

Federal Reserve Bank of San Francisco

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Energy = Money

The 6 percent of the world's people who live within this nation's borders have been increasing their energy demand almost 5 percent annually—accounting for about 33 percent of the world's energy consumption in the process—but they may have a problem keeping up this pace in the future. The nation is richly endowed with energy resources. Taken together, the United States has enough potentially recoverable resources to meet our needs for centuries to come at present consumption levels. Supplies available at current prices, however, are running short as the profligate use of fuels continues both here and abroad. Some official suggestions for solving the problem seem to come from the pages of **Poor Richard's Almanac**—Take the Bus to Work, Turn Out the Lights When Not In Use, etc. Most economists go along with these prescriptions but, perhaps more relevantly, also argue that the solution in the long run will be to permit the price system to play its proper role in stimulating increased supplies.

The daily newspapers suggest that something is wrong. In a single day last week, major oil firms announced plans to limit supplies of gasoline and heating to no more than 1972 levels, major airlines proposed such fuel-conservation measures as reducing the number of flights and flying at slower speeds and higher altitudes, and an Administration official proposed limiting

auto speeds to 50 miles per hour. Overseas, the Organization of Petroleum Exporting Countries broke off talks with producing companies in order to bring about an upward revision in the post-devaluation formula for oil prices.

Looking to the future, environmentalists point to a number of awesome consequences that could befall from a continuation of present energy trends. With electricity usage growing at present rates, one-third of the nation's total freshwater run-off could be required for power-plant cooling purposes by the end of this century. With California's power production continuing to double every eight years, the state's entire land area could be covered by power plants in little more than a century. Again, with the continuation of current trends, total energy production could approach 30 percent of solar input by the end of the century, causing our population centers to turn into giant heat radiators affecting local climates; the problem would be aggravated by the "greenhouse effect," whereby the heat energy leaving the earth is trapped by the carbon dioxide in the atmosphere.

Shift in trend?

Ways undoubtedly will be found over time to circumvent the horrors that could result if present energy trends are simply extended over time. Coping with today's problems is the first order of business, but this hasn't been made easy by the

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slowness of industry and consumers to respond to a shift in energy usage which developed about a half-dozen years ago. For most of the past half-century, energy consumption had grown at a slower rate than real GNP, thus indicating an increasingly efficient use of energy. The nation consumed 141 thousand BTUs per dollar of GNP in 1920, and this energy/GNP ratio dropped to 105 in 1940 and to 87 by 1966. But then a dogleg developed in the curve, and energy consumption has since risen at a somewhat faster rate than GNP.

The recent acceleration in the energy/GNP ratio has reflected mostly the high rate of usage by electric utilities, as businesses and consumers electrify their operations more and more. This has increased the demand for energy fuels, and also has created an unexpectedly heavy demand for new generating facilities. In addition, the automobile has played a role here, with miles-per-gallon performance decreasing as autos become larger, heavier, and less polluting.

Curbing demand

Policymakers evidently must attempt to turn this trend around, by promoting the conservation rather than the increasing usage of energy. Conservation could force changes in a number of our production processes and consumption habits. To begin with, there would be more emphasis on air-tight buildings, better mass transportation, and more efficient industrial

processes and equipment.

Building design and construction is an obvious area for improvement—through better insulation, reduced use of glass (a notoriously poor insulator), and reduced lighting in non-work areas such as hallways. Another area of improvement is rail-cargo traffic and mass-transit systems of all types; it takes four times as much energy to move a commuter by car rather than bus, nine times as much to move a passenger by plane rather than high-speed train, and four times as much to move cargo by truck rather than train. Yet another possibility is recycling, since considerably more energy is needed to produce metal from raw ore than from scrap.

Many of these measures designed to curb energy demand are long-range in nature, so that improving the supply situation becomes doubly critical. This explains the emphasis in the President's recent energy message on the expansion of domestic supplies.

Improving supply

Several major proposals in this message concerned petroleum, which accounts for almost one-half of the nation's energy consumption today. The Administration abolished the oil quota system as well as tariffs on imported oil; the limit on imports was removed, although they remain subject to a licensing fee, at least on amounts in excess of 1973 levels. New refineries were permitted to import 75 percent of their feedstock free of

charge for five years, as a means of stimulating domestic refinery construction. Also, the Administration tripled the federal leasing program for offshore oil-and-gas exploration in 1974 and, as a means of expanding the nation's capabilities for handling massive oil imports, proposed a licensing procedure for deepwater ports beyond the three-mile territorial limit.

In another area, the Administration proposed amending the Natural Gas Act to deregulate the price of new natural gas at the wellhead. (However, the price of old gas would be maintained at present contract levels, to hold down the average price for all deliveries.) This proposal helps get to the heart of the energy problem; for two decades, Federal Power Commission controls on prices paid by interstate pipelines have held gas prices below those of competitive fuels, thus encouraging wasteful use and discouraging exploration for new supplies.

The cost of natural gas at the wellhead runs about \$.25 per million BTUs—about one-third the price for the energy equivalent of heating oil and less than one-half the price for the energy equivalent of crude oil. This situation thus led to today's problem because the gas pipelines, unable to obtain new supplies, cut back on deliveries and thereby triggered a run on fuel-oil supplies. This in turn led to a gasoline shortage, as refiners concentrated on producing fuel oil and delayed

the usual seasonal buildup of gasoline supplies.

Using the price mechanism

The attack on the natural-gas shortage shows the faith of policy-makers in the ability of the market system to stretch supplies through price increases. This thesis may receive ample testing in the period ahead, since the projections of the FPC and others indicate that significant price increases are in store for all major fuels. Conceivably, the nation's energy bill—about 4 percent of GNP exclusive of taxes—might double within the next two decades. More likely, the bill will rise at a slower pace, since any major increase in energy prices should bring about greater care in its use.

Economists generally believe that the demand for energy is price-inelastic: both businesses and consumers tend to go on buying as much as they want despite price increases, because energy costs are so small in relation to total expenditures. This may not be so true over the long-run, however, as price increases make buyers increasingly kilowatt-conscious. Energy has been so cheap for so long that, except for certain heavy-using industrial processes, no one has given much thought to using it efficiently. That situation could well change; unleashing the price mechanism may be what is needed to reverse the recent trend and to force the energy/GNP ratio to resume its historical decline.

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