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Project Title:	SB 100 Joint Agency Report
TN #:	254242
Document Title:	CEC Presentation for SB 100 Land Use Workshop
Description:	CEC presentation for 02/01/2024 SB 100 Land Use Workshop "2025 SB 100 Report –Land Use Workshop" by Erica Brand
Filer:	Xieng Saephan
Organization:	California Energy Commission
Submitter Role:	Commission Staff
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2025 SB 100 Report – Land Use Workshop

Presenter: Erica Brand
Date: February 1, 2024

2025 Report Development

Actual or Anticipated Timing	Workshop	Purpose
August 22, 2023	2025 Report Kickoff Workshop	Review 2021 report and propose 2025 report vision
October 31, 2023	Analytical Framework	Present scenario construction and modeling framework
February 1, 2024	Land Use	Goals of land use evaluation and stakeholder perspectives
2024 Q1	Inputs & Assumptions	Detailed draft inputs and assumptions to be used to develop and model SB 100 scenarios
2024 Q1	Land Use (Staff Webinar)	Proposed detailed methods for land use evaluation
2024 Q2	Non-Energy Benefits	Approach to non-energy benefits (NEB)
2024 Late Q2	Draft Modeling Results	Review draft scenario modeling results
2024 Early Q3	Draft NEB and Land Use Results	Review draft NEB and land use results based on the draft scenario modeling results
2024 Late Q3	SB 100 Modeling Results	Present SB 100 modeling results
2024 Q4	Draft SB 100 Report and Recommendations	Present draft SB 100 report and recommendations
2024 Q4	Submit Report to the Legislature	

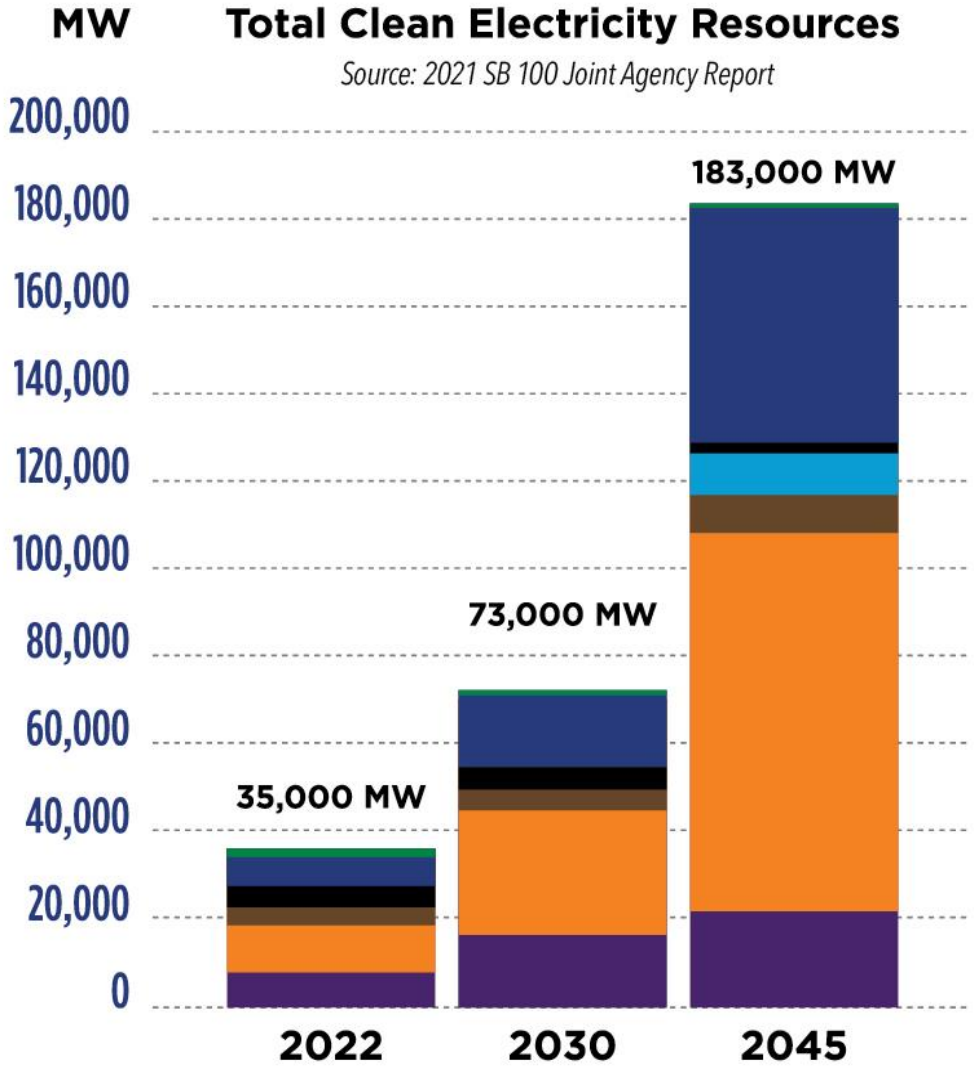
To provide 100% clean electricity by 2045,

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.

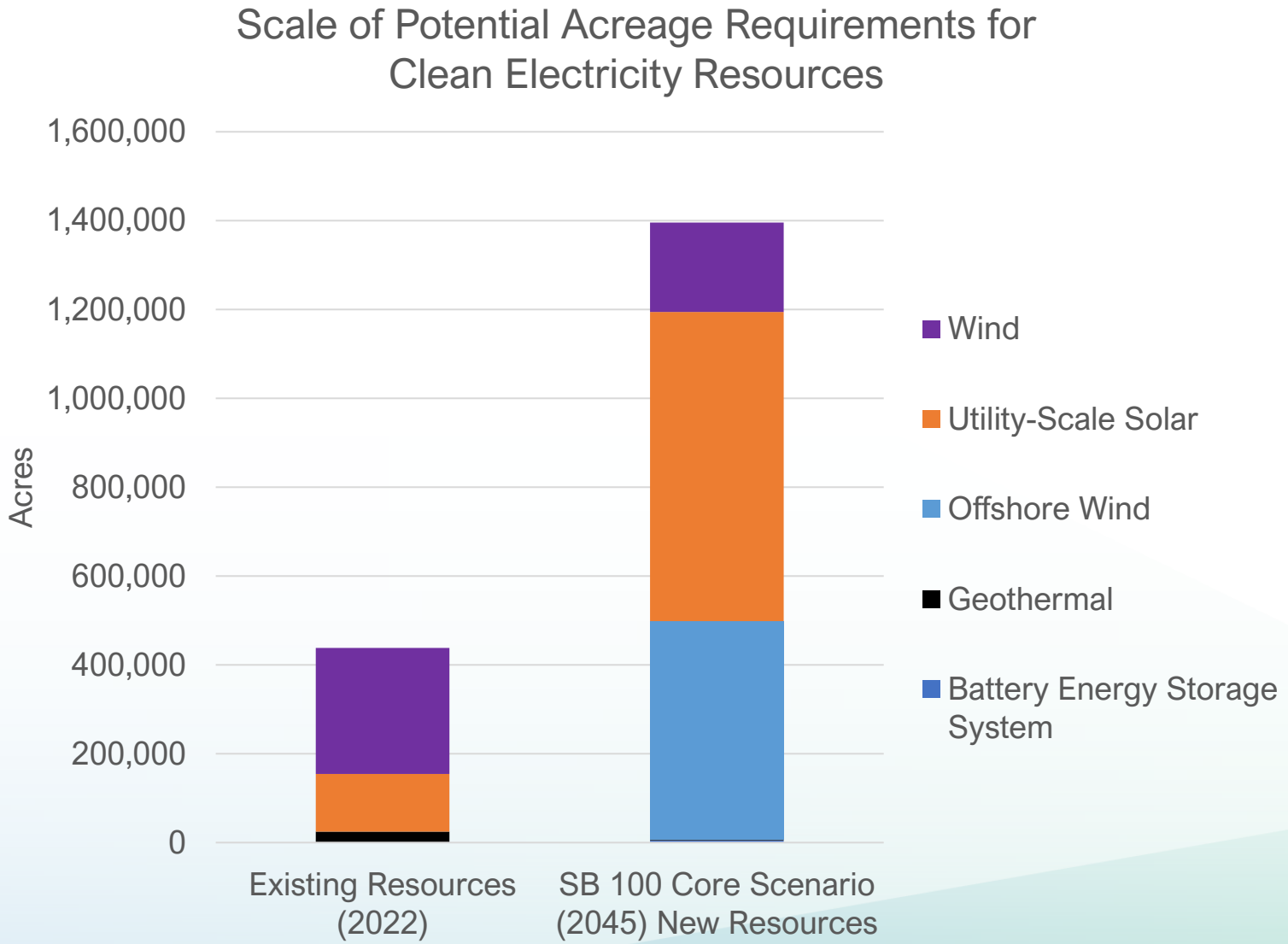
In addition, California also expects new capacity from energy efficiency, customer solar and demand response.

- Biomass
- Battery Storage
- Geothermal
- Offshore Wind
- Long Duration Energy Storage
- Utility-Scale Solar
- Wind



To provide 100% clean electricity by 2045,

the land area and sea space needed for new clean electricity resources will grow



Capacity Density Metrics (acres/MW)	
Solar (2022, existing)	7.6
Solar (2045, new)	10
Land-based Wind	46.4
Offshore Wind	49.2
Geothermal	9
BESS	0.1

Capacity Data Sources: Quarterly Fuel and Energy Report (QFER) database, 2021 SB 100 Joint Agency Report

Land Use Introduction

- California's coordinated electric resource planning processes improve how environmental and land use constraints are incorporated in long-term planning.
- Realizing California's clean electricity goals requires an unprecedented scale of new clean resources.
- Anticipating, understanding, and minimizing environmental and land use impacts is increasingly important at higher renewable penetration levels.
- Ongoing local, state, and federal coordination is needed to achieve competing land use goals.

2021 SB 100 Report - Land Use Recommendations

In future SB 100 analyses, the joint agencies will:

- “Analyze projected land-use impacts of scenarios and opportunities to reduce environmental impacts.”
- “Future system modeling and land-use impacts must be coordinated with any recommendations from the Climate Smart Strategy called for in Executive Order N-82-20 and the AB 32 Scoping Plan.”

Feedback on SB 100 and Land Use

- Spring 2023, Listening Sessions for California Native American tribes.
  - The report should align with other state processes (e.g., 30x30)
  - The land use evaluation should consider cultural resources, tribal cultural resources, and areas of cultural significance to tribes
- August 2023, Report Kickoff Workshop
  - Broad support for additional land use evaluation in the 2025 report
  - Assess land use constraints that may limit utility-scale clean energy generation and transmission projects
  - Consider implications to energy equity that might occur from the resource portfolios and where those resources will be built
  - Several commenters recommend maximizing development of new generation on already degraded or developed lands
- October 2023, Analytical Framework Workshop
  - Multiple commenters recommend using the same land use screen in all scenarios and only varying the land use screen in a land-use-specific sensitivity scenario

Overview of the Workshop

- SB 100 Joint Agencies: Environmental and Land Use in Climate and Energy Resource Planning
  - CARB – Natural and Working Lands Climate Planning
  - CPUC – Land Use in CPUC's Integrated Resource Planning
  - CEC – 2025 SB 100 Report: Approach to Environmental and Land Use Evaluation
- Panel: Perspectives of California Native American tribes
- Panel: Agency Collaboration to Evaluate and Achieve SB 100
- Panel: Land Use and Achieving SB 100

2025 SB 100 Report:
Approach to Environmental and Land Use Evaluation

Presenter: Erica Brand
Date: February 1, 2024

2025 Report Land Use Goals

1. **Review progress** on SB 100 resource build and land use planning and coordination
2. Explore opportunities to reduce environmental and land use **impacts**
3. Identify land use **implementation challenges** to resource build deployment
4. Evaluate land use uncertainties and tradeoffs across **scenarios**
   a. Expand and update understanding of the land area and sea space required to achieve SB 100 (*i.e., how many acres could be needed for future electricity infrastructure to achieve SB 100?*)
   b. Assess high-level environmental and land use constraints of each scenario to understand uncertainties and potential challenges

Review Progress

- Review and discuss actions taken by the State to include land use and environmental factors in energy resource and transmission planning.
- Review and discuss coordination with
  - Statewide state land and water conservation goals (such as, 30x30)
  - AB 1757 (Rivas 2022) and state climate smart strategy
  - State agricultural land objectives (such as, conservation, repurposing)

Impacts and Implementation Challenges

Impacts

- Identify potential environmental and land use impacts of SB 100 resources
- Identify opportunities to reduce impacts
- **Resources and Land Use Factors Under Consideration:**
  - Biological Resources
  - Cultural and Tribal Cultural Resources
  - Environmental Justice and Equity
  - Agricultural Resources

Impacts

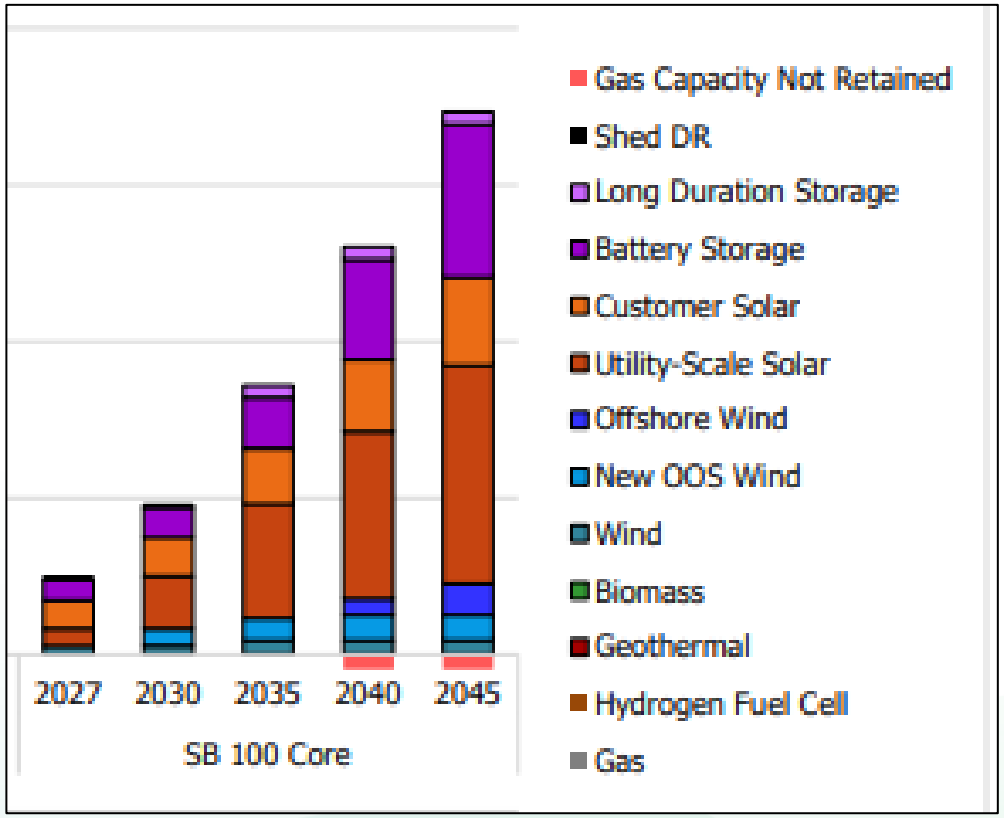
Implementation Challenges

- Identify environmental and land use implementation challenges to resource build deployment

Implementation Challenges

Scenario Analysis

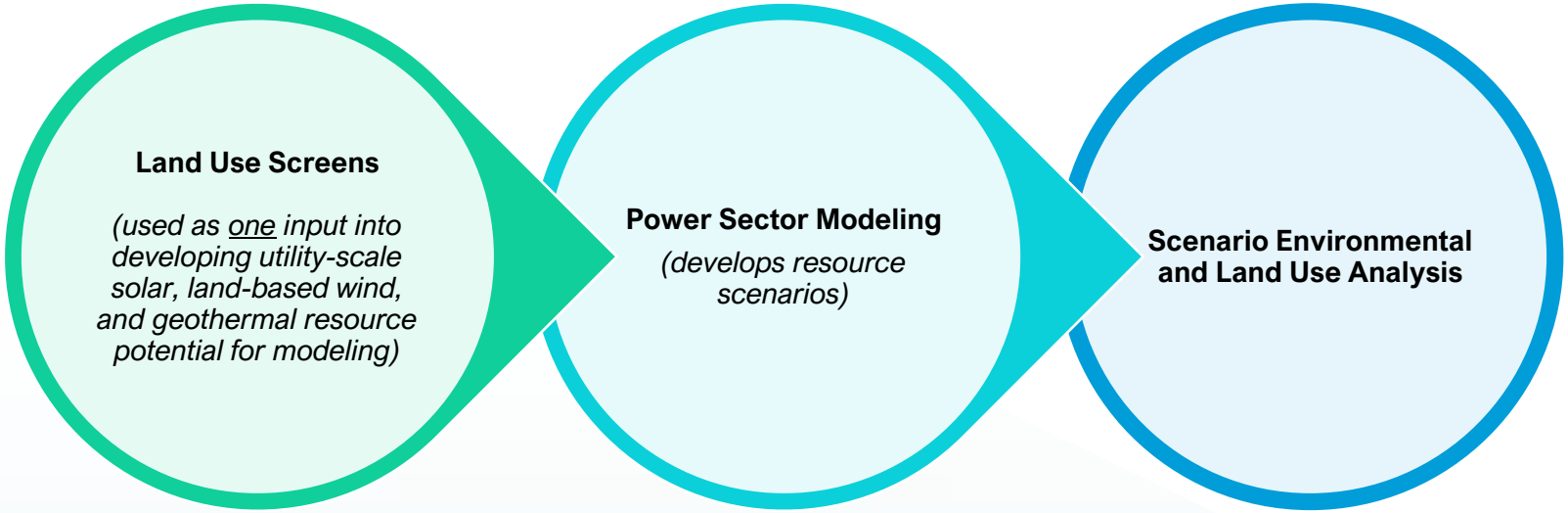
- **Evaluate land use uncertainties and tradeoffs across scenarios**
  - Evaluation of a modeled set of assumptions related to future generation, storage, and transmission capacity.
  - Analysis does not evaluate individual generation, storage, or transmission projects.
  - Analysis of scenario-level environmental and land use constraints is a best practice in power sector modeling.



Example: Capacity Additions from SB 100 Core Scenario (2021 Report)

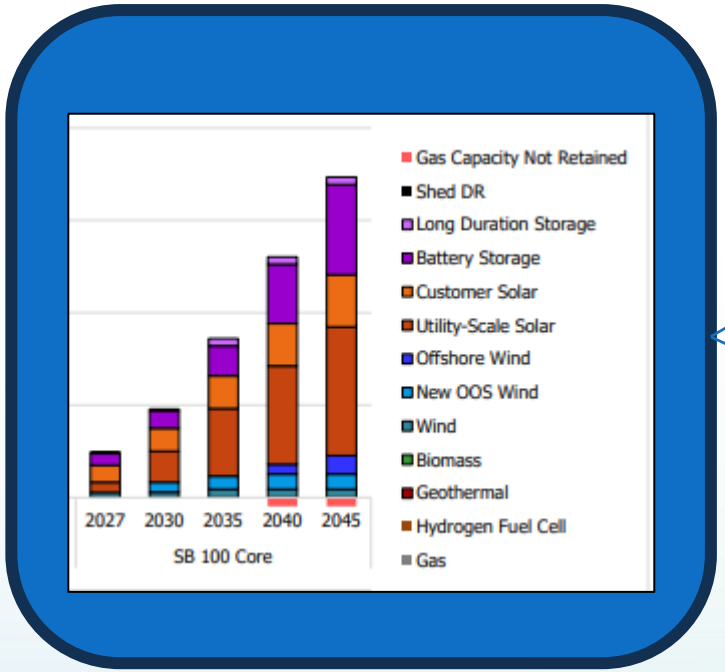
Scenario Analysis Framework

High-level depiction of environmental and land use considerations in the analytical framework of the 2025 SB 100 Report



Scenario Analysis Outputs

The scenario environmental and land use analysis will include an estimation of the land area and sea space required for the resource build in each scenario and then a high-level evaluation of projected environmental and land-use constraints using quantitative (map-based datasets) and qualitative information.



Example: Capacity Additions from SB 100 Core Scenario (2021 Report)

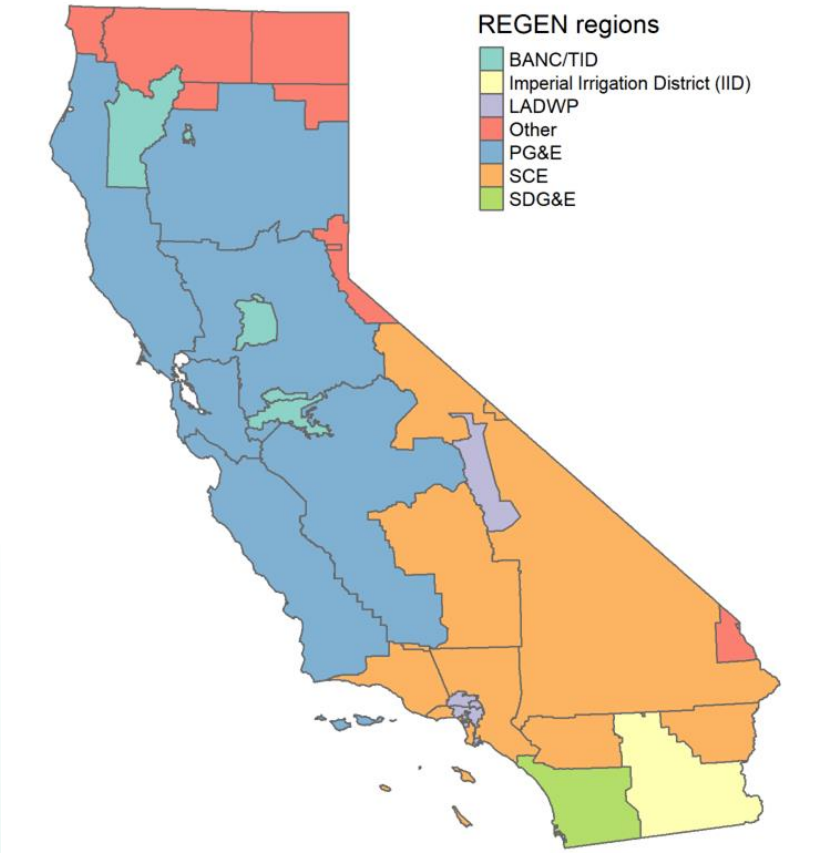
- Land area and sea space required for the resource build in the scenario
- High-level environmental and land use constraints

Scenario Analysis Resources

- Resources under consideration to inform methods development:
  - Acreage Usage:
    - Capacity density metrics (CPUC Integrated Resource Planning Inputs & Assumptions, scientific literature, GIS evaluation)
  - Environmental and Land Use Constraints:
    - CEC Land Use Screens for Electric System Planning
    - CA Nature (includes data for 30x30, climate smart strategy)
    - CPUC busbar mapping: land use evaluation data and methods
    - CAISO Update to the 20-year Transmission Outlook
    - AB 525 Strategic Plan, Identifying Additional Suitable Sea Space and Assessing Impacts and Mitigations for Offshore Wind Energy Development
    - CalEnviroScreen 4.0
    - Scientific literature

Scenario Analysis Scale

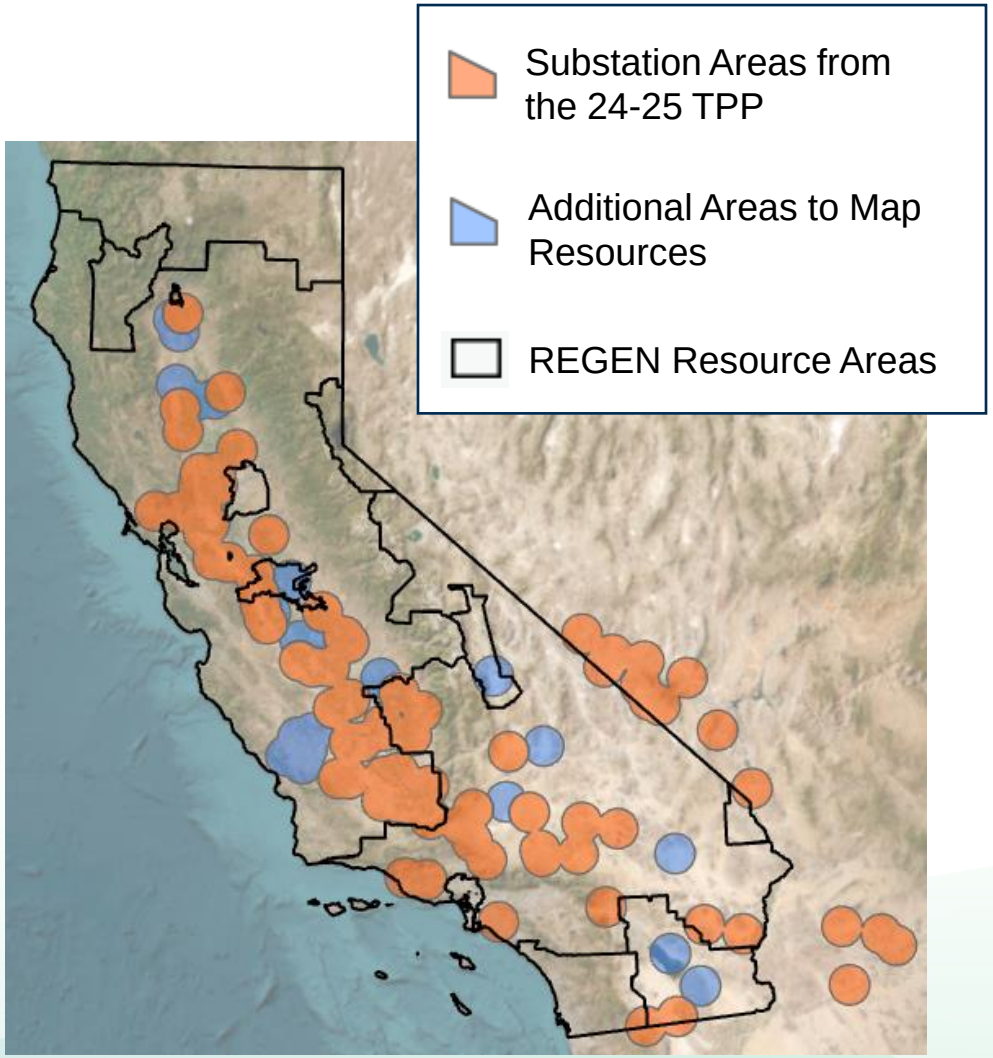
- Capacity expansion modeling results are produced at a scale that is geographically coarse (see map on right).
- The scenarios require “downscaling” or “resource mapping” of the selected capacity to smaller-scale geographic areas to conduct the environmental and land use evaluation.



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

Scenario Analysis Resource Mapping

- 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 forthcoming base portfolio for the 24-25 TPP.
- (2) Define additional study areas to map resources beyond the amounts in the recent CPUC busbar mapping.



Summary of 2025 Report Land Use Goals

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Questions for the Public

To inform written comments:

1. What are the land-use-related challenges to SB 100 implementation?
2. Do you agree with staff's proposed **goals** (slides 10 and 19)? If not, what would you recommend?
3. Do you agree with staff's **resources under consideration** (slides 12 and 16)? If not, what would you recommend?
4. Do you agree with staff's proposed approach to **resource mapping** for the scenario analysis (slide 18)? If not, what would you recommend?

Contact

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