Sustainable Residential Energy Use: Design, Feasibility, Performance

Policy Note prepared by Elizabeth Mattiuzzi

ISSUE

There has been an enormous increase in funding for and interest in residential energy efficiency in recent years. Most of the focus has been on new residential construction and single-family homes. However, there is great potential for energy savings in retrofits of multi-family housing, where almost one-third of California households live (with an even larger share in California's metropolitan areas, as shown in Figure 1). Investments to increase energy efficiency would make this situation more equitable, though it is unlikely that it will result in proportionate reductions in energy use, because many low-income families will use the savings to buy more energy to meet a basic level of comfort that was not within their reach previously.

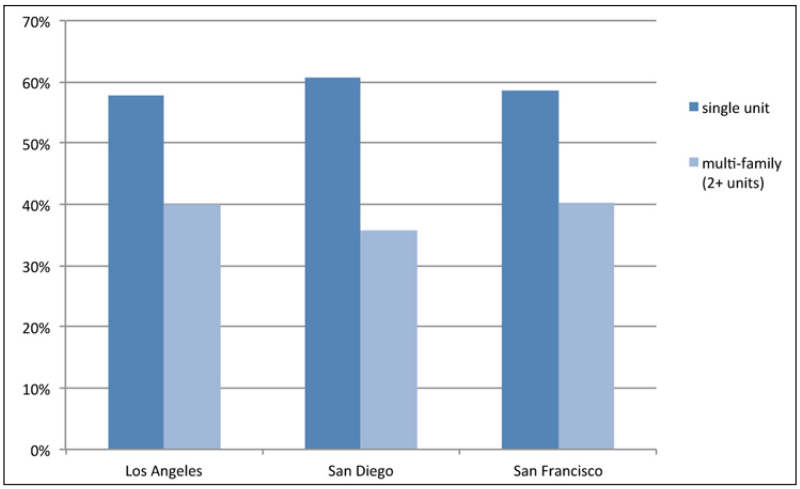

Figure 1. Percentage of households living in multi-family buildings in three highly urban California counties. Source: American Community Survey 2010

PANEL FINDINGS

Policymakers would have to address four main challenges:

- How to induce landlords and condominium owners to invest in retrofits;
- How to foster a sustainable business environment for energy contractors;
- How to address the divergent interests of renters and owners; and
- How to create market-based financing mechanisms for residential energy retrofits.

In condominiums, the main barrier to energy retrofits is a political one, requiring members to support long-term investments that can have uncertain paybacks.

The California residential market is roughly equally divided between renters (approximately 43 percent) and homeowners (approximately 57 percent). These two groups have divergent concerns in terms of the costs and benefits of investing in energy retrofits.

Designing for energy efficient homes is not a one-size-fits-all matter. For example, panelist Susan Ubbelohde, of UC Berkeley, cautioned that San Francisco Bay Area residents might see comparatively little reduction in their energy bills because outside temperatures are mild. By contrast, residents of regions in the U.S. with humid summers or harsh winters have the potential for greater cost savings.

She used a case study of a new zero-energy home that generates and sends electricity back to the grid to demonstrate that technologies are available and argued that the barriers to scaling up residential energy efficiency are those of policy and economics, not technology.

Figure 2. A 56-unit, zero-energy, solar-powered apartment complex in San Diego. Photo credit: Chris Palmeri

Alan Sanstad, of the Lawrence Berkeley National Laboratory, observed that current efforts reflected a failure to learn from lessons of the 1970s by failing to substantiate savings and overstating gains. He also cautioned that there is an important difference between policy to reduce energy use and policy to reduce greenhouse gas emissions and climate change. However, savings from energy conservation efforts could help offset, in part, what are expected to be very high costs to comply with climate change goals.

Matt Golden, who is a former energy conservation contractor and works with contractor groups, noted that profitability has yet to be achieved in the energy retrofitting industry, due to a number of factors. They include: onerous regulations, competition from lower-cost companies, uncertainty in the financial savings for each project, and uncertainty over the state of the real estate market.

RECOMMENDATIONS

For rental units, Nehemiah Stone, of The Benningfield Group, noted that the California Utility Allowance Calculator could be a model; it splits the savings from lower utility bills from solar installations between residents and landlords. The program is being tested in the Multifamily Affordable Solar Home and the New Solar Homes Partnership in California. For condominium associations, the panel encouraged residents to speak up to build support for community-wide retrofits.

Golden saw promise in solar purchasing agreements where the property owner leases solar panels from the contractor over a 20-year period and sells energy back to the utility. This removes some of the burden of risk from the individual homeowner or tenant and allows the contractor to hedge against risk. This could be a critical step towards scaling up the retrofit industry and reducing the need for subsidies. A new company that uses this approach recently attracted a substantial outside investment of private capital. Such market-based approaches are necessary; regulatory-based policies will only drive out contractors, he said.

PARTICIPANTS

Presenters
Susan Ubbelohde, UC Berkeley
Nehemiah Stone, The Benningfield Group
Alan Sanstad, Lawrence Berkely National Laboartory
Matt Golden, Recurve Inc.
Moderator
Charles Eley, Consulting Architect and Engineer

This is a Policy Note from the first panel in the first conference, "Energy Efficiency in the Residential Sector: Practice, Policy, Prospects," in the Sustainable Cities series held in 2011-2012 at UC Berkeley, organized by John Quigley and Larry Rosenthal, of the Institute of Urban and Regional Development, and Professors Michelle Wilde Anderson, Karen Chapple, and Cecilia Estolano, with support from Berkeley Law, the College of Environmental Design, the Institute of Urban and Regional Development, the University of California Transportation Center, and the Berkeley Program on Housing and Urban Policy. The Ted and Doris Lee Fund sponsored the series.

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