

Accelerating Multifamily Building Upgrades

Project Overview

StopWaste received a Local Government Challenge grant from the California Energy Commission (CEC) to carry out its *Accelerating Multifamily Building Upgrades* project. The project's goal was to develop resources and tools to increase the pace and scale of retrofits that reduce greenhouse gas emissions in California's existing multifamily housing sector. The grant contract began in 2017 and ended in December 2020.

EnergyPro Lite Multifamily Energy Modeling for the Real World

NO-COST LICENSE FOR CITIES AND ENERGY EFFICIENCY PROGRAMS

- ★ A streamlined version of the EnergyPro software, developed specifically for use with existing multifamily buildings.
- ★ Now freely available to cities and energy programs through a grant from the California Energy Commission.
- ★ Easy-to-use software includes a comprehensive manual and clear, owner-facing reports.
- ★ All-in-one tool for evaluating energy upgrades:
 - No-cost license
 - Lighting
 - Domestic hot water
 - HVAC
 - Building envelope
 - Water conservation
 - Electrification
 - Owner AND tenant savings
 - CPUC ratepayer program approved
- ★ Can model ANY existing multifamily building (5+ units):
 - Low-rise, high-rise, garden-style
 - Affordable, low-income, market-rate
 - Rentals and condominiums
 - Common area and in-unit energy baselines and savings estimates
- ★ Upcoming features:
 - Measure cost and payback
 - Site-specific energy rates

Under 2 Hours TO CREATE FULL MODEL AND PROJECT SCOPE

460 PROJECTS MODELED TO DATE REPRESENTING 31,400 UNITS

CURRENTLY USED BY: BAYREN MULTIFAMILY, PG&E Multifamily Upgrade Program, BERKELEY

QUESTIONS? CONTACT: Ben Cooper, bcooper@StopWaste.org, 510-891-6511

STOPWASTE at home at work at school

FEA REGIONAL ENERGY EFFICIENCY

ENERGY-SOFT

The project had four main deliverables:

1. Developing a low-cost, easy-to-use software tool for modeling energy upgrades and estimating savings in existing multifamily buildings
2. Researching and evaluating opportunities for California cities and counties to adopt energy upgrade policies applicable to the rental housing sector and make recommendations to improve resident access to energy efficiency data

3. Providing benchmarking technical assistance to multifamily building owners and developing a benchmarking protocol to help ensure that AB 802 benchmarking/disclosure requirements are feasible for the multifamily sector
4. Developing policy and technical guidance for the cost-effective electrification of California's existing multifamily buildings

These deliverables are available [at the Stop Waste website](https://www.stopwaste.org/accelerating-multifamily-building-upgrades)
<https://www.stopwaste.org/accelerating-multifamily-building-upgrades>

Lead Agency and Partnerships

The CEC provided the grant funding via the United States Department of Energy (DOE) American Recovery and Reinvestment Act of 2009 (ARRA). StopWaste managed the project. The Association for Energy Affordability (AEA), Franklin Energy (formerly Build It Green) and EnergySoft were the technical subcontractors.

Drivers

California has more than 3.3 million multifamily buildings, representing about 24% of the state's residential buildings. Under current market conditions and regulations, the state will not achieve its goal of reducing the energy consumption of these buildings by 50% by 2030. Market barriers to achieving scale in the multifamily retrofit sector include the split incentive (owner reluctance to invest if savings accrue to residents), ownership/management structures complicating decision making, decision makers' lack of confidence in energy savings calculations, and lack of integration among existing programs.

This project developed tools and resources to help address these and other barriers in order to accelerate energy upgrades in California's multifamily buildings.

Engagement Process

This project's deliverables had different but often overlapping stakeholders, including:

- Multifamily incentive programs such as BayREN's Bay Area Multifamily Building Enhancements (BAMBE), PG&E's Multifamily Upgrade Program and Low-Income Weatherization Program (LIWP)
- PG&E's Codes & Standards Program
- Multifamily energy efficiency NGOs such as EE Collaborative, ACEEE Multifamily Working Group, and RMI
- Local government sustainability organizations including Bay Area Air Quality Management District (BAAQMD), Green Cities California, Local Government Sustainable Energy Coalition (LGSEC), California Building Officials (CALBO), and League of California Cities
- Affordable housing entities
- Apartment rental and listing platforms

Climate Impact Area

The project's deliverables address upgrades in existing multifamily buildings that reduce greenhouse gas emissions. The project advances key strategies connected to the State of California's Existing Buildings Energy Efficiency Action Plan specific to the multifamily sector, supports the implementation of SB 350 (Clean Energy and Pollution Reduction Act), and provides foundational support for the implementation of AB 802 (Benchmarking and Public Disclosure).

Funding Source

The project was funded with \$1 million of American Recovery and Reinvestment Act of 2009 (ARRA) funds through the CEC's Local Government Challenge grant program.

Research and Data

Research methods and data sources were specific to each of the deliverables, which are available [on the Stop Waste website](https://www.stopwaste.org/accelerating-multifamily-building-upgrades) <https://www.stopwaste.org/accelerating-multifamily-building-upgrades>

Challenges

For the *Rental Housing Inspection Programs in California* report, challenges included lack of data sources that catalog rental ordinances, and difficulty getting local jurisdiction staff to complete the project's online survey or respond to interview requests within the project's timeframe. Ultimately, 46 jurisdictions responded and provided useable data. While this sample size was not large enough to allow for an accurate extrapolation of the statewide prevalence of rental housing ordinances, it did allow the researchers to glean insights and best practices related to the structure and implementation of rental housing policies.

For the *Benchmarking Multifamily Buildings in California* report, the sample size from the technical assistance activities was sufficient to uncover potential improvements to California's benchmarking data request and disclosure processes and to show interesting trends in energy efficiency and measure effectiveness. However, the sample size was not large enough to confidently draw conclusions about the relative effectiveness of various energy efficiency measures or the strongest predictor of energy use intensity (EUI) for multifamily properties in California.

Outcomes

1. *EnergyPro Lite software*. One of the barriers to increasing the pace of energy upgrades in multifamily buildings is the time and cost associated with evaluating upgrade options. To help overcome this barrier, StopWaste led the development of EnergyPro Lite, a streamlined version of the EnergyPro software specifically intended for modeling energy upgrades and potential savings in existing

multifamily buildings. EnergyPro Lite is available at no cost to cities and energy programs. This easy-to-use software can be used to model any existing multifamily building.

2. *Rental Housing Inspection Programs in California: Characteristics of Existing Programs and Potential for Including Energy Efficiency Requirements.* This report outlines key considerations for use by jurisdictions exploring the idea of enacting a rental housing ordinance with energy efficiency requirements. The study also presented three example scenarios to estimate potential energy and carbon impacts of adding energy upgrade requirements to rental housing inspection programs. As part of the process of developing these key considerations, the researchers surveyed and interviewed staff from 26 California jurisdictions to understand the characteristics of their rental housing inspection and licensing programs. They also interviewed staff of three municipal programs outside California that have energy efficiency requirements as part of their rental housing inspection programs. The report's recommendations were also informed by the research team's extensive experience managing multifamily energy efficiency upgrade programs in California.
3. *Benchmarking Multifamily Buildings in California: How It's Working and What We Can Learn from the Data.* The project team provided benchmarking technical assistance to multifamily property owners to assess potential problems with data quality and recommend solutions. During this process, the team encountered challenges to ensuring that complete and accurate data was obtained from the utilities and submitted to the CEC. The chief obstacles included difficulty ensuring that all meters are included in aggregated data requests; building owner disengagement from the benchmarking process; benchmarking portals preventing multiple data requests for the same property; challenges verifying data quality and maintaining data over time. The project team was also able to leverage the benchmarking data set to analyze the relationship between EUI and various building characteristics and to compare energy model predictions with actual performance.
4. *Accelerating Electrification of California's Multifamily Buildings: Policy Considerations and Technical Guidelines.* Part 1 of this report is intended primarily for policy makers and energy program administrators. It lays out the policy considerations for electrifying existing multifamily buildings in California, which will be a necessary step in achieving California's greenhouse gas emissions reduction goals. Part 2, intended for building industry professionals, provides an overview of electrical code, infrastructure, and technologies for electrifying

existing multifamily buildings. A solid grasp of this information can enable building professionals to explain and recommend electrification methods to building owners that are appropriate to each building's unique condition

Replicability

Although intended for the California existing multifamily building sector, each of these deliverables are likely to be of value to policy makers and practitioners outside California.

Further Information

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