

Energy Efficiency and Cities

A large share of national energy consumption takes place in cities—in the United States about three-quarters of energy use is in or related to urban areas. Accordingly, cities offer significant opportunities for energy savings from increased efficiency, but important issues remain: Will market forces produce efficiency gains when appropriate, or will market failures such as imperfect information, unavailable financing, or misunderstood risks impede market solutions? How much do people value energy savings, and how sensitive are they to changes in energy prices? The Lincoln Institute hosted a conference on energy efficiency and cities in October 2012 to address these and related issues, and a few highlights follow.

Valuing Energy Efficiency

Consumers should be willing to pay more for built space that uses less energy. Evidence indicates that users of commercial space value energy efficiency and are willing to pay more for it, and many studies indicate that LEED-certified office and commercial space sells or rents at a premium over traditional space. There is much less evidence of such preferences for residences, in part because it is difficult for most homebuyers to determine the energy efficiency of a dwelling, especially a new one with no operating record.

Some residential developments are now being classified using procedures similar to LEED certification or to the Energy Star ratings such as those used for major appliances. Dwellings in California that have the highest energy efficiency ratings sell at a premium of about 9 percent above units with average energy efficiency. Similar price premiums have been observed in the Netherlands for houses certified at the highest efficiency level using a European certification procedure. Some of these premiums may reflect the improved comfort levels that these buildings provide in addition to energy savings. It also seems likely that the energy efficiency premium observed in California is up to three times greater than the incremental cost of the higher efficiency of these dwellings.

Determining Cost

The cost of integrating energy efficiency into new buildings is less than the cost of improving the efficiency of older build-



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ings. A home built since 2000 uses about 25 percent less energy per square foot than one built in the 1960s or earlier. The technical potential for improved energy efficiency in older homes seems evident, but homeowners face two challenges: to determine which improvements have the highest payoff per dollar spent, and to obtain a contractor and financing for the work.

While many diagnostic tools are available to assess existing dwellings, their accuracy varies widely and depends critically on detailed inputs about both the dwelling's attributes and the household's living style. Obtaining a contractor and financing can involve high transaction costs for households in effort, time, and money. Many utility companies are offering both technical and financial support for energy retrofitting, but progress has been slow.

Changing Energy Consumption

It may be easier to change residential living styles than to retrofit old buildings, and many utilities are experimenting with schemes to modify household behavior. The most common program involves “nudging” households toward more efficient habits by providing periodic home energy reports that compare their recent energy use with that of their neighbors. Analysis indicates that these reports have both a short-term impact on household energy consumption and a longer-term cumulative impact that continues after the reports end. The energy savings from these programs are small, ranging from a half to one kilowatt hour per day for a household, but the program's low cost makes the results as cost-effective as many other policies.

Recognizing John Quigley

This conference was designed with John Quigley, economics professor at the University of California at Berkeley, who passed away before the conference took place. In addition to the original papers on energy and cities, papers on urban economics were presented by some of his former students, colleagues, and coauthors. All of the papers will be submitted for a forthcoming special edition of *Regional Science and Urban Economics*, which will recognize his contributions over a long and distinguished career. **L**