

DOCKETED

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Document Title:	Notice of Staff Workshop to Discuss Heating, Ventilation and Air Conditioning (HVAC) Research and Development
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Filer:	Anthony Ng
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In the matter of:)	Docket No. 16-EPIC-01
)	
California Energy Storage)	STAFF WORKSHOP
_____)	RE: Heating Ventilation and Air Conditioning

Notice of Staff Workshop to Discuss Heating, Ventilation and Air Conditioning (HVAC) Research and Development

California Energy Commission staff will conduct a public workshop to discuss the current state of HVAC technologies needed to help meet California's greenhouse gas (GHG) reduction and low global warming potential (GWP) refrigerant goals. This information will help inform future research needs. Commissioners may attend and participate. The workshop will be held on:

THURSDAY, December 21, 2017
Beginning at 10:00 a.m.
CALIFORNIA ENERGY COMMISSION
1516 9th Street
First Floor, Rosenfeld Hearing Room
Sacramento, California
(Wheelchair Accessible)

Remote Access Available by Computer or Phone via WebEx™ (Instructions below)

Purpose

The workshop provides an opportunity to discuss:

- Current state of HVAC technologies needed to meet California's greenhouse gas reduction and low global warming potential refrigerant challenges
- Manufacturer and customer perspectives on HVAC technologies needed
- Future innovations needed in the 5 to 10 year timeframe

Background

Heating, ventilation and air conditioning systems are among the largest consumers of electricity. In California, the energy consumed to heat and cool buildings uses roughly 40 percent of total electricity consumed. Furthermore, this demand will likely increase as California's climate warms. There is strong impetus to focus on HVAC and refrigeration systems that have low greenhouse gas emissions, and use refrigerants with low global warming potential while being highly efficient. The emphasis on decarbonization puts greater emphasis on finding solutions that would apply to most California climates, are cost effective, and do not impact the grid. Examples could be increased use of electric heat pumps, compressor-free systems, natural ventilation potential for future enhancements in compressor and heat exchanger technology.



The California Energy Commission administers the electricity and natural gas related research and development activities funded by surcharges on electricity and natural gas bills of investor-owned utility customers.

- **Electric Program Investment Charge (EPIC):** EPIC funds clean energy technology projects that promote greater electricity reliability, lower costs, and increased safety. Annual funding is approximately \$160 million with 80 percent administered by the Energy Commission and 20 percent by the three electric IOUs. The Energy Commission funding is awarded through competitive R&D solicitations. Energy efficiency related research is approximately one third of the budgeted funds. Information on the EPIC program can be found at: <http://www.energy.ca.gov/research/epic/index.html>.
- **Natural Gas Research and Development:** The purpose of the program is to fund research that focus on improving natural gas energy efficiency and environmental quality. Annual funding is \$24 million and the funding is awarded through competitive R&D solicitations. Energy efficiency is approximately one third of the budgeted funds. Information on the Natural Gas R&D program can be found at: <http://www.energy.ca.gov/contracts/pier.html>.

Information on past grants for HVAC projects can be found at: <http://innovation.energy.ca.gov/>.

Agenda

Please see attached agenda. The agenda will also be posted online at: www.energy.ca.gov/research/epic/documents/#wkspmeetings.

Public Comment

Oral comments: The Energy Commission will accept oral comments at the workshop. Comments may be limited to three minutes per speaker. Any comments will become part of the public record.

Written comments: Written comments should be submitted to the Dockets Unit by 5:00 p.m. on Thursday, January 11, 2018. All written comments will become part of the public record.

For the Staff Workshop to Discuss Heating, Ventilation and Air Conditioning Research and Development the Energy Commission is using an electronic commenting system. Visit our website at: <https://efiling.energy.ca.gov/Ecomment/Ecomment.aspx?docketnumber=16-EPIC-01> to add comments to the **16-EPIC-01** EPIC Ideas Exchange docket. Please enter your contact information and indicate "HVAC" in your comment title. You may include comments in the box titled "Comment Text" or attach a file with your comments. Attached comments must be in a Microsoft® Word (.doc, .docx) or Adobe® Acrobat® (.pdf) formatted file.

The Energy Commission encourages use of its electronic commenting system, but written comments may also be submitted by e-mailing them to the Dockets Office, or by U.S. Mail to:



California Energy Commission
Dockets Office, MS-4
Re: Docket No. 16-EPIC-01
1516 Ninth Street
Sacramento, CA 95814-5512

If you choose not to use the electronic filing system, please include the appropriate docket number on any e-mailed or written comments. Comments may be e-mailed to docket@energy.ca.gov.

Please note that your electronic, e-mailed, written and oral comments, attachments, and associated contact information (for example, address, phone, and e-mail) become part of the viewable public record. Additionally, this information may become available via Google, Yahoo, and other search engines.

Public Adviser and Other Commission Contacts

The Energy Commission's Public Adviser's Office provides the public assistance in participating in Energy Commission activities. If you want information on how to participate in this workshop, please contact the Public Adviser, Alana Matthews, by e-mail at PublicAdviser@energy.ca.gov or (916) 654-4489, or toll free at (800) 822-6228.

If you have a disability and require assistance to participate, please contact Poneh Jones by e-mail at poneh.jones@energy.ca.gov or (916) 654-4425 at least five days in advance of the workshop.

Media inquiries should be sent to the Media and Public Communications Office by e-mail at mediaoffice@energy.ca.gov or (916) 654-4989.

If you have questions on the technical subject matter of this meeting, please contact Bradley Meister by e-mail at brad.meister@energy.ca.gov or phone at 916-327-1722.

Notices and documents for this workshop are posted to the Energy Commission website at <http://www.energy.ca.gov/research/epic/documents/#wkspmeetings>.

Remote Attendance

You may participate in this meeting through WebEx, the Energy Commission's online meeting service. Presentations will appear on your computer screen, and you may listen to the audio via your computer or telephone. Please be aware that the meeting may be recorded.

To join a meeting:

VIA COMPUTER: Go to

<https://energy.webex.com/energy/onstage/g.php?MTID=e131849ca5bd0e4f89a0322463ac06c9e>
and enter the unique meeting number (923 712 737): No password is required.

Attendees signing in for this workshop will be asked a few brief questions as part of the Commission diversity survey and are encouraged to provide feedback.

The "Join Conference" menu will offer you a choice of audio connections:



1. To call into the meeting: Select "I will call in" and follow the on-screen directions.
2. International Attendees: Click on the "Global call-in number" link.
3. To have WebEx call you: Enter your phone number and click "Call Me."
4. To listen over the computer: If you have a broadband connection, and a headset or a computer microphone and speakers, you may use VoIP (Internet audio) by going to the Audio menu, clicking on "Use Computer Headset," then "Call Using Computer."

VIA TELEPHONE ONLY (no visual presentation): Call (866) 469-3239 (toll-free in the U.S. and Canada). When prompted, enter the unique meeting number: 923 712 737. International callers may select their number from <https://energy.webex.com/energy/globalcallin.php>.

VIA MOBILE ACCESS: Access to WebEx meetings is now available from your mobile device. To download an app, go to www.webex.com/overview/mobile-meetings.html.

If you have difficulty joining the meeting, please call the WebEx Technical Support number at (866) 569-3239.

Availability of Documents

Documents and presentations for this meeting will be available online at:

<http://www.energy.ca.gov/research/epic/documents/#wkspmeetings>.

Mail Lists:

EPIC listserv
Research listserv
Opportunity listserv
Naturalgas listserv
Efficiency listserv



Heating, Ventilation and Air Conditioning Research and Development Workshop

December 21, 2017, 10:00-4:30 PDT
1516 9th St., Arthur Rosenfeld Hearing Room, Sacramento, CA 95814

Topic	Time
1. Welcome – Bradley Meister <ol style="list-style-type: none"> a. Introductions b. Purpose of Workshop/Workshop Format 	10:00
2. Panel One: Current State of HVAC Technologies Needed to Meet California’s GHG and GWP Refrigerant Challenges <ol style="list-style-type: none"> a. Are electric heat pumps the answer? Why or why not? b. What is preventing widespread adoption or use, for new construction and retrofits? c. What other HVAC technologies have potential? d. What is the commercial status? e. What is preventing widespread adoption of these technologies for new construction and retrofits? f. What research is needed to encourage widespread adoption? <ol style="list-style-type: none"> i. Technology improvements ii. Equipment cost iii. Lack of operating data iv. Cost effectiveness g. What research is needed with respect to low GWP refrigerants for HVAC systems? And commercial refrigeration systems? 	10:30-12:30
3. Panel Two –Manufacturer and customer perspective? <ol style="list-style-type: none"> a. What do building owners want? <ol style="list-style-type: none"> i. Residential ii. Commercial iii. Multifamily-low income b. How are manufacturers positioning themselves to meet these needs? c. First cost versus operating costs? d. What is the time frame for replacement? 	1:30 3:00
4. Panel Three –Future innovations needed in the 5-10 year time frame? <ol style="list-style-type: none"> a. Compressor-less Cooling? b. Improvements in heat exchangers c. Integrated low energy HVAC systems, with controls <ul style="list-style-type: none"> • Discuss the innovations needed? • What should be the focus of research in the near term? • What policy or regulatory changes needed? • What market changes will be needed to see these innovations realized? 	3:00-4:00
5. Wrap up and Next Steps	4:00-4:30