

| <b>DOCKETED</b>         |   |
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| <b>Docket Number:</b>   | 19-ERDD-01  |
| <b>Project Title:</b>   | Research Idea Exchange  |
| <b>TN #:</b>            | 236827  |
| <b>Document Title:</b>  | Staff Workshop Notice - Randomized Trial Study to Determine the Impact of Gas Stove Interventions on Children with Asthma   |
| <b>Description:</b>     | The California Energy Commission (CEC) will host a remote-access workshop on March 2, 2021, 9:30 a.m. - 12:00 p.m. for seeking input from stakeholders on an upcoming solicitation for research to determine the impact of gas stove interventions on children with asthma. |
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| <b>Organization:</b>    | California Energy Commission  |
| <b>Submitter Role:</b>  | Commission Staff  |
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**CALIFORNIA ENERGY COMMISSION**

1516 Ninth Street  
Sacramento, California 95814

[energy.ca.gov](http://energy.ca.gov)

CEC-70 (Revised 1/2021)

*IN THE MATTER OF:*

*Request for Comments on Forthcoming  
Solicitation Regarding Randomized Trial  
Study to Determine the Impact of Gas Stove  
Interventions on Children with Asthma*

Docket No. 19-ERDD-01

NOTICE OF REMOTE-ACCESS  
WORKSHOP

RE: Randomized Trial Study to  
Determine the Impact of Gas Stove  
Interventions on Children with Asthma

**Notice of Staff Workshop****March 2, 2021**

9:30 a.m. – 12:00 p.m.

**Remote Access Only**

The California Energy Commission (CEC) will host a remote-access workshop seeking input from stakeholders on an upcoming solicitation for research to determine the impact of gas stove interventions on children with asthma.

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**

The CEC seeks input from researchers, equity experts, community-based organizations, and other interested stakeholders to inform the scope and structure of an anticipated solicitation. This workshop will introduce initial ideas on the scope and structure of a research solicitation funded by the Electric Program Investment Charge (EPIC), planned for release in the third quarter of 2021. The proposed solicitation would support research to investigate the impact of gas stove interventions -- including electrification of stove equipment -- on children with asthma using a randomized trial study, with a focus on households in under-resourced communities. Research results will provide empirical evidence of health impacts from replacing gas stoves with electric stoves and help policy and decision makers better understand the costs and benefits associated

with building electrification, particularly how it impacts disadvantaged communities and vulnerable populations.

Feedback elicited during this workshop, as well as written public comments submitted to the docket, will inform the specific research goals outlined below.

## **Background**

The *2018-2020 EPIC Triennial Investment Plan* includes the research subtheme "Evaluate Strategies to Mitigate the Impacts of the Electricity System on the Environment and Public Health and Safety." The proposed research in this upcoming solicitation is intended to support California's efforts to electrify residential buildings.

Additional information regarding the issue to be addressed as well as the desired research approach can be found in the [Appendix](#).

## Research Requirements

The CEC envisions funding a single effort through the proposed solicitation addressing the following requirements:

1. **Empirically quantify impact of gas stove electrification on children with asthma in California.** This solicitation aims to primarily focus on asthmatic children in under-resourced communities. The study funded through this solicitation could evaluate the impact on childhood asthma from changes in exposure to pollutants (such as nitrogen dioxide and fine particulate matter) from replacing gas stoves with electric stoves.
2. **Conduct a randomized trial study to determine the impact of replacing gas stoves with electric stoves.** A randomized trial is considered the ideal experimental research design for evaluating the effectiveness of a new intervention. This research will provide empirical evidence for health impacts of gas stove electrification and help guide future intervention policies and strategies.

## Questions

The CEC seeks input from stakeholders on the scope and structure of the proposed research goals. Specifically, staff seeks comments on the following questions:

1. This solicitation prioritizes under-resourced communities, specifically disadvantaged communities and vulnerable populations, as the treatment group.
  - a. Which geographic regions, if any, should be prioritized as initial targets for this research?

- b. Aside from geography, what factors should be considered when determining which communities should be selected as the treatment groups?
  - c. Are there other research study areas or programs that could inform or be leveraged to fulfill the goals and requirements of this research effort?
2. Should the study include children in single family and/or multi-family homes?
3. Previous Randomized Controlled Trial studies have indicated that large sample sizes are needed to make robust conclusions and optimally inform public health standards. What sample size would be desirable for the proposed randomized trials and how many subjects should be included to obtain meaningful results?
4. The proposed funding for this solicitation is \$1 million. Is this funding amount sufficient to support a meaningful study? If not, are there partnerships that could provide additional support?

### **Remote Attendance**

The meeting may be accessed by clicking the Zoom link below or [Zoom](https://join.zoom.us), <https://join.zoom.us>, by entering the Workshop ID and password 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 a Randomized Trial Study to Determine the Impact of Gas Stove Interventions on Children with Asthma

<https://energy.zoom.us/j/94060913656?pwd=RXFOV1VBbGhKeTISNUJNNmR5c3BLdz09>

**Workshop ID:** 940 6091 3656

**Workshop Password:** epic

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 +1 (669) 219-2599 or +1 (877) 853-5257 (Toll Free) or +1 (888) 475-4499 (Toll Free). When prompted, enter the Workshop ID: 940 6091 3656. To comment, dial \*9 to "raise your hand" and \*6 to mute/unmute your phone line.

### **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. If participating via Zoom's online platform, use the "raise hand" feature so the administrator can announce your name and unmute you. If you are participating by telephone, press \*9 to "raise your hand" and \*6 to mute/unmute.

**Written comments** must be submitted to the Docket Unit by **5:00 p.m.** on **March 16, 2021.**

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.

The CEC encourages use of its electronic commenting system. Visit the [e-commenting page](https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=19-ERDD-01) at <https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=19-ERDD-01> 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 "Randomized Trial Study to Determine the Impact of Gas Stove Interventions on Children with Asthma" in the subject line and email to [docket@energy.ca.gov](mailto: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, reach out via email at [publicadvisor@energy.ca.gov](mailto: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](mailto:mediaoffice@energy.ca.gov) or (916) 654-4989.

**Direct technical subject inquiries** to Matt Alexander at [matt.alexander@energy.ca.gov](mailto:matt.alexander@energy.ca.gov) or (916) 654-4466.

**Direct general inquiries** regarding the subject matter of this meeting to Maninder Thind at [maninder.thind@energy.ca.gov](mailto:maninder.thind@energy.ca.gov) or (916) 776-0819.

### **Availability of Documents**

Documents and presentations for this meeting will be available at docket number [19-ERDD-01](https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=19-ERDD-01) 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 list serves provided at the bottom of this notice. 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: Thursday, February 17, 2021, at Sacramento, California

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Maninder Thind  
Air Resources Engineer

List Servers:

EPIC

Opportunity

Research

DACAG

Climate Change

## Appendix

### The Issue Addressed in the Research Concept:

Indoor air pollution caused by gas stove combustion in kitchens is a public health issue as indoor air is largely unregulated in the United States and is often more polluted than outdoor air. In 2019, approximately 9 million California households used natural gas for cooking (U.S. Census Bureau 2020).

Natural gas combustion for household cooking is a large source of health-damaging pollutants including nitrogen dioxide (NO<sub>2</sub>) and fine particulate matter (PM<sub>2.5</sub>) in the indoor environment where children spend most of their time. Gas stove combustion in California homes routinely exposes children to pollutant concentrations that are considered harmful outdoors. Previous research has documented risks to respiratory health associated with gas stove pollution. Children are at higher risk of developing childhood respiratory illnesses such as asthma due to air pollution exposures (Vrijheid 2014, U.S. Environmental Protection Agency 2016). Furthermore, even at relatively low concentrations, well below the U.S. Environmental Protection Agency ambient air quality standard of 53 parts per billion NO<sub>2</sub>, exposures to NO<sub>2</sub> can increase asthma morbidity among children (Belanger, et al. 2013). A 2013 meta-analysis found that children in homes with gas stoves have a 42 percent increased risk of having current asthma, a 24 percent increased risk of lifetime asthma and an overall 32 percent increased risk of having current and lifetime asthma (Lin, Brunekreef and Gehring 2013). In particular, asthmatic children living in disadvantaged and lower-income communities are likely the most disproportionately burdened by indoor air pollution from gas stoves (U.S. Environmental Protection Agency 2016, Hansel, et al. 2008). California has made substantial progress toward reducing indoor air pollution, through efforts such as improved ventilation as required by Building Energy Efficiency Standards and decarbonization efforts that support building electrification. To appropriately incentivize such efforts and support policies that maximize health co-benefits of energy policies, systematic measurement of health impacts of gas stove interventions is needed, particularly health impacts to children and other vulnerable sub-populations in low-income and disadvantaged communities.

### The Research:

Electrification has been identified as a clean, low-cost strategy for decarbonizing buildings (Aas, et al. 2020, Billimoria, et al. 2018) which contributes to improving indoor air quality as well. In an intervention study, researchers found that replacing a gas stove with an electric stove decreased median NO<sub>2</sub> concentrations by 51 percent in the kitchen (Paulin, et al. 2014). While a few studies in Canada and the United States have looked at impacts of gas stove interventions, such as improved ventilation and air cleaners, on children with asthma (Lajoie, et al. 2014, Butz, Matsui and Breyse 2011, Moreno-Rangel, et al. 2020), there are no known studies that directly investigate the impact of electrification on asthma outcomes. There is a need for studies that further evaluate the impact of replacing gas stoves with electric stoves on childhood asthma (Seals and Krasner 2020), as well as large-scale studies that verify the effectiveness of household gas stove interventions (Moreno-Rangel, et al. 2020). As electrification policies are developed, it is

crucial that policy and decision makers “take steps to understand the costs and benefits of building electrification to low-income residents, communities of color, and other underrepresented populations” (Maurissa Brown 2020). Integrating health benefits of these vulnerable populations is critical to ensuring equitable energy transitions in California.

We propose a randomized trial study to determine the impact of gas stove interventions on children with asthma. The randomized trial is considered the ideal experimental research design for evaluating both the effectiveness and the side effects of new intervention. In such a trial, randomization is used to prevent any potential biases on the part of the investigators from influencing the assignment of participants to different treatment groups. A multitude of factors, including, but not limited to smaller unit size, more people inside the home (occupant density), inadequate stovetop ventilation, and variable cooking practices contribute to elevated concentrations of NO<sub>2</sub> and PM<sub>2.5</sub> and increased asthmatic risk for the exposed children. These factors will need to be taken into consideration in this study.

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