

## DOCKETED

<b>Docket Number:</b>	16-EPIC-01
<b>Project Title:</b>	EPIC Idea Exchange
<b>TN #:</b>	222069
<b>Document Title:</b>	Agenda for Staff Workshop on Heating, Ventilation, and Air Conditioning Research and Development
<b>Description:</b>	Agenda
<b>Filer:</b>	Anthony Ng
<b>Organization:</b>	California Energy Commission
<b>Submitter Role:</b>	Energy Commission
<b>Submission Date:</b>	12/28/2017 10:50:42 AM
<b>Docketed Date:</b>	12/28/2017



## Heating, Ventilation and Air Conditioning Research and Development Workshop

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

Topic	Time
1. Welcome – Bradley Meister <ul style="list-style-type: none"> <li>a. Introductions</li> <li>b. Purpose of Workshop/Workshop Format</li> </ul>	10:00
2. Panel One: Current State of HVAC Technologies Needed to Meet California’s GHG and GWP Refrigerant Challenges <ul style="list-style-type: none"> <li>a. Are electric heat pumps the answer? Why or why not?</li> <li>b. What is preventing widespread adoption or use, for new construction and retrofits?</li> <li>c. What other HVAC technologies have potential?</li> <li>d. What is the commercial status?</li> <li>e. What is preventing widespread adoption of these technologies for new construction and retrofits?</li> <li>f. What research is needed to encourage widespread adoption?               <ul style="list-style-type: none"> <li>i. Technology improvements</li> <li>ii. Equipment cost</li> <li>iii. Lack of operating data</li> <li>iv. Cost effectiveness</li> </ul> </li> <li>g. What research is needed with respect to low GWP refrigerants for HVAC systems? And commercial refrigeration systems?</li> </ul> Presenters: <ul style="list-style-type: none"> <li>1) Mark Modera – Western Cooling Efficiency Center</li> <li>2) Jason Meggs – California Air Resources Board</li> <li>3) Ram Narayanamurthy – Electric Power Research Institute</li> <li>4) Carl Hiller – Applied Energy Technology</li> </ul>	10:30-12:30
3. Panel Two –Manufacturer and customer perspective? <ul style="list-style-type: none"> <li>a. What do building owners want?               <ul style="list-style-type: none"> <li>i. Residential</li> <li>ii. Commercial</li> <li>iii. Multifamily-low income</li> </ul> </li> <li>b. How are manufacturers positioning themselves to meet these needs?</li> <li>c. First cost versus operating costs?</li> <li>d. What is the time frame for replacement?</li> </ul> Presenters: <ul style="list-style-type: none"> <li>1) Sean Armstrong – Redwood Energy</li> <li>2) Barry Giles – BRE America</li> <li>3) Ram Narayanamurthy – Electric Power Research Institute</li> <li>4) Rob Hammond – BIRA Energy</li> <li>5) Ryohei Hinokuma –Daikin North America</li> </ul>	1:30 3:00

<p>4. Panel Three –Future innovations needed in the 5-10 year time frame?</p> <ul style="list-style-type: none"> <li>a. Compressor-less Cooling?</li> <li>b. Improvements in heat exchangers</li> <li>c. Integrated low energy HVAC systems, with controls</li> </ul> <ul style="list-style-type: none"> <li>• Discuss the innovations needed?</li> <li>• What should be the focus of research in the near term?</li> <li>• What policy or regulatory changes needed?</li> <li>• What market changes will be needed to see these innovations realized?</li> </ul> <p>Presenters:</p> <ol style="list-style-type: none"> <li>1) Curtis Harrington – Western Cooling Efficiency Center</li> <li>2) Fred Bauman – Center for the Build Environment</li> <li>3) Jason Meggs – California Air Resources Board</li> </ol>	<p>3:00-4:00</p>
<p>5. Wrap up and Next Steps</p>	<p>4:00-4:30</p>