

Small Energy-Saving Steps Can Make Big Strides
High-Tech Solutions Can Help Lower Consumption, but Researchers See Faster Progress in Low-Tech Measures; Think Cook Stoves
By JEFFREY BALL

Some of the highest hopes to curb oil use rest on solutions like the "plug-in hybrid" car, which is supposed to stretch a single gallon of gasoline for more than 200 miles. But that supercar won't be on the road in large numbers for years. In the meantime, there is always the old option of improving the mileage of the regular car's internal-combustion engine.

Which approach is likely to make the biggest difference to the environment?

Tweaking the regular car.



Envirofit India

In Kumsi, India, a woman cooks with a low-cost stove that burns less wood and emits fewer pollutants than open fires.

Raising the average fuel economy of gasoline cars around the world to 36 mpg from 26 mpg will likely save more than six times as much oil in 2030 as rolling out enough plug-in hybrids to constitute 7% of the global auto fleet. That data come from BP PLC, an oil company with a stake in the success of gasoline powered cars, but the findings agree with other studies.

For years, the fight to curb fossil-fuel consumption has often involved moon shots. But many of those efforts -- such as cars powered by methanol, natural gas or hydrogen -- haven't exactly taken off. The smarter strategy for reducing energy consumption and pollution more broadly would be decidedly low-tech solutions, a growing number of experts say.

"Policy makers have to be careful that they don't become so wowed by the sexy new technologies that they lose sight of what's available, known and tested," says David Victor, an energy expert at the University of California, San Diego.

Low-tech steps themselves won't suffice, many scientists and policy makers say. They recommend slashing greenhouse-gas emissions 50% or more by the middle of the century, and that won't likely happen without sophisticated technologies like burying carbon-dioxide emissions underground, nuclear energy, and wind and solar power.

But big improvements from those costly technologies may be years away. Today, there are measures available for both the industrialized West and the developing world that may seem more evolutionary than revolutionary. But these unglamorous options could add up to major environmental progress -- and at a cost more palatable in struggling economies, scientists say.

When global leaders converge next month on Copenhagen, they aren't likely to agree on any sweeping policies -- particularly not a global cap on greenhouse-gas emissions, which many countries fear would stunt their economic growth. But they may make progress pursuing targeted policies to trim energy waste -- lowly but effective efforts such as improving fuel economy in cars, better insulating homes and helping families in India buy \$20 cooking stoves.

That approach may be more important than ever amid the recession. A Pew Research Center for the People and the Press survey this spring showed a steep decline in the percentage of Americans willing to pay higher prices to protect the environment: to 49% this year from 60% in 2007.

Consider the basic cook stove -- a low-cost option that can dramatically reduce pollution.

More than half the world's population burns fuel indoors to cook and heat their homes, according to the World Health Organization. Those indoor fires emit small particles that can get lodged in the lungs and that account for 1.5 million deaths annually, says the organization, which calls the fires "the killer in the kitchen." The fires also contribute to a smoggy plume known as the Atmospheric Brown Cloud. Studies, including some from Stanford University, say the cloud is trapping heat in the atmosphere.

Several companies and nonprofit groups are trying to sell large numbers of low-cost stoves, particularly in India. The stoves look like pasta pots. Because of their design, they cook a meal with less wood, which they burn more cleanly. So the stoves can slash emissions of pollutants by more than half, manufacturers say.

A paper earlier this year co-authored by Mr. Victor, the California energy expert, estimated that if half the families in India began using improved stoves, the Atmospheric Brown Cloud would shrink by about one-third.

Envirofit International, a Fort Collins, Colo., nonprofit group, has sold some 100,000 stoves over the past year in southern India. The organization sells them largely out of vans that roll along dirt roads in rural villages. One study notes that 60 million stoves, if sold in India for only \$5 each, would cost \$300 million. Even if the stoves cost more, that rollout would be cheaper than most other clean-energy options.

"The energy problem," says Steven Chu, the U.S. energy secretary, "can be advanced a long way by pretty low-tech stuff."

Simple but dramatic efficiencies are starting to be tapped by industrialized countries too. In the case of U.S. homes, studies say that using existing energy more efficiently is cheaper than renewable energy.

Yet federal tax incentives have long favored the pricier approach. Uncle Sam gives people who install renewable energy at home -- such as rooftop solar panels -- a tax credit valued at 30% of the project's total cost. But the credit for consumers who install more-efficient mechanical equipment, such as a furnace, is capped at \$1,500. And the credit for people who make even-lower-tech improvements that studies say are the most effective -- like installing insulation -- is capped at \$1,500. That applies just to materials, though the bulk of the cost of these projects is labor.

That policy lopsidedness made it a "no-brainer" this year for Michael Arendt to install solar panels on the roof of his house in Baldwinsville, N.Y. He did so without first looking into upgrading his windows or appliances, which almost certainly would have been a cheaper strategy.

Mr. Arendt, a safety engineer for an insurance company, spent about \$48,000 on the solar panels. He expects them to cut his \$300-a-month utility bill by about one-third -- meaning the full cost would take about 40 years to pay back. But he expects to get about \$35,000 of the cost back through federal and state tax breaks and utility company incentives. That is why he was "just focused on the solar," he says.

Such heavy incentives for renewable energy have benefits. They could reduce the technology's cost and help create jobs. But those benefits aren't as immediate as efficiency gains that could be made today -- a point that Mr. Chu, the energy secretary, has made himself. That is one reason why pending legislation in Washington would fix some incentive imbalances, putting simple efficiency steps on a more level playing field with high technology through tax breaks defraying up to half the cost of those simple efficiency upgrades. The more energy a project saved, the more generous the tax break would be.








Support for a low-tech approach has come from unexpected places. This summer, a group of technologists -- including Silicon Valley investors -- issued a report, called the Gigaton Throwdown, assessing ways to slash emissions. Among their top picks: improving the efficiency of existing buildings. Among the least-promising options: plug-in hybrid cars.

The only way plug-in hybrids could slash emissions by one billion tons in 2020 -- the threshold the Silicon Valley group defined as significant -- would be if every new car sold starting in 2010 were a plug-in. "That," said Sunil Paul, an Internet entrepreneur who helped fund the study, "is just not going to happen."

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Slowing the Burn

These energy-saving moves could significantly reduce global oil demand below what demand otherwise would be in 2030. Below, percentages of a total envisioned oil-demand cut that could come from various measures

Action	Description	Potential oil savings in 2030
Vehicle efficiency	Improving average fuel economy from 26 mpg to 36 mpg	 32.6%
Building efficiency	Decreasing oil use in the building sector by 35%	 18.0
Road transport fuel tax	Applying a \$0.76/gallon fuel tax	 16.9
Industry efficiency	Improving energy efficiency an additional 0.6%	 10.0
Electricity generation	Oil in power replaced by coal, gas, or renewables	 7.7
Plug-in vehicles	Enough to make up 7% of all road vehicles	 5.0
Smart transit	New and existing urban areas invest in public transport systems	 4.6
Airplane efficiency	Improving new aircraft engine efficiency	 2.7
Hybrid vehicles	Enough to make up 12% of all road vehicles	 2.3

Note: Numbers may not add to 100% due to rounding

Source: BP

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Printed in The Wall Street Journal, page A16

WSJ NOVEMBER 27, 2009