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LOW PRICES OR SELF-SUFFICIENCY:
THE CONFLICTING GOALS OF NATIONAL ENERGY POLICY

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National energy policy faces a deep conflict in objectives: Consumers want cheap energy, but producers need high prices to justify expanded production. This conflict in objectives has been a major reason for our failure to adopt a rational energy policy. So far the objective of low prices has dominated policy. Through a combination of measures, some long-standing and some thrown together quickly during the energy crisis of 1974, the price of energy to U.S. consumers has been held far below the world price. U.S. producers have been prohibited from taking advantage of the higher world price, and in the case of oil, a heavy tax has been imposed on U.S. production to finance the subsidization of imports. These measures have caused demand to rise more rapidly than production, and energy imports have risen to fill the gap between demand and production. If recent policies are continued, imports will continue to rise. Some painful choices in the objectives of energy policy will force themselves upon the United States in the next few years.

The economics of this nation's energy problem involves little more than the principle that higher prices result in less demand and more supply. The exact magnitudes and timing of the effects of price on demand and supply are still open to debate, but a summary of recent evidence would say that demand falls by about 1 percent for each 4 percent increase in price, and supply rises by about 1 percent for each 5 percent increase in price. Of course several years must pass before demand and supply fully respond to changes in price, and there is some uncertainty over the magnitude and speed of the supply response, but these numbers provide a reasonable basis for a first-cut description of the U.S. energy market. Policies in effect today have depressed the U.S. price of energy, on the average, by about 30 percent below the world price. Consumption, then, is about 8 percent

higher than it would be otherwise, and supply is about 6 percent lower. Total U.S. consumption of energy stated in oil-equivalents is about 38 million barrels per day, of which 31 million are supplied by domestically produced oil, natural gas, and coal, and the rest is imported. Eight percent of consumption is just over 3 million barrels per day, and 6 percent of U.S. production is just under 2 million barrels, so the net effect of the policy of depressing prices is to increase imports by about 5 million barrels. But current imports are around 7 million barrels per day, so a striking conclusion emerges from these simple calculations: The import problem is largely of our own making. Imports might well be much lower had our energy policy not been based on the maintenance of low prices.

Why did we inflict these policies on ourselves if they alone are largely responsible for the problem of growing imports? It is not that policymakers are ignorant of the simple economics of supply and demand, nor even that they underestimated the magnitudes of the price effects. Instead, the real moving force behind these policies has been the desire to prevent prices to consumers from rising, and to block the windfall gains that would otherwise have accrued to producers when world energy prices rose so dramatically in 1973-74 - windfall gains that would have come directly out of the pockets of consumers. The stimulus to imports has simply been a by-product of these anti-windfall policies. The paramount goal has been to prevent a wholesale redistribution of income from 215 million energy consumers, many of whom are not very well off, to a handful of producers, most of whom are quite well off. Our policies have achieved this goal, at least in part, and are unlikely to be displaced by alternatives that fail to recognize the extreme importance of this goal to the American public.

How Current Policies Keep the U.S. Energy Price Low

Two major policies have been primarily responsible for the current large gap between the world and domestic prices of energy. The first and more important policy has the general effect of taxing domestic production of crude oil, and then using the proceeds of the tax to subsidize imports, with no net effect on the Federal budget. This ingenious program was conceived and executed in a matter of months in 1974, is in operation today in a somewhat strengthened form, and is scheduled for demise in 1979. Under its provisions, the Federal Energy Administration sets an average price that domestic producers may receive for their oil (currently $7.66 per barrel). In order to refine domestic crude oil, however, refiners must purchase a ticket called an entitlement at a cost of approximately $2.00 per barrel. This cost is the tax on domestic production. On the other hand, refiners who import their crude oil at the world price of about $12.50 per barrel receive entitlements worth about $3.00 per barrel. This is the way that imports are subsidized. The effective cost of oil to refiners from either source is the same $9.50 per barrel. If the system were eliminated today, domestic producers of crude oil would receive the world price (which would mean an increase of about $5.00, or 65 percent above what they currently receive), and this would, after two or three years, increase the domestic supply of oil by about 13 percent. The cost of oil to refiners would rise by about 32 percent, and these higher costs would be passed on to consumers. Price increases to consumers would depend on the particular petroleum product; retail gasoline prices, for example, would increase by about 7 cents per gallon.

It is ironic that the desire to limit the flow of income from consumers to producers has the side effect of putting the U.S. government in the business of subsidizing oil imports, a large part of which come from OPEC - the villain of

the price increase in the first place. But the government is incapable of dictating the selling price of oil produced outside the U.S., and as long as the U.S. price is controlled and imports fill the gap between domestic production and demand, a subsidy for imports is a logical necessity. As imports continue to grow, greater and greater strains will be placed on the tax and subsidy program. As the total dollar volume of ths subsidy increases and the domestic base for the tax shrinks, continuation of the program will ultimately require some revenue out of the Federal budget - unless the average domestic price for oil is allowed to rise. The planned elimination of the program early in 1979 seems problematical from today's perspective. The powerful forces that brought the program into being in 1974 will certainly not have disappeared, and no matter what the state of our economy is in 1979, it will be argued that it is too fragile to sustain the shock of increased oil prices. Government manipulation of the oil price may well turn out to be a permanent feature of the U.S. eocnomy.

The second major policy directed at maintaining a low domestic price of energy is the long-standing regulation of the price of natural gas by the Federal Power Commission. The average price of natural gas at the wellhead has been held far below the world price of energy for a long time, and this has resulted in domestic shortages of natural gas well before the 1973 oil embargo. This policy results in a substantial subsidy for the consumption of natural gas by those who are able to obtain it (mainly households but also industries in some parts of the country). Those unable to obtain natural gas must shift their demand to oil or electricity. The effect of this price policy has been to increase the demand for energy by about one or two million barrels of oil-equivalents per day, and thus is a major contributor to the import problem. The policy has also limited the supply of natural gas, since even the prices for new contracts have been held well below world prices.

It is likely that the Federal Power Commission will significantly increase new contract prices - but probably not to the level of the world price - and average wellhead prices will rise only slowly as old contracts expire. The deregulation of natural gas markets has made little progress, again because of the redistribution of income from consumers to producers that it entails.

Where is energy policy headed? In the next two or three years, national energy policy will be forced to resolve the conflict between low prices and self-sufficiency. The dangers of mistakes in energy policy are as much in adopting inappropriate and costly programs as in failing to adopt economically sensible programs. Sound economic principles lead to a set of recommendations, first about what policy should not do, and then what it should do.

What Energy Policy Should NOT Do:

Continuation of present policies that keep the price of energy artificially low are likely to bring about two responses from policy-makers, neither of which is desirable. First, there will be growing pressure to control energy consumption by methods other than price increases. A variety of schemes are likely to be devised, including controls on the types of cars that people are permitted to buy and on the speed they drive them and controls on the amount of heating and lighting that they may use. So far, we have tried only the increasingly unpopular and unenforced speed limit reduction and have announced fuel mileage requirements for cars built in the future. Pressure will mount to impose further controls as imports grow. Proponents of these programs label them as "conservation," but that is not a fair use of the term. The energy crisis has long since shaken out much of the pure waste of energy that existed before, and most of the waste that remains is largely the result of selling energy at a price well below its true value.

Controls unnecessarily limit people's choices, and make them worse off by making their lives colder and dimmer and limiting their ability to travel. The problems of enforcing the 55 mph speed limit call attention to the difficulty of making effective any policy for limiting demand below that level that people would freely choose given the price of energy. It is not realistic to project large energy savings from the legislation of reduced temperatures in homes or offices, or reduced travel. Attempts to do the impossible simply discredit the government. Some conservation policies do make good economic sense in the present environment where the price of energy is below its true value, for example, encouraging home owners to insulate their homes by offering them low-interest loans. However, the need for this kind of conservation would shrink dramatically if the U.S. price of energy were raised to the appropriate level.

The second major threat of mistaken policy is that the taxpayers will be asked to finance the difference between the high cost of producing energy in the U.S. and the low price that consumers are asked to pay. For years the U.S. has subsidized nuclear electrical power, yet even today the future of nuclear power is under serious question. Recent policy is moving even further in the direction of subsidized production, as the Energy Research and Development Administration (ERDA) is financing domestic energy projects that make sense only if there is a permanent guarantee from the tax-payers that the output can be sold for <u>considerably more</u> than the current world price. But it is an illusion to think that Americans are better off with higher taxes in place of higher energy prices. Individuals can choose to avoid high energy prices by limiting their consumption, but high taxes must be paid no matter what level of consumption is chosen.

The principal danger from this type of mistaken policy today is deep government involvement in exotic new forms of energy, notably the gasification of coal and the extraction of oil from shale rock. So far private industry has been unwilling to undertake the commercialization of these energy forms, because they are too expensive, and are likely to remain too expensive for some time in the future. Cost estimates for these energy forms are continually revised upwards every year; curiously, the cost of shale oil is invariably estimated to be around $6 above the world price of oil, no matter what the world price of oil happens to be. It is no wonder, then, that private firms are unwilling to construct coal gasification or shale oil facilities - these energy forms are simply bad bets. They are not commercially viable, and are not likely to become commercially viable for years to come, even if OPEC raises the price of oil further. Rather than subsidize costly new energy sources, it is preferable to purchase oil from OPEC at world market prices. Offering government guarantees or subsidies to developers of these energy forms means requiring the nation to pay much more for energy than is necessary.

Those who support government participation in the commercialization of non-conventional energy forms claim that the risk associated with developing these forms is too great to be undertaken by private industry. There is some risk, but almost none is caused by the small likelihood that OPEC will reduce the world oil price. Full decontrol of oil and gas prices will eliminate the risk caused by present government controls. Most of the risk is just the normal uncertainty associated with any venture involving new and complex technology - and is not the reason that private industry is unwilling to undertake these projects. The problem is that these projects are just not commercially viable, and would not become commercially viable even if OPEC were to continue to increase prices at the rate of 10 percent or 15 percent a year for the next ten years.

What Energy Policy SHOULD Do:

1. Eliminate Price Controls on Oil and Natural Gas

It is of primary importance to move quickly towards the deregulation of oil and natural gas prices. Past and current price controls have resulted in shortages, increased imports, and the prospect of higher than necessary prices in the future. In addition, they have resulted in the wasteful consumption of energy resources that have been artificially priced below their true value.

We have already explained how the present system of price controls on crude oil results in the subsidization of a growing level of imports. If present price controls continue, domestic oil production will diminish as demand continues to grow, and we will soon face an unacceptably high level of imports that will ultimately have to be subsidized directly from general tax revenues. It is therefore essential that crude oil prices be decontrolled. This will result in greater discoveries and reserve additions of oil, as well as greater production out of existing but currently uneconomic reserves. By increasing supply and decreasing demand, higher oil prices are a more efficient way to reduce imports than a simple tax that affects only demand. Furthermore, the deregulation of crude oil prices would result in a lessening of the uncertainty over future prices that is now associated with uncertainty over government policy. The decontrol of crude oil prices could be done slowly - perhaps over three or four years - in order to avoid a sudden inflationary shock on the macroeconomy, but the process should begin soon.

The regulation of natural gas markets has been an issue before the Congress for some time, but unfortunately has resulted in no action. Studies of the natural gas market show that if wellhead prices for natural gas are fixed at

their recent levels for the next two years, we will experience shortages averaging about 25 to 30 percent of total demand by the end of that time. Furthermore, these shortages will not be spread out evenly across the country, but will be concentrated in particular areas, so that in some states shortages that are more than 50 percent of total demand will occur. This means that curtailments of natural gas will spread beyond industrial consumers to residential and commercial consumers as well, so that households may have their sources of energy for heating and cooking turned off. But even if curtailments are limited to industrial consumers, they will result in reduced output and increased unemployment, both directly and indirectly through the effects of supply bottlenecks. Obviously shortages such as these would be extremely harmful, and they must be avoided.

Shortages of natural gas could be partially dealt with by importing liquified natural gas (LNG). But just as a scalper is able to sell tickets to a Broadway show at an unreasonably high price when the box office price has been set too low, LNG represents an unreasonably costly alternative to domestic natural gas that, under deregulation, could be purchased at lower prices. In addition, the primary exporters of LNG (Algeria and Indonesia) are members of OPEC. It is interesting to note that recent contracts signed with these exporters call for a wholesale price (after regasification in the the United States) of $4 to $5 per thousand cubic feet - about double the average world market price for energy, and equivalent to oil at $24 to $30 per barrel. Consumers have been saved from higher prices through regulation, only to have to face still higher prices for LNG imports.

The effects of natural gas shortages go beyond natural gas markets, and result in increased demand for oil, coal, and electricity. Users who are unable to obtain natural gas do not conserve energy as an alternative - instead they switch to other fuels, which means greater imports.

Econometric research into natural gas and oil markets indicates that a new contract wellhead price of about $1.70 per thousand cubic feet would be sufficient to clear natural gas markets within two or three years given current crude oil prices, and new contract prices of about $2.00 would be sufficient to clear markets given higher oil prices resulting from the removal of oil price controls. By contrast, the new contract wellhead price has recently been set by the Federal Power Commission at about 50 to 60 cents. The FPC has recently attempted to raise the new contract price to $1.42, but so far has been blocked from doing so by the courts. This policy shift by the FPC represents a large step in the right direction, but is still not enough, since with decontrolled oil prices natural gas would still be underpriced by about 25 percent, and this would result in the need for growing LNG imports.

The decontrol of natural gas markets should proceed in the following manner, assuming the simultaneous decontrol of oil prices. New contract prices should be allowed to rise to $1.50 in the beginning of 1977, to $1.75 by the beginning of 1978, to $2.00 by the beginning of 1979, and new contract prices should be free of all controls by the beginning of 1980. The practice of "rolling in" prices (i.e. averaging high new contract prices with low old contract prices, so that the consumer faces a price somewhere in between) means that average wellhead prices would not reach the $2.00 level until 1983. On the other hand, natural gas supply will increase significantly over the next few years under decontrol.

2. Protect the Poor

Policy-makers have been guided by a strong desire to keep prices paid by consumers from rising. We must recognize that the decontrol of natural gas and crude oil prices will indeed result in higher fuel prices for consumers: retail natural

gas prices will increase by about 40 percent to 50 percent by 1982, and residential fuel oil prices will increase by about 25 percent to 30 percent, and this will place a significant burden on lower income families. A new energy policy must therefore include measures to offset this burden. Expansion of the present food stamp program so that it covers fuel as well as food expenditures is the most promising way to help the poor. Food stamp allotments should be increased and home heating bills (or that portion of a family's rent that would be allocated to fuels) and gasoline purchases as well as food should be covered by the stamps.

The cost to the taxpayer for this program would be modest. The expanded food stamp program would be aimed at the lowest 20 percent of the income distribution, a group that consumes about 7 percent of the energy used for heating, cooking, and transportation in this country, or about .4 billion barrels of oil equivalent per year. Since the complete decontrol of oil and natural gas would result in an average price increase of about $5 per barrel of oil equivalent, the cost of the program would be about $2 billion per year, which represents only a 15 percent increase in the cost of our current food stamp program. An improved stamp program would be much less costly to the taxpayer than subsidizing the energy consumption of all consumers.

3. Prepare Now to Counteract Future Oil Embargoes

Though an improved energy policy would reduce oil imports dramatically, some imports would continue, and it is likely that they will rise over the years as the growth in energy demand associated with economic growth outstrips the growth in domestic energy supply. Dependence on imports raises a serious issue of national security. An anti-embargo policy is essential to prevent OPEC, especially

its Arab members, from influencing U.S. international policy. With effective anti-embargo policies in place, the likelihood of an embargo is diminished, and should one occur its effect is minimized. In the absence of such policies, the threat of an embargo is almost as effective as an embargo itself.

The most important anti-embargo policies are standby programs that can be brought into action quickly after an embargo takes effect. A comprehensive policy should include the following programs:

a. Standby domestic sources of oil. The U.S. has already undertaken a small program for storing a crude oil reserve; this program should be continued and enlarged. In addition, existing government-owned petroleum reserves ought to be brought into production quickly during future embargoes. Finally, state regulation of production should be loosened during an embargo, as it was during World War II.

b. Standby programs for limiting oil consumption. Tax incentives or other methods should be used to induce utilities to prepare to convert to coal in the event of an embargo. This may require the stockpiling of coal in some regions. Federal taxes on oil, especially gasoline, should be increased substantially during an embargo to limit lower-priority uses. Regulated sectors dependent on oil, including trucking, railroads, and airlines, should be permitted to raise their rates immediately to pass through these higher taxes to induce their customers to limit consumption of energy-intensive services.

c. Increase food-energy stamp allotments during an embargo. The adverse effect of increased energy prices during an embargo should be offset for poor families by an increase in their share of food-energy stamps. Since poor families consume relatively little energy, it is not necessary to ask them to make the same proportional reduction in energy consumption during an embargo as families who are better off.

d. Expansionary monetary and fiscal policy. The economy should be kept on an even keel with a limited rate of inflation so that it will never find itself fighting high inflation at the same time an embargo is imposed. Then the country will be in a position to tolerate the modest burst of inflation that inevitably will accompany an embargo. Further, the proper use of the food-energy stamp program will limit the damaging effect of this inflation on the real incomes of the poor. In this environment, some extra stimulus from monetary and fiscal policy will be feasible to counteract the adverse effects of an embargo on unemployment and GNP. We emphasize that both the embargo itself and the expansionary response to it are somewhat inflationary. However, the termination of an embargo and the removal of the anti-embargo policies will have an anti-inflationary effect that will come close to offsetting the original inflation, and an embargo should have no lasting effect on the price level.

These programs would sharply limit the damaging effects of future embargoes. We believe that a successful anti-embargo policy is compatible with fairly high levels of imports, even levels exceeding today's level. Unfortunately many believe that national security can be achieved only with a substantial reduction in oil imports. But permanent import-reduction is an extremely expensive way to guard against a temporary embargo that may never come. A large reduction in imports can be achieved only with a large increase in the U.S. price level. Experience with the 1975 tariff on oil imports showed unequivocally that the tariff not only increases the price of the oil we import, but also increases the price of the oil produced here by the same amount. Moreover, a tariff on oil increases the prices of other energy sources as well. A deliberate policy of inflation to limit oil imports is simply counter-productive, especially when there are better ways

to achieve the goal of security that are not at all inflationary except in the unlikely event of an embargo.

Had the above rules been followed during the 1973-1974 embargo, the stress placed on the country at the time would have been much less. In fact, government policy did nothing to increase domestic supplies during the embargo. Government reserves were not brought into production, nothing was ever done about state restrictions on production, and efforts to limit oil consumption were limited to the 55 mile an hour speed limit. As prices rose, little was done to help the poor, and the lack of assistance to the poor was a major obstacle to a constructive response to the embargo. In addition, the government did not meet the embargo with an expansionary monetary and fiscal policy - instead a tax increase was proposed while the effects of the embargo were still being felt, and monetary policy during and just after the embargo were more contractionary than at any time in the previous 30 years.

The federal government relied almost entirely on a single tool to deal with the embargo. It created a gigantic bureaucracy, the Federal Energy Administration, which attempted to make itself responsible for the movement of every barrel of oil in the United States. Even though the FEA did nothing to increase supply, and very little to decrease demand, it thought that somehow it could "allocate" oil to users so that everything came out even anyway. But allocation without balancing supply and demand was impossible, and the result was long lines for gasoline.

4. Support Energy Research

Though the government should keep out of the development and production phases of energy supply, government support of basic research on a reasonable scale is a good economic policy. Better knowledge of energy sources not currently in wide-

spread use has an especially high social value beyond the incentives facing private researchers. Ideas and techniques developed in publicly-supported research should be made freely available, and the private sector can be counted upon to commercialize new energy sources that make good economic sense, without any government subsidies.

Good candidates for research support include solar energy, which is the only source of power free of thermal pollution, as well as new technologies for energy conservation. On the other hand, coal gasification and shale oil, although non-conventional, are beginning to move beyond the research stage, and should only receive support aimed at the development of new technologies that might make these energy sources economic in the future.

In addition, there should be a shift in the current allocation of research funds. Currently over 45 percent of all energy research funds is directed towards nuclear power while only 5 percent is allocated to conservation. Given the potential environmental and security hazards of nuclear power, together with its questionable economic viability, we would do well to re-allocate some of these funds to other non-conventional energy sources.

5. Undermine the OPEC Cartel

Today's high world price for energy is directly the result of the monopoly power of OPEC. The difficult problems of energy policy would largely disappear if OPEC were to disintegrate and the price of oil were to fall to $3 or $4 per barrel. Even though OPEC is by all appearances in robust health today, the U.S. should do whatever it can to weaken the cartel and encourage its members to cut the price of oil. M.A. Adelman of M.I.T. has proposed an ingenious scheme that deserves a trial. Under the Adelman plan, tickets would be sold in an anonymous auction to the highest bidders. Each ticket would give the holder the right to

import one barrel of oil. The tickets would be freely transferable, and an active resale market would be encouraged. The system would encourage cheating by permitting OPEC countries to establish brokers who would bid for and purchase tickets in the United States.

Suppose that Libya would like to increase its production by selling a certain amount of oil to the United States at a price $2.00 below the posted OPEC price. Then a broker representing Libya would bid for and purchase tickets (at a price of $2.00 per ticket) that would be transferred to an importing company in return for an agreement to buy oil from Libya. This kind of price undercutting would be hard to detect, since Libya would appear to be selling oil at the posted price, but in fact would be giving a $2.00 rebate to the U.S. Government in return for an assured sale.

It would be unwise to put too much hope in the success of this plan in spite of its ingenuity. It may result in some price undercutting, but it is unlikely to significantly weaken OPEC, and policy-makers should probably plan on OPEC setting the world oil price for years to come. On the other hand the plan could at least result in the collection of substantial revenues at OPEC's expense, and it should therefore be implemented as soon as possible.

The Outlook for Energy Policy

If our present policies are continued, and if our GNP grows in real terms by about 4 percent per year, the total demand for energy in this country will reach about 44 million barrels per day of oil equivalent by 1980. Domestic production, however, will remain roughly constant at 32 million barrels per day. This will mean a growth in oil imports to around 12 or 13 million barrels per day (about 30% of our total energy consumption, and 70 percent of our oil consumption), or else increased subsidization of high-priced non-conventional energy sources and increased imports of high-priced LNG to help close the growing gap between consumption and production. Although the average price of all domestically produced energy could

be held below $8.00 per barrel of oil equivalent, the true cost of energy to consumers would begin to rise rapidly as greater tax revenues are used to support the import program and to subsidize non-conventional sources, as taxes are imposed on energy consumption, and as the cost of LNG imports is averaged in with the cost of domestic energy and oil imports.

On the other hand, if the policies outlined above are adopted, the total demand for energy would rise to only 40 million barrels per day in 1980, and supply would increase to 34 or 35 million barrels per day. This would mean a reduction in oil imports to about 5 or 6 million barrels per day, a level that would impose no strain on the country's economic and political security. The price of energy would rise to an average of about $12.50 per barrel, but the poor would be buffered from this price increase, and consumers in general would have the option of avoiding some of the extra expense by using less energy - as opposed to being forced to subsidize the lower price through their taxes.

Adoption of the set of policies we recommend would be a startling turnabout. For the next few years, at least, policy-makers are likely to choose to limp along under the present regime of cheap energy for consumers achieved by subsidizing a growing volume of imports from OPEC. Very soon, however, the limitations of this policy will become painfully apparent. It is only a matter of a few years until the continuation of the present level of subsidy will be feasible only if funds from the federal budget are available to augment the diminishing yield of the present heavy tax on domestic oil production. Then we will enter an era of a growing flow of funds directly from U.S. taxpayers to OPEC, or preferably, growing acceptance of the need for a higher energy price. But it would be much better to anticipate this problem by moving today toward higher energy prices. Delay will only make the eventual accommodation to the high world energy price all the more difficult.