

Residential Energy Efficiency

Short Communication

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Although the importance of energy efficiency in the residential sector of the U.S. economy is highlighted by issues related to climate change [1], housing affordability [2], and economic development [3], barriers to an efficient use of energy resources prevent the realization of a large potential for energy savings. As the residential sector ac-

counts for 21% of total energy consumption in the United States (EIA, 2008), overcoming these barriers to the achievement of higher levels of energy efficiency in housing is necessary in light of the dependence of this country on imported oil to meet energy demand. Oil imports are now at levels higher than those during the 1973-74 Arab oil embargo (see Figure 1 below).

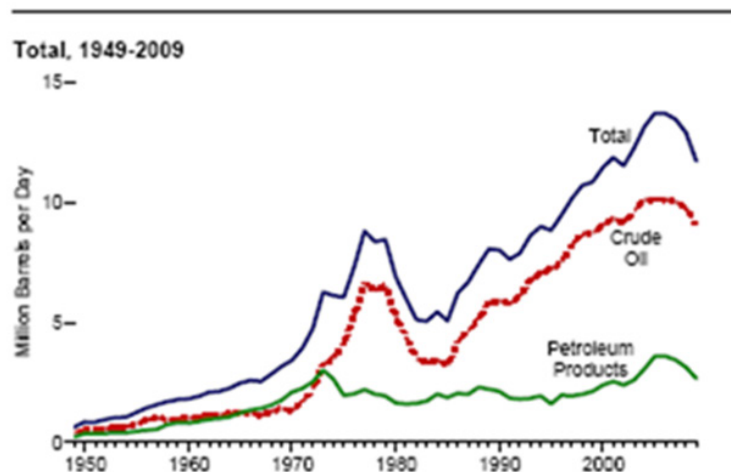


Figure 1: Petroleum imports by type.

Source: U.S. Energy Information Administration (2009) Annual Energy Review.

As oil imports have been increasing, so have home heating costs. Snyder and Baker [4] wrote that since 2005 these costs have increased 27.3 percent and have affected low income households disproportionately. These authors also reported that the average low income household now spends 16 percent of its income on home energy costs, or over four times what the average household in the U.S. spends. Achieving reductions in energy expenses is complicated by the fact

that the average head of household lacks knowledge about residential energy efficiency [5].

Emmel, Lee, Cox, and Leech [6] surveyed a sample of low income participants in a Cooperative Extension nutrition education program about home energy practices. They asked 12 energy-related questions and examined influences of household income, tenure (owners vs. renters), and type of home on perceived energy cost burdens and

energy-saving efforts. They observed more perceptions of energy cost burden among the lowest income households in the sample and also found that those households did not engage in energy-saving practices to the extent that they could. Fewer residents of multifamily buildings reported experiencing energy cost burdens than did homeowners, although more renters than homeowners borrowed money to pay energy bills. These authors concluded that energy education efforts should be directed toward renters and households of very low incomes.

Fuller, Kunkel, Zimring, Hoffman, Soroye, and Goldman [7] examined efforts aimed at motivating people to invest in comprehensive residential energy efficiency upgrades. They conducted a literature review, case studies of energy conservation programs, and interviews with industry experts. They also surveyed residential contractors. Their conclusions were organized into marketing and outreach lessons and program design and implementation lessons. They found that low rates of participation in some energy conservation programs were due to confusing language, complex program requirements, inadequate understanding of behavioral issues, and other concerns. Among their findings was the necessity of engaging trusted messengers when attempting to motivate people to engage in energy efficiency.

Who are the trusted messengers? Fuller et al. (2010) mentioned community leaders and local opinion leaders and described the Hood River Conservation Project, in which ten percent of Hood River households were recruited for end-use monitoring of homes. These households were considered to be community insiders who were viewed as trusted messengers. In the first six months of this program's operation, 55 percent of eligible households asked for a home energy assessment.

Numerous educational programs exist about residential energy efficiency. Many of these are conducted by the Cooperative Extension System. Kirby, Chilcote, and Guin [8] described North Carolina's E-Conservation Program, which has resulted from a partnership that involves the North Carolina Cooperative Extension Service, energy authorities, and county Extension Educators. This program delivers

educational messages about energy efficiency through a variety of methods, including workshops at which attendees receive energy efficient light bulbs and other energy-saving devices. Program participants also receive subsidized home energy assessments. In addition, internet-based educational resources are available for Extension Educators and consumers.

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