A recent study suggests relying on technical efficiency improvements in the home to reduce energy consumption is unlikely to produce significant energy savings unless householders also adopt lifestyles with lower consumption habits.

Lifestyles in developed countries have improved dramatically over the last century, leading to high levels of material consumption. Much of the energy for this development has come from burning fossil fuels. Although using alternative sources of energy will reduce the emissions of greenhouse gases, a reduction in the overall consumption of energy is also needed for a sustainable future. Energy efficient buildings and equipment will contribute to these efforts, but behavioural change could have the greatest impact.

In this study, energy use in households was examined from two perspectives: 1.) technical improvements designed to reduce energy consumption, and 2.) lifestyle and behavioural choices of householders that affect energy consumption. The impact of both approaches on energy conservation was compared.

Technical improvements included the installation of various forms of home insulation, using energy-efficient dishwashers and washing machines, and controlling central heating and air conditioning by thermostats, which reduces energy use. Lifestyle factors that were considered included the size of the home (number of bedrooms and coverage in square feet), the type of home and the installation of luxury appliances, such as hot tubs.

Overall, there was evidence that technological improvements, such as the use of energy-saving washing machines, reduced domestic energy use. However, there was also a strong relationship between lifestyle and energy consumption. The results suggest that families living in detached houses, for example, used 1198 kilowatt hours (kWh) more electricity per year than families living in apartment buildings consisting of two or more units. (In 2005, the annual average electricity consumption of a detached house was 12949 kWh).

Surprisingly, residential energy consumption increased, rather than decreased, under some measures of technical energy improvements. For example, well-insulated homes consumed on average 2254 kWh more electricity per year than homes with no insulation. (In 2005, the annual average electricity consumption of a well-insulated house was 11835 kWh).

One explanation for this result is that energy savings through technological means can have unintended consequences on peoples’ behaviour. For instance, although there may be initial savings for householders on their energy bills, these savings could be spent to enhance home comforts which consume further energy, such as, turning the heating up higher in cold weather, using more air conditioning in hot weather or buying more home appliances and gadgets. This could be evidence of the rebound effect, where the more efficient use of energy eventually leads to greater consumption in the long term.

It appears that technological efficiencies are not enough to compensate for high-consumption lifestyles. Changing lifestyles is thus an important step to increasing resource efficiency and reducing greenhouse gas emissions.


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