APPENDIX A

R.18-04-019 Climate Change Adaptation Order Instituting Rulemaking

Topic 4: Vulnerable and Disadvantaged Communities Staff Proposal

May 15, 2019

Introduction

The Scoping Memo for Topic 4 of the Climate Change Adaptation OIR (R.18-04-019) contains three guiding questions:

1. What is an appropriate definition of vulnerable and disadvantaged communities in the context of climate adaptation? What are the special needs of these communities that should be addressed?
2. How should utilities and the Commission include these communities in their efforts to identify and prioritize climate adaptation investments?
3. How should investments and other activities benefitting these communities in the contextof climate change impacts be identified and prioritized?

Staff issued a proposal on the definition of vulnerable and disadvantaged communities in the context of climate adaptation on March 13, 2019. A working group meeting was held on March 25, 2019 to discuss the proposal.

This staff proposal addresses questions 2 and 3 raised in the Scoping Memo. To address the second question of how to include communities in effort to identify and prioritize climate adaptation investments, staff proposes principles for engaging with these communities. To address the third question of how investments should be identified and prioritized, staff proposes a process for identifying how potential vulnerabilities to the system caused by climate change could impact local communities. The analysis in that assessment would then be used to identify and prioritize investments benefitting vulnerable and disadvantaged communities.

Throughout this staff proposal the terms “vulnerable” and “disadvantaged” communities will be used with the understanding that they will be formally defined in the decision for this proceeding.

Principles for Community Engagement on Investment Decisions

This section of the staff proposal focuses on guiding principles for community engagement and stakeholders are encouraged to bring specific ideas for including vulnerable and disadvantaged communities to the working group meeting on May 21, 2019.

The Commission has been prioritizing community engagement as a key aspect to the Investor Owned Utilities’ (IOUs’) overall planning processes. Rather than propose a prescriptive process for engagement, staff proposes principles to guide the IOU outreach, while allowing for both flexibility and innovation in the process, recognizing that each community and situation is unique. Staff proposes the following principles for utilities to follow when conducting community outreach and working with vulnerable and disadvantaged communities on the issue of climate change adaptation:

- Build enough time into the vulnerability assessment process (as described in the following section) to allow for community engagement and partnership.

- Develop and maintain partnerships with vulnerable and disadvantaged communities and their representative organizations across the IOU's service territory. Examples of potential partners include, but should not be limited to:
    - Culturally specific community-based organizations and networks
    - Faith-based organizations
    - Local governments
    - Parent-teacher associations
    - Public health providers
    - Schools
- The Commission and IOUs should work with communities to build community capacity to participate in Commission processes and create long-term relationships with community groups. Specifically, we look to strengthen skills, knowledge, relationships, and power of communities to participate in decision-making processes related to climate adaptation.
- The Commission and IOUs should work with communities to maximize communitymember participation through meeting logistics and planning
    - Meetings times should be convenient for working people and located in spaces that are centrally located and accessible via public transit. Meetings should also allow for remote participation.
    - Meeting information and outreach materials should be translated into languages spoken by community members in that area. Additionally, translation services should be made available and advertised, when appropriate.
- The Commission and IOUs should build on the best practices for community engagement that they and other organizations have identified and implemented. Similarly, the IOUs should collaborate, when appropriate, with existing efforts at the CPUC and in State government. Existing efforts include the Disadvantaged Communities Advisory Group[1] and the Telecommunications Education and Assistance in Multiple-Languages (TEAM) andCommunity Help and Awareness of Natural Gas and Electric Services (CHANGES) programs.[2]
- IOUs can consider how best to connect community members with appropriate agencies to address requests for adaptation investments/activities that are not within the IOU's jurisdiction.

[1] Established jointly with the California Energy Commission, the DACAG advises both the CEC and CPUC on how programs can effectively reach and benefit communities burdened by pollution and socio-economic challenges, including rural and tribal communities. Program areas include renewable energy, energy efficiency, and transportation electrification. The DACAG has named the Climate Adaptation OIR as one of its priority proceedings and can potentially serve as a partner to the IOUs as they seek to evaluate the impacts of climate change with respect to the utility system on vulnerable and disadvantaged communities.

[2] TEAM and CHANGES programs operated by the CPUC help Limited English Proficient customers with telecommunications issues and energy issues, respectively. TEAM and CHANGES maintains a Community Based Organization roster and directs individuals to contact those CBOs. http://www.cpuc.ca.gov/team_and_changes/

Discussion Questions

- Are there additional principles for community engagement that you think should beincluded?
- The IOU planning processes and regulatory proceedings are numerous and complex. If communities and IOUs are to work together, is education about IOU planning and regulatory process needed? If so, what might that looklike?
- Where would community input be most helpful for the IOUs?
- Where do community groups and community representatives feel they could be supportiveof IOU efforts to create more resilientcommunities?
- How should the Commission evaluate the IOUs efforts to engage with vulnerable and disadvantaged communities? Would specific metrics be a useful evaluation tool, and if so, what metrics are needed (number and location of meetings, number of participants, qualitative feedback from community members)?

Identifying Adaptation Investment and Activities benefitting Vulnerable and Disadvantaged Communities

Part 1: Assessment of Impacts to Vulnerable and Disadvantaged Communities

In order for Investor Owned Utilities (IOUs) to fully understand the risks from climate change in their service territories, they need to understand not only what impact the changes in climate will have to their assets and operations, but also how those impacts to the assets will directly and indirectly impact their customers.

As part of their membership in the U.S. Department of Energy's Climate Resilience Partnership, California's large IOUs[3] all conducted Climate Change Vulnerability Assessments. In these reports, which were completed in November 2016, each IOU assessed the climate impacts their region anticipated and then evaluated how various critical assets might be affected. PG&E for example, found that with 24 inches of sea level rise, 4 substations in the San Francisco Bay Area would be negatively impacted. However, the assessment did not address which customers and communities would be impacted if a major utility asset such as a substation was compromised. The report did not characterize the risk in terms of its scale or scope from a low-impact minimum disruption to a high-impact unacceptable risk. More relevant to this Topic 4 discussion, the report did not characterize the climate risk in terms of who is affected and did not assess the vulnerability and adaptive capacity of the people and places affected.

In its report, *Planning and Investing For A Resilient California*[4], the Governor's Office of Planning and Research also recommends that planners consider assessing the nature of a climate-related disruption on the community: is it a temporary impairment, a future-options-limiting impairment, or a permanent and irreversible harm?

Staff recommends that the utilities do an assessment to understand the risks as they relate specifically to vulnerable and disadvantaged communities in their territories. Detailed data about a how autility's

[3] Pacific Gas and Electric, San Diego Gas & Electric, Southern California Edison.
[4] Planning and Investing for a Resilient California: A Guidebook for State Agencies. http://opr.ca.gov/docs/20180313-Building_a_Resilient_CA.pdf

vulnerabilities to climate change will impact the vulnerable and disadvantaged communities are necessary. This kind of information is crucial in order to identify and prioritize investments benefiting those communities. Staff proposes that this analysis be incorporated into the "decision-making framework" that will be discussed in Topic 5 of this proceeding.

Utility vulnerability assessments should be consistent with the current state of practice established through the IPCC assessment processes. The current 2014 IPCC *Impacts, Adaptation, and Vulnerability Report* (Working Group II), frames risk as the result of interactions between a hazard, exposure and vulnerability.[5] IPCC 2014 goes on to further frame vulnerability as encompassing sensitivity and adaptive capacity. Because vulnerability is a "result of diverse historical, social, economic, political, cultural, institutional, natural resource, and environmental conditions and processes" it is important that utility efforts to identify vulnerable communities in an adaptation context include both physical utility-owned assets and also the characteristics and contexts of their customer base.[6]

In conducting their 2016 vulnerability assessments, all three IOUs determined how and when climate impacts (e.g. sea level rise, temperature, precipitation) may affect utility assets. Each of the IOUs approached the effort differently, but overall, each took similar steps:

Step 1: Determine the total number of known assets in the IOU's service territory

Step 2: Identify current and future climate risks as related to those assets.

Step 3: Assess the sensitivity of those assets to climate impacts,

To meet the objectives of the OIR, staff proposes IOUs undertake additional analysis in their vulnerability assessments:

Step 4: Within the IOU's service territory, determine the location of disadvantaged and vulnerable communities that will be potentially affected by climate impacts to the utility's infrastructure

Step 5: Determine the location-specific vulnerabilities and adaptive capacity of disadvantaged and vulnerable communities that will be impacted by climate change impacts that will curtail utility service.

[5] https://www.ipcc.ch/report/ar5/wg2/

[6] Lavell, A., M. Oppenheimer, C. Diop, J. Hess, R. Lempert, J. Li, R. Muir-Wood, and S. Myeong, 2012: Climate change: newdimensions in disaster risk, exposure, vulnerability, and resilience. In: Managing the Risks of Extreme Events and Disasters toAdvance Climate Change Adaptation[Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J.Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. A Special Report of Working Groups I and II of theIntergovernmental Panel on Climate Change (IPCC). Cambridge University Press, Cambridge, UK, and New York, NY, USA,pp. 25-64. P.32 https://www.ipcc.ch/site/assets/uploads/2018/03/SREX-Chap1_FINAL-1.pdf

Step 6: Analyze the direct and indirect impacts on vulnerable and disadvantaged communities as a result of climate impacts on utility assets; understand options before, during, and after a climate impact event that can lessen the negative effects on the community.

There are a number of tools the IOUs can use to identify vulnerable communities. For example, the Governor's Office of Planning and Research's guidance[7] for evaluating adaptive capacity includes a suite of different data and process tools that can help inform a utility vulnerability assessment:

- Tools for Identifying Vulnerable Communities
    - CalEnviroScreen
    - Climate Change and Health Vulnerability Indicators for California
    - Health Places Index
    - Regional Opportunity Index
- Additional Process Guidance Tools
    - Executive Order B-30-15 Equity Checklist
    - Government Alliance on Race Racial Equity Toolkit
    - Bay Localize Community Resilience Toolkit

Coordination with Local Governments and Community Based Organizations

Utilities should meaningfully engage with vulnerable and disadvantaged communities to identify and understand their needs with respect to climate change adaptation. Given the scale of effort needed to support meaningful engagement, utilities will need to make the best use of resources and should leverage opportunities to coordinate on adaptation with existing outreach efforts.

Staff propose that the IOUs coordinate with local governments and community-based organizations when assessing the impacts on vulnerable and disadvantaged communities. In addition to outreach specific to the IOU's vulnerability assessment, there is an opportunity for the IOUs to work with local governments to incorporate any existing and ongoing local assessments into the utility's analysis. For example, Senate Bill 379 directs local governments to incorporate climate considerations into their general plans for the protection of the community from unreasonable risks associate with the effects of various geologic hazards, flooding, and wildland and urban fires. [8] Local governments can meet this requirement through several different options including 1) the safety element of their general plan, 2) by reference into their local hazard mitigation plan or other climate mitigation and adaptation plans.

Although the utilities' assessments will likely commence before local governments are required to complete the assessments required in SB 379 in 2022, the utilities should strive to incorporate local information into their vulnerability assessments when that information is available. For example, local governments and community-based organizations might have access to data about community vulnerabilities at a more granular level than what the utility has access to. This local data can be helpful to the utilities to determine the vulnerabilities of specific populations within their service territory.

Another opportunity for utilities to collaborate with local governments is around SB 1000, which requires many local governments to develop an environmental justice element of their General Plan. While the scope of these local government efforts may not entirely align with the needs of IOUs, they

[7] http://opr.ca.gov/docs/20180723-Vulnerable_Communities.pdf
[8] Senate Bill 379, Jackson. https://leginfo.legislature.ca.gov/faces/billTextClient.xhtml?bill_id=201520160SB379

provide opportunities for utilities and local governments to leverage resources and time to better coordinate on both engagement and assessment activities.

Staff proposes that the IOUs utilize their designated Environmental Justice and Tribal Outreach personnel to consult with individuals and entities as necessary. If existing outreach efforts are insufficient for engaging with vulnerable and disadvantaged communities, then the IOUs should conduct outreach to vulnerable and disadvantaged communities throughout their service territory, including environmental justice communities and tribes.

Submission Requirements

The utilities must submit their assessment of impacts to vulnerable and disadvantaged communities within 12 months of the Commission Decision in this proceeding and must update their assessment every 3 years.

The updated vulnerability assessment must report on the IOU's coordination with local governments, CBOs, and vulnerable and disadvantaged communities. The utilities shall report on the type of outreach, number of meetings and participants, and shall include summaries of comments and feedback received from local governments, CBOs, and vulnerable and disadvantaged communities.

Part 2: From Assessment to Planning

The assessment of impacts to vulnerable and disadvantaged communities allows the IOUs to plan for adaptation investments and activities with more complete information about where and to what extent communities will be negatively impacted by climate change. As the utilities develop plans for investing in adaptation activities specifically to address vulnerability, it may be beneficial to look to examples of how others outside of California are approaching community engagement. . The following Appendix includes examples of local jurisdictions are working on innovative community engagement tools and best practices.

Discussion Questions

- Are there any additional elements/categories that utilities should be required to include in their assessments of impacts to vulnerable and disadvantaged communities? (Steps 4-6 on p. 4-5)
- Should utilities conduct separate outreach for climate adaptation, or can the utilities combine outreach on adaptation with existing outreach activities?
- Who should the utilities work with in developing their vulnerability assessment? (Academics, local governments, community members?)
- Are there additional tools/data sources needed for identifying vulnerable communities?

Appendix: Additional Examples of Community Engagement

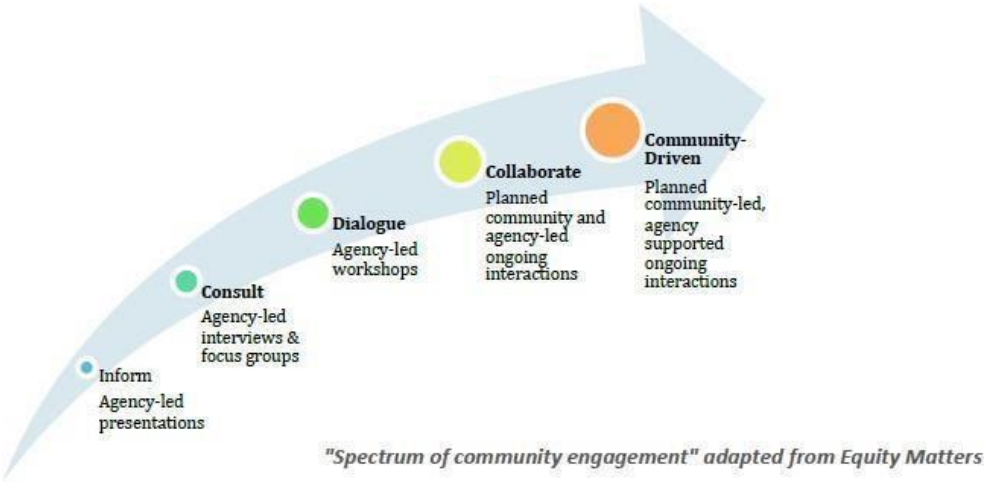
King County/City of Seattle: King County has developed a Community Engagement Guide, which includes an explanation of the "Continuum" of community engagement (from "inform" to "community directed"): https://www.kingcounty.gov/~/media/elected/executive/equity-social-justice/documents/CommunityEngagementGuideContinuum2011.ashx?la=en

Race and Social Justice initiative (RSJI): developed a Racial Equity Toolkit to Assess Policies, Initiatives, Programs, and Budget Issues.
https://www.seattle.gov/Documents/Departments/RSJI/RacialEquityToolkit_FINAL_August2012.pdf

The Toolkit includes specific guidance on identifying stakeholders and listening to communities of color. Ask the community: 1. What do we need to know about this issue? How will the policy, program, initiative or budget issue burden or benefit the community? 2. What factors produce or perpetuate racial inequity related to this issue? 3. What are ways to minimize any negative impacts (harm to communities of color, increased racial disparities, etc.) that may result? What opportunities exist for increasing racial equity?

Urban Sustainability Directors Network - collaborative project with Seattle and King County and the Puget Sound Clean Air Agency Case Study:
https://www.usdn.org/uploads/cms/documents/heat_sceanrio_racial_equity_evaluation_mini-report_-_final.pdf. This pilot project seeks to go beyond inclusive outreach and community engagement to "sharing power and decision-making responsibility" with community members.

- Community-driven planning process
- Community-centered outcome
- Identification of racially equitable planning tactics



Georgetown Climate Center developed a guide to community-centered engagement in D.C. and a report on Opportunities for Equitable Adaptation in Cities (developed in collaboration with the Urban

Sustainability Director's Network) https://www.georgetownclimate.org/files/report/GCC-Opportunities_for_Equitable_Adaptation-Feb_2017.pdf

- Long-term commitment to relationship building - institutionalized, not project-specific
- Hold meetings at convenient times for working people; include interpreters and notices in inclusive languages
- Partner with others: community-based organizations, community institutions, foundations
- Link climate polities with larger issues such as poverty, housing security, and racial equity. Linking other policies and activities with climate adaptation can improve economic and social resilience of residents.

City of Portland and Multnomah County 2015 Climate Action Plan https://www.portlandoregon.gov/bps/article/583501 Developed 9 equity considerations (on page 12 of the report) Disproportionate impacts, shared benefits, accessibility, engagement, capacity building, alignment and partnership, relationship building, economic opportunity and staff diversity, accountability.

- Portland Climate Action Plan Equity Considerations and implementation objectives[9]
  - Disproportionate Impacts
    - Does the proposed action generate burdens (including costs), either directly or indirectly, to communities of color or low-income populations? If yes, are there opportunities to mitigate these impacts?
  - Shared Benefits
    - Can the benefits of the proposed action be targeted in progressive ways to reduce historical or current disparities?
  - Accessibility
    - Are the benefits of the proposed action broadly accessible to households and businesses throughout the community — particularly communities of color, low-income populations, and minority, women and emerging small businesses?
  - Engagement
    - Does the proposed action engage and empower communities of color and low-income populations in a meaningful, authentic and culturally appropriate manner?
  - Capacity Building
    - Does the proposed action help build community capacity through funding, an expanded knowledge base or other resources?
  - Alignment and Partnership
    - Does the proposed action align with and support existing communities of color and low-income population priorities, creating an opportunity to leverage resources and build collaborative partnerships?
  - Relationship Building

[9] The integration of equity in the Portland/Multnomah County 2015 Climate Action Plan, July 12, 2016. https://www.portlandoregon.gov/bps/article/583501 p. 12

- Does the proposed action help foster the building of effective, long-term relationships and trust between diverse communities and local government?

APPENDIX B

R.18-04-019, Topic 5: Climate Change Adaptation Decision-Making Framework

Staff Proposal

Introduction

The California Public Utilities Commission (CPUC) opened the Climate Change Adaptation Order Instituting Rulemaking (R.18-04-019) on May 7, 2018, to discuss the impact of climate change on the investor-owned public utilities and consider adaptation strategies as a prudent next step to ensure safety and reliability. While Phase 1 will only address the larger electricity and natural gas utilities, the CPUC anticipates future phases to deal with other CPUC-jurisdictional industries as well as the smaller and multi-jurisdictional energy utilities. Phase 1 includes 5 key topics:

1. Definition of climate adaptation for utilities (addressed in Proposed Decision mailed on September 16, 2019, at time of writing);
2. Appropriate data sources, models, and tools for adaptation-related decision-making (addressed in Proposed Decision at time of writing);
3. Guidelines for utility climate adaptation assessment and planning (this topic is now subsumed in this proposal under Topic 5);
4. Identification and prioritization of actions to address the climate change related needs of vulnerable and disadvantages communities; and
5. Framework for climate-related decision-making and accountability (subject of this Staff Proposal).

The purpose of this proposal is to address Topic 5 of Phase 1, which requires the development of a framework for making climate-related decisions under a high degree of uncertainty, including a standard decision-making approach, additional reporting and accountability, and potential procedural venues.

The Scoping Memo included three guiding questions related to Topic 5:

1. How should the CPUC and utilities consider and apply climate risks to key utility functions (generation, transmission, distribution, storage) and major investments in long-life, climate-vulnerable assets?
2. What additional reporting by utilities is necessary to enable decision-making and accountability? Examples include a framework for the utilities to conduct climate vulnerability assessments, a framework for development of adaptation pathways, outcome magnitudes and probabilities, climate-related metrics, disadvantaged and vulnerable community impacts.
3. In what procedural venue, such as General Rate Cases or specific climate change adaptation applications, should climate change adaptation-related proposals be made?

Proposal Background and Assumptions

This staff proposal provides staff recommendations on how to address these Scoping Memo questions, as well as an overall climate change adaptation decision-making framework. Questions for stakeholders in response to staff's recommendations are provided at the end of the proposal.

This document builds on work already accomplished in this proceeding and adaptation work completed by other agencies

- **CPUC Proposed Decision on Climate Adaptation Definition and Source of Data**: On September 16, 2019, the CPUC issued a Proposed Decision on Phase 1 Topics 1 and 2[1] (Topics 1 and 2 PD) in this proceeding: a definition of climate change adaptation for California's energy utilities; identification of the California Fourth Climate Change Assessment[2] (Fourth Assessment) and any subsequent assessments as the primary source of climate forecasts, pathways, and scientific studies; and the criteria for any further data or models that energy utilities may develop to understand climate impacts. As stated in the Topics 1 and 2 PD, staff's thinking about the expert panel concept has evolved, which isalso addressed in this staff proposal. This staff proposal uses the guidance set out in the Topics 1 and 2 PD; any modifications in the final decision will be incorporated into this proposal or a proposed decision on this topic.

- **Working Group Draft Definition of Disadvantaged and Vulnerable Communities:** This staff proposal uses the phrase "disadvantaged and vulnerable communities." The working group on Topic 4 in this proceeding discussed a definition of disadvantaged communities as those that fall within the 25% highest scoring census tracts in CalEnviroScreen, with the possible addition of Tribal lands and census tractsinwhich median area household income is less than 80% of the area's household income. This staff proposal uses that as a working definition, and the content here does not rely on a final approved definition. "Vulnerable" in this context means a community that is particularly vulnerable to climate change impacts because of its location or topography; it may or may not be a disadvantaged community. This staff proposal also draws on the community engagement proposal raised in Topic 4.

- **California Department of Water Resources' Climate Change Vulnerability Assessment:** This staff proposal draws on the California Department of Water Resources' Climate Change Vulnerability Assessment[3] (DWR Vulnerability Assessment) as an example of a climate change impact analysis addressing a statewide agency's facilities, managedlands, operations, and staff activities.

[1] The proposed decision can be accessed at http://docs.cpuc.ca.gov/PublishedDocs/Efile/G000/M312/K462/312462925.PDF. The first opportunity the CPUC will have to vote on the proposal will be at the business meeting on October 24, 2019.

[2] See http://www.climateassessment.ca.gov/.

[3] Dept. of Water Resources, *CAP III Vulnerability Assessment.* February 2019. Accessible at https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/All-Programs/Climate-Change-Program/Climate-Action-Plan/Files/CAP-III-Vulnerability-Assessment.pdf.

Staff Responses to Scoping Memo Questions

Staff's proposed responses to each Scoping Memo question are summarized here:

1. **How should the CPUC and utilities consider and apply climate risks to key utility functions (generation, transmission, distribution, storage) and major investments in long-life, climate-vulnerable assets?**
    - Each utility[4] will research and develop a new form of risk assessment called a Vulnerability Assessment. Within the vulnerability assessment, the utility will examine the risks posed by climate change to their core lines of business, including generation, transmission, distribution, and storage, irrespective of who owns the assets. It will also examine risks to surrounding communities, particularly those most vulnerable to climate impacts. The information contained in the Vulnerability Assessment can be used to identify risks and proposed investments, actions or planning assumptions within the relevant CPUC proceedings for these purposes.

2. **What additional reporting by utilities is necessary to enable decision-making and accountability?**
    - Staff proposes that utility reporting needed to enable decision-making and accountability be accomplished within the proposed Vulnerability Assessments. The information and reporting elements that staff proposes to include in the vulnerability assessments are the use of climate change impact studies available within the Fourth Assessment, analysis of the impact of utility's infrastructure risks on vulnerable and disadvantaged communities, information resulting from engagement of communities vulnerable to climate change impacts, and the use of a time horizon that captures the effects of climate change. Staff recognizes that Vulnerability Assessments for climate change adaptation are a new type of analysis, and there are not yet established methodologies for this type of assessment. Thus, the type and scope of reporting and data needed for this analysis will need to be re-evaluated on an iterative basis.

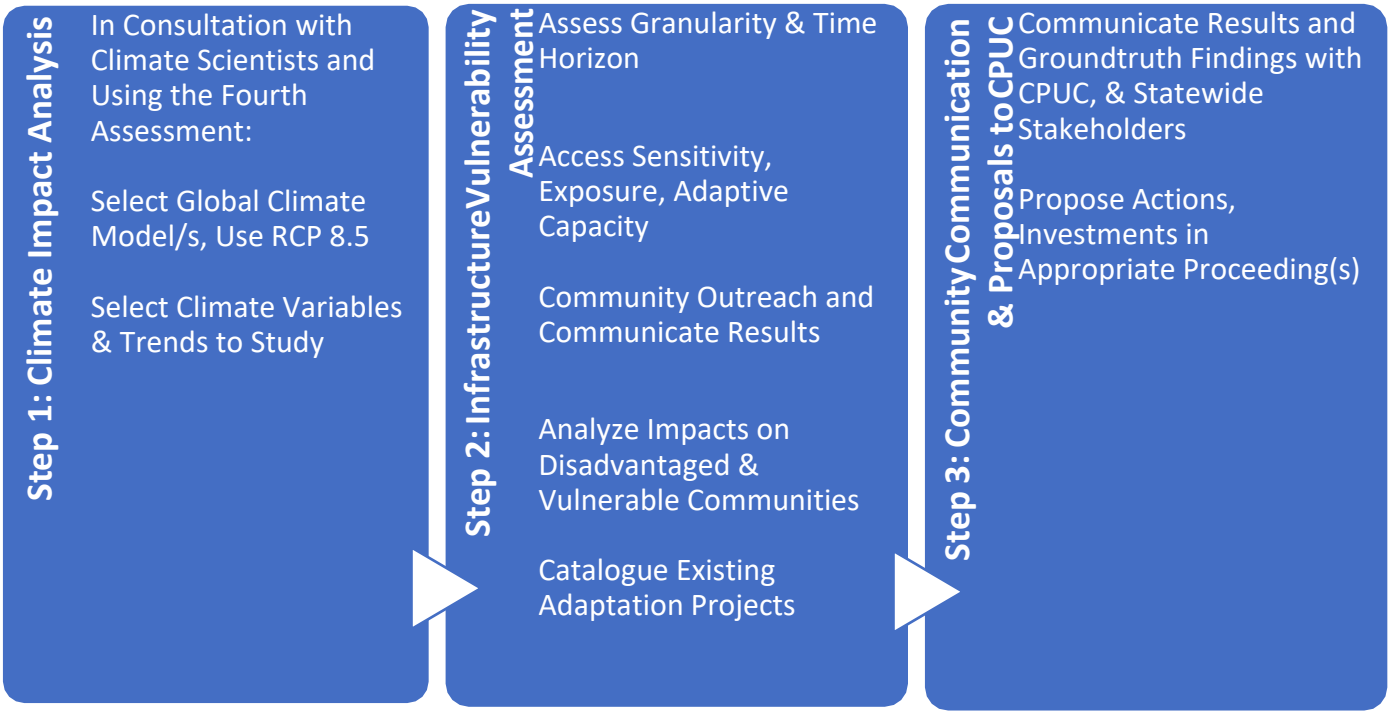
3. **In which procedural venue(s) should climate adaptation-related proposals be made?**
    - Climate change-driven risks and proposed investments to adapt to and plan for those risks could be considered in venues such as the Risk Assessment and Mitigation Phase (RAMP) proceedings, General Rate Case (GRC) cycles for each utility, and standalone applications.

[4] Utility respondents to this OIR include: PG&E, SCE, SDG&E, Southern California Gas Company, PacifiCorp, Liberty Utilities (CalPeco Electric) LLC, Bear Valley Electric Service, Southwest Gas, Alpine Natural Gas Operating Company, Lodi Gas Storage, Wild Goose Storage, Central Valley Storage, and Gill Ranch Storage.

Proposed Climate Change Adaptation Decision-Making Framework

Staff proposes to define "decision-making framework" in this context as the process by which utilities will use climate change vulnerability assessments to evaluate, prioritize, and propose climate change adaptation-informed investments to the CPUC.

The steps in the diagram are described in more detail below.



Step 1: Climate Impact Analysis

In this step, each utility will conduct an analysis of climate impacts within its respective service territory by drawing on the models and tools in the Fourth Assessment, as set out in the Topics 1 and 2 PD. The analytical steps in general are:

- **Select a Global Climate Model (GCM):** This means selecting a scientifically accepted model that can be used to project future climate conditions under different emissions trajectories. As set out in the Topics 1 and 2 PD, utilities will adhere to the 10 Global Climate Models used in the Fourth Assessment to simulate California's historical and projected temperatures, precipitation, and other climate impacts.

- **Study an Emissions Scenario:** Within the Fourth Assessment, emissions scenarios are presented by Representative Concentration Pathways (RCPs). An RCP represents a projected level of emissions given assumptions about policy, demographic, and economic futures. Consistent with the Topics 1 and 2 PD, utilities will use RCP 8.5 as identified in the Fourth Assessment, which is consistent with planning models being used by other state

agencies. RCP 8.5 is a business-as-usual scenario in which CO_2 concentration exceeds 900 ppm by 2100.

- **Select climate variables and trends:** In this step the utility will select the climate variables, such as temperature, sea level rise, wildfire, subsidence, and hydrologic changes, that will impact its infrastructure. As set out in the Topics 1 and 2 PD, utilities shall use the available studies in the Fourth Assessment, and will follow the CPUC's guidance on any original research that needs to be conducted about climate variables and trends more specific to a utility's infrastructure and service territory.

Working with Climate Scientists

Staff proposes that utilities each identify and contract with climate scientists as needed for these impact studies. While the Fourth Assessment offers tools and existing studies, it is possible that utilities will need a range of expert support on technical issues such as which GCM(s) to use, how to apply a GCM to their service territory, and how to further downscale a climate impact study to their service territory. Utilities would assess the gaps in their expertise and work with appropriate scientists, such as those who worked on studies within the Fourth Assessment or who are associated with the academic climate change community in California or other states.[5]

This idea replaces the statewide expert panel that was the subject of earlier discussion in this proceeding. Staff proposes that having scientists work directly with each utility will yield impact studies that are more accurate and relevant to a given service territory.

Step 2: Infrastructure Vulnerability Assessment and Community Engagement

To properly support a proposed climate change adaptation-driven investment request, each utility must conduct an infrastructure vulnerability assessment.

The S-MAP and RAMP vehicles created in recent years, which are now being implemented across GRCs for all energy utilities, have provided the CPUC and stakeholders with experience conducting utility-specific risk assessments. The climate change-informed vulnerability assessment staff proposes here has some similarities to and some differences from these other risk assessments. Significantly, this proposal posits analyzing utility infrastructure with a time horizon of 2050, representing a significantly longer term assessment than is typically considered in S-MAP, RAMP, or GRCs. In addition, there is a community engagement component to the vulnerability assessment that will require more time and resources to perform.

Staff proposes that the DWR Vulnerability Assessment can act as a model for methodology, scope, format, and terminology for the energy utilities. The DWR Vulnerability Assessment examines six climate change-driven trends on a mid-century time horizon: wildfire; extreme heat; sea-level rise; long-term persistent hydrologic changes; short-term, extreme hydrologic events; and habitat and

[5] In California, two examples are the UCLA Center for Climate Science (see https://www.ioes.ucla.edu/climate/), and the UC Berkeley California Institute for Energy and Environment (see https://vcresearch.berkeley.edu/research-unit/california-institute-energy-and-environment).

ecosystem services degradation. While the data and scientific studies used in the DWR Vulnerability Assessment were developed from 2013 to 2016 and thus predated the Fourth Assessment, DWR intends to use studies and data from future California assessments in any update of its own. Other major elements of the DWR Vulnerability Assessment that can serve as a model for the energy utilities include:

- **Assessment time horizon:** The DWR Vulnerability Assessment chose a mid-range time horizon of 2030-2070. Staff propose that the IOU vulnerability assessment evaluate to a time horizon of 2050 to align with the recommendations *Pierce et al.* provided for the Fourth Assessment.[6]

- **Assets included**: The DWR Vulnerability Assessment examined DWR-owned or -managed facilities, including the State Water Project, flood facilities, regional offices, and the Suisun Marsh facility, and thousands of acres of managed lands across California. Similarly, the energy utilities should evaluate their planned and presently owned, jointly-owned, or jointly-managed physical assets and staff activities. For electrical facilities, staff proposes that utilities evaluate to the individual substation level, and also evaluate climate change impacts on supply-chain assets and asset types (e.g., wood poles, steel poles, etc.) in geographic regions within their service territories where such generalization makes sense.

- ***Exposure, sensitivity, risk,* and *adaptive capacity* definitions and metrics**:
  - **Exposure** – "Spatial extent to which an increased degree of hazard overlaps with the resource under examination."
  - **Sensitivity** – "Susceptibility to harm of a facility, operations, or group of people when exposed to a climate hazard."
  - **Risk** – combination of exposure and sensitivity of an asset.
  - **Adaptive capacity**- "ability to cope or the flexibility to take adaptive measures, thus offsetting the risk and reducing vulnerability."[7]

- **Publicly available:** Similar to the DWR Vulnerability Assessment, the utilities' vulnerability assessment studies, methodology, results, and report will be publicly available.

Staff proposes some additional elements for the utility vulnerability assessments:

- **Outreach and coordination with the community:** Utilities should communicate and coordinate with the local and regional entities, such as cities, counties, planning agencies, and community-based organizations in their service territories, many of whom may be already engaging in climate change adaptation planning. As part of this outreach and coordination, utilities should be proactive in establishing partnerships with key organizations and entities that serve vulnerable populations and disadvantaged communities and ensure that residents themselves are directly consulted in understanding infrastructure vulnerabilities based on their lived experiences. The infrastructure vulnerability assessment results can form the basis

[6] Pierce et al. *Creating climate projections to support the 4th California Climate Assessment*, Scripps Institute of Oceanography, 13 June 2016. pg. 15

[7] California Department of Water Resources, *CAP III Vulnerability Assessment,* Page 24. Accessed at: https://water.ca.gov/-/media/DWR-Website/Web-Pages/Programs/All-Programs/Climate-Change-Program/Climate-Action-Plan/Files/CAP-III-Vulnerability-Assessment.pdf

for continued outreach to and communication with local communities, with an emphasis on communities identified as disadvantaged and/or vulnerable and located in an area with a high exposure to risk.

- **Disadvantaged and vulnerable community impact analysis:** Utilities should analyze the impacts of infrastructure or service failure on disadvantaged and vulnerable communities, and the geographical extent of the vulnerability. The assessments should address specific impacts these communities may face during a service interruption, including effects on medical equipment, drinking water, transportation, communication, and other elements of daily life. As discussed in Topic 4 staff proposal, "[d]etailed data about how a utility's vulnerabilities to climate change will impact the vulnerable and disadvantaged communities are necessary. This kind of information is crucial in order to identify and prioritize investments benefiting those communities."[8]

- **Existing adaptation and green infrastructure projects:** Utilities should seek to learn where any adaptation-informed and/or green infrastructure proposals have been planned or are in development. Utilities can catalogue any such projects and incorporate the potential adaptation benefits or adaptive capacity for utility infrastructure that may result from them.

Step 3: Investment or Action Based on Infrastructure Vulnerability Assessments

Goals

After completing a vulnerability assessment, the utility should evaluate the results to determine whether to propose actions and/or investments to the CPUC for approval. When the utility ultimately proposes actions or investments to the CPUC, it should:

- For adaptation action or investments in a high-risk area, describe the direct, meaningful, and likely benefits to disadvantaged and vulnerable communities that will be impacted. If the utility adaptation proposal is based on other factors, such as extreme risk, then the utility will describe why it made that choice.

- For other actions or investments, the utility will demonstrate the climate risk analysis conducted in the vulnerability assessment and how that analysis contributes to the prudency and reasonableness of the proposed action or investment is prudent.

New Concepts That May Flow from Vulnerability Assessments

Given the new elements of vulnerability assessments, such as the longer time horizon for climate risk assessment, community engagement, and connection to local and regional government adaptation efforts, it is possible that utilities will make proposals for planning, activities, or investments that incorporate new and different concepts:

[8] CPUC Staff, *Topic 4: Vulnerable and Disadvantaged Communities Staff Proposal*, 15 May 2019, page 4

- **Adaptive capacity:** The ability to cope and the flexibility to take adaptive measures is not specifically articulated in CPUC guidance for any of the below types of proceedings presently. Staff proposes that after utilities examine the adaptive capacity of their facilities and operations within the vulnerability assessments, they may use adaptive capacity as the foundation of a new justification factor for investment proposals.

- **Green infrastructure alternatives:** Staff proposes that the utilities evaluate green infrastructure alternatives. State policy leaders are proposing green infrastructure initiatives for their usefulness in reducing climate risks and protecting natural environments.[9] Examples include constructed wetlands as a buffer against sea level rise, and science-based forest management to address wildfire risk.

Venues

There are several venues where the results of the infrastructure vulnerability assessments can be incorporated into the CPUC's decision-making process. It also may be more procedurally efficient to create a new standalone proceeding, or incorporate certain elements into relevant existing proceedings. The outcome of the vulnerability assessment may dictate which procedural venue is most appropriate. Staff recognize that a piece-meal approach to climate adaptation proposals may lead to inefficiencies and difficulties in coordinating funding, and aim to ensure that climate adaptation investments are transparent and prudent.

In any proposal, the utility would bear the standard burden of proof of demonstrating the long-range planning assumptions used, alternatives examined, and measurable adaptation that would result from the proposed investment or action.

The CPUC has several existing and pending proceedings that relate to risk identification, assessment and mitigation:

Safety Model Assessment Proceeding (S-MAP): S-MAP is an umbrella proceeding that aims to make utility decision-making about safety risks more transparent, uniform, and quantitatively rigorous, and ultimately increase accountability for utility risk mitigation expenditure. Utilities are required to publicly present analysis about their top risks, seek input from interested parties and CPUC staff, and perform quantitative analysis to determine and compare risk reduction benefits from mitigation measures. The utilities submit annual reports on 26 safety performance metrics to measure achieved safety improvements. The S-MAP proceeding adopts minimum requirements for utility risk assessment models and presentation of model results in RAMP filings. The CPUC intends to initiate a new S-MAP rulemaking to consider additional issues associated with utility risk assessment frameworks and could consider specific requirements for reflecting climate risks and/or the results of vulnerability assessments in these frameworks.

[9] California Insurance Commissioner Ricardo Lara recently announced an initiative seeking to catalyze insurance company investment in natural infrastructure as a tool to mitigating risks posed by climate change in California. See https://www.insurance.ca.gov/0400-news/0100-press-releases/2019/release056-19.cfm.

Risk Assessment and Mitigation Phase (RAMP): Each major energy utility now starts a RAMP proceeding one year before the start of its GRC. The objective of the RAMP proceedings is to bring the risk assessment approach developed in S-MAP to bear on the investments proposed by the utility in its GRC. Each utility prepares a RAMP report, which includes preliminary risk mitigation proposals, and identifies the safety benefits of each mitigation measure. This is intended to ensure greater accountability and transparency in a utility's investment requests and allow stakeholders to identify the risks actually mitigated by the dollars spent. The CPUC's Safety and Enforcement Division reviews each RAMP report, and proposed mitigation actions are then incorporated into the utility's General Rate Case.

General Rate Cases: In these cases, utilities present their proposed investments and activities for a three-year period. CPUC staff and intervenors examine the proposals for impact on ratepayer bills, accuracy of cost forecasts, progress toward policy goals, and mitigation of safety risks, among other factors. While GRCs are the appropriate vehicle for many kinds of proposed investments, the three-year time horizon might be too short to accommodate adaptation-related investments whose justification may rely on a longer time horizon.

Standalone infrastructure applications: Even if climate change vulnerabilities are incorporated into the CPUC's risk assessment proceedings, the longer-term horizon of a vulnerability assessment means that a given infrastructure proposal may not fit well with the three-year horizon used for the RAMP process and the subsequent General Rate Case. A standalone application may be a more appropriate vehicle, in which the utility demonstrates the long-range planning assumptions used, alternatives examined, and adaptation that would result from the proposed investment or action. A standalone proceeding could also offer opportunities for incremental and total cost analysis with an eye towards additional transparency and insights.

IEPR: How should the Commission coordinate with the California Energy Commission (CEC)? Should any changes be made in the near term to how information is presented in the CEC's Integrated Energy Policy Report (IEPR) forecast?

Discussion Questions

- Please comment on the proposed climate change adaptation decision-making framework overall.
- Climate impact analysis
    - Please comment on the proposal for utilities to work with climate scientists as laid out in this proposal.
    - Are previously completed studies that examine impacts of climate change on California energy systems granular enough for IOUs to use in planning? Examples would include *Estimating Risk to California Energy Infrastructure from Projected Climate Change* (Sathaye, Dale, Larsen, & Fitts, 2012). Are there gaps in the Fourth Assessment that are known now?
- Infrastructure vulnerability assessment and community engagement
    - Is a time horizon range such as 2030-2070 feasible to examine?
    - Please comment on the appropriate level of infrastructure granularity the utilities should study for climate impacts.

- How long should a vulnerability assessment take to conduct, including the community engagement activity, and how frequently should it be updated orrefined?
- How can vulnerability assessment-driven infrastructure projects be executed while minimizing disruption to local communities?
- What are the elements of a more succinct first-round vulnerability assessment (e.g., examine asset classes only; use existing research and do not sponsor new/original research), and what are the pros/cons of this approach?
- Are the definitions of exposure, sensitivity, risk and adaptive capacity appropriate for California's energy utilities, or should they be modified? If yes, what modifications should be made and why?
- In what format should inputs and results data from the vulnerability assessments be produced, made public and stored? What forms of inputs and results data are most useful for community or local jurisdiction planning entities?
- Is the guidance complete on outreach and coordination with the community, and particularly disadvantaged and vulnerable communities? Should the utilities undertake deeper partnerships with organizations, and if yes, how should they determine which organizations?
- Is the guidance on disadvantaged and vulnerable community impact analysis complete?
- Are stakeholders aware of any existing adaptation and/or greeninfrastructure projects in certain communities?
- How should we assess whether utility costs to conduct theinfrastructure vulnerability assessments are reasonable?
- Is the guidance on continued outreach to communities that are disadvantaged and/or vulnerable complete?

- Results: Investment and/or action proposals
  - Are there any further elements unique to climate change adaptation that may be included in a utility proposal (aside from adaptive capacity and green infrastructure alternatives)?
  - Is the risk-assessment approach the correct framework to use to incorporate climate adaptation into CPUC proceedings, CPUC planning processes and utility infrastructure planning processes?
  - How can the CPUC ensure that climate change-driven risks and changes are systematically incorporated into its decision-making and planningprocesses?
  - Should the utilities prioritize or rank the climate change-driven risks identified inthe vulnerability assessments?
  - Which CPUC proceeding(s) may be appropriate procedural vehicles to considerthe results of climate change vulnerability assessments and any proposedinfrastructure investments or activities based on these results? Comment on the preliminary list above, and suggest other CPUC proceedings that might beappropriate.
  - How can a proposed investment that adapts infrastructure to the projected yet uncertain impacts of climate change over a 10-60 year time horizon be presentedand justified in a 3-year General Rate Case? Are there other assets subject to long planning horizons and lifespans subject to comparable levels of planning uncertainty we can learn from?