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BEFORE THE PUBLIC UTILITIES COMMISSION OF THE STATE OF CALIFORNIA

Order Instituting Rulemaking to
Consider Strategies and Guidance
for Climate Change Adaptation.

Rulemaking 18-04-019

DECISION ON PHASE 1 TOPICS 1 AND 2

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DECISION ON PHASE 1 TOPICS 1 and 2

Summary

This decision defines climate change adaptation for energy utilities in California; identifies the California Fourth Climate Assessment and any subsequent assessments as the primary source of climate forecasts, pathways, and scientific studies; and establishes the criteria for any further data or models that energy utilities may develop to understand climate impacts.

At its essence, climate change adaptation for California's investor-owned energy utilities focuses on incorporating the best available climate science into utility infrastructure and operational planning for the long term to help ensure provision of resilient and reliable service to all customers. The purpose of this Rulemaking and the guidance adopted herein is to provide a forum for addressing how energy utilities should plan and prepare for increased operational risks due to changing climate conditions and heightened risks from wildfires, extreme heat, extreme storms, drought, subsidence and sea level rise, among other climate change phenomena. Energy utilities need this guidance to plan to continue to fulfill their mission to provide safe, reliable and affordable service in the future's more difficult operating environment.

This decision adopts a working definition of climate change adaptation for the Commission's immediate use, and provides guidance on the tools, models, and data appropriate for incorporating consideration of climate change adaptation in future utility planning. This decision thus resolves the key questions raised by Topics 1 and 2 in the Scoping Memo and Ruling issued in this proceeding on October 10, 2018; the remaining issues in Phase 1 of this Rulemaking will be considered in a subsequent decision anticipated in 2020.

This proceeding remains open.

1. Procedural Background

The Order Instituting Rulemaking to Consider Strategies and Guidance for Climate Change Adaptation (Rulemaking or OIR) was adopted by the Commission on April 26, 2018. The Rulemaking was motivated by statewide policy directives, recent climate events, as well as advancements in – and availability of – climate science data and tools for evaluating the data. Climate change adaptation planning in a time of worsening climate impacts is a prudent step to ensure the safety and reliability of the investments and operations of all investor-owned public utilities.

As outlined in the Rulemaking, Phase 1 of this proceeding considers how to define climate change adaptation for electric and gas utilities, tools/data/resources for planning and operations related to climate adaptation, how to assess and mitigate risks facing vulnerable and disadvantaged communities with respect to climate change impacts and the magnitudes of these risks, and guidance to electric and gas utilities on how to incorporate climate change adaptation into utility planning and operations.

The following California investor-owned electric and natural gas utilities are respondents to this Rulemaking: Pacific Gas and Electric Company, Southern California Edison Company, San Diego Gas & Electric Company, Southern California Gas Company, PacificCorp, 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. According to the Scoping Memo, the entities filing as the California Association of Small and Multi-Jurisdictional Utilities and

Independent Storage Providers are not required to participate in Phase 1.¹ California investor-owned telecommunications and water utilities are invited, but not required, to participate in Phase 1.

Comments were filed on the OIR by Communities for a Better Environment, Asian Pacific Environmental Network, Independent Energy Producers Association, Small Business Utility Advocates (SBUA), Pacific Gas and Electric Company (PG&E), California Water Association (CWA), Southern California Gas Company (SoCalGas), Public Advocates Office (Cal Advocates), PacifiCorp, Liberty Utilities, Bear Valley Electric Service, Climate Resolve, The Utility Reform Network, Green Power Institute (GPI), Southern California Edison Company (SCE), Southwest Gas Corporation, San Diego Gas & Electric Company (SDG&E), Bioenergy Association of California, Central Valley Gas Storage, Wild Goose Storage, Lodi Gas Storage, and Gill Ranch Storage.

Comments on the Scoping Memo were filed by Communities for a Better Environment, UC Berkeley Environmental Law Clinic, Leadership Counsel for Justice and Accountability (Leadership Counsel), California Environmental Justice Alliance (CEJA), SBUA, Cal Advocates, SoCalGas, SCE, PG&E, SDG&E, Climate Resolve, and GPI.

Phase 2 will be scoped at a later time, but it is expected to address similar issues for the small and multi-jurisdictional utilities, and may also include guidance for other utilities, including water and telecommunication companies.

¹ In the Scoping Memo for Phase 2 of this proceeding, we will again consider the request of these entities that they be removed as Respondents to this Rulemaking.

1.1. Working Group Process

The Scoping Memo adopted a working group process for developing the issues under five topics. These topics include defining adaptation, providing guidance to utilities on which data sources and models to use, adopting data criteria, developing key climate-related inputs for use by utilities and in Commission proceedings, considering the needs of vulnerable and disadvantaged communities and developing a framework for decision-making given the high degree of uncertainty.

According to the Scoping Memo, the goal for each working group is not necessarily “to reach consensus among participants but rather to develop a full understanding of the interplay of factors and externalities within each question, and to develop recommendations to be considered for adoption. The intent is to issue a guidance document to aid in utility planning for climate change adaptation.”² The Scoping Memo initially called for all five issues to be resolved by September 2019. The ambitious working group process outlined in the Scoping Memo has required additional time and work to ensure informed participation by stakeholders. As a result, this decision addresses Topics 1 and 2, and the remaining Phase 1 issues will be addressed in a decision expected early next year.

The oral comments of the stakeholders who participated in working group Topics 1 and 2 are reflected in the working group reports issued by rulings in this proceeding on January 25, 2019, and March 15, 2019, respectively. A number of parties filed opening and/or reply comments on the working group reports, as discussed below.

² Scoping Memo at 11.

2. Issues Before the Commission

In this decision, we adopt a definition of adaptation for energy utilities, and provide guidance to the energy utilities on which data sources, tools and models should be used as resources for inputs into their planning processes. We will address the January 2019 Staff Proposal to establish a “Technical Advisory Group,” which we refer to in this decision as an expert panel, in a subsequent decision. In this decision, we consider key available data sources, models, and tools for forecasting future climate impacts, the degree to which they are useful, and whether and how they should be adopted for use by the utilities and/or Commission.

3. Background on Topic 1

3.1. Topic 1 - Definition of Climate Change Adaptation

The Scoping Memo directed the Topic 1 working group to develop an appropriate definition of adaptation for use in utility planning and Commission proceedings.

On November 29, 2018, an initial working group meeting was held, followed by a second meeting on December 18, 2018. Following the initial stakeholder meeting, Commission staff issued a proposal defining climate adaptation for energy utilities. This proposal was the focus of the December 18, 2019 meeting.

Following the two meetings, a Working Group Session Report on “Definition of Adaptation for Utilities” (Definition Report) was prepared³ and was served on parties by ruling dated January 25, 2019. The Definition Report

³ This report was prepared by SCE. Parties had the opportunity to comment on it and staff edited the final version.

described and summarized the consensus and non-consensus items⁴ that emerged during the working group stakeholder discussions regarding how best to define adaptation for electric and natural gas utilities. Parties filed opening and reply comments on the Definition Report on February 8 and 22, 2019, respectively. All the citations to opening and reply comments in Section 3.1 *et seq.* are to the comments filed in February on Topic 1.

3.1.1. Topic 1 Purpose

The purpose of Topic 1 is to develop a definition of climate change adaptation and identify the risks the utilities are facing and will continue to face as the planet becomes hotter. These environmental risks include: wildfire, extreme heat, extreme storms, drought, subsidence and sea level rise.⁵ Each risk poses challenges for energy utilities because wildfire, heat, storms, drought, subsidence and sea level rise risk will require changes in utility infrastructure. The Commission's aim is to identify adaptation measures such as infrastructure hardening and relocation. These measures should be cost-effective to maintain affordability, and effective at preserving reliability, resilience and safety.⁶

Six sets of opening comments were filed on the Definition Report, including comments from the following entities: The Natural Resources Defense Council (NRDC), CEJA and Leadership Counsel (jointly), Cal Advocates, CWA,

⁴ In comments, some parties challenged the interpretation that certain items were the subject of consensus. However, as the Scoping Memo stated, consensus was not the goal for the working groups. We therefore disregard the "consensus" and "nonconsensus" designations in the Definition Report. Scoping Memo at 11.

⁵ *See, e.g., id.* at 5, see also PG&E's 2017 Risk Assessment and Mitigation Phase Report (2017), Ch. 22 in I.71-11-003..

⁶ *See, e.g.,* PG&E's Comments at 5.

PG&E, and SCE. Reply comments were filed by SBUA, Cal Advocates, NRDC, Climate Resolve, SCE and PG&E (jointly), and SDG&E and SoCalGas (jointly).

3.1.2. Party Positions on Definition of Adaptation

Several parties urge additional process before adopting a definition of climate adaptation in this proceeding. Other parties urge us to adopt an established definition. Several parties propose their own definitions. Still others suggest a hybrid definition combining an established definition and the staff proposal. In addition, parties focus on several terms contained in the staff proposal, arguing for inclusion, deletion or modification.

The two established definitions are as follows:

The Safeguarding California definition of climate adaptation from the Governor's Office of Planning and Research reads

Adjustment in natural or human systems to a new or changing environment. Adaptation to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderate harm or exploits beneficial opportunities.⁷

The United Nations Intergovernmental Panel on Climate Change (IPCC) definition of climate change adaptation is

The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.⁸

⁷ California Natural Resources Agency, Safeguarding California Plan: 2018 Update California's Climate Adaptation Strategy, Appendix B, Glossary of Terms (citing U.S. Environmental Protection Agency 2013 Climate Index) (January 2018).

⁸ IPCC Fifth Assessment, https://www.ipcc.ch/site/assets/uploads/2018/02/WGIIARS-AnnexII_FINAL.pdf.

As explained in the Definition Report, a number of parties supported using one of these established definitions because 1) these definitions have been pre-approved and vetted in other forums, 2) using the Safeguarding California definition would better align with other state agencies such as California Department of Forestry and Fire Protection (CalFIRE) and California Office of Emergency Services (CalOES) that have adopted the same definition, and 3) there are already extensive studies and literature on each word's meaning in the established definitions to which parties can refer. When pressed for a preference between the definition from Safeguarding California developed by the Governor's Office of Planning and Research or the IPCC definition, a majority of participants preferred Safeguarding California.⁹ Commission staff developed a more utility-specific version, based on the written comments received by December 2018 and the Topic 1 Working Group discussion on November 29, 2018. The staff proposal reads:

Climate adaptation for electric and natural gas utilities is: strategic and data-driven consideration and incorporation of current and likely future climate-driven risks into utility planning, operations, and communications, in order to maintain safe, reliable, affordable, and resilient operations, in alignment with state policy goals.

At the second meeting, staff explained that its proposal considered two other definition examples - US Global Change Research Program's (USGCRP)¹⁰

⁹ Definition Report at 7.

¹⁰ The USGCRP definition included in the Topic 1 staff presentation is the definition for resilience used by the federal government: A capability to anticipate, prepare for, react to, and recover from significant, multi-hazard threats with minimum damage to social well-being, the economy, and the environment. (See https://www.whitehouse.gov/sites/whitehouse.gov/files/ceq/2011_adaptation_progress_report.pdf (page 2), <https://19january2017snapshot.epa.gov/climatechange/glossary-climate-change-terms.html#R>. (the second link doesn't work).

and PG&E's¹¹ – in its proposal.¹² The staff proposal further explains that its definition is organized into four categories:

1. **Actions:** strategic and data-driven consideration and incorporation of risks into utility planning, operations, and communications.
2. **Hazards:** Relevant current and likely future climate-driven risks.
3. **Outcomes:** Maintain safe, reliable, affordable, and resilient operations, in alignment with state policy goals.
4. **Whom/what to protect:** Protections are no less broad than in other contexts and are therefore not explicitly mentioned in the definition.¹³

According to the Definition Report, at the December 18, 2018 meeting, parties recommended edits and changes to the staff proposal.¹⁴ Critics of the staff proposal argued that several terms introduced too many ambiguities. NRDC proposed adopting either the Safeguarding California or the IPCC definitions of adaptation and then applying this definition to the utility sector in California.

In written comments on the Definition Report, several parties suggest that since no consensus on the definition of adaptation was reached, the Commission should hold further discussion of the definition.¹⁵ Cal Advocates recommends that if the Commission does not allow further discussion of the definition, the

¹¹ PG&E's definition is from its 2017 RAMP compliance filing in I.17-11-003, Ch. 22 at 3 and states: "...that climate adaptation involves actions taken related to PG&E's assets, infrastructure, operations, employees and customers to mitigate against potential consequences of and adapt to a changing climate and associated weather patterns."

¹² See Definition Report at 7.

¹³ See Definition Report at 10.

¹⁴ See Definition Report at 8 and 9.

¹⁵ Cal Advocates' Comments at 2.

Safeguarding California definition should be adopted. Cal Advocates notes that the state agencies with which the utilities interface use this definition as a starting point and that the Safeguarding California definition of climate adaptation was also used by researchers for the Fourth Climate Assessment.¹⁶ Cal Advocates also suggests that if the Commission adopts a utility-specific definition, its application should be limited to Commission proceedings and, for purposes of coordinating with other agencies, the Commission should use a definition common to those agencies.¹⁷

Cal Advocates also stresses the need for additional context for defining adaptation, including whether the definition applies to both the Commission and utilities, or only utilities, and whether the definition will be used in this proceeding only or across all Commission proceedings.¹⁸ CEJA and Leadership Counsel raise this concern as well.¹⁹ Cal Advocates calls for revisiting the definition issue following more complete development of knowledge over the next working group meetings.²⁰ NRDC agrees.²¹

In its reply comments, NRDC clarifies that its primary recommendation is that the Commission hold off on adopting a definition until later in this proceeding due to uncertainty.²² In the meantime, NRDC urges that the Commission commit to a “hybrid definition” development process that uses

¹⁶ Cal Advocates’ Comments at 2-3.

¹⁷ Cal Advocates’ Comments at 3.

¹⁸ Cal Advocates’ Comments at 3.

¹⁹ CEJA and Leadership Counsel Comments at 4. See also NRDC Comments at 2.

²⁰ *Id.* at 6-7. See also NRDC Comments at 2.

²¹ NRDC Comments at 2.

²² NRDC Reply Comments at 3.

Safeguarding California's definition as the basis.²³ If the Commission must adopt a definition, NRDC supports the Safeguarding California definition, since it was arrived at through the participation of 38 state agencies.²⁴

CEJA and the Leadership Counsel's joint comments make three main points. First, the Commission should adopt a clear definition of adaptation that includes protection of disadvantaged and vulnerable communities. Second, the Commission should not use tradeoff language, which might mean that certain communities bear the costs of climate adaptation.²⁵ Third, the Commission should clarify the intended use of the policies developed in this proceeding.²⁶

CEJA and the Leadership Counsel propose the following definition:

Data and community-driven consideration and incorporation of current and likely future climate-driven risks into utility planning, operations and communications, in order to main safe, reliable, affordable, and resilient operations for all customers, in alignment with state policy goals, taking into account principles of equity and prioritizing disadvantaged and vulnerable communities.²⁷

CEJA and the Leadership Counsel strongly believe that any definition of adaptation should explicitly include protection of disadvantaged and vulnerable communities and consideration of equity, citing the "climate gap" between the general population and low-income communities of color.²⁸ The joint comments

²³ NRDC Reply Comments at 2.

²⁴ *Id.*

²⁵ Joint Comments of CEJA and Leadership Counsel at 7-8.

²⁶ *Id.* at 2.

²⁷ *Id.* at 3.

²⁸ *Id.* at 4, citing the Definition Report at 3.

note that the proposed Commission staff definition does not specify whom the utilities should be seeking to protect.²⁹

While utilities may think that adaptation measures that address the needs of the general population may be sufficient to address disadvantaged communities, any “one-size-fits-all” approach would fundamentally ignore the vulnerabilities that makes [sic] these communities especially susceptible to climate disasters.³⁰

CWA’s comments support a hybrid definition that tailors an “established” definition of adaptation to the utility industry. The Definition Report states that PG&E and SCE support the staff proposed definition³¹ as consistent with the utilities’ missions, while allowing for flexibility and recognizing tradeoffs faced by utilities and the customers they serve. PG&E’s comments support the staff’s proposed definition, with minor modifications, as encompassing “many of the complex dimensions of IOU activity while generally reflecting the structure of the widely vetted definitions of adaption established by the IPCC and Safeguarding California report.”³² PG&E believes IPCC’s definition is too broad, and prefers the staff proposal as more practical and specific as to what the utilities do.³³

²⁹ *Id.* at 6. See the Definition Report at 11, where the staff’s framework for whom/what to protect explains that protections are no less broad than in other contexts and are therefore not explicitly mentioned in the definition. The staff states that certain groups likely require additional prioritization for protection in the adaptation context and that these should be considered in detail in Working Group Topics 4 and 5.

³⁰ *Id.* at 6.

³¹ Again, the staff definition reads: Climate adaptation for electric and natural gas utilities is: strategic and data-driven consideration and incorporation of current and likely future climate-driven risks into utility planning, operations, and communications, in order to maintain safe, reliable, affordable, and resilient operations, in alignment with state policy goals.

³² PG&E’s Comments at 7.

³³ Definition Report at 7-8.

SDG&E and SoCalGas recommend the Commission adopt a definition of climate change adaptation for utilities that is already widely accepted at the global level and within California. They support the definition provided by the IPCC, in which adaptation is defined “as adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects.”³⁴

Alternatively, SDG&E and SoCalGas would support the Safeguarding California definition quoted above, which is very similar to the IPCC definition.³⁵ SDG&E and SoCalGas appear to support the hybrid definition as well, blending a standardized definition with a utility-specific one,³⁶ This approach, according to SDG&E and SoCalGas, will provide coherence and ensure “that climate change adaption activities undertaken in the California energy sector are regulated in a consistent manner to other sectors in the State, for example transportation or community development.”³⁷

In reply comments, SBUA recommends using IPCC’s definition as a starting point. SBUA resubmits the proposed definition submitted in its comments on the OIR:

“Climate Adaptation” is defined as the response to actual or expected climate changes and their effects on utilities, ratepayers, and communities, including by moderating harms and exploiting beneficial opportunities.

Moderating harms includes taking practical steps to protect ratepayers and communities from the possible disruption and damage that may result from climate change impacts on utility assets, safety, power reliability, and energy infrastructure, and

³⁴ SDG&E and SoCalGas’ Reply Comments at 1-2.

³⁵ *Id.* at 2.

³⁶ *Id.* at 2.

³⁷ *Id.* at 2.

ensuring the costs of such actions are just and reasonable to ratepayers. Beneficial opportunities include economic benefits that might accrue to ratepayers as well as utilities in helping to implement climate change strategies.³⁸

Climate Resolve supports the idea of a hybrid definition building on an existing definition.³⁹ Climate Resolve supports the staff's proposed definition with one change. Because utilities own and manage lands impacted by climate change, Climate Resolve proposes that "ecologically sound" be included in the definition of adaptation:

...strategic and data-driven consideration and incorporation of current and likely future climate-driven risks into utility planning, operations, and communications, in order to maintain safe, reliable, affordable, ecologically sound and resilient operations, in alignment with state policy goals.⁴⁰

3.1.3. Party Positions on Changes and Edits to Staff Proposal

Parties recommend several word changes to the staff proposal, which again reads:

Climate adaptation for electric and natural gas utilities is: strategic and data-driven consideration and incorporation of current and likely future climate-driven risks into utility planning, operations, and communications, in order to maintain safe, reliable, affordable, and resilient operations, in alignment with state policy goals.

Representative comments follow. First, SDG&E and SoCalGas agree with PG&E that "maintain" should be replaced by "support," because not all utilities have already taken climate actions, and "maintain" could imply an obligation to

³⁸ SBUA's Comments on OIR, filed June 6, 2018 at 3.

³⁹ *Id.* at 4.

⁴⁰ Climate Resolve Reply Comments at 3.

provide a certain level of performance despite a possible need for necessary trade-offs between safety, reliability and affordability in the future.⁴¹

Second, the staff proposed to define “resilient” in the December 2018 staff proposal⁴² as “the ability to withstand extreme events and the speed and ease with which utility systems can recover when a disruption does occur.”⁴³ SDG&E and SoCalGas support SCE’s suggestion to remove the term “extreme events” from the staff proposal defining “resilient” because it “implies that climate effects are felt only in acute instances, whereas many climate impacts are gradual or incremental.”⁴⁴ They also support SCE’s proposal to remove the terms “speed and ease” from the staff’s definition of “resilience,” asserting that “there are no metrics available against which to compare the expediency of the recovery period.”⁴⁵

If the Commission adopts a definition that includes terms from the staff proposal, Cal Advocates urges deleting the phrase “in alignment with state policy goals” as ambiguous and unnecessary since utilities are obligated to follow state policy goals if they are codified in state law.⁴⁶ On the other hand, Climate Resolve supports retaining the phrase “alignment with state policy goals” to foster effective coordination with other state agencies working on climate

⁴¹ SDG&E and SoCalGas’ Reply Comments at 3.

⁴² Definition Report at 11.

⁴³ *Id.*

⁴⁴ SDG&E and SoCalGas’ Reply Comments at 3.

⁴⁵ *Id.* at 3-4.

⁴⁶ *Id.* at 4.

change, but suggests modifying the definition to read, “alignment with principles in state law, policy and plans.”⁴⁷

CWA and PG&E claim that the term “strategic” in the first line of the staff definition helps to capture the concept that the utilities must balance costs, service, and climate risks.⁴⁸ Cal Advocates disagrees, recommending eliminating the term from the definition because it adds no benefit and raises concerns of inherent support for uncertain tradeoffs.⁴⁹ Cal Advocates and CEJA assert that the term “strategic” suggests that utilities could use the language to ignore the needs of vulnerable communities.⁵⁰ PG&E’s comments quoted below, according to Cal Advocates, reflect the tradeoff concept:

The definition of climate adaptation for utilities should allow for flexibility to adjust to changing circumstances. There are a range of predicted impacts from climate change and, according, a wide range of adaption measures. The costs and benefits of these adaptation measures can change depending upon how climate impacts materialize, when various technologies become available, and other market forces.⁵¹

The trade-off concept is objectionable, according to CEJA/Leadership Counsel, as it “would provide a backdoor for less protection of vulnerable and disadvantaged communities.”⁵² In Cal Advocates’ view, inclusion of the term “strategic” in the definition is ambiguous and further exacerbates the trade-off risk because the definition does not state who the utilities are tasked with

⁴⁷ Climate Resolve’s Reply Comments at 3.

⁴⁸ PG&E Comments at 2; CWA’s Comments at 3.

⁴⁹ Cal Advocates’ Reply Comments at 5.

⁵⁰ *Id.* at 5, quoting CEJA at 5-10.

⁵¹ PG&E’s Comments at 2.

⁵² CEJA/Leadership Counsel’s Comments at 7.

protecting,⁵³ and could be used to ignore the needs of vulnerable communities.⁵⁴ NRDC agrees with CEJA/Leadership Counsel that “strategic” is an ambiguous term because it implies that cost-effectiveness should be considered in determining what adaptation measures to adopt.⁵⁵ Further, NRDC is concerned that without a shared understanding among parties of what adaptation for utilities means, “language of cost-effectiveness might prematurely make its way into the definition without clarity or specificity as to whom or what ‘cost-effectiveness’ intends to protect.”⁵⁶

PG&E and SCE (“Joint Utilities”) disagree with CEJA’s claim that using the term “tradeoffs” could be interpreted to allow for prioritizing utility costs over other factors like affordability, thus shifting climate adaptation costs to overburdened communities.⁵⁷ The Joint Utilities assert it is imperative that affordability is evaluated within a cost-benefit framework considering customers and society as a whole and that the Commission and others need to strike the right balance between near-term priorities and long-term goals and the impact on affordability for energy customers.⁵⁸ Furthermore, utilities need to optimize their energy resource portfolios to balance affordability and each resource’s greenhouse gas (GHG) reduction potential. Thus, the Joint Utilities continue,

⁵³ Cal Advocates’ Reply Comments at 6.

⁵⁴ Cal Advocates’ comments at 4.

⁵⁵ NRDC Reply Comments at 5.

⁵⁶ *Id.*

⁵⁷ Joint Utilities’ Reply Comments at 4, responding to CEJA/Leadership Counsel’s Comments at 8.

⁵⁸ *Id.*

reducing GHG emissions and improving air quality will also generate costs, something to be kept in mind while measuring affordability.⁵⁹

Cal Advocates argues that the terms “likely” and “risks” in the staff proposal detract from the scientific rooting of the definition and adds uncertainty. Cal Advocates suggests the use of the term “impacts” rather than “risks.”⁶⁰

According to SCE, the staff proposal should be modified from context of the proposed definition of “resilient” to remove the term “extreme events,” because many climate impacts are gradual or incremental. The terms “speed and ease” should also be removed, because according to the Joint Utilities there are no metrics available to quantify those terms.⁶¹ SDG&E and SoCalGas agree with both these recommendations.⁶²

The Joint Utilities raise an additional two points relevant here. First, they respond to NRDC’s suggestion that the Commission should take steps to enable better interagency coordination on climate adaptation. NRDC made this comment in the context of recommending the hybrid definition. However, while the Joint Utilities continue to support the staff proposal, they also agree that, “to improve interagency coordination, that the climate scenarios and parameters chosen by the Commission be aligned with those employed by the State.”⁶³

Second, responding to several parties’ call for clarification as to the purpose and intended use of a definition of adaptation, the Joint Utilities

⁵⁹ *Id.*

⁶⁰ Cal Advocates’ Comments at 7-8.

⁶¹ SCE’s Comments at 3.

⁶² SDG&E and SoCalGas Reply Comments at 3.

⁶³ Joint Utilities’ Reply Comments at 2.

recommend that the Commission establish performance objectives as part of a stepwise approach to measurable goals, which can better inform future metrics.⁶⁴ This is a new proposal raised for the first time in reply comments. While we will not consider it in the context of defining adaptation, the Joint Utilities are encouraged to raise this approach in the context of Topic 5, where we will consider integration of climate change adaptation data into utility planning. Metrics to measure performance objectives and goals could be an important part of such planning.

Parties also discussed the difference between reliability and resilience in the working groups and in comments. At the November 29, 2018 meeting, staff suggested that current reliability standards do not capture all the necessary actions that utilities should take to adapt to climate conditions and that resilience might be a separate topic.⁶⁵ In response, PG&E explains that its starting point for distinguishing between reliability and resilience is the mission for California utilities: to provide safe, clean, affordable, and reliable energy service to customers. Climate change is predicted to result in changes in natural conditions that will put utility infrastructure at increased risk, while failure to improve resilience could result in diminished energy reliability. The Joint Utilities urge the Commission to conform the definition of “resilient” in the staff proposal to accord with SCE’s comments that resilient “is the ability to withstand business disruptions and the ability to recover when those disruptions occur.”⁶⁶

⁶⁴ Joint Utilities’ Reply Comments at 3.

⁶⁵ Definition Report at 6.

⁶⁶ *Id.* at 5.

As to what entities the utilities should be protecting and what assets they should protect, state law and Commission directives frame utility responsibilities as to their duty to serve the general public, including disadvantaged communities, according to PG&E.⁶⁷

3.1.4. Discussion of Topic 1, Definition of Adaptation

We adopt the following definition for climate change adaptation:

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.

The adopted hybrid definition blends essential elements from both the Safeguarding California definition and staff's proposal. Our purpose in crafting a hybrid adaptation definition is to ensure that utilities plan for reliability and resilience based on future climatic conditions. We clarify in response to parties' questions that we intend the definition to be used in the energy utilities' internal decision-making, as well as by the Commission in future proceedings where appropriate.

While this definition does not apply to other state agencies, it is consistent with the Safeguarding California definition. It is specifically applicable to energy utilities and is based on the stakeholder discussion in working group meetings, the Definition report, and party comments.

This definition may undergo changes as both the Commission and the parties gain familiarity with the subject matter. While our adopted definition

⁶⁷ PG&E's Comments at 5.

provides appropriate flexibility, we note the iterative nature of providing guidance to utilities as they face changing climatic conditions and are open to modifying our definition as changing circumstances require. For example, IPCC changed its definition of adaptation between the Fourth Assessment and the Fifth Assessment due to “progress in science.” We will also consider in Phase 2 whether any changes are necessary to apply the definition to water and telecommunications utilities.

Using portions of the established definition helps ensure that the climate change adaptation activities undertaken by the energy sector are regulated in a consistent manner to other sectors in California. Other components of our hybrid definition come from the staff’s proposed definition, including several phrases and words that address the specific activities of regulated energy utilities. Several parties caution that certain terms in the staff proposal could add ambiguity.⁶⁸ We therefore modify or delete several phrases of the staff proposal, based on stakeholder input, as discussed below. We focus on the following phrases:

1. "all aspects and impacts of utility operations,"
2. “to maintain safe, reliable, affordable and resilient operations, in alignment with state policy goals,”; and
3. “strategic and data-driven consideration and incorporation of current and likely future climate-driven risks.

We delete the phrase “and incorporation of current and likely future climate-driven risks” from the third phrase as unnecessary, given our adoption of the Safeguarding California language “of actual or expected climatic stimuli or

⁶⁸ See, e.g., NRDC’s Reply Comments at 4, where NRDC states that the term “likely” indicates the existence of an unspecified threshold of probability under which adaptation will not be considered necessary.

their effects,” which conveys similar meaning. We note that the Safeguarding California language was vetted by 38 state agencies and the terms are thus well understood. By substituting the Safeguarding California language, we remove the uncertainty over the term “likely.

Using this phrase from Safeguarding California responds to the concern raised by Cal Advocates over the use of the term “risk.”⁶⁹ Cal Advocates asserts that “climate-driven risks” in the third phrase fails to capture the scientific observation that climate change and human systems interactions cause more changes than simply increased potential for harm. “Impact” is thus a broader term than “risk.” As the CEC’s energy procurement planning document, Integrated Energy Policy Report (IEPR) points out, climate impacts on temperature have implications for energy load and the energy system, warranting consideration and planning, while not being risks.⁷⁰ Thus, Cal Advocates recommends addressing the level of risk in various climate change scenarios in subsequent working groups and not in the definition of climate adaptation.

Cal Advocates cautions that “risks” adds uncertainty and recommends use of the term “impacts” instead.⁷¹ We agree. Using the word “impacts” from the Safeguarding California definition thus eliminates at least two concerns raised by parties over terms used in the staff proposal. At the same time, our hybrid definition includes the phrase “on utility planning, facilities maintenance and construction, and communications, to support safe, reliable, affordable and

⁶⁹ Cal Advocates’ Reply Comments at 8.

⁷⁰ *Id.*, citation to the 2017 IEPR in Cal Advocates’ Reply Comments omitted here.

⁷¹ *Id.*

resilient operations,” which we find necessary and appropriate to tailor the definition to utilities.

One change here is to delete “operations” the first time it appears and replace it with “facilities maintenance and construction.” This specific language provides guidance to the utilities as to additional areas where the Commission contemplates a need for utility and Commission consideration of changing climate conditions. At the same time, the overriding concept of utility operations continues to be captured by the definition with the use of “operations” at the end of the definition.

Second, we do not agree with comments⁷² that “maintain” as used in the staff proposal should be changed to “support.” We expect on a going-forward basis that energy utilities will have primary responsibility for taking all reasonable actions to prepare for climate change and the term “maintain” better captures that responsibility. Third, we delete the phrase “in alignment with state policy goals” as used in the staff proposal. This phrase is unnecessary given the requirement that all utility actions operate in compliance with law and regulations.

Finally, despite opposition from some parties,⁷³ we find that “strategic” is an important element of our proposed definition as it implies that the utilities will necessarily consider a cost-benefit analysis in planning and building facilities to operate under actual and changing conditions. Given finite resources, utilities would be imprudent if they failed to consider costs in their construction and operations planning. We are not persuaded that the term

⁷² See SDG&E and SoCalGas’s Reply Comments at 3 and PG&E’s Comments at 7.

⁷³ See, e.g., NRDC Reply Comments at 4.

strategic is ambiguous or including cost-effectiveness terminology “is too vague to meaningfully protect the Californians who are most at risk from climate change and can least afford to bear increased rates.”⁷⁴ In this regard, we agree with the staff explanation of its proposal, which expands on the protection concept:

For example, utilities have an obligation to protect the general public, their own assets, public and private property, and ecosystems...Certain groups [are] likely to require additional *prioritization* for protections in the adaptation context (*e.g.*, vulnerable and disadvantaged communities, and low-income customers.) This should be considered in detail in Working Group Topic 4 and 5.⁷⁵

We will consider prioritization of needs of disadvantaged and vulnerable communities for protection in the future as the climate changes and will consider this important issue further in the context of Working Group Topics 4 and 5. However, we cannot ignore the reality of costs and benefits of various climate adaptation strategies in adopting a definition of climate change adaptation providing guidance to energy utilities.

As noted by PG&E, and supported by several parties, “adaptation” and “resilience” mean two different things. PG&E notes that adaptation refers to the *process* of becoming more resilient to climate change, while resilience means the *ability* to respond to climate impacts.⁷⁶ SDG&E and SoCalGas agree with this

⁷⁴ NRDC’s Reply Comments at 5.

⁷⁵ Definition Report at 11, emphasis added. Also, since we agree with staff that utilities have an implicit obligation to protect “ecosystems,” we find unnecessary Climate Resolve’s recommendation to include the term “ecologically sound” as an additional descriptor of utility operations.

⁷⁶ PG&E’s Comments at 2.

more general definition of “resilient,” which aligns with the Safeguarding California definition.⁷⁷

With respect to the term “resilient” as used in the proposed staff definition, explanatory materials accompanying the staff proposal indicate that resilient means the ability to withstand extreme events and the speed and ease with which utility systems can recover when a disruption occurs. Several utilities would remove the term “extreme events” from this definition as well as “speed” and “ease” because of the possible implication that climate change is only acute, when in fact many climate change impacts are gradual or incremental.⁷⁸

We find the term “resilient” should encompass both extreme events such as wildfires and other more incremental changes such as sea level rise. We define “resilience” as the achieved outcome of an adaptation strategy and “resilient” as the ability to withstand business disruptions and the ability to recover when those disruptions occur.⁷⁹

As to whom the definition is meant to protect, the protections we intend are no less broad than in other contexts and therefore do not need to be explicitly mentioned in the definition.⁸⁰ However, our proposed hybrid definition starts with the Safeguarding California definition which leads off with “[A]djustment

⁷⁷ SDG&E and SoCalGas’ Reply Comments at 4.

⁷⁸ See, e.g., SCE Comments at 4.

⁷⁹ *Id.*

⁸⁰ See Definition Report at 11.

in natural or human systems to a new or changing environment.”⁸¹ This language makes clear that the main purpose for the Commission in providing guidance to utilities facing climate change in their operational and facilities planning is to protect humans. We emphasize this vital change since parties criticized the staff proposal for failing to reference any specific human protections. By adopting a definition of adaptation for the energy utility sector, we are stating unequivocally that the utilities we regulate are responsible for ensuring reliability and resiliency for their customers now and in the future when conditions will be dramatically different than they are today.

4. Topic 2 Climate Adaptation Data Sources, Models and Tools⁸²

4.1. Appropriate Data Sources, Models and Tools

As the OIR stated, the scope of Phase 1 of this Rulemaking is to consider how to address climate change adaptation for the investor-owned electric and gas utilities to ensure safety and reliability of utility operations. The Commission may also consider ways in which adaptation can be incorporated into specific Commission proceedings and activities, including the development of specific procedures. Guidance in this proceeding will instruct utilities on how to incorporate adaptation in their investment plans, program design, and operations.⁸³ In Topic 2, we address what climate data sources, models and tools the energy utilities should use to understand climate-driven risks.

⁸¹ California Natural Resources Agency, *Safeguarding California Plan: 2018 Update California’s Climate Adaptation Strategy*, Appendix B, Glossary of Terms (citing U.S. Environmental Protection Agency 2013 Climate Index) (January 2018).

⁸² As discussed below, the Commission will address the “Technical Advisory Group/expert panel” in a subsequent decision, although we outline party comments on the issue in this decision.

⁸³ OIR at 3.

The Commission held two working group meetings on Topic 2, on January 8, 2019 and February 4, 2019. A working group report prepared by PG&E was issued for comment to the parties on March 15, 2019 (Data Report). Comments were filed on March 29, 2019 and reply comments were filed on April 12, 2019. All the citations to opening and reply comments in Section 4.2 *et seq.* are to the comments filed in March on Topic 2.

4.2. Background on Topic 2

Many parties noted in their opening comments that it is critical to rely on the most current, rigorous scientific data, models and recommendations in addressing climate change impacts. These resources and tools regarding climate change available for utility adaptation planning include Cal-Adapt, a clearinghouse for climate data, models, and projections; the IEPR; Demand and Distributed Energy Resources (DER) forecasts developed by the CEC, which embed some climate scenarios and models;⁸⁴ Planning and Investing for a Resilient California: A Guidebook for State Agencies;⁸⁵ California's Climate Assessments, which are updated every 3-7 years, in accordance with revised international assessments of global emissions and associated impacts;⁸⁶ State of California Sea-Level Rise Guidance,⁸⁷ and many other scientific data sources, noted in the OIR and in parties' comments.

⁸⁴ The inputs for the IEPR forecasts are derived from the Locally Constructed Analogs (LOCA) models found in the Cal-Adapt tool. *See* SCE's Comments on Topic 2 at 3.

⁸⁵ Governor's Office of Planning and Research with guidance from the B-30-15 Technical Advisory Group. 2018 http://opr.ca.gov/docs/20180313-Building_a_Resilient_CA.pdf, p. 21.

⁸⁶ California Climate Change Assessments
http://climatechange.ca.gov/climate_action_team/reports/climate_assesments.html

⁸⁷ California Natural Resources Agency Ocean Protection Council 2018
http://www.opc.ca.gov/webmaster/ftp/pdf/agenda_items/20180314/Item3_Exhibit-A OPC SLR Guidance-rd3.pdf

In this regard, Climate Resolve points out that the best data sources will depend on the particular climate risks, so it is important to consider on a risk-by-risk basis which data sources to include. Climate Resolve urges the Commission to work closely with CalEPA, the California Natural Resources Agency and the CEC, as well as the individual departments and agencies with expertise in each risk area to identify the best available data and recommendations for climate adaptation⁸⁸

4.3. Party positions on What Climate-Related Data Sources, Scenarios, Tools and Other Resources Should be Used to Inform Commission Activities and Utility Planning

While Cal Advocates agrees with modifications to the staff proposal made by the working group on February 4, 2019, it is concerned how the Commission or the utilities intend for climate data to be used, and notes that without this information needed characteristics of the data cannot be determined.

Cal Advocates refers the Commission to Executive Order B-30-15 which requires state agencies to consider climate change in their planning and investment decisions. Cal Advocates points out that Guiding Principle 5 of this executive order, although developed for agencies, is nonetheless relevant and applicable to utilities, and directs planning and investment decisions to be based on the best available science.⁸⁹

Principle 5 of the Executive Order recommends that agencies evaluate project performance using planning parameters that reflect future changing climate conditions and develop parameters using downscaled⁹⁰ climate data

⁸⁸ Climate Resolve's Reply Comments at 7.

⁸⁹ *Id.*

⁹⁰ Downscaled climate data is data taken from a large map or data set that is reduced to a smaller location to make predictions about climate change in that locality.

(based on Localized Constructed Analog (LOCA) methodology) from the State Climate Change Assessment. Where appropriate, the LOCA data can be supplemented with more locally or regionally specific data sources, or employ other tools that integrate changing climate conditions, using tools to understand projected climate impacts and develop and report metrics to track progress.⁹¹

SoCalGas filed comments noting a presentation given by ICF at the beginning of the February 4th working group titled “Potential Climate Impacts and Adaptation Options for Electricity and Natural Gas Systems in the San Diego Region.” In addition to examining electricity assets exposed to coastal hazard impacts and recommending including adaptation in existing decision-making processes to support adaptation implementation and cost recovery, the study also examined natural gas asset exposure to coastal hazard impacts, wildfire, extreme heat, inland flooding and geologic instability.

SoCalGas relies on this study for the proposition that gas assets and services are not likely to experience the same impacts and disruptions as electric utility assets and services. The study’s findings for several variables including coast hazard impacts, wildfire, and extreme heat showed limited impacts due to most assets being underground, pressurized, and not sensitive. Findings for inland flooding and geologic instability showed limited impact as well. The company concluded that based on this study, gas assets and services are likely to experience limited impacts and widespread disruptions are not expected due to climate hazards.⁹²

⁹¹ Cal Advocates Comments at 4-5.

⁹² SoCalGas Comments at 1-2.

NRDC asserts that the Working Group 2 meetings lacked scientific expertise, quoting the Data Report: “LBNL replied that more representation from the climate science community would be necessary to determine which data sets were credible and appropriate for use in utility operations and planning.”⁹³ NRDC agrees in principle with Staff’s proposal to establish an ongoing process to determine what climate data should be applied to utility planning processes and how the data should be applied. NRDC submits a proposal for determining what climate data should apply to utility planning in Phase 2.⁹⁴ NRDC proposes more interagency coordination, states how existing state guidance should impact Commission proceedings, advocates a process for identifying information gaps, and suggests developing a list of Commission proceedings where the guidance will apply. In reply comments, SBUA suggests a hybrid approach based on the NRDC proposal and the “Technical Advisory Group” structure proposed by staff.⁹⁵

PG&E raises two concerns regarding Topic 2. First, there is an urgent need for scientifically rigorous guidelines to inform the use of climate data, models, and tools in utility adaptation planning. This includes guidance on how to incorporate periodic updates and advances in climate science. Second, there is a broader need for accessible and consistent climate data information to enable coordinated statewide adaptation action. In the absence of statewide climate adaptation planning guidance, the outcomes of this OIR could serve as *de facto* policy beyond the energy sector.

⁹³ NRDC Comments at 2.

⁹⁴ *Id.*

⁹⁵ SBUA Reply Comments at 4.

PG&E asks that the Commission provide basic guidance regarding climate models, tools, and data for near term adaptation planning. PG&E asks the Commission to endorse an appropriate representative concentration pathway (RCP) and priority Global Climate Models (GCMs), establish guidelines for appropriate data sources beyond Cal-Adapt and associated GCMs, and outline a process for updating available climate data in line with international advances in climate science. Specifically, PG&E asks the Commission to endorse the RCP 8.5 scenario when analyzing impacts as part of utility adaptation planning prior to 2050 and the same four priority GCMs as endorsed by California's Climate Action Team.⁹⁶ PG&E points out that "Planning and Investing for a Resilient California: A Guidebook for State Agencies" already recommends the consistent use of the RCP 8.5 emissions scenario.⁹⁷ In addition, while PG&E agrees that Cal-Adapt be endorsed as a source of data for utility adaptation planning, it asks the Commission to clarify that other high quality data sets should not be excluded.⁹⁸ Finally PG&E recommends that updates to the climate science sources recommended for use in proceedings occur on a regular basis.⁹⁹

SCE encourages the Commission to have close coordination with the CEC to reflect climate information in CEC forecasts. In particular, SCE asks the Commission to work with the CEC to avoid double-counting potential climate change impacts in utility planning. SCE points out the CEC has already adopted RCP 8.5, the high-emissions scenario, in its forecasting process. The CEC has also incorporated assumptions about climate-driven temperature impacts based

⁹⁶ PG&E Comments at 3.

⁹⁷ PG&E Reply Comments at 2.

⁹⁸ PG&E's Comments at 1-5.

⁹⁹ *Id.* at 5.

on this scenario into its 2018 IEPR. According to SCE, the Commission and the CEC should evaluate and confirm the climate change assumptions already embedded in existing forecasts and planning standards.¹⁰⁰

SCE states it is important for the Commission to provide guidance on a reference case containing a selection of appropriate data sources, models and tools for use by utilities to ensure consistency in planning across load serving entities. SCE points out that it is important for the Commission to weigh in on the models used to construct each pathway, as the different models could yield different outcomes, even with a particular RCP scenario.

Various global emissions projections can impact climate variables in California. The models based on the RCP 8.5 scenario in Cal-Adapt help illustrate this point. RCP 8.5 represents a future in which global emissions rise through 2050 and plateau around 2100. To date, California state agencies have aligned around this RCP as a unified planning scenario. To better understand how these global emissions projections could impact climate variables in California, the Cal-Adapt tool displays downscaled LOCA models to represent climate variables for each location within California. While each of these LOCA models predicts that most locations within California will likely be affected by increased temperatures, the LOCA models vary widely in terms of timing, frequency and magnitude of the potential impact of extreme heat for any given location. Therefore, according to SCE, the selection of a LOCA model could have significant downstream impacts for utility planning activities.¹⁰¹

¹⁰⁰ SCE's Comments at 2.

¹⁰¹ *Id.* at 3.

SCE asks the Commission to provide guidance on a reference case with a selection of tools for utilities to use. SCE also wants flexible adaptation guidance so that utilities can assess the impacts of climate change using tools and climate data not contained in the reference case, stating that utilities may benefit from exploring additional data, models and/or tools to better understand the extent to which their specific operations or systems are sensitive to higher levels of climate impacts. Cal-Adapt may not provide for new climate data sets and new approaches. SCE asks for a process by which load serving entities can submit data sets to the Commission for approval.¹⁰²

SCE supports the staff proposal that climate data's resolution should be temporally and spatially appropriate for utility planning. Timescales to be considered for particular variables include hourly (temperature, precipitation, wind, solar radiation, humidity), daily (convective activity, streamflow, snow water equivalent), and yearly (coastal erosion, sea level rise).¹⁰³ Finally, SCE argues that historical observations have a place in informing utility planning and operations and asks the Commission to allow utilities to continue to use historical observations in addition to climate projections in utility planning.¹⁰⁴

SCE and NRDC assert that issues such as wildfire risks must be considered in climate adaptation planning. SCE recommends that the Commission identify ways to integrate adaptation planning across proceedings and state agencies that share responsibility. NRDC suggests that integration can take place in the

¹⁰² *Id.* at 4.

¹⁰³ *Id.* at 5.

¹⁰⁴ *Id.* at 6.

proceedings such as the Safety Model Assessment Proceeding, the Risk Assessment Mitigation Phase and General Rate Cases.¹⁰⁵

SBUA supports establishing criteria that are flexible and allow event-specific modeling, such as years of drought resulting in fires.¹⁰⁶ SBUA believes effective climate change planning must recognize that certain ratepayer groups are uniquely vulnerable to climate change impacts. SBUA stresses that utilities need to be aware of customer vulnerability to climate change so they can develop plans on how to meet the needs of vulnerable customers. SBUA asserts the definition of “vulnerable” should be broader than disadvantaged on a socioeconomic basis and include other vulnerable groups such as small businesses.¹⁰⁷

CEJA and Leadership Counsel urge the Commission to ensure that the climate data inputs utilized by utilities to guide their climate adaptation planning and processes allow for consideration and prioritization of disadvantaged communities. The criteria adopted by the Commission should include socio-economic data such as that provided by CalEnviroScreen, community-based data provided by community-based organizations, data that reflects differences among communities and their vulnerabilities, and data that reflects everyday conditions rather than only extreme events.¹⁰⁸

CEJA and Leadership Counsel support using Cal-Adapt as a primary data tool for adaptation planning given its ability to overlay the CalEnviroScreen data. This data includes evaluation of pollution sources and community vulnerability

¹⁰⁵ SCE Reply Comments at 2.

¹⁰⁶ SBUA Comments at 1.

¹⁰⁷ SBUA Comments at 2-3.

¹⁰⁸ Joint Comments of CEJA and Leadership Counsel at 2.

given socioeconomic criteria, and scores census tracts in California based on their combined pollution burden and population characteristics. Users of Cal-Adapt are able to view and compare predicted climate changes within and between disadvantaged communities.¹⁰⁹ According to CEJA and Leadership Counsel, by ensuring socio-economic factors are included as an input in planning, utilities can properly identify and prioritize these communities.¹¹⁰ CEJA and Leadership Counsel also state that community-based organizations can provide more specific information about differences in community vulnerabilities and adaptation needs than provided by CalEnviroScreen, and that utilities should use such information in their climate adaptation planning when considering community vulnerabilities and prioritization of disadvantaged and vulnerable communities.¹¹¹

CEJA and Leadership Counsel also recommend that any climate data used to determine changes in vulnerabilities or impacts use geographic data at a fine enough resolution to account for these differences. They urge the Commission to adopt a criterion that “climate data should provide the geographical resolution and temporal resolution required for the research or planning at hand” to plan for and prioritize investments in disadvantaged communities.¹¹²

In reply comments, CEJA and Leadership Counsel urge the Commission to be consistent with other state agency data sources that use RCP 8.5 as a baseline model.¹¹³ CEJA and Leadership Counsel agree with PG&E and SCE that the

¹⁰⁹ *Id.* at 4.

¹¹⁰ *Id.* at 5.

¹¹¹ *Id.* at 11.

¹¹² *Id.* at 12.

¹¹³ CEJA and Leadership Counsel Reply Comments at 3.

Commission should adopt RCP 8.5 to allow the utilities to move forward with consistent projections, noting that RCP 8.5 is consistent with other state recommendations and actions.¹¹⁴ CEJA and Leadership Counsel agree with PG&E that while Cal-Adapt should be endorsed as a data tool for utility adaptation planning, this endorsement should not exclude other high-quality data sets.¹¹⁵ CEJA and Leadership Counsel agree with the PG&E and SCE requests that location-appropriate data be used for adaptation planning and that data must be location-appropriate to account for differences between communities and unique vulnerabilities.¹¹⁶

Climate Resolve agrees with other parties that argue it is critical to determine how climate adaptation data and recommendations will be incorporated into the Commission's other proceedings and utility operations. It argues that unless this proceeding clarifies how utility adaptation guidelines will be incorporated into action, utilities, ratepayers and the public will not be protected from climate change impacts. Climate Resolve asks the Commission to focus on each of the specific climate change impacts that are affecting utility operations and identify how adaptation measures can mitigate those specific climate impacts. This includes 1) identifying the location of utility infrastructure that is vulnerable to climate change impacts and developing a vulnerability scale, 2) determining how utility infrastructure and operations may exacerbate climate impacts and how to mitigate those impacts, and 3) working with the CEC to

¹¹⁴ *Id.* at 6.

¹¹⁵ *Id.* at 4-5.

¹¹⁶ *Id.* at 6.

identify how climate impacts will affect energy output from different energy sources.¹¹⁷

GPI agrees with NRDC that the important outcome is to ensure that climate change adaptation is considered in all relevant Commission proceedings, and that science updates are integrated into utility planning for infrastructure investment and operation.¹¹⁸ GPI disagrees with SoCalGas' comments that exposure of natural gas infrastructure to climate change is limited. According to GPI, that conclusion appears premature and not reflective of the full range of possible impacts. GPI agrees with Cal Advocates that Executive Order B-30-15¹¹⁹ provides the appropriate structure and framework for applying data, sources and tools to energy utilities.¹²⁰ Finally, GPI stresses the important secondary impact that climate change will have on energy demands of water utilities.¹²¹

4.4. Discussion

The Scoping Memo lists questions to consider in determining what tools, data sources, and studies the energy utilities should use to examine climate impacts. The most pertinent are:

- Should the Commission adopt certain existing studies as being acceptable data sources for utility decision making in planning for investments and operations?
- Should the Commission adopt certain tools/databases/sources under continual development, such as Cal-Adapt?

¹¹⁷ Climate Resolve Reply Comments at 3-5.

¹¹⁸ Green Power Institute Reply Comments at 1.

¹¹⁹ Executive Order B-30-15 is applicable to all state agencies and equally applicable to private entities within California and requires that data should be forward-looking and reflect rigorous scientific analysis.

¹²⁰ Green Power Institute Reply Comments at 2.

¹²¹ *Id.* at 4.

- Should the Commission require use of certain climate scenarios/timeframes?
- Should the Commission adopt guidance on the use of specific Global Climate Models?
- Should the Commission adopt any general guidance on use of downscaled projections, or other specific types of modeling?¹²²

Several parties believe it is premature to adopt criteria for data sources, tools, and databases now, and request that the Commission solicit additional input from climate scientists. We disagree. While there are some unanswered questions, it is appropriate to establish this guidance that can be updated as climate science evolves. Our guidance can be adjusted as necessary as the Commission, utilities and stakeholders gain experience with using climate change models and data in infrastructure vulnerability assessment, planning, and operational activities.

We turn now to the staff proposal for data guidance, issued on January 23, 2019. The Working Group Session Report on Topic 2, Data Sources, Models, and Tools (Data Report) includes the staff proposal on data selection criteria shown as Appendix 1 to the Data Report. According to the staff proposal, the first step is to develop criteria for the Commission and utilities to identify which existing climate data sets, models, tools, studies, and analysis (“climate data”) are most appropriate for utilities to use for proceedings addressing infrastructure or operations planning in which climate change impact projections should be considered.¹²³ Establishing criteria for data, rather than picking specific models or data sets, allows for flexibility in the choice of data

¹²² Scoping Memo at 5.

¹²³ Staff Proposal, Appendix 1 to Data Report at 12.

sources while allowing some standardization of assumptions that will be inherent in projections.¹²⁴

At the working group meeting on February 4, 2019, stakeholders discussed the staff proposal. Key areas of agreement emerged, including the necessity of considering forward-looking weather and climate data. Parties also agreed that Commission guidance to utilities requires use of the most up-to-date climate projections, evolving climate science and use of Cal-Adapt as a peer-reviewed repository of climate science data that allows users to interact with LOCA downscaled data from the Fourth California Climate Assessment.¹²⁵

The group focused on the climate selection criteria from the staff proposal and a consensus developed around the following guidance:¹²⁶

- The climate data will adhere to selection of Global Climate Models (GCM), climate scenarios, and downscaling techniques provided by the Climate Action Team Research Working Group for the most recent California Climate Change Assessment.
- Climate data should provide the geographical resolution and temporal resolution required for the research or planning at hand.
- Methodology should have demonstrated acceptance by the community-of-practice (Modified from: peer-reviewed methods used to produce data should be given priority over non-peer-reviewed methodologies).
- The data sets replicate, in a statistical sense, historical conditions.

¹²⁴ *Id.*

¹²⁵ Data Report at 4-5.

¹²⁶ Data Report at 5.

- Multiple climate variables (*e.g.*, temperature, precipitation, wind, humidity, solar radiation) should be provided.

Several changes were made to the staff's criteria at the second working group meeting. With respect to Criterion 1, inclusion in a California Climate Assessment should be a sufficient qualifier for use, but not a minimum requirement which might exclude other useful data, such as hydrological data.¹²⁷ In this regard, we agree with the LBNL representative that the better way to think about data guidance is as "best practices" versus "minimum requirements."¹²⁸ According to the Data Report, there was general acceptance of the suggestion that Criterion 1 be modified to apply principles beyond GCMs to ensure other useful climate data such as hydrological data is not excluded. We agree with these comments and they are reflected in the direction we give the utilities today.

With regard to Criterion 2, several parties supported the staff criteria that resolutions should be temporally and spatially appropriate for utility planning. Timescales should include hourly, daily and yearly.¹²⁹ Also, CEJA and Leadership Counsel assert that any climate data used to determine changes in climate impacts or vulnerabilities must include geographic data at a fine enough resolution to account for these differences.¹³⁰ We find merit to these suggestions and will therefore keep Criterion 2 as originally proposed by staff.

As to Criterion 3, staff originally proposed that peer-reviewed methods used to produce data should be given priority over non-peer reviewed

¹²⁷ Data Report at 5.

¹²⁸ *Id.*

¹²⁹ *See, e.g.*, SCE Comments at 5.

¹³⁰ CEJA and Leadership Counsel Comments at 11.

methodologies. This was changed in the working group to the “methodology should have demonstrated acceptance by the community of practice.”¹³¹ We find staff’s initial proposal is clearer and we will therefore adopt Criterion 3 as originally proposed in the staff proposal in our direction to the utilities today.

We agree with removing Criteria 4 and 5 based on the reasons given by the facilitator and based on our review of party comments. Criterion 4, “[t]he data sets replicate, in a statistical sense, historical conditions,” was deleted because it seemed unnecessary, since most modeling data is validated through hindcasting.¹³² Criterion 5, which required multiple climate variables (*e.g.*, temperature, precipitation, wind, humidity, solar radiation) be provided was deleted as possibly too restrictive.¹³³ Although both historical data and climate variables are vital criteria to consider, we agree that Criterion 4 is unnecessary and Criterion 5, by enumerating specific variables, may leave others out.

We take our overarching direction from the most recent Statewide Climate Change Assessment as well as Executive Order B-30-15, applicable to all state agencies and equally applicable to private entities within California, that the data should be forward-looking and reflect rigorous scientific analysis. For other climate variables and climate trend datasets and tools, the utilities should prioritize peer-reviewed methodologies over non-peer reviewed methodologies, as directed by Criterion 3.

¹³¹ See Data Report at t.

¹³² *Id.* We also note here SCE’s assertion that historical observations have a place in formatting utility planning and operations and asks the Commission to allow utilities to continue to use historical observations in addition to climate projections in utility planning. SCE Comments at 6.

¹³³ *Id.*

The utilities are directed to use the California Fourth Climate Change Assessment¹³⁴ and the studies, data, tools,¹³⁵ and models contained in that Assessment when analyzing climate impacts, climate risk, and climate vulnerability of utility infrastructure and operations. If an energy utility sponsors additional studies or research to fill a gap not met by the studies in the Fourth Assessment, then such studies or research shall be derived from or based on the same climate scenarios and projections contained in the Fourth Assessment. To the extent the Fifth Assessment or any future Assessment updates these climate scenarios and projections, the utilities shall align their analyses with the newly adopted scenarios and projections.

By setting out the Fourth Assessment as the primary source of climate change scenarios, studies, and tools for energy utilities to use, we are answering several of the questions asked in the original OIR. Specifically, we adopt the following criteria for use in utility planning processes:

1. This data guidance shall apply to all climate impact, climate risk, and climate vulnerability analyses undertaken by the energy utilities with respect to their infrastructure assets and operations.
2. The energy utilities shall use the tools, scenarios, analyses, and data from the 2018 California Fourth Statewide Climate Change Assessment when analyzing climate impacts, climate risk, and climate vulnerability of utility infrastructure systems and operations. Third party

¹³⁴ See <http://www.climateassessment.ca.gov/>.

¹³⁵ The tools available within the Fourth Climate Assessment include Cal-Adapt (climate change projections and visualizations of climate scenarios), CHAT (expected local heat wave changes over time), CoSMoS (coastal flooding scenarios), HERA (linking flood projections to socioeconomic impacts in coastal communities), Adapt-CA (local government toolkit to implement climate change adaptation measures), and CERI-Climate (evaluate flood and wildfire risk to 600 emergency facilities statewide).

analyses or datasets used by the utilities shall be derived from or based on the same climate scenarios and projections as the most recent Statewide Climate Change Assessment.

- a. The Fourth Assessment uses 10 GCMs (from among more than 30 GCMs used in IPCC studies) and two RCPs, a moderate RCP 4.5 and a business-as-usual RCP 8.5, to simulate California's historical and projected temperatures, precipitation, and other climate impacts and variables such as relative humidity and soil moisture.¹³⁶ Thus, with this guidance to use the Fourth Assessment, the energy utilities will apply studies, tools, and datasets that incorporate the same 10 Global Climate Models, and can examine future projections using the same two Representative Climate Pathways. The Fourth Assessment tools and studies are downscaled to understand impacts at regional levels in California, and thus with this guidance, energy utilities are enabled to use the same downscaled tools and studies.
 - b. If the Fifth Assessment or a future Assessment updates the GCMs and/or selects a different set of GCMs to simulate climate future scenarios in California, or selects a different RCP or RCPs to represent California's emissions pathway, or further enhances the tools and downscaling techniques, the energy utilities shall align their analyses with those updates by filing a Tier 3 Advice Letter with Energy Division within six months of the new Assessment Update.
3. Energy utilities are directed to use the business-as-usual RCP 8.5 for planning, proposed investment and operational purposes. At present, we will not direct the use of a specific planning horizon and will take that up in the forthcoming staff proposal on Topic 5 addressing

¹³⁶ Fourth Climate Change Assessment at 20.

climate change adaptation within the decision-making framework.

4. If there are climate change-driven impacts for which data, tools, or analyses are not available within the Fourth Assessment yet present a needed method of forecasting and analyzing climate-driven risks to utility infrastructure, energy utilities should prioritize peer-reviewed methodologies, use of one or more of the same 10 GCMs as selected in the Fourth Assessment, use of RCP 8.5, and geographic downscaling appropriate to the analysis needed. This topic will be addressed greater detail in the forthcoming staff proposal described below.

The guidance criteria we adopt today is applicable to energy utilities. It is prudent to apply our guidance to gas utilities as well as electric utilities since the full range of possible climate impacts on gas utility infrastructure and operations is far from clear. For this reason, our order today will apply to both electric and gas utilities. If appropriate, we will re-examine this guidance for gas utilities in Phase 2.

4.5. Technical Advisory Group/Expert Panel

4.5.1. Staff Proposal for Expert Panel

As noted above, we defer formation of an expert panel to a subsequent decision, because comments and events have caused us to refine the purpose of the panel. The focus is less on determining which climate models and data are the most up-to-date, since this decision already does that, and more on using experts to determine which of the chosen models and data apply to the energy utilities we regulate, and how to apply them to energy utility systems.

The Staff Proposal on which parties commented recommends formation of a “Technical Advisory Group” consisting of Commission staff, climate science experts, social scientists and energy utility representatives to revise and update climate data criteria. In essence, the proposal is for an expert panel of climate

science data experts who can ensure each year that the energy utilities are using the most up-to-date climate models and data produced or used by agencies of the State of California. Under the recommendation, the panel would conduct the following tasks:

- review existing climate data and assess new, emerging climate data;
- review the criteria for climate data considered suitable for energy utility planning and operations; and
- deliver a report to the Commission on an annual basis that includes:
 - recommendations to the energy utilities on which data are acceptable for use in energy utility adaptation planning;
 - recommendations to the CPUC if and when the panel identifies any changes that it suggests to the data criteria.¹³⁷

4.5.2. Comments on Expert Panel

Cal Advocates, PG&E, SCE, SoCalGas, SBUA, NRDC, CEJA/Leadership Counsel, GPI and Climate Resolve commented on staff's proposal, with the energy utilities and CEJA/Leadership Counsel supporting formation of the expert panel with caveats, and Cal Advocates, NRDC and Climate Resolve suggesting other approaches that rely on existing efforts being carried out by other state agencies and researchers. The key comments expressing concern are that 1) there are already groups working with State government to do the work the proposed panel would do; and 2) the panel must be composed of climate data scientists and related experts.

Cal Advocates and Climate Resolve question the need for a panel at all. Cal Advocates states that panel formation is premature and poses several questions that it believes should be answered in Phase 2 of this proceeding. The

¹³⁷ *Id.*

questions focus on the panel member selection process; panel members' expertise and mandates; and avoiding overlap with pre-existing climate-focused bodies in California.¹³⁸ Climate Resolve asserts that state agencies already possess that expertise and are required to assess and filter new data, make the appropriate updates to climate models, and synthesize recommendations for climate adaptation in their risk area. Climate Resolve asserts that advisory committees often end up being stakeholder-driven bodies rather a group of true technical experts.¹³⁹

The energy utilities support creation of an expert panel, but note that the proposed panel functions will require a highly skilled group of technical experts with, at a minimum, an understanding of climate science and specific climate impacts, decision-making under uncertainty, utility planning processes, and California energy agency processes.¹⁴⁰ PG&E observes that using Cal-Adapt is complex and requires making implicit policy choices about the severity of climate risks for which to plan due to the wide range of data available in the tool, including nine climate variables, two RCPs and up to ten global climate models.¹⁴¹ SCE states that increased representation from the climate science community will help determine the credibility and appropriateness of the data sets being used.¹⁴² SoCalGas agrees that the focus should be on technical expertise.¹⁴³ PG&E and SCE also ask that panel membership include

¹³⁸ Cal Advocates' Comments at 6. GPI raises similar arguments. GPI Reply Comments at 3.

¹³⁹ Climate Resolve Reply Comments at 9.

¹⁴⁰ PG&E Comments at 4.

¹⁴¹ PG&E Comments at 6.

¹⁴² SCE Comments at 6.

¹⁴³ SoCalGas Comments at 1.

representatives of industries to which panel data guidance applies in order to ensure that guidance is provided in forms that can be operationalized.¹⁴⁴

PG&E suggests the panel coordinate with the existing Integrated Climate Adaptation and Resilience Program (ICARP) Technical Advisory Council (TAC), which is composed of public and local government representatives. PG&E recommends that the panel be organized under the auspices the Office of Planning and Research's ICARP program in order to facilitate a "whole-of-government" approach to climate data guidance, promoting consistency and coordination within state government and beyond to the private sector.¹⁴⁵

NRDC submits a proposal, supported by Cal Advocates and SBUA,¹⁴⁶ that involves more interagency coordination, direction on how existing state guidance should impact Commission proceedings, a process for identifying information gaps in existing literature, and a list of relevant Commission proceedings affected by the input, among other recommendations.¹⁴⁷

CEJA and Leadership Counsel request that the panel include either direct DAC representation or consultation with the Commission's Disadvantaged Communities Advisory Group (DACAG).¹⁴⁸

¹⁴⁴ PG&E Comments at 8; SCE Comments at 6.

¹⁴⁵ PG&E Comments at 8.

¹⁴⁶ SBUA Reply Comments at 4-5.

¹⁴⁷ NRDC clarifies its proposal somewhat in the reply comments, stating it represents the end product of the panel's work.

¹⁴⁸ CEJA and Leadership Counsel Comments at 13. The DACAG is a joint CEC-CPUC advisory group required by Senate Bill 350 (Stats. 2015, Ch. 547), codified at Public Utilities Code Section 400(g). As CEJA/Leadership Counsel note, one of the DACAG's five priorities is this climate adaptation proceeding. *See, e.g.*, DACAG July 19, 2019 meeting agenda, available at <https://ww2.energy.ca.gov/sb350/DCAG/documents/index.html>.

4.5.3. Postpone Decision on Expert Panel to Allow Further Input

The comments lead us to conclude that further analysis and input are necessary on the type of panel and its mandate. We agree with Climate Resolve, NRDC, Cal Advocates and the energy utilities that there are existing bodies focused on determining the most up-to-date climate models and data, and this decision answers the question for the foreseeable future. What is lacking is expert input on which model(s) and dataset(s) to apply to energy utility infrastructure and operations, and how to apply such tools to the electric and gas utility context. This task will require familiarity with utility infrastructure and operations as well as knowledge of climate adaptation modeling and data. The essential task will be to use expert input to determine which of the studies within the Fourth Assessment can be used to examine climate impacts on utility operations and infrastructure for the vulnerability assessments the Commission will address as part of Topic 5. We will take additional input on the issue via the Staff Proposal on Topic 5 and address the matter further in a subsequent decision.

5. Categorization and Need for Hearing

This rulemaking is quasi-legislative. There is no need for evidentiary hearings.

6. Comments on Proposed Decision

The proposed decision in this matter was mailed to the parties in accordance with Section 311 of the Public Utilities Code and comments were allowed under Rule 14.3 of the CPUC's Rules of Practice and Procedure. Comments were filed on October 7, 2019 by CEJA and Leadership Counsel, GPI, Cal Advocates, SDG&E, SBUA, SCE and SoCalGas, and reply comments were

filed on October 14, 2019 by CEJA and Leadership Counsel, NRDC, PG&E and SCE. Most of the commenters supported the PD, with some modifications. No legal, factual or policy errors were identified. With respect to Topic 1, the definition of climate change adaptation, parties raised similar arguments as in their initial comments on the Working Group Report and we decline to make any changes to our definition of climate change adaptation for energy utilities at this time. As with all our ordering paragraphs in this decision, as we gain additional understanding of these complex topics, we will make changes as necessary.

Some parties raised the concern that certain ordering paragraphs may go beyond the scope of Topics 1 and 2 and should instead be addressed in Topic 5. We clarify that this proceeding is flexible and Topic 5 is broad enough to further consider the application of data guidance, (including consideration of new data sources), reviewing expectations for utility climate analysis updates, and using specific tools to assess community vulnerabilities and sensitivities, to the extent necessary. In keeping with the spirit of this proceeding, we agree with CEJA/Leadership Counsel¹⁴⁹ that the guidance set forth in this decision does not apply to Sempra's RAMP report due in November 2019.

With respect to Topic 2 – Data Sources, Models and Tools, Cal Advocates and CEJA/Leadership Counsel urge that the PD replace the Peer-Reviewed Standard with a Best Available Science Standard.¹⁵⁰ This was opposed by SCE in its reply comments, which state that SCE supports the PD's directive for utilities to prioritize use of peer-review studies over non-peer-reviewed studies. SCE notes that the best-available science standard advocated by Cal Advocates in

¹⁴⁹ CEJA/Leadership Counsel Reply Comments on PD at 3.

¹⁵⁰ See, e.g., CEJA/Leadership Counsel's Comments on PD at 12.

ambiguous and brings uncertainty to the process of defining what information to use.¹⁵¹ We agree and will keep the Peer-Reviewed Standard as written.

Certain utilities recommended several changes to ordering paragraphs, which we have considered along with other parties' comments, both in support and in opposition to the recommended changes. The first recommended change we address was raised by SDG&E to Ordering Paragraph (OP) 6, which is that utilities should only be required to update climate impact, climate risk, and climate vulnerability assessments if subsequent state Assessments result in significant changes to climate scenarios or projections. We decline to make this change. We agree with CEJA/Leadership Counsel that utilities should be prepared to move quickly to address the impacts of climate change.¹⁵² As always, if an extension of time is warranted for filing advice letters, the utilities are aware that is a possibility.

SCE also recommends a change to OP 4 to clarify that RCP 8.5 should be used directly for utilities' planning activities focused on climate risk analysis and asset vulnerability assessments but should indirectly inform utilities' annual capacity planning and investment activities in terms of the underlying demand forecasts developed by the CEC. In declining to make this change, we note PG&E's reply comments that disagree with SCE's recommendations on this issue. PG&E points out that many of the utility planning processes listed in SCE's comments should take climate change data into account, except for near-term operational planning, which is conducted on a shorter time scale than climate

¹⁵¹ SCE's Reply Comments on PD at 4.

¹⁵² CEJA/Leadership Counsel's Reply Comments on PD at 4.

data can meaningfully inform.¹⁵³ In this regard, we recognize that further discussion is warranted on how climate information is used in various utility processes and proceedings. The Topic 5 working group process will provide an opportunity for stakeholders to comment further on this issue and a subsequent Phase 1 decision may refine the findings and ordering paragraphs made in this decision if necessary.

Finally, SCE recommends that utilities not be limited to the ten global climate models used in the Fourth California Climate Assessment and that OP 3 be modified to clarify that those utilities should use at least those ten models. PG&E agrees with a slightly different wording change: that the utilities shall prioritize those ten models.¹⁵⁴ Despite our concern that the ten GCMs contain a great deal of data, we will make the change to OP 3, as recommended by SCE, to give the utilities additional flexibility in their climate change adaptation planning.

In addition, several typographical corrections have been made throughout the document.

7. Assignment of Proceeding

Liane M. Randolph is the assigned Commissioner and Sarah R. Thomas and Mary McKenzie are the assigned Administrative Law Judges (ALJs) in this proceeding.

Findings of Fact

1. The Commission determined it would adopt a definition of climate change adaptation for energy utilities in Phase 1 of this proceeding.

¹⁵³ PG&E's Reply Comments on PD at 3.

¹⁵⁴ *Id.* at 4.

2. The scoping memo directed the Topic 1 working group to address an appropriate definition of climate change adaptation.
3. Some parties supported the Commission adopting an established definition such as Safeguarding California's or IPCC's definition.
4. The staff proposal considered two definitions in its proposal, USGCPP and PG&E's definition from its 2017 RAMP filing.
5. Some parties supported using a more utility-specific version of the definition than either the two established definitions discussed, Safeguarding California and IPCC, both of which are general and high-level.
6. Some parties supported using a hybrid definition, tailoring an established definition for specific utility needs.
7. Parties expressed preference for the Safeguarding California definition over the IPCC definition.
8. The Safeguarding California definition is used by other state agencies and in the California Climate Assessment.
9. Safeguarding California's definition was vetted by 38 state agencies and is well understood.
10. A hybrid definition based on the Safeguarding California definition should help ensure that climate change adaptation activities undertaken by the California energy sector are consistent with other sectors in California.
11. The hybrid approach should include elements from the Safeguarding California definition as well as elements from the staff proposal.
12. The definition should use the term "impacts" rather than "risks," which fails to capture the scientific observation that climate change and human system interactions cause more changes than simply increased potential for harm.

13. The staff proposal contains many elements applicable to concerns of regulated energy utilities.

14. Including the phrase “utility planning, facilities maintenance and construction, and communications, to maintain safe, reliable, affordable and resilient operations” tailors the definition to energy utilities.

15. It is reasonable to include “strategic” as it implies consideration of cost-benefit analysis in planning and operations.

16. A key purpose of defining climate change adaptation is to make clear that the overriding reason for considering climate change adaptation in their planning, investments and operations is protecting humans.

17. “Resilience” is the achieved outcome of an adaptation strategy.

18. “Resilient” means able to withstand extreme and incremental events and the ability of utility systems to recover when a disruption occurs.

19. It is reasonable for the energy utilities to use the forward-looking climate scenarios and projections used in the most recent Statewide Climate Change Assessment when analyzing climate impacts, risks and vulnerability of utility systems, operations and customers.

20. The energy utilities should support the use of peer-reviewed data over non-peer reviewed data.

21. Climate data should provide the geographical and temporal resolution required for the research or planning at hand.

22. The energy utilities should use RCP 8.5 in their planning activities.

23. Third-party analyses used by the utilities should be based on the same climate scenarios as the most recent Statewide Climate Change Assessment.

24. Utilities should align their analysis with any future statewide Climate Change Assessment updates.

25. The staff report recommended a “Technical Advisory Group” tasked with making recommendations to the energy utilities on which data are acceptable for use in utility adaptation planning.

26. An expert panel or “Technical Advisory Group” focused on which data are acceptable for utility use is not necessary at this time. The Commission will seek input on how to use experts in applying the climate models and data approved in this decision to the electric and gas utility context.

Conclusions of Law

1. It is reasonable to use the Safeguarding California definition as a starting point in the Commission’s hybrid definition of climate change adaptation.

2. The hybrid definition should help ensure that climate change adaptation activities undertaken by the California energy sector are consistent with other sectors in California.

3. The Commission can adjust the climate data as necessary as the Commission, utilities and stakeholders gain experience with using climate change criteria in planning activities.

4. It is reasonable to include “strategic” in the definition as it implies consideration of cost-benefit analysis in planning and operations.

5. “In alignment with state policy goals” should be deleted because there is an implied requirement for utilities to operate in compliance with law and regulations.

6. Executive Order B-30-15, applicable to all state agencies and private entities within California, requires that the data should be forward-looking and reflect rigorous scientific analysis.

O R D E R

IT IS ORDERED that:

1. The definition of climate change adaptation for California's energy utilities is as follows:

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.

2. The data guidance developed herein shall apply to all climate impact, climate risk, and climate vulnerability analyses undertaken by the investor-owned energy utilities with respect to their infrastructure assets, operations, and customer impacts.

3. The energy utilities shall adhere to at least the same climate scenarios and projections used in the most recent California Statewide Climate Change Assessment when analyzing climate impacts, climate risk, and climate vulnerability of utility systems, operations, and customers. Third party analyses or datasets used by the energy utilities should be derived from or based on the same climate scenarios and projections as the most recent Statewide Climate Change Assessment.

- a. The Fourth Assessment uses 10 Global Climate Models and two Representative Climate Pathways to simulate California's historical and projected temperatures, perception, and other climate outcomes such as relative humidity and soil moisture.
- b. If the Fifth Assessment or future Assessment updates these climate scenarios and projections, the energy utilities shall

align their analyses with the newly adopted scenarios and projections.

4. Energy utilities are directed to use the business-as-usual Representative Concentration Pathways 8.5 for planning, investment and operational purposes.

5. For other climate variables and climate trend datasets and tools, energy utilities shall prioritize peer-reviewed methodologies over non-peer reviewed methodologies.

6. If the Fifth Assessment or a future Assessment updates these models, representative concentration pathways, climate scenarios or projections, the energy utilities shall align their analyses with those updates by filing a Tier 3 Advice Letter with Energy Division within six months of the new Assessment update.

This order is effective today.

Dated October 24, 2019, at Redding, California.

MARYBEL BATJER

President

LIANE M. RANDOLPH

MARTHA GUZMAN ACEVES

CLIFFORD RECHTSCHAFFEN

GENEVIEVE SHIROMA

Commissioners