
WHEN oil and gas prices surged after Hurricanes Katrina and Rita, President Bush appealed to Americans to conserve energy. He asked people to cut back on nonessential travel, for example, and to carpool to work. Then, in October, the White House started a campaign for energy conservation in American homes, dusting off some old ideas like switching to fluorescent light bulbs and installing better insulation in attics.

Some critics derided the program as a bizarre flashback from the 1970's -- a collection of worn-out ideas that evoked feelings of deprivation and gloom. It will be a pity, though, if an effective energy policy never gets off the ground. Much has been learned since the 70's about what works and what doesn't. Clearly, energy conservation isn't what it used to be.

The preferred term these days, however, is energy efficiency -- something that economics and even chief executives can relate to. The phrase implies getting more out of what we have -- and that's not gloomy at all. Technology can deliver increased benefits with less energy, in effect replacing some of that electricity and oil with brain power. And efficiency holds the promise of greater satisfaction, not self-sacrifice.

There are reasons for optimism. One is that market forces can help provide solutions: higher prices, on their own, can make people cut back. Just how responsive consumers are to price changes -- what economists call the elasticity of demand -- has been the focus of much research. Today, economists believe that they have developed a pretty good rule of thumb for energy use. In the case of electricity, which is relatively easy to measure, they have found that when the price rises 10 percent, electricity use falls roughly 3 percent. At the gas pump, a 10 percent increase in price leads to a decline of around 2 percent in demand.

Consumer behavior can change quickly in a crisis. A study by Peter C. Reiss, a professor of economics at Stanford, and Matthew W. White, a professor of business and public policy at the Wharton School of the University of Pennsylvania, provides some recent evidence. In examining San Diego households during the California electricity crisis of 2000 and 2001, they found that use of electricity dropped surprisingly fast. In the summer of 2000, within 60 days of seeing monthly electric bills rise by about $60 -- an increase of 130 percent -- the average household cut its use of electricity by 12 percent.

That kind of drop requires a big change in behavior. The authors found that households had turned off air-conditioners in the middle of summer and had invested in new energy-efficient appliances, among other things.

High costs aren't the only force that will influence consumers to cut back. Although public appeals to save energy may be ridiculed by comedians on late-night television -- recall President Jimmy Carter's cardigan sweater -- the efforts can have a substantial impact.

Professors Reiss and White found that to be true in San Diego. In February 2001, with electricity prices capped, the state of California began a campaign to have households conserve electricity. It worked. "It was clear by about six months into 2001 that public appeals were having a big impact," Professor White said. Such campaigns can have significant effects on consumer behavior, he said, if they offer a clear explanation of what people can do and how it will make a difference.

Perhaps the most important reason for optimism is technology's role in promoting energy savings. From 1979 to
1985, in the aftermath of energy shortages, Americans reduced their oil consumption by 15 percent. The single biggest factor was a shift in car-buying habits. Americans found that driving fuel-efficient cars, instead of gas guzzlers, didn't stop them from going where they wanted to go. The shift also had a big macroeconomic effect, sending world oil prices tumbling and setting the stage for two decades of low energy costs.

During those decades, energy conservation would gradually fade from public view. But higher prices are again capturing the public's attention. Big companies are finding ways to conserve energy to improve the bottom line. Last month, Wal-Mart announced a plan to cut energy use in its stores, to double the fuel efficiency of its trucks and to minimize the use of packaging. Consumers are changing their habits, too. Sales of S.U.V.'s, for example, have fallen and automakers that bet heavily on cheap energy are suffering declining fortunes.

How much more energy-efficient can we become? Amory B. Lovins, chief executive of the Rocky Mountain Institute, a nonprofit energy research group in Snowmass, Colo., says that a barrel of oil today already does twice as much work as it did in 1975. Mr. Lovins calculates that by moving to vehicles that consume less fuel, the nation could double that efficiency again.

Because vehicles account for 40 percent of total domestic oil consumption, there is a big opportunity for savings. According to Mr. Lovins, hybrids like the Toyota Prius use just half the oil of typical vehicles, and an ultralight version of a hybrid could halve that consumption again. If everyone drove an ultralight hybrid, national oil consumption would drop 28 percent over all. And moving to new fuel technology for big trucks and aircraft could produce similar savings.

In the case of electricity, waste is glaringly apparent. About 5 percent of the electricity consumed in United States households is simply lost to computers, televisions and other appliances that are turned off but still plugged in. The savings from using electricity more efficiently could be even larger than those from oil, Mr. Lovins says. Rate structures in most states, he says, still reward utilities for selling more electricity. One solution is to decouple the profits of utilities from their sales volumes, and to let utilities keep as profit some of the savings they achieve for their customers.

Energy efficiency tends to increase as technology becomes better and cheaper. The prices of some energy-efficient kitchen appliances, for example, are now similar to those of other models. And the Internet, which wasn't around for the conservation efforts of the 1970's, can also be a powerful ally. Consider its potential for real-time billing of electricity consumption at home. If households can see at any moment how much they are spending on energy, they can better decide whether changing their habits makes economic sense.

In the end, the most effective energy policy won't be one that fights against market forces. It will be one that helps them work better.

CAPTION(S):

Chart: "Long Comeback"

Oil consumption in the United States began to fall sharply in 1977. It resumed its generally upward climb in the 1980's.

Graph tracks oil consumption, measured in millions of barrels a day, since the 1950's.

(Source by Energy Information Administration)