

Can Product Labels Nudge

Energy Efficient Behavior?

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To minimize costs, consumers looking to purchase a new appliance should give equal weight to the purchase price and the discounted operating cost over the appliance lifetime—that is, they should be willing to pay \$1 in increased purchase cost for each dollar of reduced lifetime operating cost of the appliance. But many experts argue that in reality, consumers undervalue energy savings. This results in the classic energy efficiency gap—consumers are reluctant to adopt energy efficiency investments that could save them money down the road.

One possible reason is that understanding the operating cost can be a challenge that involves calculating the daily kilowatt-hour consumption rates of appliances to estimate annual costs and energy consumption per year. To streamline this process, appliance manufacturers are required to provide information about the operating costs of major household appliances through labeling programs, such as EnergyGuide. But do these labels actually encourage energy efficient purchases? And what label features most effectively encourage investment in energy efficiency?

In an experimental study to examine these questions, we evaluated the effectiveness of different energy efficiency labels in guid-

ing households' energy efficiency decisions. We surveyed 1,248 households and used randomized treatments with alternative energy efficiency labels to see how the label and the information it contains affects households' willingness to pay for energy efficiency. The labels in Figure 1 on page 16 represent an illustrative subset of the labeling treatments used in the experiment. We sampled respondents who are the owners of single-family homes and asked them to make choices about purchasing a central household water heater.

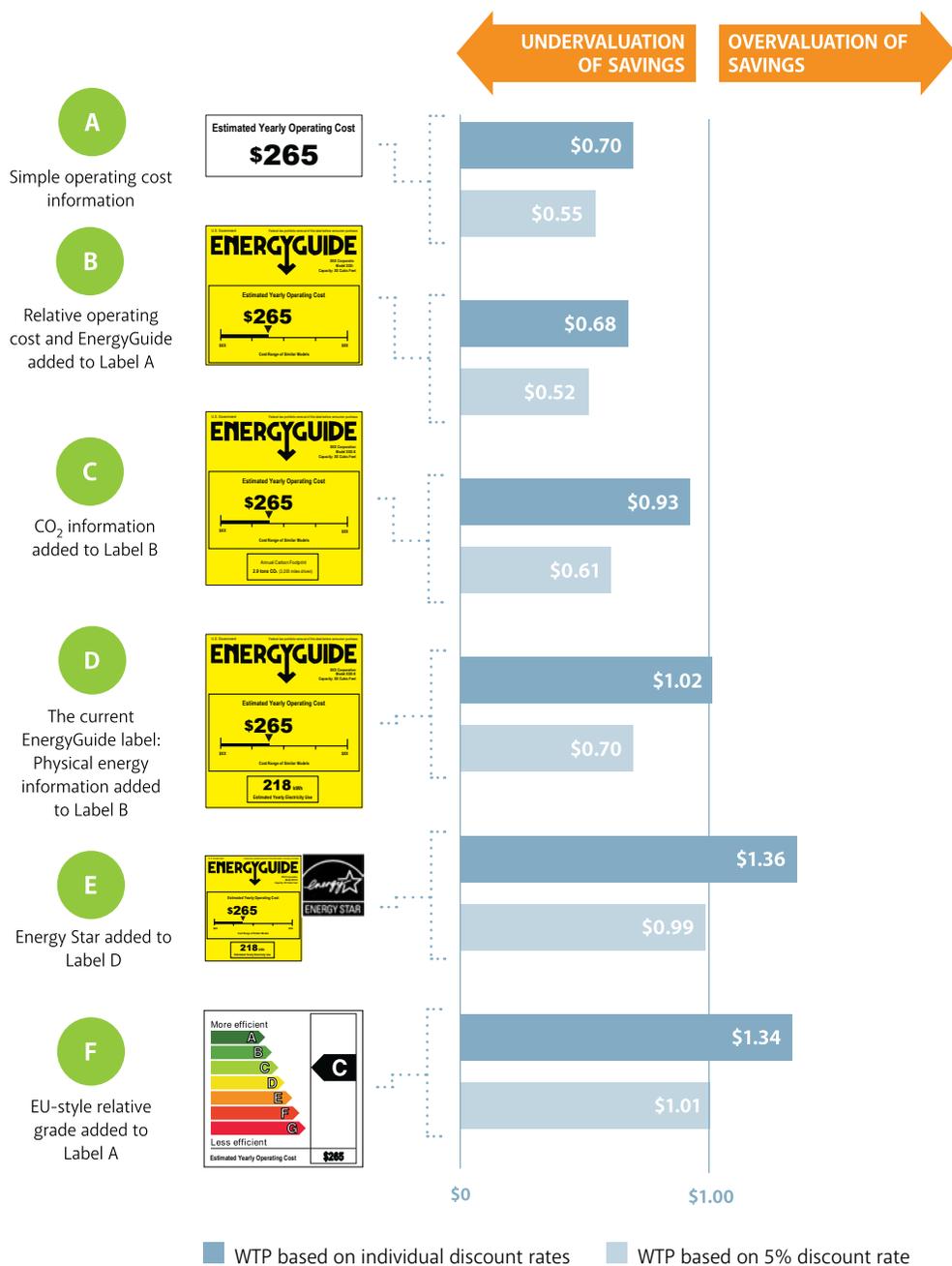
We found that providing simple information on the cost of operating the appliance was the most important element for encouraging investments in energy efficiency. Information on physical energy use and carbon dioxide (CO₂) emissions has additional but lesser importance. And labels that endorse or grade appliance models have a substantial impact on encouraging choices with higher energy efficiency, potentially even beyond what makes economic sense.

Energy Efficiency Labels

The current EnergyGuide label (Figure 1, Label D) provides the baseline for most of the treatments we administered. Our experimental approach involves evaluat-

Figure 1. Relative Willingness to Pay (WTP) for Energy Savings

Amount survey respondents are willing to pay for \$1 of reduced lifetime operating costs



Source: Newell and Siikamäki (forthcoming).

ing both the information content and the style of representing the information on the label. We evaluated the use of economic information, physical information on energy use and CO₂ emissions, a letter grade indicating efficiency rank, the Energy Star logo, as well as the inclusion or exclusion of the range of energy costs of other, similar appliance options in the market. To evaluate the effectiveness of these attributes, we fielded multiple treatments, which either included or excluded the above information content, to enable us to empirically identify the effect of a specific piece of information.

Paying for Purchase Cost versus Operating Cost

Figure 1 summarizes the estimated willingness to pay for reduced operating cost, based on the six different labeling treatments.

For a decision to be cost-minimizing, \$1 should be worth \$1 whether it is paid for buying a product or operating it. In contrast, a value less than \$1 indicates relative undervaluation of energy savings, while a value greater than \$1 represents overvaluation of energy savings. A complicating factor, however, is that operating costs occur in the future, so we must account for the time value of money by discounting operating costs to compare them to the purchase cost.

We find that the degree to which different labels guide households toward accurate valuation of energy savings depends importantly on the discount rate assumed for the analysis. To examine this, we estimated the effects of different labels using two alternative discount rates: individual-specific discount rates elicited in the experiment and a 5 percent rate typical of regulatory analysis.

Information labeling treatment A includes only simple operating cost information. It

yields an estimated mean willingness to pay for discounted operating cost savings of \$0.70 when employing individual discount rates—which have a mean value of 11 percent—and \$0.55 when using a 5 percent rate. Although this suggests a significant undervaluation of energy efficiency, it also indicates how potent even the most basic information can be. Adding information on the relative operating cost range of comparable models and the yellow EnergyGuide image (Label B) does not add to the basic information value already given by Label A.

Adding CO₂ emissions information in Label C provides a boost to the relative value of energy savings but is not as important as the direct monetary value of energy cost reductions. Label D—the current EnergyGuide label—leads to a willingness to pay \$1.02 for \$1 in energy cost reductions when individual discount rates are used. But if one questions the relatively high individual discount rates and instead uses a 5 percent rate, Label D is associated with choices that undervalue energy savings by about 30 percent.

Adding the Energy Star endorsement (Label E), which is approved for display on high-efficiency product models by the US Environmental Protection Agency, significantly raises the value placed on energy efficiency. Similarly, Label F—which bears a European Union-style energy efficiency letter grade—shows how even a relatively simple indication of energy operating cost has a powerful effect. Label E and F suggest roughly cost-minimizing behavior using a 5 percent discount rate and about 35 percent overvaluation of energy savings using individual discount rates.

FURTHER READING

Newell, Richard A., and Juha V. Siikamäki. Forthcoming. Nudging Energy Efficiency Behavior: The Role of Information Labels. Discussion paper 13-17REV. Washington, DC: RFF.