

DOCKETED

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| Document Title: | Notice of Staff Workshop Research to Support a Climate Resilient Transition to a Clean Electricity System |
| Description: | March 5, 2021; 9:30- a.m. - The California Energy Commission (CEC) will host a remote-access workshop seeking public comment on an upcoming solicitation for research to support a climate resilient transition to a clean electricity system. |
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CALIFORNIA ENERGY COMMISSION

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Sacramento, California 95814

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CEC-70 (Revised 1/2021)

*IN THE MATTER OF:*

*Request for Comments on Forthcoming
Solicitation Regarding Research to Support a
Climate Resilient Transition to a Clean
Electricity System*

Docket No. 19-ERDD-01

NOTICE OF REMOTE-ACCESS
WORKSHOP

RE: Forthcoming Solicitation
Regarding Research to Support a
Climate Resilient Transition to a Clean
Electricity System

Notice of Staff Workshop: Research to Support a Climate Resilient Transition to a Clean Electricity System

March 5, 2021

9:30 a.m.

Remote Access Only

The California Energy Commission (CEC) will host a remote-access workshop seeking public comment on an upcoming solicitation for research to support a climate resilient transition to a clean electricity system.

The workshop will be held remotely, consistent with Executive Orders N-25-20 and N-29-20 and the recommendations from the California Department of Public Health, to encourage physical distancing to slow the spread of COVID-19. The public is able to participate in the workshop consistent with the direction in these Executive Orders. There will be opportunities for public comment. Instructions for remote participation via Zoom are below.

Agenda

CEC staff are seeking input from researchers, equity experts, industry leaders, investor-owned utilities (IOUs), and other interested stakeholders to inform the scope of an anticipated solicitation, as well as the processes to facilitate actionable research. The proposed solicitation will support research efforts to establish a scientifically rigorous foundation that fosters and supports climate resilience planning for California's ongoing transition to a clean electricity system and will contribute to implementation of the 2018-2020 Electric Program Investment Charge (EPIC)

Triennial Investment Plan. This workshop will introduce the initial ideas on the scope and focus of two proposed efforts of an EPIC-funded research solicitation, planned for release in the fourth quarter of 2021.

Background for Research Efforts

Effort 1: Assessing and improving the climate resilience of an electricity system in transition

There is an urgent need to better understand the implications of a changing climate on an electricity system that is transitioning to zero-carbon as directed by the goals of Senate Bill (SB) 100. Prior research on long-term energy scenarios for California generally has considered the effects of average climate changes on demand and generation. But heat waves, heavy storms, wildfires, and other climate-related extremes can substantially affect electricity supply and demand, disrupt electricity operations, and damage grid infrastructure. Long-term energy system planning and modeling needs to further incorporate the effects of climate variability and extremes – as well as regional differences in climate change impacts – on the energy system serving California. Incorporating these effects will support meeting the goals of SB 100 in a manner that is resilient to changing climate.

Effort 2: Resiliency of solar, wind, and hydropower generation in a changing climate

Climate change could have substantial impacts on where and when solar, wind, and hydropower resources are available in California. Anticipating these impacts when planning a high-renewables future is crucial to achieving a zero-carbon, reliable, cost-effective electricity grid. Ongoing efforts to generate improved, higher resolution historical datasets and next-generation climate projections provide an opportunity to generate a shared knowledge base for how solar, wind, and hydropower resources may vary and evolve over the coming decades, a period when the state expects to substantially increase its reliance on renewable resources to achieve the goals of SB 100.

The [Appendix](#) below contains additional information regarding key activities expected of applicants for these two efforts and the specific questions on which stakeholder feedback will be solicited at this workshop.

Public Comment

Oral comments will be accepted at the end of the workshop. Comments may be limited to three minutes or less per speaker and one person per organization. See detailed remote attendance instructions below.

Written comments must be submitted to the Docket Unit by 5:00 p.m. March 19, 2021. Comments, attachments, and associated contact information (including address, phone number, and email address) will become part of the public record of this proceeding with access available via any internet search engine.

The CEC encourages use of its electronic commenting system. Visit the [e-commenting page](#), which links to the comment page for this docket. Enter your contact information and a comment title describing the subject of your comment(s). Comments may be included in the "Comment Text" box or attached as a downloadable, searchable document in Microsoft® Word or Adobe® Acrobat®. The maximum file size allowed is 10 MB.

Written comments may be submitted by email. Include docket number 19-ERDD-01 and "Staff Workshop on Research to Support a Climate Resilient Transition to a Clean Electricity System" in the subject line and email to docket@energy.ca.gov.

A paper copy may be sent to:

California Energy Commission
Docket Unit, MS-4
Docket No. 19-ERDD-01
1516 Ninth Street
Sacramento, California 95814-5512

Public Advisor and Other CEC Contacts

The CEC's Public Advisor's Office provides the public with assistance in participating in CEC proceedings. For information on participation or to request interpreting services or reasonable accommodations, please contact Public Advisor Noemí O. Gallardo at publicadvisor@energy.ca.gov, by phone at (916) 654-4489, or toll free at (800) 822-6228. Requests for interpreting services and reasonable accommodations should be made at least five days in advance. The CEC will work diligently to accommodate all requests.

Direct media inquiries to mediaoffice@energy.ca.gov or (916) 654-4989.

Direct technical subject inquiries to Susan Wilhelm at susan.wilhelm@energy.ca.gov or Michael Mastrandrea at michael.mastrandrea@energy.ca.gov.

Direct general inquiries regarding the Staff Workshop on Research to Support a Climate Resilient Transition to a Clean Electricity System to Alexandra Kovalick at alexandra.kovalick@energy.ca.gov or (916) 776-0781.

Remote Attendance

The meeting may be accessed by clicking the Zoom link below or [Zoom](#), <https://join.zoom.us>, by entering the Meeting ID and password for the workshop listed below. If you experience difficulties joining, you may contact Zoom at (888) 799-9666 ext. 2, or the Public Advisor's Office via email or phone.

Link to Workshop: Staff Workshop on Research to Support a Climate Resilient Transition to a Clean Electricity System

<https://energy.zoom.us/j/91714467355?pwd=ZzZQNUt6WFdDeEpaamJuenJqbi9kQT09>

Workshop ID: 917 1446 7355

Workshop Password: resilience

Use the “raise hand feature” to indicate you want to speak and the event facilitator will indicate when your line is open and ready for you to make comment.

To Participate by Telephone, dial (669) 219-2599. When prompted, enter the Meeting ID: 917 1446 7355. To comment, dial *9 to “raise your hand” and *6 to mute/unmute your phone line.

Availability of Documents

Documents and presentations for this meeting will be available at <https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-ERDD-01>

When new information is posted, an email will be sent to those on the EPIC list serve. To receive these notices, subscribe at <https://www.energy.ca.gov/programs-and-topics/programs/electric-program-investment-charge-epic-program> page. Manage existing list serves or sign up for others at [CEC List Servers, https://ww2.energy.ca.gov/listservers/index_cms.html](https://ww2.energy.ca.gov/listservers/index_cms.html).

Dated: 09 February 2021 (of signing), at Sacramento, California



Alexandra Kovalick
Associate Energy Specialist

- List Servers:
- EPIC
- Climatechange
- Opportunity
- Research
- DACAG
- SB350

Appendix of Draft Solicitation Topics on which Staff is Seeking Feedback

Effort 1: Assessing and improving the climate resilience of an electricity system in transition

KEY ACTIVITIES

At a minimum, applicants shall do the following:

- Assess the climate resilience of the electricity system serving California in three time periods: (1) the system of today; (2) modeled system(s) of the future that achieve the goals of SB 100; (3) the modeled system transitioning from (1) to (2). Assess resilience to the effects of climate variability and extremes, as well as the regional distribution of climate change impacts.
- Evaluate strategies for improving the climate resilience of SB 100-compliant long-term scenarios for the electricity sector, in the context of energy system transition pathways consistent with the state's economy-wide carbon neutrality and sectoral decarbonization goals.
- Utilize climate projections based on Coupled Model Intercomparison Project Phase 6 (CMIP6)¹; stakeholder-informed use cases, analytics, and stress tests; and other features (including guidance on model selection for specific applications and representations of uncertainty and variability) of a data platform funded by EPC-20-007.
- Directly engage IOUs and other electricity-sector stakeholders from project inception to completion, leveraging and coordinating with existing stakeholder engagement efforts or related grants (for example, EPC-20-006, EPC-20-007) funded by Grant Funding Opportunity (GFO)-19-311.

Additionally, successful applicants must demonstrate:

- A skilled, well-resourced management team to ensure coordination between the different aspects of the proposed research as well as coordination between related research efforts.
- A clearly articulated approach to stakeholder engagement, including dedicated funding and expertise.

It is also desirable that applicants:

- Develop results and products that facilitate these future analyses:
 - Equity implications of concurrent climate and energy system changes over the next 20-30 years (through mid-century).
 - Economic costs of climate impacts and resilience strategies for California's electricity system.

¹ The Coupled Model Intercomparison Project (CMIP) is a collaborative framework used to analyze, validate, compare, share, and improve climate models in a systematic way, serving as a basis for climate change research and assessments. CMIP Phase 6 (CMIP6) is the most recent and most advanced initiative, using state-of-the-art climate models and scenarios.

- Near-term (sub-seasonal and seasonal to decadal) probabilistic forecasts to inform resilient operations for a grid in transition.
- Seek to extend the capabilities of energy system models to incorporate climate variability and extremes in order to address the requirements listed above, particularly models used in support of state policy and planning by IOUs.
- Illuminate trends (both magnitude and variability) of natural gas demand for electricity generation to inform long-term natural gas planning.

Effort 2: Resiliency of solar, wind, and hydropower generation in a changing climate

KEY ACTIVITIES

At a minimum, applicants shall do the following:

- Generate projected changes in solar, wind, and hydropower resource availability and variability over the next decade and through mid-century. Evaluate changes in each resource individually, their spatial and temporal correlations, and the changing likelihood and scale of extreme events relevant to electricity demand and supply.
- Leverage CMIP6-based climate scenarios, stakeholder-informed use cases and stress tests, and a data platform funded by GFO-19-311.
- Expand consideration of climate-related phenomena that affect solar and wind resources in California and are now better represented in next-generation climate projections (for example, coastal low cloudiness, local-scale wind fields).
- Assess resilience strategies for utilization of California solar, wind, and hydropower resources in the context of grid transitions and SB 100 implementation, including potential roles for offshore wind and long-term energy storage technologies.
- Directly engage IOUs and other electricity-sector stakeholders from project inception to completion, leveraging and coordinating with existing stakeholder engagement efforts under related grants (for example, EPC-20-006, EPC-20-007 funded by GFO-19-311).

Additionally, successful applicants must demonstrate:

- A skilled, well-resourced management team to ensure coordination between the different aspects of the proposed research as well as coordination with related research efforts.
- A clearly articulated approach to stakeholder engagement, including dedicated funding and expertise.

It is also desirable that applicants:

- Support the development of methods for quantifying benefits to reliability of potential resilience strategies.
- Support further integration of climate variability, extremes, and longer-term change and their effects on renewable resources into tools used for electricity planning and infrastructure-related decisions, with direct engagement of electricity-sector stakeholders.

Workshop Questions that will Inform a Future Solicitation:

1. What suggestions would you make to improve the scope and/or focus of these efforts, given the total of \$3 million available for these efforts?
 - a. How can the efforts outlined above best complement and build on other research and analysis efforts?
 - b. How can the efforts outlined above best deliver high-impact, policy-relevant results?
 - c. What are key gaps in knowledge and methods to inform a reliable, resilient transition to a zero-carbon electricity system, as directed by the goals of SB 100?
 - d. Are there other research gaps that are higher priority for fostering electricity-sector resilience than those identified here?
 - e. Specifically, for Effort 1, are there additional follow-on analyses that should be reflected in the GFO language, beyond or instead of the three categories currently listed (equity, costs, probabilistic forecasting)?
 - f. Specifically, for Effort 2, what is the relative priority of wind, solar, and hydropower analyses, given available funds?
2. Where are the highest priorities for extending the capability of energy models to incorporate climate change, variability, and extremes? Are these priorities highest for specific model types (for example, economy-wide energy system models, capacity expansion and resource portfolio investment models, resource adequacy and reliability models)?
 - a. Are current models well-suited for the activities proposed here?
 - b. Should this GFO support extending the capabilities of existing energy models or utilize them in their current form?
3. A goal of this GFO is to apply the next-generation climate projections, analytics, and data platform under development through GFO-19-311.
 - a. What are the highest-priority applications of climate projections and analytics to foster electricity-sector resilience and address research gaps?
 - b. To what extent should these efforts focus on priority climate projections that are anticipated to be identified by GFO-19-311-funded efforts versus the full suite of available downscaled projections based on CMIP6?
4. A total of \$3 million is available for these efforts, with a proposed allocation of \$1.5 million for each effort.
 - a. In what manner should funds be allocated across the two identified efforts?
5. To what extent can the datasets offered as foundational for this initiative (for example, CMIP6 downscaling under EPC-20-006, development of a high-resolution historical dataset under PIR-19-007, and data platform efforts under EPC-20-007 and PIR-19-006) inform climate-resilient operations of a grid in transition through the analyses described in both points a. and b. below?
 - a. Producing relatively near-term (sub-seasonal and seasonal to decadal) probabilistic projections.

- b. Distinguishing projected changes in solar and wind resource availability and variability over the next decade versus through mid-century.