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ENERGY POLICY—SUPPLY AND DEMAND ALTERNATIVES

GOVERNMENT

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HEARING BEFORE THE SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS OF THE COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE HOUSE OF REPRESENTATIVES NINETY-SIXTH CONGRESS

FIRST SESSION

JULY 26, 1979

Serial No. 96-90

Printed for the use of the
Committee on Interstate and Foreign Commerce

DOCUMENTS

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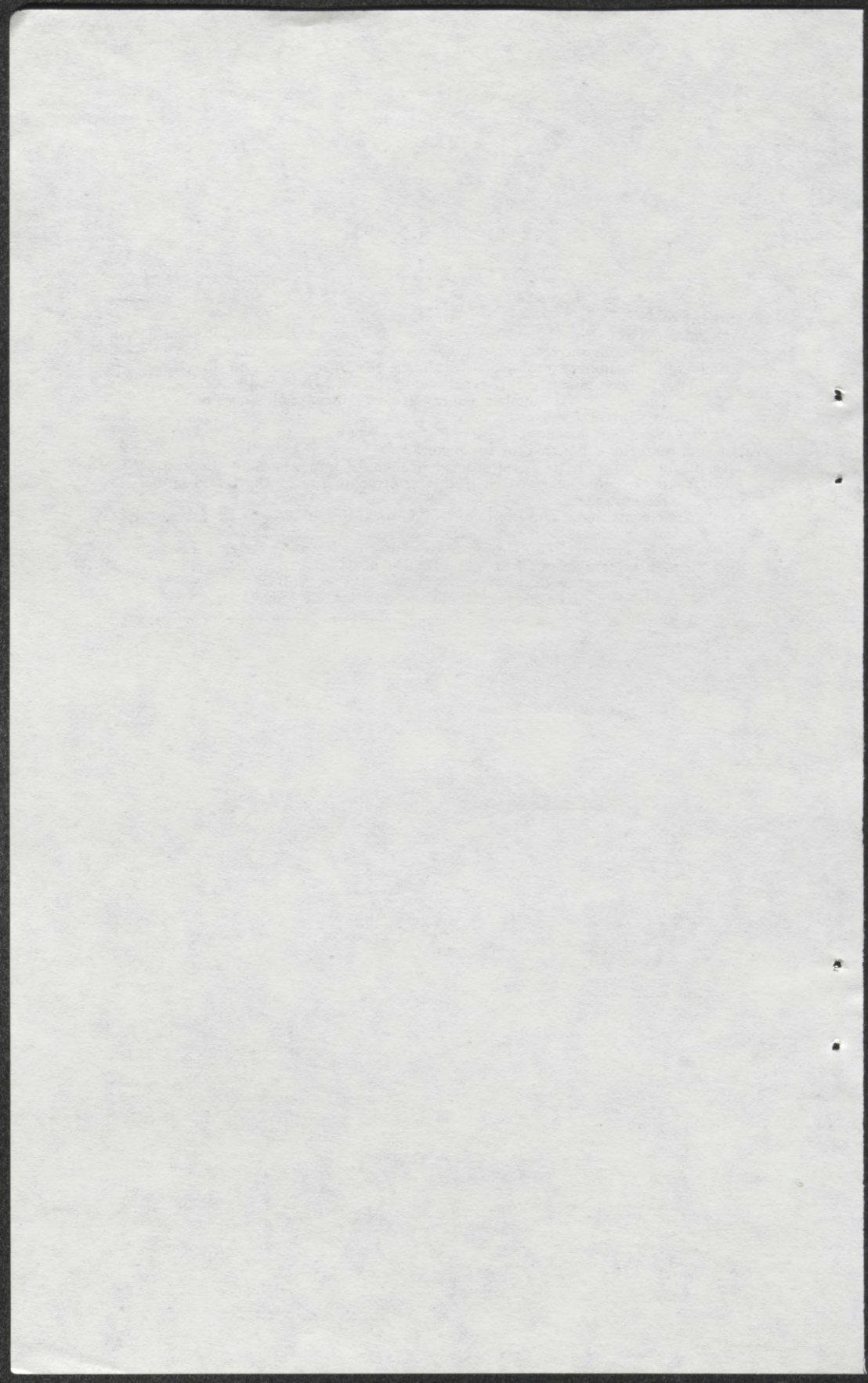
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ENERGY POLICY—SUPPLY AND DEMAND ALTERNATIVES

THURSDAY, JULY 26, 1979

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON OVERSIGHT AND INVESTIGATIONS,
COMMITTEE ON INTERSTATE AND FOREIGN COMMERCE,
Washington, D.C.

The subcommittee met, pursuant to notice, at 9 a.m., in room 2322, Rayburn House Office Building, Hon. Bob Eckhardt, chairman presiding.

Mr. ECKHARDT. The Subcommittee on Oversight and Investigations will be convened at this time.

Our Nation has come to a crossroads in energy policy. The President has suggested one path, which envisions a massive synthetic fuels program to cut our imports of foreign crude oil in half. There are other paths, involving different methods to increase supply and restrain demand. We will explore these alternatives in some detail today. First, however, I think that it is necessary to place the consideration of alternative energy policies in context.

As was the case following the first great round of OPEC oil price rises in 1973 to 1974, the leading non-Communist industrial nations are sliding into a recession together. In other recessions since World War II, the United States and the Western European economies have usually not been in lockstep, which made it possible for one to help pull the other out of recession or at least limit the economic downturn.

The primary cause of our current economic malaise is, of course, the nearly 50 percent increase in crude oil prices put into effect by OPEC this year. Inflation, as measured by the Consumer Price Index, has ballooned to an annual rate of 14 percent. Energy prices are the leading factor, as anyone who has purchased a refined petroleum product such as gasoline, diesel fuel, or home heating oil can attest. In May, energy added over 4 percentage points to inflation, a figure greater than in any month following the Arab embargo of October 1973.

Our balance of payments will remain heavily in the red and the dollar, which was already shaky before the sacking of Treasury Secretary Blumenthal, is likely to drop even further. In sum, we are on the verge of the worst possible combination of economic trends: A worldwide recession with inflation and interest rates remaining high. What has been the response of the Carter administration to these trends?

Until the President announced his ambitious \$142 billion energy program on July 15, the essence of the administration's energy

program has been rationing by price. In March, the refiner tilt on gasoline was put into effect by rule. This program, which signaled refiners to emphasize the production of gasoline when we needed an all-out effort to rebuild critically low distillate stocks, will cost consumers over \$5 billion per year. More recently, and again by regulation, the Department of Energy has raised the retailer's margin on gasoline. The national average retail margin—which is the retailer's markup over the wholesale price—has risen to between 13 cents and 14 cents per gallon despite DOE rules limiting the legal ceiling to about 10.7 cents. Effective August 1, the DOE raised this to 15.4 cents per gallon. If the average retail price continues to rise toward this new ceiling, and I know of no reason why it should not, consumers will pay another billion dollars or two.

In June, the President's domestic crude oil decontrol plan began. By October 1981, when all domestic crude oil will receive whatever price OPEC sets, the increased cost to consumers compared to the phased increases mandated under the Energy Production and Conservation Act of 1975 will be over \$25 billion. Much of this windfall to the oil companies will, of course, come from old oil, which has already been discovered and would most likely be produced whatever the price for newly discovered oil. In all, the price increases on regulated crude oil and gasoline will cost consumers over \$1 billion a month between June and the ending of controls in October 1981. This staggering and highly inflationary sum does not count the rapid price rises on decontrolled products such as diesel or home heating oil, whose price may almost double this winter compared to last winter.

Most recently, the President has unveiled a plan to cut imports in half by 1990. The President would achieve this admirable goal largely through a crash program to build synthetic fuel plants. Such facilities in the Carter plan are necessary because despite the transfer of billions of dollars from consumers to oil companies under the domestic crude oil decontrol program, and a 20-year high in domestic exploration and drilling, very little additional oil is likely to be produced from conventional sources.

The heart of the President's import reduction program is the proposed Energy Security Corporation, which would be given \$88 billion in financial authority to oversee the production in 1990 of 2.5 million barrels a day of oil equivalent from coal liquefaction and gasification, extracting oil from shale, biomass, and unconventional sources of natural gas. Leaving aside the very considerable environmental and health questions, I believe it is fair to say that there is real doubt as to whether it is possible from an engineering standpoint to construct and successfully operate on the scale contemplated and at the projected cost the number of synthetic fuels plants contemplated in the President's plan.

Accordingly, I believe that it is essential that the Congress take a careful and realistic look at the alternative combinations of increasing supply and restraining demand. The stakes are very high.

A totally successful synfuels program might justify the enormous cost. An unsuccessful or partially successful program would be wasteful but, more importantly, it would leave us at the mercy of OPEC in the late 1980's when the supply and demand balance for

crude oil will likely be far tighter than it is now and it will be too late to grieve over the path not taken.

We are honored and privileged today to have a panel of distinguished persons knowledgeable in the economic field. We have Prof. Robert Stobaugh of the Harvard Business School; Prof. Daniel Yergin, Kennedy School of Harvard; Pro. Paul Davidson, Rutgers University; and Seymour Zucker, economics editor of Business Week.

Gentlemen, we have a custom on this subcommittee to swear in witnesses. We frequently take factual testimony on close questions. Therefore, I shall not break the custom here.

Do you swear to tell the truth, the whole truth, and nothing but the truth, so help you God?

Dr. STOBAUGH. I do.

Dr. YERGIN. I do.

Dr. DAVIDSON. I do.

Mr. ZUCKER. I do.

Mr. ECKHARDT. You may proceed in any way you see fit.

TESTIMONY OF ROBERT STOBAUGH, PH. D., PROFESSOR OF BUSINESS ADMINISTRATION, AND DIRECTOR, ENERGY PROJECT, HARVARD BUSINESS SCHOOL, HARVARD UNIVERSITY; DANIEL YERGIN, PH. D., MEMBER, ENERGY PROJECT, HARVARD BUSINESS SCHOOL; HARVARD UNIVERSITY; PAUL DAVIDSON, PH. D., PROFESSOR OF ECONOMICS, AND ASSOCIATE DIRECTOR, BUREAU OF ECONOMIC RESEARCH, RUTGERS; AND SEYMOUR ZUCKER, ECONOMICS EDITOR, BUSINESS WEEK

Dr. STOBAUGH. Thank you for the privilege of being here today. I am especially pleased to be appearing before this subcommittee inasmuch as I am an ex-Houstonian myself.

Mr. Chairman and other members of the subcommittee, I am Robert Stobaugh, professor of business administration and director of the energy project at Harvard Business School. Thank you for the opportunity of participating in the panel discussion.

My remarks will be based primarily on research conducted by members of the energy project at Harvard Business School.

The energy project began in 1972. Our book, "Energy Future: Report of the energy project at Harvard Business School," published by Random House, contains the principal findings of our research.

Because we will have a panel discussion, I will speak only briefly; I will cover the outlook for conventional energy sources. My colleague, Dr. Daniel Yergin, who is also a member of the energy project at Harvard Business School and who is coeditor with me of "Energy Future," will cover conservation and solar energy.

Other authors of the book, who are not here today, will be happy to respond to any questions that you might have later on their respective subjects: natural gas, Dr. I. C. Bupp and Mr. Frank Schuller; coal, Dr. Mel Horwitch; nuclear, Dr. I. C. Bupp. Dr. Bupp also is coauthor of a book published by Basic Books last year with the prophetic title, "Light Water: How the Nuclear Dream Dissolved." Also for solar, Modesto A. Maidique, and econometric models, Mr. Sergio Koreisha, would be happy to respond.

We reached three main conclusions:

One, the monetary cost and political risks of heavy reliance on imported oil are much greater than most Americans have recognized; yet this reliance increases all the time. In 1970 we imported 24 percent of our oil consumption; in 1974, 38 percent; and in 1978, 47 percent.

Two, it is nothing short of romanticism to imagine that we can halt the steady rise of oil imports by means of the four conventional domestic energy sources—oil, gas, coal, and nuclear power—even if extraordinary measures are taken, as they must be.

Because of geology, technical problems, and political realities, we would be foolish to base a national policy on the supposition of dramatic growth in those sources.

Three, the only promising way to level off oil imports in the 1980's is to give a fair chance to the unconventional programs, namely, conservation and solar energy. So far these have not been given that chance. They have a big potential which can be exploited more rapidly if the Nation's managers pay proper attention to them and if the Government gives proper encouragement. Large Federal incentives for conservation and solar energy are justified because they compete against conventional energy supplies which are being sold in the United States at far below their true economic cost.

Here are some of the highlights of our findings about the conventional energy sources.

I turn now to imported oil. A new era arrived in 1973 when Middle East oil suddenly became expensive and insecure. Unfortunately, it soon became fashionable to consider the crisis as a unique event. We have consistently disagreed, viewing the crisis as a warning of a fundamental and dangerous disorder.

The interruption in Iran's exports during the Iranian revolution emphasized the risks of depending so heavily on the Middle East. It also revealed that the margin of surplus in the world oil market was narrower than most experts thought. A continuing growth of U.S. imports in the 1980's would cause the market to remain tight, thereby driving up prices further. The additional imports would cost us more than double the actual dollars paid to the foreign producers for them because they would raise the cost of all other oil we import. The results are likely to be higher inflation and a major world recession, with worse relations between oil-importing countries. New oil in Mexico and China will be important, but Saudi Arabia will remain the central controller of the world oil market.

Now for domestic oil, in the debate about oil, three main domestic solutions have been put forward—break up the industry, decontrol oil prices, and use unconventional technology. Breaking up the industry would do nothing to increase supply. Deregulation and new methods of production are needed just to keep production at current levels, though they cannot be expected to increase it.

As for domestic gas, the question on natural gas has been: Should it continue to be regulated, with price based on cost of production, or should it be deregulated, with price based on value? The best that one can expect is that a deregulated price will enable natural gas production to remain at current levels.

As for coal, given America's great coal reserves, large-scale substitution of domestic coal for imported oil appears feasible on paper, but in practice it probably is not—at least not between now and 1990. External costs, in the forms of environmental and health problems are rung up at every step in coal's journey from the mine along the railroad to the boiler where it is burned. Coal's importance is likely to grow, but the outlook is considerably less promising than officially projected.

I know that we will get into a further discussion of the synthetic fuels program. At this point I would like to add an insert that we are in favor of a synthetic fuel program but we think the scope and timing of the current proposals are much too large in terms of our capability to manage that kind of program.

I turn now to nuclear power. In the 1960's, the nuclear advocates rushed ahead to attempt one of the most massive technological innovations in history—converting the world's electric generating system from fossil to nuclear fuels. But they confused dreams with reality. The further development of nuclear power is stalemated by political controversy. In particular, unless fast progress is made in the problems of nuclear waste, there can even be an absolute decline in nuclear energy by 1990. This was our conclusion before the Three Mile Island incident, and that incident casts an additional cloud on nuclear prospects.

I know that our analysis runs counter to many other evaluations, especially those based on uncritical acceptance of projections which omitted political and institutional factors. But because econometric and engineering estimates have been so misleading—being unduly optimistic—in the past, I believe that it is unwise for the Nation to plan on large increases in conventional domestic sources.

To sum up our argument to this point, the prospect for major increases in domestic energy supplies from the four conventional sources—oil, gas, coal, and nuclear energy—is bleak. Today domestic production from these four sources accounts for the equivalent of 27 million barrels of oil per day. Over a period of 10 years or so, that 27-million barrels per day could perhaps be stretched to 32 million barrels per day. If such an increase does take place, it will be primarily due to increased coal output. But even an increase of 5 million barrels per day of oil equivalent—and this is optimistic—would not provide the United States with enough energy for an adequate level of economic growth. And importing ever-increasing quantities of oil is an unstable foundation for economic growth.

Therefore, to insure economic growth for the 1980's, the United States must use its energy more efficiently—hence, the need for a much greater emphasis on conservation and the need to encourage the growth of solar energy.

Thank you, Mr. Chairman and members of the committee. I will look forward to hearing questions from you.

Mr. ECKHARDT. Professor Yergin, you may proceed.

TESTIMONY OF DANIEL YERGIN, PH. D.

Dr. YERGIN. Mr. Chairman and other members of the subcommittee, I am Daniel Yergin, a lecturer at Harvard University and a member of the Energy Project at Harvard Business School. I am pleased to be here today, especially so that I can tell you something

about the findings we have made in our study and in particular about the news that we have about what we call conservation energy.

Professor Stobaugh presented the bad news. It is my turn to present a little bit of good news.

Today Americans are conservation-conscious to a degree that would have been unthinkable a decade ago. A great many Americans are aware that the United States now uses much more energy per capita and per unit of GNP than other advanced industrial countries that enjoy as high an average standard of living. And considerable progress has been made on a few fronts: The increased gasoline mileage of new automobile production—now slated to rise to an average of 27.5-miles per gallon by 1985—may in itself be saving 2-million barrels a day by the late 1980's, as compared to what consumption levels would be if the gasoline mileage of new cars had stayed at pre-1974 levels. But since automobiles will continue to be central to American life, there is a need for post-1985 performance standards that will allow automakers to find flexible ways to reach a higher goal of perhaps 50 miles per gallon.

But it is also true that on many major fronts we have hardly begun to practice serious conservation. In American industry, the range for further energy savings remains very broad—from better housekeeping to recovery of waste heat and materials, to major technological innovation. Altogether, according to one recent major study, it may be possible to reduce industrial energy use in economically justifiable ways by more than a third through familiar conservation methods, without any breakthrough—without any Manhattan projects.

While there are notable examples of effective energy savings in U.S. industry, the overall record could be improved considerably. There are many reasons why the improvement has not been greater. One is the confusion over energy prices and uncertainty about whether there is an energy problem. One of the principal obstacles, it now appears, is the high rate of return that many firms demand for conservation investments—30 percent after taxes—or in some cases twice that required for strategic investments. The rather small tax credits in the National Energy Act are insufficient to overcome this critical obstacle, which is probably retarding industrial energy conservation more than anything else. A more stimulative policy that encourages investment could be very effective.

The same kind of broad potential exists in the building sector. Almost 40 percent of American energy consumption goes for space heating, hot water, air conditioning, and lighting in homes, commercial structures, and factories. Since 1973, energy-conscious design has begun to work its way into the repertoire of architects and construction companies. But, even with the push of new standards, the effects on energy-conscious design will take a decade or more to be felt, as the building stock turns over very slowly.

The real opportunity in the building sector is retrofit—changes in equipment and structure that button up buildings, that is, improve thermal and lighting efficiency. The possibilities are considerable, both in commercial buildings and residences. For example, studies across the country indicate that 25- to 50-percent reductions in energy use in the American housing stock are possible with

relatively simple efforts. There is further evidence that I may be understating the matter when I say 25 to 50 percent.

We are confident that much, much larger savings in energy consumption in the United States can be achieved without affecting predicted levels of economic growth. Indeed, mounting evidence strongly suggests that energy conservation is itself a form of productive investment, yielding much more rapid and substantial real changes in the energy balance of the Nation than almost any given investment in energy production. Furthermore, it can actually stimulate employment, innovation, and solidly based economic growth.

I want to stress that point. Energy conservation in 1980 is what can stimulate employment, innovation, and solidly based economic growth.

But conservation energy is not so simple to recover as it might seem. Unfortunately, it is a diffuse source. All of us sitting in this room might in our mind's eye imagine what a syncrude plant looks like. However, it is very hard to imagine in our mind's eye what conservation looks like.

Conservation has no clear constituency in the way that oil, gas, coal, and nuclear do. Public policy must be its champion, and many different strategies will be needed. If we have decades, then the market alone, working through gradual rises in prices, would be sufficient. But the decades are not there as we look into the 1980's, so Federal support is justified—as explained later.

Now let's look beyond conservation to renewables—to what is called solar energy. There is a growing agreement that eventually a transition will have to be made from oil, gas, coal, and uranium to what is called solar energy. The term solar covers many diverse sources, their common thread being that they are all renewable, depend ultimately on the sun, and, in the case of burnable materials, have come into existence on the Earth recently, in the last century or so—in contrast to fossil fuels.

At the present time, all forms of solar energy account for only 1-million barrels per day of oil equivalent in the U.S. energy balance—and this only if one includes hydroelectric power under this heading, although there is some growing evidence that the impact may actually be larger but so much use of wood is not included in conventional statistics. And in 1990, conventional forecast for this amount is predicted only to double, to a 2-million-barrel-a-day level.

Especially under the Carter administration, the amounts allocated by the Government to solar energy research and development have increased substantially, as have the attention and effort by private companies. But far too of the present research program is directed at big solar—expensive, high-technology projects, such as the power tower and orbiting satellites, which are highly uncertain and probably quite far away. These are 21st century, if ever. Unfortunately, Federal solar policy favors these programs at the expense of small solar—the decentralized forms of renewable energy that can deliver a sizable contribution in this century. The relatively near-term, practical small solar, which can do a lot very quickly, is not getting the same kind of support that it needs. It is what can really deliver the energy that we need.

In terms of quantitative contribution, solar space and hot water heating can make its greatest impact, in the next decade at least, through the so-called active systems, which involve mechanical moving parts on roofs, and through passive solar heating—designing buildings to take advantage of the environment and save energy.

Recent evidence indicates that passive solar heating can also be effectively retrofitted onto existing structures, on a substantial scale and in a much shorter time.

The key problem, and the key problem of Congress in considering solar, is to help the diffusion of innovation occur at a more rapid rate, and this requires mechanisms to help overcome a series of economic and institutional obstacles.

The most important is the question of payback—how fast a building owner will recover his investment. Other major obstacles include building codes, financing, “the right to sunlight,” quality control, distribution, and the relationship to utilities, a subject to which I hope we will return. That list is a most important consideration. Some proponents of solar power are making a serious error in trying to keep utilities out of solar energy, instead of encouraging them to enter the business of delivering solar energy by taking the responsibility for installing and financing—perhaps owning—solar units. Wide diffusion of solar heating will have a major impact on the utilities, and if they feel threatened and so oppose it, then large-scale implementation of solar could be delayed for a long time. Similarly, utilities should be encouraged to enter the conservation business.

The other major near-term renewable source is biomass—organic matter from plants and animals. Biomass can be burned, or it can be converted into a gas or liquid fuel. The main source of biomass fuel in the near term will probably be wood, forest wastes, and other plant products. That potential can be augmented through the development of fast-growing energy crops. The equivalent of 3 million barrels a day of oil might be obtained from burning forest wastes and wood without relying on sophisticated forest management techniques and new tree species, but such a high level will take many years, perhaps several decades.

Rapid expansion of the use of solar energy requires, at this stage, major additional support from Government, along lines to be discussed later. If such support were forthcoming, we believe that it would be reasonable to project by the late 1980's a supply from solar sources equivalent to 4 million barrels a day of oil, roughly twice the current Department of Energy forecast. Let's say by the year 1990.

This projection does not assume any dramatic technological breakthroughs becoming available on a production basis during this time frame. The most obvious area to look for breakthrough—and we are not saying it will not happen but just that we will not count on it but it indeed might happen—has to do with photovoltaics, that is, small cells of silicon that convert sunlight directly into electricity, with costs coming down rapidly. We omit photovoltaics not because we are skeptical, for we are not, but rather to underline the potential of existing technologies that do not require a major breakthrough.

You may, at this point, be bothered by what seems a paradox. On the one hand, we say that conservation and solar energy are most effective alternatives to extra increments of imported oil. Yet, on the other hand, the thrust of our argument is to point out that they suffer from the least momentum and the weakest advocacy. Do not the very difficulties faced by conservation and solar, some may say, undercut our argument?

The answer lies in clarifying some of the obstacles and some of the handicaps under which conservation and solar energy labor.

First, let's be frank, they run against the force of habit, the familiar patterns of energy production that have been associated not with energy production throughout American history, but with the modes of energy production since the Second World War—those modes of production associated with the great period of postwar economic growth.

Second, conservation and solar do not now have a fair chance in the market to compete with imported oil and other traditional sources. The subsidies caused by price controls that encourage consumers to use oil, gas, and electricity run into tens of billions of dollars yearly. Moreover, many of the conventional sources carry potentially great external costs that are not reflected in prices. Indeed, these costs tend to be seriously underestimated.

Third, conservation and solar lack the constituency of the conventional sources. A solar constituency is beginning to develop, but it is still quite small, and is often disregarded as a fringe element. Conservation has virtually no constituency. When people talk about conservation, I am afraid that it sounds like apple pie and does not sound serious. As the former Assistant Federal Energy Administrator for conservation observed:

The oil companies and utilities are busy talking up how much they need to produce. But no one's out there wholesaling conservation by the ton and barrel.

Fourth, conventional energy sources generally depend upon centralized production by highly competent firms. But conservation and solar energy involve much more decisionmaking and acting at the point of end-use energy. That, in turn, means that energy decisionmaking becomes highly decentralized, involving millions and millions of actors, often poorly informed, without easy access to capital or to the requisite skills, and for whom energy is only one of myriad of concerns, rather than the central organizational focus. It means that many people have to spend at least a couple hours being a amateur energy engineer.

An ever more regulated system is not the answer to the problems posed by energy. But if the market is to resolve the problems, its distortions must be corrected so that all energy sources, including conservation and solar, will be able to compete on an equal footing. Without a transition to a more balanced energy program, the market system itself in the years ahead will inevitably become increasingly constrained by regulation and disruption. Although both incentives and sanctions have a role to play in the process of equilibration, the emphasis should be placed on incentives. The carrot makes for better politics and more acceptable change than does the stick, at least in the United States.

The last point is crucial, because a politically acceptable program that can make a significant contribution to a solution of the energy problem is better than one that might theoretically solve the problem altogether but which has no chance at all of being adopted or approved by Congress.

We do not claim to know the exact appropriate level of subsidy, whether grants or tax credits, for conservation and solar energy. The fact that the true costs of imported oil are potentially at least three times its current U.S. market price suggests an offsetting subsidy of two-thirds of the cost of implementing conservation and solar energy. We do not, however, recommend this large a subsidy, for we acknowledge readily that our calculations are only crude approximations. Furthermore, for the most part we would think somewhat lower subsidies would probably be sufficient to encourage a substantial increase investment in conservation and solar energy. We suggest, as rough guides, conservation subsidies of 40 to 50 percent and solar subsidies up to 60 percent, with the higher solar subsidies being justified because of the need—and value to society—of encouraging the diffusion of technology not widely used.

We would propose that the bulk of this be financed through the inevitable windfall tax on old oil and that that tax be used specifically assigned to financing—by tax credits, grants, and loans—conservation and solar energy, which are the two most promising alternatives to oil, as opposed to being used primarily to finance synthetic fuels. And, as the windfall tax might be self-extinguishing as we move to a free market for domestic oil, so these credits might be self-extinguishing over a period of 10 years—an important feature because it has often proved difficult in the past to stop programs once launched. Our proposal would thus respond to two of the most urgent problems in U.S. energy policy—the stimulation of conservation and solar energy, and the need to gradually free all oil prices, not just those of new oil.

Our proposal would respond to another need, a political need, if the Nation is ever to get out of this stalemate and resolve its energy difficulties. It would help to bridge the gap between contending parties in the bitter American energy debate. The various interest groups—oil and gas producers, advocates of conservation and solar, even environmentalists and consumerists, people who live in Texas and people who live in New Jersey—are secret allies, though, to understate the matter, not all by any means would recognize this truth.

Oil and gas producers are convinced that they need higher prices in order to maintain production. Advocates of conservation and solar energy should recognize that they need higher prices to make their programs more attractive. I say this as a person living in the Northeast. I think consumerists need somewhat higher prices now to help protect the public against the awesomely high prices that could eventuate if the United States demand for imported oil continues to increase. It is not merely rhetoric, but absolute necessity, to find some ways to make this alliance clear to the various participants. We believe that our proposal reconciles their interests.

In sum, the Government must lead. It must be a champion. But Government leadership does not mean Government management. Rather, it means correcting market defects in a way to create more

jobs and more business opportunities for both large established companies and small new firms with a stake in conservation and solar energy—and at the same time protect the consumer and the economy in a lasting, not a temporary, way.

Thank you.

Mr. ECKHARDT. Dr. Davidson, you may proceed.

TESTIMONY OF PAUL DAVIDSON, PH. D

Mr. DAVIDSON. My name is Paul Davidson, professor of economics at Rutgers University. My interest in the oil industry started in 1960 when I was the assistant director of the Continental Oil Co., now called Conoco.

I have a 20-page statement which I will not read but will summarize. I would like to have it put into the record.

Mr. ECKHARDT. Without objection, it will be inserted in the record. (See p. 19.)

Dr. DAVIDSON. I brought something that just came out, an editorial from the Wall Street weekly publication, the Money Manager, which I think is a strong endorsement of the national energy plan which I suggest in my testimony. It is entitled "A Modest Proposal." It is from the July 16, 1979, issue.

This proposal will spell out some detail for the committee but I think the editorial might well go into the record as well.

Mr. ECKHARDT. Without objection, it will be entered [see p. 58].

Dr. DAVIDSON. To start off, just like the Surgeon General who always tells us that smoking may be dangerous to our health, we must start off with the further knowledge in any discussion that the current world price of oil "has no possible relationship to scarcity—present or future, known or feared." This is a quote from Professor Adelman. I highly endorse that quote.

My own energy studies of supply for the Ford Foundation and Brookings Institution have led me to the same conclusion. We are not on a worldwide basis or on a western hemisphere basis running out of energy from depletable fuels.

Even President Carter noted in his July 15, 1979, speech that the Middle East has only 5 percent of the world's energy and the United States has 24 percent of the world's energy, that is, of the economical viable sources of energy. Therefore, we have plenty of energy in the United States and tremendous quantities of energy in the western hemisphere.

The only question is the cost of that energy, the supply side. My proposal will be suggestions as to how we can get the supply side going at minimum cost.

Given that the current supply conditions are dominated by expectations of producers of energy that the Persian Gulf States will for the foreseeable future continue to manipulate oil prices so that they more than keep up with inflation. Therefore, oil in the ground is better than money in the bank. Increasing the price of oil, decontrol, or anything of that sort will not allocate significantly additional resources into increasing the actual worldwide production of energy.

Under existing supply conditions deregulating world market prices of oil in the United States and elsewhere is merely a device for redistributing income between consumers of energy and produc-

ing companies and, we should not forget, property owners or royalty receivers who also will tend to gain.

The energy crisis in my view is strictly a struggle between consumers and producers, not between man and Mother Nature. We are not running out of energy.

Now there are only two ways of resolving the energy crisis. One is to allow the market price to rise until energy consumers are so impoverished, the pockets are emptied, and therefore the producers or the suppliers of energy have nothing left to exploit or else they will become so rich they will not wish to exploit whatever they want to leave with the consumers.

The second is to actively adopt Government policies which at least fracture, if they do not break, the cartel's grip on the energy cost. It is this control that everybody knows which assures everybody that the price of energy will keep up or more than keep up with inflation.

What I am calling for is an economic war, not a military war, against the Persian Gulf States. The United States was not the initiator of this war. It began in 1970, and the Persian Gulf States made it an all-out war in 1973. We can win this war but it is not easy and it will require disruptions by controlling the supply side. Hopefully, the disruptions will be minimal.

However, I would point out to you that I think—and the people at The Money Manager apparently think this as well—that the alternative to this is the permanent draining of income and wealth from the consuming nations of the world. I think there is even a threat ultimately, when people recognize what is happening, of military action against the Persian Gulf, which I certainly would not desire and I do not think anybody here would desire that.

Therefore, I think it is in our best interest to break the grip of the cartel. It may well be in the best interest of the governments in the Persian Gulf that we at least reduce, if not completely break, their grip on prices.

Nothing that the Carter administration has done will break the cartel. In fact, I believe that the administration's plan accepts the cartel's power as a parameter and merely attempts to live with the cartel. To minimize its impact on us is what they want to do but not to prevent it from maintaining energy prices.

I think the cartel should be broken. Furthermore, even if we could afford to give away 2 or 3 percent more of our gross national product to the OPEC cartel—and we are rich enough and probably can afford it—I think it would be a disaster not only for the citizens of our country, but the less-developed countries require strong, vigorous, capitalist economies in Western Europe and in the United States in order for their growth of a standard of living as well as ours.

I was glad to see that in his opening statement the chairman reminded us that the energy problem is associated with inflation and stagflation and, that unless we solve that problem, we are likely to stumble into the second great crisis of capitalism, the first one being the great depression and the second one being stagflation. I think the energy situation is essential here to consider.

Let me proceed now to conservation and demand. I am not against conservation nor am I advocating waste. However, before

we launch out on a conservation crusade, we should note that in economics there are two separate and distinct meanings of less usage of oil.

Economists talk of a downward sloping demand curve. They say that at a higher price people will use less oil. Consumers' sensitivity to the higher oil price depends on the price elasticity of demand.

However, we can use less oil two ways in economics. We can move up a demand curve by forcing higher prices and consequently consumers conserving or we can shift the demand curve in. Therefore, even at the same price, consumers will use less oil.

Technically it is interesting that economists note that if you move up a demand curve with higher prices, this is not a change in demand. This is not a decrease in demand. The only time you decrease demand in technical terms is by shifting the entire demand curve in.

The question is whether you want conservation by moving up the demand curve or whether you want the demand curve shifted in. Different policies will occur one way or the other.

President Carter's basic focus is conservation via moving up a demand curve with higher prices. Economists point out that people will conserve with higher prices only if there are two effects—a substitution effect and income effect.

The substitution effect occurs if the price of oil rises relative to the price of substitutes. Therefore, consumers voluntarily start buying the cheaper commodity.

However, empirically, whenever the price of oil rises, the domestic substitutes such as coal, shale, uranium, et cetera, tend to rise sympathetically. The term "sympathetically" was used by the New York Times on April 5. That is an empirical fact, and I think there are good theoretical reasons as well. If prices tend to rise in unison, there will be no substitution effect. Therefore, we should expect little or no conservation due to the substitution effect if we deregulate domestic prices.

Accordingly, deregulation means conservation by an income effect, that is, by reducing the real income of consumers, the standard of living. This will occur only because when consumers have less real income so they not only buy less oil but they buy less of everything else. This is what we are really doing when we conserve by higher prices.

Furthermore, it is even worse than that because how much you conserve depends on how much your standard of living goes down. That depends on what the energy cost is as a portion of your budget and how much of your income you earn in the energy industry.

For some people, oil executives and people who own property that produces oil, real income will actually rise under deregulation and decontrol. Therefore, they will not worry about the price of gasoline. They will actually consume more, just as the Arabs when they come to Western Europe and the United States have found the price of gasoline rising, that does not prevent them from buying gas-guzzling automobiles, yachts, and other things because their income has risen even higher.

Therefore, conservation by raising the domestic price is merely nothing more than conservation by redistributing the income from some people who will conserve a lot, namely, poor people in the snow belts, to higher real income for others.

I should point out that Marie Antoinette 200 years ago ran into a similar problem when we had a bread crisis. They let the free market solve that. Marie Antoinette, understanding something about economics, said, "Let them eat cake." In other words, let's have a substitution effect.

Of course, the problem with that is that the cakemaking firms and the breadmaking firms are the same firms. Therefore, the prices rise sympathetically. Marie Antoinette found out that the only way they were going to conserve on bread was by an income effect. She lost her head because people would not stand for that kind of income effect.

Mr. ECKHARDT. Would you call that synfuel's cake?

Mr. DAVIDSON. Yes; it may well be.

However, the answer is clearly that income effects are not politically popular. You may all lose your heads if you try to conserve by higher prices if you do not offer a substitute whose price does not rise. I think we ought to be very clear about that. President Carter has probably already lost his head because of this problem.

If you must conserve, instead of going up a demand curve and doing it by an income effect, the obvious solution is to shift the demand curve in. That can be done by a number of things. Economists call this changes in taste, changes in consumer technology, and so on.

Let me just suggest mandating fuel-efficient cars. We have already done that. I have seen some studies that say that the gasoline demand in the United States will peak in 1981. After that, even though we drive more miles, because of the change of the stock of automobiles the actual gallonage used in the United States will start declining starting in 1982. That is obvious.

Another one which President Carter did mention in his speech in Kansas City on Monday would be to have insulation done by utilities with low interest loans to consumers and no amortization of the principal for the installation charges until the house is sold. On an average house that would add \$100 to \$200 a year to the fuel bill, collected by the utility as interest on the installation but it would probably be cheaper than allowing the price to go up.

There are lots of those kinds of things that can be done. Some of them have been suggested by Dr. Yergin. I would suggest that is the kind of conservation you want. You want to shift the demand curve in. Deregulation, on the other, merely redistributes income. I think that is bad.

Rationing is another way of conserving. Mr. Zucker will talk about that. I should point out to you that rationing with the white market will redistribute income but it will reward people who use less energy than the average. They will be able to sell their coupons and get more income. It will penalize people who use more than the average. That at least provides the right reward system via redistribution of income, not merely by redistributing by regions.

Now let me turn to the supply side for a couple minutes.

Mr. GORE. Let me interrupt at this point. I represent a rural area. I think a point which ought to be made at this point in your testimony is this. One of the strengths of this Nation for 200 years has been that we have seen the wisdom of encouraging the development of the great expanse between our metropolitan areas. We have tried to improve the quality of life in rural areas. The general tax base has grown dramatically in the United States because we have followed policies such as REA and the post office policies.

One consequence of that is that people in the less densely populated areas have on the average a much longer distance to travel to and from their place of employment. Therefore, a white market of the kind that you described does avoid a redistribution of income from the rest of the country to the oil-producing sector of the United States, but it does not avoid the massive transfer of income from the less densely populated parts of the United States to the more concentrated population centers.

Dr. DAVIDSON. I have not said how you initially distribute the coupons. There is no reason that you have to distribute them initially x per head. It may be that people in New York City need less gasoline per head than people out in Tennessee. That is right obviously because there is mass transit. It depends on what you initially do. If you initially set it right, then you are rewarding people for saving even if they are in the rural areas. I think that is what you want to do.

Mr. MOTT. Excuse me, Mr. Chairman, may I pose one question?

Professor Davidson, you say we have to fight back the cartel, and I agree. What about our food cartel, technology cartel, and the consuming nations? Is this what you are suggesting? How would you suggest that?

Dr. DAVIDSON. I am not suggesting that because I think that is what economists call bilateral monopoly, monopolies facing monopolies. You may or may not succeed on that.

There are strange characteristics about oil that are not true of wheat, such as storage costs, carrying costs, and so on, which would give them the upper hand.

I think by playing on the supply side, which is what I am getting to now, we can develop energy sources and supply in the United States because we do have tremendous energy resources. It is the supply side plus a little uncertainty about the power of the cartel that we could add by an import auction market and a few other things like changing the tax structure of the United States and reducing foreign tax credits and so on.

I have a list of 10 proposals. There we can create dissension among the cartel and promote cheating among the members of the cartel. That is the way to break it. This would be via the use of energy.

The attempt to use wheat against energy or something like that is a much riskier game. I am less certain of success with that than I am with this.

Mr. MOTT. Thank you.

Dr. DAVIDSON. Let me continue now with the supply side. First, phased decontrol is the worse possible situation in the world. According to Alice Rivlin, one category of old oil will double in price between June and next January. That is a 117-percent increase.

Other categories of old oil will rise by 167 percent in 28 months or approximately 70 percent per annum. What other investment will yield a greater return merely by being held for 28 months? Therefore, phased decontrol creates a tremendous incentive for producers of old oil to keep oil in the ground.

I point out to you that on June 25, 1979, there was an article in the New York Times about the big dip in domestic oil production. We do not know why it has occurred but there has been a big drop in domestic oil production.

I believe if you looked at the Federal production on properties in the gulf you would find that starting last fall several companies reduced their production much greater than the decline rate. This was, I believe, in my view expecting a statement of phased decontrol. I understand one company reduced their production in the gulf by over 45 percent between last August and last February. Other companies reduced it by less than that, but there is no evidence. The Justice Department is looking into it. Certainly there are incentives to withhold and wait for decontrol.

However, even if we completely decontrol oil and bring all the price up, Mr. Schlesinger estimates we will only get 500,000 barrels more a day by 1984. That is optimistic. There are 8 million barrels being imported. We are going to be left in the hands of ayatollahs and sheiks even if we only import 7.5 million barrels. Therefore, I do not think that is the way to go. You are not really going to get very much oil.

I should point out that if you decontrol and have a windfall profits tax, I would also argue—although nobody else seems to do so—that we ought to have a windfall royalty tax. Not only does the price go up for the producers and companies, but the royalty owners get 12.5 to 20 or 30 percent more depending upon what the royalty is every time the price goes up on old oil. No one else seems to mention this. If the producers, as President Carter says, did not earn the income, then certainly the royalty owners did not earn their income.

Let me close by saying this. There are things we can do. Let me list 10 things that we can do which will improve the supply situation. They will improve it by breaking expectations of a cartel control of price and by creating market incentives for the cartel to cheat.

The first one, I would argue, is divestiture. I do not want to go into this now. It has been said that divestiture would not increase the supply of oil. I think there are good theoretical reasons to argue that it would increase the supply of oil because multi-product firms make different profit-maximizing decisions. They relate the profits of one of their products with the profits of the other. They will never cause product A to compete with product B. It is not in their best interest. With conglomerate divestiture we get coal firms that have no vested interest in keeping the value of oil reserves up. On the other hand there is a vested interest not to compete if you do not divest.

Second, I would argue that what we need is regulation of well-head price, not deregulation, for reasons I have argued before. If you have to raise the wellhead price because it is too low, then there are ways of doing it.

Third, I would tax production below MER—every well in the United States. The Department of Energy now has a figure on maximum efficient rates of production. Many of them are producing below that. Let us use the stick rather than the carrot to get people to produce.

Suppose you have a well that is MER rated at 100 barrels per day and it is only producing 85 barrels per day. Let's put a tax between the 85 and the 100. If they can produce at 100 barrels a day, they pay no tax. If they insist on holding 15 barrels a day in the ground, we will put a penalty on them and thereby force them to produce.

Mr. DANNEMEYER. What happens if the pump stops?

Dr. DAVIDSON. That is right, the wells are always down for maintenance. This is a war. You are asking people to tighten up. Let's encourage them to work overtime if necessary and get the sand out of the pump.

Mr. DANNEMEYER. How much bureaucracy would we create in order to have this capacity to check to see whether they were officially taking the sand out of the pumps?

Dr. DAVIDSON. You tell them they are going to pay a tax every day. Therefore, it is an incentive to produce. If you pull a well out of production, there is an incentive to bring it back into production rapidly. They have to report production every day. We know what the MER's are. You can have a decline rate. We can estimate that.

I would argue that this is a real war. If you want to get really tough, then you can go 10 percent above MER. There is evidence by geologists that going above MER by certain fractions does not really damage ultimate recovery. We could probably increase domestic production in the neighborhood of 15 percent by such a tax.

Similarly, if you do not like refineries running at 83 percent when you think they ought to be running at 93 percent, then you do not do what Mr. Schlesinger says and threaten them. You just say, "Let's put a tax on it." Then if they run at 83 percent, it will cost money. If they run at 93 percent, then they make money. They will sell their product, make a profit, and not pay any taxes. Let's reward them for producing and not make any incentives where they can get rewarded for withholding.

I am not saying whether or not they are withholding. I am just saying let's change the market so that they only get paid if they produce. The Department of Energy would set the goals, as it is doing anyhow.

Then there is the repeal of the Federal tax credit. I would use the Federal Corrupt Practices Act and suggest that any royalty payment paid to an OPEC nation in excess of 20 percent would not be a normal cost of doing business. Therefore, this excess would not be deductible. It would not only be not creditable but it would not be deductible.

What that would do immediately would be to change profitable production in the Middle East to unprofitable. We just received the latest oil profit reports. All the oil companies are making much higher profits this year than last year on their foreign production. Despite the fact OPEC keeps raising the price, oil companies get more and more profits.

I have calculated in a rough calculation that for every dollar OPEC price goes up, the four American partners of Aramco probably make around another \$150 million a year. There is an incentive after taxes for them to stay with OPEC rather than to bargain very hard. As long as OPEC is not going higher than the profit-maximizing price, they are getting a share of the profits.

Let's change the game. We do not need anybody watching the company. All we have to do is make it difficult for them to make profits. If they make losses every time they lift a barrel of oil from Saudi Arabia, they will go to Saudi Arabia and say, "Look, unless you change the bargain, we will not lift oil."

It is a tough game. There are going to be dislocations. That is what an economic war is about. The game is tough anyhow. There is no way of avoiding it.

Let me stop there and yield to my colleague Mr. Zucker.

[Testimony resumes on p. 60.]

[Dr. Davidson's prepared statement and attachments, and the editorial referred to, follow:]

STATEMENT OF DR. PAUL DAVIDSON
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 HOUSE OF REPRESENTATIVES

July 26, 1979

My name is Paul Davidson. I live at 18 Turner Court, Princeton, New Jersey. I received a Bachelor of Science degree from Brooklyn College in 1950, a master of Business Administration degree from City College of New York in 1955 and a Ph.D. in Economics from the University of Pennsylvania in 1959. I was a member of the Economics Department of the Wharton School of Commerce and Finance of the University of Pennsylvania and taught there during the periods of 1955-1958 and 1961-1966. From 1958 to 1960 I was an Assistant Professor of Economics at Rutgers University. In 1960-61, I was Assistant Director of Economics Division of the Continental Oil Company. In 1964-65, I was Visiting Lecturer and Fulbright Scholar at the University of Bristol in England. In 1970-71, I was a Senior Visitor at the Faculty of Economics and Politics of the University of Cambridge (England). I have been a Professor of Economics at Rutgers since July 1966. I am the coeditor of the Journal of Post Keynesian Economics.

I am the author of a book entitled Theories of Aggregate Income Distribution (Rutgers University Press, 1960) and one entitled Money and the Real World (Macmillan, 1972, 2nd edition 1978). I have coauthored books entitled Aggregate Supply and Demand Analysis (Harper and Row, 1964), Milton Friedman's Monetary Framework (University of Chicago Press, 1975), and a monograph entitled Demand and Supply of Outdoor Recreation (Bureau of Outdoor Recreation, 1969). I am the author of numerous articles on various economic subjects which have been published in professional journals such as The American Economic Review, The Economic Journal, Oxford Economic Papers, Canadian Journal of Economics and Political Science, Public Finance, Econometrica, Land Economics, The Southern Economic Journal, The Natural Resources Journal, Review of Economics and Statistics, The Journal of Political Economy, The Journal of Post Keynesian Economics, Challenge, Highway Research Record, The Annals, Chemical Engineering Process, Economie Applique, Economies et Societies, Economic Inquiry, and the Brookings Papers on Economic Activity.

My interest in the economic problems of the oil and gas industry can be traced back to 1960 when I was the Assistant Director of the Economic Division of the Continental Oil Company. Since then I have analyzed economic aspects of oil and gas in professional articles, in testimony as an expert witness before the Federal Power Commission and various congressional committees, as a member of the Supply-Technical Advisory Committee of the National Gas Survey, and in the past few years as a consultant to the Ford Foundation's Energy Policy Project where I was the senior investigator on a study entitled "The Relations of Economic Rent and Price Incentives to Oil and Gas Supply," and as a member of the Brookings Economic Panel where I was the senior investigator of a study entitled "Oil: Its Time Allocation and Project Independence."

I. WHAT IS THE ENERGY CRISIS?

Just as the Surgeon General has required that all consumers of cigarettes must be warned that consumption "may be injurious to your health", it is my firm belief that all Congressional discussion and Presidential speeches on energy should start with the motto developed by Professor M.A. Adelman of M.I.T. in a 1976 study where he demonstrated that the current world price of oil "has no possible relation to scarcity present or future, known or feared". ["The World Oil Cartel" Quarterly Review of Economics and Business, 1976, p. 11].

My own analysis of energy supplies has led me to a similar conclusion. If one interpretes scarcity in terms of a Malthusian shortage -- where within our lifetime, or our children's etc. the world will "run out" of this basic depletable natural resource -- the deregulated wellhead price of oil will not reflect "true" scarcity or even the replacement value of energy that would exist in the absence of a cartel!

What had happened was that, partly due to historical circumstances and partly due to U.S. government policies originating in the 1950's (some with the express purpose of making the U.S. not dependent on foreign oil supply and some for the covert purpose of providing aid to non-communist governments in the Persian Gulf) the reserves base of the petroleum industry was developed and concentrated in a small area of the world. Thus seeds of the world's most powerful cartel were sown.

The energy question, of course is merely at what price are American consumers going to get all their energy needs filled. Neither the oil industry spokesman nor academics will deny there is plenty of domestic energy as well as western hemisphere, and other foreign sources of hydrocarbons which could take us well into the 21st century, even if there was no further technological development. As President Carter noted in his speech of July 15, 1979: "The Middle East has only 5 percent of the world's energy, but the United States has 24 percent." The only question is the cost of this energy! Given that current supplies conditions are dominated by expectations (user costs) of producers of energy that Persian Gulf States will for the foreseeable future continue to manipulate oil prices so that they more than keep up with inflation (i.e. oil in the ground is

better than money in the bank) then increasing the price of oil will not allocate significant additional resources to increasing the actual daily world wide flow of production of oil (although it may, at best, encourage some increase in resources used in finding underground hydrocarbon reserves.)¹ Under existing supply conditions (involving a cartel and "user costs"), the unregulated world market price of oil is merely a device for redistributing the income and wealth from consumers of energy to producing companies and property owners of energy throughout the world. Thus, the so-called "energy crisis" essentially involves an economic struggle over relative income shares between consumers and producers - it does not involve a struggle between man and mother nature. Hence, there are only two, ways of ultimately resolving our current energy crisis. They are either to (1) passively permit the market price of oil to continue to escalate until energy consumers in the world are so impoverished they have little income left to be extorted by the producing sector interests and/or the energy sector become so satiated in their wealth, they decide not to plunder any more; or (2) to actively adopt government policies which at least fractures (or breaks) the cartels' grip so that energy producers' expectations (user costs) are no longer biased in the belief that the cartel can keep the price of energy rising more rapidly than world inflation! This second (activist) way involves the U.S. engagin

1. For the analytical basis for this conclusion, see my article "The Economics of Natural Resources" Challenge, March/April 1979 pp. 40-46. This article is appended to this written statement as Exhibit 1.

In economic war with the Persian Gulf States. (The U.S. was not the initiator of this war; it began in 1970 and the Persian Gulf States made it an all out war in 1973).

In Section III (below) I present a ten point National Energy Program (NEP) which will significantly reduce the control of the cartel on world energy prices. This NEP uses economic (not military) forces to wage war on the Persian Gulf States. This is a war where we can be successful if we have the will and the leadership -- but it is not going to be won easily or without any disruptions. This war should not be avoided for the only choice is between (a) incurring temporary and hopefully minor dislocations and inconveniences during the initial state of economic warfare or (b) the permanent draining of income from consumers of energy. I would hope that we would have chosen the active policy of fracturing the cartel. Unfortunately President Carter has opted for a policy which will passively adopt to OPEC's perpetual domination of energy (except perhaps "in the long run" where as John Maynard Keynes noted "we'll all be dead").

II THE CARTER-SCHLESINGER POLICY

The Carter energy proposal (circa 1977 and 1979) to deal with the "moral equivalent of war" in energy, attempts to resolve the problem via the passive impoverishment of consumer. If the administration proposals are enacted, success will come only by bleeding consumers white. Any observer from outer space seeing the President of the largest consuming nation in the world supporting such a policy, would think the Administration has gone mad. Carter's deregulation order can appear

to be rational only if it is based on the premise that it is not in the U.S. best interest (at any price) to severely weaken the power of the cartel - or more specifically the power of the current non-communist Persian Gulf States. The Carter deregulation order announced to the world that the U.S. government recognizes, legitimizes and gives respectability to the actions of a cartel which explicitly extorts huge sums of income from consumers throughout the world.

Apparently the Carter Administration has preempted any public discussion of "Should the OPEC Cartel Be Broken?" Instead the administration accepts the power of the Cartel as a parameter and hence the Administration's energy policy should be subtitled "Dr. Shlesinger, or How I Learned to Live with the OPEC Cartel and Love It."

Not only should the cartel be broken, but it must be broken if Western Capitalist Nations (as we know them) are to remain vigorous healthy economies. Even if the U.S. can, as a nation, afford to turn over in the next few years 2 or 3 percent more of its GNP to Persian Gulf Kingdoms and also permit smaller crumbs from the cartel cake to fall into the laps of our own domestic producers and royalty owners, and even if the regional impact of this redistribution income and wealth is politically tolerable (and I believe it is not), the ultimate impact of continued Persian Gulf greed (and their continued ability to exercise it over a subservient consumer nation) will be to exacerbate and make unmanageable the stagflation disease afflicting all capitalist consumer nations and bring about the Second Great Collapse of Capitalism in the Twentieth Century. (The First was the Great Depression!) This must be avoided at all costs for the

strength of these capitalist economies is not only necessary to improve the standard of living of their own citizens but it is also an essential factor in providing similar benefits for the LDC's of the Third World.

II A. INFLATIONARY ASPECTS OF DEREGULATION

In modern, market production economies, inflation is caused by various organized groups of economic units attempting to use market power to obtain a greater portion of the output of industry for themselves. In other words inflation is the method that modern market economies redistribute income, and continuing inflation is a symptom of a continuing struggle for further redistribution. Since President Carter's deregulation order merely stimulates additional redistribution from domestic consumers to domestic producers and royalty owners, it must severely aggravate already-existing inflationary processes. (Section IV below explains in some analytical detail why if we do not break the cartel's grip on energy prices, the problem of stagflation will become even more threatening).

Quantitative estimates of the inflationary impact of the President's policy proposals are dependent on ceteris paribus assumptions regarding (a) the reactions of organized groups of workers and industries towards acceptance of the loss in real income engendered by higher energy prices and (b) the willingness of the cartel to limit future price increases. Thus such forecasts by the DOE will depend on the ex Post realism of their basic assumptions, i.e. whether the future obeys Dr. Schlesinger's vision of the world. I do not feel the need to compete with DOE on the production of such speculative computer printouts and three color flip charts. I believe the DOE forecasts are bound to seriously

underestimate the inflationary impact of deregulation while significantly overestimating the supply and conservation responses (see Section II B *infra*) to higher oil prices.

Government projections released to coincide with Presidential policy pronouncements should, as a rule, be viewed with a jaundiced eye.

in 1970, for example, the Cabinet Task Force on Import Controls, using information and expertise supplied by the major oil companies, the CEA, the Department of Interior, the Office of Technology, etc. predicted that with a wellhead price of \$3.30 per barrel (approximately \$6.00 in 1979 dollars) U.S. oil producers could profitably produce 13.5 million barrels per day by 1980. Now the DOE indicates that at a deregulated price of approximately \$15 per barrel, domestic producers are unlikely to profitably produce even 10 million BBL/D in the 1980's. If the 1970 Cabinet Projections were so inaccurate; what reason do we have to believe today's CIA-DOE, forecasts?

I need only remind you that the administration forecast are made by the same people who only a short time ago brought you President Carter's assurance that the Shah was and would continue to be the rock of stability in the Persian Gulf. If their economic forecasts are as good as their political forecasts, we should expect that if a competitive oil market could be established, the consumer would be inundated in a sea of oil at current prices!

In his 1977 energy message, President Carter accepted Schlesinger's unproven supposition about supply: it is a "fact that we are running out of petroleum." Accordingly, consumers must be forced to "conserve" through higher prices in order to buy time while R & D, financed this time via

an Energy Trust Fund, tries to trick Mother Nature into providing other abundant sources of energy at lower real costs than current technology permits.

II B. CONSERVATION VIA REGIONAL INCOME TRANSFERS

I am not against conservation or advocating waste, but before we launch out on a Conservation Crusade (with some deep seated feeling that deprivation is good for the soul), it should be noted that conservation has two possible separate and distinct technical meanings in economics.

Economists talk of a downward sloping demand curve for such commodities as oil which, given consumers taste, consumption technology, and money incomes, indicates that at higher prices, consumers will buy less oil. Consumer's sensitivity to higher oil prices is measured by the price elasticity of demand as given by a movement up a demand curve. Policies to encourage conservation (i.e. less usage of oil) can be associated with either (a) a movement up an unchanging, demand curve (due to higher prices) or (b) a shift of the entire demand curve inward so that even at the same price consumers would use less oil. Technically, in economist's jargon, conservation via (a) does not change the demand for oil. Only via (b), that is a shift in the demand curve, can we speak of a decline in the demand for oil. Different policies are necessary to achieve conservation via (a) than via (b); which form of conservation, if it is desired, should we strive for?

President Carter has directed primary focus on achieving conservation via (a) i.e., by permitting domestic oil prices to rise to the cartel price (net of transportation and quality differentials). Economists however,

recognize that the amount of conservation induced by moving up a demand curve (price elasticity) depends on the summation of the magnitudes of a (i) substitution effect and (ii) an income effect.

A substitution effect occurs if the price of oil rises relative to the price of energy substitutes. Empirically, however, the price of domestic substitutes (coal, shale oil, uranium, etc.) tend to rise "sympathetically" (as the N.Y. Times noted on April 5, 1979) with the price of oil. Moreover, as I have demonstrated, given the current structure of the energy industry, there are good logical reasons for this sympathetic rise.³ Consequently we should expect little or no conservation due to the substitution effect as the deregulated money price of domestic oil increases.

Accordingly, if the President's deregulation action brings about any conservation in oil usage it must be due to the income effect, i.e. rising oil prices reduces the real income (standard of living) of U.S. Consumers so they can not afford to buy as much energy and other goods as otherwise. This effect will cause only those U.S. consumers to conserve whose energy costs as a proportion of their total budget exceeds the proportion of their income and wealth which is derived from property rights in energy reserves. Thus U.S. energy consumers with no economic interests in energy reserves will suffer the greatest real income loss while those with extensive energy property rights might actual find their real income rising and they will actually tend to use more energy than otherwise. Since energy costs as a proportion of ones budget, and

3. See my "The Economics of Natural Resources, Challenge, March/April 1979, p. 45 -- Exhibit #1 attached.

energy wealth as a proportion of one's wealth are closely associated with residence in various regions of this country, such a policy can only promote regional disharmony and conflict, when what is needed is National harmony and cooperation against an external economic enemy who declared economic war on the U.S. almost a decade ago. Thus, in my view, conservation via higher prices is wrong-headed policy.

If President Carter insists on Conservation as a centerpiece of his energy policy, he should realize that he is relying almost solely on an income effect to achieve this objective. Once explicit recognition that conservation to the extent it is successful via moving up a demand curve will rely solely on reducing real ^{income} of many buyers (via large inter-regional income transfers) it should be obvious that there are other, fairer methods of reducing consumer incomes. An income tax based on ability to pay could be designed to remove sufficient income from all U.S. consumers to achieve any conservation goal desired. Such a tax would shift the demand curve inwards, thereby reducing demand without raising domestic prices. (Once (b) is recognized as an alternative to (a) to achieve conservation without raising prices, it is not difficult to conceive other policies/which need not require income loss ^(e.g. rationing) per se to conserve!).

Deregulation merely permits oil producers and royalty owners to act as if they were private "tax collectors" and, given the creative accounting of the domestic oil industry, to keep the lion's share of this tax for themselves; President Carter's "windfall" profit tax attempts to strike a deal so that the IRS gets a share of this largesse generated in the name of conservation.

II C. SUPPLY RESPONSE TO ADMINISTRATION POLICY

As I have already suggested, given the current state of energy markets, I expect a very low supply response to higher domestic wellhead prices⁴. The President's decontrol order guarantees domestic producers of "old" oil that there is more to be gained by limiting production during the period of phased decontrol. For example, Alice Rivlin in written testimony before the Subcommittee on Energy of the Joint Economic Committee (April 25, 1979) states that the President's program will, for one category of old oil, more than double the price from \$6 to \$13 in six months, thus the value of any such oil kept in the ground will increase by 117 per cent from June 1979 to January 1980. Other categories of old oil will have different rates of price increase but, on average, old oil prices will rise by 167 per cent in 28 months or approximately 70 per cent per annum. What other investment will yield such a rate of return merely by being held for 28 months? Thus if producers are rational then during the next two years the flow of old oil should be reduced sharply, thereby contributing to a potential crude shortage and long gasoline lines. This potential source of shortage would not occur if the President had not ordered decontrol or if his order had followed point (2) of my National Energy Program as detailed in Section III.

Secretary Schlesinger estimates that the President's decontrol program will provide incentives for domestic production to increase by 700,000 barrels a day in 1985 while Alice Rivlin estimates the increase by 1985 to be in the 400 - 500,000 barrel per day range. Even if the President's goal of 2½ million barrels of oil per day via alternative domestic "synthetic crude" by 1990 is met, the President's program will still

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leave the U.S. significantly dependent on OPEC oil and the U.S. price of energy will continue to be controlled by Sheiks and Ayatollahs throughout the 1980's and probably for decades to come.

There are additional and effective ways of improving domestic supplies of energy. Points (1), (2), (5), (6) and (10) of my National Energy Program could provide immediate improvement in domestic supply availability to carry us into the 1990's when synthetic crudes come on stream.

11 D. A TRUST FUND FOR WHAT PURPOSE?

If despite all the arguments already presented, the President still insists on conserving by moving up a demand curve (without a change in demand), then a stiff windfall profits tax would be, in my view, highly desirable. As I argued in a paper in the Journal of Post Keynesian Economics⁵ if the U.S. government does not have the courage to break OPEC, then as at least, the government should join them and share in the monopoly rents generated by the cartel. Taxes such as the windfall profits tax, the earlier proposed crude oil equalization tax, and the ending of the foreign tax credit are ways where our government can share in this income extorted from consumers.

I would suggest that the revenues obtained from such a tax be used to subsidize mass transportation, financing a FOGCO and similar activities which will immediately create good substitutes to private use of gasoline or industry-controlled supplies of oil whose price can move

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4. I have estimated in detail supply elasticities for crude oil in my Ford Foundation Energy Project Study "The Relations of Economic Rents and Price Incentives to Oil and Gas Supplies" by P. Davidson, L. Falk and H. Lee in Energy Taxes and Subsidies, edited by G. M. Brannon (Ballinger, Cambridge Mass., 1974).
 5. See exhibit 2 attached -- P. Davidson, "The United States Internal Revenue Service: Fourteenth Member of OPEC?" Journal of Post Keynesian Economics, Winter 1979, pp. 53-55.

in the opposite direction from world oil prices and thereby induce a substitution effect as well as an income effect and increase the price elasticity of demand facing the cartel.

Let me be clear that I am not against R & D per se, if, however, we subsidize substitutes which can not be controlled by the profit maximizing calculations of the cartel and willing industry supplicants who have a vested interest in not changing (shifting) the demand for oil while the Government spurs conservation, we will create market incentives for the industry to use their own money for R & D in reducing energy costs to the consumer as they find they have to compete (for a change) for the consumers' dollar.

III. PROPOSAL FOR A NATIONAL ENERGY POLICY (NEP)

The sudden quadrupling of the world crude oil price during the 1973-74 period was at least partly responsible for the severity of the world wide recession and economic dislocations. Moreover, OPEC's further crude oil price policies remain a serious threat to the survival of the world's monetary relations during the next few years.

In this section I propose to outline a ten point National Energy Policy (NEP) for the United States which will have both short run and longer run implications.

In the short run we should not undertake policies which are likely to exacerbate the current problems of unemployment and inflation.⁶ In

6. The Nobel Prize winning economist, Sir John Hicks, has suggested that the reason the U.S. has not experienced the same higher rates of inflation of Western Europe in 1974 and 1975 was due to the fact that the price-rise of imported oil, "while it has a large effect on the American import price index, has not been allowed to soak through to the domestic American economy. The American oil producers have not been allowed to raise their prices..." [J.R. Hicks, "What's wrong with Monetarism", Lloyds Bank Review, October, 1975, p. 12]. (For a further discussion of this aspect, see the section below entitled "Energy Policy and the Problems of Inflation and Recession.")

the longer run, our policies should be oriented towards breaking up the OPEC cartel and the growing monopolistic control of domestic energy sources.

A ten point National Energy Policy (NEP) which could provide U.S. consumers with sufficient energy while allowing producers to earn a competitive return rather than permitting them to share in cartel profits would include: (1) extensive antitrust action to break up conglomerate energy companies and to create competitive alternative sources of energy (competitive to OPEC sources and the major oil and gas producers), (2) governmental coordination and regulation of wellhead prices of oil and natural gas so that any necessary price increases occur at such low annual rates as to make speculative withholding unprofitable (and in no case should wellhead price of oil and gas be suddenly decontrolled), (3) prohibitive capital gains taxes on oil and gas properties to catch any speculative profits which avoid other policy nets, (4) the changing of leasing policies on federal properties in order to reduce the financial constraint of the front-loaded bonuses and permit independents to develop offshore properties, (5) policies which encourage and require accelerated exploitation of old and new properties, even if in certain situations such policies were to encourage flows in excess of MER,^{6a} (6) policies which prohibit the "shut-ins" and other practices which permit speculative withholding, (7) an announced increasing schedule of import taxes on foreign crude oil and products over the next three (perhaps only on non Western hemisphere oil) or four years. Such an import tax schedule must be phased in with growing U.S. production while U.S. wellhead prices are controlled as suggested

6a. This can be done by increasing the carrying cost of oil that was being held underground via a per barrel tax on oil that is not produced. For example, any oil property in the U.S. which is producing less than MER can be taxed on a per barrel per day basis on the difference between actual daily production and MER (or even say 10% above MER).

in (2) above, (8) a federal sponsored corporation which at a minimum would aid in financing the development of new properties and might even enter into joint ventures with independents; in other words, a Federal Oil and Gas Corporation (FOGCO); (9) the adoption for an import auctioning system with unidentifiable foreign sellers and long term guaranteed markets (see further explanation below) to supply the diminishing share of the U.S. market as we approach self-sufficiency in the next few years is desirable. Such a program will create a positive incentive for members of OPEC to break with the cartel, and for other non-OPEC producers whose price rises in sympathy with OPEC (e.g. Mexico) to be more competitive; (10) elimination of the foreign tax credit, and as I have argued elsewhere,⁷ treating payments to OPEC nations above traditional royalty rates as extortion or bribery and hence not a normal cost of doing business and therefore not deductible from the U.S. income taxes. This last point would create a major economic incentive for domestic based offtakers and refiners who are buyers of crude oil to reflect consumers interests for a change rather than producers interests as they have in the past.

7. See exhibit 2 - P. Davidson "The United States IRS: The Fourteenth member of OPEC" Journal of Post Keynesian Economics, Winter 1978-79.

In December, 1974, I first proposed a simpler NEP to the Senate Committee on the Budget. At that time I warned:

If, on the other hand, the government permits an unregulated market price for oil without altering existing market institutions and conditions, the 1980 domestic wellhead price for crude oil could easily be higher than the \$11 per barrel that the government's Project Independence forecasts as domestic oil prices will in essence be set by the Sheiks on the Persian Gulf; I see no reason to believe that the OPEC cartel will necessarily unravel of its own accord. The OPEC nations are engaged in an economic war with the major consuming nations over the distribution of the world's wealth. Existing economic and political conditions in consuming nations such as the U.S. have made the OPEC cartel's job of preventing price cutting competition from alternative sources easier. Until the consuming nations recognize that the dispute underlying this economic warfare can only be negotiated from a position of internal strength, the consuming countries will remain at the mercy of the producing nations and domestic conglomerates and royalty owners who have a vested interest in redistributing wealth from consumers to producers and property owners.⁸

I believe that events, unfortunately, have proved that my forecast was all too accurate. (For comparison it should be noticed that Milton Friedman predicated in Newsweek (March 4, 1974) that "In order to keep prices up, the Arabs would have to curtail their output by even larger amounts. But even if they cut their output to zero, they would not for long keep the world price of crude at \$10 a barrel. Well before that point the cartel would collapse." [Italics added].)

8. The same prediction was made as early as December 14, 1974 to the Senate Committee on the Budget.

IIIA. AN IMPORT AUCTION SCHEME

To help achieve the intermediate range goals of breaking the OPEC cartel with the desirable attendant reduction in Arab-country power over Western Europe and the Third World, I would argue for elimination of the major international oil companies as direct importers of OPEC crude for the U.S. The OPEC cartel has not yet broken down, as a cartel usually will (because of its members cheating on price), for two important reasons: 1) the solidarity among the Arab producers, and 2) because the international companies willingly police prices and quantities in non-Arab OPEC countries. To act differently would threaten their Arab oil concessions. For example, Aramco, the sole producer in Saudi Arabia is a combination of four of the "Seven Sisters." These four companies cannot purchase large quantities of crude over long periods at prices well below OPEC levels from sources outside Saudi Arabia, or else they will be in serious danger of losing their control of more than 8 million bbls. per day of crude production in Saudi Arabia.

The establishment of a federal agency as the sole purchaser of imported crude and petroleum products via a secret auction system would eliminate the price surveillance mechanism of the internationals which is a strong prop holding the OPEC cartel together. This federal agency should not be limited to making a zero profit or loss in each year. The agency should be able to, at any point of time, refuse any or all sealed bids as part of a strategy to prevent collusive bidding arrangements; hence, the agency may not be able to purchase sufficient oil to cover the difference between domestic demand and supply for any one period. If the agency was forced to sell this limited quantity of imports at a zero profit price, and if there was no domestic price controls, the refining companies could make a windfall profit because of the shortage. Moreover, for reasons given below, there may be circumstances where it may be strategic for the agency to operate at a loss.

The bidding duration of purchase contracts should have a built-in flexibility which encourages sellers to price at less than the cartel price so that the greater the discount offered from the cartel price, the longer the purchase agreement. For example, suppose all bids submitted are at the world cartel price. The agency should be required to limit purchases to 60 or 90 days (and perhaps even reduce imports) and request another auction. If sellers are willing to undercut the world price, the purchase contract should have a longer duration. For example, if the seller's dollar price is 5% below world price, a 4 month contract for a specified quantity per month would be accepted; if the discount is 10%, a year contract; if 15%, a two year contract; etc. Such a duration-discount schedule may be extended to as long as four or five year purchases for substantial discounts. This will increase incentives to cheat on the cartel if the U.S. will guarantee quantity purchases at below current cartel prices for a number of years; especially if a cartel member thinks that this may mean a guaranteed market in later years at a dollar price above the world price when the cartel disintegrates. The objective is to make it so lucrative for any one member of OPEC to cheat and guarantee his income for a number of years that each member is uncertain as to who will be the first to break; while those with the greatest reserves have the most to lose if others break first.

Of course, if the agency is successful in breaking the cartel, it will be saddled with purchase contracts for specified quantities for a number of years which may be at a price above the market price. The agency should then sell the oil to domestic refiners at the world price thereby passing the gain on to the American consumer, and the loss of the agency should be subsidized from tax revenues. These agency losses can be looked upon as a defense expenditure for economic warfare, and a successful expenditure at that!

.. IV. ENERGY POLICY AND THE PROBLEMS OF INFLATION AND RECESSION

There have been two main ways by which the rapid increase in energy prices have affected the recent U.S. inflationary and recessionary problems. Moreover, the energy sector will continue to exacerbate these problems in the future until the relations are properly understood and positive action undertaken to offset the energy sector impact.

In the first place, the exceedingly large increase in the cost of OPEC oil has led to an enormous transfer of purchasing power and real income from the residents of the U.S. (and other consuming nations) to the OPEC nations. Since the latter cannot or do not wish to spend most of their increasing claims on the purchase of newly produced U.S. goods (in economic jargon, the marginal propensity to save of OPEC nations is very high vis-a-vis American income recipients) even if the U.S. had not adopted restrictive anti-inflationary monetary and fiscal policies, there would have been, *ceteris paribus*, a reduction in aggregate demand. To the extent that the OPEC nations are willing to hold financial claims and not buy U.S. goods with the wealth that the cartel has extorted from U.S. consumers, the loss in U.S. real income due to redistribution will take the form of higher unemployment rather than a transfer of real goods. Since the cartel does not want real goods, the U.S. could, if we wished, maintain a higher current standard of living by enacting vigorous expansionary monetary and fiscal policies to offset the recessionary savings of OPEC.

Secondly, any increase in OPEC and domestic oil prices (and other commodities to a lesser extent) creates what in the 1920's was called a Commodity Inflation. A Commodity Inflation must not be allowed to spill over into an Incomes Inflation⁹ since the former can, with proper policies, be reversed; but the latter (i.e., a wage and profit margin inflation) is almost inevitably irreversible.

Inflation is a device for redistributing income. A commodity inflation will, as long as it lasts, redistribute real income from consumers of commodities to producers and owners of property from which the commodity comes. The world and domestic oil price inflation is a symptom of the real income redistribution that has occurred from energy consumers to the OPEC nations, multinational companies and domestic producers and property owners. The major impetus for this redistribution was the growing power of the OPEC cartel supported in large part by the lack of countervailing efforts in recent years by the multinational oil companies, the U.S. State Department, and the federal and state governments.

The American people must ultimately be told the inevitable economic realities of the recent world oil price rise, namely that there has been

9. See J. M. Keynes, A Treatise on Money (Macmillan, 1930), Vol. 1, pp. 155-6 for an early discussion of this process. See P. Davidson, Money and the Real World (Macmillan, 1972) pp. 338-57 for a more up-to-date interpretation of this inflation process.

some reduction in the available total real income of the U.S.¹⁰ and a considerable reduction of the real income of U.S. energy consumers. Until and unless we break the cartel, the only question which our society can control is how we divide the burden of this lower real income among members of the U.S. economy. But each group of workers and energy using industries will refuse to accept a fair share of the lower standard of living which this income loss entails. Instead each group tries to maintain the former purchasing power of its income share by raising its wages or prices and thus push the burden of the loss on others. These uncoordinated, inconsistent and competing claims for higher money income to offset higher commodity prices results in a rampant wage-price spiral, i.e., an incomes inflation that puts us all on a treadmill where we must all run faster--demand more money income--merely to try to catch up. But since there is less goods and services to go around, all oil consumers cannot all catch-up to their pre-Commodity inflation shares of the National Product.

The traditional remedy for an incomes inflation is sufficient stringency in monetary and fiscal policies ("bullet-biting") so that the economy becomes so impoverished that it cannot be held for economic blackmail by powerful subgroups in the economy who take action to maintain or improve their well-being at costs to others in society.¹¹

The high levels of inflation and unemployment that we experienced in 1974 and 1975 were in large measure the result of (i) free market forces attempting to distribute the loss in real income (due to the 1973-74 cartel oil price rise) to the economically weak sectors of the U.S. economy, and (ii) deliberate Administration policies to at least nibble on, if not bite, the bullet. We are still witnessing the economic ripples of the OPEC extortion which has severely lowered the real wealth and income of our cities, our public sector employees, our last-in first-out members of the labor force, and particular vulnerable energy using industries. Nevertheless this continuing economic loss (as long as the cartel remains) has been absorbed by our economy with, all things considered, amazing resiliency.

Economic forecasters see a slow (perhaps too slow) recovery as long as there are no further devastating price shocks by oil producers or other powerful economic groups attempting further increases in their income via extortionary price increases.

¹⁰ The loss in real income could have been reduced, however, had the U.S. Government recognized in 1970 that OPEC was engaged in economic warfare with the consuming countries.

¹¹ In essence each subgroup will attempt to emulate the Arab Sheiks and obtain and protect as much wealth for themselves as possible. Many economists in the U.S. are willing to force groups in our own country to bite-the-bullet, to accept economic impoverishment to fight inflation, but are strangely silent about encouraging bullet-biting remedies on the Sheiks of the Persian Gulf.

Carter

Unfortunately both the/ Energy Policy (which is ultimately oriented towards a further redistribution of income and wealth from energy consumers to energy producers and royalty owners) and the OPEC strategy of regaining some of the extorted real income it lost due to the inflation of consuming countries' price levels will inevitably re-aggravate the inflationary and recessionary problems of the U.S. economy.

The remedy for our enlightened society which is faced with a redistribution of income towards foreign nations and domestic producers and royalty owners is not to adopt the free market philosophy of the "survival of the fittest" race to push the loss of real income onto others in our society. Instead, we should attempt to break the cartel and stop the redistribution via a coordinated national energy policy similar to the one I suggest above. To the extent that we must accept some of the already accomplished redistribution and potential future redistribution until the cartel is broken, an enlightened society should adopt a national policy for coordinating the income claims of various groups and equitably sharing the remaining output that would be available at full employment. Such a policy goes under various euphemisms such as "a social contract," or an "incomes policy" or even "wage and price regulation and coordination," i.e., "controls." In my view such a National Policy to Coordinate Income Claims (NPCIC) is the only viable alternative to the Darwinism of free markets where economic power is not equitably distributed²⁰ or a combination of Darwinism and "bullet-biting" where the hope of keeping each group in society in its place is to be accomplished by so debilitating our economy so no one can afford to make any demands.

The desirability of instituting full employment monetary and fiscal policies in tandem with a NPCIC is clear and I anticipate the Congress and the Administration will recognize its obligations in this area in the next few months. Accordingly, a National Energy Policy must be developed that is consistent with a NPCIC and the concomitant expansionary fiscal and monetary policies that prevent the redistribution of purchasing power to OPEC and domestic producers and royalty owners to take the form of a high unemployment and inflation in the U.S.

²⁰A NPCIC is not as shocking as it seems. The government already deliberately affects the after-tax income distribution via fiscal policy and President Ford²¹ is suggesting a new redistribution with his energy tax of \$3 per barrel and a simultaneous reduction in other forms of taxation. It is not a big step forward to coordinate pre-tax income distribution as it is determined in "free" markets. Most people might find they like the results of such a policy once they get over the shock of it.

A Guide to Post-Keynesian Economics

The Economics of Natural Resources

PAUL DAVIDSON

If user costs and monopoly power are given their proper weight, the current energy crisis can be better understood. The price of oil is not checked by market forces, but rather is likely to rise as a result of its own internal dynamics.

Post-Keynesian theorists view the economic problems surrounding raw materials (that is, natural resources) in a very different light from orthodox neoclassical economic theory. This point can perhaps best be illustrated in the context of the current so-called "energy crisis."

In 1973, the onset of an energy crisis, in a world that for a century had been plagued by a potential oversupply of fossil fuels at existing market prices, caught many knowledgeable observers by surprise. The energy shortage immediately generated a search for a scapegoat or a rational explanation of the predicament faced by the highly developed capitalist economies heavily based on energy

resources, such as the United States, Western Europe, and Japan.

Orthodox economic theory has taught that businessmen's single-minded pursuit of profit opportunities, tempered by competition and the absence of externalities, would result in an optimum allocation of resources and the maximization of the community's welfare. Thus if orthodox theory is to be believed, executives of multinational energy companies should not be pilloried for failing to meet the needs of any one selfish nation, for in their pursuit of profits they are unwittingly maximizing the economic welfare of mankind. As for the evidence showing the lack of competition

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at the various stages of the vertically integrated oil industry, some students of the industry, such as Hartshorn claim that the international supply of crude oil is "the same as what might be expected to arise from the operation of the law of comparative costs in a freely competitive international market" (*Politics and the World Economy: An Account of the International Oil Industry in Its Political Environment*, Praeger, 1962). After all, the consumer seemed to be plentifully, and cheaply, supplied.

According to neoclassical economists, the problem of depletable natural resources such as oil is one of determining, in Solow's words, the "optimal social management of a stock of a nonrenewable but essential resource" ("Economics of Resources or the Resources of Economics" in *American Economic Review, Papers and Proceedings*, Vol. 64, May 1974). An immediate consequence of this way of conceptualizing the problem is an analysis of the existing structure of the resource market to see whether it provides "proper" price allocative guidelines. If it can be proven that the market "fails," then it follows (for those who use this approach) that the role of the economist is to design policies to improve market performance and bring it closer to the competitive ideal. In other words, the first instinct of neoclassical economists in this field is to leave the decision as to the time rate of exploitation of exhaustible resources to the invisible hand, unless a market failure can be demonstrated and a corrective policy can be developed. Government control of prices is to be avoided.

Two fundamental questions

Post-Keynesian economic theory, however, begins at an earlier stage and raises two fundamental questions. First, can market prices, even in a competitive environment, provide adequate guidelines for approaching an efficient and optimal rate of utilization of exhaustible resources over a period of calendar time? Second, in a world of conglomerate energy companies, does rationality of entrepreneurial policies imply anticompetitive and antisocial behavior that redistributes income from consumers to producers and owners of resource-bearing property?

The "optimal" use of any exhaustible natural

resource depends, in the context of private markets, on entrepreneurial decisions as to the time rate of production for that resource. For a market price system to provide guidance in determining the "optimal social management of a depletable resource" over time, all of the following conditions must hold:

1. Well-organized forward markets exist for each date in the future.
2. Consumers know with actuarial certainty all their needs for energy resources at each date.
3. Consumers are able and willing to exercise all these future demands by currently entering into forward contracts for each date.
4. Entrepreneurs know with actuarial certainty the cost of production associated with production flows for each date.
5. Sellers can choose between an immediate contract at today's market prices and a forward contract at the market price associated with any future delivery date (and there are over 73,000 such delivery dates in the next two centuries).
6. Entrepreneurs know with actuarial certainty the course of future interest rates.
7. The social rate of discount (the rate at which society values present over future goods) equals



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the rate at which entrepreneurs discount future earnings and costs.

8. No false trading occurs—that is, no production or exchange ever takes place at nonequilibrium prices.

If all these conditions are met, then, in a competitive environment, market prices can be shown to be an efficient or socially optimal way to allocate energy resources over time, in the sense of maximizing the sum of discounted consumer and producer benefits. If one or more of these conditions are violated—as they always must be in the real world—then an unfettered market system cannot provide guidance on an optimal intertemporal allocation of natural resources, and all the mumbo-jumbo of orthodox economists about the ability of “free markets” to guide “proper” decisions—as contrasted with the blunders that would be made by a bureaucracy—has no foundation in logic or in fact.

Post-Keynesian theory, on the other hand, suggests that in a world where the future is uncertain, it is impossible to identify which future intertemporal allocation path for natural resources will, in fact, be socially optimal or efficient, since the efficient or optimal path can only be defined for known future conditions. Post-Keynesian economists reject the idea that either economists or real world market prices can or do play the role of Delphic oracle. Instead, they hold that the economist's function is to analyze alternative market and regulatory controls of resource production and consumption decisions, and then to explain the implications of these alternatives for production flows, prices, income, and the distribution of wealth and economic power. Economists, it is argued, should acknowledge their role as “soft” scientists providing advice to policy-makers regarding “hard” decisions. Moreover, even as soft scientists, economists should not hesitate to suggest that policy should aim at (1) protecting consumers from paying more than the normal supply price for essential goods and services, and (2) encouraging “enterprise” and preventing “speculation” from dominating economic activities.⁴

The role of user costs

One of the basic post-Keynesian conceptual tools for analyzing the use of natural resources is the

concept of “user costs” for, as J. M. Keynes emphasized in *The General Theory*, “In the case of raw materials the necessity of allowing for user cost is obvious.” (Keynes borrowed the term “user cost” from Marshall but was the first to develop the concept and apply it to the question of intertemporal production from any depletable properties.) User costs constitute one of the major economic links between the current situation and the future, because they involve weighing expected future profits against current ones. The concept of user costs can be illustrated as follows.

For any particular property, the fossil fuels in the ground are a fixed inventory (or exhaustible resource). The more of these fuels that are used today, *ceteris paribus*, the less will be available for future delivery. Consequently, a rational entrepreneur will compare the present value of expected profits for a forward contract sale at each possible future date with the profitability of selling that amount today. If profit-maximizing entrepreneurs are to produce for current sale, current marginal revenue must be expected to cover not only current marginal production costs associated with that barrel of oil, but also the user costs inherent in all depletable resources—namely, the highest present value of marginal future profits given up by producing that barrel of oil currently rather than in the future. If well-organized forward markets existed in the real world, producers of natural resources could readily use the forward prices to estimate user costs. However, forward markets for oil and other natural resources for days, months, and years in the future do not exist. Only if such forward markets already existed and only if they truly represented the demand that future consumers would have (and not the views of today's speculators regarding the future demand) could entrepreneurs then employ the concept of user costs to obtain an efficient intertemporal production program by following the guidance of free market prices. Instead, the only information available to producers is the history of the industry, the current situation, and the individual's hopes, fears, and expectations about the future prices of resources. Thus the current production plans depend in large measure on unfounded expectations about the future where waves of propaganda, optimism, or pessimism can overwhelm “rational” entrepreneurs and make oil-bearing properties objects of

speculation. Most ultimate consumers of oil and other natural resources do not know, nor can they predict accurately, their demands for the products of natural resources weeks, months, or years into the future.

It therefore follows that in a world where the future is uncertain, with producers "free" to make any production decisions they think most profitable, we are left with a bootstrap theory of the time rate of exploitation of fossil fuel-bearing properties. Current expectations of producers about future prices relative to costs play the pivotal role. Accordingly, relative stability over time in prices and production of energy resources requires that most producers believe that tomorrow will not be significantly different from the recent past, although the market can perhaps accommodate some divergence of views among producers as long as producers expect stability on average.

Competition in such markets will provide intertemporal stability of prices and production flows only if the views of the competitors either coalesce in the belief that the future will not be significantly different from the recent past, or if the views of the competitors differ as to whether user costs are positive or negative in such a way that the "average" view is that user costs are zero. If, even with competition, most producers expect a significant change in prices relative to costs in the future, the current rate of exploitation will be accelerated (that is, if user costs are, on average, negative) or retarded (if average user costs are positive).

Thus, in the 1930s the discovery of the huge East Texas fields touched off expectations of large negative user costs (in other words, expectations of wellhead price declines) in an industry that at that time was relatively competitive—at least in the state of Texas at the wellhead stage. The result was a disastrously rapid rate of exploitation of domestic oil fields which brought about the fulfillment of the expectations of rapidly declining wellhead prices relative to costs. (The moral of this historical episode is that expectations of rapidly changing prices relative to costs in this industry can encourage behavior which will make the prophecy self-fulfilling, if the expectations are widely held and not readily altered.) State government-enforced market prorationing (proportional cutbacks in wellhead production), supported by the 1935

federal Connally Hot Oil Act, was required to alter these negative user cost expectations of competitive producers and stabilize the domestic industry. In later years, as foreign oil became important in world supplies, the operation of import quotas plus state market prorationing effectively eliminated any strong negative user cost expectations by domestic producers. At the same time, user cost speculation in the international market was restrained by the ability of the "Seven Sisters" to maintain an orderly market.

Most sellers of energy resources have, however, been led to expect rapidly rising prices by the events of the early seventies. The most important of these include the relaxation of prorationing arrangements in Texas and other oil-producing states, the growth of the power of the Organization of Petroleum Exporting Countries (OPEC) at the same time as import quotas were being removed, and the unsettled politics of the Middle East. These events have stimulated speculative proclivities and consequently retarded current production of fossil fuels and other energy sources such as uranium.

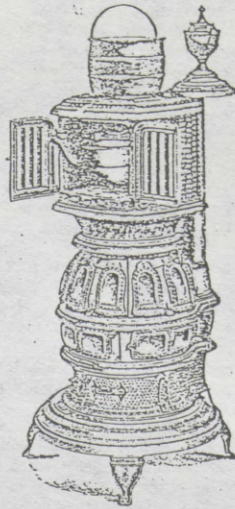
Current events have created an environment where most domestic energy producers and property owners expect rapidly rising wellhead prices of natural gas, old crude oil, and coal (as conglomerates "require" equal returns from each division). Even the price of "new" crude is expected to rise as OPEC turns the cartel screw a little tighter and tries to "catch up" to some extent with the world inflationary forces that the cartel released in the recent past, and politicians talk about removing all controls from wellhead prices or permitting U.S. prices to rise to world levels. Currently regulated wellhead prices in the United States are below what the market could be forced to pay (that is, demand is in the price inelastic range), while competitive fuels are controlled by growing monopolies, such as OPEC, and separate but not independent divisions of the same "energy companies." Congress, meanwhile, continues to hold public hearings to determine whether the wellhead price should be increased or even decontrolled. All these factors encourage producers to expect, at worst, no change in the existing price; and at best, a substantial increase. In other words, producer expectations are biased in the direction of price increases as monopolistic control of supply is validated by events and governmental policies—and

hence speculative expectations can have a significant impact on diminishing current supply offerings. User cost considerations currently dominate discussions as to the rate at which energy resources should be exploited.

Keynes once pointed out that economic progress depends on the spirit of Enterprise, which in this context refers to the activity of producers motivated by a desire for action rather than inaction, and operating under reasonably stable conditions in an uncertain world, to produce a steady flow of output for the economy. Keynes recognized that in an uncertain world some men's proclivities would always influence them to try making speculative profits via supply manipulations, and he noted, "Speculators may do no harm as bubbles on a steady stream of Enterprise. But the position is serious when Enterprise becomes the bubble on a whirlpool of Speculation." The current critical supply situation for natural gas and oil in the United States, and the cartelized supply of all fossil fuels in the world, is in part due to Enterprise becoming engulfed in Speculative practices. Underlying the situation are the positive user costs expectations generated by the growing power of a worldwide energy cartel.

The evidence of monopoly restraint

What evidence is there that the current energy shortage is due to the fact that the monopoly constraint on supply leads to expectations of future further monopoly profits (user costs), rather than being due to increasing costs of production? During the years 1962 through 1972—when, until the very end of the period, prices were not rising—world consumption of petroleum increased by 107.4 percent, while world crude oil proved reserves increased by 108.5 percent. In other words, the world was not facing any greater threat of running out of crude oil in 1972 than it was in 1962. Moreover, historically, the real price of oil had declined as reserves and production grew for the first hundred years of the oil industry. Yet suddenly, we were told that nature's supply of oil was dwindling rapidly and that only prices several hundred percent greater than those prevailing in the early seventies could increase supply substantially—and even that increment would be all but gone by the turn of the century (if Energy Secretary



Arcand Parlor Oven Stove

James Schlesinger was to be believed). Thus, the conventional view, as expressed by orthodox economist Schlesinger, was that the law of increasing production costs (and not an artificial cartel restriction) had finally caught up with the profligate consumer. Hence, the Carter-Schlesinger policy proposals for conservation of oil with higher prices (through taxes, so that the income goes mostly to the government rather than to the producers).

Studies carried out for the Ford Foundation and the Brookings Institution from a post-Keynesian perspective have attempted to estimate the elasticity of production costs for oil and gas, separating these costs from the "user costs" which could drive a significant wedge between supply price responses of oil producers to demand and their production costs. These studies indicate that if user costs could be eliminated by public policy, real production costs would have to rise only modestly to \$7.00-\$9.00 a barrel in 1978 dollars for the United States to achieve virtual independence from the OPEC cartel. To eliminate the user costs, however, the

present exploitable market position of the energy cartel and its willing industry supplicants must either be weakened or eliminated.

The existence of an exploitable monopoly position depends on the present and future price elasticity of demand in the relevant price range. As far as the OPEC cartel is concerned, therefore, it depends in large measure on the current price in consuming countries and ultimately on the supply price at which alternative sources of energy will become significant substitutes for OPEC oil. Suppose, however, that the supplier of a substitute energy source also has an economic interest in OPEC petroleum reserves because it is a conglomerate energy company with an OPEC concession or has other large oil reserves. It must then take into account the positive user cost in providing any substitute fuels. This positive user cost will raise the supply price (above resource costs).

In these circumstances, the positive user cost of substitutes internalizes a cost that in a competitive economy would be external to the firm. Independent producers of domestic oil, shale, tar sands, coal, uranium, and so on (provided they were not permitted to share the monopoly returns of the major energy companies) would not care if they inflicted capital losses on the value of foreign underground reserves of petroleum by providing a cheaper energy source. The existence of rational, multisource, energy-producing conglomerates, however, constrains production of substitute fuels, makes monopolistic control of energy markets easier, and reduces consumer welfare. The ability of conglomerates to maintain high prices for substitute sources of energy tends to reinforce their monopoly power in marketing their OPEC oil.

If, at the current price, consumer demand for OPEC oil is therefore still in the exploitable range, a strong cartel of oil-producing nations can allow multinational energy conglomerates to continue to raise prices relative to real resource costs. The continuous revenue increases of host nations since 1970 seem to be attempts to search out the points at which demand for OPEC oil becomes so elastic that monopoly rents are fully exploited. (Higher prices require production restrictions, however, and hence the market-sharing arrangements that have been worked out to prevent one member of the cartel from increasing its gains at the expense

of others.) Since the multinational energy companies also have vested interests in the price of OPEC reserves, they are willing to support the OPEC cartel by maintaining an "orderly" production market in all fossil fuels. Thus, monopolistic and speculative withholding reinforce each other and merge into one.

The policy implications

The policy implications of the foregoing analysis are easily drawn. Public policy must:

(1) Create an elastic demand for imported oil by encouraging the existence of many independent domestic producers of energy who cannot share in the monopoly rents of OPEC and the multinational energy conglomerates.

(2) Squelch producer speculation activities in all energy sources.

(3) Provide incentives for individual OPEC members to cheat on the cartel by removing the international energy companies as a mechanism for enforcing OPEC price decisions.

Speculation can be squelched in either of two ways:

A regulated wellhead price policy can be adopted, to create an atmosphere of certainty that any future price increases relative to production costs will be at an annual rate so small as to be below the annual interest charge on inventory. Once this has been done, it will never pay to speculate on inventories (for example, ceiling prices will never increase by more than the cost of borrowing short-term funds). The alternative is to create conditions which make expectations of a future price decline just as likely as an increase, so that individuals' speculative expectations tend to cancel. Bluntly, in the current context, this means permitting those who have withheld production in order to profit by it to be so well rewarded by the "free" market that it would appear to many that consumers no longer have any more wealth or income to be exploited.

Unfortunately, President Ford's energy policy (which would have led to a further shift of income and wealth from energy consumers to energy producers and royalty owners), President Carter's energy program (which only slightly modifies the income redistribution features of the Ford plan), and the OPEC strategy of regaining some of the extorted real income it lost due to the inflation of

consuming countries' price levels, all point to the second means of squelching speculation. The problem with this approach is that it will inevitably exacerbate the inflationary and recessionary problems of the U.S. economy.

Conclusion

The current world energy crisis illustrates the importance of analyzing, as a post-Keynesian approach does, such factors as monopoly power and user costs in trying to understand the production flows and market prices of natural resources—especially when these flows and prices are changing rapidly and unexpectedly in the face of slowly expanding world output. Unlike the Pavlovian response of neoclassical equilibrium theorists, post-Keynesian analysts do not immediately see rising natural resource prices as evidence *per se* that the law of diminishing returns is operating in perfectly competitive markets—or, in other

words, that we are running out of cheap energy and other raw materials. A post-Keynesian perspective would instead suggest that such price changes can best be understood (and an appropriate policy response formulated) by analyzing the behavior of entrepreneurial agents and resource property owners in terms of perceived market power and/or expectations about the future.

In this connection, Keynes' concept of "user cost" is a critical one. Keynes recognized that the "user cost" concept applied not only to raw materials such as fossil fuels, but to all capital equipment, "for in deciding his scale of production an entrepreneur has to exercise a choice between using up his equipment now and preserving it to be used later on." For Keynes, the concept of user costs was the keystone of his analysis of production; and in *The General Theory* he insisted, "Supply price is, I think, an incompletely defined term, if the problem of defining user costs has been ignored. . . . The exclusion of user cost from supply price . . . is inappropriate to the problem of supply price of a unit of output for an individual firm."

For those who adopt the post-Keynesian approach to economic analysis, the decision to utilize natural resources is therefore viewed as similar to that of disinvestment in capital equipment, while the search for new sources of natural resources is merely a form of capital investment. These positive and negative investment activities depend on the hopes, dreams, and fears of mortals—or what Keynes called "animal spirits." And thus there is a need to take seriously Keynes' admonition that "there is no clear evidence from experience that the investment policy which is socially advantageous coincides with that which is [thought to be] most profitable." Natural resource utilization, like all investment activities, will generate specific patterns of growth, employment, and income distribution. Economists, if they follow a post-Keynesian approach, should be able to indicate what will be the consequences of different patterns of natural resource use—just as they would for any change in gross and net investment activity. But at the same time they should be careful to indicate that the pattern which is discerned as socially desirable need not be that which, under given market conditions, appears to be most profitable to entrepreneurs.

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The United States Internal Revenue Service: Fourteenth member of OPEC?

PAUL DAVIDSON

In the early 1950s, the United States Internal Revenue Service (IRS) issued a ruling that permitted a tremendous transfer of income from U.S. taxpayers and oil consumers to the oil-producing governments of the Middle East, thereby fostering growth in the economic and financial power of the nucleus of governments now forming the backbone of OPEC. At that time, the IRS ruled that "income taxes"¹ paid by oil companies to such governments were creditable against U.S. tax liabilities on foreign operations. (Other consumer governments were then forced by the competitive demands of oil companies to provide similar tax credits, so that the effect was ultimately to transfer income from taxpayers in European countries as well.)

Recent congressional hearings turned up an internal U.S. Treasury memo (dated September 1951) stating that the Treasury recognized these so-called income taxes to Middle Eastern governments were "a substitute for royalties which [censored] would otherwise be required to pay," and that consequently this tax was *not* eligible for tax credit status (U.S., Congress, 1977, p. 496). Evidence presented at these hearings indicated that it was State Department pressure, instigated by the large oil companies, which caused the IRS to make this ruling. Thus the multinational oil

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¹ For all practical purposes, since production costs per barrel are negligible relative to the posted price, and therefore the calculated profit per barrel, these so-called income taxes become a per-barrel tax that only foreign oil companies pay.

companies, at no cost to themselves,² appeased Arab demands for a greater share in the economic rents generated by Middle Eastern oil production. The IRS ruling permitted the oil companies, instead of sharing these rents directly, to act as transfer agents providing financial aid to anti-Communist governments from the U.S. Treasury without any U.S. public discussion and/or congressional approval.³ (In fact, given the pro-Israeli sentiment in the United States at the time, it is highly unlikely that congressional approval could have been obtained for aid of that magnitude to countries like Saudi Arabia.)

With the onset of the energy crisis created by the OPEC cartel, the oil companies discovered that it was not only costless but perhaps might even be profitable (after taxes) for them to cooperate with OPEC in raising prices to consumers and limiting production (prorating). Every dollar of increased taxes demanded by OPEC not only can be credited against U.S. tax liabilities on foreign operations but can also be used as a rationale for raising prices to consumers worldwide. Thus, as long as companies have any potential U.S. tax liabilities on such foreign operations, U.S. oil companies can gain twice from each additional dollar paid to OPEC, since the cost of the payments to OPEC governments are borne by the taxpayers, while the ensuing market price increase swells oil company profits by raising their take at any producing properties they might have outside of the OPEC nations (U.S., Congress, 1974, pt. 7, p. 546). Finally, as Federal Energy Office administrator John Sawhill testified, under the Nixon price control program, anything that raised the transfer price between a foreign affiliate and a U.S. affiliate increased "landed costs" and therefore could be passed immediately through in consumer oil prices (U.S., Congress, 1974, pt. 9, p. 3). This means that at least until October 1973, when oil companies *as buyers* established the posted prices on foreign crude,

² In 1973, for example, Exxon, the world's largest corporation, with less than a quarter interest in the Arabian-American Oil Company (Aramco) received \$789 million in tax-free dividends, while its before U.S. tax total profits from worldwide operations was \$2.4 billion (U.S., Congress, 1974, p. 7, p. 231). Thus almost one-third of Exxon's earnings comes from tax-sheltered (through tax credits) Arabian oil production.

³ A 1976 internal Treasury memo, discussing a recent request for similar beneficial tax treatment by an oil company spokesman, stated "... the form of co-operation suggested by Mr. [censored] would be improper. It would give the appearance of secret dealings with big oil companies to negotiate a tax credit just as was done in the early 1950's in the case of [censored]" (U.S., Congress, 1977, p. 435).

there was no incentive for the companies to hold down prices; even today, under somewhat stricter government regulations, the oil companies' self-interest appears to be tilted toward higher rather than lower prices.

In sum, the IRS tax credit ruling two decades ago has contributed to a long-term situation in which multinational oil companies need not bear any of the economic costs (and may actually profit) from acquiescing to the cartel's demands.⁴ Hence the companies cannot be expected to reflect consumers' interests adequately as they bargain with OPEC (and especially with the Saudis and the Shah). This does not necessarily mean that the U.S. government need directly intervene in the foreign crude oil market to improve the consumers' position vis-à-vis the cartel: as the following analysis will show, changes in the U.S. tax laws (and presumably the tax laws of other developed oil-consuming nations as well) can force the companies to more truly reflect consumers' interests as they go about their business of producing oil worldwide.

Royalties, Taxes, Rents, and Incentives

An essential aspect of the current energy problem concerns how large an increase in market prices for oil and gas would be required (in a competitive market) to bring forth quantities of oil and gas that would balance supply and demand. In theory, there is a Marshallian competitive supply price that can be specified for each

⁴ Even as the OPEC nations are negotiating with the oil companies for greater ownership of the producing concessions in their countries, the companies are attempting to use this IRS tax credit ruling to avoid capital gains taxes (U.S., Congress, 1974, pt. 7, p. 533). Since cash payments for the full monopolized rent value of the oil companies' interests in these concessions (or what the companies and OPEC governments agree are the "updated book value") would be subject to U.S. capital gains tax, the companies have bargained for special low prices on "buy-back oil," i.e., the percentage of oil produced that represents the host government's proportional ownership in the concession. This bargain price is in addition to payment of a service fee to companies such as Aramco for each barrel of "government-owned" oil produced by Aramco. This service fee, which at least in part represents compensation to the companies for the host governments' increased takeover of the concession, is free of U.S. taxes because of the credits accruing from the "income tax" paid to the host government. Thus, because of the IRS ruling, U.S. taxpayers are in effect compensating the companies for the OPEC governments' increasing nationalization of oil concessions. (The Treasury has indicated that at least five OPEC countries—Algeria, Iran, Libya, Saudi Arabia, and the United Arab Emirates—have adopted some form of these buy-back arrangements [U.S., Congress, 1977, p. 270]).

barrel of oil produced, where supply price is defined as "the price required to call forth the exertion necessary for producing any given amount of a commodity" (Marshall, 1950, p. 142). If producers receive payments from consumers in excess of these supply prices, then consumers have paid a price which is more than that required to bring forth the unit of output, and the excess of price paid by consumers over competitive supply prices is called *economic rents*. If economic rents were to be reduced or eliminated, there would be no change in supply.

Economic rents earned because of increasing resource or factor costs at the intensive and extensive margin, given the state of technology, can be termed "diminishing returns rents," while cartelization can give rise to what may be called "monopoly rents." Given the history of world oil prices since 1970, it is obvious that huge monopoly rents are currently being obtained on the oil production from OPEC sources.

In the early 1970s, as the "free" market price for oil rose due to the increased economic power of the OPEC cartel, some suppliers of this oil from OPEC and other sources, as well as all property-owners (by means of royalties), immediately received higher income per barrel on all production from properties that were already on stream. Since, in a more competitive environment, such producers and property owners would have been willing to accept a lower price, these additional receipts represent monopoly economic rents. Of course, it is a well-established principle of economic theory that, since these payments exceed the minimum necessary to bring forth production from the oil-bearing properties, these economic rents could be taxed by governments without altering production decisions.

The Carter administration has recognized that if domestic well-head prices on "old" oil and gas were to be deregulated, huge economic rents (or "windfall profits" as they are sometimes labeled) would accrue to producers (and property owners by means of royalties). Thus the Carter plan to levy a wellhead tax ultimately equal to the difference between the world price and the regulated price⁵ is an attempt to capture these monopoly rents on U.S. production for the U.S. Treasury.⁶ Hence, the Carter wellhead tax, like the

⁵ It is assumed that the regulated wellhead price equals or exceeds the supply price of "old" oil.

⁶ Joan Robinson (1933, p. 163) labeled such a plan "an ingenious though impractical scheme" when she first introduced the idea into the professional literature.

THE IRS: FOURTEENTH MEMBER OF OPEC?

"income taxes" levied by the OPEC nations on the producing companies, seeks to recover the monopoly rents that otherwise accrue to producers when the market price exceeds the Marshallian competitive supply price.

There are two major differences, however, between the Carter wellhead tax proposal and the OPEC "income tax" plan. First, the Carter proposal was made after the OPEC cartel raised the price, while the OPEC tax take on posted price was the mechanism through which the cartel encouraged the oil producers to raise the "free" market price to consumers. Second, and more importantly, the Carter wellhead tax proposal will attempt to recycle the monopoly rents collected through taxes on "old" oil back to U.S. taxpayers (who are in general major oil consumers), while OPEC's tax system uses the oil-producing companies to act as monopoly rent collectors for the host nations, which are not major consumers of oil.

Since the IRS has ruled that at least until July 1, 1978,⁷ multinational oil companies can write off these monopoly rent collections for OPEC as a tax credit against U.S. corporate tax liabilities, there is no incentive for companies that would otherwise have a U.S. tax liability to engage in tough arms-length bargaining with the cartel regarding either the announced wellhead price or the tax imposed by the host government. As long as the cartel's policies (1) do not dictate a market price in excess of the one that would be charged by a single monopolist *and* (2) permit the companies to retain a competitive after-tax return *or more*, it is in the companies' self-interest to be willing worldwide tax collectors for the OPEC governments. Whatever monopoly rents (extorted from con-

⁷On January 16, 1978, IRS Revenue Ruling 78-63 revoked the tax credit status beginning in July 1978 because the tax was based on posted price, which IRS stated "is an arbitrary value assigned to oil which differs from the actual market price of oil." Several days prior to Ruling 78-63, according to Aramco spokesman J. W. Glassman, "Aramco notified the Treasury Department and the Internal Revenue Service that Aramco was no longer required to sell crude oil at 'posted prices' but, instead, was authorized to sell at government-established market prices" (prepared written testimony of J. W. Glassman before the Senate Subcommittee on Foreign Economic Policy, February 22, 1978). Since the basis of the Saudi tax is now a "market price," Aramco claims it is still entitled to a tax credit. The IRS has not ruled on this latest development, and IRS commissioner J. Kurtz refused to indicate to the subcommittee how the Treasury would rule on Aramco's latest claim. Hence, it is quite possible that the IRS will continue to encourage U.S. companies to act as monopoly rent collectors for the OPEC cartel by permitting a tax credit status now that the posted price nomenclature has been changed by Saudi decree to government-established market prices.

sumers at a \$12 per barrel price) remain after OPEC has collected taxes and royalties, accrue to the producing companies, who will in effect have become silent, but willing, minority partners in the cartel. Moreover, even if the cartel permits the companies to earn only the competitive supply price on OPEC oil, if the companies can convince Congress that it is in the nation's best interests to deregulate domestic wellhead prices and force the domestic price to equality (net of transportation differentials) with the cartel price, then these multinationals will receive monopoly rents on their domestic production. Consequently, the multinational oil companies have a vested interest in maintaining the cartel's market power.

The Many Forms of Economic Rents

In economic theory, if economic rents accrue to the production and sale of fossil fuels, and if there is active competition to lease properties (obtain concessions) as well as sufficient information about the future market value of fossil fuels in the subsoil and their cost of production, then the lessors (host nations) can capture all these future rents by means of the payments (bonuses, royalties, etc.) specified in the original lease contract (or concession), and the oil-producing companies will earn only a competitive return (Davidson, 1963, p. 104). Under such circumstances, underground oil would be like many other capital assets where the estimated future income stream is known to such a degree that the buyer and seller can agree on a fixed purchase sum that each feels approximates the ex post economic rent. This is not true of oil leases, however. Given the large dispersion around the expected mean value of an oil property (the probability of an extreme result such as a dry hole or a gusher is significant), both the producer and the mineral rights owner recognize the extremely small probability that the ex ante rent will even approximate the ex post economic rent. Consequently, a royalty payment based on a percentage of the gross value of crude oil as it is produced allows the producer and the landowner to share in the inherent uncertainties. The way the parties contractually agree to split the expected economic rent into a fixed sum (the lease bonus) and a variable sum (the royalty) depends, in part, on the expected risks of finding oil for different classes of oil-bearing properties.

Once oil is discovered, the lease contract normally remains in force as long as oil can profitably be produced. If the landowner

has (from hindsight) made a bad deal, the producer will end up with some of the ex post economic rent. This is especially important when the degree of monopoly—that is, the markup of market price relative to cost of production or supply price—has risen significantly more than was expected when the original leasehold contract (or concession) was signed. Private landowners who must abide by the law of contracts will, by means of their royalty share, capture only a portion of the increased monopoly economic rents in any monopoly price increase. Host nations, however, can share in these monopoly rents through both royalties *and* “income” taxes. Although royalty percentages are fixed for the life of the contract (unless renegotiated), “income” tax rates can be changed unilaterally. Moreover, OPEC can apparently unilaterally change the posted or government established market price—which is the basis of both the “tax” and the royalty. Thus it would appear that, all other things being equal, OPEC nations can capture any economic rents consumers can be required to pay at any point of time, because they can in essence unilaterally alter their take from the market for crude—as long as the cartel controls the market price. Thus, when OPEC announced a posted price of \$11.65 per barrel in 1974, the cartel explicitly stated that this was the “relevant posted price” necessary to “set government take of \$7 per barrel [through taxes plus royalties] for the market crude, Arabian Light 34° API” (U.S., Congress, 1977, p. 136). Apparently, OPEC ministers had estimated that, in 1974, the economic rents per barrel that could be exploited from oil consumers equaled or exceeded \$7 per barrel.

It is a well-established principle of economic theory that when a producer is earning monopoly rents, a government may tax away all of these rents by means of a per-unit tax equal to the monopoly rent per unit without affecting the production decision of the producer. The OPEC nations have merely put into practice this well-known economic principle. The OPEC governments are utilizing the oil companies as a tax collector for what is essentially a sales tax (equal to their estimate of available monopoly rents) levied against consumers who are facing a cartel. The cartel relies on the expertise and records of the oil companies’ producing affiliates, such as Aramco, to limit production and shipments (U.S., Congress, 1974, pt. 7, pp. 418-19, 515-17) in order to balance supply with demand at the cartel’s best estimate of the monopolist profit-maximizing price.

If, however, the oil-producing company in an OPEC nation is a domestic corporation or a subsidiary of a domestic corporation, then the home country can, if it desires, attempt to share in the monopoly rents generated by the artificially high market price by also taxing the revenues of the producer. On the other hand, if the home country permits a tax credit on any payments made by the producing firm to the host (OPEC) country, then in effect the home country has given the OPEC nations exclusive privilege to keep all the monopoly rents if they so desire.

In sum, when monopoly rents are being received by sellers in the world oil market (as they are today), there are several parties who can attempt to claim or share in these rents. These are:

- 1) the oil-producing firms;
- 2) the landowners—generally foreign governments who regard interests in the subsoil as the property of the state, but these could be private landowners as well; and
- 3) the home country treasury of the oil-producing firms.

Since the IRS has permitted tax payments to OPEC nations to be treated as tax credits, it has in effect announced that the U.S. government has no interest in any monopoly rents accruing from foreign oil production. On the other hand, the Carter administration's wellhead tax proposal on "old" oil implies that the U.S. government wants 100 percent interest in any monopoly rents accruing from domestic oil production *when* the wellhead price of "old" oil is allowed to rise to join the OPEC price. Thus the U.S. government seems in the position of condoning (and even encouraging) foreign (OPEC) nations to extort monopoly rents from U.S. (and other) consumers, while forbidding domestic producers of "old" oil and the landowners of such properties from having any share in the monopoly rents that would be created by permitting the domestic market price to rise to the OPEC-controlled price (net of transportation differentials). Thus, the U.S. government, through the IRS, permits and encourages the cartel to gain all the fruits of exploiting consumers by exercising its monopoly power and appears to be unconcerned over the huge windfalls Arab sheiks have obtained, while it simultaneously expresses righteous indignation if domestic producers and landowners get a few crumbs.

Given the growth of the economic power of the OPEC cartel in recent years and its ability to "establish" market prices, the real major dispute underlying the so-called worldwide "energy crisis" involves who is to share in the huge redistribution of income and

wealth that is occurring by means of monopoly rents collected from consumers by oil producers who, because of the U.S. and OPEC tax systems and regulated wellhead prices in the United States, turn most, if not all, of these monopoly rents over to the OPEC nations. In fact, because the United States treats oil producers' "income taxes" on foreign oil production paid to host nations as a tax credit instead of a tax deduction, the U.S. Treasury (and ultimately the U.S. taxpayer) will never share in any of the monopoly rents derived from foreign oil production as long as producers earn any income subject to domestic income taxes.

In sum, then, royalties and income taxes paid to foreign nations on foreign oil produced are merely different ways OPEC landowners have used to capture the monopoly rents generated by means of the cartel-controlled market price of oil. As the old cliché reminds us, "A rose by any other name would smell as sweet," and economic rents, whether captured through royalties or through taxes, are still economic rents.

In a recent study, Adelman has clearly demonstrated that the world price of crude oil "has no possible relation to scarcity, present or future, known or feared" (1976, p. 11). In other words, the current world market price of crude oil is not a reflection of the stinginess of nature (diminishing returns). Rather, the high cost of oil in world markets is primarily a reflection of the huge monopoly rents that are being extracted from helpless energy consumers. The OPEC nations are utilizing their tax system to a far larger extent than their contractually agreed upon royalty system to extort these monopoly rents from consumers. U.S. oil companies have little incentive to contain OPEC's tax demands, based on the cartel's estimate of how much monopoly rents can be squeezed out of consumers. The United States is permitting a 100 percent reduction in U.S. tax liabilities for every dollar of monopoly rent the oil producer turns over to OPEC. If such tax payments to OPEC were treated by the IRS as tax deductions, however, then at least the U.S. Treasury (and hence the U.S. taxpayer) would have the opportunity to share in these monopoly rents.

Policy Implications

The primary objective of any U.S. energy policy should be to reduce the monopoly power of (and hence the monopoly rents col-

lected by) the OPEC cartel. This will require active policies to (1) bring forth alternative sources of energy supplies produced by firms that have no incentive to cooperate with the cartel but rather are encouraged actively to undersell the cartel, and (2) create market incentives for members of the cartel to cheat.

During the interim while the United States is developing alternative supplies and creating forces to break up the cartel—or even if the United States does not have the courage to declare an economic war on the cartel and instead adopts the Carter energy package, which teaches us to live with and love OPEC—then it should at least attempt to obtain a share of the monopoly rents. The simplest way for the United States to obtain a share of the monopoly rents on foreign oil is to change U.S. tax law so as to deny both tax credit and tax deduction status for *any* payments to any members of a cartel that deliberately uses its economic power and threats of embargo to extort income and wealth from oil consumers throughout the world. After all, the U.S. tax code recognizes that bribery payments to obtain business contracts are not tax deductible costs of doing business. Why should extortion payments to a cartel be treated differently?

Such vigorous action by the U.S. government against the most powerful cartel the world has ever known can only be applauded by those who believe that such concentration of economic power is unacceptable. The effect of such a change in U.S. tax law would be to force oil producers, who are the major collectors of the monopoly rents due to the increase in oil prices since 1973, to turn over 48 percent of these rents to the U.S. Treasury.⁸ The Carter wellhead tax plan would require producers of “old” oil to turn over 100 percent of monopoly rents collected on domestic “old” oil production to the U.S. Treasury. Thus the Carter wellhead tax plan is equivalent to treating monopoly rents gained on “old” oil as a *negative* tax credit! Disallowing tax credit or tax deduction status for payments of producers to OPEC does not treat the monopoly rents generated on foreign oil production by U.S. producers as drastically as the Carter crude oil tax treats monopoly rents on domestic production.

⁸ One hopes that all other consuming governments would institute similar tax law changes.

If the OPEC nations were already extracting all of the available monopoly rents by means of taxes and royalties, and therefore leaving U.S. producers with only competitive after-tax earnings, then changing U.S. tax law to deny tax credit or tax deduction treatment for these payments would reduce the producers' short-run after-tax profits on OPEC production to less than a competitive return, thereby encouraging producers either to bargain for better terms with OPEC or to reduce their production from OPEC and increase production elsewhere. Barring other changes, this in turn would reduce OPEC's ability to distribute oil in the United States, and other consuming nations and over time would create further worldwide potential production overcapacity, thus seriously weakening the cartel's power.

In effect, such a vigorous policy of not allowing either tax credit or tax deduction for payments to OPEC—while not as punishing as treating the collection of monopoly rents as a negative tax credit, as would Carter's wellhead tax proposal—does announce to OPEC that the U.S. government will not stand helplessly by and permit OPEC nations to keep all the fruits of unrestrained exploitation of oil consumers by powerful monopolistic interests.

If this simple but forceful proposal for pressuring OPEC is unacceptable for either political or legalistic reasons, then the U.S. government should change the status of such tax payments to OPEC nations from tax credit to tax deduction. The difference between permitting tax deductions and not permitting either tax deduction or credit is merely a matter of degree—for permitting tax deduction status merely reduces the U.S. government's ability to share in the monopoly rents collected by U.S. producers of foreign oil. Permitting tax deductions rather than tax credits may not seem as threatening to the OPEC nations, but it will still permit the U.S. Treasury in essence to join the cartel and share some of the crumbs of monopoly power. As a result, some small portion of the monopoly rents could be recycled to U.S. oil consumers *cum* taxpayers. Thus, at a minimum, Congress should remove tax credit status for any taxes paid to the OPEC nations. If Congress will not fight the cartel, then at least we should join it.⁹

⁹ Adelman has recently suggested a similar proposal of an excise tax in consuming countries to force the OPEC price down (Adelman, 1978).

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[From the July 16, 1979, Wall Street weekly publication "The Money Manager"]

COMMENTARY: A MODEST PROPOSAL

(By Sanford Rose)

It has been estimated that the amount of goods and services Americans must give up to pay for imported oil rose by 1,900 percent from 1973 to yearend 1978. With the 1979 price increases tacked on, that figure should now exceed 2,000 percent. Part of this rise stems from the upsurge in the volume of imports. But most of it is a consequence of skyrocketing prices. The fact that American exports buys only a tiny fraction of the imported oil it once bought.

The terms-of-trade loss is the primary impact of the persistent rise in world oil prices. The secondary impacts are even more severe. They include, among other things, "capital obsolescence." Because oil has become so expensive, it is now uneconomic to operate a lot of energy-intensive capital equipment, which must be left idle or used only sparingly. Estimates of the decline in potential manufacturing output resulting from the surge in oil prices range from about 2.5 percent to 4 percent. In other words, OPEC has been engaged in a kind of non-violent vandalism, in effect destroying or damaging between two and four machines out of every hundred in the United States.

How long can this state of affairs be allowed to continue? The Administration repeatedly urge conservation and phased oil-price decontrol. But neither step will materially reduce the enormous loss of wealth and output. Suppose, however, that oil prices in the United States were suddenly allowed to rise to OPEC levels. Such a step would increase domestic production—though not necessarily by very much. The American oil producer must still decide whether to lift oil now or in the future. The rational producer will defer lifting oil if he expects the price of oil in the ground to rise by more than the opportunity cost of capital. The proceeds of oil marketed today can be invested in financial assets yielding between 9 percent and 10 percent. So, if the producer expects OPEC to raise the world price by an average of more than 10 percent a year, he will logically defer production—or, more likely, slow it down since the present value of oil lifted a few years hence will be greater than the value of oil currently being lifted.

As long as OPEC controls the world price of oil, it is foolish to rely on free-market mechanisms to elicit a significant addition to domestic production. And the longer domestic production is deferred, the stronger OPEC becomes. Hence, it is appropriate to consider new approaches to raising domestic output. One such approach—advocated by Prof. Paul Davidson of Rutgers University—is to apply a series of punitive taxes. Prof. Davidson has evidence that many U.S. companies are producing at least 10 percent less than MER—the maximum rate of production allowed in

a given oil reservoir. The Rutgers professor would levy a tax on the difference between MER and current production, thereby forcing companies to lift oil now rather than in the future. In fact, since many, if not most oil reservoirs can be safely produced at 10 percent above MER, Prof. Davidson would tax the companies on the difference between the amount of output and current levels of production (provided state rules are amended to permit production in excess of MER). In this manner, about 20 percent more output can be coaxed out of the major U.S. oil fields. Going a step further, Prof. Davidson would levy taxes on those oil fields located on Federally leased lands that are not now in production—of which there are a sizable number. Finally, he advocates intensive exploitation of our naval oil reserves and the use of subsidiaries to stimulate tertiary methods of oil recovery.

Although the suggestions made by Prof. Davidson are radical, the problems they address are so grave as to warrant their serious consideration. Adoption of these suggestions will not ensure oil self-sufficiency, but it could reduce imports by perhaps 1 to 2 million barrels a day.

It has become fashionable in some quarters to assert that OPEC exercises a benign influence on the industrialized countries. In fact, one economist recently made that hackneyed but inevitable comment: "If OPEC didn't exist, we'd have to invent it." Considering the negative impact OPEC has had on the rate of productivity growth in the West, such statements are singularly ludicrous. The fact that they are made at all probably stems from the "if-you-can't-lick-them-join-them" syndrome. Yet it must be said that the United States has never really tried very hard to lick OPEC. An opportunity presented itself a few years ago when an oil glut developed and the cartel was in danger of fragmenting. Instead of exploiting this opportunity, the United States came to OPEC's aid by agreeing to buy surplus oil in order to build a so-called strategic reserve.

Today the cartel is stronger than ever and more baleful. Fighting OPEC involves a commitment to full-scale economic warfare. What would that entail? Prof. Davidson argues that, despite the virtually confiscatory Saudi tax laws, the oil companies made more money lifting oil in Saudi Arabia than they do in the United States. Every time the price of oil rises by a dollar, the four U.S. companies that still own Aramco earn about an extra \$250 million in after tax profits. Hence the companies have no incentive to resist OPEC price rises.

At present, the companies pay an 85 percent Saudi tax on the posted price minus royalties and production costs. The IRS is already toying with the idea of depriving the companies of the use of the foreign tax credit. Prof. Davidson would go further. Since the 85 percent Saudi impost constitutes a form of extortion, he would invoke the Foreign Corrupt Practices Act to bar companies from using the Saudi tax as a corporate deduction in the United States. The companies would thus be forced to pay the Saudis their 85 percent and the United States the full corporate tax of 46 percent, meaning that they would lose money on their Saudi operations.

The upshot, according to Prof. Davidson, is that the companies would tell the Saudi government to reduce the 85 percent levy or else they could no longer market Saudi oil. If the Saudi government responded favorably, then the price of oil would probably drop. If it responded unfavorably, the companies would have to stop operating, leaving the Saudis to market their own oil. It is Prof. Davidson's contention that the Saudis would find it impossible to market anything like their normal daily output without the companies' help. Hence, in his view, this would predispose them to compromise and initiate a tax and therefore price reduction.

However, he is acutely aware that U.S. actions of this type might also cause the Saudis to try withholding their oil. To help withstand a potential Saudi embargo, Prof. Davidson would quickly move to various schemes designed to encourage maximum sales from other countries. Mexico, for example, might be encouraged to greatly expand sales if the United States accepted more immigrants. Another long-standing proposal is to offer contracts to sellers who agree to cheat on OPEC's price. For example, if a country agreed to sell at 10 percent below OPEC's price, it would get a year's contract. If it undersold OPEC by 20 percent, it would be rewarded with a two-year contract, etc.

Since sellers do not know how the United States-Saudi confrontation will turn out, some, including those that are members of OPEC itself, may decide to cash in on an opportunity for long-term contracts at relatively high prices. After all, if the Saudis were forced to back down, the price of oil might drop far below the price at which the cheaters had contracted to sell. In this way, OPEC members might be encouraged to break ranks, even though defections would weaken the cartel and thus undermine their long-term interests.

The Davidson plan creates dangerous precedents and also involves substantial risks, as would any proposal for economic warfare. Yet what is the alternative? A

gradual hemorrhaging of wealth until the United States becomes too weak to wage economic war. It might be better to draw the line now while we still have the capacity to fight.

Mr. ECKHARDT. Mr. Zucker, you may proceed.

TESTIMONY OF SEYMOUR ZUCKER

Mr. ZUCKER. Thank you, Mr. Chairman.

I am Seymour Zucker, economics editor of Business Week magazine. Prior to my current position, I was an economist for the National Broadcasting Co. from 1969 to 1973. From 1962 to 1969, I was an economist for the Port Authority of New York and New Jersey. In that capacity, I was responsible for analyzing and forecasting the demand for automobile travel. My special area of research was determining what value motorists put on their travel time. I hold a doctorate in economics from the New School for Social Research. My remarks before this committee in no way reflect the views of Business Week magazine.

On July 15 and 16, President Carter proposed a huge \$140 billion investment to put the United States on the road to energy autonomy. The Carter program, unfortunately, won't bring relief from the stranglehold that OPEC exerts on the well-being of the Nation until, maybe, the end of the 1980's. The program is pitifully lacking in any short-term solutions, especially to reduce the demand for oil and oil products. Perhaps just as disturbing, the President continues to talk about the need for the Nation to adapt to high-priced oil, and by that he means OPEC-priced oil.

Clearly the major reason for the energy crisis is the emergence of the cartel and its legitimization by the Western democracies. Since the beginning of this year, OPEC has raised its prices by 60 percent. In 1979 alone, this will shift an extra \$70 billion from the oil-importing countries to OPEC, with more than \$20 billion coming from the United States. Once again, the world economy is being brought to the brink of a major recession.

It should now be evident that OPEC refrained from raising prices between January 1, 1977, and the end of 1978 not because of any benevolence toward the oil-importing countries but simply because there was an oversupply of oil on the market. Indeed, discounts and stretched-out payments were common. Conversely, with the Iranian shutdown and ensuing shortfalls, OPEC prices went through the roof. Although we have been told repeatedly that higher crude oil prices will bring forth a surge of new supply, that is certainly not the case when it comes to OPEC. The supply curve of many OPEC members is, in fact, backward-bending—higher prices result in less, not more, supply. Countries like Iraq and Iran, for example, will produce only enough oil to generate the revenue to meet their development goals. Higher crude oil prices, therefore, lead to cutbacks in output. Nigeria today announced a 10-percent reduction in output effective August 1.

U.S. policy should be directed toward transforming the current conditions of tight oil supply into one of oversupply as soon as possible. This means working on the demand side of the equation. The United States desperately needs to force a meaningful cutback in the use of oil and put pressure on the cartel.

There are three ways to bring about a cutback, and all focus on gasoline usage, which accounts for nearly 50 percent of the crude oil used in the United States. All three, of course, bear an economic cost. But one of them—rationing through coupons—probably is the most efficient and the least costly to society.

Many policymakers argue that boosting oil prices is an effective way to reduce the demand for oil products. This myth has been espoused by Western leaders, as well as OPEC oil ministers, and it has given OPEC the rationale to raise prices. How many times have we read statements by OPEC members to the effect that the cartel was raising its prices to force the West to mend its profligate ways?

But the evidence shows that the elasticity of demand for oil products is extremely low. The elasticity of demand is the term used to describe the response of demand to changes in price. A high elasticity means that as price moves up, demand falls sharply. Inelastic demand means that consumers respond very little even to big changes in prices. Numerous estimates put the elasticity of demand for gasoline at about 0.1 over a 2-year period; it would thus take a huge 100 percent rise in gasoline prices to cut consumption by only 10 percent. In other words, prices would have to hit perhaps \$3.50 to \$4 a gallon to reduce demand 20 percent.

Pushing gasoline prices anywhere near that high level in order to dampen demand would turn the current economic slowdown into a severe recession. People become poorer when it takes \$50 to fill the tank, and they cut back on all their spending. The price of \$4 gasoline is high unemployment and another bout of accelerating inflation.

Instead of using price, the Government could mandate that the oil companies significantly reduce the output of gasoline. But this would result in "scramble pricing," where motorists are in effect being forced to outscramble each other to get as much as they can of the reduced gas supply. Much of the Nation experienced such chaos in June, when supplies fell below demand by an estimated 12 percent, and long gas lines, station closings, and purchase limits were widespread.

The costs to the Nation of scramble pricing are enormous. Time is a resource; the saving of time yields an economic benefit to society. People are consistently willing to spend money in order to save time; witness the growth of airplane versus train and bus travel. Indeed, when we talk about increasing the Nation's productivity, we mean nothing more than producing goods and services in less time. The loss of time thus represents an economic loss to society.

How much would a system that allocates a shortfall of, let's say, 20 percent through scramble pricing cost the Nation in lost time? Obviously, one can only attempt a rough estimate, but here it goes. There are about 113 million cars in the United States. Assume that 110 million get their gasoline from retail filling stations. The average number of passengers per car is close to two. But in searching for gasoline, let's say that the number of occupants is 1.1 per vehicle. Assume further that the average motorist spends a total of just 1 hour per week looking for an open service station and waiting on gas lines. In the New York region, people had to wait

for up to 3 hours to get just 5 gallons of gasoline. Using the more conservative figure of 1 hour per week yields a total of 121 million hours a week in lost time for the overall economy.

To convert this lost time into dollars and cents, we have to estimate the value that motorists place on their time. For the 42 percent of driving that is done for work and business purposes, we can use the current average hourly wage of \$6 in manufacturing. My own analysis, using data for the New York metropolitan region, indicates that even when motorists are making trips for nonwork purposes, such as shopping, visiting, or going to the doctor, they place a value on their time that is close to the wage rate. This leads to the conclusion that the value of lost time could easily top \$600 million a week.

Moreover, this estimate does not include the extra gas that motorists waste when they are forced to engage in scramble pricing. If a motorist burns just one additional gallon per week in searching and waiting on a gas line, then for the Nation as a whole about \$90 million worth of gasoline is wasted. According to General Motors Corp., an automobile uses between 0.3 and 0.7 gallons per hour while idling.

Not only does scramble pricing exact a huge toll in lost productivity as motorists waste time and effort trying to buy gasoline, but the system has negative impacts on the economy in other ways. Travel-related industries suffer, as do retailing, home purchases, and automobile sales.

Coupon rationing is the third and, in my view, the least disruptive method for reducing gas usage. The Department of Energy estimates the startup costs of such a program at \$400 million and total operating costs at about \$1.5 billion per year. But this is minuscule when you compare it with the alternatives. Under coupon rationing, each motorist is assured a limited—but certain—supply of gasoline. The price is controlled at the pump. Those who want to drive more can buy tickets from those who are willing to forego an auto trip in exchange for cash. This so-called white market would, in effect, combine the virtues of the price system and the virtues of the coupon system.

The price of the tickets, plus the pump price, would about equal the free market price for the reduced gas supply. But this higher price would represent internal transfers between motorists rather than payments to OPEC, so it would have a minimal depressing effect on the economy. Coupon rationing would not generate gasoline lines because the amount of coupons would match the predetermined supply.

Moreover, the certainty of supply would allow the public to plan its driving more efficiently. It would therefore sharply reduce the secondary negative effects on the economy caused by the uncertainty of finding a station with gasoline.

But perhaps most important, the adoption of coupon rationing as an ongoing system will provide the United States with the muscle to bargain forcefully with the oil cartel. A sustained 20-percent reduction in gas use would produce a glut of oil. And that is the best guarantee against OPEC once again raising prices. Indeed, rationing should be maintained even as the glut continues, for in

the short-run it is the most effective way to force crude oil prices to decline.

Thank you.

Mr. ECKHARDT. Gentlemen and members of the committee, I think we might be best served if we, first, permitted members of the panel to comment on each other's statements or make criticism in this respect. The Chair would certainly entertain any introductions by members of the committee at such times as may be appropriate.

However, the Chair would like to see a free-flowing discussion here without lengthy presentations from the panel. I think we might restrain our questions so as to make them provocative rather than declaratory.

Does someone have a comment or another statement? Are you particularly disturbed about something that another panelist said?

Professor Stobaugh?

Dr. STOBAUGH. Thank you.

I think one of the things that we are facing is a very complicated situation. We really do not know what the outcome is likely to be.

I agree with Professor Davidson's view that the computer print-outs and programs and estimates of a few years ago are not very accurate. Why would we need them now? I would say that all the estimates that you have gotten both from us and other members of the panel are unlikely to be very accurate because of the overall complexity of the system with which we are operating.

With that as a caveat, as I understand it, part of Professor Davidson's main thrust is to break up OPEC by having them bid for oil to be delivered to the United States. That is one thing. The other things are subsidizing mass transportation and a Federal oil-gas company.

I have not seen any evidence that if we go to a bid system that it would work, simply because the way it is now OPEC can do without our market longer than we can do without OPEC oil. I do not know what the economic consequences would be if OPEC or any of the other oil producers refused to bid.

This idea has been floating around for quite a long while but I have not seen any hard evidence to answer that particular question.

In terms of subsidizing mass transportation, we agree. On the financing of a Federal oil and gas company, we think there are other ways to go about increasing production and that the emphasis ought to be on short-run conservation.

Even if you did finance a Federal energy company, we do not believe it would immediately create substitutes, which is what Professor Davidson mentioned in his testimony. I think anything on the supply side is likely to be very, very long, which is one of the reasons that we believe we should emphasize using more efficiently the energy we have now.

We do not think simple solutions are the way to answer our problems, either short term or long term. I am afraid if we go to some of these programs, then everybody will say that solves the problem and the problems are gone. We do not believe they would be.

Dr. YERGIN. Let me first say that I agree with Mr. Zucker's statement. I agree with his diagnosis of the problem. I think he has grappled with an issue that all of us grapple with when we think about these things and what we are going to do about American oil and gasoline consumption when we face the fact that one out of nine barrels of oil that is used in the world every day is used by the American motorist. I like his diagnosis.

Given the shortfall, I am concerned that we would be creating new problems once we get into rationing. Politically there is no consensus or acceptance of it. If you think there have been hearings about energy now, if we had rationing you could spend 12 hours a day in hearings.

I listened with some puzzlement to Mr. Davidson's remarks. I felt there was a lot of an economist's moving of curves to the left and to the right and not really grappling with the reality of energy conservation and the nitty-gritty of conservation. It seemed to be portrayed, as nearly as I could tell, as a kind of penalty rather than realizing the source of productive investment there.

We have to face something. There are a lot of different ways to get conservation. There is not going to be one miracle thing. In a society such as ours it works by regulations, it works by incentives, it works by prices, and it works, I must stress, by information. You have to do all of them.

We are kidding ourselves if we think we can have gasoline prices at the beginning of 1979 in real terms corrected for inflation the same as in 1960, the year OPEC was founded because oil prices were too low. We are kidding ourselves if we think that does not give the wrong information to consumers. It does give the wrong information. It tells them, "Don't worry about a gas efficient car." It tells Detroit, "Don't worry about a gas efficient car."

I think Mr. Zucker is right that insofar as we know the elasticities—and there has not been much time in the past few years to talk about elasticities and it is not fair to use the elasticities from pre-1973—gasoline prices do have a big effect on the decision people make next time they buy a car. Because half the car fleet turns over every 5 years, that is a pretty quick fix.

If we had gotten mileage efficiency back in 1973, we would not have had gas lines in 1979. Indeed, I think if our prices had given us the correct information in 1973, in 1979 we might not have had gas lines.

We should not kid ourselves as to the notion there is lots of oil out there. There may be lots of oil, but let's keep in mind that there has been one significant find of oil in the 1970's. That was Mexico, which was found in 1972. The incentives for finding giant fields has increased fivefold, sixfold, and sevenfold since 1973, but we have not seen those giant fields found.

I think it is irresponsible and not prudent to try to base Government policy on the notion there is lots of oil out there and it is just hidden under the ground, and not to acknowledge the fact that as it is today OPEC really does have us over a barrel.

Mr. ECKHARDT. Let me make one comment. I will not take much time on it.

There has been a reasonably regular rate of production of oil from 1974 until the fall of 1978. Of course, one reason why the

curve was held up was because of the discovery of the Alaskan oil. There has been a decline in the lower 48. The rate of production remained remarkably stable during that period of time, except for certain seasonal dips usually around the winter months.

However, there was a remarkably heavy seasonal dip—maybe it was not seasonal but to a certain extent in anticipation of removal of price controls—in June of 1979. That is problematic.

At any rate, the dip from about October of 1978 through around April of 1979 resulted in a shortfall of crude production in the United States of about 40 million barrels per day. Excuse me, it is 40 million barrels total. Per day we only use about 18 million. I am talking about total. That is still a rather large amount per day, about 200,000.

Dr. YERGIN. Mr. Chairman, we should not be looking at this. Obviously at the margins waiting for decontrol will have some effect, but we have to go back a little more in time. We have to go back to the year 1970 when U.S. oil production reached its peak of 11.3 million barrels a day and began its decline.

When that decline began, that is when we became more and more integrated into the OPEC system and more and more dependent. Our thinking has not kept up with how dependent we became.

If we did not have Alaskan oil, we would be down in regular production to 8.8 million barrels a day. Alaska has kept us up to 10 million.

As Professor Stobaugh argues at some length in our book *Energy Future* and tries to demonstrate, American geology has matured. It has been picked over. We can wish or pray but the great challenge is to keep domestic production from falling further.

Mr. ECKHARDT. I have not brought out these figures to assert or to argue for complacency. I do not think there is any question that over a period of time we simply have to find other sources of energy. The only reason I brought forth the figures was to illustrate that even though during that time there was a considerable increase in price, there has not been a great change during that period of time in production.

As you recall, in late 1973 when the embargo came about and when there was a failure of the eastern nations to produce oil that was available to the United States, the price had been about \$3.80 average at that time. Crude oil had run around \$3.35 to \$3.40 all during the 1960's. Then, of course, it had gone up a bit. After the Arab boycott the price went up to the neighborhood of \$7.50, as I recall around the middle of the summer of 1974.

As it continued to go up and pull up the price of old oil in the United States, we decided that we had to put some kind of a limitation on price, which we did through EPCA in the later part of the spring and summer of 1975.

The number of wells that were in operation did not go down at that time. As a matter of fact, they began to go up around the summer of 1975. It was on an upward curve until relatively recently. I suspect that it will continue on an upward curve.

However, price has gone up considerably during that period of time. There has not been much response to an increased price. I have serious doubts that there would have been any more response to a higher price.

Of course, the price for imported oil is about \$20 a barrel. The price of upper-tier domestic oil in the United States is \$13; the price of lower-tier is \$6. The refinery acquisition cost is somewhere around \$14.50 at the present time. I have \$14.52 in April; it is probably higher now.

Therefore, there has been a movement upward. I wonder what your feeling is as to whether or not a fast increase in price would have greatly altered the question.

Dr. STOBAUGH. I agree with your general scenario. Prices have gone up. There does not seem to be much correlation between price and production.

Mr. ECKHARDT. It seems to me that certainty of price over some period in the future has more to do with encouraging production than anything else.

Dr. STOBAUGH. Another important thing for encouraging production is the leasing of lands that are not now available for drilling. If you recall, the east coast was held up for quite a well. That was one of the hopes that the oil companies had. However, now that they have been opened and drilling has begun to start, it has been more disappointing because their finds have not been as good as they had hoped.

The truth is nobody knows the effect of a rise in price on how much oil we will find or how much oil we will produce. We are operating outside the range of historical experience. Elasticities are not going to do us any good in trying to reach this issue.

Historically we know some things. The rise in price has caused drilling activity to go up substantially. The number of new oil wells found has gone up substantially. The number of new gas wells has gone up substantially. The number of dry holes has gone up substantially.

In spite of the increase in drilling, we are getting a gradual decline in our reserves which I think is important because, however we vary production in the short-run, in the long-run it is our reserve base that has to provide the oil and gas for us.

Mr. ECKHARDT. Drilling really went up after the OPEC prices.

Dr. STOBAUGH. Yes.

Mr. ECKHARDT. It continued upward until somewhere around 1974. Then it began to drop.

Then we passed EPCA and decided what prices were going to be over a period presumably through September 30 of 1981. Drilling began up again. It went down through the passage of EPCA, but shortly thereafter it began an upward trend which has continued relatively constantly until the late fall or winter of last year. The last I heard there was something of a dip or a plateau of drilling activity. However, all the evidence we have is that there are very substantial plans for drilling at the present time.

Dr. STOBAUGH. To put the drilling into perspective, in 1973 there were 26,600 wells drilled. By 1976 that had gone up to almost 40,000. It stayed above 40,000.

There was really a big jump from 1973. By 1975 the big jump had been there. In 1976 and onward it has been at a very high plateau. Any leveling off has been quite minor compared to this new high level.

I do not believe anybody can say with certainty we would have found more oil if we had had higher prices. You also get into the question of constraint. Would there have been more drilling rigs available?

However, we did see that the oil industry responded fairly quickly with a lot of extra drilling. How they would respond with \$20 instead of \$13, I do not think anybody knows. At the margin there are going to be some holes drilled at \$20 that would not be economical at \$13. Nobody knows how many of those there are. Nobody knows what we will find.

Dr. DAVIDSON. I think you hit the nail right on the head. The importance of a certainty of price and a certainty of markets is much more important than rising prices. In fact, as Mr. Zucker has suggested and as I have suggested, you might have a perverse relationship with OPEC. With higher prices, they will get more revenues per barrel and they are producing less barrels. However, the same incentives may well hold for domestic producers.

All of my arguments have been to create a market situation where producers will know what they get and where they will know that it does not pay to speculate.

Secretary Schlesinger said a couple weeks ago that the oil companies were being conservative in their inventories of crude. I am not trying to make a judgment whether they are conservative or they are speculating. All I am saying is let's make the market situation where we never pay speculators for withholding. Let's pay people for producing. That is the way we want to do it. Let the market do it. Rising prices per se will not do it.

I want to call your attention to two forecasts. In 1974 I appeared before the Senate Committee on Budget. I gave the similar program to what I gave now. I projected at that time—and this is quoted on page 16 of my prepared statement which I will not read—that unless we fight OPEC the price of oil will be well above \$11 a barrel in 1980, which was what all the Government agencies were forecasting would be the price in 1980. I predicted we would have this huge redistribution and still have a shortage and a problem.

At the same time Milton Friedman on March 4, 1974, said in *Newsweek*, "In order to keep prices up, the Arabs would have to curtail their output by even larger amounts. But even if they cut their output to zero, they would not for long keep the world price of crude at \$10 a barrel. Well before that point the cartel would collapse."

The point of the matter is the cartel is stronger at \$20 a barrel. Even if you adjust for inflation, that is still about \$10 a barrel. It is stronger.

Letting prices rise will not do anything for you because there is this strange situation. The incentives at the current level are tremendous. If you take the Hawkins field case as an example, much of that drilling, I would suspect, is drilling to get around regulations. That is why it has not been productive.

Dr. STobaugh. We were talking about forecasts. It is only fair to point out that many of the people who are supporting an option system are using a model of the OPEC oligopoly. In the early 1970's they were predicting that the price would go to \$1 a barrel.

If we are going to talk about the forecasts economists made, I think we ought to keep that in mind. Many of the people, talking about using the bid option with OPEC, in 1970 and 1971 were saying that the price of oil would go to \$1 a barrel. That is a measure of the uncertainty.

Dr. DAVIDSON. That was the cost.

Mr. STobaugh. No; that was the price. You are mistaken on that.

Dr. DAVIDSON. The assumption was that the cartel would not get the power it did.

Dr. STobaugh. I can show in writing a forecast that the price of oil, not the cost, was the figure.

Dr. YERGIN. When you get many economists dealing with this issue, they tend to see it as an economic model. They do not realize there are politics and things such as wars and accidents that happen. They have a simple view of the world. Those who are not economists can sometimes be intimidated by it because we look at it and think it is all the answers. We do not realize the limitations.

Mr. DANNEMEYER. We have four capable gentlemen here, each of whom present different shades of economic philosophy. I am thoroughly enjoying this but I cannot help but observe that we have out there in our economic system one of the greatest measuring devices for adjusting supply and demand called the marketplace. That marketplace over the years has served us quite well in replacing the dialog between four learned economists. We have all been served quite well with it.

I suspect if we had the courage to go back to it, we would be a little farther ahead than we are today.

Mr. RUSSO. I hear about this great free marketplace.

Mr. ECKHARDT. The free marketplace of ideas.

Mr. RUSSO. Dr. Davidson worked for an oil company. Let me toss out the great idea of free enterprise. When the oil companies were making all these major finds in Texas, Oklahoma, and Louisiana, they came up with the various mechanisms designed to protect the price of domestic petroleum. Abroad was inexpensive Saudi Arabian oil that was going for less than domestic crude. Were the oil companies yelling, "Free market for the consumers in this country"? What they said was, "Screw the consumers in this country. Put import quotas on the cheap foreign oil. Don't let it in."

They stopped oil shale development in the 1950's. They persuaded the President into doing that. They established market demand pro rationing in Texas to harm consumers even more.

Now when the Saudis learned all these notions and jacked the price up, the oil companies that taught them all these tricks began to ask, "How are they doing it when we cannot get away with it anymore here?" They say, "Let's jack the price up some more." That is free enterprise.

Let's not kid anybody in this country. Free enterprise is a principle adhered to as long as it puts money in your pocket. It doesn't matter who has to suffer. That is exactly what the oil companies are doing. We are suffering because the Saudis learned the tricks.

Mr. GORE. I cannot resist making a comment. My colleague from California began by saying there is a wonderfully efficient mechanism out there for controlling prices and supply. I thought he was going to say "the OPEC cartel."

Mr. ZUCKER. Pressure has been going up sitting here.

I am not joking about that.

With regard to the comment on the free market, I think the free market works very well in allocating supply when you have a free market. However, the cartel is not a free market. It is the very antithesis of a free market.

To talk about fighting OPEC with the free market is like sending out David to fight Goliath armed only with the "Wealth of Nations."

Mr. DANNEMEYER. He won.

Mr. ZUCKER. He did not have the "Wealth of Nations." You need a stronger force than the free market. If you had a public utility that kept raising prices, and if the local mayor or governor said, "Look, folks, do not get upset; just cut back," prices would keep going higher and people would keep cutting back more and more. But that is no solution.

All the gentlemen here have proposed some long-run solutions. I think we need a short-run solution.

Mr. ECKHARDT. This discussion is so interesting that I am sure no member wants to miss any of it. Therefore, we are going to recess briefly in time for everybody to vote on the floor of the house and come back.

[Brief recess.]

Mr. ECKHARDT. The subcommittee will resume its sitting.

Before we recessed in order to vote and regain control of our blood pressures, we were discussing the free market and its effect.

I would like to direct that question to one specific point. I think some persons here have indicated that there is not, in effect, a free market with respect to the price of oil. I suspect that is not only recently, but also goes back to the early 1930's with the Texas Railroad Commission rather effectively controlling the quantity of the product in the market. Also, the Federal Government with respect to imports of foreign oil controlled it after the Texas Railroad Commission's control became somewhat obsolete in the 1950's.

What about Mr. Dannemeyer's position that a free market ought to have some influence? That may carry a considerable amount of weight when you consider the present price of oil and what should be done with respect to competing sources, as for instance synfuels.

Synfuels means a lot of things. It means some of those things that Dr. Stobaugh and Dr. Yergin have been talking about with respect to some of the replenishable sources. It also deals with questions of oil from coal and gas from coal. There are also certain competing possible energy sources.

For instance, one would be further extension of drilling for gas at greater depths under generally conventional processes. However, there is the unconventional means of getting gas from geopressured brine and there are a wide range of choices at different prices and different costs.

To a certain extent under the President's program those choices are envisaged to be more or less engineered and controlled by an agency or corporation which might devise various amounts of money or devices to subsidize the ultimate sales cost and so forth. Maybe there is a place for the market there, assuming that the price of oil has reached a certain level, whether by free market or otherwise. I just raise that question for your discussion.

Dr. YERGIN. You have gotten to a very important point. We do not want to get bogged down in the history of oil pricing because what we are trying to consider today is obviously how to deal with the future, how to allocate, and how to make difficult decisions. We are not just talking about supply from the ground but the behavior and alternatives, the question you have raised.

If one looks at the energy corporation, the purpose is to cut through red tape and bureaucracy but it is going to create an incredibly powerful bureaucracy. All we need to do is look at certain other Western countries such as France.

In France there are powerful state agencies that can take control of the whole economy and that operate as a state within a state. No matter what one's general philosophy on oil pricing in the past, in a sense they can say, "We are going to go down this one path," Even though there are lots of other paths that may be cheaper, safer, more accessible, and quicker, we are not going to get to them. Eighty-eight billion dollars for synfuels and \$2 billion for conservation may not be the optimal split by any means.

You have gotten to a very important point in raising that question, Mr. Chairman.

Mr. Russo. How do you feel about the President's synfuel program?

Dr. YERGIN. We argue in our book "Energy Future" that we need synthetic fuels, that we need them on national security grounds and that we should go ahead.

The question one wants to raise about the President's program is: Is it going to do more good or more harm for synthetic fuels? Our belief is that it is going to do more harm for synthetic fuels than good. It could lead to very exaggerated expectations—expectations that will not be satisfied, that will not be met, and that will lead to disillusionment, disappointment, cynicism, and an undercutting of the synthetic fuels program.

The danger is that what is supposed to be another man-in-space program will end up being another Skylab. What we need is a balanced, reasonable program where we scale up from pilot plants and get some idea of what the costs really are.

We have some cost estimates done in 1974 for synthetic fuels saying that we would have them in 1980 for \$7 to \$10. Now they are talking about three times that. However, there still is not any engineering data to make any reasonable price expectation. We need a reasoned, balanced, measured program that goes step by step rather than a head-long rush into a very uncertain terrain.

Mr. ECKHARDT. What about Mr. Dannemeyer's market control, at least with respect to the choices of new energy sources?

Dr. YERGIN. I am the advocate of conservation here today. This is normally advocated by kooks, freaks, and academics.

It is also advocated by a lot of hard-headed businessmen who see that if you save \$40 million that is a pretty good thing to do.

It is not encouraging the market system. It is a very rigid way to go about it.

Mr. ECKHARDT. I understand that. Maybe we ought to depend more on the market, Mr. Dannemeyer says. If something will sell on the market, then we could produce it.

Dr. STOBAUGH. In our book what we are talking about is this: If we want the market to work, which we do, we must recognize that, the value of those fuels to society is greater than the market would place on them. We think that is the case because we think the true cost of imported oil is really higher than the cost being paid by individual consumers. The cost of imported oil to society is higher.

One way to try to get the market to work for synthetic fuels would be to put up for a bid a demonstration plant or a commercial plant where there would be some kind of competitive bidding of the size of the subsidy, dollars per barrel, on a contract to deliver oil from it.

That would be a better approach to allocating money than to have a Government corporation that calls in people and negotiates individual contracts.

I think the negotiation of individual contracts might run \$4 billion or so. I am not sure that will be as efficient a way to spend \$4 billion compared with more competition in the gaining of those contracts.

Mr. ECKHARDT. That does not go to the question of letting the market control. That simply establishes a guaranteed return and then chooses the applicant on the basis of the bids.

Dr. STOBAUGH. You are using the market method—that is, competition—in order to decide which applicant to use.

Dr. DAVIDSON. We have some evidence for this. You want a competitive market. You want the producer of energy source A to be competitive with energy source B. If energy source A and B are both by the same producers, you have a problem.

Let's take coal for an example. In 1973, when we first had this problem, everybody told us about the 400 years of reserves at relatively low prices then that we had of coal. In the next 2 years, or almost 3 years afterwards, the price of coal went up by about 145 percent. Production of coal went up by about 14 percent. That is a supply elasticity of 0.1

Now there are lots of reasons. There always are lots of reasons. However, the evidence is that coal is falling back now. Coal did not come onstream. Why didn't it come onstream?

I was working for Continental when we were one of the first companies in the industry to think of ourselves as an energy company as opposed to oil and gas. At that time we were considering Consolidation Coal, which is the largest coal producer.

There is a lot of theory. However, suppose you have two products and you want to get profits. Let's say you have a huge inventory in one product where the price is higher than the cost, there are good profits there, that inventory is underground, and it is not very costly to carry. You have another product that can undersell the first product and still make a profit on the second one.

What is your incentive to undersell the first product with the second product if the first one has large capital value? There is no incentive to undersell because although you may profit on coal, you will reduce future profits on oil. That is strictly a market incentive system.

I am grateful for markets but let's get the incentive right.

Dr. YERGIN. That is not an accurate description of the coal and oil market.

Mr. ECKHARDT. Let Mr. Yergin put in his point.

Dr. YERGIN. It is a misleading description. The oil industry does not have that kind of domination of the coal market.

The reason for the problems of coal is that there is a weak demand for coal because utilities are very uncertain as to whether they want to make the commitment to go back to coal. Ten years ago they were told, "Get out of coal." They spent a lot of money to get out of coal. Now they are told to go back into the coal. They are dragging their feet, but for good reasons.

There are environmental questions. There are questions about infrastructure.

Mr. ECKHARDT. The more important question is about the cost of delivery. Is that right?

Dr. YERGIN. Yes. All of these things are in there. Therefore, it is not that coal production has only gone up 14 percent. In fact, there is a weak demand for coal. We are struggling to find ways to use more coal.

To come in with that particular interpretation, which is not justified either by description of the industry or description of the market, really misleads the situation.

Mr. ECKHARDT. Mr. Zucker?

Mr. ZUCKER. Let me say a number of things. I hope you do not have another vote on the floor so that I get interrupted.

Let me go back to the conservation argument. Dr. Yergin mentioned the fact that if you look at the per capita energy use in Europe versus the United States for the same standard of living, you will find that the Europeans do very much better than we do.

I might point out that there is no adjustment made in that calculation for density. This gets back to Mr. Gore's point.

This is a very large country. You can take all of Western Europe and put it in Texas.

Our policies should not be to foresake the automobile. It has made this country grow. This notion that we ought to do as the Europeans do I think is fallacious. Any policies built on that, I believe, are doomed to failure.

We have gone through 18 months of a President condemning the American people for using their automobiles. I think that is a mistake. We had cheap energy in this country and we used that cheap energy. That is how the market works. Now are we to condemn ourselves for doing that?

Dr. STOBAUGH. You are misquoting what he said. He said there are different ways to look at how much money we might save or how much energy we might save, and that one of them is to examine our patterns against those of Western Europe.

In his chapter on conservation he says you cannot make a direct comparison because of things such as density. Also in the chapter on conservation he does not say we ought to foresake the automobile. He says we are going to have it with us for a long time.

Mr. ZUCKER. I did not say he said that.

Mr. STOBAUGH. But Business Week just came out with a review of our book. They said that anybody interested in energy ought to read it. I recommend that you read the parts on conservation.

Mr. ZUCKER. I did not put words in his mouth. I just finished the review. I agree with the review. I will read the book.

Dr. STOBAUGH. Thank you.

Mr. ZUCKER. I do not think we ought to put Business Week into this discussion.

Dr. STOBAUGH. All right. I agree.

Mr. ZUCKER. Clearly my views are not those of Business Week. I do not want to make my views those of the magazine. We have a lot of different views on the magazine.

Dr. STOBAUGH. Our views are not the official posture of Harvard University or Harvard Business School or any other organization.

Mr. ZUCKER. Let me address the question Dr. Yergin raised about the acceptability of rationing.

The polls show that the U.S. public is in favor of rationing. The CBS-Times poll showed something like 69 percent of the population wants rationing. What they want is a certain supply of gasoline. They do not want to go running from service station to service station trying to get gas.

With regard to Mr. Gore's previous point about the rural areas, I believe that if I were in charge of a rationing program what I would do is allocate a certain predetermined supply, let's say a reduction of 10 to 20 percent by State, according to population density. Then I would leave it to the local officials, the Governor, to decide how that given supply should be allocated within that State.

There are going to be problems. There is no question that the urban-suburban conflict will come about. However, I think it has to be decided on a local level.

Then we can go into a white market in trading. I think that might in some way alleviate Mr. Gore's problem.

Mr. GORE. Let me respond. We had the rationing bill on the floor last night. It will be back next week. A part of what we did is this: This was a second effort to get a rationing plan. It was to try to instruct the Department of Energy in as strong as possible terms to come up with the kind of plan that you just outlined.

It is an awkward political situation concerning rationing. It is difficult to get a sensible plan passed. However, I think if we are going to go to rationing to deal with the shortfall which may occur, then we ought to do it on the basis of need. Otherwise, we are going to fly in the face of policies that have been developed in this country for a long, long time, and we will hurt our economic growth.

I would like to throw out another idea, Mr. Chairman. I think this is a fantastic discussion and very interesting.

I want to pause and extend my sympathies to the reporter who is undoubtedly having a hard time getting the biplay back and forth here.

I think the discussion of the market earlier was interesting. I think the authors of the Harvard Business School study have said clearly, and I think accurately, that there are external costs of oil that are not reflected in the price that consumers here pay, leaving price controls completely out of the argument.

In the past I have characterized that as an insurance cost that is not being paid. Some people again make the comparison with Western Europe and Japan and say that they are dependent for 99 percent of their oil on imports, but they are in turn dependent on

us. If our economic security is threatened, theirs is also. They are only able to reach that high percentage dependence because they have the American security umbrella.

If we allow our dependence to grow, then this insurance cost has to be reflected. The whole energy crisis, the keystone of the whole thing, is this vulnerability to disruptions, whether for political or military reasons, in the continued availability of imported oil.

Now you say that the synthetic option is not a good one. You think it has been overplayed and that the expectations have been raised too high. I tend to agree with that. However, let me throw out this idea and get the comments of the panel.

The lines are being drawn now on the synthetics program. I am not sure yet where I stand on it. I think expectations have been raised too high. I think the cost of synthetics is going to be enormous.

However, frankly I am leaning in favor of a dramatic synthetics effort because of this backward-bending curve that Mr. Zucker talked about and described so eloquently that gives the OPEC countries an incentive to cut back on production as the price goes up.

Again, there is the chairman's insightful statement throughout this Congress on the certainty of price being more important than the actual level or price. There is no certainty of price as far as OPEC is concerned. The direction is up with no ceiling possible. They know that if they hold their reserves in the ground the value is going to appreciate more rapidly than the dollars they get in return for that oil.

My point is this: If we develop the capacity to produce synthetic oil, if we convince OPEC that there is a price at which synthetic oil can be produced by this country and will be produced in growing quantities, then that is the only opportunity I see, short of some misguided military venture, to put an effective ceiling on the expectation of price on the part of the OPEC cartel.

Therefore, I agree with the pessimism about the total amounts of synthetic oil that we can get in the coming decades. I agree with the statements about expectation. However, I favor it because it can give us that ceiling price that maybe will affect this backward-bending curve.

Have I made that concept clear enough? It is awkward for me to describe it. I wonder if you can respond.

Mr. ECKHARDT. Mr. Stobaugh?

Mr. STOBAGH. In addition to being a professor at Harvard Business School, I have another background. For years I was in project management designing and building new facilities. Therefore, I know something about the issues of new technology and building facilities.

What we are talking about on the synthetic fuel program in a way could be characterized like this: We have built three doll-houses, and that is comparable to what we know about how to build these plants. We are going to scale up from that knowledge and build a whole subdivision of 40 full-sized homes without ever having built a house before in our lives. In a way that is the analogy.

We are not against a synthetic fuels program. In our book we say in a number of places that we are in favor of a synthetic fuel program. However, from what we have studied in the way of developing new technologies, we believe that if they are pushed too hard too quickly, then it is difficult to get a good operating system there that will support the ongoing operation of those facilities.

People mentioned the Manhattan project. I understand that after the second bomb the President asked how many more do we have. The answer was none. He asked how long it was going to take to get some. The answer was it is going to take some years.

Mr. GORE. But the expectation, to draw the analogy, was that we would develop the capacity, and so on.

Dr. STobaugh. Yes. Let's develop the capacity but I would not raise the expectation that it is possible to get 2.5 million barrels of oil a day by 1990 with an expenditure of \$88 billion. We are likely to end up with a program disappointing people and making them unhappy. There will be opposition from environmentalists. To try to achieve that you are going to have to run over a lot of environmentalists. Then you may end up spending \$50 billion of the \$88 billion having a bunch of white elephants and not operating them.

We are in favor of building some plants. We do not know what the exact number is, but perhaps \$10 or \$20 billion over the next 10 years might be more appropriate than \$88 billion. We would like to see \$50 billion of the \$88 billion going to conservation.

Mr. GORE. Mr. Chairman, let me yield to my colleague, Mr. Russo.

Mr. ECKHARDT. He can horn in at any time. Everybody may horn in at any time.

Mr. Russo. The gentleman supports conservation. Don't you think that a very optimistic synfuel program actually inhibits efforts toward conservation? People then tend to think that if we can solve our energy difficulty by using more synthetic fuels, then we really do not have to conserve because in the future we will get another 2 or 3 million barrels a day through synfuels. Therefore, the chances of encouraging conservation might be lessened. I toss that out for discussion.

Mr. GORE. Let me get a response to the first question before we open this up.

We are suspending all procedural rules because of the severity of this crisis.

Dr. DAVIDSON. You are talking about the long run—10 years or so before synfuels come on the market and perhaps at \$30 or \$40 a barrel. You are right; that puts a limit.

However, it depends on who runs the syncrude factories. Are you going to allow the oil and gas companies to run them?

Mr. GORE. The President does not do that.

Dr. DAVIDSON. But if you allow market forces, I will bet you who is going to end up running them.

Mr. GORE. The President is setting up a Government corporation to establish the capacity.

Dr. DAVIDSON. That is right. Let me draw the analogy to aluminum.

Before the war and during the war the Government set the capacity for aluminum production. Our goal was a monopolist

really. What did they do? They do not allow Alcoa to buy. They got companies not in the business to buy, such as Kaiser.

Therefore, if you do set up syncrude, it seems to me you ought to make sure that it cannot be companies that are now in the energy business.

However, you still have a short-run problem. What are you going to do for the next 10 years?

Mr. GORE. I think you get an immediate effect. I think this is an important idea. I think you get an immediate effect.

I have seen correspondence from the Secretary General of OPEC in demanding tones asking for the computer tapes from the Department of Energy showing our projections of when synthetics come on line. I do not think it is wild speculation to think that one of the reasons we see the production increase now is in response to the dramatic initiative on synthetics.

Dr. YERGIN. They do not take it seriously.

Dr. DAVIDSON. If I believe your forecast, I would say this: Beat the hell out of the market in the next 10 years and then undercut when they come onstream. We still have 10-cents-a-barrel or 20-cents-a-barrel oil. They can beat the hell out of it for 10 years and then worry about the future. That is a problem.

The first and fundamental thing is this: You have to decide: Does it to pay to break OPEC and can we?

Mr. ECKHARDT. Mr. Dannemeyer?

Mr. DANNEMEYER. Let me ask the four members of the panel this question. When the economies of the world moved from using primarily wood to using primarily coal, at the time when that transition was made how much did government invest in order to cause that shift to take place?

Mr. DAVIDSON. That is an excellent point. Wood is the only renewable resource—

Mr. DANNEMEYER. How much did government invest to cause that shift to take place? How much?

Dr. YERGIN. It depends on which country you are talking about.

Mr. DANNEMEYER. How much?

Dr. DAVIDSON. Which time? We switched twice from wood in Europe.

Mr. DANNEMEYER. How much did government invest to cause the shift?

Dr. DAVIDSON. It invested in the railroads to move it.

Mr. DANNEMEYER. Then when the economies moved from coal to oil, how much did the governments of the world invest to cause that shift?

Dr. DAVIDSON. The governments invested tremendously, but they did it not by direct investment but by laws and regulations.

Dr. YERGIN. Look at the example of Western Europe, which in 1955 got three quarters of its energy from coal and about one quarter from oil. By 1972 those two figures were reversed.

A number of these countries did have concerted programs to run down their coal industry. France's strategy for industrial modernization was based on cheap Middle Eastern oil. Things such as that got us in the current fix.

Governments directly and indirectly did play quite a role.

Mr. DANNEMEYER. Of the four of you, which of you advocate immediate deregulation of Government price of oil, gasoline, natural gas, and the scrapping of the gasoline allocation system in this country as a means of getting rid of the shortage of petroleum products in this country? Which of you advocate that right now? Apparently none.

I did not call this meeting. The chairman called this meeting.

Let me observe, Mr. Chairman, that there are responsible economists in this country who suggest that is precisely the step this country should take.

Mr. ECKHARDT. We had Mr. Mitchell the other day who would agree entirely.

Mr. DANNEMEYER. I also understand Mr. Blumenthal shares that view. He was fired.

In a hearing of this type, to give the proper complexion to all of it, it is appropriate to have an advocate of that point of view here in this forum to express that philosophical point of view.

Mr. ECKHARDT. Mr. Dannemeyer, before these gentlemen were called, Mr. George Mitchell, a strong advocate of complete decontrol, was called in this same series of hearings.

Mr. DANNEMEYER. I am sorry I missed his testimony.

Dr. STobaugh. I would like to respond briefly. If we are talking philosophy, I agree. However, we are talking political reality and also what would be the immediate impact upon inflation and the economy—I am really not a macroeconomist but many of my macroeconomist friends say that it would be quite disruptive.

Therefore, that is why we think a phased-in program is likely to do it.

Mr. DANNEMEYER. I accept that there are essentially two ways to ration. One is by lining up and the other is by price.

Mr. ZUCKER. There is a third one that I have been talking about.

Mr. DANNEMEYER. I submit the coupon will cause people to line up to buy the coupons.

Mr. ZUCKER. Not if you do it correctly.

Mr. DANNEMEYER. I have one other point. I accept the idea that we should move to the development of synfuels. I accept that.

We have oil companies, for want of a better term, out there. I understand they are prepared to make the capital investment on their own without Government intervention for the purpose of building a plant to produce synthetic fuels provided they are given a \$3 tax credit for every barrel of oil produced.

It strikes me that if you have the alternative between having the Government collect taxes, organize a bureaucracy, interview people, let a contract by some means, and develop a plant of questioned economic efficiency as opposed to letting private capital in the market system build the plant with the condition of a \$3 tax credit per barrel, from the standpoint of a choice as a Member of Congress who has to vote I would opt for the \$3 tax credit rather than building up a bureaucracy.

Dr. STobaugh. I would also. I would not build up the bureaucracy. I would do it either by tax credit or other forms of payments. I would let private capital do it.

However, when I say subsidy for synthetic fuels, I am really counting a tax credit as a means of giving that subsidy. I was not

talking about a large Federal bureaucracy or a Federal organization.

I would be willing to give more than a \$3 tax credit and let them go into it, but I do not think many of them will be built with a \$3-a-barrel tax credit.

I would offer it to them. I would give them the \$3 tax credit and tell them to go build it.

Mr. DANNEMEYER. I have a bill in the House.

Dr. STOBAUGH. I would support that.

In terms of hopes for synthetics, let me say this. I remember when I first became a chemical engineer in 1947 we were working with shale oil economics. We were generally taught then that if the price of crude oil went up 20 percent from where it was in 1947 that shale oil would be economical. The cost escalations have continued to go up.

When we talk about OPEC's expectations, our estimates did affect OPEC's decision in December 1973. I was talking to the Shah not too long after that. He told me that when they decided on a \$10 posted price in December that was a net-back price to the Nation of about \$7 a barrel. They were a little afraid of going too much higher than that because they had hired consulting firms in the United States to produce these estimates of synthetic fuels. These estimates had come out \$7 a barrel.

In the meantime they have gotten experience. They now see the estimates, instead of \$7, are \$30 or \$40. I think this is where false expectations come in. It may be that in current dollars synthetic fuels might come out to be \$60 a barrel. Nobody really knows until we get commercial-sized units. That is why I think we ought to go down that road and let private capital take that risk.

Mr. ECKHARDT. They have kept quiet about it.

Dr. STOBAUGH. We may never meet a \$30 expectation. We may end up with a lot of problems we do not foresee now. OPEC may then say that the only alternative is \$60 a barrel and so they will raise prices.

Mr. ZUCKER. Let me respond to Mr. Dannemeyer's provocative question. I am talking about the free market.

Part of the confusion is a question of what is the goal and what you want the goal to be. If you want to allocate a fixed supply, then perhaps the free market is a good way to do it. It worked in the potato famine in Ireland. It allocated a fixed supply.

However, if the goal is to bring pressure on OPEC, then I would maintain that rationing is the best bet.

Mr. DANNEMEYER. Let me respond. I think the only way we are going to break the cartel is to use whatever means we can in this country to accentuate the production of energy. I do not care what source it is, if it be synthetic fuels, solar, nuclear, or whatever.

If we put the accelerator on that side of it, the demand side will adjust. I trust that allocation of demand.

Mr. ZUCKER. But I am suggesting that we work on both sides. That is all I am suggesting.

Dr. YERGIN. Mr. Russo raised a question earlier. Our best short-term energy source, the one that is really going to have the impact on the world market, is conservation for 1990 or 2000. Look at the economics of the President's proposal. The conservation barrel will

cost one-ninth of what the synthetic barrel is going to cost. That is a good investment.

Mr. DANNEMEYER. When I hear this talk of conservation, I am reminded of this: Can you push a string?

Dr. YERGIN. I do not understand.

Mr. DANNEMEYER. You cannot push a string.

Dr. STobaugh. Suppose you offered industry a tax credit of 40 or 50 percent to install investments that would increase the efficiency of their use of energy. That would be pulling a string.

Our guess is that industry would rush out and invest a lot of money. We would really have economic growth with a moderate increase in energy growth instead of a rapid increase.

Mr. DANNEMEYER. I have far more confidence in the cost of that energy rising to the point where the producer of whatever product the society economically comes to grips with—

Dr. YERGIN. It will rise like that [indicating.]

Dr. DAVIDSON. Mr. Dannemeyer, the four companies in Aramco paid the Saudi Arabian Government an 85-percent tax. Yet their profits, as you see from their statements, are higher in foreign than in domestic production. Those are free of United States taxes. What price are you going to have to have in the United States to get that kind of return?

You want to give them a \$3 tax credit or a \$4 tax credit. If you want to really play the game, would you add a little further incentive—every barrel they sell must be at least \$2 below the price of OPEC oil imported? They will only get the tax credit if they produce oil and they sell it not at the world price but below the world price. How about that?

You want the free market? Let's make it.

As long as you allow the same companies to produce overseas and here, the tax laws are biased for them to produce overseas. You will not beat that under any system of subsidy.

Mr. ECKHARDT. Mr. Russo?

Mr. RUSSO. Mr. Chairman, let me gather my thoughts. I would like to have an answer to one question I threw out earlier—whether or not the expectations of greater production in synfuels will actually hurt the conservation effort in the long run.

Dr. YERGIN. That is one of the central questions we face. The answer is a categorical yes.

Once again, we are going to have to believe in miracle solutions. We have had a series of miracle solutions since 1974. We have had nuclear; we have had Mexican oil; we had fusion for about 6 months; and now we have synthetic fuels again. This misleads people and takes them off the point. It takes their minds away from the real issue.

We can have 5 million barrels a day of conservation energy. We have to struggle to create an environment.

On the question of prices, between 1975 and 1978 the real price of industrial fuel oil decreased by 15 percent. That was not a signal to people to conserve. If we do not focus on conservation, we are going to have a roller coaster. Prices will go up. We will have a bad recession. Prices will level out in real terms and then they will go up again.

However, the potential for conservation is illustrated by this pen I have. The Papermate pen is made with 40 percent less energy than it was made for in 1973.

Again and again when people get right down to it, they can save a lot of energy with a relatively minimal capital investment. As you rightly say, that is what we should be focusing on.

Mr. Russo. In your foreign affairs article you contend that conservation efforts could save us about 8 million barrels a day. In the President's plan they are talking about 1.5 to 2 million barrels a day. Why is there such a difference there?

The President wants to sell conservation as well as you do. His estimate is far lower.

Dr. YERGIN. I wonder about this a lot. There is a real gap between the rhetoric that we heard from the President, although he emphasized the sacrifice side of conservation too much, and the attention to policy.

Having worked in this area of conservation for 5 years, my strong sense is that there is no real policy followthrough. There is no real effort to sit down and say, "How do we create an environment where it is attractive to people to save energy and be more efficient?"

Conservation is a stepchild of the energy policy; it is not the centerpiece. It has not been taken up very seriously until now by the people who have been running U.S. energy policy. They mumble about it and give a speech occasionally, but their minds are focused on synthetic fuels or nuclear. That is where their energies, attention, and time are going. They are not getting down to thinking about how we make this happen.

Mr. Russo. When you talk about nuclear energy, as the demand for electricity goes down and people begin to conserve, the fact is the nuclear power plant cost us a lot of dollars to build. When it comes onstream, nevertheless, it is cost efficient. As the demand for energy goes down, then the nuclear power plant is still there and still has to be paid for.

Eventually will it not get to the point where the nuclear power plant no longer will be cost efficient because of the conservation?

Back home people are complaining about consuming 15 or 20 percent less electricity but the bills are continually going up. Part of the reason the bills are going up is because that \$2 billion plant has to operate. Whether it generates 100 percent capacity or 80 percent capacity, it still has to be paid for. No matter what its capacity, it has to be paid for.

Does this create problems in nuclear?

Dr. YERGIN. How you handle utilities in general is a major point. In the old days they built the plants and it was great. However, in the new era electricity demand is uncertain. It creates a lot of problems in terms of ratemaking.

The one thing they do know is this: They do not want to build new capacity if they can avoid it because the marginal cost of that new capacity is so much higher, as you are suggesting, with new nuclear power plants than the average cost. We do have to search for mechanisms to get the utilities more into the conservation business so that they do not have a knee jerk reaction of raising the prices when people take the constructive steps of conservation.

Mr. Russo. Professor Davidson, you have not talked much about conservation. You talked about designing incentives to force individuals to produce.

Don't you see conservation as something we should be doing? Wouldn't it be the price to pay through the Energy Trust Fund to give tax credits and rebates or whatever is necessary to encourage the American people to put insulation in their homes and maybe even give the automobile industry incentives to produce cars that get 50 miles a gallon? They ought to be doing that without our incentives. However, as much as we want the free market system to work, it seems that the Government has to encourage the free market system to be free by providing incentives.

Dr. DAVIDSON. I am perfectly willing, and I do encourage conservation by nonprice methods. We mandated fuel-efficient autos. We did not let the price system develop that.

Mr. Russo. It was not the automobile industry saying, "Look"—

Dr. DAVIDSON. We ought to mandate it. We ought to force them. Clearly that is what I call a shift-down demand curve.

As far as insulation is concerned, I think President Carter in a very small portion of his speech mentioned, "Let's have low-cost loans from the utilities for everybody to insulate. They only have to pay the interest on the loan. They do not pay the principal until they sell the house." I think that is an excellent way of mandating it without forcing income effects.

You said we raise the price, we conserve, and some people will not buy. Who will not buy? Clearly the poor people who use a lot of energy will not buy. People with old cars and poorly insulated houses will not do this. That is conservation.

From a humanitarian standpoint we are then going to go and give them income back. We are going to give them a tax rebate out of the windfall profits tax. If you gave them dollar for dollar for every dollar they spent a dollar rebate back, they would buy just the same amount of oil and gas as ever, and there would be no conservation.

Therefore, if you are going to conserve by price, you have to recognize what you are saying is that we have to stick it to the poor people primarily. The very wealthy may buy a smaller Mercedes or something like that, but they are still going to go on their yachts and take their vacations, particularly if you let the price go to \$4 a gallon and they are certain they are going to get the gasoline. What difference does it make to an oil executive or to an executive of General Electric?

Mr. Russo. What about rationing?

Dr. DAVIDSON. Yes; clearly we ought to go to rationing. I would subscribe to Mr. Zucker's point.

The demand for oil is very inelastic. It takes a very small swing to go from glut to shortage. We saw that—just a few million barrels, 5 percent of the world's oil, and we suddenly swing.

In 1978 and 1977 there was a terrific glut. We did just the wrong thing. The U.S. Government went into the market and started buying surplus oil for a strategic reserve which we cannot get out of the ground when we have a shortage anyhow. This was just to hold the marketplace up. I think this was the wrong thing.

Mr. Russo. Why did we do that?

Dr. DAVIDSON. You had better ask Mr. Schlesinger. I have no idea.

Mr. Russo. Do you have any ideas?

Dr. DAVIDSON. I argue that the only rational explanation that I can see for the Carter administration proposal is the assumption that we do not want to create any economic problems for the non-Communist Persian Gulf States. This is a political decision. Any fight with OPEC means basically a fight with the Persian Gulf States. We may well weaken the governments there.

Therefore, it is my view—and I am not a political scientist—that we accept the OPEC power as a parameter and then we work around it.

Mr. Zucker and I have been arguing this: Do you want to break OPEC and can you break OPEC? I think you can. It is going to cause problems and dislocations, but the alternative is to be under their thumbs through 1990 and maybe through the year 2000. Who knows how long it will be? Each year you are going to lose 2 or 3 percent of your gross national product to them, and perhaps even more.

I openly think the worse part of the problem is inflation. Every 1 cent that the free market will allow the price of gasoline to go up is the equivalent of \$1 billion tax on the American consumer. When gasoline prices go up, what do workers immediately do? They ask for a cost-of-living adjustment.

Dr. Lower tells me that the latest statistics from the BLS says that the price of gasoline is now adding approximately 6 percent to the Consumer Price Index. I am sorry, that is total energy.

How can you ask people to settle for 7-percent wage increases when the energy component alone is going up by 6 percent? You will never get a hold on inflation unless you create a devastating depression with people so weak nobody has a job and they cannot ask for higher wages.

That macroproblem cannot be separated from this microproblem. That is in the last two pages of my testimony. There is this big argument. These are not separate issues. It has nothing to do with the money supply. This has to do with cost of living and people's desire and determination.

Remember what I said about Marie Antoinette. If you do not give them those cost-of-living adjustments, then we are on a treadmill where we are all running faster and the rate of inflation goes up. They are going to get rid of the politicians until somebody does. It will be at the worse possible time, not the best possible time.

Mr. ECKHARDT. Professor Stobaugh?

Dr. STOBAUGH. I do not think we need a professor of economics to tell people in the Congress what is popular with voters and consumers when it comes to prices.

Mr. ECKHARDT. There may be a lag in Congress with respect to people's views concerning gasoline rationing.

Dr. STOBAUGH. That is right.

Let me talk a moment about breaking OPEC. We got into a discussion earlier. Mr. Davidson brought up the name of one of the economists, Mr. Adelman, whose name is associated with the belief that you can break the OPEC oligopoly because different members

of the OPEC oligopoly or cartel will cheat on one another and come in with lower prices.

Dr. Davidson brought Mr. Adelman's name into the discussion. I did not intend for his name to be brought into the discussion because many people have had that general idea. The fact that I do not believe that idea in no way is intended to disparage Professor Adelman because he has done some superb research there.

However, when it comes to breaking OPEC, one must think that there is a theory that says these people are going to cheat on each other and cannot hold the price.

Second, there is a theory that says, "Aha, let's pick out one enemy." I believe that picking out one enemy is a much too simple solution to a very complex problem.

Third, if OPEC gave us their oil, my guess is that over a period of years it might end up ruining the Nation. Once we ran out of free oil, we would not have any mechanism for additional oil supply.

Therefore, I am not sanguine at all that focusing our attention on breaking OPEC is a useful thought in terms of energy policy. I am glad Mr. Davidson agrees with us that conservation is necessary, and it is good to shift the demand curve there.

Mr. ECKHARDT. Let me bring Mr. Lent into this discussion.

Mr. LENT. Thank you.

Let me say, gentlemen, that I certainly have enjoyed the discussion this morning.

Earlier Mr. Zucker, in discussing his rationing program, said that it depends on how you do it. This was in response to Mr. Dannemeyer's question as to whether it would work and whether people would be waiting in coupon lines instead of gasoline lines.

I agree with you. If we have rationing, we should have a white marketing of coupons. Certainly the prospect of a guaranteed gas supply for motorists is very promising as compared with the alternative of waiting in line.

However, I am concerned with the reality of how a rationing plan would operate. For example, how would the coupons be distributed? Would we use the mail? We are told HEW loses over \$1 billion a year through fraud and stolen checks. Would they be distributed at banks? The banks tell us they would have to double the number of tellers and the capacity of the number of windows in order to accommodate all of the coupons. We are told the lines could be chaotic.

Do you issue the coupons by licensed driver or by registration? If you register coupons by licensed driver, you shortchange the two-car or three-car families. If you issue coupons by car ownership, you invite abuses such as accumulating junk automobiles in a family.

What about the misallocation of the gasoline supplies after the coupons are issued? How would you remedy the different driving habits of the rural versus the urban driver, the blue collar driver versus the white collar driver, the resort community commuter versus the farmer, and so forth?

What is your plan? How would you outline the best possible rationing program that the President ought to put on the shelf under this legislation we are now considering?

Mr. ZUCKER. I happen to have that plan in my pocket.

Mr. LENT. Yes; I am sure you have given it a lot of thought.

Mr. ZUCKER. Let me make a number of points. The first one is this. All three plans, as I see them—which are price, scramble pricing, and coupon rationing—entail economic cost. The Department of Energy's estimate of \$1.5 billion a year includes every conceivable cost. By the way, this is not a conservative estimate. In my view it is a very high estimate on how much it is going to cost.

It includes the cost of the time of station owners in counting these coupons and returning them to their suppliers to get gasoline.

Now let's address the question of equity which you raise. You have to go to a system that works quickly. Therefore, my idea would be basically to give coupons to every owner of a registered vehicle. We know there are some rich families and even some middle class families who have two or three cars. It is not unusual in the suburbs for a wife and perhaps a teenager and of course the head of the household to each own a car. There are going to be some inequities.

However, there is no question that the inequity of \$4 oil outweighs that. That is what you have to look at. There is no perfect solution. The question is, What is the best alternative?

For example, the notion of a white market in a sense does say if you have more money, you are going to drive more. However, as Paul Davidson said, there is some incentive for people to drive less if they want the cold cash.

There are inequities in the price system, too. What is equitable about somebody who can afford \$4 gasoline getting gasoline and someone who cannot afford it getting nothing? There is an inequity there. The question again is, What are the alternatives and what is the best bet?

I know there might be coupon lines. The banks say they cannot distribute them. I have spoken to people who handled coupon rationing during the Second World War. It worked fairly well. At that time there was a black market, that is, tickets were not transferable.

I think there is a lot more support for coupon rationing than Congressmen believe.

Mr. GORE. If the gentleman will yield, if you have spoken to people who handled the rationing program in World War II, you have spoken to people that the Department of Energy never thought to consult in the design of the rationing plan they submitted to the Congress. They never talked to a single one of them.

I thank the gentleman for yielding.

Mr. LENT. Let me move to the synfuels question. We have a distinguished colleague of ours, Congressman Dave Stockman, who wrote an article more or less criticizing what he called the senseless stampede to synfuels. It was contained in a recent issue of the Washington Post. I apparently do not have the date of it.

However, he made the point—and I wonder if you would agree with it—that for this expenditure of \$88 billion for a synfuels program, even if we managed to turn out 2 million barrels of oil a day by the early 1990's which would take an estimated 40 of these

synfuel plants, it would increase the world supply by only 3 percent. That would have only a modest effect on the price.

Do you agree with that?

Dr. STobaugh. What bothers me about that is the assumption he makes that we can actually end up building 40 of these plants and have them operating in 1990.

Mr. LENT. He is not making that assumption. He says it will not happen. However, he says even if it were to happen and if all the promises of the administration were to be fulfilled, even if we had 40 plants on line producing 2 million barrels a day by the 1990's, then this would increase world supply by only the small 3 percent. He makes the point that it would not have a significant effect on the price.

Dr. STobaugh. The latter point is indeterminant.

Let me mention one bit of factual evidence. At the beginning of this year the world oil market began to get really tight because of the Iranian shutdown. If we had had an additional 2.5 million barrels per day of productive capacity in this country, it would have saved us a lot of money. Each barrel of oil probably would have been worth \$50 or more to us in terms of keeping the record rise of oil from happening.

Therefore, I agree with Professor Davidson that oil is inelastic. It is indeterminant.

Mr. LENT. What about the effect on the OPEC stranglehold? Congressman Stockman goes on to say, after first saying he feels it would have only a modest impact on price, that this synfuels program would do practically nothing about OPEC because they would still have a significant portion of the market.

Dr. STobaugh. They will continue to have a significant portion of the market. There is nothing we can do to prevent that.

However, what we can do is this. Our goal ought to be to keep exports from OPEC countries lower than they would otherwise be. In our own program we are talking about imports of about 30 million barrels a day in 1990 as opposed to something approaching 40 million barrels a day. A 10-million-barrel-a-day difference obviously is really important, but even 2 or 3 million can be important in certain times. At the beginning of this year it would have been important.

Mr. LENT. Presumably we in the Congress will have to be voting on this issue in the not-too-distant future. Do you support the \$88 billion expenditure for a 2- or 2.5-million-barrel output in the 1990's?

Dr. STobaugh. I do not support an \$88 billion program for synthetic fuels. I support continuing help for the synthetic fuel program but too much too quickly may end up killing it because of disillusionment and disappointment with it.

Mr. LENT. You take the route of conservation as your main thesis. Is that right?

Dr. STobaugh. Yes, but we think there is a role for synthetic fuels in the long run. We think \$88 billion is too much. If we spent \$50 billion of that for conservation, we would get a lot more energy out of it.

Mr. LENT. I am told that a 2-mile-a-gallon increase in the average fuel economy of the United States automobile fleet would equal

the annual output of 10 of these 40 synfuel plants. Does that sound correct?

Dr. STobaugh. I have not done those calculations.

Dr. YERGIN. That is a basic question: How do you want to get the Btu's? You can get them by making more efficient cars, by syn-fuels, or by putting insulation in houses. You are raising the question.

Mr. LENT. It would seem to me far more economical and less upsetting to the environment to try to extract a 2-mile-a-gallon extra mileage from the American automobile fleet.

Dr. YERGIN. I agree. Our emphasis should be on the short and middle term and to get the energy conservation, including mileage per gallon. However, let's have a reasoned, balanced, measured synthetic fuels program rather than a stampede.

Mr. ECKHARDT. Let me say to my colleagues that Professors Yergin and Stobaugh have an appointment at 12:20. We will have to excuse them then.

Mr. RINALDO. I am fascinated by what you are saying because in effect, as I interpret it, you are saying that we have to go into a program of solar energy and the development of alternative sources of energy but, along with that, you place heavy emphasis and much reliance on conservation.

Do you have a conservation plan? In other words, how do you conserve?

Dr. YERGIN. That is a fair question. Let's get down to it.

The problem is we could come in with 22 steps, everything from an information campaign to refrigerator efficiency. However, aside from the automobiles, we are talking about a decentralized world energy consumption. We ought to get the signals straight.

We think that a fast way to deliver it and a fast way to get it is with tax credits and grants and get it moving in society. We will get it diffused because there are lots of itsy-bitsy things. None of you want to spend time regulating at what height a Venetian blind should be. Let people find out for themselves. Let them make the investments that do it, but make it attractive and create an environment where there are not obstacles to it.

Mr. RINALDO. You have to do more than that. Oil is consumed as a result of gasoline consumption.

Dr. YERGIN. Half of it.

Dr. STobaugh. Less than half. The figure is 39 percent of our petroleum products for gasoline.

Mr. RINALDO. But there is no other source that uses that much by the consumer. Is that right?

Dr. STobaugh. That is right.

Mr. RINALDO. How do we get people to conserve?

For example, my district is probably a microcosm of America. It happens all over where I travel. When there is a gas line, people recognize there is a shortage. The minute the line goes away, you get the type of answer, "Well, I told you, Congressman, as soon as it goes to a dollar a gallon those oil companies will turn it out." Nobody believes there is a shortage. They feel it is a conspiracy by the oil companies to put the price up.

It becomes very, very difficult, even with price increases, as you have pointed out, to force people to conserve.

Dr. YERGIN. With the automobile, you have three manufacturers and you lean on them. You do not put \$88 billion into synfuels; you give a few billion to Detroit to speed up their process until we get to the point of a 27-mile-per-gallon car and we get to the 50-mile-per-gallon car.

Mr. RINALDO. It will never work. I went out to Detroit. I went to the General Motors proving grounds. I talked to all their technical people. Before they put anything on the market, they want the safest possible boundaries. They test in one specific market area and they test in a larger market area. Then they want to test the car to make sure nothing is going to happen.

I read an article recently where it was stated that maybe we ought to give the money to the group with the best technology and scientific knowledge and let them come up with it. That is NASA. I think that is far better than giving it to automobile manufacturers who want to test ad infinitum.

Dr. YERGIN. They want to stay in business, too. I think the shock of this crisis has shown them if they do not want to see America driving Toyotas entirely they had better get moving.

Mr. GORE. Would the gentleman yield?

Mr. LENT. Yes.

Mr. GORE. We did a lot of work on this subcommittee last year on the insulation market. I think your study is great. One of the few concrete recommendations that I read in your study is dramatic increase in tax credits for insulation.

Dr. STobaugh. Or financial payments.

Mr. GORE. What we found was that when you had the tax credit already there and the economic incentive for installation that is already there, then the marketplace has become so chaotic and clogged up that we find shortages of every key component of insulation. There are shortages of manufacturing capacity for insulation. There are ripoff artists getting into the market on a wholesale basis. Americans are experiencing the exact kind of disillusionment with insulation that you predict when you see these problems that may confront us when producing alternatives to oil.

Dr. YERGIN. That is important. The economists would dismiss this.

If you and I own a house and somebody comes and wants to sell us insulation, we are going to be very skeptical. We are going to worry about it. He may be a bad salesman.

One of our proposals is to get the utilities into the energy conservation delivery—

Mr. GORE. But the insulation is not there. The borax is not there. The fiberglass plants are not there.

Dr. YERGIN. It is a lot easier to do that than syncrude.

Mr. GORE. It may not be easier than something like heavy oil.

Dr. STobaugh. Philosophically we cannot expect a perfect system. Sure, there are going to be some ripoffs. Sure, there is going to be some waste. However, there is going to be a lot less waste spending billions on conservation or energy efficiency than there is spending \$88 billion on syncrude.

Mr. GORE. Perhaps.

I thank the gentleman for yielding.

Mr. ECKHARDT. Mr. Stobaugh and Mr. Yergin, we thank you for your presence. We excuse you now to make your travel plans.

Dr. Davidson?

Dr. DAVIDSON. If you look at the statistics of the average miles per gallon of cars, between the 1950's and 1972 it did not change even though we were importing smaller cars, Volkswagens, and so on. In 1973 it started to change and it has been dropping dramatically.

That is because of mandated efficiencies, not because people chose to drive small cars. In fact, I would argue that as long as we allow people to make gas-guzzlers, there are still a number of people who will continue to buy gas-guzzlers.

We would have done better not to leave it to the free marketplace of buying a small car and getting cheap gas. It would have been better if we had mandated that no car in the United States could get less than x miles to the gallon.

I think the same thing is true for mandating appliances. We ought to get engineers and find out what is possible and mandate these things. That would not be very expensive.

With regard to insulation, I would argue we ought to do both demand and supply. Eighty-eight billion dollars is a lot of money. We can spread it out. We ought to encourage lots of things, including conservation and syncrudes.

However, personally I am not very optimistic about syncrudes. I think heavy oils, tertiary recovery, and things like that would be more productive in the next few years.

I do not know and nobody knows. Anybody can make a forecast, and they are all going to be wrong.

If you are talking about so much money, we know we have to hit the supply side and we know we have to hit the demand side. Let's do it and make sure all the alternative sources of supply are by independent operators, people who have no vested interest in maintaining the price. Let's do it on the demand side with the least income effects.

Mr. ECKHARDT. Let me ask one question, Mr. Zucker. We have all been talking in terms of some kind of control on price. I do not think anyone here was advocating complete removal of that at this time, considering of course the situation in the economy. I am talking about the panel. As a matter of fact, Mr. Dannemeyer mentioned the opposite earlier.

If that is so, there has to be some control on demand. We had considerable discussion by Professor Stobaugh, Professor Yergin, and Professor Davidson about the question of decreasing demand by conservation. Mr. Zucker, I think you are the one who pointed out the use of rationing that would control demand.

The bill that we are presently considering contains a provision that does not permit the program to go into effect until there is a 20-percent shortfall of oil. Therefore, the bill utilizes the process of rationing not to control demand, it seems to me, but rather to meet an emergency.

Are you talking about rationing as a means of controlling demand? I suppose ultimately we will almost undoubtedly run into a situation in which we will have to use oil products in their most important and necessary way.

For instance, we may find ourselves compelled to decrease the use of oil for gasoline in order to attain enough No. 2 heating oil and diesel fuel to operate the economy. Somewhere down the line we may replace No. 2 heating oil by gas, if we get it flowing in interstate commerce. We may still need to keep that fluid which seems to me to be the major mobile fluid of the economy.

We may not run into an actual shortage in any period of time. We may run into a situation in which we simply need to control demand of gasoline, without a crisis.

Would you ever apply rationing under such circumstances or would you only reserve it for a last means of solving a crisis situation?

Mr. ZUCKER. My testimony here today before this subcommittee advocated an ongoing program of rationing, not a standby program.

I would say we are in an emergency situation now, not in terms of the shortfall of gasoline but in terms of the world economy and economic growth, both in the United States and in major industrial nations.

Mr. Chairman, the President's program and the limitation of 20 percent is even worse. What Congress would be doing is saying, "Look, we are going to ration through scramble pricing up to 20 percent. Then we are going to introduce this newfangled coupon rationing."

As I have pointed out in my testimony, the economic cost of scramble pricing in allocating a 20 percent shortfall is horrendous. The economy cannot take it. The economic loss approaches something like \$50 billion a year, plus the psychological impacts of people having to out-hustle and outwit each other. Doctors and Congressmen would be stuck in lines.

The emergency is now. It is not off in the future when Iranian production falls off again, as it probably will.

If you have an ongoing rationing program, you can handle an emergency situation. If we get another Iranian shortfall, then Congress will move immediately to give the President power to go to emergency rationing. I do not think we need it at that point. We need an ongoing rationing system now. That is my position.

Mr. ECKHARDT. Do other members have questions? Mr. Russo?

Mr. Russo. I have one question of Mr. Davidson.

Having been a former employee of a large oil company, obviously you have gained certain insights into the operation of those companies. Has that contributed to the development of your position today. It is a result of your inside knowledge?

Dr. DAVIDSON. I do not believe oil executives are malevolent. I think they do watch profits, the bottom line.

As I see the market system operate, there is more money to be made from doing all sorts of antisocial things in the energy field at the moment than doing prosocial things, namely, production. When the system works that way, you do not need collusion. If everybody has a similar incentive, they do not have to get together and talk on the telephone. Of course, they have to do so because they are in a lot of joint ventures.

It is impossible not to prorate a good deal of the market when you have large corporations in 70 percent of the total world produc-

tion. I do not think they are malevolent. That is just the way a manager ought to operate.

Therefore, my proposal is not to nationalize them but to create a market system where all the incentives are for them to work and get profits for the social good rather than getting the profits for things that may be deleterious.

It would be nice if we started from the Garden of Eden. We started from a terrible position. Therefore, some of the things I am suggesting are not what conservatives would like but they are not what liberals would like either. I am not talking about nationalizing the industry.

Ultimately my proposals have a minimum of administrative bureaucracy.

Mr. RUSSO. When you are talking about divestiture, are you talking about horizontal?

Dr. DAVIDSON. The immediate one is horizontal. I think the vertical one is a desirable thing, too. However, it seems to me that immediately you have to make sure that oil companies are not in the coal business. You cannot get them out of the natural gas business.

Mr. RUSSO. Professor Yergin in the book talks about a lot of the dollars invested in coal research have come from the oil companies. They only represent 20 percent of the market, but yet they spend 60 percent of the dollars for coal research.

Dr. DAVIDSON. They own the coal reserves.

Mr. ZUCKER. May I respond to that? Economists in general, and for that matter Congressmen, waste too much time looking for easy scapegoats, namely, the oil companies.

Mr. DANNEMEYER. And Government.

Mr. ZUCKER. Yes, and Government, too.

In this whole debate about whether we should divest horizontally or vertically, we are just spinning our wheels.

We had \$2.50 oil in this country in 1972. There was no conspiracy by the oil companies. Let's get away from the discussion of conspiracies and identify where the problems are. They are not with the oil companies but with the international OPEC cartel. That is what we ought to attack.

We are going to go through bills and debates over how we should divest oil companies. It is really nickel and dime stuff.

Mr. RUSSO. Let's talk about the international cartel then. If what Professor Davidson says is correct—that is, that the four major oil companies in this country that are part of Aramco have an incentive to see prices rise—then you are going to have to do something about those particular companies doing business overseas where it is very profitable for them to do it.

Do you agree or disagree?

Mr. ZUCKER. There is no question about that. You have a point. I think Mr. Davidson has a point.

Oil companies like to see high prices because profits go up, and all businessmen like to see that. However, the question is not that. The question is who is responsible for \$20 oil and how can we get it down. It is not the oil companies.

The President has made a mistake by identifying the oil companies and the oil lobbies as the culprits. We are looking for scapegoats. We are not attacking the problem.

Mr. RUSSO. How would you attack it? Rationing? Is that your only solution?

Mr. ZUCKER. No; that is not my only solution.

Let me make this point again. We have to mount a multifaceted attack, both long run and short run.

With regard to synthetic fuels, I do not know economics. Professors Yergin and Stobaugh say that perhaps we should not spend that much. I do not know. However, I would have to agree with Mr. Gore that we have to show OPEC that we are serious.

Whether we overspend \$10 billion or not, we have thrown away much more than that on other programs that never even got started. Let's not worry about that so much.

Then we have to mount a shortrun attack. To quote Paul Davidson's favorite economist, John Maynard Keynes, "In the long run we're all dead." I would say in the short run we're all dead.

If we do not do anything about the shortrun, then we are really going to have problems. We are going to be talking about synthetic fuels at \$50 a barrel.

I am suggesting that the debate over rationing has centered on a standby program which the administration never really wanted in the first place and never presented correctly in the first place. Now it is down to 20 percent. The question is how to reduce the demand today. I do not think it is a question of philosophy or ideology. The question is what works best.

Mr. DANNEMEYER. I say the marketplace. That is philosophy.

Mr. ZUCKER. I do not think it is a question of philosophy.

Mr. DANNEMEYER. I say it is.

Mr. ZUCKER. That is why there are so many different opinions.

Mr. ECKHARDT. Gentlemen, it would seem to me that Congress has had an energy program. As a matter of fact, in 1975 Congress enacted a means of preventing old oil prices from going to the market price. Had prices done that, very quickly it would have cost the American people, we estimated at the time, around \$58 billion. I forget the span of years but it was an enormous amount.

We did not enact a permanent program. We enacted one that ran through September 30, 1981.

Between the time of passage of that act and 1981 several things were to happen under the bill. No. 1, as it was finally amended, the prices under the bill, or at least the composite price which affected both new and old oil prices, would move up at the rate of about 10 percent a year. At the same time, old oil, in effect, phases itself out as it ceases to be a large component of the market.

Therefore, in September of 1981 controls on the basis of EPCA would no longer be worth their cost. I think that was generally recognized and accepted.

The attempt was to control price to prevent a tremendous skewing of the market. There was no attempt, in my opinion, to prevent a sensitive concern of providing enough price to produce new oil.

It would seem to me that this is not at all in conflict with the program—and we are more and more dependent on OPEC—to attain what is the equivalent of producing oil which backs out

OPEC oil through a means of conservation, as Professor Stobaugh and Professor Yergin suggest.

In addition to that, it seems to me that there must be some kind of control on demand, as you, Mr. Zucker, are suggesting, not merely as an emergency situation but as a situation which will assure us some kind of control and reduce the demand in the area in which oil is used most wastefully, or at least in the way that we may decrease it the most.

In addition to that, I have not heard any dispute here that there should continue to be an attempt to find energy and to develop energy in whatever forms it may be found and developed. However, I find considerable dissent from Professor Stobaugh and Professor Yergin to the proposition of assuring a price at a level that seems beyond that which would be reasonable and pressing for development at a time that seems to be too short to derive the benefits sought.

You, Mr. Zucker, impressed most strongly on us, as did Professor Davidson, that our immediate situation with respect to inflation is perhaps the most serious problem that faces us today.

I wonder in outlining these things if we have a disagreement in this area. If so, where?

Dr. DAVIDSON. Another famous economist said that the market is like two blades of a scissor; you cannot tell which blade cuts. One blade is supply and the other blade is demand. You can hold one still and cut with the other or vice versa.

Mr. Zucker and I clearly say that OPEC is really the basic problem. We cannot afford to live with OPEC. We have lived with it 5 or 6 years too long.

Mr. Zucker is saying let's do it all on demand. I would say it should not be standby but it is important to get the rationing in where there is no shortage. It is a lot easier to put it in than administratively.

However, I am arguing that this is a war. Nobody knows how the war is going to end. We cannot guarantee the beating of OPEC but we ought to try it rather than accept it. If we cannot win, we will be no worse off because they will strangle us one way or the other.

Let us do lots of things on the demand side and whatever we can do for conservation and so on. On the supply side, let's throw lots of things into the fire so that there are alternative supplies coming onstream right away, not 10 years from now.

If you penalize producers for not producing because they are producing at less than MER, that 10 percent oil could come onstream right away.

I do not know whether it is going to be \$40 or \$50 a barrel. However, I think Professor Stobaugh made a good point earlier. When I was at the oil company we said, "When shale gets to \$5 to \$6 a barrel, we will come onstream with shale." The 20 percent between the market price and shale always seems to stay at 20 percent. It has gotten higher, but why don't they come onstream? I do not know why. I am not an engineer. Clearly a multiproduct firm has less incentive to start producing a product competitive with itself.

Mr. ECKHARDT. That may be so. I understand there may be some dispute around the table on that position.

Dr. DAVIDSON. There is nothing to be lost.

Mr. ECKHARDT. Let us assume, first, that you could work out some scheme by which those who might produce oil in more or less esoteric ways were permitted to do so competitively.

I am wondering about Mr. Dannemeyer's proposition. If that were true, perhaps the best thing is simply to let that kind of production come into play at such time as a \$20 price, which exists now, or \$25 price, which may exist 3 or 4 years from now, brings that particular type production into existence rather than attempting to determine that by some Federal corporation that provides an assurance of \$25 or \$30 payment.

Dr. DAVIDSON. The problem is it will never be profitable for private enterprise because you have another organization that has 20-cent-per-barrel oil. Any time the costs go up to \$20 and the price goes up and you can come onstream with \$20, all OPEC can come in and undersell you. Everybody knows that. Therefore, unless you guarantee that market—

Mr. ECKHARDT. I do not know that they would do that. Presently probably the surest three things are death, taxes, and an upward movement of OPEC prices.

Although I do not have much faith in the idea of breaking up OPEC by creating breaks within the group, I think it would be very, very difficult for OPEC to induce upon its members a decrease in price in the face of competitive fuels. They would probably be happy to take their share of the market.

Dr. DAVIDSON. I agree.

Mr. ECKHARDT. I wonder if we have evidence that it would happen. If it did happen, we have time enough to subsidize to break that matter up.

Dr. DAVIDSON. The question is whether private enterprise will go into the business of synfuels. I do not think they will unless the Government guarantees the market because of the fear that OPEC might undersell.

Mr. ECKHARDT. Maybe they should not go into it if they do not feel it is a good thing.

Dr. DAVIDSON. Maybe we will never get synfuels onstream unless the Government does it.

Mr. ECKHARDT. Not necessarily. At some point it is bound to come in.

For instance, if OPEC prices went above the cost of synfuels, it seems to be doubtful that American capital would be so timid as not to go into a game in which they can undersell substantially their competitors.

Dr. DAVIDSON. It is not the price which is the problem but the cost that is the problem.

Mr. ECKHARDT. It is essentially price and predictability of price. The capital would be raised if the prospects of profit are reasonable.

Dr. DAVIDSON. I agree.

Mr. ECKHARDT. It seems to me that is something of a failure in our own thinking. We seem to believe that because capital accumulation is very great that the Government has to get into it. Of course, what the Government is really getting into is an assurance of price. What is really meant by that is that the Government is

willing to take losses if losses occur and is willing to forego the profits if profits accrue.

Dr. DAVIDSON. I agree.

However, I would like to see a lot of the \$88 billion going elsewhere. I do not know whether you can bring this on.

We used to talk about shale at \$5 or \$6 a barrel. Maybe there will be a technical breakthrough. I do not know. I would hate to cut off that option completely. There is no evidence that the private companies are really making strong efforts in these areas.

Mr. ECKHARDT. Gentlemen, you have been very helpful to the subcommittee. We have kept you a long time. We appreciate your being here.

The subcommittee will adjourn at this time.

[Whereupon, at 12:25 p.m., the subcommittee adjourned.]

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