Energy: Shortages Loom, but Conservation Lags

Whether or not the current "energy crisis" is a fabrication of fuel producers, it will be real before long if present consumption trends continue. Not only are long-range energy conservation policies needed in order to preserve the environment, but immediate steps need to be taken in order to buy time until new, clean power sources become available.

The question of energy conservation is finally getting serious attention from private groups, some state governments, and some parts of the federal government.

But the President's April energy message is widely regarded as deficient when it comes to conservation. In fact, the message read more like an expanded utility advertisement—one of those layouts that purports to tell the public the "true facts" about the energy crisis and urges incentives for stepped-up exploration of fossil fuel sources, temporary relaxation of environmental controls, and full speed ahead with nuclear energy.

Despite speeches by Council on Environmental Quality chairman Russell Train and former Environmental Protection Agency head William Ruckelshaus, the Executive Office seems strangely reluctant to get its feet wet in the matter of energy conservation. Charles DiBona, the President's new special consultant on energy matters and a former defense analyst, is said by environmental groups who have met with him to have only a peripheral interest in this problem. No legislative initiatives are as yet forthcoming from the executive branch—a CEQ staff man explained that things have to be studied more first. The new Office of Energy Conservation in the Department of the Interior, according to tentative outlines given by an Interior spokesperson, appears to be little more than a public information office that will churn out pamphlets advising people to keep their cars tuned and not run the air conditioner when they are out of town.

All this seems odd in light of the fact that gasoline shortages are already cropping up, and spot shortages of heating oil seem certain for next winter.

While nothing has so far been done to reduce the nation's rate of energy consumption, a lot of people have started thinking about it very hard. The Office of Emergency Preparedness produced a report, "The Potential for Energy Conservation," last fall; the Rand Corporation has been figuring out how to modify California's electricity consumption; and the Ford Foundation's Energy Policy Project is in the midst of a $3.5 million study to draw up the nation's future energy options. Perhaps most important, some members of Congress are actually working on getting some new laws passed.

Some Measures Obvious

The steps that could be taken to reduce fuel consumption and make electricity more efficient have been spelled out many times: build automobiles that operate on lower horsepower, develop urban mass transit, shift freight from planes and trucks to rails and waterways, insulate buildings, design new buildings for maximum use of heating and cooling systems, set minimum efficiency requirements for power-consuming products, save natural gas for uses other than production of electricity, recycle waste, change power rates to encourage efficiency, and so forth.

But who is to do all these things and how? There are two basic ways to push the nation into the "conservation ethic" recommended by the President: economic leverage and outright regulation. An artful combination of both is needed. Since energy conservation is a matter of chipping away at a lot of little things in order to produce large cumulative savings, it looks as though the federal government will have the largest role in this effort.

Discussions of energy consumption usually divide the subject into the following categories: transportation; space heating of homes and businesses; appliances, lighting, water heating, and air conditioning; industry; and electric utilities.

Ideas for solutions in the transportation area seem to be the most advanced, but there is strong resistance to needed changes in the automobile and fuel industries. Train has pointed out in numerous speeches that a reduction by half of an automobile's weight would bring about a 100 percent increase in mileage per gallon. By contrast, he says, emission control devices bring about no more than a 10 percent loss in fuel economy. Automobile interests persist in blaming low mileage on safety equipment and pollution control equipment: ". . . the key to the trouble is late-model autos with their gas-consuming emission-control devices," says the *Oil and Gas Journal*. It also says, "Safety requirements are responsible for most of the added weight."

Several bills aimed at reshaping these attitudes are now being worked on in Congress. Representative Charles A. Vanik (D–Ohio), who seems to be the House live wire when it comes to actually working up energy conservation bills, has introduced an auto excise tax, based on fuel economy, that would go into effect in 1977. A car that met minimum requirements (7 miles per gallon) would be taxed several hundred dollars, with the tax decreasing as mileage rose. A car getting 20 or more miles per gallon would not be taxed. Senator Ernest F. Hollings's (D–S.C.) staff has drafted a similar bill. Raising gasoline taxes has been considered and, for the most part, rejected. One reason is that buyers are much more responsive to the initial cost of an item rather than to operation and maintenance projections over the lifetime of the item, so the deterrent effect of such a tax is uncertain. The other reason is that the tax would be a burden on low-income people who must use their cars, and it would not significantly reward those who bought small, energy-efficient cars.

Efficiency requirements for automobiles are only the first step. In the long run, entire patterns of transportation will have to be changed. One group tackling this problem is the staff of the Senate Commerce Committee. The director of the staff report, Barry Hyman, points out that, as federal subsidies are now arranged, mammoth growth of the two most profligate fuel users is assured—automobiles and airplanes. The Federal Aviation Administration, for example, underwrites 90 percent of the cost of new airport development. It is projected that the FAA will spend $3 billion on new airports between 1979 and 1990. Airplanes consume 10 times as much energy per passenger mile as

buses, and air freight uses 50 times as much energy as rail freight. Hyman points out that diverting some of this money to refurbishing the withering railroad system would not only result in tremendous energy savings, it would also eliminate the need for huge new land-takings, since most necessary rail lines have already been built. Hyman says such a shift would not impede growth of the airline industry. With the "modal split" his staff recommends, 7 percent of passenger miles for intercity travel would be by airplane in 1985—constituting a tripling of airplane passenger miles in 15 years. By contrast, the Department of Transportation estimates that the percentage will climb to 19 percent—almost a quintupling of passenger miles. It has also been estimated that some 800 million gallons of jet fuel could be conserved each year—without a decrease in passenger mileage—if the Civil Aeronautics Board directed airlines to consolidate runs and work out optimum flight schedules.

The Highway Trust Fund is also a symptom of government-inspired energy profligacy. For example, a 9-mile stretch of commuter-used highway in Virginia will cost $125 million—$25 million more than the cost of purchasing and refurbishing the entire metropolitan bus system.

Space heating and cooling for businesses and residences constitutes another huge portion of the national energy budget. Here the political obstacles are not as great as they are with transportation, but changes will have to come piecemeal because states and municipalities are responsible for building codes, architectural criteria, and zoning. The only federal lever for nonfederal buildings is the Federal Housing Administration, which is now under pressure to tighten insulation requirements for homes financed by FHA loans. The FHA has the only national insulation standards, but the extent to which they influence local codes is subject to question.

Meanwhile, several congressmen are formulating measures that would offer tax deductions for homeowners who backfitted their homes with new insulation. Some say tax incentives would be insufficient, considering the fact that such a project costs a homeowner several thousand dollars; others maintain that the prospect of avoiding revenue payments has a magical effect on the taxpayer. It has also been suggested that better loan terms be offered purchasers who plan to backfit their homes and heat them with oil or gas. All-electric homes take twice as much fuel to heat because of the energy lost in converting fuel to electricity.

Federal agencies don't seem to be planning any moves, but they are actively studying energy use as it relates to building technology. The General Services Administration is constructing a federal office building in Manchester, N.H., that will incorporate all the latest knowledge in energy-saving, and the National Bureau of Standards and the Department of Housing and Urban Development are experimenting with the use of total energy systems in residential and shopping complexes. These complexes would have their own power-generating facilities and would incur savings by using waste heat.

The recycling of waste materials as well as heat is a way of making small but incremental energy savings. But shifts in other sectors will have to be made before it becomes profitable. For example, it takes less power to make paper from recycled stock than from virgin timber, but freight rates currently discriminate against recycled material.

One of the major thrusts of public education about energy conservation—perhaps the most significant one—will be to teach people to think in terms of the lifetime cost, rather than the initial outlay, for everything they buy, from houses to automobiles to electrical appliances. One way to compel people to think in these terms is the labeling bill proposed by Senator John Tunney (D–Calif.). The Tunney bill would require that all electrical appliances conform to minimum efficiency standards and that consumption rates be indicated on the product. This could be particularly useful for purchasers of air conditioners, one of the all-time great power gobblers, whose efficiency rates vary widely.

The potential for more efficient use of power by energy-intensive industries has yet to be clearly defined. On the

POINT OF VIEW

Marston Warns of Threat to NIH

A direct sense of alarm for the future of the National Institutes of Health is evident in the farewell speech of former director Robert Q. Marston. Associates of Marston, who was abruptly dismissed this January, say he was told by the White House that the decision was for neither personal nor institutional reasons. Others have suggested that Marston was dismissed simply because he was appointed by a Democratic Administration. However this may be, Marston's valedictory, delivered on 27 April, is concerned not about his own situation, but that of the NIH.

Let me suggest that you view your concerns against [remarks by Mahlon B. Hoagland, director of the Worcester Foundation]: "It has taken nearly a quarter of a century to build up the National Institutes of Health. The support of research has been a model other countries have imitated. The peer review system has given us the best science through a federal agency with the least political interference of any governmental process ever developed. It is truly one of the great achievements of American government, but it is being destroyed." . . .

In this country, so far at least, enlightened leadership in both the Executive and Congressional Branches have resulted not only in a sound and healthy growth in biomedical research, but in a minimum of attempts to bend science to meet short-term political needs. Of course, a major check on such temptations has been the existence of the NIH peer review system.

This necessary freedom to conduct research in a free environment is sometimes being misunderstood as advocacy for special-interest groups on the one hand, and potential disloyalty on the other. Such a misunderstanding could result in what has been feared in other countries—that is, a distortion of the truth, a substitution of bias for objectivity. . . .

So long as [the NIH's] aspirations remain so high and its accomplishments unquestioned by competent people, its course must continue to be upwards. Of course, as Representative [William R.] Roy [D–Kans.] . . . said recently . . . : "Any jackass can kick a barn down but it takes a carpenter to build one." Thus one does have to remain alert to attack from the ignorant or unintentionally destructive.

theory that industry is more sensitive to the price of power than are small customers, Vanik has introduced a bill that would tax fuels and electricity on the basis of use. While it can be assumed that increased power costs would be passed on to the consumers of the goods manufactured, a Vanik aide explains that the purpose of the tax would be to stimulate industrial users to develop more energy-efficient processes. The bill would also create an "energy trust fund" to finance research on efficient production, conversion, transmission, and use of energy.

The energy tax proposal, if passed, would be one way of attacking the sacred basis of all electric power pricing—the rate structure, which encourages massive energy consumption.

The economics of the utility industry are unique in that they are structured in almost every conceivable way to encourage production and stimulate demand. This served the country well in the days when it was rapidly being electrified and cheap power was a key to rapid economic development. Now that the environmental costs are becoming painfully evident, shortages are looming, and profligate energy use has reached extreme proportions, the need for a revised philosophy is evident.

There is much talk of the need for flattening or inverting the declining block rate structure that, in effect, has small power users subsidizing the big ones, but so far this sacred cow remains unmolested. The Federal Power

Watergate Fallout: Administration Quakes, Science Sneezes

The Watergate affair has already decimated the ranks of the White House staff, assisted in the early demise of the new supercabinet structure, and ushered in a musical chairs routine among top level government officials. Its effects are even noticeable in such lower level matters as the administration of science. Like any other part of the government machinery, science to a large extent runs itself. Officials at the National Science Foundation, the National Bureau of Standards, and elsewhere say that business is proceeding as usual. But Stanley M. Greenfield, chief scientist at the Environmental Protection Agency, says that "anything which requires approval from above is just moving a great deal slower."

Certainly, White House response seems to be overdue on three major problems relating to science. One is the national cancer plan, which has never been released. Another is the implementation of the recent energy message which, in terms of R & D assignments and other plans, needs White House guidance. A third issue is the Administration's unpopular cuts in the health budget. In a marked display of indifference to the executive, the House of Representatives on 31 May restored some $216 million in biomedical research fellowship authorizations. The 316-to-5 vote, which some officials admit could not have occurred without Watergate, may foreshadow a long fight with Congress on these issues.

Equally important for science in the long term is that the Watergate paralysis is occurring at a time when almost every major science post in the federal government is either vacant, has only recently been filled, or has an incumbent burdened with a fresh set of marching orders. At the Department of Defense, for example, John S. Foster, Jr., the defense research czar, who had intended to resign on 1 January, has remained on (gossip has it that he seeks the post of Air Force Secretary Robert Seamans). However, Foster's successor, Malcolm Currie, has been on the job for several months, making two defense research czars. Meanwhile, the offices of the assistant secretaries for R & D of the Army and Navy Departments, and those of many of their deputies, are all vacant, leaving the military research establishment—so long dominated by Foster—in a state of confusion the like of which hasn't been seen for years.

The previously vacant post of assistant secretary of commerce for R & D has just been filled; the director of the NSF gets new duties, effective 1 July, as science adviser; the assistant secretary of HEW for health, Charles Edwards, has just formally taken office; there is a new chairman of the Atomic Energy Commission, not to mention a changeover at the Arms Control and Disarmament Agency and a new assignment for the director of the Advanced Research Projects Agency.

Some bureaucrats advance the theory that new centers of power could emerge. A former administrator rhapsodizes: "Boy, I'd give anything to be in Washington right now. I could do anything I wanted without having the White House on my back." But others said that the jamming of signals to and from the White House would only hinder these new administrators; "You can't make a significant move in Washington without offending someone," said a former Department of Commerce administrator. "These people won't try to do anything new because there won't be anyone to back them up." One research administrator recalls that White House backing hasn't been consistent for months. When the President and his former aides H. R. Haldeman and John Erlichman started reorganizing the White House in January, he said, "the word was passed down the pipeline: 'Don't hurry us; any commitments you thought you had from us are now open.' " Watergate may serve to keep key officials who are new to their jobs or who have new assignments in a continuing state of jitters and could usher in a highly cautionary period for many science-related programs.

Apart from these effects, however, some scientists interviewed in the last week declared that the myopic view of the outside world which allegedly led some Presidential aides to participate in the bugging coverup proves, retroactively, that they didn't know enough about reality to understand science advice. A former member of the President's Science Advisory Committee (PSAC) said bitterly: "They took criticism of their programs as criticism of themselves. They never bothered to do their homework on what PSAC was for. . . ."

The Watergate scandal may vindicate those scientists deposed by the Haldeman-Erlichman machinery. Or, if it brings decision-making by high level people to a halt, it could cramp science in the long run. For the time being some of the small wheels, anyway, are still grinding.—DEBORAH SHAPLEY

Jaffe To Leave Drug Office

Jerome H. Jaffe, director of the President's Special Action Office for Drug Abuse Prevention, has resigned his post effective 17 June. To succeed him, President Nixon has nominated Robert L. DuPont, the 37-year-old director of the Narcotics Treatment Administration (NTA) in Washington, D.C.

Jaffe came from the directorship of the Illinois State Drug Abuse Program to head the Special Action Office when it was created 2 years ago. He is known to be desirous of getting back into the academic world (he was on the psychiatry faculty of the University of Chicago). He is also known to be displeased with an Administration-sponsored bill, now sitting in the Senate Judiciary Committee, that would lay harsh new penalties on the possession of heroin.

DuPont, also a psychiatrist, was apparently a natural choice to succeed Jaffe. He has worked closely with the Administration on drug problems, and the NTA, which he has directed since its creation in 1970, has come to be known as one of the most effective comprehensive drug treatment programs in the country.

The Special Action Office has 2 more years to complete its job of pulling together and coordinating federal drug abuse and treatment efforts. It is scheduled to go out of business in mid-1975.—C.H.

Commission regulates wholesale interstate power rates, but unless Congress broadens its mandate, an unlikely event, prospects for change are few—and it would take a strong-minded state utility commission to overthrow entrenched tradition.

The utility industry enjoys enormous economies of scale. Since capital costs are very high, the larger the generating capacity the more profitable the operation. Since legally permissible profits are based on a percentage of capital investment, a utility that wants to increase its output stands to gain much more by building a new facility than by buying power from another company for transmission to its customers.

To justify expansion, utilities have to show that the demand exists. This they do by creating it, through promotional policies, discriminatory pricing, and the declining rate structure. Thus a crusade such as the Edison Electric Institute's "Save a Watt" campaign runs against the grain of the industry's economics and can hardly be expected to make much of a dent in consumption.

Senator Lee Metcalf (D–Mont.) has formulated an ambitious proposal that would create a national grid for the transmission of electricity. His staff estimates that such a system would result in a 20 to 25 percent annual reduction of the need for new generating capacity. Utilities oppose the bill, which would loosen their monopolistic hold on power supply in many parts of the country.

While utilities at present seem untouchable, the federal government could begin by reorganizing rates at its own installations, such as the Tennessee Valley Authority and the Bonneville Power Administration.

Representative Ken Hechler (D–W. Va.) recently called for some TVA reforms. He pointed out that it led the way in the mass production of cheap power and comprehensive resource management, and that now it was time for TVA to show the nation how to produce clean efficient power without tearing up the landscape. "Cheap power, the balm of a generation ago, has become the narcotic, debilitating drug of the present," he proclaimed.

Despite the overwhelmingly wasteful use of energy in this country—Representative Morris Udall (D–Ariz.) pointed out that Americans consume for air conditioning the same amount of power that all 800 million Chinese need for everything—the conservation bandwagon has hardly begun to roll. The elasticity of demand in response to rising energy prices is being intensively studied and hotly disputed. The backlashes and trade offs to be anticipated from one policy or another are only dimly foreseen. For example, if everyone were forced to buy less powerful cars, would this bring about a sharp rise in intercity air travel?

So the studies go on, the alternatives are weighed, scenarios analyzed, cost-benefit ratios computed, and elasticities prognosticated. Meanwhile, per capita energy consumption is expected to quadruple by the end of the century, and it may be that by the time all the options have been thoroughly assessed, some will have quietly slipped away.

—CONSTANCE HOLDEN

RECENT DEATHS

Lee W. Anderson, 46; professor of mathematics, Pennsylvania State University; 5 February.

Lev A. Artsimovich, 64; head, atomic physics department, Moscow University; 1 March.

Alexander Askochinsky, 75; former deputy minister of agriculture, U.S.S.R.; 6 March.

Robert B. Bailey, 50; professor of education, Southwestern State College; 23 March.

Elizabeth F. Baker, 87; professor emeritus of economics, Barnard College; 28 January.

Herbert G. Birch, 54; professor of pediatrics, Albert Einstein College of Medicine; 4 February.

Ira S. Bowen, 73; retired director, both Mount Wilson and Palomar observatories; 6 February.

Clement G. Bowers, 79; former research associate in ornamental horticulture, Cornell University; 12 April.

W. J. Brogden, 60; professor of psychology, University of Wisconsin, Madison; 22 February.

Robert E. Buchanan, 88; dean emeritus, Graduate College, Iowa State University; 21 February.

Henry A. Bullock, 66; professor of economics, University of Texas; 8 February.

Harold S. Burr, 83; professor emeritus of anatomy, Yale University; 17 February.

Doak S. Campbell, 84; president emeritus, Florida State University; 23 March.

Jaime R. Carbonell, 44; manager, artificial intelligence department, Bolt, Beranek & Newman, Inc.; 2 February.

Dwight W. Chapman, Jr., 67; professor of psychology, Vassar College; 11 April.

Finla G. Crawford, 78; vice chancellor emeritus, Syracuse University; 13 April.

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