



An Action Plan for CCS in California: Challenges & Solutions

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Engaging Stakeholders to Identify Challenges for CCS

Industry/Affiliation	#
Cement	3
Chemicals	3
Diversified Energy	15
Environmental Advocacy	5
Infrastructure	8
Investment	3
Labor Unions	2
Power	6
Private Equity	2
Public Sector	3
Refinery	5
Reinsurance	2
Utility	2
Total*	59

* Indicates number of interviews; most interviews included multiple interviewees.

- Technology developers
- Industry
- Power producers
- Project financiers
- NGOs

Stakeholder interviews



- Ambiguity of State Support
- Regulatory complexity
- Financial uncertainty
- Education and public support

Assessment of challenges



Analysis identified key challenges for CCS project development in California through interviews with project developers, financiers, and industry stakeholders, as well as archival research and analysis of California's policy landscape.



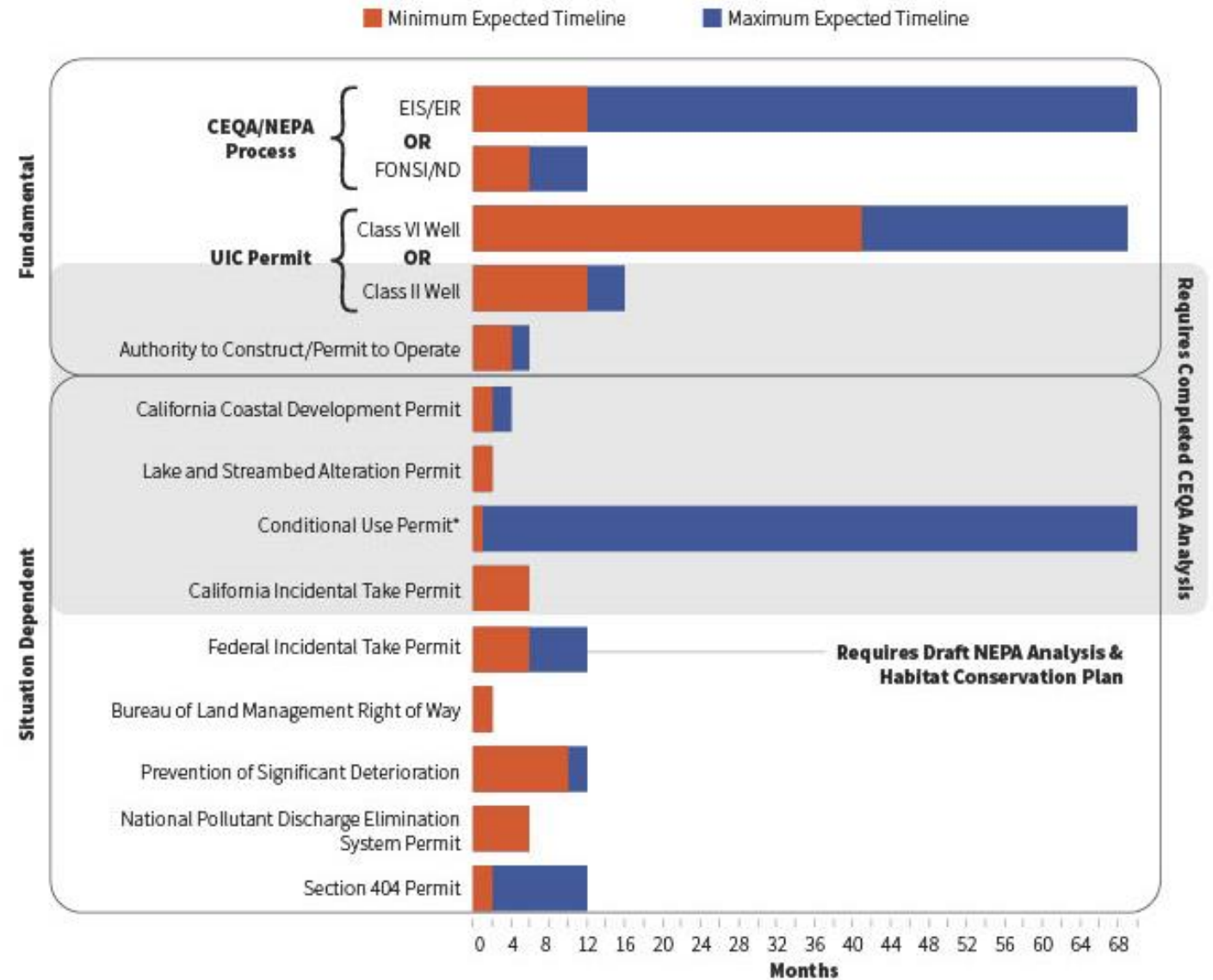
Complexity and Uncertainty Reduce Attractiveness of Investment in CCS





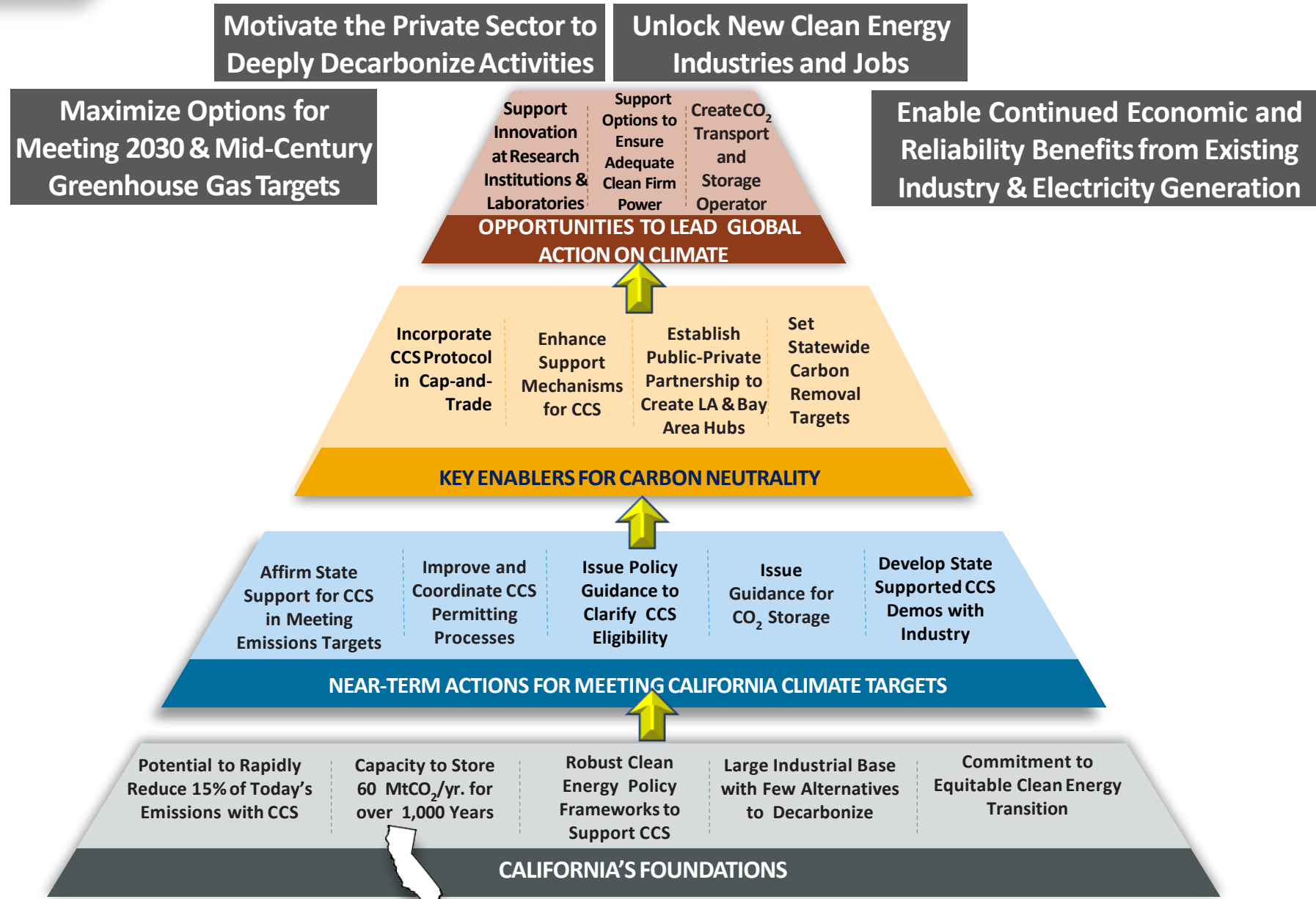
Uncertain Permitting Timelines & Numerous Agencies Involved

- Three fundamental permits and processes
- At least nine additional situation-dependent permits
- Of note, some state and local permits required completed CEQA to commence
- Agency of jurisdiction depends on if project is in electricity or industry sector





A Policy Action Plan for CCS in California to Meet the High-Level Goals





Near-Term Actions for Meeting California's Climate Targets with CCS

Affirm State Support for CCS in Meeting Emissions Targets

- Issue policy guidance to align state agencies
- Promote local community support through stakeholder engagement and explicit benefits
- Preserve and grow existing industry workforce to support clean industrialization

Issue Policy Guidance to Clarify CCS Eligibility

- Appoint a lead coordinating agency for CCS activities
- Establish a multiagency work group
- Consider seeking class VI primacy

Issue Policy Guidance to Clarify CCS Eligibility

- SB100
- Integrated resource plan (IRP) process
- Integrated Energy Planning Report (IEPR)

Issue Guidance for CO₂ Storage

- Provide certainty on pore space ownership
- Address long-term monitoring and stewardship issues

Develop State Supported CCS Demos with Industry

- Located at or near suitable geologic storage
- Demonstrates local air quality and jobs benefits

NEAR-TERM ACTIONS FOR MEETING CALIFORNIA CLIMATE TARGETS



Key Enablers for Carbon Neutrality

Incorporate CCS Protocol in Cap-and-Trade

- Adopt same CCS Protocol that has been developed under the LCFS for the Cap-and-Trade program

Enhance Support Mechanisms for CCS

- Support early project with state grants (e.g. FEED studies, startup grants)
- Seek 45Q extension
- Extend, clarify, and revise LCFS

Establish Public-Private Partnership to Create LA & Bay Area Hubs

- Support building out CCS hubs with shared transportation and storage infrastructure
- State could prioritize projects with local air quality and jobs benefits

Set Statewide Carbon Removal Targets

- Set statewide carbon dioxide removal target
- Multi-agency review of eligible CDR pathways

KEY ENABLERS FOR CARBON NEUTRALITY



Opportunities to Lead Global Action on Climate Change

Support Innovation and Research Institutions and Laboratories

- Support hydrogen innovation programs
- Invest in direct air capture (DAC) programs
- Support CO₂ utilization technologies

Support Options to Ensure Adequate Clean Firm Power

- Assess how much clean firm power is needed for the grid that is decarbonizing to inform reliability planning
- Identify technology and resource options
- Develop policy approaches to support the development and deployment clean firm power

Create CO₂ Transport and Storage Operator

- Public or private entity could be authorized to manage CO₂ transportation under bilateral contracts
- CO₂ storage could also be managed by a private or public entity and serve multiple customers

OPPORTUNITIES TO LEAD GLOBAL ACTION ON CLIMATE



Questions?

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