

Study: Can we balance air conditioning, saving energy?

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(PhysOrg.com) -- When it's 100-plus degrees outside, all you want to do is turn up the air conditioning inside. Because of all of this cooling, some government-mandated incentive programs are aimed at getting us to buy more efficient air conditioners to save energy and money. However, a recent study from the W. P. Carey School of Business at Arizona State University explains why, even if we buy the more efficient devices, the plan won't necessarily work.

Assistant research professor Matthew Croucher, who authored the study, says, "Utility companies, energy-efficiency advocates and the Arizona Corporation Commission may be forecasting a certain amount of energy savings that won't materialize, and homeowners may not save as much money as expected."

He points to a program where a California utility company subsidized purchases of energy-saving light bulbs for consumers. The bulbs were expected to help dramatically improve overall state energy efficiency. In reality, many of the bulbs just sat in customers' garages and the ones used were later shown to have burned out much sooner than previously estimated. The Wall Street Journal says regulators found the \$92-million rebate program was a whopping 73-percent less effective than predicted, but the government paid a bonus to the utility company anyway.

In Arizona, state regulators want to reduce [electricity usage](#) by at least 22 percent by 2020. In the service area covered by utility company APS, [air conditioning](#) currently accounts for 35.5 percent of all residential

electricity usage and 22 percent of commercial and industrial usage. Therefore, incentives are being offered for customers to buy more energy-efficient air conditioners. However, we may face the same uncertainty as California.

“It’s like when you go to the gym every day and ‘reward’ yourself with a pint of ice cream on the way home; then you wonder why you’re not losing weight fast enough,” says Croucher, an economist at the L. William Seidman Research Institute at the W. P. Carey School of Business and a senior sustainability scientist at ASU. “Sure, a more energy-efficient air conditioner can potentially reduce your electricity usage and save you money, but not if you just use the air conditioner more or spend the savings on other energy-consuming devices. That’s when we see something called ‘the rebound effect.’”

Croucher says “the rebound effect” describes what happens when the technical efficiency of something, such as an air conditioner, improves, but the net result is a smaller-than-expected reduction -- or even an increase -- in how much the device is used. For example, people may use the money they’re saving on air conditioning to buy other energy-using items, or they may simply turn their thermostats lower to enjoy cooler temperatures because it costs the same as it previously did to maintain a warmer home.

Still, Croucher says we can help buffer the rebound effect.

“As consumers, we can help the situation by making real behavioral changes, not being tempted to lower the thermostat after purchasing an energy-efficient [air conditioner](#) and not buying more energy-sapping devices,” says Croucher. “We can also utilize weatherization techniques: improve roof and wall insulation, repair leaky air ducts, seal doors and window frames, and use screens on windows, all of which the utility companies are willing to subsidize.”

Croucher also says older homes have more room for energy improvement, so they're worth focusing on. He adds changing building codes or electricity prices can have a significant influence on energy savings in the future, too. Historically, in times when electricity costs more, builders tend to construct homes to be more energy-efficient.

“Ask any economist what the simplest way is to encourage less use of a product, and most will say to raise its price,” says Croucher.

“Interestingly, energy efficiency tends to do the opposite, so we shouldn't be surprised if savings are not as high as expected.”

Provided by Arizona State University

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