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California's Heat Pump and Decarbonization Goals

April 5, 2022

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- Senate Bill 32 (Pavley, Chapter 249, Statutes of 2016) calls for a statewide reduction of greenhouse gas emissions of 40 percent below 1990 levels by 2030.
- Assembly Bill 3232 (Friedman, Chapter 373, Statutes of 2018) required the CEC to assess the potential to reduce greenhouse gas emissions from residential and commercial buildings by 40 percent of 1990 levels by 2030.



1. Building end-use electrification

2. Decarbonizing electricity generation system

3. Energy efficiency

4. Refrigerant conversion and leakage reduction

5. Distributed energy resources

6. Decarbonizing gas system

7. Demand flexibility



Some conclusions from the assessment:

- Large-scale deployment of electric heat pumps
- Large investments in existing buildings needed
- Refrigerant leakage reduction is critical
- Evaluate decarbonization actions through equity lens
- Government and stakeholder collaboration needed

Source: Kenney, Michael, Nicholas Janusch, Ingrid Neumann, and Mike Jaske. 2021. California Building Decarbonization Assessment. California Energy Commission. Publication Number: CEC-400-2021-006-CMF.



Few electric heat pumps used in California today

- In 2021, roughly 600,000 residential heat pumps used in California (CEC staff; based on 2019 RASS and 2021 DOF estimates)
- Not enough heat pumps projected to be installed from existing and proposed programs
 - Majority of heat pump installations will be in new construction buildings due to California's building energy standards (Title 24, Part 6)
 - Will need substantially more installations in existing buildings to achieve the AB 3232 direct-emissions goal
- Manufacturing capacity constraints
 - According to the US EPA,104,000 Heat Pump Water Heaters shipped nationwide in 2020 (84,000 were shipped in 2019)

Source: ENERGY STAR® Unit Shipment and Market Penetration Report Calendar Year 2020 Summary.



- In the 2021 Integrated Energy Policy Report, the CEC recommended a goal of installing at least 6 million heat pumps by 2030.
- The CEC commits to working with manufacturers, labor, environmental advocates, and other stakeholders to accelerate the market to meet this goal and to push beyond it toward comprehensive migration to heat pumps for space and water heating.



Thank you

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