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The entrepreneur*

FREEDOM'S FOUNDATION HONORS HARDING'S CENTER, NEWSLETTER, AND DIRECTOR

The Freedom's Foundation of Valley Forge, Pennsylvania, in its presentation of annual awards for the betterment of America has notified us of the following results of the National Awards Jury deliberations: (1) In the Nonprofit Publication category, the Harding College Center for Private Enterprise Education won a George Washington Honor medal for its bimonthly publication, "The Entrepreneur" (This business and economic newsletter which began in October, 1976, is distributed to educators, businesses, chambers of commerce, foundations and interested friends and alumni of Harding College); (2) Dr. Don Diffine, Editor and Director of the student-staffed Center received an identical award for "an outstanding accomplishment in helping achieve a better understanding of the American way of life;" and in addition, (3) Diffine received a George Washington Honor medal in the Published Article category for his recent work titled "Freedom From Want."

The Economics of the Energy Crisis

by W. Philip Gramm

Dr. Gramm, a January, 1977 speaker at Harding's Management Seminar, is a Professor of Economics at Texas A&M University. He has done contract research for numerous federal agencies on energy and is a special consultant to the Ministry of Natural Resources in Ontario on Mineral Economics. Dr. Gramm has testified before the U.S. Congress and state legislatures on energy problems and has written on numerous facets of the nation's economic and energy problems.

The Economics of the Energy Crisis

In his address to the nation President Carter called the energy problem the "greatest domestic challenge our nation will face in our lifetime." Certainly there are many outward and visible measures of the magnitude of America's current energy problems. Our dependency on imported crude petroleum is generating a $35 billion drain on the American economy. We are over 40 per cent dependent on imported crude petroleum to meet domestic demands. The wholesale price of crude petroleum has risen by almost 400 per cent in the last four years. The price of natural gas and coal has paralleled that of crude petroleum. And the nation has just suffered a natural gas shortage which closed factories and schools and disrupted the economic process in the Northeast and Midwest.

The President's proposed methods of coping on a temporary or permanent basis with America's energy problems can be broken into two broad categories of approach: learning to live on less and producing more. The purpose of this article is to assess the economic feasibility of coping with America's energy problems by conservation of energy resources and by increasing energy production. As a separate topic, the paper will also discuss the long term resource problem and the question of resource exhaustion.

Conservation as a Method of Dealing with America's Energy Problems

Four years ago, Stewart Udall made a lot of headlines by traveling around the country accusing the American people of being energy pigs and wasting the world's energy resources. Udall based his assertion on the fact that the American people comprised only six per cent of the world's population and consumed about one-third of the world's energy resources. What he failed to mention was that the U.S. economy also produces over one-third of the world's goods and services and by any economic measure of efficiency, such as least-cost combination of capital, labor, and energy or maximum output given resource input, Americans are probably the most efficient energy users in the world. Energy consumption per capita in the United States reflects largely our level of economic attainment and the relative prices of energy, capital, and labor which have existed in the United States over the last quarter century.

By taking the price of all energy resources consumed by the American public and weighing those prices by the level of usage, it is possible to develop an energy price

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index on an annual basis. When that energy price index is deflated by the wholesale price index to eliminate the impact of inflation, it is possible to gauge changes in energy prices in terms of constant purchasing power dollars. In an American Enterprise Institute monograph, Edward Mitchell found that in terms of constant purchasing power dollars, real energy prices fell on an accelerating basis from 1950 to the Arab Embargo in 1973. From 1950 to 1955 real energy prices in terms of constant purchasing power dollars fell by 3.1 per cent, and from 1970 to October 1973 on a five year basis real energy prices fell by 9.4 per cent.

Given the presence of falling energy prices in constant purchasing power dollars, accelerating real wages and rising capital costs; American industry and agriculture minimized cost and maximized output subject to resource inputs by increasing the energy intensity of industrial and agricultural production. Such substitution of cheap energy for labor and capital, far from being wasteful, represented a method by which the U.S. economy grew at a rate during the 1950's and 60's which has not been equaled in the 1970's. To have failed to make these substitutions would have deprived the American people of goods and services and jobs.

Not only did national wealth increase substantially between 1950 and October 1973, the value of the consumer's time in terms of his wage rate accelerated during the same period. With higher income and wealth levels combined with the increased value of time in the market place, the American consumer chose time-saving devices and modes of transportation which by and large embodied increasing energy consumption. With falling energy prices, the consumer stopped waiting on the bus to take him to shop or to work, but instead bought his own car. He bought a bigger car and air conditioned it, central air conditioned and heated his home, and electrified the can opener. These decisions were made not on an irrational basis but in a rational attempt on the part of each consumer to be efficient in the use of his time and to maximize his own welfare subject to the economic constraints he faced.

Energy Production and Environmental Restrictions

Perhaps no form of government intervention has had a larger impact on energy production in the United States than environmental restrictions. Horror stories related to government regulations and their impact on energy production with little or no potential benefit to any significant group of the American economy have become so commonplace that the American people have lost their ability to be outraged. In virtually all facets of the energy industry, environmental controls, which have ranged from restrictions on drilling for oil and gas in the Continental Shelf to the stopping of construction of pipelines and nuclear reactors, have had a tremendous impact on energy production, foreign dependence, and the price of energy to the consumer.

We have now drilled less than five per cent of the Continental Shelf which geologists claim is the most promising area for exploration available to the American oil and gas industry. The principal impediment to exploration has been a hold up in leasing due to environmental objections. Out of 20,000 wells drilled in the 200 miles of shallow water around the United States, there have been less than a dozen major leaks. While it makes good demagogic material for politicians on the East Coast to claim that the producing states are holding back natural gas, in reality it is East Coast politicians who are holding back natural gas from East Coast consumers by preventing exploration and production along the New England Coast.

In dealing with the potential environmental risks involved in oil and gas exploration, the government has used a typical anti-market approach to the problem by imposing the burden of preventing environmental destruction on the consumer by simply prohibiting drilling. The burden of environmental protection could be shifted to the producer by allowing competitive bidding for the right to drill in the Continental Shelf and imposing severe penalties on those companies that allow a leak to occur due to negligence. If the federal government imposed damages on those operators who failed to take sufficient precautions to prevent leaks, not only could a compensation be made to those who are damaged, but a strong incentive would be available to encourage petroleum producers to develop new technology to protect the environment.

Environmental and regulatory problems of licensing nuclear reactors are of course legendary. President Carter's call for a streamlining of nuclear reactor licensing is long overdue. While no one doubts the potential danger of nuclear materials, it is important to note that no person has ever died in a nuclear accident related to power generation in the United States. In fact there has never been a serious nuclear accident. This is certainly not to say that there will never be one, but it is important to remember that virtually all types of production involve some risk. The relevant question that the American people must ask themselves is not whether nuclear reactors are dangerous, but do the benefits outweigh the potential costs?

While stringent regulations may well be justified, a great deal of streamlining concerning paperwork and the overlapping of authority in nuclear power generation licensing can certainly be achieved. Less than two per cent of America's energy needs are currently being met by nuclear power. Virtually every projection of our end-of-century consumption and production counts heavily on growth in nuclear power generation to meet the gap between growth in consumption and production from conventional sources. Unless something is done to streamline the rgulatory process most of the goals set by the Federal Energy Administration for nuclear power generation will not be met by the end of this century.

No one disagrees with the President's emphasis on expanding coal production, but the question is how to achieve that goal? Perhaps the best short run resource which is available to meet America's energy demands is low sulphur coal which can be strip mined at relatively low cost in the West. In strip mining as in the liscensing of nuclear reactors, what is needed is some reasoned trade off between environmental protection and energy production. Given our resource base and the current

state of technology, the use of coal seems destined to grow through the end of the century. The price the consumer will pay for it will depend on the reasonableness of environmental restrictions.

Short-run Options Presently Available

Let me summarize the courses of action that I believe to be absolutely essential to cope with America's energy problems in the short run. (1) We must deregulate new natural gas prices on interstate sales immediately and phase out the regulation of old gas so that all Americans pay the same price for natural gas and so that sufficient incentive is provided to produce exploration and drilling which alone can solve the natural gas shortage. (2) Price controls on all crude petroleum must be phased out to provide incentives for production and conservation. (3) We need to open up the Continental Shelf for drilling not just along the coast of Texas and Louisiana but along the coasts of California and Massachusetts as well. A heavy burden of penalty should be placed on drillers who allow leaks to occur.

The first seven miles of the Continental Shelf should probably be left under the control of the states. If the states on the East and West Coasts do not want drilling within the seven mile limit that decision should be left up to them. The federal government should assert its authority from seven miles out to the end of the Continental Shelf and allow leasing at the federal level. (4) We need to streamline the production and licensing of nuclear reactors. (5) We must make some hard decisions with regard to the trade off between environmental protection and energy production with regards to strip mining coal in the western states.

If we took these steps, the potential impact on American energy production would have a significant effect on the policy decisions of OPEC and in my opinion would ultimately plant the seeds for the destruction of the OPEC cartel pricing agreement. Our unwillingness to produce our own energy resources and our willingness to deal with the OPEC cartel as if it were a legitimate lawful marketing arrangement has done more than anything else to foster the strength and solidarity of the OPEC oil cartel.

Uncertainty concerning federal energy policy since the Arab embargo has been a major impediment to long term investment. No doubt if President Carter's proposal to cearly define government energy policy is carried out, it would be a positive boon to both the producer and consumer of energy in America. It is unfortunate, however, that at the same time the President talks about clearing the air of uncertainty he rattles the saber of divestiture at the oil industry and implicitly accuses the oil industry of conspiring against the public interest. It is very detrimental to the basic foundations of our economic system for the President of the United States to assert, without presentation of evidence, that the oil industry has in the past or is now engaged in collusion in restraint of trade.

By any objective measure, the oil industry is as competitive as the average American industry engaged in industrial production. Over the last 25 years, the after-tax rate of return on capital investment in the petroleum industry has not been significantly different than the after-tax yield on investment produced by Standard and Poor's 425 industrials. In exploration and marketing, few industries in America can compare with the petroleum industry so far as fragmentation of market shares is concerned. Even in the refining stage of production, the petroleum industry is far more competitive, as measured by market shares held by individual firms, than the automobile industry, pharmaceutical industry, and a half-dozen other major industry classifications.

The concepts of just price and fair return have been employed by government, at least rhetorically, since the Middle Ages. Such concepts are good politics and bad economics. If the President is serious about not allowing anyone to benefit from the energy crisis, our problems will never be solved. It is precisely the benefit which is available in terms of above average profits in the production of a product in short supply that attracts resources and investment into that industry. To eliminate those enticements is to eliminate the market process which alone is capable of solving the problem.

Long-run Energy Prospects: Doomsday?

Even if the action that I have outlined above would contribute substantially to increasing America's energy supply for the remainder of this century, the question still remains as to what are our long-run prospects for producing the energy we need. Many proponents of conservation believe conservation is a method of simply prolonging our ability to cope with the energy problem and that all steps to increase energy production such as those I have outlined above will simply hasten the day when we will run out of energy. Since this doomsday philosophy underlies, much of the thinking which is being espoused at all levels of government, no analysis of our energy problems would be complete without a discussion of long-term energy problems and the possibility of resource exhaustion.

From the birth of the ancient Greek science and philosophy until this century, man viewed the world as possessing a given "stockpile" of resources. In every age, men have employed the stockpile view of resources to predict doom. All such predictions have had basic elements in common: (1) they all assume man possesses only the capacity to adapt to a fixed environment; (2) they all assume that technology is bounded by a fixed resource base, and most importantly; (3) all of them have proved to be wrong.

The world is moved not by the philosophers but by the doers, and practical men employing ingenuity and common sense have never been bound by the constraints that bind the philosopher. What history has documented thousands of times, modern science has finally recognized. In a fundamental sense, natural resources are not fixed but they are functions of science and technology. As science and technology progress, new resources come into existence and old resources become valueless. To those who walked naked in the forest, the only mineral resource was a sharp stone. By using resources that were to such a man valueless, we were able

to walk on the moon. Man creates his own environment and his own resources and is bounded only by the limits of his imagination and freedom of action. A case study of man's ability to cope with resource constraints is found in the whale oil crisis of the 19th century. From roughly 900 A.D. until the 1860's, whale oil was an important source of lighting and lubrication. Whales were hunted in the bays and inlets of Western Europe on a sporadic basis until the middle of the 16th century. When whales began to disappear in the north, the fleets turned southward and exploited the American coast. In 1848, American whalers entered the Artic Ocean.

The long journey from the coast of France to the Bering Straits is a testament to the ability of man to exploit his resources and to adapt himself to nature. We did not run out of whale oil. Its price simply got so high that the same genius that had so augmented its supply was employed to develop its replacement. From the Artic Ocean man turned to Pennsylvania in search of a cheaper and more abundant source of lighting and lubrication and found a great energy source in the process. A non-resource, crude petroleum, was thus made a resource by science and technology and man adapted nature to his requirements.

We are experiencing the second major energy crisis in American history. The people of the 19th century did not need computers to project that the supply of whales could not keep pace with the rapid expansion in demand. As prices rose, coal gasification became an economically feasible substitute and the quantity of whale oil demanded leveled off especially in Europe.

In 1859, petroleum was discovered, an event which in a few years ended the whale oil "crisis" forever. The first oil well in Titusville, Pennsylvania, marked the beginning of the end for whale oil as a light source.

The high prices for sperm and whale oil between 1859 and 1867 provided a growing profit incentive to develop an efficient refining process for crude petroleum. Subsequent investment in research and development resulted in the production of kerosene. By 1863, 300 firms were refining petroleum products and kerosene quickly broke the sperm and whale oil market causing prices to tumble.

The encroachment of petroleum into the domain formerly dominated by whale oil did not end with the use of kerosene as a light source. Soon lubricants were derived from petroleum residuals, and paraffin robbed whale oil of even its ornamental uses. Whale bone and secretions which were considered waste products in 1800 saved the industry from total extinction.

The whale oil crisis is a case study of how the free-market system solves a scarcity problem and circumvents resource depletion. When demand increased, the price of whale oil rose and higher prices increased the number of feasible substitutes. The rise in prices from 1820-1847 saw tonnage of whaling vessels rise almost 600 per cent, and technological improvements in the whaling industry were numerous. The rising prices caused output to increase perhaps by 1,000 per cent or more. Had government possessed the power and volition to attempt to ration sperm and whale oil in order to hold its price down or to levy a tax on whale oil to reap the gains from the price rise, the shortage could have been catastrophic and the advent of kerosene and other petroleum products might have been delayed for decades.

The profit incentive produced by higher prices for whale oil gave an impetus to seek out and perfect alternative energy sources. The end product of this process of discovery and innovation is the Petroleum Age in which we live. We owe the benefits and comforts of this age to free enterprise and the scarcity of whales.

The history of our first "energy crisis" and hundreds of thousands of other "crises" teach us that there is no reason to believe that we face long-term doom. If technology were suddenly frozen some of the dire projections being made now might be realized in several hundred years or less, depending on which "expert" of the week one believes. But technology is *not* frozen, it is instead progressing at a rate unprecedented in history. The Petroleum Age will pass as did the Stone Age. The real danger is that we may foolishly restrict the exploitation of current resources, forego investment opportunities, and allow conserved resources to become obsolete. Only if we elminate the market incentives for innovation and investment must we face a real, long-term "resource crisis."

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