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<th><strong>Docket Number:</strong></th>
<th>21-IEPR-06</th>
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<tr>
<td><strong>Project Title:</strong></td>
<td>Building Decarbonization and Energy Efficiency</td>
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<td><strong>TN #:</strong></td>
<td>239660</td>
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<tr>
<td><strong>Document Title:</strong></td>
<td>Presentation - Quality Installation of Heating and Air Conditioning Equipment</td>
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<tr>
<td><strong>Description:</strong></td>
<td>1.0 Bill Pennington, CEC</td>
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<td><strong>Filer:</strong></td>
<td>Raquel Kravitz</td>
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<td><strong>Organization:</strong></td>
<td>California Energy Commission</td>
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<td><strong>Submitter Role:</strong></td>
<td>Commission Staff</td>
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<tr>
<td><strong>Submission Date:</strong></td>
<td>9/9/2021 7:41:44 PM</td>
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<td><strong>Docketed Date:</strong></td>
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IEPR Workshop

Quality Installation of Heating and Air Conditioning Equipment

Bill Pennington, Advisor to Commissioner McAllister for Building Efficiency Standards

September 10, 2021
Quality Installation Standards

• CEC Interest in energy savings from quality installation from 1990’s
• Extensive research found poor installation undermines efficiency improvements
  • Proper installation leads to energy savings = 30-40%
  • Defects can also result in comfort and indoor air quality problems
• Active in development of ASHRAE standard for duct leakage testing
• Collaborative with CBIA and IOUs on installation protocols
• California field research for HVAC installation problems
• Building Standards field verification process from 1998
• Quality installation in the Building Standards from 2001 for Newly Constructed Buildings … from 2005 for HVAC change-outs
AB 2021 (2006): develop a plan to improve the energy efficiency and decrease the peak electricity demand of air-conditioners

CEC/CPUC formed a 45-member working group of HVAC professionals to prepare the plan

Working group identified widespread lack of quality installation of HVAC systems increasing peak demand by 20 to 30%

Only 10% of 350,000 annual residential replacement installations are done with building permits

Only 15% of all installations would meet CEC quality installation standards

Estimated if 85% met CEC quality installation standards, save annually 130 MW (about 80% of entire energy efficiency program of SCE)
Actions Taken

• 2 CEC/CSLB MOUs to coordinate – CSLB stings, industry information
• CPUC formed Western HVAC Performance Alliance – action plan
• Compliance Improvement Advisory Group – white papers
• ARRA funded programs – encourage permits, improved quality
• AG’s Office request for utility rebates – owner declaration: “installed … in accordance with all applicable permitting requirements, and where applicable by a licensed contractor”
• 2017 CPUC/DNV-GL: 7.9% permit rate; 1 million annual change-outs
• Well-intended actions have failed to move the needle
• Industry remains challenged to improve performance
Legislation

- AB 350 (2015) – Clean Energy and Pollution Reduction Act
  - “ensure that retrofits meet high-quality performance standards and reduce energy savings lost due to poor-quality workmanship”

- SB 1414 (2016)
  - “approve a plan that will promote compliance with Part 6 of Title 24 … in the installation of central air-conditioning and heat pumps”
  - “adopt regulations to increase compliance with permitting and inspection requirements … and associated sales and installations”

- SB 1383 (2016)
  - Reduce emissions of short-lived climate pollutants to achieve a reduction in … hydrofluorocarbon gases by 40% … by 2030
Climate Change Imperative

- EO B-55-18: “achieve carbon neutrality … no later than 2045”
- Governor Newsom, September 11, 2020:
  - We’re in a climate crisis … There is no doubt climate change is here and is happening faster than most had anticipated.
  - We’re going to have to fast track our efforts. We’re going to have to be more aggressive in terms of meeting our goals much sooner.
- Building decarbonization calls for rapid expansion of use of heat pumps for space heating systems
- Quality installation problems lead not only to energy losses but also to refrigerant loss to the atmosphere, both compromising GHG reductions
- More critical than ever to find ways to improve quality installation