safety, decarbonization)
- Allow for a holistic understanding of impacts on communities and alignment with broader state policy (e.g. environmental goals)
- Identify potential areas for non-ratepayer investments for increased societal benefits



Additional Venue for Evaluating Methods for NEIs

- On March 13th, the CEC opened an Order Instituting an Informational Proceeding (OIP) to initiate a transparent public process to determine methodologies to integrate NEIs into CEC planning processes & decision making.



Progress in State Agency Planning Processes

CARB – Bonnie Holmes-Gen, Branch Manager

CPUC – Dan Buch, Branch Manager, Energy Division

CEC – Mona Badie, Public Advisor



Questions from the Dais





Public Q&A





Lunch Break





Non-Energy Impacts Analysis in SB 100 2025 Report

April 16, 2024

Liz Gill, PhD— Reliability Branch Manager, Energy Assessments Division



SB 100 2025 Report Analysis Process

Scenario Definition

Results

Demand Scenarios

Resource Assumptions
Land Use Screens

System Information



Capacity Expansion / Resource Portfolio

As needed



Reliability Modeling



- Non-Energy Impacts
- Land Use Analysis



Evaluation:

- Tradeoffs
- Commonalities
- Risk Assessment

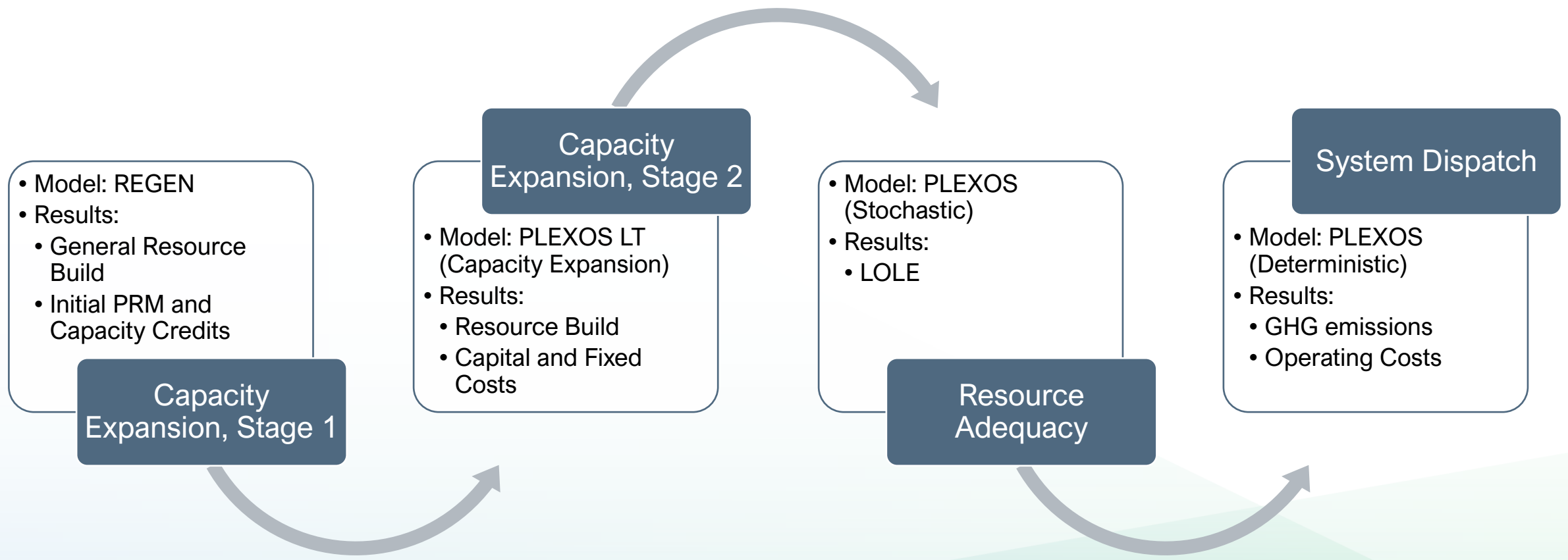


Main Scenarios

Reference	Existing resource plans replace the base resource, including the CPUC's Preferred System Plan through 2039, and POU Resource Plans.
Base	Least cost model based on current demand scenario and resource cost projections. Existing Resource Plans through 2030.
Minimum Compliance	Base scenario without constraints on GHG emissions. This scenario is focused on SB 100 compliance only.
DER Focus	Higher levels of distributed energy resources, including BTM and FTM generation and storage resources, and demand flexibility.
Resource Diversification	Procurement and technology advancements for a variety of existing and emerging resources able to be used for SB 100 compliance.
Geographic Diversification	Expanded regional transmission allowing for greater energy exchanges between California and the rest of the WECC.
Combustion Resource Retirement	Transition from combustion power plants to only non-combustion power plants.

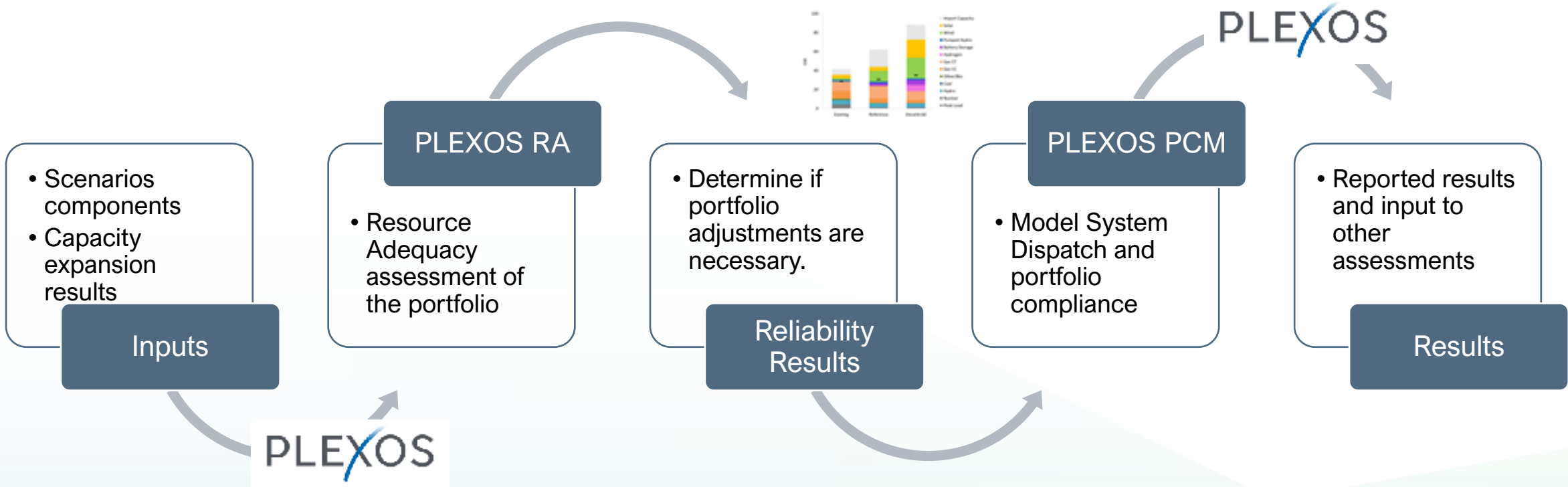


Electricity System Supply Model





Analyzing Resource Builds





Capacity Expansion Modeling Results

- Output for Modeled Years: 2035, 2040, 2045

- Capacity Expansion
 - Generation resources, storage & transmission added
 - Technology type
 - Capacity
 - Resource capital costs



Production Cost Modeling Results

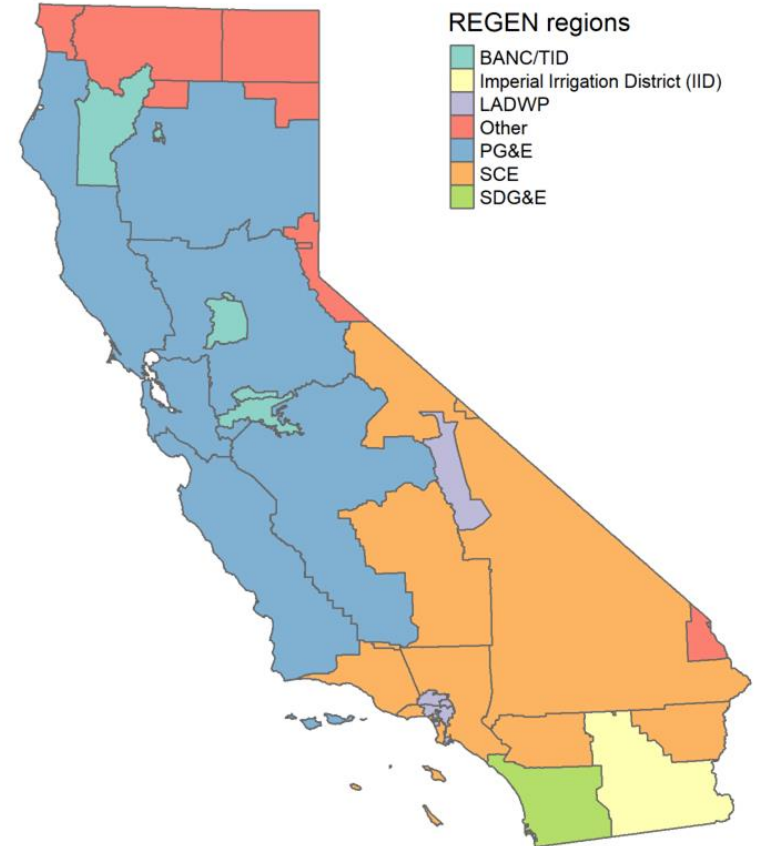
- Output for Modeled Years: 2035, 2040, 2045

- Production Cost Modeling
 - Operational costs
 - Fuel burn
 - Total generation by resource type
 - GHG Emissions
 - Criteria pollutants in post processing

Modeling Outputs are Geographically Coarse

- Capacity expansion modeling results are produced at a scale that is geographically coarse (see map on right).
- The scenarios require “downscaling” or “resource mapping” of the selected capacity to smaller-scale geographic areas to evaluate the results on a sub-regional level.

Downscaling – the allocating of results to smaller geographical areas



Example of geographic scale of modeling:
Map of REGEN resource areas



Principles for Identifying NEI Analysis

- Provide meaningful results by combining available methods with the available scenario data.
- Utilize and leverage existing methods currently used in related planning processes and programs.
- Consider quantitative and qualitative evaluations.
- Consider whether NEIs should be calculated at regional or sub-regional levels given the data inputs.



Challenges & Limitations for Evaluating NEIs in SB 100 Modeling

Community level data is required to evaluate community level impacts.

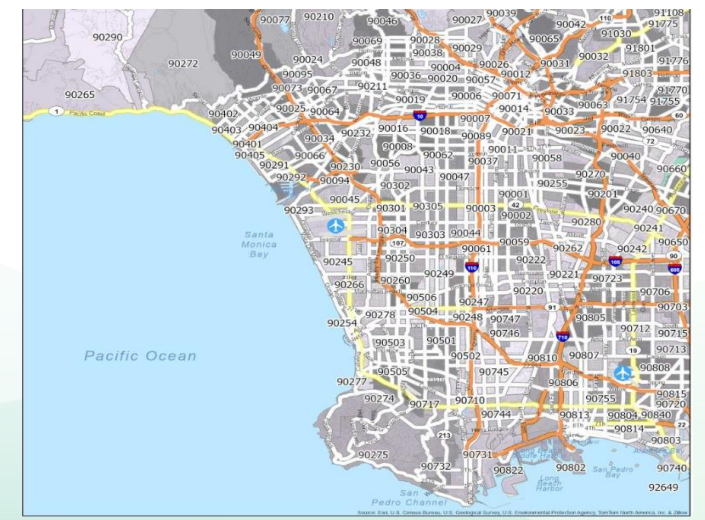
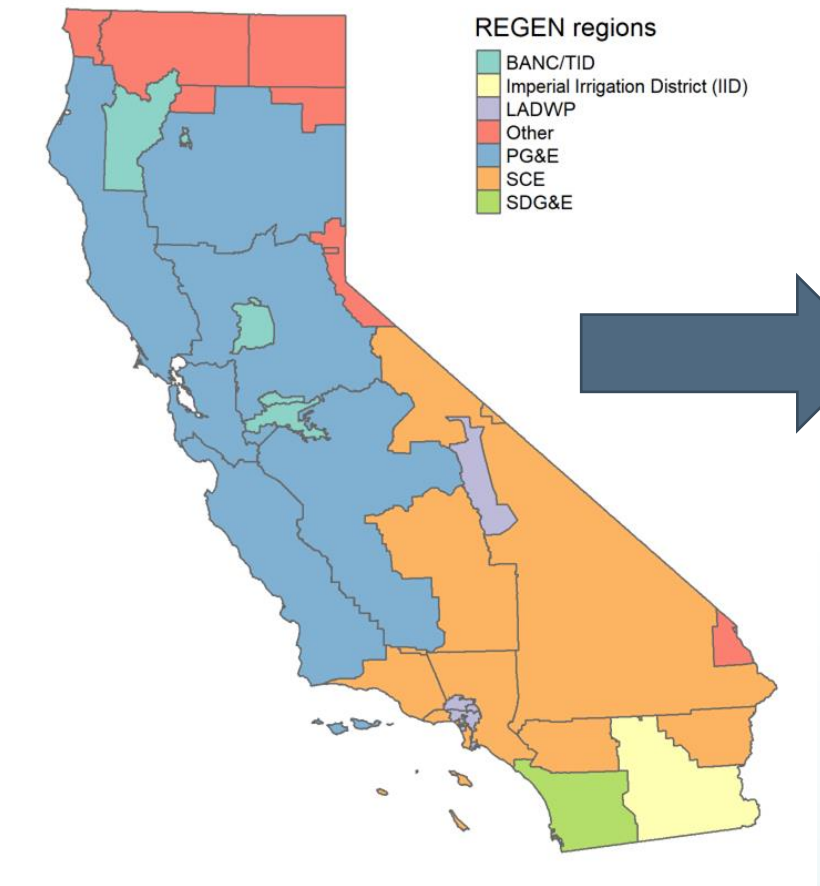
Results provided at region level. Does not meaningfully include:

- Individual plant dispatch results
- Location of new renewable or zero-carbon generation
- Location of economically retired facilities

Data granularity is the primary challenge in determining NEIs at a community level for the state analysis.



Downscaling is Required for Many Metrics



Downscaling – the allocating of results to smaller geographical areas



Downscaling Considerations for Meaningful Results

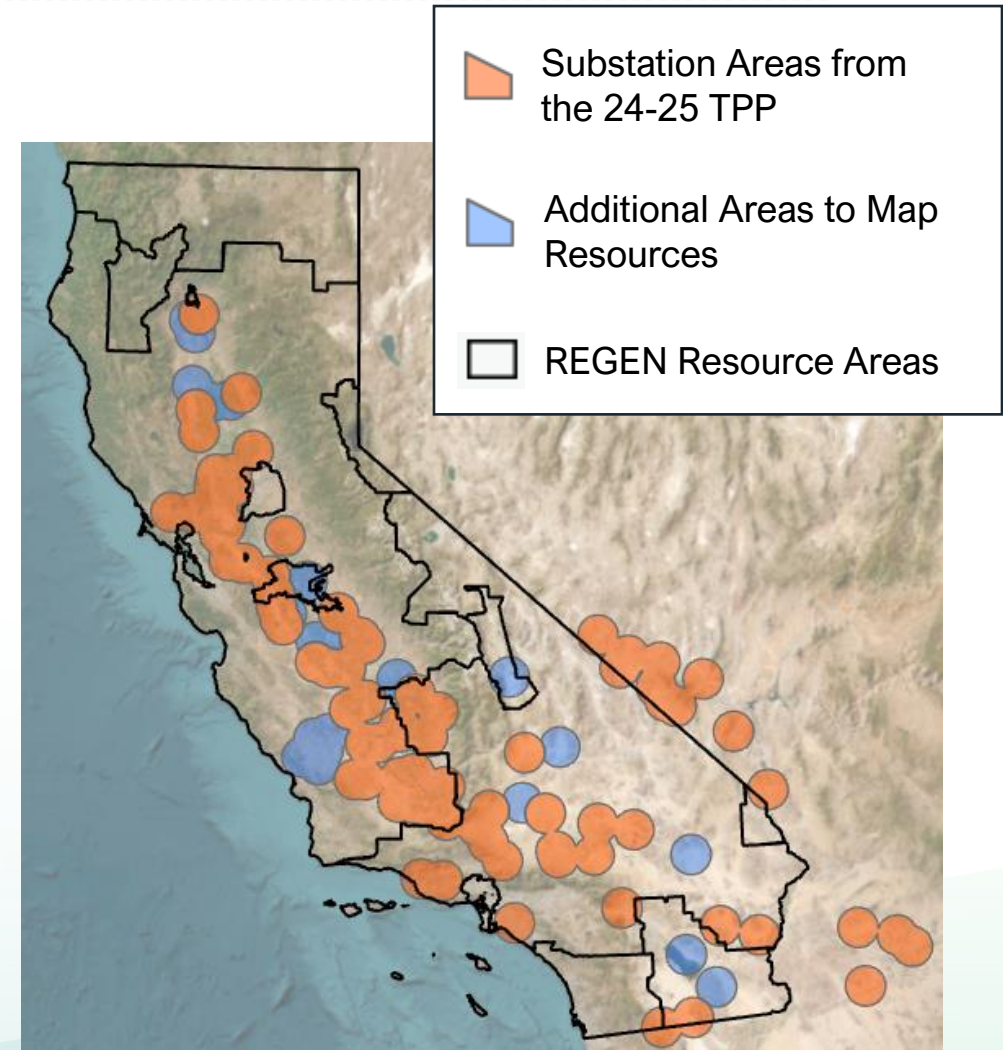
Certain metrics may be appropriate for downscaling.

In determining whether downscaling methods will enable meaningful results, the agencies will consider:

- Is there a **reasonable basis** for the allocation?
 - Is the allocation based on historical information or future-looking information? If historical, is historical information a reasonable prediction of the future?
 - What are the assumptions and uncertainties in downscaling to the chosen scale?
- If downscaling is needed to perform the analysis, will it be used to compare **differences in impacts between locations**?
 - Or will it be aggregated back up for regional or statewide results?
 - Is aggregation to regional scale comparison more appropriate?
- How dependent are the results on the allocation process?

Scenario Analysis Resource Mapping for Land Use Analysis

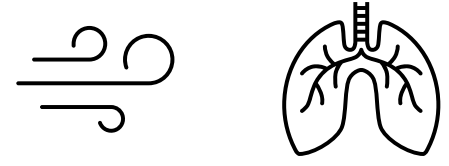
- Follow an approach similar to the resource mapping conducted for the *2045 Scenario for the Update to the 20-Year Transmission Outlook* ([report](#), [workshop materials](#)).
- (1) Rely on busbar mapping results from the CPUC’s 23-24 TPP base case and the base portfolio for the 24-25 TPP.
- (2) Define additional study areas to map resources beyond the amounts in the recent CPUC busbar mapping.
- Does *not* downscale dispatch results.



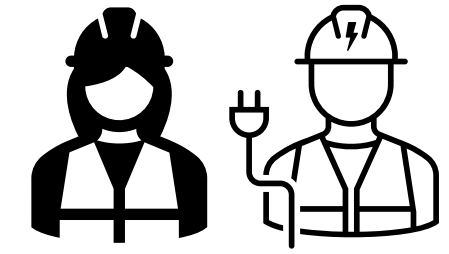


Sample NEI Metrics Under Consideration

Air Quality & Public Health

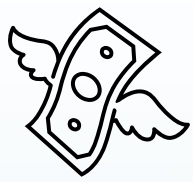


Workforce Implications



Social Cost of Carbon

Affordability



Resilience and Energy Availability





Next Steps

Tentative Schedule

- Summer: Staff Webinar on Proposed Metrics
- Q3: Non-Energy Impacts Draft Results Workshop



Questions from the Dais





Public Q&A





Panel Discussion





Questions from the Dais





Public Q&A





Public Comments

Zoom:

- Use the “raise hand” feature.

Telephone:

- Dial *9 to raise your hand.
- Dial *6 to mute/unmute your phone line. You may also use the mute feature on your phone.

Zoom/phone participants, when called upon:

- Your microphone will be opened.
- Unmute your line.
- State and spell your name for the record, and then begin speaking.

Limited to one representative per organization.

Three-Minute Timer





Closing Remarks from the Dais





APPENDIX

