

Energy: The Avoidable Oil Crisis

A simple strategy will reduce shortages and keep costs down

By Amory B. Lovins and L. Hunter Lovins

The Atlantic

December 1987, Volume 260, No. 6

THE UNITED STATES, having pumped more oil for longer than any other country, has largely depleted its cheapest oil. More oil can be found, but only at higher cost and in more remote and fragile places. Foreign oil now costs less to find and extract than ours, and despite American technological prowess, the cost gap will gradually widen. Only three responses to this trend seem to be available at present: protectionism, trade, and substitution.

The protectionist option

Many U.S. oil companies, like companies in other industries whose products can no longer compete in global markets, want tariffs that will make imported oil look as costly as domestic, or a restoration of recently reduced government subsidies that made domestic oil look as cheap as imported, or both. Tariffs would encourage, and subsidies discourage, the more efficient use of oil. Either move would stimulate domestic exploration and extraction of oil, but with side effects. Either move would make Americans pay more for oil than others pay, making the U.S. economy less competitive. Worse, by making new domestic oil look cheaper than it really is—at least, relative to foreign oil—either move would speed up the very depletion that was supposedly such a worry in the first place.

A more thoughtful variation on the protectionist theme would be to raise the

taxes on gasoline and other oil products to discourage consumption. This wouldn't affect oil companies' choices between drilling for oil at home and importing it from abroad: they would do whatever was least expensive—namely, import. It could, however, keep domestic oil companies in business longer, because reduced consumption would slow oil depletion. Unfortunately, though tax increases would spur oil savings by those who could afford to buy more-efficient cars (half our oil is used on the highway), they would burden those who can barely afford the cars they have. More generally, any tax on final energy products is disproportionately hard on people with low incomes, because they spend a larger fraction of their income on fuel. An oil tax would also further distort investment and purchasing choices between oil and other fuels. Both these problems could be avoided by uniformly taxing all depletable fuels as they come out of the ground or into the country. That might be a good idea, and it could greatly enrich the Treasury, but it's an oblique, long-term response to the depletion of low-cost U.S. oil.

The trade option

The free-trade alternative to protectionism is to buy the cheapest oil, even if it's foreign. Americans are doing just that. Last year net imports rose to 33 percent of all oil used in the United

States—less than throughout 1973–1981, much less than the all-time high of 46 percent, which occurred in 1977, but a bit above the recent low of 27 percent, achieved in 1985. The halving of world oil prices last year, brought about largely by the previous decade’s U.S. oil savings, prompted a temporary 3.5 percent boost in domestic oil use while discouraging costly domestic output. If these two trends were to continue (unlikely, since oil prices have about doubled again), they could drive imports above 50 percent of the oil we will use in the 1990s.

Of course, the United States already imports many commodities that others produce better or more cheaply than we do: in 1986, for example, we imported 75 percent of the nickel we used, 92 percent of the bauxite, 70 percent of the tungsten, and 83 percent of the tin. We import coffee and cattle, fish and cheese, perfume and beer, cars and televisions. To pay for these or any other imports, we must export something else that others prefer to buy from us. As Japan has demonstrated, a major industrial power can import nearly all its oil, but if we did that we would have to match Japan’s export success as well. To be sure, the potential balance-of-trade burden is easily exaggerated: the U.S. trade deficit for energy, having peaked at \$75 billion in 1980, had fallen to \$29 billion last year. This was a striking reduction, but those gains were more than offset by the year’s \$110 billion deficit on non-energy imports. Nonetheless, if oil again cost \$24 a barrel, as U.S. oil did in 1980, and if we imported as much of it as we did at the 1977 peak, the dollar outflow would match that of 1980.

A deeper fear is that foreign oil can be cut off by war or politics, much as the United States has embargoed wheat and soybean exports to previously trusting trading partners. For many Americans, the possibility of oil cutoffs suggests not just the inconvenience of gas lines but a threat to this nation’s military power, although the latter idea is probably an exaggeration, since the Department of Defense uses less than three percent of the nation’s oil and is so unconcerned about oil cutoffs that it is depleting its Naval Petroleum Reserve.

National security is too important to be cheapened by invoking it for special pleading. Those who say that national security requires the substitution of costlier domestic oil for foreign oil are glossing over three sets of basic facts.

First, conditions today bear little relation to those of 1973. OPEC now provides only 30 percent of the world’s oil output, not 56 percent, and the Persian Gulf only 19 percent, not 37 percent. Oil is plentiful, not in short supply; the oil market favors buyers, not sellers. Once-rich oil exporters, now struggling with budget deficits, can hardly sacrifice revenues, let alone destroy the value of the Western assets that harbor their shrinking cash reserves.

Supplies, stocks, and transportation and marketing arrangements have also become enormously more diverse and flexible than they were fourteen years ago. Overland routes to Red Sea and Mediterranean ports now exist, and other parts of the world (Venezuela, Mexico, Nigeria, Indonesia) have two to three million barrels a day of spare output capacity. Five million barrels of oil a day could be immediately forthcoming if needed. In the first half of this year only about seven million barrels a day came

through the Strait of Hormuz—roughly half the early-1980s level.

Second, four specific precautions or countermeasures against oil cutoffs are now available: friendly relations, diversification, stockpiling, and military intervention.

The most effective approach would be simply to behave so that others want to continue doing business with us—specifically, those others with whom we have interests in common. In the 1990s, when most U.S. oil imports will probably come from Mexico, Venezuela, and Canada, we may wish we had devoted to those countries' prosperity, stability, and friendship a tenth of the attention we're now lavishing on arguably less vital relationships in the Persian Gulf. Instead, our policies on such issues as immigration, debt, trade, Nicaragua, and acid rain are souring relations in the Western Hemisphere for decades to come.

The United States has already diversified its oil sources. More than half of our net oil imports last year came from the Western Hemisphere and Britain. Of all oil used by the United States in 1986, just 17 percent came from OPEC (including such countries as Nigeria, Indonesia, and Venezuela), seven percent from Arab countries, and less than six percent from the Persian Gulf.

Another basic precaution—stockpiling, in the 530-million-barrel Strategic Petroleum Reserve and in private reserves—has already been taken, and not just by the United States. Japan, for example, has about 150 million barrels of crude oil in anchored tankers—a month's worth of oil, for all uses, for the country. Government stockpiles among twenty-one advanced nations now contain about 800 million barrels—more

than four times the 1979 level. This very large reserve, bought at high cost, can make up for more than a year the net deficit that might be caused by a sudden cutoff of shipments through the Strait of Hormuz. A year is long enough for fuel switching and the reactivation of shut-in wells to fill the gap: the noncommunist world's spare oil-extracting capacity on such a time scale is about 10 million barrels a day, or more than a fifth of the same countries' total oil demand.

Still remaining is the option (assuming it is considered moral, effective, and safe) of threatening to use or using force to maintain access to foreign oil. This card, however, has already been overplayed, and the stakes are high. Earl Ravenal, of the Georgetown University School of Foreign Service, found that in fiscal year 1985 alone, before the [USS] *Stark* attack, the United States spent \$47 billion projecting power into the Persian Gulf—\$468 per barrel imported from the Gulf in that year, or eighteen times the \$27 or so that we paid for the oil itself.

Of course, more is at stake in the Gulf than simply the flow of oil to the United States. We are, however, paying a heavy price to ensure that oil is shipped—from a war zone partly of our own making—to ourselves (we receive about 10 percent of the Gulf's oil) and to our business competitors (about 90 percent). What's more, we're paying the price in money borrowed from those competitors and from the oil exporters themselves.

Persian Gulf oil, whose total purchase-plus-military cost in fiscal year 1985 was \$495 a barrel plus interest, is hardly a competitive fuel for the American economy. Today some 25,000 members of the U.S. military are in the Gulf region. The costs of that expanded presence and its military risks, even

spread over more barrels imported from the Gulf, still amount to hundreds of dollars per barrel. To paraphrase a cartoon by Dan Wasserman, we're spending money we don't have, to defend ships that aren't ours, to ship oil we don't use, for allies who won't pay, in pursuit of a policy we haven't formulated.

Third, the premise underlying the national-security argument—that foreign oil is less secure than domestic—is not necessarily valid. Six years ago our study for the Pentagon (published as *Brittle Power: Energy Strategy for National Security*, summarized in *The Atlantic* of November, 1983) found that a handful of people could cut off three-fourths of the oil and gas supply to the eastern states—so efficiently that it would take upwards of a year to restore it—in one evening's work, without even leaving Louisiana. That remains true. Twenty-three percent of all crude oil extracted and 16 percent of all crude oil used in the United States flows through the Trans-Alaska Pipeline System—two and a half times as much as we're importing from the Persian Gulf. Yet the pipeline has already been repeatedly, if incompetently, attacked, and the Army has declared it indefensible. The pipeline is far easier to disrupt and harder to mend than Middle Eastern oil facilities and tanker shipments. We know of many alternative routes for Middle Eastern oil—the Saudis, for example, are completing their second pipeline to the Red Sea, avoiding the Gulf altogether—but none for Alaskan oil. Far more of our oil supply, therefore, is now unavoidably at risk from a single, simple, unattributable act by a lone saboteur in Alaska than could possibly be cut off by an all-out war in the Strait of Hormuz. Seeking additional oil in the

Arctic National Wildlife Refuge, where the odds of cost-effectively finding any are at best one in five, therefore would be not just uneconomic; it would also perpetuate one of the gravest threats to U.S. energy security.

The substitution option

The third option, though largely ignored, works better and costs less. It avoids all the problems of the first two options. It increases security instead of risks, saves money instead of spending it, and avoids the damage to our economy and environment that would come from rapidly depleting our domestic oil reserves. This option is to avoid using oil in the first place—that is, to reduce oil use through increases in efficiency, or to substitute alternative liquid fuels, or both.

The lower forty-nine states have two supergiant oil fields, each bigger than the biggest in Saudi Arabia, both nearly as economical (only a few dollars a barrel) and both about four-fifths untapped. They are the “weatherization oil field” in our attics and the “accelerated-scrappage-of-gas-guzzlers oil field” in Detroit. By saving oil, or natural gas that can replace oil, we could eliminate U.S. oil imports. We could do so before any new power plant or synfuel plant ordered now could be built and before production from any new Arctic oil field could begin—and at a fivefold to tenfold lower cost. In fact, if we spent as much to make buildings heat-tight as we now spend in one year on the military forces meant to protect the Middle Eastern oil fields, we could eliminate the need to import any oil from the Middle East.

(An impractical kind of oil saving is sometimes proposed instead: building more coal or nuclear power stations.

Since less than five percent of our electricity is made from oil, and less than five percent of our oil is used to make electricity, the two have almost no connection. Power plants are virtually irrelevant to the oil problem—except that the huge expense involved in building new ones would draw money away from investment in effective oil savings. The modest amounts of oil and gas still burned in power plants—and, for that matter, most of the coal and all of the uranium, too—can be cost-effectively displaced by superefficient new lights, motors, appliances, and building components.)

Saving oil isn't just theoretical. From 1977 to 1985, real U.S. GNP grew 21 percent, the number of registered vehicles grew 20 percent, but total oil use fell 15 percent. The oil saving in 1985 equaled three times our 1986 imports from the Persian Gulf.

Americans now use 38 percent less oil and gas to produce a dollar of GNP than they did in 1973—and they achieved that saving mainly with caulk guns, duct tape, and slightly more fuel-efficient cars, not with the powerful new technologies that can now save even more energy at even lower cost. For example, full use of American-made superwindows, which insulate two to four times better than triple glazing, could save the nation more oil and gas than Alaska now supplies. Widespread use of these efficiency measures would cost less, protect the environment, and deplete no critical resource.

Last year the thirteen-year-old “energy-efficiency industry” produced, in effect, two-fifths more energy than the century-old oil industry. We're getting less domestic oil at higher costs each year, but more efficiency at lower costs.

Reserves of oil are dwindling, but reserves of efficiency are expanding. Why, then, does federal policy emphasize depleting oil quickly and saving it slowly? The 1986 rollback of new-car efficiency standards, from 27.5 to 26 miles a gallon, is wasting more oil than the areas currently off limits in Alaska and offshore California might yield.

Conversely, improvements in the efficiency of the car fleet in use between 1973 and 1986 (from 13.1 to only about 18 miles per gallon) saved over twice as much oil last year as we imported from the Persian Gulf, or slightly more than Alaska's total output. We can do much better. The most efficient four-to-five-passenger cars in 1985 were getting more than 55 miles per gallon in commercial models and 70 to 100 mpg in prototypes.

After two previous oil crises, in 1973–1974 and 1979–1980, the United States tried ignoring efficiency and boosting supply. The result was overbuilt and insolvent supply industries that couldn't respond to the gush of energy savings produced in the marketplace. Today, with the potential for savings bigger than ever, the Reagan Administration seems determined to make the same mistake. When Donald Hodel, now Secretary of the Interior, was head of the Bonneville Power Administration, he proclaimed imminent electricity shortages in the Pacific Northwest and promoted the now notorious nuclear project WPPSS. Instead of the shortage prophesied, the northwestern states found themselves with a seemingly permanent surplus, triggering a \$7 billion deficit. Now Hodel wants to inflict the same genius on the struggling oil industry.

“Drilling” for oil in our inefficient cars and buildings isn’t instant or free. But it’s faster and much cheaper, safer and far surer, than drilling anywhere else. Energy savings have already cut the national energy bill by some \$150 billion a year. That’s an average of more than \$1,700 a year cash savings for each household in the United States—tax-free extra income that largely recirculates in our local economics, supporting local jobs and local multipliers.

But this achievement represents a mere fraction of the amount of energy efficiency available and worth buying. If Americans were now as efficient as our Japanese and Western European competitors are—and even they have a long way to go—we’d save an additional \$200 billion a year, which is more than last year’s federal budget deficit. Buying the economically optimal amount of energy efficiency for the rest of this century could lead to net savings of several trillion dollars—enough, in principle, to pay off the entire national debt.

Energy inefficiency costs American jobs in world markets. Japan’s higher energy efficiency, for example, gives all its exports an automatic cost advantage over ours, averaging about five percent—much more for energy-intensive products. Conversely, whether measured per unit of energy saved or per dollar invested, buying energy efficiency creates several times as many American jobs as supplying more energy: not jobs in boom-and-bust frontier towns, but jobs right in the communities of the people who need them.

The efficient use of oil can also buy time for the decades-long switch to the renewable sources that, one way or another, we’ll adopt as oil becomes too

costly. This transition won’t be quick or cheap, but that’s all the more reason for getting started now—before the cheap oil and the cheap money made from it are gone. Already, American oil is becoming costlier than imported oil, and the faster oil is used, the sooner other oil-supplying nations will find their oil becoming costlier than OPEC’s huge reserves. The problem that we have now, others will have later, though Saudi Arabia (according to our present knowledge of petroleum geology) will have it last of all.

The short-term oil savings and diversification in our sources of oil extraction that have resulted from the past two oil shocks now offer a unique opportunity: roughly a two-decade-long respite (longer if the exploration of new areas is unexpectedly successful, shorter if federal policy continues to stifle gains in efficiency) from Middle Eastern dominance of the global oil supply. If this interval is frittered away, it could end with the United States, its alternative options expired, needing Middle Eastern oil more than ever. If, instead, we increase our oil efficiency and make sensible use of diverse alternative fuels, this grace period could expire on a United States that no longer substantially depends on oil from the Middle East or anywhere else outside our borders. Without efficient cars, no liquid-fuel future makes sense for long. With efficient cars, alcohols and other liquid fuels made from natural gas and sustainably grown biofuels—abundant or even inexhaustible resources, whose use poses little or no risk to the world’s climate—can meet our energy needs at reasonable cost. Efficiency and alternative fuels are natural partners. With both, we can with confidence, buy American.

*Note: This PDF was corrected in
November 2010.*