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(ATTACHMENT A)

CLIMATE ADAPTATION FRAMEWORK

Safety Policy Division, CPUC

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DRAFT

CPUC Climate Adaptation Framework for Utilities

Summary

The scale, complexity, uncertainty, and interdependencies of climate change justify establishing a uniform collection of information and data on the use of climate adaptation hazard and risk requirements established by the CPUC. This Climate Adaptation Framework establishes a unified approach to integrating climate adaptation into the activities of investor-owned utilities regulated by the California Public Utilities Commission (CPUC). The purpose of this framework is to provide policy guidance on climate adaptation considerations for applications before the CPUC. Below are the goals of this framework:

1. Further integrate climate hazard and risk analysis into regulatory processes.
2. Protect Vulnerable Communities and ensure service continuity.
3. Enhance the understanding of the Climate Adaptation situation for utilities regulated by the CPUC.

The Safety Policy Division developed the Climate Adaptation Framework by analyzing governmental climate adaptation plans, academic work, existing CPUC General Orders and decisions, workshop input, and consultations with CPUC divisions. Through this analysis, SPD developed a methodology to examine existing regulatory requirements and identify Climate Adaptation policy areas to guide IOUs in integrating climate adaptation.¹² The policy areas include the operation, development, and maintenance of utility infrastructure, as well as activities where incorporating climate adaptation can improve situational awareness of the infrastructure and its relationship to climate risks.

The five identified Climate Adaptation policy areas are:

- 1) *Repetitive loss and failure*
- 2) *Site selection*
- 3) *Design and engineering*
- 4) *Equipment tolerance*

¹ California Natural Resources Agency. (n.d.). *California climate adaptation strategy*. <https://www.climate resilience.ca.gov/>

² Bedsworth, L., Cayan, D., Franco, G., Fisher, L., & Ziaja, S. (2018). *Statewide summary report: California's Fourth Climate Change Assessment* (Publication No. SUM-CCCA4-2018-013). California Governor's Office of Planning and Research, Scripps Institution of Oceanography, California Energy Commission, & California Public Utilities Commission. https://www.energy.ca.gov/sites/default/files/2019-11/Statewide_Reports-SUM-CCCA4-2018-013_Statewide_Summary_Report_ADA.pdf

5) *Climate risk modeling*

These policy areas cover a wide range of IOU activities regulated by the CPUC and are deliberately broad to ensure future flexibility and the integration of the best available science. The guidance also includes tracking actions in these policy areas to build a more detailed picture of climate adaptation. By integrating climate considerations into applications before the CPUC, the Commission would further improve future reliability and reduce redundant costs for customers caused by climate change.

CPUC Climate Adaptation Roadmap

Currently, the California Public Utilities Commission (CPUC) has three foundational requirements for climate hazard and risk analysis. These requirements are the Climate data, scenarios, and projections established by D.19-10-054,³ Climate Adaptation and Vulnerability Assessment, and Risk Assessment and Mitigation Plan. The Climate Adaptation Framework establishes a common roadmap for applications before the CPUC. This roadmap will help identify places where climate adaptation should be considered and create avenues for incorporating analysis from the foundational documents (below).

Below are the three foundational requirements for climate hazard and risk analysis.

Climate data, scenarios, and projections - On May 7, 2018, through Rulemaking (R.) 18-04-019, the Commission established a formal approach to consider strategies and guidance for climate adaptation across regulated utilities. Decision (D.) 19-10-054 issued on October 24, 2019, defined climate adaptation, identified climate data, scenarios, and projections (i.e., most recent California Statewide Climate Change Assessment), and specified planning standards (i.e., Representative Concentration Pathways 8.5). D. 24-08-005,⁴ issued on August 22, 2024, updates and refines the climate risk modeling that utilities must use. The decision adopts new baseline climate scenarios and requires utilities to update modeling practices as climate science evolves.

Climate Adaptation Vulnerability Assessment - D.20-08-046,⁵ issued on September 3, 2020, defined Disadvantaged Vulnerable Communities (DVCs), established requirements

³ California Public Utilities Commission. (2019, October 24). *Decision D.19-10-054: Definitions and data — Phase 1 decision addressing climate adaptation topics* (Rulemaking R.18-04-019).

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M319/K075/319075453.PDF>

⁴ California Public Utilities Commission. (2024, August 22). *Decision 24-08-005: Phase 2 decision updating climate change adaptation modeling requirements and refining the climate adaptation and vulnerability assessments* (Rulemaking 18-04-019).

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M537/K988/537988980.PDF>

⁵ California Public Utilities Commission. (2020, September 3). *Decision D.20-08-046: Decision on energy utility climate change vulnerability assessments and climate adaptation in disadvantaged communities*

for community engagement with DVCs, and required utilities to conduct and file a Climate Adaptation Vulnerability Assessment (CAVA) every four years. At a minimum, the decision specifies 11 elements for the CAVA, beginning with climate risks to IOU operations, services, and utility assets under the utilities' control.

Risk Assessment and Mitigation Plan - The CPUC's Risk Assessment and Mitigation Phase (RAMP) is a mandatory, four-year regulatory process requiring major California energy utilities to identify their top safety risks and propose cost-effective mitigation plans. RAMP serves to identify, analyze, quantify, and reduce a wide range of risks.

Framework Development

For Rulemaking (R.) 18-04-019, the Safety Policy Division (SPD) analyzed CPUC's General Orders. SPD examined all 94 General Orders that regulate utility infrastructure to identify areas where climate adaptation could be integrated and the related policy gaps.

To conduct this analysis and develop this framework, SPD went through a multi-phase process, including:

- Conducting a three-step screening process to identify GOs that could be modified to account for a changing climate and identify common policy themes
- Consulting with CPUC Industry Divisions to elicit subject matter expertise
- Reviewing academic and climate change touchstones to shape and guide future policy
- Conducting a workshop on opening Phase 3 of R. 18-04-019
- Asking parties ruling questions following the workshop

This process ultimately led to the development of five policy areas that can be effectively leveraged by the Commission to influence climate adaptation policy.

Framework Development

Under the R. 18-04-019 June 2, 2023, Scoping Memo, Safety Policy Division (SPD) sought to answer Task 6: Need for Updates to General Orders to Reflect Climate Adaptation.⁶ SPD presented the analysis of this task during the April 17, 2025, workshop. Following the workshop, parties responded to questions on the GO analysis.

GO Screening Process

At the April 17, 2025, workshop, SPD presented their GO screening process, outlined below. In the first step of the analysis, SPD identified criteria and used them to identify the

(Rulemaking R. 18-04-019).

<https://docs.cpuc.ca.gov/PublishedDocs/Published/G000/M346/K285/346285534.PDF>

⁶ California Public Utilities Commission. (2023). *Phase 2 scoping memo and ruling* (Rulemaking R.18-04-019). <https://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M510/K465/510465632.PDF>

targeted industries outlined by R.18-04-019 and assess their potential impact on climate adaptation.⁷ SPD excluded GOs related to utilities outside the scope of June 2, 2023, R.18-04-019 scoping ruling (e.g., rail and passenger carriers) and those addressing purely ministerial or financial matters, with exclusion criteria taking precedence. In the second step of the screening process, SPD developed six questions, based primarily on the California Climate Assessment, to evaluate the 16 GOs identified in the first round of screening.

Subject Matter Expert Consultation

SPD staff consulted subject-matter experts (SMEs) from various CPUC divisions, including Water, Energy, Safety Enforcement, Safety Policy, and Legal, to review and validate the initial identification of General Orders suitable for climate-adaptation modifications. Industry Divisions were asked to provide input on how climate affects utility planning, facilities maintenance, construction, operation, communication, technology, and infrastructure. The consultation produced the following areas to target:

- **Infrastructure Resilience:** Certain sectors have established weather protocols and may factor in historical weather impacts; opportunities exist to strengthen the integration of climate adaptation
- **Resilient Construction and Reconstruction:** Construction and reconstruction are areas for integration of climate adaptation to inform the development of construction and reconstruction standards.
- **Applying Best Available Science (Climate Risk Modeling):** Many of the General Orders rely on historical data analysis rather than forward-looking climate modeling. In addition, the time horizon of this historical weather analysis is, at best, focused on mitigating current risks and hazards rather than future ones.

Academic and Climate Change and Climate Adaptation Plan Reviews

SPD reviewed more than 25 peer-reviewed academic articles from institutions including the California Fourth Climate Assessment, University of California (UC) Berkeley, UC Davis, UCLA, New York University, University of Melbourne, Columbia University, Cornell University, Carnegie Mellon University, and Arizona State University. In addition, the research included a review of policies and procedures from other jurisdictions. The findings that informed the framework include:

- **Evidence-Based Policy:** California implements evidence-based climate policies across industries, including integrated regional water management and building efficiency.

⁷ Materials from the April 17, 2025, Workshop are included at the end of this document for reference.

- **System Resilience:** Effective policy interventions must consider social and ecological factors affecting system resilience and the needs of vulnerable populations.
- **Risk and Tradeoffs:** Adaptation strategies must examine risks, uncertainties, and tradeoffs.
- **Cross-Sector Outreach:** Continuous cross-sector outreach is essential for effective policy development.

Insights from the Gridworks Report⁸ (2025) support these findings as they relate to climate adaptation by sharing lessons learned and a collaborative hazard analysis. Practices such as these can enhance utility climate adaptation by prioritizing risk reduction and improving transparency.

Policy Area Identification

The policy areas were derived from a review of Commission General Orders and represent activities and infrastructure where climate adaptation could be considered. These policy areas synthesize vulnerabilities identified in the Fourth Climate Change Assessment, themes from the GOs, consultation with subject-matter experts, and broader academic research (including the Gridworks report).

⁸ Gridworks. (2025, December). *Ending Catastrophic Wildfire Together*. https://gridworks.org/wp-content/uploads/2025/12/GW_CREPC-Wildfire-Report.pdf

Climate Adaptation Policy Areas

The General Order Analysis identified and tested five climate adaptation policy areas that could be used to examine applications that come before the CPUC.

- 1) *Repetitive loss and failure*: This refers to the recurring damage, failure, or service disruption impacting the same utility asset over time, typically driven by persistent or worsening underlying conditions. This can also include the loss, degradation, or unsafe operation of a utility system that prevents it from performing its intended function in compliance with CPUC safety, reliability, and service standards. By identifying specific assets or geographic segments that have experienced failure or recurring damage, utilities can target investments and implement hardening measures to address underlying conditions, reduce future vulnerabilities and prevent recurring service disruptions.
- 2) *Site selection*: This refers to the process by which locations for utility infrastructure projects (e.g., electric transmission lines, substations, generation facilities, gas facilities, and other regulated utility assets) are identified, evaluated, and approved to ensure they are safe, cost-effective, and consistent with CPUC policy and regulations. By ensuring that siting decisions incorporate Climate hazards and risks, utilities can assess impacts on climate-vulnerable communities and evaluate alternatives that could reduce risk.
- 3) *Design and Engineering*: This refers to the physical modification, replacement, or new construction of utility infrastructure regulated by the CPUC. This can also refer to the substantial rebuilding, replacement, or reconfiguration of an existing infrastructure. By requiring that design practices incorporate climate-resilient design and materials, utilities can demonstrate that their construction and reconstruction can withstand projected climate hazards, extend asset life, and reduce the overall risk of failure under extreme weather conditions.
- 4) *Equipment tolerance*: This refers to the ability of utility equipment to safely and reliably perform within specified physical, electrical, mechanical, and environmental limits over its intended service life. A key aspect in equipment tolerance is assessing whether utility infrastructure supports system reliability during extreme events and projected climate conditions.
- 5) *Climate Risk Modeling*: This refers to the science-based methods that utilities and regulators use to identify, evaluate, and manage risks to regulated infrastructure and operations arising from current and projected climate conditions. This includes modeling climate risks, assessing asset exposure and vulnerability, estimating the likelihood and consequences of hazards, and integrating these results into planning, inspections, maintenance, reconstruction, and emergency preparedness. By specifying the climate models and scenarios used, accounting for uncertainties in future

projections, and identifying thresholds at which infrastructure may be exceeded, utilities can apply science-based risk analysis to evaluate exposure and vulnerability and integrate these insights into planning, operations, and resilience measures.

Framework Scope and Application

This framework applies to electric and gas utilities under CPUC jurisdiction that submit applications related to infrastructure planning, construction, maintenance, and risk management including, but not limited to, applications submitted pursuant to GO 131-E (Planning and Construction of Electric Generation, Transmission/Power/Distribution Line Facilities and Substations Located in California) and GO 177 (Planning and Construction Review for Gas System Infrastructure), as well as emergency response plans and filings such as plans filed pursuant to General Order 166 and D. 21-06-034 (Public Safety Power Shutoffs).

Implementation: Instructions for Utilities

While not mandatory, the Commission proposes the following guidance to encourage uniform structure to discussion and consideration of climate adaptation in applications. Applicants are free and expected to tailor the discussion to be commensurate with the scope, scale, and specificity of the application and to the extent that the requested relief relates to other climate adaptation planning efforts. At a minimum, applicants with a Climate Adaptation Vulnerability Assessment (CAVA) and/or Risk Assessment and Mitigation Phase (RAMP) are expected to discuss the relationship of the application to those planning documents or specifically explain why those planning documents were not utilized and what factors the IOU believes would make that choice reasonable in this instance.

General Guidance on Implementation

Step 1: Screening Process to Identify if the Application or Filing has a Relationship with the Climate Adaptation Policy Areas.

Table 2: Does my application before the CPUC involve the policy areas?

Policy Area	Question	Apply? (Y/N)
1. Repetitive Loss and Failure	Does the application address assets with a history of recurring damage or failure and factor in future climate risk?	☐

2. Site Selection	Does the application involve selecting a location for new infrastructure or evaluating the safety of existing sites?	☐
3. Design and Engineering	Does the application propose design standards, material selection, or construction of physical assets?	☐
4. Equipment Tolerance	Does the application specify equipment ratings (e.g., thermal, wind, load) or replacement of aging assets?	☐
5. Climate Risk Modeling	Does the application rely on weather data, risk forecasting, or long-term planning assumptions?	☐

Step 2: Policy Area Analysis

Explain how the application relates to the IOU's CAVA, RAMP, and any other of the applicant's climate adaptation analysis and planning efforts. If there is no relationship, the applicant should state no relationship and provide a reason.

Analysis and narrative should address the following topics and questions for each of the Climate Adaptation policy areas:

- A. Climate Modelling: Describe the climate risks (i.e., expected conditions) that may impact the proposal in the future.
 - a. Include risks that may have been addressed during the planning and design of the proposal.
- B. Describe what modelling was used to base this analysis upon, such as the modeling methodology, and time horizon(s) considered.
- C. Historical concerns for the specific location/project (this may overlap with the objectives of the project).
 - i. Reconstruction from disaster and mitigation measures for projected climate change conditions
 - ii. Repetitive Loss from climate change conditions
 - iii. History of System Failure tied to climate change conditions
- D. Explain how the above noted climate risks and historical concerns are addressed in the application. This should include those climate risks and historical concerns addressed in the planning and design process.

- E. Considerations when identified climate risks and historical concerns are not fully addressed
- F. Additional analysis and data related to climate adaptation and this application
- G. Where a reasonable effort to identify climate risks was made and no climate risks to the proposed action are identified, no further discussion may be necessary.

Step 3: Tracking and Monitoring

Once the framework is established, utilities will provide an annual report summarizing, at minimum, how this framework was integrated into applicable filings during the annual reporting period. This report should include the number of applications or filings made to the CPUC for which the IOU reported information pursuant to this framework, how many of those applications or filings implicated each of the five policy areas, usage hazard and risk assessments used in reporting as part of the application or filing, and a summary of climate adaptation actions proposed by the utility or authorized by the Commission. The reporting submission date will be May 15 for the preceding 12-month period beginning on April 3 and ending on April 2.

The report shall identify:

- The number of applications or filings filed during that reporting period,
- Number of reports that report no climate change risks identified
- The applications or filings to which this policy applies,
- The applications or filings the IOU identified no climate risk,
- The applications or filings in which the IOU addressed all identified climate risks without modifications or additions ordered by the Commission in its approval to how climate risks were addressed, and
- A narrative summary explanation of each of the climate risks that the IOU identified but that the Commission determined required modifications or additions to the application or filing to how those climate risks were addressed prior to approval .

The CPUC will develop reporting tools to facilitate standardized reporting.

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Materials from April 17, 2025, Workshop

R.18-04-019: Workshop on Climate Adaptation and General Orders

April 17, 2025



California Public
Utilities Commission

Welcome and Opening Remarks

Commissioner Darcie L. Houck

Agenda

Topic	Speaker	Time
I. Welcome and Opening Remarks	Commissioner Houck	9:00 to 9:15 a.m.
II. Background and Purpose	Junaid Rahman (CPUC)	9:15 to 9:20 a.m.
III. California Climate Adaptation Landscape	Sara Moore (CPUC)	9:20 to 9:30 a.m.
IV. OEIS Presentation on Climate Adaptation	Colin Lang (OEIS)	9:30 to 10:00 a.m.
V. General Order Analysis Findings and Thematic Categories	Britney Gaines (CPUC) Maria Jaya (CPUC)	10:00 to 10:45 a.m.
BREAK		10:45 to 11:00 a.m.
VI. Proposed Regulatory Approaches	Sara Karim (CPUC)	11:00 to 11:30 a.m.
VII. Panel on Climate Adaptation Policy	Moderator: Audrey Williams (CPUC)	11:30 a.m. to 12:30 p.m.
VIII. Open Discussion	All	12:30 to 12:40 p.m.
IX. Next Steps and Closing Remarks	Audrey Williams (CPUC)	12:40 to 12:50 p.m.

Virtual Housekeeping

- Workshop is structured to stimulate conversations and engage different perspectives
- Keep comments courteous, professional and respectful
- Reach out to IT if you experience technical issues

Logistics

- All attendees have been muted
- To ask questions, please use the Chat function
- Opportunity to unmute during open Q&A
- Reminder – please mute when finished
- Workshop will be recorded and posted to CPUC website

Opening Remarks

Commissioner Houck, California Public Utilities Commission

Background and Purpose

Junaid Rahman, Senior Regulatory Analyst, Safety Policy Division

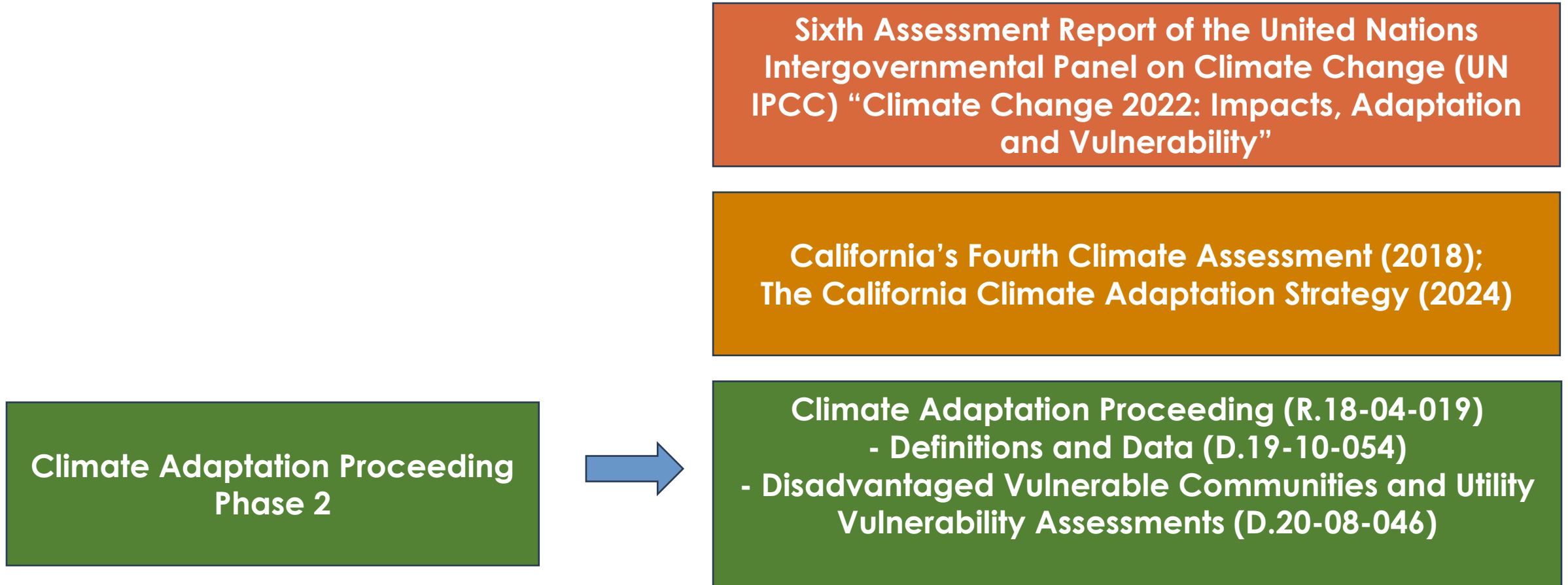
II. Background

- AB 111, passed in 2019, mandated review, as necessary... safety and regulatory requirements for electric facilities, along with recommendations related to climate change.
- The Phase 2 Scoping Memo (R.18-04-019, June 2, 2023) identified the need to update General Orders to better align with climate adaptation efforts.
 - The Safety Policy Division conducted a thorough review of the General Orders to assess and identify necessary modifications aimed at addressing climate adaptation.

CPUC Procedural History of R.18-04-019

- Order Initiating Rulemaking (R.18-04-019, May 7, 2018) was established to integrate climate change adaptation matters in relevant CPUC proceedings, safeguarding California's utility access against climate threats.
- The CPUC has issued two decisions in R.18-04-019 Phase 1 related to electric and gas utilities.
 - Decision on Definitions and Data (D.19-10-054, November 1, 2019)
 - Defines climate change adaptation for energy utilities in California:
"Climate change adaptation is adjustment in natural and human systems to a new or changing environment. Adaptation to climate change for energy utilities regulated by the Commission refers to adjustment in utility systems using strategic and data-driven consideration of actual or expected climatic impacts and stimuli or their effects on utility planning, facilities maintenance and construction, and communications, to maintain safe, reliable, affordable and resilient operations."
 - Decision on Disadvantaged Vulnerable Communities and Utility Vulnerability Assessments (D.20-08-046, September 3, 2020)
 - Established Community Engagement Plans and Climate Adaptation Vulnerability Assessments (CAVAs)

Alignment with International and California Climate Adaptation Efforts



Workshop Purpose

- This workshop will present findings from the Safety Policy Division's analysis of the CPUC's General Orders regarding R.18-04-019 Phase 2 Task 6.
 - Task 6 focuses on updating General Orders to incorporate climate adaptation measures.
- This workshop aims to engage experts to gather insights on three possible strategies SPD proposes to update the General Orders in line with climate adaptation requirements.
- We are seeking to adequately incorporate climate adaptation into energy utility processes to increase ratepayer safety, reliability, and resilience, while having positive or neutral impacts on ratepayer affordability.

Questions?

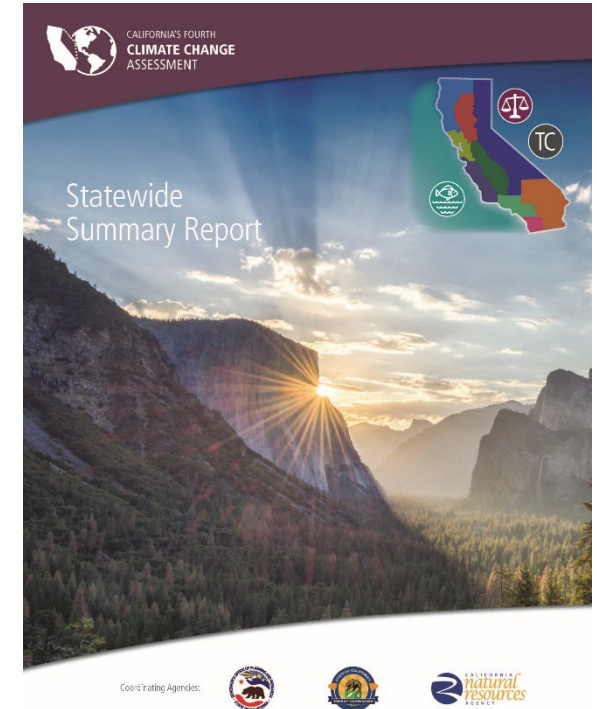


California Climate Adaptation Landscape

Sara Moore, Senior Regulatory Analyst, Safety Policy Division

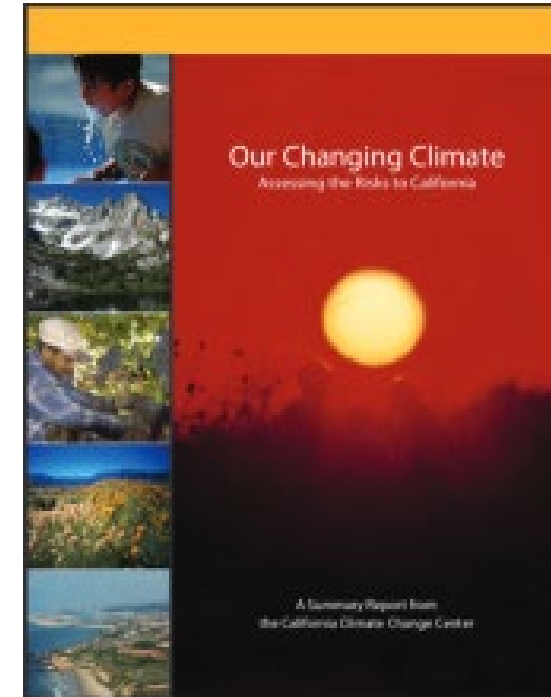
California Assessments and Strategy

- **California's Climate Change Assessment** (5-year cycle)
 - Interagency report (Natural Resources Agency, Energy Commission, Governor's Office of Land Use and Climate Innovation)
 - Conducted via the Integrated Climate Adaptation and Resiliency Program (ICARP)
 - 4th assessment released in 2018
 - 5th is underway and scheduled for 2026
 - Includes 9 regional reports
- **California Climate Adaptation Strategy** (3-year cycle)
links together the state's existing and planned climate adaptation efforts, showing how they fit together to achieve California's climate resilience priorities.



State Climate Adaptation – Highlights

Year	Effort
2005	State launched CA Climate Change Assessment “Our Changing Climate” (2006), downscales UN IPCC models, updated every 5 years
2008	State launched CA Climate Adaptation Strategy (2009), updated every 3 years
2009	Office of Environmental Health Hazard Assessment (OEHHA) launched the first “Indicators of Climate Change in California” report, updated every 3 years
2010	Ocean Protection Council issued State of California Sea-Level Rise Guidance, updated 2013, 2018, 2024
2011	Cal-Adapt.org launched, updated 2017 (Cal-Adapt 2.0)
2012	California Emergency Management Agency and California Natural Resources Agency (CNRA) launched the first California Adaptation Planning Guide, updated 2020 by California Governor’s Office of Emergency Services
2013	California Environmental Protection Agency and the California Department of Public Health launched Preparing California for Extreme Heat, updated 2022 by CNRA



Climate Adaptation Phase 2 (R.18-04-019)

- Phase 2 is outlined in the June 2023 Scoping Memo. Task 6 in the Scoping Memo describes possible updates to General Orders for climate adaptation.
 - “Should the Commission update any General Orders to ensure they appropriately reflect climate adaptation needs? If so, which General Orders merit consideration? What process should be used to update them?”
 - Safety Policy Division conducted an analysis of CPUC General Orders.



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Questions?



Office of Energy Infrastructure Safety (OEIS) Presentation

Colin Lang (OEIS)

AREAS TO CONSIDER FOR GENERAL ORDER MODIFICATION TO ADDRESS THE DYNAMIC RISK OF CLIMATE CHANGE AND TO MITIGATE WILDFIRE RISK

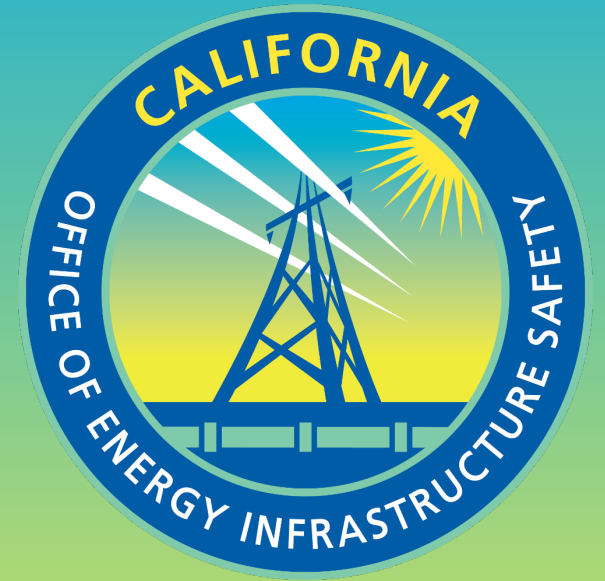
Pursuant to PUC 326(a)(7)

April 17, 2025



AGENDA

- Statutory Authority
- Wildfire Mitigation as Climate Mitigation
- Research and Inputs
- Areas to Consider for General Order Modification
- Conclusion



STATUTORY AUTHORITY

Public Utilities Code section 326(a)(7) authorizes the Office of Energy Infrastructure Safety to:

*...review, as necessary, in coordination with the California Wildfire Safety Advisory Board and necessary commission staff, **safety requirements** for electrical transmission and distribution infrastructure and infrastructure and equipment attached to that electrical infrastructure, and **provide recommendations to the commission to address the dynamic risk of climate change and to mitigate wildfire risk.***

WILDFIRE MITIGATION AS CLIMATE MITIGATION

- **Safety:** Reducing wildfire risk from utility infrastructure protects Californians and ecosystems from climate-enhanced wildfire disasters.
- **Reliability:** Wildfire mitigations, such as vegetation management and grid hardening, reduce outages.
- **Resilience:** Wildfire mitigations, including grid monitoring and weather forecasting allows utilities to anticipate risks from wind, heat, and other climate factors, and prepares utilities to proactively respond to/prepare for climate-enhanced disasters.

RESEARCH AND INPUTS

Energy Safety has considered the following inputs in its effort:

- WMPs, WMP evaluations, and WMP maturity surveys
- Assigned contractor baseline and recommendation reports – contract duration: June 2022 to December 2023
- Stakeholder feedback via workshop and written comments submitted post-workshop – workshop held July 13 & 14, 2023
- Wildfire Safety Advisory Board (WSAB) recommendations and policy papers – policy papers published February 2024



Areas to Consider for General Order Modification

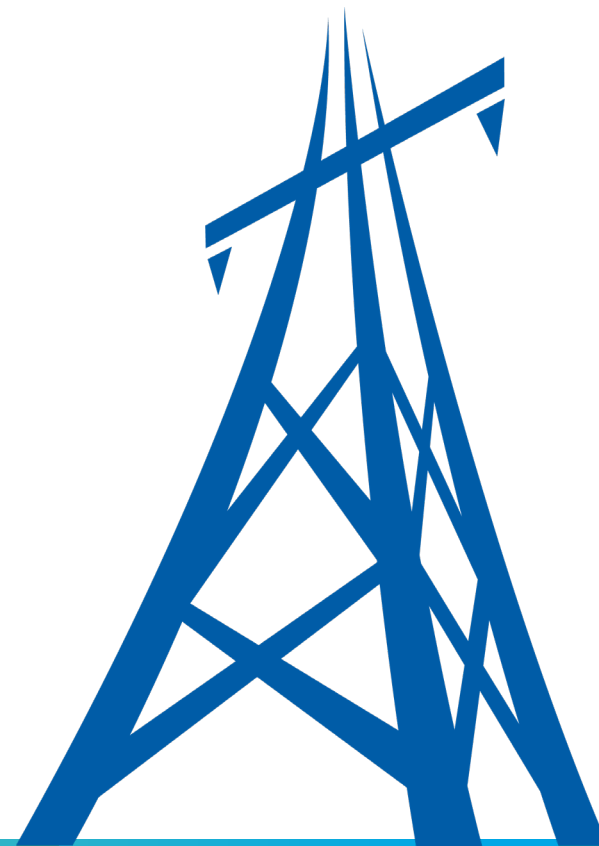
ASSET INVENTORIES

Asset inventories are necessary for:

- Recording of essential information about electrical assets.
- Facilitating evolution to component lifecycle management (and away from run to failure) through:
 - Proactive inspections and maintenance.
 - Timely identification and remediation of potential issues.

For Consideration:

- Establish General Order requirements for asset inventories that are digital, geospatial, and include standard attributes and nomenclature.



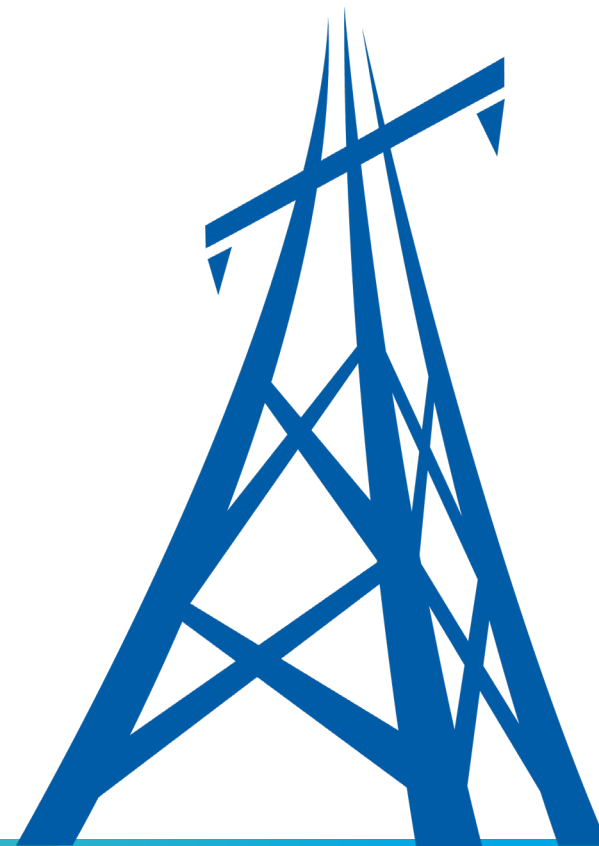
WEATHER STATIONS & DATA

Accurate weather data are necessary for:

- Forecasting weather indicative of high wildfire/climate risk
- Operationally responding to that weather (e.g., disable reclosers, initiate a PSPS, pause construction that may produce sparks).
- Improving risk modeling, risk prioritization, and decision-making for maintenance, operations, and construction (e.g., identify and prioritize circuits for system hardening investment, such as covered conductor and undergrounding).

For consideration:

- Establish General Order requirements for weather stations, including the capabilities of stations, placement of stations, maintenance of stations, data collection standards, and use of the data.

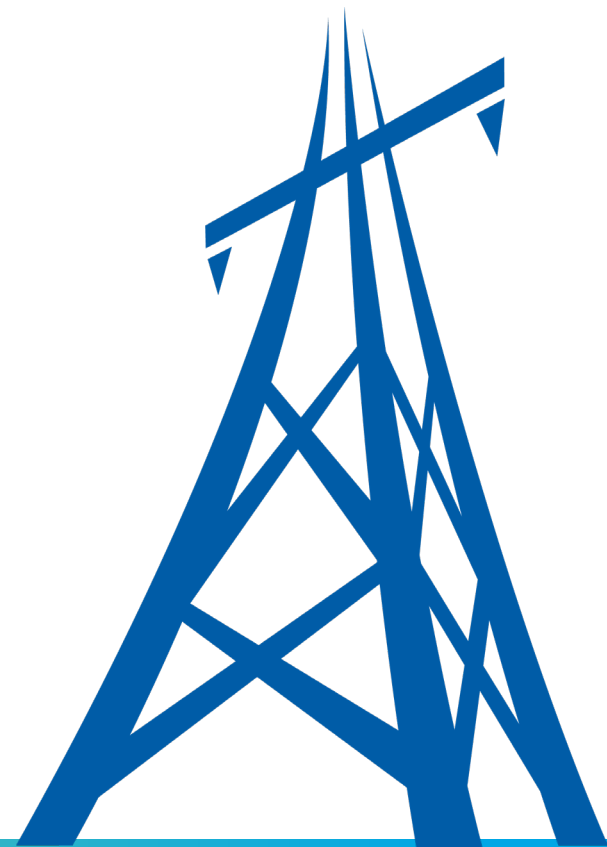


FUTURE CLIMATE CONDITIONS IN CONSTRUCTION STANDARDS

General Order 95, Rule 31.1 requires that design, construction, and maintenance be done in accordance with “known local conditions.”

For Consideration:

- Modify General Order 95 to require the consideration of climate change forecasts in design, construction, and maintenance.



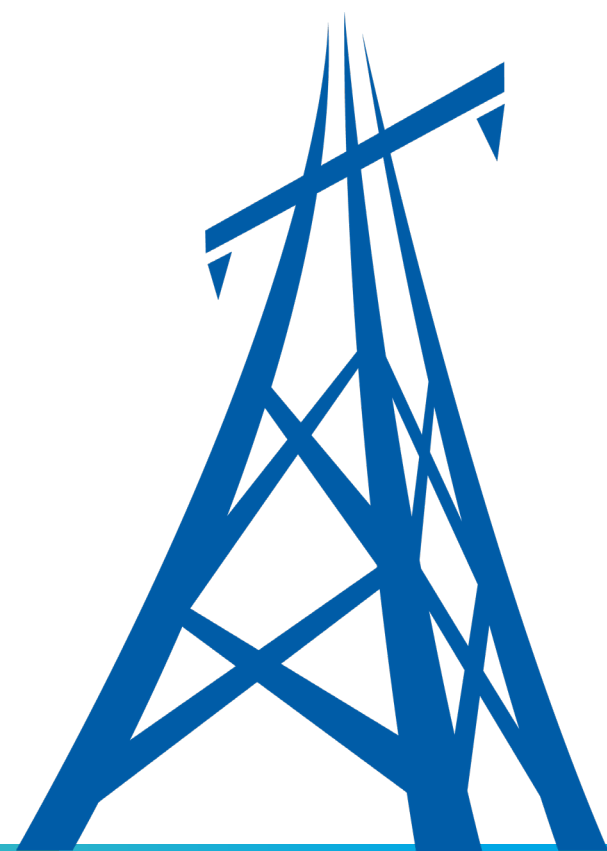
EXEMPT/NON-EXEMPT EQUIPMENT

Exempt equipment is designed and tested to limit arcs/sparks and/or expelling of hot material during operation.

Replacement non-exempt equipment would reduce the number of possible utility-related ignitions.

For Consideration:

- Modify General Order 95 to prohibit the installation of new non-exempt equipment in high wildfire risk areas.
 - Prioritize non-exempt equipment with a higher likelihood of ignition, such as fuses and lightning arrestors.
- Modify General Order 95 to require the proactive replacement of non-exempt equipment with exempt equipment in high wildfire risk areas.



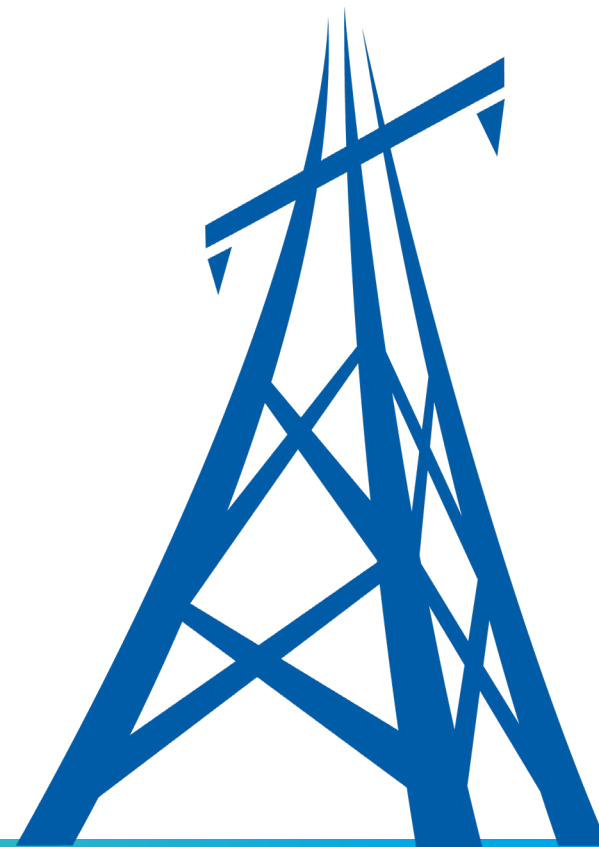
PRE-GO 95 EQUIPMENT

Equipment installed prior to the inception of and updates to GO 95 (pre-GO 95 equipment) may not necessarily meet the purpose of the rules to “secure safety... to the public...” and may pose a wildfire risk.

Aging equipment and infrastructure, including pre-GO 95 equipment, is associated with increasing wildfire risks.

For Consideration:

- Establish General Order requirements regarding the continued use of equipment predating General Order 95 and the conditions under which pre-GO 95 equipment should be replaced.



RISK-INFORMED INSPECTIONS

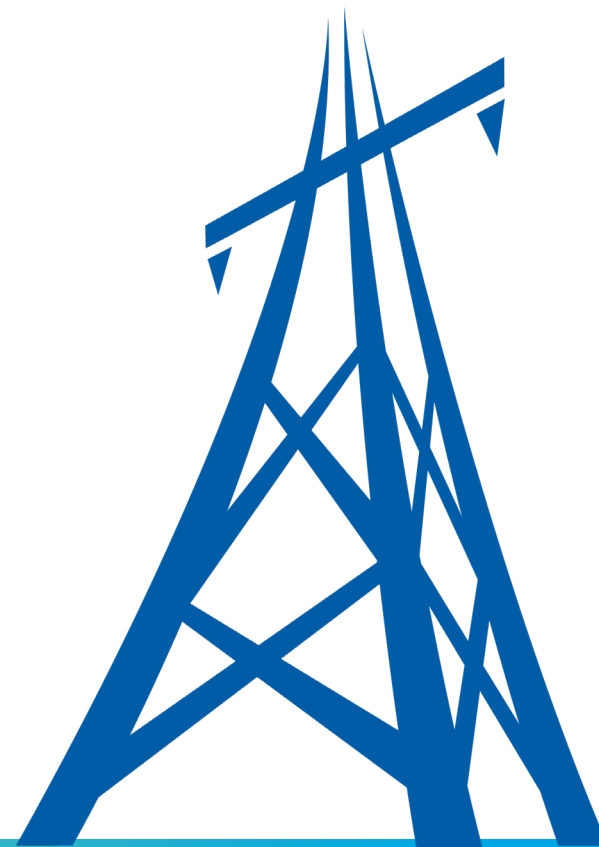
Certain electrical assets are more likely to cause an ignition.

Certain areas have a higher likelihood of ignition and consequence if an ignition occurs.

General Orders do not explicitly require the inspection of vegetation.

For Consideration:

- Modify General Order 165 to require risk-based, risk-prioritized inspections of assets and vegetation in high wildfire risk areas.



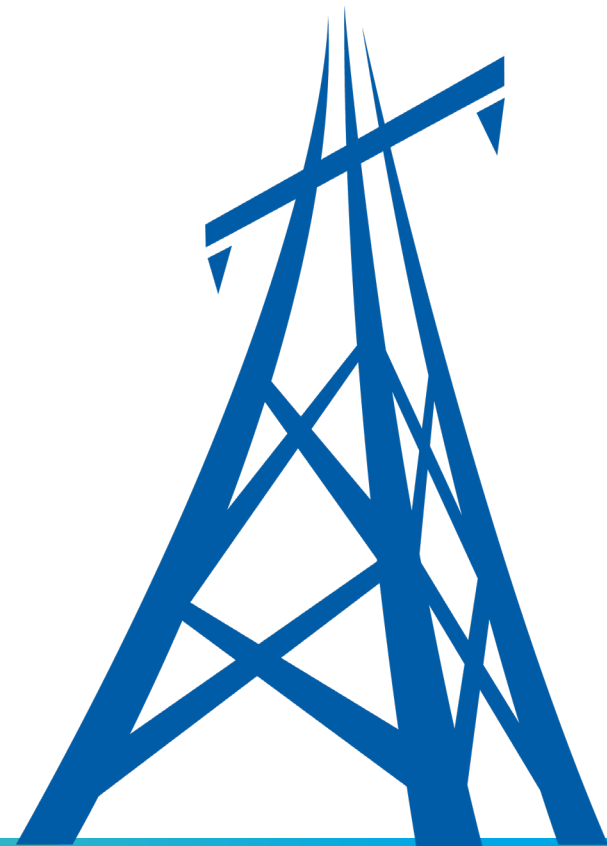
REMOTE MONITORING & OPERATING DEVICES

Remote devices can detect faults and other critical conditions and trigger automatic operations, like de-energization and the dispatch of resources.

- Reduce the likelihood of the fault causing an ignition.
- Decrease response time to critical conditions.

For consideration:

- Establish General Order requirements for the installation and maintenance of remote monitoring and operating devices.
- Modify General Order 95 to require lines in high wildfire risk areas be fitted with protective devices whose response times can be increased, and automatic reclosers that are capable of being remotely disabled.



ADOPTION OF ANSI STANDARDS

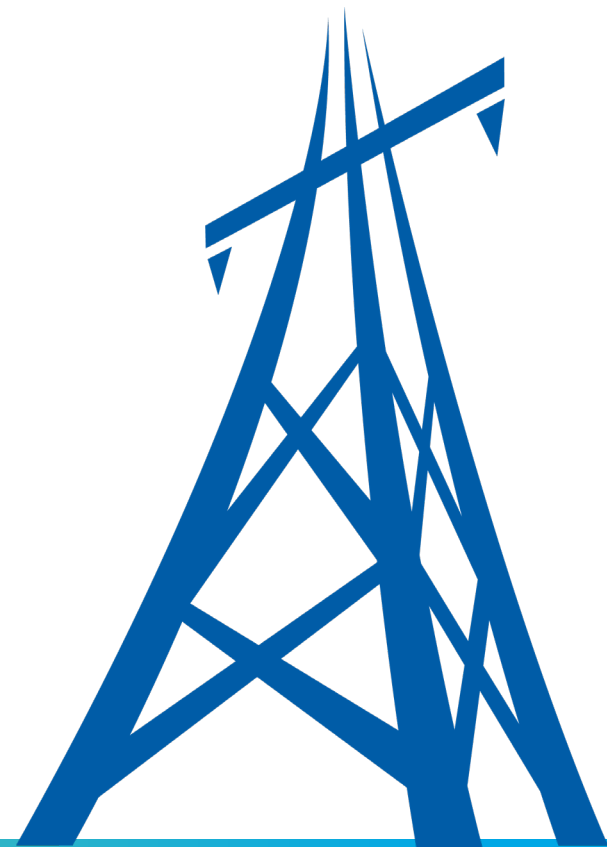
The American National Standards Institute (ANSI) A300 Tree Care standards provide standard practices and specifications for, amongst other things, the pruning of trees.

Adherence to ANSI A300 standards ensures the health of the tree and reduces the need for and expense of repeated pruning.

These industry standards are currently in use by all the electrical corporations.

For Consideration:

- Modify General Order 95, Rule 35 and Table 1, to align with ANSI A300 pruning standards.





Conclusion

Given the changing climate, we need to think differently about the minimum standards for how utilities design, construct, and maintain the grid.





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Questions?



General Order Analysis

Britney Gaines, Research Data Specialist, Safety Policy Division

General Order Analysis – Background

- **GO – General Order** ([CPUC Glossary](#)): A Public Utilities Commission order that sets standards, procedures, or guidelines applicable to a class of utilities, rather than a decision affecting just one utility.
- SPD conducted a comprehensive review of CPUC's 94 GOs to assess their ability to address utility infrastructure, construction, maintenance, and management in relation to climate adaptation.
- SPD identified GOs that fit within the scope of R.18-04-019 and could be modified to align with climate adaptation goals.
- Our analysis was grounded in the Fourth California Climate Assessment and Strategy.

California Climate Adaptation Strategy – Priorities



Priority
Strengthen Protections for Climate Vulnerable Communities



Priority
Bolster Public Health and Safety to Protect Against Increasing Climate Risks



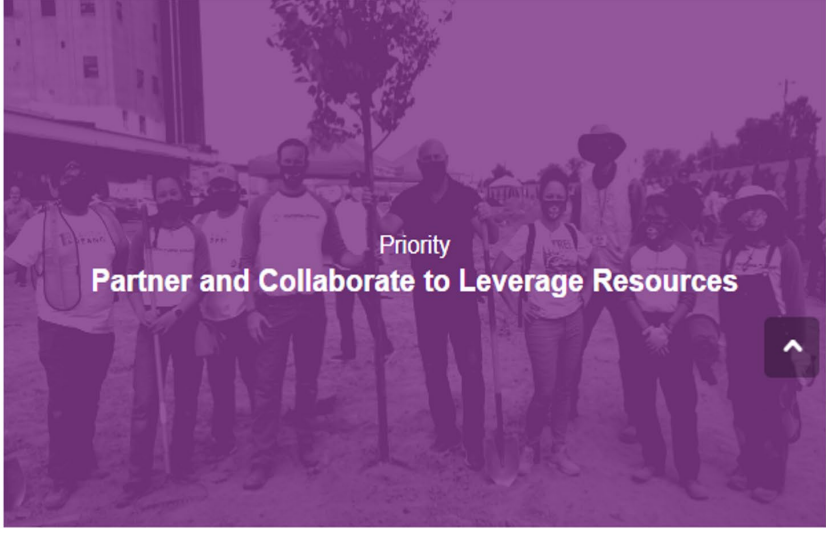
Priority
Build a Climate Resilient Economy



Priority
Accelerate Nature-Based Climate Solutions and Strengthen Climate Resilience of Natural Systems



Priority
Make Decisions Based on the Best Available Climate Science



Priority
Partner and Collaborate to Leverage Resources

GO Analysis – Explained

- SPD analyzed 94 CPUC GOs.
- The analysis objective was to assess the ability of GOs to address utility infrastructure, construction, maintenance, and management in relation to climate adaptation.
- The analysis used a 3-round process applying inclusion criteria to each GO:



First Round Screening – Criteria

- Identified GOs that target industries within R.18-04-019 scope and infrastructure that could incorporate consideration of a changing climate
- Excluded GOs with only ministerial or financial transactions purposes

Inclusion Criteria
Electric, Gas, Telecommunication
Safety, Reliability Standards
Operation, inspection, facilities maintenance
Assets (e.g, substations)
Utility planning, site selection process for infrastructure, construction
Hazard analysis, vulnerability analysis of services or system designs
Ratemaking for standard services that are not related to transportation industry
Communication including outreach to customers and the public, internal communication, and reporting to the CPUC

Exclusion Criteria
Rail including railroad, railway, train
Easement
Privacy
Financial transaction including fees, notes, interest, liability
Ministerial including record keeping or internal CPUC administration
Transportation, including carriers, ferries, and motor vehicles

First Round Screening – Outcome

- 16 GOs included

- 78 GOs Excluded

Inclusion Criteria	GOs Fitting Criteria *
Electric, Gas, Telecommunication	(16) 50, 52, 58-A, 58-B, 94-B, 95, 103-A, 112-F, 128, 159-A, 165, 166, 167-B, 171, 174, 177
Safety, Reliability Standards	(5) 58-A, 58-B, 103-A, 166, 167-B
Operation, inspection, facilities maintenance	(6) 52, 58-B, 94-B, 112-F, 165, 167-B
Assets (e.g, substations)	(1) 174
Utility planning, site selection process for infrastructure, construction	(7) 50-B, 52, 94-B, 95, 103-A, 112-F, 159-A
Hazard analysis, vulnerability analysis of services or system designs	(3) 94-B, 103-A, 112-F
Ratemaking for standard services that are not related to transportation industry	(2) 58-A, 103-A
Communication including outreach to customers and the public, internal communication, and reporting to the CPUC	(1) 177

Second Round Screening – Criteria and Outcome

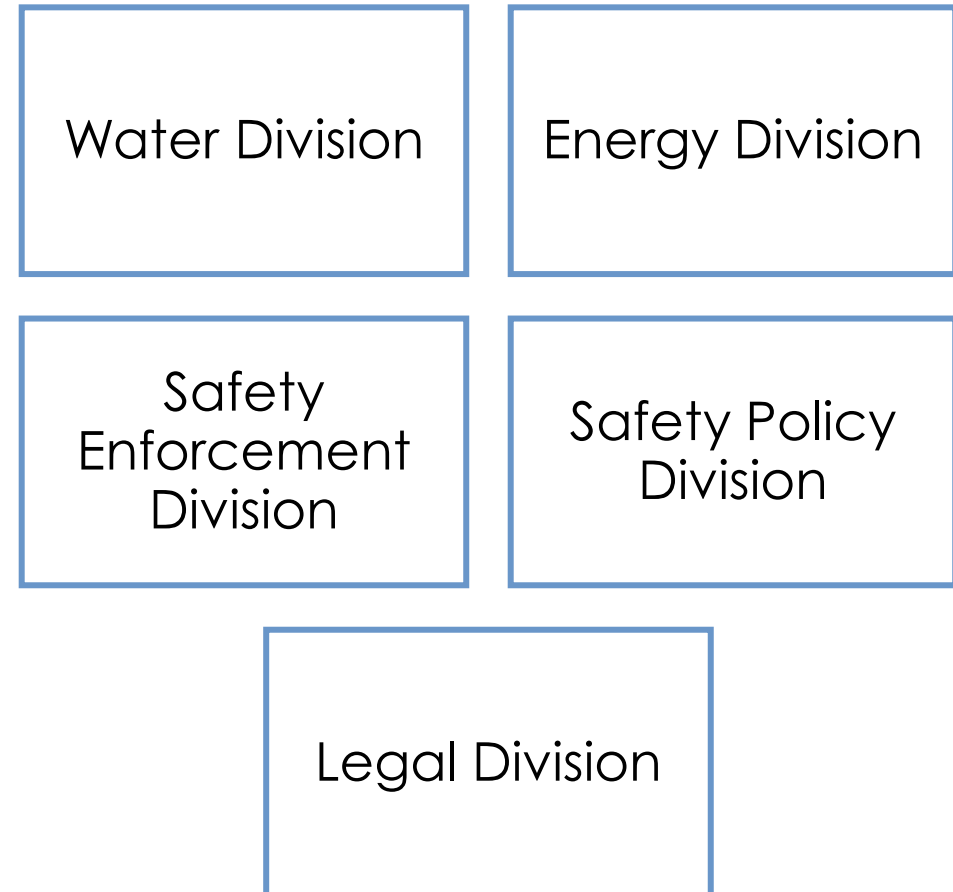
- 6 questions informed by the 6 State Climate Adaptation priorities, evaluating the 16 GOs selected from First Round
- 11 GOs fit the inclusion criteria for Second Round

Inclusion Questions	Number of GOs Fitting Inclusion Criteria
1. Can the GO be leveraged and/or modified to account for change in climate?	11
2. Are there sections of the GO that are connected to continuity of service failure?	8
3. Does the GO focus on the way generation, transmission, substations, or other facilities are designed, build, sited and operated?	10
4. Are there any opportunities for technological advancement in the GO to account for a change in climate?	2
5. Can the GO be leveraged and/or modified to touch on repetitive loss or repair of an infrastructure?	7
6. Is there some sort of hazard or vulnerability captured within the GO?	9

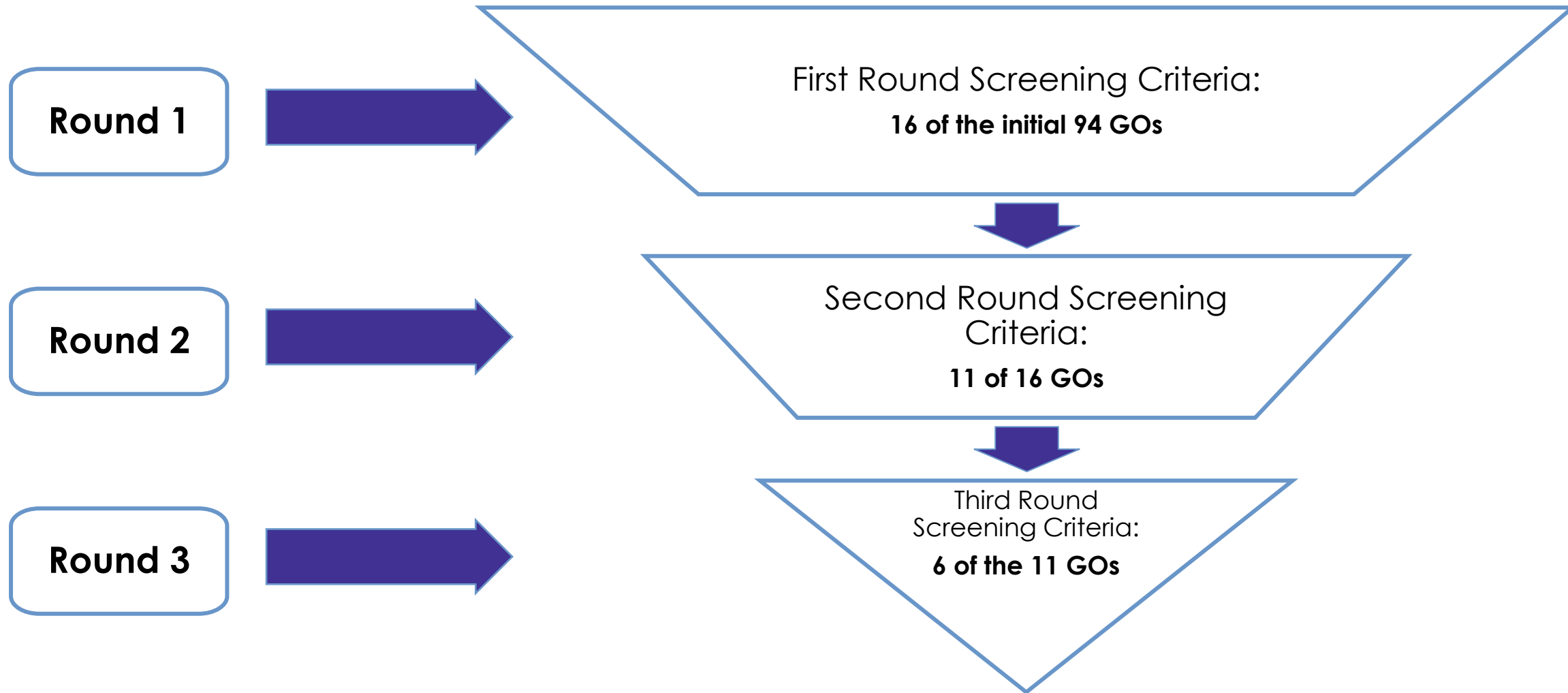
Third Round Screening – Criteria and Outcome

- SPD collaborated with subject matter experts across CPUC to review 11 GOs from the second round.
 - Review objective - to assess feasibility of GOs being altered to address climate adaptation priorities
- **5 GOs were excluded** because they could not be modified and/or already addressed climate adaptation requirements.
- **6 GOs were included** as they could feasibly be adjusted to address priorities and fit previous screening criteria.

Subject matter experts from CPUC's:



General Order Analysis – Screening Results



Analysis: Thematic Categories (1/2)

- Examined the final 6 GOs and derived common categories and crosscutting themes related to climate adaptation.
- Thematic categories could assist in defining lanes to help strategically approach modifications to General Orders.

Analysis: Thematic Categories (2/2)

1. Site Selection

- Requirements for selecting a site on energy projects

2. Construction

- Requirements for constructing a new energy infrastructure

3. Equipment Tolerance

- Requirements for equipment tolerance for climate adaptation

4. Repetitive Loss

- Requirements that relates to loss of infrastructures

5. Reporting Requirement

- Requirements for reporting to CPUC

6. Inspections

- Requirements on inspections and maintenance of infrastructures

7. System Failure

- Requirements on service disruptions or continuity of services

8. Reconstruction

- Requirements on damaged infrastructures

9. Processes

- Requirements on vulnerabilities through state and federal engagement

Questions?



Findings and Thematic Categories

Maria Jaya, Senior Regulatory Analyst, Safety Policy Division

Introduction to Findings and Thematic Categories

- To address climate change, we may need to modify these GOs to enhance resilience, minimize disruptions, and protect communities.
- Thematic categories for climate adaptation could facilitate a structured policy modification.
 - Climate adaptation thematic categories cross-cut multiple GOs, highlighting common regulatory themes across infrastructure type.

Findings of GO Analysis

- SPD identified 6 GOs that could be modified to address climate adaptation for energy utilities.

GO 95:
Overhead
Electric Line
Construction

GO 128:
Rules for
Underground
Electric
Supply and
Communicati
on Systems

GO 165:
Inspection
Cycles for
Electric
Distribution
Facilities

GO 166:
Standards for
Operation,
Reliability,
and Safety
During
Emergencies
and Disasters

GO 167-B:
Enforcement
of
Maintenance
and
Operation
Standards for
Electric
Generating
Facilities

GO 174:
Rules for
Electric Utility
Substations

Nine Thematic Categories

1. Site Selection

- Requirements for selecting a site on energy projects

2. Construction

- Requirements for constructing a new energy infrastructure

3. Equipment Tolerance

- Requirements for equipment tolerance for climate adaptation

4. Repetitive Loss

- Requirements that relates to loss of infrastructures

5. Reporting Requirement

- Requirements for reporting to CPUC

6. Inspections

- Requirements on inspections and maintenance of infrastructures

7. System Failure

- Requirements on service disruptions or continuity of services

8. Reconstruction

- Requirements on damaged infrastructures

9. Processes

- Requirements on vulnerabilities through state and federal engagement

Thematic Categories and GO Findings

- The 9 thematic categories for climate adaptation cut across these GOs

	GO 95	GO 128	GO 165	GO 166	GO 167-B	GO 174
1. Site Selection	X	X				X
2. Construction	X	X				X
3. Equipment Tolerance	X	X		X	X	X
4. Repetitive Loss	X				X	
5. Reporting Requirement	X		X	X	X	X
6. Inspections	X	X	X		X	X
7. System Failure Data	X	X			X	
8. Reconstruction	X	X			X	
9. Processes		X	X	X	X	

Examples of Organizing by Thematic Categories

- Impacts to **site selection** for infrastructure (e.g., GO 95, GO 128, and GO 174)
- Scope or frequency of **inspections** by utilities could be modified to better monitor current and future climate change impacts (e.g., GO 128, GO 165, and GO 174)
- **Mandatory reporting** could be modified to capture the role of climate change impacts in outages or system failures (e.g., GO 128 and GO 166)
- Standards for how infrastructure is **designed and constructed** (e.g., GO 95, GO 128, and GO 174)

Questions?



Break

Return at 10:20 AM

Proposed Regulatory Approaches

Sara Karim, Regulatory Analyst, Safety Policy Division

Considerations for Courses of Action

- Support resilience
 - Guide future rulemaking
 - Consistent and complementary
- Minimize Damage
 - System failures
 - Major outages
 - Climate hazards
- Affordability for ratepayers

Courses of Action

1. Update individual General Orders through separate proceedings or one larger proceeding with multiple tracks and phases.
2. Establish standards and rules for climate adaptation through a General Order.
3. Establish standards and rules for climate adaptation through a CPUC Decision using thematic categories.

Course of Action 1 – Update Individual General Orders

Update individual General Orders through separate proceedings or one larger proceeding

- The CPUC could update existing GOs with climate adaptation requirements
- Example text from one General Order: Present language of GO 128 Rule 17.1 Design, Construction, and Maintenance:
 - Electrical supply and communication systems shall be designed, constructed, and maintained for their intended use, regarding the conditions under which they are to be operated, to enable the furnishing of safe, proper, and adequate service
 - For all particulars not specified in these rules, design, construction, and maintenance should be done in accordance with accepted good practice for the given local conditions known at the time by those responsible for the design, construction, or maintenance of [the] communication or supply lines and equipment

Pros and Cons

Course 1: Update Individual General Orders

Pros	Cons
• Addressing General Orders individually allows for a tailored modification to address climate adaptation. • Individual decisions may be amended through the Petition for Modifications process or fully replaced by new decisions.	• Will require individual proceedings for each identified General Order or one large proceeding with multiple tracks and phases. • This may make future maintenance and modifications of decisions more complex.

Course of Action 2 – Proposed Climate Adaptation General Order

Establish standards and rules for climate adaptation through a General Order using thematic categories

For example:

- Integrate climate change considerations into infrastructure development and maintenance, which would be organized by the nine thematic categories
- Integrate climate hazard projections in the site selection of electrical infrastructure
- Require Electrical IOUs to provide reports on projects that are organized by the nine thematic categories (short to medium term)
- Establish a working group that will meet monthly to share best practices in these areas

Pros and Cons

Course 2: Climate Adaptation General Order

Pros	Cons
• General Orders can create an umbrella over certain topics • Centralize and provide a foundation for coordination of future modification of climate adaptation rules and standards	• General Orders may require more coordination to modify than individual decisions • Creating a general order can take a long time versus a decision

Course of Action 3 – CPUC Decision Establishing Standards and Rules

Establish standards and rules for climate adaptation through a CPUC Decision using thematic categories

- Involve creating some encompassing climate adaptation documents through the current proceeding
- Would not directly modify any GO
- Could achieve similar ends as examples given for creating a new GO

Pros and Cons

Course 3: Climate Adaptation Decision

Pros	Cons
• Decisions are more flexible and easier to change to respond to new science and environments. • Decisions can be more targeted and specific.	• Flexibility may not be a goal we want to achieve. • Decisions are less centralized than General Orders, to enable future modification • This may make future maintenance and modifications of decisions more complex.

Questions?



Panel on Climate Adaptation Policy

Audrey Williams, Program & Project Supervisor, Safety Policy Division

Questions

- Introduction
 - Name, title, organization
 - Reaction to presented analysis

Questions

- How is climate change adaptation currently incorporated into energy utility planning processes in the short-, medium-, and long-term?
- What are the gaps in climate change adaptation within the energy utility planning processes, if any, in the short-, medium-, and long-term?
- What, if anything, can be done to help improve the resiliency of California's electric infrastructure to climate hazards, including coastal flooding, inland flooding, storms, extreme heat, and drought?

Questions

- How can General Orders be modified to adequately incorporate climate adaptation considerations into energy utility planning processes to improve:
 - ratepayer safety
 - reliability
 - resilience
- How can we do this while maintaining positive or neutral impacts on ratepayer affordability?
- Are there suggestions on ways to organize the discussed approaches? (ie GO vs. thematic category)

Open Discussion

Next Steps and Closing Remarks

Audrey Williams, Program & Project Supervisor, Safety Policy Division

Building the Evidentiary Record

- Follow up ruling will be issued with questions for parties on this proposal.
- The recording for this workshop will be posted to our website.



California Public Utilities Commission

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