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CEC-70 (Revised 7/22)

IN THE MATTER OF: *Staff Workshop Regarding Modeling and Monitoring Air Quality and Co-Benefits of Energy Interventions to Inform a Clean and Equitable Energy Transition (MAQCEET)*	DOCKET NO. 23-ERDD-01 NOTICE OF "REMOTE-ACCESS" WORKSHOP RE: Request for Comments on Forthcoming Solicitation Regarding Modeling and Monitoring Air Quality and Co-Benefits of Energy Interventions to Inform a Clean and Equitable Energy Transition (MAQCEET)

Notice of Staff Workshop: Funding to Support Modeling and Monitoring Air Quality and Co-Benefits of Energy Interventions to Inform a Clean and Equitable Energy Transition (MAQCEET)

January 30, 2024
10:00 a.m. – 12:00 p.m.
Remote Access Only
See Attendance Instructions.

California Energy Commission (CEC) staff will host a remote-access staff workshop to seek public input on a proposed upcoming solicitation for research to support modeling and monitoring air quality and co-benefits of energy interventions to inform a clean and equitable energy transition (MAQCEET).

The public can participate in the staff workshop consistent with the attendance instructions below. The CEC aims to begin promptly at the start time posted, and the end time is an estimate based on the proposed agenda. The workshop may end sooner or later than the posted end time.

Agenda
CEC staff are seeking input from researchers, industry leaders, equity experts, California Native American Tribes, government agencies, investor-owned utilities, and other interested members of the public to inform the scope of an anticipated solicitation.

The proposed solicitation will support research efforts to improve existing ambient air quality modeling and measurement approaches and conduct analysis to quantify the air quality implications and related human health impacts of clean energy interventions across energy use

sectors. Ultimately, the research will help develop new tools that may monetize non-energy impacts of clean energy interventions.

The workshop will introduce staff's initial ideas on the scope and focus of the proposed solicitation, planned for release by the second quarter of 2024. Staff will invite participants to discuss posed and other public questions and offer suggestions for consideration as staff refines the upcoming solicitation's focus and scope (see attached appendix for workshop discussion questions).

Background

The proposed solicitation will contribute to implementation of the Electric Program Investment Charge (EPIC) 2021-2025 Investment Plan. The proposed research responds to the strategic objective: "Inform California's Transition to an Equitable, Zero-Carbon Energy System that is Climate-Resilient and Meets Environmental Goals" (Chapter 7) and will support Initiative 43, "Evaluating Air Quality, Health, and Equity in Clean Energy Solutions."

Improvement in air quality and related human health outcomes is an important direct benefit of decarbonizing energy sectors that currently rely on fossil fuels. Capturing these impacts is important to motivate investments in decarbonization strategies but is also a challenging task. Computer modeling and field monitoring are two methods that enable quantification of air quality impacts. Ambient air quality modeling tools simulate complex atmospheric chemistry and physics to translate pollutant emissions to concentrations that may result in human exposures to health-damaging pollutants. Ambient measurement instruments monitor air quality in real time at a specific location. Modeling is useful to understand impacts for a large geographical area and population but lacks accuracy in characterizing specific cases or communities due to, for example, the need to make assumptions regarding typical weather patterns. On the other hand, monitoring techniques offer real, on-ground air quality measurements that more accurately portray actual air quality on specific communities, but these measurements are resource-intensive, especially if there is a desire to cover a large geography and population. Further, it can be difficult to disentangle causes of changes to observed air quality, whereas models enable experimental simulations wherein all air-quality-related parameters (e.g., meteorology and atmospheric chemistry) are held constant except for the clean energy interventions of interest. Used together, robust modeling and measurement tools can help to accurately project the air quality-related benefits and ultimately monetize human health impacts of clean energy interventions such as implementation of Senate Bill 100 (SB 100, De León, Chapter 312, Statutes of 2018), transportation electrification, and building electrification.

The proposed research will contribute to improved, robust ambient air quality models and instrumentation and will provide better information and tools to maximize ambient air quality and health co-benefits of clean energy pathways in California.

The attached appendix contains additional information regarding key activities expected of applicants for these efforts and the specific questions on which feedback will be solicited at this workshop.

A draft description of the two proposed efforts follows.

Group 1: Advancing Ambient Air Quality Data and Modeling Capabilities and Analysis (Anticipated Funding: $3 million).

Modeling air quality helps inform future policy decisions. Many air quality models are used in regulatory and research communities, each with strengths and weaknesses. Complex chemical transport models (CTMs) represent state-of-the-science atmospheric models and provide the most robust estimates available when time and computational constraints are not limiting. However, because complex CTMs are time- and resource-intensive, in some cases modelers may prefer reduced-complexity air quality models (RCMs). There are many areas in which air quality models can be improved for greater efficiency, inclusion of multiple pollutants, and improved accuracy of results.

Group 1 will support an applied research project to advance modeling capabilities of ambient air quality models, test optimal and equitable placement of sensors within the current air quality sensor network, and perform analysis using data and air quality models to answer policy-relevant questions.

Group 2: Development of Low-cost Air Quality Sensors to Assess Household Air Pollution (Anticipated Funding: $3 million).

There is need to fill data gaps on indoor air quality in homes to understand air quality-related health consequences of clean energy and energy efficiency interventions, track progress, and identify disparities in air quality impacts. Low-cost air quality sensors present an opportunity to collect data in an inexpensive way but may pose performance and validation issues.

Group 2 will support a research project to identify gaps and challenges in low-cost sensor technology, develop a new low-cost air quality sensor, and validate it in the indoor environment.

Attendance Instructions

Remote participants may join via Zoom by internet or phone.

- **To join via Zoom.** Click on https://energy.zoom.us/j/88592838172?pwd=NjNpamg0Q2hQcHY0d0NITXk1QjVsUT09 or navigate to https://join.zoom.us/ and enter the Webinar ID 885 9283 8172 and passcode maqceet and follow all prompts.
- **To join by telephone.** Call toll-free at (888) 475-4499 or toll at (669) 219-2599. When prompted, enter the Webinar ID 885 9283 8172 and press "#."

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captioning, close the "Live Transcript" or select "Hide Subtitle" from the pop-up menu. If joining by phone, closed captioning is automatic and cannot be turned off. While closed captioning is available in real-time, it can include errors.

Zoom Difficulty. Contact Zoom at (888) 799-9666 ext. 2, or the CEC Public Advisor at publicadvisor@energy.ca.gov, or by phone at (916) 957-7910.

Public Comment.
The CEC encourages the use of its electronic commenting system. Visit the e-commenting page for this docket 23-ERDD-01 at https://efiling.energy.ca.gov/EComment/EComment.aspx? Enter your contact information and a subject title that describes your comment. 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.

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. To comment via Zoom, use the "raise hand" feature so the administrator can announce your name and unmute you. To comment via telephone, press *9 to "raise your hand" and *6 to mute/unmute.

Written comments may be submitted to the Docket Unit by 5:00 p.m. on February 13, 2024.

Written and oral 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. Written comments may also be submitted by email. Include docket number 23-ERDD-01 and "Staff Workshop Regarding Modeling and Monitoring Air Quality and Co-Benefits of Energy Interventions to Inform a Clean and Equitable Energy Transition (MAQCEET)" in the subject line and email to docket@energy.ca.gov.

A paper copy may be mailed to:
California Energy Commission
Docket Unit, MS-4
Docket No. 23-ERDD-01
715 P Street
Sacramento, California 95814

Public Advisor. The CEC's Public Advisor assists the public with participation in CEC proceedings. To request assistance, interpreting services, or reasonable modifications and accommodations, call (916) 957-7910 or email publicadvisor@energy.ca.gov as soon as possible but at least five days in advance of the workshop. The CEC will work diligently to meet all requests based on availability.

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Technical Subject and General Inquiries. Email Maninder Thind at Maninder.thind@energy.ca.gov or call (916) 776-0819.**Availability of Documents:** Documents and presentations for this meeting will be available at 23-ERDD-01, at https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=23-ERDD-01.

When new information is posted, an email will be sent to those subscribed to the Electric Program Investment Charge (EPIC) Program, Energy Research and Development, Disadvantaged Communities Advisory Group, Decarbonization Topics, Climate Change Issues, and Solicitations and Awards Announcements Only list servers. To receive these notices or notices of other email subscription topics, visit Subscriptions, at https://www.energy.ca.gov/subscriptions.

Dated: January 12, 2024 at Sacramento, California.

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Jonah Steinbuck

Director, Energy Research and Development Division

Subscriptions:

Electric Program Investment Charge (EPIC) Program
Energy Research and Development
Disadvantaged Communities Advisory Group
Decarbonization Topics
Climate Change Issues
Solicitations and Awards Announcements Only

Appendix of Draft Solicitation Topics on which Staff is Seeking Feedback

Group 1: Advancing Ambient Air Quality Data and Modeling Capabilities and Analysis.

Research supported by this solicitation aims to improve ambient air quality models and quantification of air quality-related impacts and *must* include:

1. Extensive literature review to identify an existing ambient air quality model to improve or justify development of a new model.
2. Novel methodologies, such as machine learning and artificial intelligence approaches, to improve the existing, or develop the new, model.
3. Using improved or new tools, perform analysis to answer important policy-relevant questions, including, at a minimum:
    a. Quantify air quality and health impacts of clean energy transitions in California, namely Senate Bill 100 (SB 100, De León, Chapter 312, Statutes of 2018) implementation[1], building electrification, transportation electrification, bioenergy deployments, and distributed generation, with particular attention to fine particulate matter ($PM_{2.5}$) and ozone (O_3), which are leading environmental risk factors for premature mortality. Applicants will identify specific questions that need to be addressed in different scenarios of energy interventions.
    b. Clarify how air quality and health implications of clean energy transitions are affected by climate change and community's relative vulnerability to air pollution.
    c. Quantify distributional impacts of existing (for benchmarking) and future clean energy scenarios to underserved communities, including disadvantaged and low-income communities.
    d. Illuminate impacts of residential electrification on outdoor air quality and human health.
    e. Illuminate marginal emission impacts of interventions such as electric vehicles and renewable energy generation.
    f. Develop preliminary estimates that monetize impacts of clean energy interventions to clarify, for example, net costs of electrification by factoring in the non-energy costs with upfront, operational, and maintenance costs. This will provide important empirical grounding for net financial costs to households in underserved communities when switching from gas to electric appliances.
    g. Estimate the combined climate and health impacts of clean energy interventions.
    h. Perform air quality and geographic analysis of existing and future gas power plants to reduce impact of health-damaging pollutants on underserved communities, including disadvantaged and low-income communities.
4. Create a high-resolution spatial tool that informs air quality-related health and monetized benefits as well as implications for underserved communities of future electrification scenarios across energy sectors.
5. Test optimal and equitable placement of sensors within the current air quality sensor network for $PM_{2.5}$, nitrogen dioxide (NO_2), and O_3.

[1] Gill et al. SB 100 Joint Agency Report, Achieving 100 Percent Clean Electricity in California: An Initial Assessment, CEC-200-2021-001 (2021).

- Identify high-priority sensor locations to capture air quality benefits of future clean energy interventions.
- Identify what (if any) improvements are needed to the air quality monitoring network.

Group 2: Development of Low-cost Air Quality Sensors to Assess Household Air Pollution.

Research supported by this solicitation develops an improved low-cost air quality sensor and *must* include:

1. Identification of pollutant[s] of concern (e.g., $PM_{2.5}$, NO_2) for developing the low-cost air quality sensor.
2. Review of literature on performance assessment of existing low-cost sensors.
3. Development of an improved low-cost air quality sensor addressing the identified challenges.
4. Validation of the new low-cost air quality sensor.

Specific research projects may include:

1. Development of wearable air quality sensors to advance research for dynamic and real-time measurements of environmental exposures.
2. Development of methods to link population-based air quality-related health data back into the healthcare system.

Workshop Questions that will Inform a Future Solicitation:

1) What ongoing or planned research efforts should this work coordinate with or leverage to help inform research goals and increase the impact of this effort?
2) How should the study approach be structured to provide insights on the following?
    a. What improvements are needed to the existing ambient air quality models and their validation?
    b. What are the challenges in the existing low-cost air quality sensor technology(ies) and validation?
3) For Group 2, should the focus of a low-cost air quality sensor be for regulatory use and/or public and user-based to collected household air quality data?
4) The proposed funding for Group 1 is $3 million. Is this funding amount sufficient to support research scope of Group 1?
5) The proposed funding for Group 2 is $3 million. Is this funding amount sufficient to support research and development of a new low-cost air quality sensor or improve an existing sensor? If not, are there partnerships that could provide additional support?
6) Any other questions from attendees?